



POSTERIOR FRACTURE-DISLOCATION HIP WITH IPSILATERAL UNSTABLE INTERTROCHANTERIC FEMUR FRACTURE: A CASE REPORT

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ABSTRACT

Introduction: Posterior Hip dislocation injury is not uncommon in a motor vehicle accident. A hip fracture-dislocation associated with ipsilateral Peri-trochanteric femur fracture is extremely rare and only very few cases have been reported. **Patient and methods:** In our case, we report it in a 33 years old lady who underwent open reduction internal fixation with 2 lag screws & buttressing plate for the posterior acetabular wall fracture, long Gamma nail for the trochanteric fracture and hooked plate with ethibond sutures for the greater trochanter comminuted fracture. At 6 months follow up, patient had a good function and radiological outcome without evidence of avascular necrosis nor other complications. **Discussion:** Such a case is rare, but there is a need of well-established management protocol due to its happening would be more common with increasing of modern high energy trauma like a motor vehicle accident.

KEYWORDS: Case Report, posterior dislocation hip, intertrochanteric fracture, open reduction, ipsilateral.

INTRODUCTION

Posterior hip fracture-dislocation injuries have become more frequent due to increased motor vehicle accidents. Fracture of the acetabulum or femoral head are the most associated fractures. A posterior hip dislocation associated with ipsilateral acetabulum and peri-trochanteric femur fracture is extremely rare. The ideal treatment for such complex injuries remains unclear and they represent a challenge to orthopedic surgeons. These injuries are so infrequent that it is very difficult for observers to perform an adequately powered study, and only few case reports have been published.^[1,2]

In this case report, we describe the management of a posterior hip dislocation associated with an unstable ipsilateral peri-trochanteric femur and posterior wall acetabulum fractures.

PATIENT AND METHODS

A 33-years old female presented to our emergency department after being a passenger in a high-speed motor vehicle accident. She was brought to our trauma center by Ambulance 4 hours after accident, and on arrival, she was evaluated per the ATLS protocol. She was conscious, alert, oriented and all her vital parameters were within normal range.

On examination, she was unable to move her right lower limb which was shorter than the left lower limb and externally rotated. She had no tenderness to the ipsilateral knee or ankle and had intact neurovascular exam. Examination of the chest and trunk showed no associated injuries.

Plain radiographs showed posterior hip dislocation with ipsilateral proximal femoral fracture (image 1). Computed tomography (CT) scan of the involved hip with three-dimensional (3D) reconstruction demonstrated that the patient had a posterior dislocation of the hip associated with posterior wall fracture of the acetabulum and ipsilateral peri-trochanteric fracture of the proximal femur. The femoral head and neck were intact (images 2).

After informed consent, the patient was transferred to operating room the same day. The patient received general anesthesia and was placed in the right lateral decubitus position. She was given 2 gm of intravenous cefazolin for surgical prophylaxis and 1gm of intravenous tranexamic acid one hour prior to skin incision.

We started our procedure by performing a posterolateral hip approach. The femoral head was found dislocated underneath the gluteus maximus and significant comminution of the trochanter was appreciated. We started by applying a 5 mm Schanz pin to the femoral head, and with manual traction and manipulation, we were able to reduce the head. After reduction of the head, we reduced the posterior wall fracture and held reduction via two 4.0mm lag screws. We then proceeded by placement of a 3.5mm reconstruction buttress plate. The hip was then examined and found to be stable with maintained concentric reduction of the head.

We then directed our attention to the peri-trochanteric fracture which was severely comminuted. The medial calcar was less comminuted and was used as a landmark for reduction and proper alignment. After acceptable reduction was checked under fluoroscopy and found to be satisfactory, two 2.0 mm k-wires were used for temporary fixation. A Long cephalomedullary nail was then placed. Adequate reduction of the neck-shaft angle was ensured prior to placement of the femoral head lag screw. The contralateral neck-shaft angle was measured on the preoperative anteroposterior pelvis radiograph and used to assess reduction of the injured side. Multiple #2

Ethibond sutures were used to approximate the greater trochanter fragments. An additional hook plate was applied to enforce the trochanteric repair and fixed to the femur via multiple cerclage wires (image 3).

The patient was made non weightbearing postoperatively. We encouraged 45 degrees semi-sitting position from day #1, static strengthening exercises for quadriceps and passive ROM for the knee. Follow up x-rays were taken at 6th week postoperatively and showed stable fixation. At this time, partial weight bearing with a walker was allowed.

At 3 months postoperatively, her Harris hip score was 42 and the patient was advanced to full weightbearing without an aid. Patient demonstrated a Trendelenburg gait due to weak abductors. She was advised to continue with physical therapy with special emphasis on abductors strengthening. At her last follow up visit at 6 months postoperatively, x-rays revealed complete union of both acetabular and proximal femoral fractures with no signs of avascular necrosis of femoral head (AVN) or heterotopic ossification (HO) (image 4). Harris hip score at that time was 84 and the patient did not report any hip pain and had adequate ROM of the hip.

