Case Report

Posterior dislocation of a native hip joint associated with ipsilateral per-trochanteric fracture: A rare case report

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ABSTRACT

We describe a case of traumatic posterior dislocation of a native hip joint associated with ipsilateral comminuted inter-trochanteric femoral fracture. In our case, closed reduction was attempted but proved unsuccessful. Taking into account the planned subsequent intra-medullary femoral nail, open reduction through a lateral incision was undertaken. Post-operatively, the planned mobility was for a non-weight bearing period of 6 weeks followed by a partial-weight bearing period of 6 weeks before progressing to full-weight bearing. Post-operatively, the patient completed a comprehensive course of physiotherapy. At five months, he was able to walk for five miles over the course of a weekend. At six months, the patient was looking at phased return to work as a fire fighter. Radiographs taken at the time demonstrated evidence of healing to his inter-trochanteric fracture. At ten months, the patient was back to normal duties at work as a fire fighter.

Introduction

The hip joint is stabilised by a strong soft tissue envelop. The architecture of the ball and socket provides inherit stability. The aforementioned architecture is support by strong ligaments and groups of muscles. Thus, the hip joint is very stable and dislocation of a native hip joint requires high energy trauma. Said high energy trauma can lead to femoral head and/or acetabular fractures. We describe a case of traumatic posterior dislocation of a hip joint associated with ipsilateral comminuted inter-trochanteric femoral fracture. The description includes initial and medium term management of this incredibly rare occurrence.

Case report

In September of 2015, a 31 years old fire fighter was a restrained passenger in the front seat of a fire truck that was driven into a tree resulting in significant intrusion injuries. At the scene of the accident, the cervical spine was immobilised. His airway, breathing and circulation remained stable throughout. He was a level 1 trauma call and had a computed topography (CT) trauma series and full examination following initial resuscitation. He was previously fit and well. He does not take any regular medications. The CT scan demonstrated an isolated closed posterior dislocation of the right hip with a comminuted inter-trochanteric fracture (Figs. 1–5). There was no associated neurovascular deficit. No further skeletal, spinal or visceral injuries were identified on secondary and tertiary surveys, focused assessment with sonography for trauma (FAST) and CT scans.

Few hours following resuscitation, he was taken to the operating theatre. Intra-operatively, the femoral head was found to have...
buttonholed posteriorly through the joint capsule, significant comminution to the per-trochanteric fracture with multiple bony fragments penetrating the muscle envelope including the calcar. Initially, closed reduction was attempted, this proved unsuccessful. The decision was taken to proceed to open reduction of the hip joint through a lateral incision. A cork screw was inserted into the femoral head and neck (Figs. 6 & 7).

The femoral head was successfully reduced into the acetabulum of the hip joint. The inter-trochanteric fracture was reduced and held with sharp reduction forceps (Fig. 8).

After reduction of the fracture, the femur was prepared to receive a long T2 gamma intra-medullary (IM) nail. The IM nail was locked distally. On day one post-operatively, radiographs demonstrated a congruent hip joint, satisfactory fracture and metalwork position (Figs. 9–11).
On day six post-operatively, a computed topography (CT) scan of both hips was performed to evaluate the joint space. The scan demonstrated a bony fragment interposed between the femoral head and acetabulum, within the antero-medial aspect of the joint. The bony fragment measured approximately $11 \times 4 \times 14$ mm. The scan also demonstrated a cortical defect at the adjacent part of the femoral head which in terms of size correlates with the free bone fragment (Figs. 12 & 13).

Post-operatively, the patient was mobilised non-weight bearing for six weeks. The patient was discharged on day twelve following completion of satisfactory in patient physiotherapy. The patient then progressed to mobilise partially weight bearing for a further six weeks.
Post-operatively, the patient completed a comprehensive course of physiotherapy. Initially, the patient had grade 4/5 power to his hip muscles, mainly hip abductors, and demonstrated an antalgic unaided gate over short distances. During his rehabilitation, the patient received a two weeks residential rehabilitation placement followed by hydrotherapy and land-based physiotherapy input. At four months, the patient was discharged from physiotherapy although he continued to receive privately funded physiotherapy. At five months, he was able to walk for 5 miles over the course of the weekend. At six months, the patient was looking at phased return to work as a fire fighter. Radiographs taken at the time demonstrated evidence of healing to his inter-trochanteric fracture (Fig. 14).

At ten months, the patient was back to normal duties at work. He continued to have discomfort in his thigh on lying down. Radiographs taken at the time demonstrated further healing of his inter-trochanteric fracture and no evidence of avascular necrosis of
the femoral head (Fig. 15). He was put on annual review from that point onwards.

Discussion

Injuries to native hip joints sustained following road traffic accidents range from soft tissue sprain to significant bony/joint destruction resulting in life long disabilities. Traumatic hip joint dislocation is posterior in around 90% of cases [1] and is associated with nerve injury in 10% [2-5]. 60–70% of associated sciatic nerve injuries recover spontaneously [2]. The position of the hip joint together with the direction and magnitude of the offending forces determine the direction of dislocation and the occurrence of associated fractures [6]. In a flexed and adducted hip joint, an axial force applied to the femur retrograde can result in fracture of the

![Reconstruction superior view of computed topography (CT) image at Presentation demonstrating the location of the femoral head in relation to the ipsilateral acetabulum and comminution at the inter-trochanteric fracture site.](image-url)
Fig. 5. Reconstruction oblique view of computed topography (CT) image at Presentation demonstrating a dislocated femoral head, empty acetabulum and comminution at the inter-trochanteric fracture site (1: femoral head, 2: acetabulum).

Fig. 6. Intra-operative fluoroscopy images demonstrating the reduction procedure using a cork screw.
Fig. 7. Intra-operative fluoroscopy images demonstrating the reduction procedure using a cork screw.

Fig. 8. Inter-trochanteric fracture reduction held prior to introduction of intra-medullary (IM) nail.
In our case, the patient was a restrained passenger in a fire truck that collided head on with a tree. We believe, the intrusion of the dash board into the cabin applied retrograde axial force on the femur with the hip joint flexed almost to right angle.

In medical literature, combined hip joint dislocation and ipsilateral inter-trochanteric fracture are rarely reported [3,4,8–14]. Concomitant posterior dislocation of the hip joint and proximal femoral fracture constitute a surgical emergency [3,5,9,10,15]. Prompt reduction of the dislocated hip, within 6 h, is recommended [5,16,17]. Some authors recommend immediate open reduction and nerve exploration in complicated cases of hip dislocation [18–20]. Other authors recommend attempting closed reduction and non-surgical management of any concomitant nerve injury [21,22].

In our case, closed reduction was attempted but proved unsuccessful. Taking into account the planned subsequent intra-medullary femoral neck [7].
Fig. 10. Day one post-operative radiographs.

Fig. 11. Day one post-operative radiographs.
femoral nail, open reduction through a lateral incision was undertaken. Post-operatively, the planned mobility was for a non-weight bearing period of 6 weeks followed by a partial-weight bearing period of 6 weeks before progressing to full-weight bearing.

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Fig. 13. Day six post-operative computed topography (CT) scan of both hip joints, axial section.

Fig. 14. Hip joint and proximal femur radiograph at six months.
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**Fig. 15.** Hip joint and proximal femur radiograph at ten months.
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