Slipped Upper Femoral Epiphysis: A Retrospective Study of Fixation With A Single screw: The Importance of Correct Screw Placement To Obtain Good Results

Rajeev Kanwar, Amin Muneer, Bhushan Rao, Ram Vallamshetla, Vijay Killampalli, Christopher Bache
Paediatric Orthopaedics, Birmingham Children,s Department, Birmingham, United Kingdom

Introduction: When SUFE has been diagnosed, the goal of the treatment is directed towards prevention of further slippage and to enhance fusion of the physis. Previously, conservative treatment in a spica cast was advocated, but has been eventually proven to be inferior to surgical treatment. Amongst the many surgical procedures advocated, in situ pinning using a single screw has been shown to have better long term results.

But pinning of SUFE is not without complications. Avascular necrosis of the femoral head, chondrolysis, continued slippage of the slip, wound infections, persistent pain and penetration of the screw into the joint have been known to complicate the surgical procedure.

In this study we attempted to determine the success rate of fixation of SUFE with a single cannulated screw. The position of the screw in the capital femoral epiphysis and the number of treads of screw across the physis are determinants of successful outcome.

Materials and Methods: 56 children (79 hips) with SUFE were included in this retrospective study. There were 23 bilateral cases. Prophylactic pinning in 15 cases. The slips were graded in severity; 18 preslip, 37 mild, 19 moderate and 9 severe. All hips pinned in situ. Partially threaded screws used in 45 hips, fully threaded screws in 34. Average follow up was 4 years (2—8).

Radiologically position of screw in the capital femoral epiphysis and number of threads across physis critically analysed. The head of femur was classified into three zones on both AP and lateral views; Central, Intermediate and outer. Fixation considered good if the pin was in central zone on both AP and lateral views. The fixation was satisfactory if the pin was in intermediate zone and poor if pin in the outer zone.

Results: Following the above criteria, 27 hips were good, 33 satisfactory and 19 poor. 37 hips had 4 threads across the physis, 27 had 3, 11 had 2 and 4 hips had 5 threads across physis. Overall 88% had no pain at long term follow up. Slip was controlled in 96%. In three hips screw penetrated joint.

In three hips, screws backed out. AVN was encountered in one hip and sub-trochanteric fracture in another. Three patients had revision surgery, six proceed to imhauser osteotomy Central screw placement had predictably good outcome. Screws with less than three threads crossing the epiphysis or in non central positions were associated with complications.

Discussion: SUFE is a common disorder in the adolescent hip. Our study supports the currently believed demographic facts about SUFE. The average age at which girls present with SUFE is earlier than that seen in boys. In our study the male female ratio was 2:1.

Our study also supports the commonly held belief that SUFE is more commonly seen in patients who were above the 90th centile on the age-weight chart.

There was no demonstrable difference between the outcomes of the hips which were fixed by partially threaded screws and hips fixed by fully threaded screws.

Screw placed in the central zone had predictably good outcome and screw in peripheral zone was associated with complications. Most of the complications mentioned above were encountered in ‘good’ slips which were fixed in a ‘bad’ way, and not necessarily in ‘bad’ slips which were fixed in a ‘good’ way.

In SUFE, the capital femoral epiphysis is inferior and posterior. Thus to get the screw in the centre of the physis, the entry point for the screw has to be more medial on an AP view, and more anterior on a lateral view.

Pin placement is critical for obtaining good results. Ideally a minimum of three threads are needed to cross the physis in both views. This is best achieved with central pin placement on both AP & lateral views.