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Greater Trochanter Avulsion Associated with Posterior Hip Dislocation

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Abstract

Hip dislocation occurs when axial loading force is transmitted through intact femoral shaft to the hip joint leading to a posterior dislocation of the femoral head with or without posterior acetabular fracture. However dislocation of the hip with associated fracture of the trochanter, neck or shaft of femur is uncommon in literature. We present the case of a 56 year old patient who fell from a height. Clinical and imaging [radiography, CT] examination revealed a comminuted greater trochanteric fracture associated with ipsilateral posterior hip dislocation.

Keywords: Greater Trochanter Avulsion; Posterior Hip Dislocation

Introduction

Posterior dislocation of the hip is common in high energy accidents like road traffic crashes where due to direction and severity of impact force, dislocation is often associated with fractures. Posterior dislocation of the hip associated with fracture of the head of femur or acetabulum are well documented [1,2]. However dislocation of the hip with associated fracture of the trochanter, neck or shaft of femur is uncommon in literature with the best reported evidence we came across being reported as case reports, additionally operative management is the recommended management [2-5].

We present a case report of posterior hip dislocation with associated greater trochanter avulsion successfully managed non-operatively. We obtained patient's informed consent and shall seek the Aga Khan University research ethics committee's approval to use images and publish the case report. We confirm that this manuscript is original, has not already been published in a journal and is not currently under consideration by another journal.

Case Report

A 56 years old electrician presented to Aga Khan University Hospital accident and emergency department after falling from a height of about four metres off an electric pole, following electrocution. He landed on his left hip resulting in severe pain and inability to bear weight on the limb. General examination showed a fully conscious, hemodynamically and neurologically stable male in good general condition. Clinical examination revealed shortened, external rotated left lower limb with significant swelling of the upper thigh. However there were no open wounds noted and distal neurovascular status was intact. Further examination revealed partial thickness electric burns of both hands. There were no associated lumbar spine, pelvis or calcaneal injuries.
Standard anterior-posterior radiographs revealed a posterior dislocation of the femoral head associated with comminuted trochanteric fracture of the left hip [Figure 1 and 3].Computerised tomography examination confirmed the diagnosis. The patient underwent immediate closed reduction of the hip dislocation under general anaethesia using Allis manoeuvre. Post reduction radiographs confirmed successful reduction [Figure 2 and 4]. Communated tronchanteric fracture was managed non-operatively having achieved acceptable reduction.

He was on non-weight-bearing ambulation for two weeks then partial weight bearing for one week and full weight bearing thereafter.

There was no evidence of myoglobinuria or renal impairment. Burn wounds were managed by daily dressing with silver sulphadiazine cream and healed well save for minimal contractures due to joint involvement in burns.

At six weeks, post-operative pelvic plain radiographs done confirmed well healed left trochanteric fracture [Figure 4]. He was discharged home thereafter to continue with hand physiotherapy. Contracture release was subsequently done six months later.

Figure 1: Plain radiographs showing left posterior hip dislocation and ipsilateral greater trochanter fracture

Figure 1: Pre-reduction plain pelvic radiograph

Figure 2: CT scan of pelvis showing left greater trochanter fracture after hip reduction

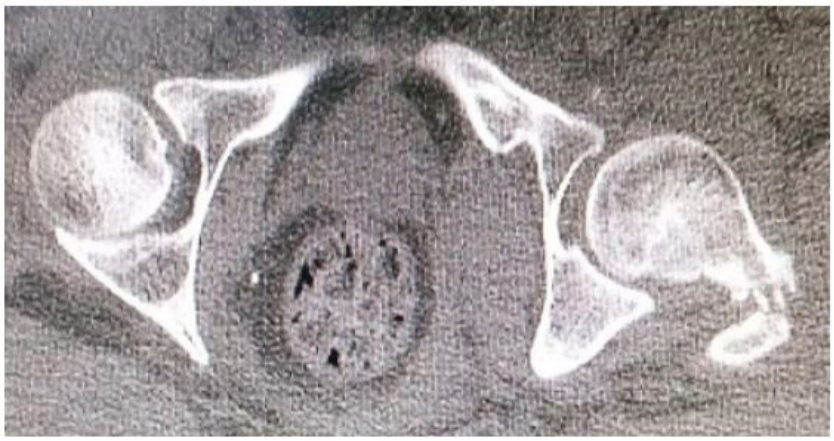

Figure 2: Post-reduction Pelvic CT scan

Figure 3: CT scan 3D reconstruction of showing left greater trochanter fracture after hip reduction and

Figure 3: Three Dimensional Pelvic CT Scan reconstruction

Figure 4: Pelvic plain radiograph showing healed Left trochanteric fracture six weeks after injury

Figure 4: Post-reduction Plain pelvic radiogragh

Discussion

Hip dislocations are usually associated with high-energy trauma like seen in high speed motor vehicle crashes. Typically, the driver or the front seat passenger suffers a classical bumper injury. Due to hip joint flexed position, force of the impact is transmitted along femoral axis, leading to a posterior dislocation of the femoral head from the acetabular cup. This may be associated with fracture of posterior acetabular columns and/or femoral head fractures [1,3,6]. However, such injuries occur in instances where there is intact femur to transmit the force of the impact to the femoral head and/or acetabular rim. Therefore diaphysial or sub-trochanteric fracture associated with hip dislocation is a rarity [2,7,8].

In our review of literature we came across case reports as described by Raja J, *et al.* [4] who estimated the incidence at 1/100,000 whereas Agarwal *et al.* [5] documented only 19 such cases in their literature. It's postulated that extremely forceful fascicular contraction of the muscles inserting on the greater trochanter initiated by passage of electric current through muscle tissue during electrocution leads to trochanteric avulsion fracture [7].

Additionally, Korovessis *et al.* [1] and Wood J, *et al.* [9] present a case each, involving anterior dislocation with associated fracture of the greater trochanter. Moreover, Barquet *et al.* [10] presented a case of fracture-dislocation of the femoral head with an associated ipsilateral fracture of the trochanter and femoral diaphysis. Similarly, Haq *et al.* [11], recorded a case of inferior hip dislocation associated with inter-trochanteric ipsilateral fracture. Finally, Agarwal *et al.* [5] describes for the first time a case in which the posterior hip dislocation was associated with a comminuted ipsilateral trochanteric fracture. In terms of treatment, operative approach is recommended in displacement of avulsed fragment, presence of fracture fragment in hip joint or if diagnosed four to twelve weeks later [2,3,8,12] The most feared frequent late complication is avascular necrosis of the femoral head [6,4,13].

In our case, we hypothesize that the patient could have landed on flexed knee, causing postero-superior dislocation before subsequently hitting his hip on the ground causing direct trauma to the greater trochanter that could explain the avulsion fracture. Thus we postulate that the dislocation must have occurred before the avulsion fracture [4,14].

Conclusion

Cases of Greater trochanter avulsion associated with Posterior Hip dislocation remains a rarity and mechanisms responsible poorly understood thus need for more studies to document similar encounters thus help better explain the possible mechanisms. Additionally this case confirms that greater trochanter avulsion associated with posterior hip dislocation can be successfully managed non-operatively.

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