



Original Research Article

Efficacy of cheilectomy in patients with bilateral healed legg calves perthes disease

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ABSTRACT

Introduction: Legg calves Perthes disease (LCPD) is caused mainly due to idiopathic osteonecrosis or AVN of the proximal femoral epiphysis leading to remodelling during period of development, this will gradually progress into onset of hip osteoarthritis depending upon the rate at which the sphericity and congruency of the femoral head deteriorate. LCPD is usually associated with a hinge abduction deformity, in this condition the major aspherical portion of the head is shifted laterally, in such deformity; Valgus intertrochanteric osteotomy has to been utilized for correction. Cheilectomy deals with excision of exuberant portion of femoral head epiphysis, thereby eliminating hinged abduction and facilitating containment, which also maintains the blood supply, buy protecting the surrounding soft tissue structures.

Materials and Methods: We have included 10 patients for this study, from age group 9-16yrs, between July 15th to April 18. The criteria for patient selection being primarily adolescent age with radiological evidence of LCPD, with coxa plana and decreased range of motion. Patient under 10 years of age and with history of previous surgeries have been excluded. All the patients were planned preoperatively and operated under spinal anaesthesia. Through posterior kocherlangenback approach, capsulotomy was done posterior-superiorly and lateral protuberance was identified and excised. A common feature through most surgeries being femoro-acetabular impingement (CAM type) secondary to aspherical femoral head. There were a total of 7 cases of complex CAM type deformities and 3 pincer induced deformities. Postoperatively weight bearing and ROM was restricted for 4 weeks. Physiotherapy protocol was followed for improving ROM. Patients were followed at 4,8,12 weeks to evaluate clinical and radiological progress.

Results: Majority of the patient experienced improved pain after surgical intervention and 1 patient had worsening of pain at 3 months of followup. 2 patients had complication of delayed wound healing due to superficial infections. No further complications such as osteonecrosis and non-union were not observed.

Conclusion: Though this study we can conclude that osteochondroplasty of the femoral head and neck performed in conjunction with other procedures, through the surgical dislocation of hip approach has improved pain and restored function in a majority of the patients, while avoiding any dreaded complications. Although the results were satisfactory in a 3 month follow up, we may conclude that a long term follow up is needed for the efficacy of this method in restoration of painless joint function and avoidance of arthroplasty at a later date.

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1. Introduction

Legg calves Perthes disease (LCPD) is caused mainly due to idiopathic osteonecrosis or AVN of the proximal

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femoral epiphysis leading to remodelling during period of development, this will gradually progress into onset of hip osteoarthritis,¹ depending upon the rate at which the sphericity and congruency of the femoral head deteriorate. The management should first begin by identifying the risk factors which will affect the prognosis of the condition, such as age of onset, the amount of necrosis, and level of femoral head extrusion. Further a treatment plan should be proposed that will be focused on intervening the remodeling so as to prevent further deformity and disability to the patient.^{2,3} Depending upon the presentation of the patient, various methods have been designed: Triple Pelvic Osteotomy, remodeling the acetabulum with shelf acetabulo-plasty, and femoral Varus or Valgus osteotomy to prevent the deformity. Stulberg classification divided into 5 stages, based on the radiographic evaluation at skeletal maturity is as follows:

1. Stage 1 for a hip with no abnormalities on radiography.
2. Stage 2 for a spherical femoral head with normal sphericity.
3. Stage 3 for an oval femoral head.
4. Stage 4 for congruent coxa plana.
5. Stage 5 for incongruent coxa plana.

Also, the Sanctis MRI classification, based on percentage of epiphyseal necrosis and 2 risk signs (lateral extrusion and physeal involvement) is used for assessment. Last stages of the condition having the worst prognosis. Presentation with a painful hip has been observed in patients even before the onset of hip osteoarthritis or impingement in the 1980's by Gross beard and later Catterall, associated with labral lesions.^{3,4} The subsequent proximal femoral deformity associated with growth disturbance becomes evident with varying severity often associated with FAI, enlarged and deformed femoral head, etc. Usually impingement occurs between the head and neck junction of the femur and acetabular rim, mostly seen in the anterior portion, this is termed as Femoro-acetabular impingement. In Legg CalveePerthes disease, impingement occurs due to the asphericity of the head, termed as CAM type of impingement, or due to abnormal coverage of acetabulum over the femoral head, termed as Pincer type of impingement.

LCPD is usually associated with a hinge abduction deformity, in this condition the major aspherical portion of the head is shifted laterally, in such deformity; Valgus intertrochanteric osteotomy has to been utilized for correction. But when the aspherical portion of the head is shifted more anteriorly as opposed to laterally, then Femoral valgus ITO fails to provide resolution of the deformity. Accessing the femoral head through surgical dislocation of the hip has proven to provide us with better visualization as well as reducing the associated complications. Cheilectomy deals with excision

of exuberant portion of femoral head epiphysis, thereby eliminating hinged abduction and facilitating containment, which also maintains the blood supply, buy protecting the surrounding soft tissue structures.⁵ Surgical dislocation provides the surgeon with various advantages, such as being able to directly inspect the deformities of the head leading to abnormal hip movements, further the surgeon can then undertake a variety of procedures based of the inspector findings.⁶ In a case report of 10 patients with bilateral deformity of the hip secondary to LCPD, operated with cheilectomy through surgical dislocation of the hip, we can conclude that this approach was useful to alter hip biomechanics so as to delay osteoarthritis, and eventually arthroplasty procedure in adolescents with healed Perthes' disease.⁷

