

Surgical Dilemma in a Case of Residual Perthes Disease

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Abstract

Introduction: The treatment strategies of Perthes disease is not established yet, there are many school of thoughts about the approaches and the management but the disease is so complex that following a particular strategy without applying another can result in a spectacular failure in providing the basic goals of treatment.

Case presentation: Here we are presenting case report of a 12-year-old boy, who developed right Perthes disease. He has had a past surgical history of undergoing varus femoral osteotomy of the right side at the age of 9 years and underwent varus femoral osteotomy of the left side at the age of 10 years. Postoperatively, he was treated with partial weight bearing crutches. At 12 years of age, range of motion (ROM) of his left hip was markedly limited at 30° flexion, 10° abduction, 70° external rotation, and -20° internal rotation with a difficulty maintaining a sitting position. On plain radiography, aspherical incongruency noted (Stulberg class 5). CT showed collapse of the femoral head on coronal plane but the ball-shape was maintained in the posterior femoral head on sagittal and transverse sections and hence a decision of Valgus-flexion-internal rotation osteotomy was taken to improve the ROM.

Result: Left hip ROM improved to 90° flexion, 20° abduction, 50° external rotation, and 40° internal rotation immediately after the surgery. He was able to sit 10 months postoperatively but was left with a limp and limited ROM in the left hip at 60° flexion. Chondroplasty was performed during the plate removal surgery at 10 months postoperatively, which improved hip flexion to 100° immediately after the surgery. The patient was left with limited ROM of 60° flexion of the left hip at the final observation.

Conclusion: Femoral osteotomy to improve ROM could be an option for residual deformity of Perthes disease.

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I. Introduction:

Legg-Calvé-Perthes disease, or osteochondrosis of the femoral head, occurs predominantly in boys 4 to 7 years of age. The disease progresses through synovitis, necrosis, fragmentation, and a residual stage. Outcome can be affected by age at disease onset, the extent of femoral head involvement as determined by x-ray, and the degree to which normal range of motion is maintained.¹ Based on the incidence study in India it was noted that the minimum incidence of Perthes' disease in Udipi Taluk on the western coastal plain of south India was 4.4 per 100,000 children aged 5 to 14 years, while the prevalence survey suggested that the incidence may be as high as 14.8 per 100,000 children. The studies showed that there is a marked geographical variation in the incidence of Perthes disease in south India, the disease being much more common in the western coastal region than elsewhere.²

The aim of treatment is to achieve sphericity by containing the epiphysis within the acetabulum. A uniform regime of management cannot be recommended for all patients. Prolonged weight relief in containment appears to be the most satisfactory method of treatment in those with poor prognosis. Operation is necessary to provide containment in the presence of epiphyseal protrusion, and may also shorten the length of treatment in some younger patients. In the majority of young children the use of abduction braces which permit walking is recommended.³

II. Case presentation

A 12-year-old boy presented to us with pain in the right hip. He was a known case of right Perthes disease diagnosed at 9 years of age (classified as lateral pillar classification group B, Catterall group 3). Varus femoral osteotomy was performed on the right side. Left hip pain and left Perthes disease was diagnosed at 10 years of age. No significant medical and family history



Fig 1. Early stage, lateral pillar group B



Fig. 2. Varus femoral osteotomy

The patient walked on crutches postoperatively to relieve load on the left leg. Limited ROM of the left hip was evident. He limped and had difficulty sitting but did not have pain. ROM in the left hip was 30° flexion, 10° abduction, 70° external rotation, -20° internal rotation, and Drehmann sign-positive. On plain radiography (Fig. 3). Poor congruency of the joint surfaces at maximum abduction and adduction was also detected on functional image of plain radiography.



Fig. 3 Stulberg class 5

CT showed collapse of the load-bearing part of the femoral head on the coronal plane but the ball-shape was maintained in the posterior femoral head on sagittal and transverse sections. Salvage surgery was done to improve ROM. 30° flexion osteotomy for the restricted flexion, 30° internal rotation osteotomy for restricted internal rotation, and 20° valgus osteotomy for restricted abduction.

The ROM improved immediately postoperatively from flexion 30° to 90°, abduction 10° to 20°, external rotation 70° to 50° and internal rotation -20° to 40°. The limp persisted, but walking was possible at 9 months postoperatively. A Chondroplasty was done during plate removal surgery at 10 months postoperatively and hip flexion improved to 100° immediately postoperatively, but a limited hip ROM of 60° flexion, 20° abduction, 60° external rotation and 15° internal rotation remained at the final observation.

III. Discussion:

There are many management modalities for Perthes hip to be followed but a treatment strategy for residual deformity after skeletal maturity is yet to be established, an osteotomy for hip arthrosis in young patients require $\geq 80^\circ$ flexion to prevent postoperative spontaneous ankylosis.⁴ Perhaps total hip arthroplasty (THA) should be considered immediately for patients with only 30° flexion. However, THA should be cautiously indicated, considering the patient's young age and because high revision rate was reported THA for sequelae of Perthes disease.⁵ Choi et al. performed valgus osteotomy for a noncontainable Perthes hip to obtain

congruency with added flexion-internal rotation osteotomy.⁶ The surgery we performed in this patient was similar, but the concept was different. Thus, the goal of the surgery was changed from achieving congruency to restoring ROM. Valgus osteotomy was performed for the limited abduction, flexion osteotomy was performed for the limited flexion, and internal rotation osteotomy for the limited internal rotation .

IV. Conclusion:

To improve the outcome, a Valgus-flexion-internal rotation osteotomy was performed as salvage surgery for residual deformity of Perthes disease, which resulted in improved ROM without having any downtime.

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