

## Case Report

# Management of post traumatic posterior acetabular labral tear: a case report

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### ABSTRACT

Traumatic acetabular labral tears causing hip instability are rare. Surgical management of posterior labral tear is essential to prevent chronic hip instability and secondary arthritis. We report a 27-year-old female presented following RTA, with posterior hip dislocation along with posterior labral avulsion, managed by surgical repair using suture anchors. Patient had excellent functional outcome at 12 months of follow-up. High index of suspicion for labral injuries is required in patients with posterior hip dislocation and posterior wall fractures. Early surgical repair of torn labrum is must for excellent functional outcome.

**Keywords:** Acetabulum, Labral tear, Surgical repair, Suture anchors

### INTRODUCTION

Acetabular labrum is horseshoe-shaped fibrocartilaginous structure attached to the rim of the acetabulum. It plays a significant role in the stability of the hip joint. It reduces the contact stress by distributing the load transmitted and has sealing effect on synovial fluid.<sup>1</sup> Posterior labral tears occur in consort with posterior acetabular wall fractures which are associated with the posterior hip dislocation occurring as a result of axial loading of the lower limb with hip in more than 90° flexion. Such injuries are usually a result of high-energy trauma (mainly motor vehicle accidents-dash-board injuries). Isolated labral tear without acetabular wall fracture in a dislocated hip is a rare entity.<sup>2,3</sup> In this report we describe surgical management of posterior acetabular labral tear following posterior dislocation of hip in a young female.

### CASE REPORT

A 27-year-old female presented with pain in right groin following a road traffic accident. On examination right

lower limb was shortened, adducted and internally rotated. There was a swelling over right gluteal region, right hip was tender and the movements were restricted and painful. A clinical diagnosis of posterior hip dislocation was made.

After confirming the same on the radiograph, closed reduction was performed by Allis technique (Figure 1A). Though the reduction was congruent; the hip was unstable in 30-40° of flexion. Hence, high tibial skeletal traction was applied and she was further evaluated with computed tomography (CT) of the pelvis with both hips. CT scan revealed rim avulsion fracture of the posterior acetabular wall, head of the femur found to be normal. The acetabular fleck sign was noted in the axial view which is a pathognomonic sign of posterior labrum avulsion (Figure 1B).<sup>4</sup> However, the posterior wall was found to be intact, more suggestive of posterior labral avulsion fracture.

Unstable hip warranted for surgical stabilization of the acetabular labrum. After taking informed consent, patient was positioned left lateral under spinal anaesthesia. Right hip was exposed by Kocher-Langenbeck approach and the sciatic nerve was identified and protected throughout the

procedure. Intraoperatively osteo-ligamentous avulsion of acetabular labrum was noted (Figure 1C). This lesion was unique from the conventional posterior acetabular wall fracture which is commonly associated with posterior dislocation of the hip. The hip was dislocated and was cleared of the intra-articular fragments. The labral avulsion was not amenable to fixation by plates and screws; hence it was anchored to the posterior acetabular wall by three suture anchors. The avulsion was reduced anatomically and the anchors were placed in the postero-superior, posterior and postero-inferior aspect of the posterior acetabular wall and tied using ethibond 2.0. The reduction of the fragment and placement of the anchors were checked under the fluoroscopy.

Post-operatively, upper tibia skeletal traction was applied for three weeks. Static quadriceps strengthening exercises were started from day one. At three weeks, non-weight bearing mobilization was started. Patient was allowed full weight bearing with support at 8 weeks post-operatively. At three months follow-up, patient was pain-free, right hip had full range of movements with good muscle strength. Hence, patient was allowed to mobilize without support. At 12 months follow-up, patient had no complaints and had excellent functional outcome with Harris hip score of 96 (Figure 1D and E).



**Figure 1 (A-E): Radiograph at presentation showing posterior dislocation of the hip. Post closed reduction CT scan showing “Fleck sign” which is pathognomonic of the posterior labral avulsion. Intra-operative picture of the posterior labral tear exposed by posterior approach of the hip. Post-operative radiograph at one year follow-up. Clinical pictures of the patient at one year follow-up.**

## DISCUSSION

The acetabular labrum is a horse-shoe shaped fibrocartilaginous structure firmly attached to the acetabular rim due to its triangular shaped cross-sectional morphology. It has a significant biochemical property by which it opposes the flow of synovial fluid from the central and peripheral compartments by creating a seal in between them. Hence, a negative pressure is developed within the joint which increases the stability of the joint and resists the distraction of the femoral head. It also plays a critical role in providing nutrition to the articular cartilage and assures smooth gliding surface between the femoral head and the acetabulum. Any damage to the labrum leads to increased contact stresses between the cartilage surfaces, in turn increasing the friction between the joint surfaces.<sup>5</sup>