Table 1: literature of case reports of fracture dislocation hip with ipsilateral intertrochanteric fracture.

Author	Mechanism of injury	Management	Follow UP			
			union	Pain& ROM and Function outcome	Avascular necrosis AVN	Heterotopic ossification HO
Barquet & Mussio(1983) ^[9]	Fracture dislocation of femoral head with associated trochanteric and shaft fracture.	Open reduction of the hip dislocation and internal fixation of the trochanteric and shaft fracture.	Good fracture healing at 27 weeks	Pain free at 27 months post-surgery, with slight hip internal rotation restriction	NO evidence of AVN	
Singh et al. (2006) ^[10]	Inferior dislocation of hip with ipsilateral intertrochanteric fracture.	Closed reduction of the hip dislocation followed by internal fixation of intertrochanteric fracture with dynamic hip screw.		After 2.5 years of follow up, symmetrical range of motion versus contralateral normal hip	NO AVN at 2.5 years follow up	
Agrwal et al. (2008) ^[11]	Posterior dislocation hip with ipsilateral comminuted intertrochanteric fracture.	Open reduction of the hip dislocation followed by internal fixation of intertrochanteric fracture with dynamic condylar screw.		Painless hip at 1 year with restricted range of motion of hip and knee	No signs of AVN at 1 year follow up	
Radulescu et al. (2013) ^[2]	Anterior dislocation hip with ipsilateral intertrochanteric fracture.	Open reduction of the hip dislocation followed by internal fixation of intertrochanteric fracture with dynamic hip screw.		Good function outcome at 6 months. according to Merle d'Aubigné score was 15/18		
Sinha et al. (2013) ^[8]	Posterior hip dislocation with posterior wall and transverse fractures of ipsilateral acetabulum with intertrochanteric	Open reduction& internal fixation with reconstruction plate of the posterior acetabular wall fracture and dynamic hip screw for intertrochanteric	The radiograph shows Evidence of fracture union at 6 months			

	fracture.	fracture.				
Yousefi et al. (2013) ^[12]	Posterior dislocation hip with posterior acetabular wall fracture and ipsilateral intertrochanteric fracture.	Open reduction & internal fixation with reconstruction plate of the posterior acetabular wall fracture and dynamic hip screw for intertrochanteric fracture.	At 8 months, the radiograph of pelvis showed union.	Movements of hip were terminally restricted and dorsal right foot remained numb	No AVN at 8 months follow up	
Ping Zhen (2013) ^[13]	Posterior Hip Dislocation with Ipsilateral Comminuted Femoral Intertrochanteric Fracture.	Uncemented total hip replacement and K-wires with tension band for intertrochanteric fracture.		Equal ROM of both hips at 6 months follow up by telephone	No evidence of AVN	
Fageir M et al. (2015) ^[6]	Posterior hip dislocation with ipsilateral comminuted intertrochanteric fracture.	Open reduction of hip dislocation followed by internal fixation of intertrochanteric fracture with long femoral intramedullary nail.	Evidence of healing at 6 months	At 10 months the patient was back to normal duties at work. He had discomfort in his thigh on lying down	No evidence of AVN at 10 months follow up	
Keyur B. Desai. et al. (2019) ^[14]	Posterior hip dislocation with ipsilateral intertrochanteric and superior pubic rami fractures.	Open reduction of the hip dislocation followed by internal fixation of intertrochanteric fracture with dynamic hip screw & stainless-steel wires.	Radiographs showed solid union of fracture at 6 and 12 months of follow up.	At 6- and 12-months good hip function, full weight bearing, squat and sit crossed leg. Painless hip with Harris hip score of 84.	No signs of AVN at 6 and 12 months follow up	
Haq et al. (2020) ^[15]	Posterior dislocation hip with ipsilateral intertrochanteric fracture.	Open reduction of the hip dislocation followed by internal fixation of intertrochanteric fracture with dynamic hip screw.	At 6 & 12 months, radiograph showed union for the first case. for the second case, radiograph showed union at 12 months.	Fair function outcome. Painless hip with Harris hip score of 86 for the first case & 72 for the second case	No evidence of AVN for both cases	

Images



Image 1: Shows preoperative CT and X ray. (a) coronal CT view, (b) sagittal CT view, (c) axial CT view and (d) plain X-ray shows AP view.



Image 2: Shows preoperative CT with 3D cuts.

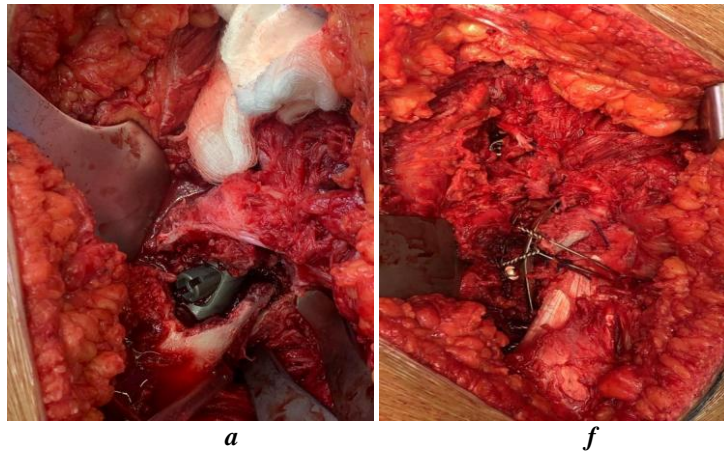


Image 3: Shows intraoperative image after reduction and fixation of acetabular and proximal femoral fracture. (e) shows a gap at the greater trochanter site, (f) shows greater trochanter after application of hook plate.

