

Posterior Fracture – Dislocation of the Femoral Head: A Case Report and Review of the Literature

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Abstract

Case Report

Background: Posterior fracture-dislocation of the femoral head is an uncommon but severe injury that typically results from high-energy trauma such as motor vehicle collisions or falls from height. Early recognition and appropriate management are essential to prevent long-term complications, notably post-traumatic osteoarthritis and avascular necrosis (AVN) of the femoral head. **Case Presentation:** We report the case of a 47-year-old male who sustained a right posterior fracture-dislocation of the femoral head (Pipkin Type II) following a road traffic accident. Closed reduction under general anesthesia failed, necessitating open reduction and internal fixation via a posterior Moore approach. The patient achieved a satisfactory functional outcome without major complications at two years' follow-up. **Conclusion:** Early diagnosis, precise imaging, and timely surgical intervention are critical for optimizing outcomes in femoral head fracture-dislocations. Open reduction and fixation remain the treatment of choice in irreducible cases

Keywords: Femoral head fracture, Posterior dislocation, Pipkin classification, Open reduction, Internal fixation, Avascular necrosis.

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INTRODUCTION

Fractures of the femoral head associated with hip dislocation are rare, accounting for approximately 8–26% of all hip dislocations [1]. Irreducible dislocations represent a smaller subset—around 3%—and are often associated with capsulolabral interposition within the acetabulum [2]. These lesions carry a significant risk of avascular necrosis (20%) and post-traumatic osteoarthritis within the first five years [3].

The management of femoral head fracture-dislocations remains challenging. Surgical decision-making must balance the goals of anatomic reduction, preservation of femoral head vascularity, and minimization of long-term joint degeneration. We present a case of an irreducible Pipkin Type II posterior fracture-dislocation treated surgically, followed by a review of the literature.

CASE REPORT

A 47-year-old male, with no relevant medical history, was admitted to the emergency department four hours after a closed right hip injury sustained in a car-to-car collision. On examination, the patient was hemodynamically, respiratory, and neurologically stable.

The right lower limb was held in flexion, adduction, and internal rotation, consistent with posterior dislocation. Distal pulses were palpable, and no sensory or motor deficit was observed. Plain radiographs revealed a posterior hip dislocation with suspicion of an associated femoral head fracture (Figure 1).



Figure 1: X-Ray of the pelvis showing the posterosuperior dislocation with suspicion of an associated fracture.

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Computed tomography (CT) with 3D reconstruction confirmed a Pipkin Type II fracture-dislocation (**Figures 2 and 3**).

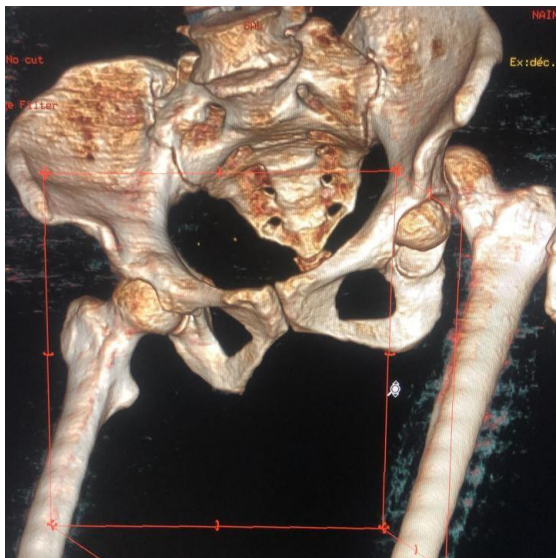


Figure 2: Anterior front view of the 3D CT scan of the pelvis confirming the fracture dislocation of the left femoral head



Figure 3: Posterior front view of the 3D CT scan of the pelvis confirming the fracture-dislocation of the left femoral head

Surgical Management

Closed reduction under general anesthesia, attempted three hours post-injury, was unsuccessful. The patient subsequently underwent open reduction via a posterior Moore approach. Intraoperative findings included partial tearing of the short external rotators, an impaction of the femoral head against the posterior acetabular rim, and a posteriorly displaced cephalic fragment attached to the ligamentum teres (**Figure 4**).



Figure 4: Intraoperative clinical image showing the head that was split into two fragments.

Reduction was hindered by a buttonhole effect of the capsule, which was carefully released. The femoral head was anatomically repositioned, and the intra-articular anteroinferior fragment was fixed with three Herbert screws, reinforced by two 3.5 mm cannulated screws for compression and stability (**Figure 5**).



Figure 5: Post-operative scopy showing the screwing after open reduction of the fracture-dislocation

Postoperative Care

The patient was maintained non-weight-bearing under skeletal traction for four weeks. Prophylactic anticoagulation was administered to prevent deep vein thrombosis. Sutures were removed at day 15, passive mobilization began at six weeks, and partial weight-bearing was resumed by the third postoperative month.