Direct trauma (motor vehicle accident/fall from height) leading to the axial loading of the lower limb with hip

flexed more than 90° is a known cause for labral tears in concurrence to posterior hip dislocation and posterior acetabular wall fractures. Developmental dysplasia and secondary degenerative arthritis are main causes for degenerative tears of the labrum. Causes leading to aspherical femoral head like slipped capital femoral epiphysis, Perthes disease and hip trauma can also lead to the labral tears. Sports personal and athletes are at high risk for labral tears due to their activities. Recently, femoroacetabular impingement (FAI) have been associated with high incidence of labral tears.<sup>6,7</sup>

Tears have been reported in all regions of the labrum. Posterior labral tears are considered to be the most common in studies from Japan, whereas, studies in the US and Europe reveal anterior tears to be most common. The difference is attributed to the difference in the lifestyles of the population. There has been no data in the literature regarding the same in Indian population. The posterior

labral tears are divided into four types: 1. Osseous avulsion and posterior root avulsion tear. 2. Longitudinal peripheral tear and posterior root avulsion tear. 3. Longitudinal peripheral tear. 4. Osseous avulsion tear.<sup>3,6</sup>

Post-traumatic tears lead to incongruent reduction of the dislocated hip. Instability of the hip can lead to re-dislocation of the hip joint. Non-traumatic tears are more common in females (high incidence of dysplasia), more than 90% patients complain of hip or groin pain, majority of patients complain of mechanical symptoms like clicking, locking or catching. Most patients present with limitation of range of movements (mainly rotations). Many provocative tests have been used but none of them have been found to be sensitive or specific.<sup>6</sup>

The presence of acetabular ‘fleck sign’ on the CT scan in the absence of an obvious acetabular fracture is indicative of the labral avulsion from the acetabulum. It was first described by Blanchard et al. in the year 2016 in a series of adolescents presenting with posterior hip dislocation. In non-traumatic tears CT and MRI are less sensitive in diagnosing labral tears. MRA is better investigation than CT and MRI as the pathology is better delineated in a distended joint. MRA has a major limitation as it fails to differentiate between acetabulum labrum and articular cartilage abnormalities. It is also considered less efficient in identifying posterior and lateral tears. Arthroscopy is considered the gold standard for diagnosis of the labral tears; it can also be therapeutic in most of the cases.<sup>4,7</sup>

**Table 1: Decision making for surgical management of labral pathology of the acetabulum.<sup>9</sup>**

Technique	Recommended in
<b>Repair (most common)</b>	Young active individuals, Primary arthroscopy Unstable labral base Adequate tissue quality Labral suction seal able to be restored.
<b>Augmentation</b>	Young active individuals Intact chondro-labral junction Hypoplastic labrum Potential for instability Revision surgery
<b>Reconstruction</b>	Increasing age Loss of chondro-labral junction Ossified labrum Revision surgery
<b>Debridement (least preferred)</b>	Sedentary lifestyle Mild degenerative arthritis Adequate bony stability

Non-operative management in the form of analgesics and focused physiotherapy for 4-6 weeks can be attempted in non-traumatic labral tears (mainly secondary to FAI). Failure to control pain and when there are functional limitations surgical management is indicated. All

traumatic tears with unstable hip require immediate surgical attention.<sup>7</sup> Operative management can be by arthroscopic or open technique (Kocher-Langenbeck approach with or without surgical dislocation of the hip). Unstable hip after reduction of the dislocation is an important contraindication for arthroscopic management.<sup>3,8</sup> Operative management can be debridement, repair, reconstruction or augmentation (Table 1). The main aim of debridement procedure is pain relief. Debridement procedure has a major limitation of high conversion to total hip replacement in near future. Arthroscopic repair using suture anchors has emerged treatment of choice irrespective of the etiology of the tear. Excellent short-term outcomes have been observed in patients undergoing this procedure, however, there is very less data regarding long term results in the literature. Reconstruction/ augmentation rarely necessary in primary setting, Fascia Lata autograft most commonly used.<sup>9</sup>

Our patient had a posterior labral tear with osseous avulsion, posterior instability of the hip was the indication for the surgical management. As arthroscopic repair was contraindicated labral avulsion were reduced and fixed with suture anchors by Kocher-Langenbeck approach. Patient had excellent functional outcome at one year follow-up. Long term follow-up is necessary as these injuries can lead to secondary hip arthritis.

**CONCLUSION**

Posterior acetabular wall fractures with or without labral injuries are most common cause for instability of the hip post reduction of posterior dislocation. Posterior labral tear without wall fractures is rare and needs high index of suspicion for early diagnosis. Fleck sign on axial view of CT scan is highly indicative of labral avulsion. Early surgical repair is must in patients with unstable hip post reduction for good functional outcome.

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