



OBLIQUE PERCUTANEOUS IN-SITU CANNULATED SCREW FIXATION OF STABLE SLIPPED CAPITAL FEMORAL EPIPHYSIS- OUR SURGICAL EXPERIENCE

Orthopedics

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ABSTRACT

Introduction: The percutaneous in-situ pinning perpendicular to the physis has been described as the standard technique for fixing mild to moderate stable Slipped capital femoral epiphysis. In this study we are going to discuss about our results using an alternative anterolateral oblique pinning technique for SCFE.

Methods: We treated 10 patients by this technique from June 2015 to May 2017. The average age of the patients was 12 years with the range between 10 to 15 years. Only mild to moderate slips as measured by Southwick angle of less than 60 degrees in frog leg lateral view were included in this study.

Results: None of the patients developed complications like screw penetration, AVN, chondrolysis, slip progression or breakage of screw. There was restriction of terminal 10 degrees abduction in 6 patients and obligatory external rotation on hip flexion in 3 patients.

Conclusion: To conclude anterolaterally based insitu oblique screw fixation is a relatively easier technique providing better stability without risk of complications.

KEYWORDS

Slipped capital femoral epiphysis (SCFE), percutaneous in-situ pinning, oblique screw fixation

Introduction:

Slipped capital femoral epiphysis (SCFE) is a common adolescent hip disorder with a male predominance. The growth plate fails letting the femoral metaphysis displace anterosuperiorly in relation to capital femoral epiphysis. This results in a three dimensional deformity with the distal fragment in varus in the coronal plane, extended in the sagittal plane and externally rotated in the axial plane. The percutaneous in-situ pinning perpendicular to the physis has been described as the standard technique for fixing mild to moderate stable SCFE1. Recently few articles have described the usage of anterolateral screws inserted oblique to the physis2 rather than anteroposterior screws perpendicular to the physis. In this study we are going to discuss about our results using this anterolateral oblique pinning technique.

Methods:

We treated 14 hips in 10 patients by insitu pinning from June 2015 to May 2017. Of them 4 patients had prophylactic pinning of opposite hip. Hence we had operated using oblique insitu screw fixation technique in 10 hips. Among the 10 patients 9 were boys. The average age of the patients was 12 years with the range between 10 to 15 years. Only mild to moderate slips as measured by Southwick angle of less than 60 degrees in frog leg lateral view were included in this study.

Surgical Technique:

The patient is positioned in the fracture table without traction and care is taken not to internally rotate the limb beyond neutral (patella facing the roof) to avoid inadvertent reduction. The opposite limb is placed in lithotomy post. The limb is prepared and draped in a standard manner. Under image intensifier control, a guide wire is placed over the skin and marked such that it passes through the centre of the head and neck in the AP view. But in the lateral view it should be close to the posterior neck so that a more lateral starting point could be chosen. The entry point is taken at the intersection of these two marking lines



(Fig. 1). The guidepin is passed freehand such that it gains purchase in

the anterolateral femoral cortex and lateral to intertrochanteric line in the AP view. The guidepin is drilled and advanced by adjusting it in in both the planes under image intensifier guidance such that it crosses the physis in an oblique direction. A half an inch stab incision is made. After drilling and measuring, a 6.5 mm fully threaded or 32 mm threaded cannulated cancellous screw of appropriate length is inserted (Fig. 2).



Care should be taken that at least 4 threads3 cross the physis but without breaching the subchondral bone. This should be confirmed by taking oblique views in addition to the standard AP and lateral views. Partial weight bearing with crutches is allowed depending on pain tolerance.

Results:

None of the patient had joint penetration by the screw. There was no complications like avascular necrosis, chondrolysis, slip progression or breakage of screw. After an average followup of 10 months all the operated physes closed. There was restriction of terminal 10 degrees abduction in 6 patients and obligatory external rotation on hip flexion in 3 patients.

Discussion:

For mild to moderate stable SCFE, the classical teaching is to use center-center screw perpendicular to the physis1. But to apply in such a pattern carries a few disadvantages. In high degree slips the entry point is very much anterior resulting in anterior femoro acetabular impingement (FAI)4 due to prominent screw head and neck of femur fractures5. FAI may cause pain, irritation and restricted range of motion. To avoid this, an entry point lateral to intertrochanteric line as suggested by Wenger et al.4 has been used. The distance between the physis and the subchondral bone is less when the screw passes perpendicularly. But if the screw is passed obliquely we can get space

for an additional thread resulting in increased stability². Biomechanical study comparing perpendicular and obliquely placed screws has shown no difference in stability in both patterns⁶. The limitation of our study is that it is a case series with smaller number of patients and relatively short follow-up. Also there is no control group or comparative analysis. To conclude, anterolaterally based insitu oblique screw fixation is a relatively easier technique providing better stability without risk of screw penetration, FAI, AVN and femoral neck fractures.

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