2. Materials and Methods

A total of 10 patients (M:F=4:1), aged between 9 to 16 years, who were admitted into MKCG medical college and hospital, between July 2015 and April 2018 were included in the study. The primary criteria were adolescent age group with radiological Caterall stages 3&4 of Legg Calve Perthes disease, presenting with coxa plana and decreased range of motion. Patients with age < 10 years, or who had a history of previous surgery, or who were suffering from any other systemic illness were excluded from the study. All the patients were operated upon spinal anesthesia. Posterior Kocher-Langenbeck approach was used in all patients. Posterior superior neck capsulotomy was done and the lateral protuberance was identified. At the time of capsulotomy, with the capsule open, the hip was moved through an arc of motion to assess and localize areas of impingement dynamically. The entire protuberance was excised with a sharp osteotome. A common feature for most patients was the presence of intra-articular impingement secondary to the aspherical femoral head (cam-type FAI). A femoral head-neck osteochondroplasty (FHNO) was performed as a first step to remove the aspherical portion of the femoral head in all hips. The extent of the FHNO was assessed both clinically and by C-arm monitoring. There were 12 cases of complex cam-type deformities in which the aspherical portion of the femoral head was too large to enter the acetabulum and 3 cases in which pincer-induced indentation lesion in the anterosuperior aspect of the femoral head/neck was identified. The acetabular rim and the labrum were inspected and Partial debridement of (incompletely) torn labrum was done.

Post operatively patients' weight-bearing was restricted and they were started on exercises focused of improving range of movement of the hip, for 4 weeks. D physiotherapy protocol was followed to improve range of motion. Patients were further evaluated at a follow up of 1, 2, and 3 months postoperatively for clinical evaluation and monitor

progress radiologically. Clinical outcome was evaluated through means of modified Harris Hip score for children.



Fig. 1: Surgically dislocated hip before osteochondroplasty, for inspection



Fig. 2: Surgically dislocated hip post resection of the femoral head



Fig. 3: X-ray of the bilateral hip with pelvis, in symptomatic stage preoperatively



Fig. 4: X-ray of bilateral hip with pelvis, postoperatively

3. Results

Out of a total of 10 patients, 2 were females and the rest 8 were males. Most of these patients had severe restriction of movements especially internal rotation. Adduction, abduction and flexion. Postoperatively 9 out of 10 patients had no fresh complaints and had improvement in pain after the surgery, whereas 1 patient increase in complaint of pain at 3 months follow up, the results have been shown above in Tables 1 and 2. In the above tables we can evaluate that almost all the patients had improved their total ROM not associated with any pain. 2 of the patients had complications such as delayed wound healing due to superficial wound infections, which was managed with oral antibiotics. There were no cases of osteonecrosis, implant failure, deep infection, or osteotomy nonunion during the observation period.

4. Discussion and Conclusion

Legg calve Perthes disease usually results in a variety of deformities usually due to the remodeling seen in the femoral head and acetabulum which can further cause impingement of the femoral head and degenerative disease of the joint young adults.^{8,9} The advantage provided by chielectomy through surgical dislocations of the hip will allow the surgeon to dynamically inspect the hip joint and apply a number of procedures to prevent any further deformity.^{9,10} The aim of this study is to question whether osteochondroplasty of the hip joint performed through

Table 1: Comparing range of motion in female patients

Patient (F)	Abduction	Adduction	Internal rotation	External rotation	Flexion	Extension	
1	8	5	0	5	90	0	Pre-op
2	10	7	0	5	100	0	
1	16	12	8	10	100	5	1 Month follow up
2	17	11	8	10	110	5	
1	20	17	15	12	110	5	3 month follow up
2	22	18	14	14	115	10	

Table 2: Comparing range of motion in male patients

Patients (M)	Abduction	Adduction	Internal rotation	External rotation	Flexion	Extension	
1	8	5	0	8	80	0	Pre-op
2	8	6	5	5	90	0	
3	10	5	0	5	90	0	
4	11	5	0	8	90	0	
5	8	7	5	6	90	0	
6	5	4	0	3	45	0	
7	9	5	5	5	80	0	
8	10	5	0	5	90	0	
1	12	10	8	10	100	5	1 Month follow up
2	14	12	10	7	110	5	
3	14	11	10	7	110	7	
4	12	12	9	12	110	5	
5	15	13	8	10	110	0	
6	10	8	5	5	60	7	
7	15	10	10	10	100	6	
8	13	12	10	10	100		
1	20	16	15	14	110	10	3 Month follow up
2	19	15	14	12	115	5	
3	18	14	13	12	110	7	
4	21	17	15	17	100	10	
5	22	15	15	15	115	5	
6	15	10	7	7	60	0	
7	22	14	15	15	110	10	
8	20	17	13	15	115	10	

the approach of surgical dislocation of hip were able to provide any improvement in the patient wellbeing in regards to pain, deformity and function and to the monitor the complication rates associated with this particular approach. With this approach the surgeon will be able to inspect the femoral head and the acetabular margins to better evaluate the pathology present and to investigate for FAI.^{11,12} This study has allowed us to perform osteochondroplasty of the femoral head in many cases and to check for impingement dynamically, the results have shown us that, there was improvement in patient clinical condition following the surgery, with very few exceptions. There was also improvement in modified Harris Hip score for children with symptomatic LCPD. None of the patient in our study

has required further hip arthroplasty at the latest follow up.^{10,13} We can infer from the study that inspection of the femoral head and acetabulum to check for extra articular and intra articular abnormalities, can only be achieved by surgical dislocation of the hip. The complications rates associated through this approach for various procedures have been minimal.^{10,14} The findings we have provided above are however preliminary and should be interpreted with caution, although this study confirms short term relieve in pain and function, we have to understand midterm and long term follow ups are necessary, to validate if procedures through this surgical approach of hip dislocation has long term benefits of pain free function of the hip and avoidance of further arthroplasty.

5. Source of Funding

None.

6. Conflicts of Interest

There is no conflict of interest.

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