

# Management of Traumatic Posterior Dislocation of Hip with Fracture Head of Femur

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## ABSTRACT

**Background:** Traumatic dislocation of hip is a rare injury that occurs due to high energy trauma. Fracture head of femur associated with dislocation of hip occurs is even rarer. Some surgeons recommend conservative treatment, while others recommend surgery. The purpose of this study was to evaluate the method of treatment and outcomes of femoral head fractures. **Methods:** This study was conducted between 2006-2018 & included 4 patients who presented to the department and were diagnosed with posterior dislocation of hip with fracture of head of femur with a minimum followup of 12 months. **Results:** All the four cases that presented to the hospital were managed by closed reduction of the hip on the same day & were managed surgically the very next day. Three of four patients presented with clinically & radiologically excellent results on followup. **Conclusion:** Traumatic dislocation of hip with fractures of the femoral head are rare. Patients can be surgically managed by either excision of fragments or fixation using headless screws. Avascular necrosis and post traumatic degenerative disease of the hip occur but are relatively uncommon.

**Keywords:** Femoral head fracture, Hip, Surgical dislocation, Hip dislocation, Trauma.

## INTRODUCTION

Traumatic dislocation of hip is a rare & important injury that occurs due to high energy trauma. There are many associated injuries which influence the final outcome. These include fractures of the head of femur, neck or shaft fractures, acetabular fractures, knee injuries, pelvic fractures, foot and ankle injuries, or a combination of these. Most commonly the hip dislocations occur due to road traffic accidents.<sup>[1,2]</sup> Hip dislocation is of three types anterior dislocation, central dislocation and posterior dislocation. Most common type being the posterior dislocation (90% incidence). There are two original classifications which have been described for posterior dislocation of hip. Epstein's classification is the most common accepted classification for fracture head of femur.<sup>[3]</sup> Type 5 Epstein's classification includes fracture of head of

femur which has been further subdivided by Pipkin into the following types:<sup>[4,5]</sup> Type I: fracture which is below the fovea and doesn't involve the weight bearing surface of the head of femur. Type II: fracture above the fovea and involves weight bearing surface of the head of femur. Type III: type I or II fracture associated with fracture neck of femur. Type IV: type I or II fracture associated with the acetabular fracture. The most common mode of injury for fracture head of femur is the traumatic posterior dislocation the hip joint.<sup>[6]</sup> Fracture head of femur occurs due to the head forcibly being sheared against the rim of the acetabulum as it exits the acetabulum.<sup>[7]</sup> Traumatic posterior dislocation of hip joint is due to an axially applied force to the shaft of femur with the hip being positioned in flexion, adduction, and internal rotation. (eg, the passenger's knee hitting the dashboard during a motor collision).<sup>[8]</sup> The aims of definitive treatment for acute fractures of head of femur are to achieve anatomical reduction, restoration or maintenance of stability & removing the interposed fragments of bone whenever required. These goals are very rarely achieved with conservative management.

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## MATERIALS AND METHODS

This study was conducted at SGT Hospital, Gurugram & Base Hospital, Delhi Cantt between 2006-2018 & included 4 patients with posterior dislocation of hip with fracture of head of femur with a minimum followup of 12 months. The patients' ages ranged from 18 years to 62 years. One of the patients was female and the other 3 were males. The Inclusion criteria comprised of patients who had sustained posterior dislocation of hip joint along with fracture of the head of femur. All patients were included in this study after obtaining informed written consent. The mode of injury of the 4 fractures consisted of a motor vehicle accident in 03 cases and a motor cycle accident in one of the cases. All the patients presented with posterior hip dislocation associated with fracture of head of femur. To diagnose fractures of the head of femur, all the necessary radiological investigations were performed in all the patients. This consisted of anteroposterior radiograph of pelvis with bilateral hip joint. We used computed tomography only in one case in which the radiography was not sufficient for a definitive diagnosis of the fracture.

**The patients were classified in accordance with Pipkin's classification.<sup>[4,5]</sup>**

**Table 1: Distribution of patients according to Pipkin classification**

Pipkin Classification	Definition	Numbers of cases
Type 1	Fragment caudal to fovea	1 case
Type 2	Fragment cephalic to fovea	3 cases
Type 3	Association of type 1 or type 2 with femoral neck fracture	-
Type 4	Association of type 1 or type 2 with acetabular fracture	-

Surgical treatment was performed in all cases.

