The Use of Modified Dunn Procedure in the Treatment of Adolescent Slipped Capital Femoral Epiphysis

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LIST OF ABBREVIATIONS

SCFE	Slipped Capital Femoral Epiphyses
MFCA	Medial Femoral Circumflex Artery
FAI	Femoro-Acetabular Impingement
AVN	Avascular Necrosis
CT	Computed Tomography
MRI	Magnetic Resonance Imaging
WOMAC	Western Ontario and McMaster Universities
AP	Antero-Posterior
ROM	Range Of Motion
H.O	Heterotopic Ossification
O.A	Osteoarthritis
BMI	Body Mass Index
LLD	Limb Length Discrepancy

ABSTRACT

Introduction: Surgical procedures with use of traditional techniques to reposition the proximal femoral epiphysis in the treatment of slipped capital femoral epiphysis are associated with a high rate of femoral head osteonecrosis.[56] Therefore, most surgeons advocate in situ fixation of the slipped epiphysis with acceptance of any persistent deformity in the proximal part of the femur.[38] This residual deformity can lead to secondary osteoarthritis resulting from femoroacetabular cam impingement.[57]

Objective: The primary aim of our study was to report the results of the technique of capital realignment with **Ganz** surgical hip dislocation and its reproducibility to restore hip anatomy and function.In this study we looked for: (1) Radiological outcome, slip angle and alpha angle. (2) The incidence of major complications especially AVN. (3) Clinical outcome with recording the range of motion of the hip and evaluating short-term clinical scores (Merle d'Aubigne´-Harris hip score -WOMAC). (4) The extent of intra-articular damage and relating this to clinical stability and symptom duration. (5) Comparing our results to what was reported in the literature.

Patients and Methods: This prospective case series study included thirty-one patients (32 hips, 21 Lt hip and 11 Rt hip) with stable chronic slipped capital femoral epiphysis after surgical correction with a **modified Dunn** procedure.

This study included 26 males and 5 females. The mean age of our patients was 14.26 years (11-17 years). The mean duration of symptoms before the operation was 8.42 month (1 -26 months). Mean follow up period was 16.11 month (7- 40 month).

The mean preoperative Alpha angle was 99.97^0 (range 87^0 - 109^0). The mean preoperative Slip angle was 56^0 (range 40^0-75^0).

Harris hip score was done for all patients pre operatively and its mean was 67.91 (ranged from 61-74), mean Womac score was 64.03 (range 54-72), mean Merle d'Aubigne score was 12.09 (range 11-14).

Results: Twenty-seven patients, (28 hips) had excellent clinical and radiographic outcomes with respect to hip function and radiographic parameters. Four patients had fair to poor clinical outcome including 2 patients developed AVN, one case of deep infection and a case of limited flexion. The difference between those who developed AVN and those who didn't develop AVN was statistically significant in postoperative clinical scores (p 0.000).

The mean slip angle of the femoral head was 56^0 preoperatively and was corrected to a mean value of 12^0 postoperatively with mean correction of 44^0 (p 0.000). Mean postoperative Alpha angle was 47^0 (ranged from 25^0-60^0), with mean correction of 53^0(p 0.000).

Post operative flexion was ranged from 30 to 130 with mean of 104.34. Post operative IR in 90^0 flexion was ranged from 10 to 50 with mean of 40.Post operative ER in 90^0 flexion was ranged from 15 to 60 with mean of 45.

As regarding postoperative HHS, in our series its mean was 96.3 (ranged from 65 to 100) mean correction was 28.5 (p 0.000). Mean WOMAC score was 97 (ranged from 72 to 100) with mean correction of 33 (p 0.000). Mean Merle d'Aubigne score was 16.8 (ranged from 10 to 18) with mean correction of 4.8 (p 0.000).

Conclusions: This study showed that the treatment of slipped capital femoral epiphysis with the **modified Dunn** procedure allows the restoration of normal proximal femoral anatomy by complete correction of the slip angle, such that probability of secondary osteoarthritis and femoroacetabular cam impingement may be minimized. It also allowed direct inspection, preservation of physeal blood supply and inspection of intra-articular pathology which can be evaluated and treated at the time of operation.

The complication rate from this procedure in our series was low as compared to what was reported in other series in the literature.

INTRODUCTION AND AIM OF THE STUDY