Outcomes of Slipped capital femoral epiphysis after in situ pinning

Essay

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By

Ahmed Abd Elmoniem Hamed

(M.B. B.Ch.)

Supervised by

Prof. Dr

Yehia Tarraf

Professor of Orthopedic surgery

Faculty of Medicine, Cairo University.

Prof. Dr

Hisham Abdel-Ghani

Professor of Orthopedic surgery

Faculty of Medicine, Cairo University

Faculty of Medicine

Cairo University

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Abstract

Slipped capital femoral epiphysis (SCFE) is the most common hip disorder in adolescents. The goal of treatment is to achieve premature closure of epiphysis to prevent further slippage. Outcomes after in situ pinning include complications and subsequent treatment from re-pinning and reconstructive surgery. Residual pain and functional disturbance through leg length discrepancy and impingement is the most common outcome.

Key words: Outcomes, SCFE, after in situ pinning.

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AVN	=	Avascular Necrosis.
CT	=	Computerized tomography.
FAI	=	Femoroacetabular impingement.
LESA	=	lateral epiphyseal-shaft angle.
MRI	=	Magnetic resonance imaging.
OA	=	Osteoarthritis.
PSA	=	Posterior sloping angle.
ROM	=	Rang of motion.
SCFE	=	Slipped capital femoral epiphysis.

INTRODUCTION

Slipped capital femoral epiphysis (SCFE) is the most common misdiagnosed hip disease in adolescence. It affects the proximal femoral epiphysis with the femoral head maintaining its normal relationships with the acetabulum and an anterioro-superior dislocation of the femoral neck at the physeal plate level (exception for the rare valgus slip, where the displacement is posterior-superior) ***(Segal et al., 1991).***

Previous long-term studies have shown good outcomes for most patients after in situ pinning of SCFE. However the concern is growing about the effects of leaving the epiphysis in a non anatomic position, residual pain and others outcomes that happened after in situ pinning which lead to further operations as re-pinning and reconstructive surgery ***(Larson et al., 2012).***

The aim of study:

The aim of this study to explore the different studies and literatures those concerned about the outcomes after in situ pinning which include complication, success rate and subsequent surgeries.

CLASSIFICATIONS OF SCFE

Slipped capital femoral epiphysis is classified according to the stability and the degree of slippage.

The preferred clinical classification for SCFE is based on physeal stability, which is determined by the ability of the child to bear weight on the affected leg ***(Loder et al., 1993).***

A) Classification according to stability:

1-Stable*:* It is considered stable when the child is able to walk with or without crutches, ultrasound demonstrates metaphyseal remodeling and the absence of an effusion ***(Beaty et al., 2001).***

2-Unstable*:* It is considered unstable when the child cannot walk with or without crutches, the ultrasound demonstrates the absence of metaphyseal remodeling and the presence of an effusion ***(Beaty et al., 2001).***

Although this classification is useful in estimating the risk of osteonecrosis but it does not describe the magnitude of the resulting hip deformity.

Furthermore, a recent study reported that some clinically unstable slips were noted to be stable at the time of surgical dislocation and

some clinically stable slips were tenuously perched on the neck ***(Kuzyk et al., 2011).***

B) Classification according to degree of slippage:

Degree of slip was classified based on percentage of the width of the femoral neck:

1-Mild (<33%).

2-Moderate (33% to 50%).

3- severe(>50%) **(Fig.1)** ***(Wilson et al., 1965).***

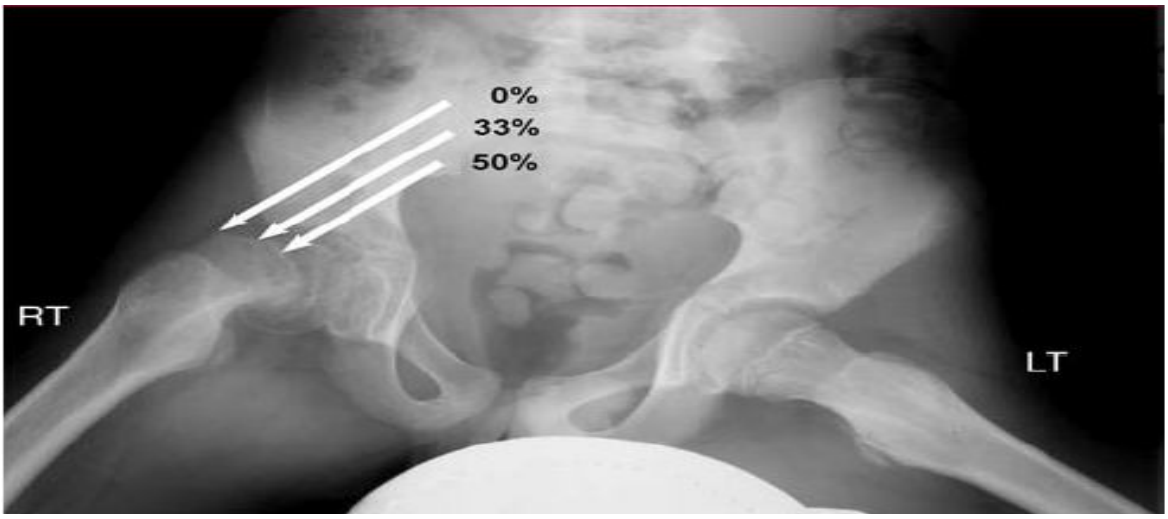

Fig.1 Frog-leg lateral pelvis radiograph showing moderate SCFE of the right hip and a normal left hip. Classification is based on the percentage of displacement of the epiphysis on the width of the metaphysis (mild, < 33%; moderate, 33% to 50%; severe, >50%) ***(Aronson et al., 2006).***

Southwick developed a classification that describe slip severity and that was also useful for planning corrective intertrochanteric osteotomy. The angle of the epiphysis to the femoral shaft is measured on the frog-lateral radiograph **(Fig. 2)** ***(Southwick, 1967).***

The degree of slip is calculated by subtracting the epiphyseal-shaft angle of the unaffected side from the corresponding angle on the side with SCFE. A value of 12° is used in persons with bilateral SCFE. Severity of the slip is classified as mild (<30°), moderate (30° to 60°), or severe (>60°).

This classification is the most useful for describing the deformity because it measures malalignment in the sagittal plane, thereby it demonstrating the amount of flexion that required for correction as intertrochanteric osteotomy ***(Kuzyk et al., 2011).***

Fig.2 Frog-lateral pelvis radiograph of a patient with bilateral SCFE. A line is drawn parallel to the physis and second line is drawn perpendicular to it. The epiphyseal-shaft angle is the angle between this second line and a line drawn parallel to the femoral shaft. In the left hip the epiphyseal-shaft angle measures 47° with a resultant slip angle of 35° (47°-12°). The metaphyseal bump is marked with an asterisk ***(Kuzyk et al., 2011).***

PATHOMECHANICS OF SCFE

The position of the proximal physis normally changes from horizontal to oblique during preadolescence and adolescence, to redirecting the hip forces from compression forces to shear forces. This shear forces increased by an association between femoral neck retroversion and a reduced neck-shaft angle in SCFE ***(Rab et al., 1985).***

Sequelae of SCFE include proximal femoral deformity, femoroacetabular impingement between the anterocranial femoral metaphysis and the adjacent acetabulum may result with compromised load-distribution function of a malpositioned femoral head ***(Kordelle et al., 2001).***

Deformity in SCFE:

The deformity resulting from SCFE occurs not only in the sagittal plane but may also involve deformity in the coronal plane and axial plane ***(Kuzyk et al., 2011).***