Anterior Hip Dislocation Associated with Ipsilateral Avulsion of Greater Trochanter of the Femur: Case Report

Aakash*; I Wayan Subawa**

*Orthopaedic and Traumatology Resident, Medical Faculty Udayana University, Sanglah General Hospital, Denpasar Bali
** Orthopaedic and Traumatology Consultant, Medical Faculty Udayana University, Sanglah General Hospital, Denpasar Bali

Abstract
Dislocation of the hip usually occur following a high energy trauma, such as road traffic accidents, sport injuries, or falls from height, and it may be associated with various patterns of fracture such as acetabular fractures, fracture of the head, neck, or shaft femur. In the case of hip dislocation, posterior hip dislocation is approximately 9 times more often compare to the other type. Anterior hip dislocation associated with ipsilateral intertrochanteric fracture while the head and neck of the femur remain intact is very rare, with only few cases reported in the literature.

The aim of this paper is to present the case of a patient, aged 45, victim of a trauma by precipitation from height (6 metres height), diagnosed with anterior left hip dislocation and intertrochanteric fracture of the ipsilateral femur. We treated the patient by closed reduction in less than six hours with general anesthesia and maintained the reduced hip with skin traction for a week, then we performed open reduction internal fixation of the intertrochanteric fracture of the femur using an intertrochanteric plate.

Post operative follow up was done 4 months post operatively by clinical and radiological examinations, and the functional outcome of the patient was observed using Modified Merle d’Aubigne Score and Oxford Hip Score showing a satisfactory results.
Introduction
Dislocation of the hip usually occur following a high energy trauma, such as road traffic accidents, sport injuries, or falls from height, and it may be associated with various patterns of fracture such as acetabular fractures, fracture of the head, neck, or shaft femur. In the case of hip dislocation, posterior hip dislocation is approximately 9 times more often compare to the other type. Traumatic anterior dislocation of the hip is a relatively rare condition, especially when compared to the more encountered posterior dislocation of the hip joint. This is largely because of the very different mechanisms required to produce injury in either instance. Anterior superior dislocation is even less commonly encountered because of the mechanism of extreme abduction, extension and external rotation required to produce the dislocation. (1)
Owing to the ligamentous and muscle forces around the hip, it is only rarely possible to successfully perform a closed reduction of an anterior superior dislocation of the hip joint. The combination between the anterior hip dislocation and the ipsilateral avulsion of greater trochanter, with the femoral head remaining intact, is extremely rare, only a few cases being reported in the literature. (2)
The aim of this paper is to present the case of a patient, aged 45, victim of a trauma by precipitation from height (6m), diagnosed with anterior left hip dislocation and avulsion of greater trochanter of the ipsilateral femur

Case Presentation
A 45 year old male came admitted to the emergency room after suffering a trauma precipitation from jackfruit tree 6 metres height. The patient general state is conscious, cooperative with stable hemodynamic. The patient complained severe pain on his left hip after falling from height with his hip bumped on the ground. He was unable to stand or bear weight on the left lower limb. The patient hip was in abducted position, and externally rotated with no signs of neurovascular compromise. In the groin area, an ovoid hard consistency can be detected by palpation. We performed an clinical and laboratory examination to exclude other coexisting injuries such as abdominal, thoracic, neurological, or musculoskeletal conditions.
To confirmed our assessment, we do an xray examination of the pelvis, it confirmed the diagnosis of Left Anterior hip dislocation Epstein IB associated with avulsion of the left greater trochanter.
An emergency surgical reduction was performed within 5 hours since the trauma occurred. The anterior hip dislocation was reduced by closed method with general anesthesia, by hip extension,
in-line traction, and external rotation for reduction then we immobilized the hip using a skin traction with 5 kilograms load. We cannot do the open fixation of the fracture due to limitations of the implants and instrumentation in the ER Operating Room. After a week of time, the patient undergoes another surgery to fixate the left greater trochanter avulsion. The patient was in lateral position under epidural spinal anesthesia, then the incision was made using lateral approach, exposure of the tensor fascia, and bluntly expose the vastus lateralis. Retracting the vastus lateralis until the femoral shaft proximal and the avulsion of the greater trochanter was visible.

![Figure 3. Intra operative picture shows avulsion of the left greater trochanter](image1)

Open reduction was done, then the avulsed fragment was fixated using intertrochanteric locking plate 5 holes. At the end of surgery, the stability of the hip is checked by performing a 90 degrees flexion of the thigh, internal external rotation and abduction-adduction.