The type 1 case was treated by means of reduction performed in emergency OT in the evening & open reduction and internal fixation done next day morning with two screws. Two cases of Type 2 fractures were treated by means of open reduction and internal fixation: one using three headless screws and one with two headless screws in small fragments. And a 62 year old patient with type 2 fracture was treated with primary total hip replacement due to advanced age. A 3rd generation cephalosporin was used for antibiotic prophylaxis for 5 days and post op traction was continued for 6 weeks. Ambulation with weight bearing was done as tolerated by the patient & was continued till radiological evidence of union. Each patient was followed up post-operatively clinically, radiologically and functionally at 6 weeks, 03 months, 06 months and 1 year.

## RESULTS

The case of Pipkin 1 fracture that underwent open reduction internal fixation with 2 screws, presented results that were both clinically and radiographically excellent. The two cases of Pipkin 2 fracture who underwent open reduction and internal fixation with headless screws; one of them presented clinically and radiographically excellent results. The other case with three headless screws presented with severe pain and significant restriction of hip movement six months after the surgery. This patient also showed evident radiographic signs of avascular necrosis, with marked diminution of the joint space. The 62 year old patient with Pipkin 2 fracture who underwent total primary hip arthroplasty presented clinically and radiographically excellent results.



**X-Ray of Posterior Dislocation Of Hip & Fracture Of Head Of Femur**



**X-Ray after Closed Reduction of Hip**



X-Ray after ORIF with 3 Headless Screws



X-Ray Of Avascular Necrosis after ORIF with 3 Headless Screws



Operative Image of Headless Screws Being Fixed On Femoral Head



X-Ray after ORIF with 2 Screws



Operative Image of Final Reduction of Femoral Head with 3 Headless Screws

## DISCUSSION

Since the publication of the first case in 1869, fracture of the femoral head has been a very rare case. Now a days its occurrence has increased significantly due to the increase in the number of motor vehicle accidents.<sup>9</sup> Some authors recommend non-surgical treatment while others are in support of surgery. Among the latter, there is still a controversy whether to carry out resection of fracture fragments or fixation of the fragments. According to a study conducted by Urist, the type of fracture was much more important to predict the prognosis rather than the treatment that was carried out. Thus, he recommended that the conservative treatment as the least preferred mode of

treatment.<sup>[10]</sup> Herbert Screws are a good fixation option, which provide compression at fracture site and don't protrude at intra articular surface and are easy to use.<sup>[11,12]</sup> In our opinion, reduction of hip dislocation should be done non-surgically as a matter of urgency being in a rural area & due to non-availability of implant at short notice. The treatment for femoral head fractures is surgical, and the technique used will depend on the type of fracture. In a study conducted by Hermus, open reduction internal fixation in 11 cases was done by screws and revealed satisfactory clinical results.<sup>[13]</sup> For Pipkin type 1 fractures, we recommend that the fragment should be anatomically fixed. We believe that non-surgical treatment is not a good option, since it would impede early mobilization, due to pain and the risk of fragment interposition. The case with Pipkin 1 fractures, presented satisfactory final results, which makes us think that fixation of the fragment is necessary. In a study conducted by Chen ZW et al.<sup>[14]</sup> a comparative study was carried out between operative and nonoperative treatment of Pipkins type-II fractures associated with posterior dislocation of the hip and concluded that open reduction internal fixation by screws is an effective treatment. In type 2 fractures, we also recommend that the fragment should be anatomically fixed, so that the loading zone of the femur can be biomechanically preserved. The more preferable approach to hip joint for open reduction internal fixation for fracture of femoral head is Smith-Petersen anterior approach as this approach prevents any added compromise to the blood supply and permits easier access to the head of femur but in our study, Moore's Southern Posterior Approach to hip was used because of the surgeon's being more familiar to this approach & in our opinion the posterior approach even prevents further more damage to anterior blood supply to hip. A comparative study that compares the anterior & posterior approach to hip joint in Pipkins type 1 & 2 fractures concludes lesser blood loss and shorter operating time with anterior approach without increased chances of avascular necrosis. Also recent studies have reported similar rates of osteonecrosis with the anterior and posterior approaches.<sup>[15,16]</sup>

## CONCLUSION

Traumatic dislocation of hip with fractures of the femoral head are rare. Patients can be surgically managed by either excision of fragments or fixation using headless screws. Avascular necrosis and post traumatic degenerative disease of the hip occur but are relatively uncommon.

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