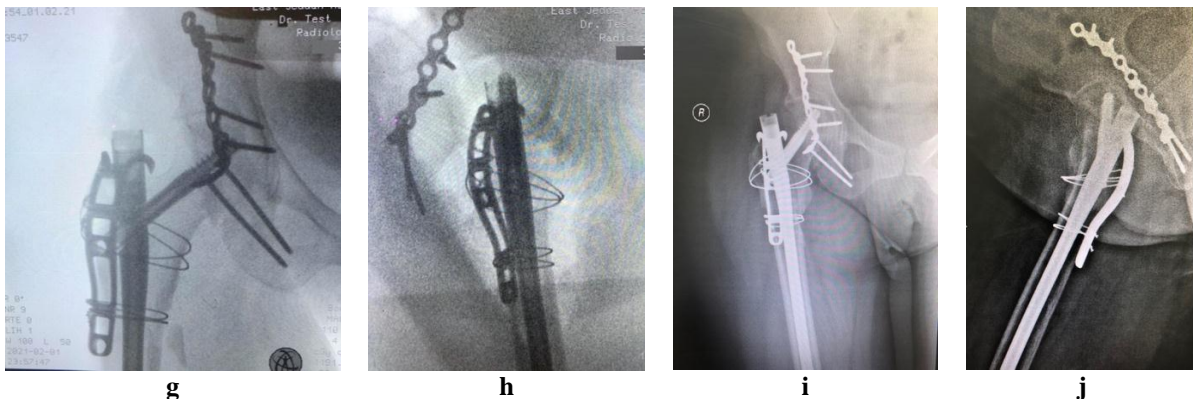


Image 4: (g) Intraoperative AP view, (h) intraoperative lateral view, (i) 6 months postoperative AP view and (j) 6 months postoperative lateral view.

DISCUSSION

Association of posterior hip dislocation with intertrochanteric femur fracture has been noted in the literature, but they were described infrequently. These injuries are difficult to manage and can lead to poor outcomes.^[3,4] The limb position at the time of the trauma usually determines whether the hip dislocates with or without additional bony injuries of the femoral head or posterior acetabular wall. The combination between an axial compression force with adduction followed by an external rotation force was the most likely mechanism of injury in our case.^[2]

It is well known that reduction of the hip is recommended within 6 hours of the dislocation for better outcomes. Open reduction is recommended by most authors and has become the standard treatment for complex hip fracture-dislocations in order to reduce the risk of injury to the femoral vessels when inadequate closed manipulation is applied on the dislocated femoral head.^[3,6]

Plain radiographs alone are not enough for proper delineation of these injuries and proper preoperative planning. Computed Tomography (CT) with 3D reconstruction is often necessary to complete the

evaluation and to determine the management plan.^[1,6] A posterolateral approach in the lateral decubitus position is preferred as it allows an easier access to the dislocated hip, acetabulum fracture and proximal femur fracture without the need for repositioning.

The literature describing these complex injuries is sparse and only few case reports are available (table 1). *Sinha et al.*^[8] reported a case report of a 45-years old male who fell from a moving train and sustained a posterior hip dislocation with associated transverse fracture of the acetabulum and ipsilateral intertrochanteric femur fracture. The patient had foot drop on presentation and was managed similarly to our case with urgent open reduction and internal fixation of the fractures. In their case, they started with fixation of the intertrochanteric fracture with a dynamic hip screw before the acetabulum fracture was fixed via combination of reconstruction plate and lag screws. In another study by *Yousefi et al.*, a 43-years old male sustained a posterior hip dislocation with associated posterior wall acetabulum and intertrochanteric femur fractures. This patient also had a foot drop on presentation. They were managed through a posterolateral approach with fixation of the acetabulum fracture first followed by fixation of the intertrochanteric fracture via a dynamic hip screw.^[7] In both cases, there were no signs of avascular necrosis of the hip at the final follow up. There are no guidelines for management of these complex injuries regarding order of fixation or the approach to use or method of fixation of the proximal femur fracture. We elected to use an intramedullary nail in our case given the unstable pattern of the fracture.^[5]

The main complications associated with this type of injury are avascular necrosis of the femoral head, heterotopic ossification, peripheral nerve damage and osteoarthritis. Although our patient had no signs of avascular necrosis, we acknowledge that longer follow up is mandatory in these cases to detect these complications.

Conflict of interests

The Authors has no conflict of interests related to this study to declare.

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