![Figure 4. Intra operative picture showing fixation of the avulsed fragment of the left greater trochanter](image2)
Figure 5. Post Operative Xray revealing fracture and dislocation reduction and fixation with trochanteric plate

Postoperatively, the patient is kept at rest in bed for 6 weeks and antithrombotic prophylaxis is initiated. Physical therapy is started immediately after surgery by predominantly isometric exercises for toning the muscles, at 3 weeks hip joint mobilization exercises and later at 6 weeks after surgery walking without weight bearing on the left lower limb is started. Progressive weight bearing of the injured limb is allowed at 3 months after surgery. Post-operative follow-up was assessed by radiological and functional criteria. X-rays examinations were performed immediately after surgery, at 4 weeks, at 3 months, 6 months and at one year.

Figure 6. One Month Post Operative Xray
Functional evaluation was carried out at 3 months after surgery, according Oxford Hip Score with the measured functional score was 40 points out of a maximum of, signifying a good postoperative result.

**Discussion**

The hip is a spheroidal type of joint with a good congruence between the femoral head and the acetabulum and reinforced by a thick articular capsule and strong ligaments. All these anatomical features make the hip joint very stable. That is why, hip dislocations usually occur following significant trauma. Hip dislocations can be posterior (most frequent) and anterior (10-15%). The anterior dislocations are described by the Epstein Classification [3]:

- **Type I - Superior dislocations**
  - IA: no associated fractures
  - IB: associated fracture or impaction of the femoral head
  - IC: associated fracture of the acetabulum
- **Type II - Inferior dislocations**
  - IIA: no associated fractures
  - IIB: associated fracture or impaction of the femoral head
  - IIC: associated fracture of the acetabulum

Anterior dislocations usually result after a high energy trauma, which determines forced abduction and external rotation and of the hip. Depending on the position of the hip at the time of
the impact, dislocations may be anterior-inferior (if the hip is in flexion) or anterior-superior (if the hip is in extension). The main peculiarity of the presented case is the association of an anterior-superior dislocation of the hip with ipsilateral avulsion of greater trochanter. The latter can be explained by the developing of powerful forces that acted on the lateral aspect of the greater trochanter or by the impact of the greater trochanter against the iliac bone in a forced abduction and external rotation position of the hip. Another rare aspect of this case is the lack of acetabulum fractures. Although the forces that acted during the trauma were strong enough to lead to dislocation of the hip (a very strong articulation) and fracture of the femur (the strongest long bone in the body), they did not produce any bone lesion in the acetabulum. (4)

Frequently, hip dislocation is associated with acetabulum fractures. Forces acting on the femoral head of the femur put high pressure on the walls of the acetabulum, exceeding their strength, breaking them, thus creating new spaces for the dislocation.(5)

Finally, the absence of the associated lesions is also peculiar to this case. Generally speaking, due to high energy trauma forces involved in the process, abdominal and thoracic visceral injuries, neurological or other musculoskeletal lesions can frequently occur but overwhelmed by the dominant hip symptoms. Consequently, a careful general examination of the patient is mandatory in order accomplish a complete diagnosis.

Hip dislocation is an orthopedic emergency that must be addressed to the hospital as soon as possible and its reduction must be accomplished as soon as the patient's condition allows anesthesia and surgery, in order to avoid further complications.

The main complications that can occur following hip dislocation are represented by avascular necrosis of the femoral head, leading in time to osteoarthritis, heterotopic ossification around the joint and paralysis of the sciatic nerve. The most feared late complication of hip dislocation is avascular necrosis of the femoral head. This complication is thought to be multifactorial; on one hand, during dislocation, the vascular network emerging from the trochanteric area is damaged together with the joint capsule and the round ligament artery. If we take into consideration this mechanism, the early reduction of the dislocated hip decreases the risk of avascular necrosis. A delay of more than 6 hours increases the risk of avascular necrosis from 10 to 40%. (6)

Conclusions
The clinical outcome of such a case depends on a rapid evaluation and treatment. Providing a stable reduction of the dislocation and a firm internal fixation of the fracture as soon as possible (within the first 6 hours) will allow an early physical rehabilitation and decrease the risk of complications.

References:


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dr. Aakash

dr. I Wayan Subawa, Sp.OT

Faculty Of Medicine Udayana University
Departement Of Orthopedic and Traumatologic
Sanglah Hospital
Denpasar
October 2017