At two years' follow-up, the patient demonstrated satisfactory functional recovery, with no evidence of femoral head collapse, AVN, or degenerative changes.

DISCUSSION

Irreducible hip dislocations are rare but carry a high risk of complications if not managed appropriately. In such cases, forceful closed reduction may lead to femoral neck fracture (12–27%) or interposition of fracture fragments [3,4]. Early CT evaluation is essential

to identify the exact fracture pattern and to plan the surgical approach.

Pipkin Classification

The Pipkin classification remains the most widely accepted system for categorizing femoral head fractures [5]:

- Type I: Fracture inferior to the fovea capitis (non-weight-bearing surface).
- Type II: Fracture involving the foveal region (weight-bearing surface).
- Type III: Type I or II fracture associated with a femoral neck fracture.
- Type IV: Type I or II fracture associated with a posterior acetabular wall fracture.

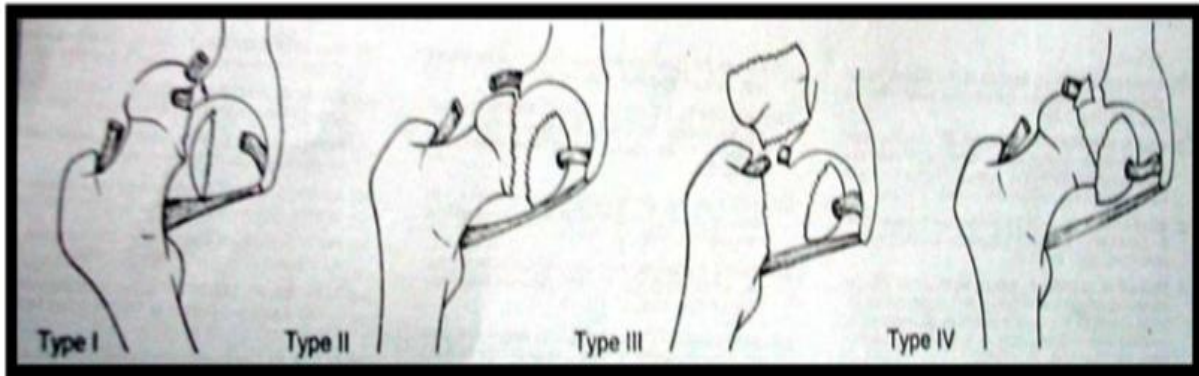


Figure 6: Diagram illustrating each of the 4 types of Pipkin's classification

Surgical Considerations

Open reduction and internal fixation (ORIF) remain the standard treatment for irreducible Pipkin Type II fractures [6]. The posterior approach is preferred for posterior dislocations, while the anterior approach may reduce the risk of vascular compromise. Duquenois and colleagues recommend a posterior approach combined with trochanteric osteotomy to preserve the vascular supply while ensuring adequate visualization and reduction [7,8].

Whenever feasible, preservation and fixation of the femoral head fragment is favored over excision to reduce the incidence of post-traumatic osteoarthritis.

Postoperatively, skeletal traction for 3–4 weeks followed by gradual rehabilitation is generally advocated.

Long-term complications include:

- Avascular necrosis (AVN) – typically within two years post-injury.
- Heterotopic ossification – particularly with extensive surgical exposure.
- Sciatic nerve palsy – either traumatic or iatrogenic [9–11].

Therapeutic Recommendations

Based on our case and literature review [12], the following principles may guide management:

Pipkin Type	Recommended Management
I	Closed reduction. If incarcerated → excision; if displaced but not incarcerated → conservative.
II	If good reduction → conservative; if displaced → anterolateral ORIF; if comminuted → primary arthroplasty.
III	Type I + femoral neck fracture → internal fixation; Type II + femoral neck fracture → prosthetic replacement.
IV	Type I + posterior wall fracture → osteosynthesis if reducible; if incarcerated → excision and wall fixation. Type II + posterior wall fracture → osteosynthesis if satisfactory reduction; otherwise, posterior approach and ORIF.

CONCLUSION

Partial fractures of the femoral head are rare injuries that reflect high-energy trauma, often associated with posterior hip dislocation. Prognosis largely depends on early recognition, proper imaging, and timely surgical management. Anatomic reduction and stable internal fixation are paramount to restoring hip congruency and minimizing the risk of avascular necrosis and secondary osteoarthritis.

Surgical intervention is indicated after failed closed reduction or when:

- A femoral neck fracture complicates reduction;
- The hip remains unstable post-reduction;
- A cephalic fragment causes joint incongruity;
- A large displaced fragment is present.

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