

CASE REPORT

Pure Posterior Native Hip Dislocation Following Low-Energy Injury – a Rare Case Report

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ABSTRACT

Hip dislocations are traumatic injuries that commonly derive from high energy trauma such as traffic accidents or falls from great heights. In addition, these injuries present an increased incidence after partial or total hip arthroplasty in elderly patients. Associate literature dictates that in case of a native hip dislocation, early reduction is crucial for avoidance of further complications such as avascular necrosis of the femoral head and post traumatic arthritis. In this article, we present a rare case of a native pure posterior hip dislocation after low-energy trauma. We also demonstrate the treatment and follow-up algorithm concerning this kind of injury.

Keywords: posterior dislocation, hip, low-energy, trauma.

BACKGROUND

Native hip joint dislocations in adults are considered as a rare clinical entity. Mainly, these injuries are the result of high energy impacts such as road traffic collisions (1). The majority of these hip dislocations mostly occur in males aged between 16 and 40 years old (2). The current literature reports that a percentage up to 70% in the epidemiology of posterior hip dislocations is related to motor vehicle collisions (3). A recent study based on the Trauma

Register of the German Trauma Society, that included 170,934 major trauma patients, identified 1359 individuals with a traumatic hip dislocation (0.8%), of which 75.9% were males with a mean age of 43 years. Those individuals were mostly involved in road traffic accidents (78%), mainly motor vehicle collisions (49.9%) (4).

Although uncommon, there are reports in the literature regarding low-energy dislocations of a native hip in patients with neuromuscular disorders such as hypertonía, cerebral palsy or muscular atrophy (5). Severe hip dysplasia may also be a predisposing factor for a hip dislocation or sub-

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luxation following a low-energy injury (6). In the elderly, they are mostly associated with concomitant fractures of the acetabular rim or the femoral head (Pipkin) (7). We report a rare case of pure native hip dislocation after falling from a minor height without any associated fractures in a patient with no other pre-existing risk factors. $\square$

CASE PRESENTATION

History

A 78-year-old female with a body mass index (BMI) of 23.8 arrived at the emergency room with a referred left hip injury secondary to falling from an indoor height of approximately 15 cm at home. The patient's medical history featured controlled osteoporosis, arterial hypertension and dyslipidemia. According to the patient's report, she was an active self-cared person with no gait abnormalities. The mechanism of injury included adduction and internal rotation of the hip as it was clearly stated by the patient.

During the initial assessment, it was observed that the affected limb was in slight flexion and internal rotation. A diminished range of motion and tenderness of the left hip were also noted. Joint stiffness and inability to bear weight were prominent during clinical evaluation. The neurovascular examination of the lower extremity did not reveal any significant findings. The following radiological evaluation included anteroposterior views of the pelvis and left hip. Due to the nature of injury, the patient was unable to cooperate for lateral views. Radiological findings revealed posterior native hip dislocation of the left femoral head (Figure 1). No obvious fracture lines were observed around the acetabular socket or femoral head. No major pathologies or

comorbidities such as osteoarthritis, hip dysplasia or past history injuries were signified.

Treatment

After the primary diagnosis, patient was transferred to the resuscitation area in the Emergency Department. Intravenous administration of pain killers was conducted to control distress and promote muscle relaxation. The patient was alleviated from pain and was placed in a supine position. Under sedation, closed reduction on the affected hip was performed, achieving relocation of the femoral head that was confirmed by new x-rays. Furthermore, a computed tomography (CT) scan of the pelvis provided insight of the anatomical area to exclude possible fractures of the pelvic ring and the affected femur that could have been missed from plain radiographs, as well as to exclude the possible presence of incarcerated bone fragments between the acetabulum and the femoral head (Figure 2). An ad-



FIGURE 1. Pre-reduction anteroposterior pelvic radiograph showing posterior left hip dislocation



FIGURE 2. A) Post-reduction axial pelvic computed tomography (CT); (B) post-reduction coronal pelvic CT demonstrating successful relocation of the femoral head without any bone fragments (pure dislocation)

hesive skin traction was placed to the limb to avoid new dislocation.

Outcome and follow-up

The patient was kept in bed for the rest of the day. The skin traction was removed the following day. The patient was encouraged to ambulate using a walking frame. No complaints of pain or instability were reported. After a two-day hospitalization, instructions on how to ambulate at home were given and the patient was discharged. Low molecular weight heparin was prescribed in order to avoid deep vein thrombosis (DVT). She was thoroughly informed about potential future complications of her injury such as avascular necrosis of the femoral head, post-traumatic arthritis and heterotopic ossification.

After two weeks, she was advised to ambulate with partial weight bearing. Full weight bearing was allowed one month after the initial injury. The patient came for the three- and six-month follow-up visits and reported no dis-

comfort, pain or leg length discrepancy. Radiographic findings did not reveal any other complications. One year after the initial trauma, the patient displayed similar clinical and radiological findings (Figure 3) and had fully returned to her pre-injury activities. □

DISCUSSION

To our knowledge, there is a scarce literature regarding native hip dislocation in elderly individuals following a low-energy non-contact injury, especially when the dislocation is not combined with the presence of fractures or any other associated pathology.

In fact, posterior native hip dislocation might be the result of a high-energy impact. However, very rarely, a native hip dislocation might be caused after a low-energy trauma, particularly in patients with systemic disorders that could affect the musculoskeletal system, such as rheumatic diseases, congenital discrepancies, severe hip dysplasia, joint laxity syndrome and joint infections (8, 9). Previous fractures around the hip joint and partial or total arthroplasty are also significant predisposing factors (10).

The mechanism of injury frequently indicates the direction of dislocation. The most common mechanism includes axial load of the femur with the hip in flexion and abduction, thus leading to a posterior dislocation (11). These injury patterns have been described and classified by Epstein and Thomson in 1951. Their classification divides posterior dislocation into five different types, taking into consideration the existence of an associated fracture pattern (Table 1). Although posterior dislocations constitute the most common form accounting for 90% of cases, a different mechanism of injury may result in a different type of dislocation.

TABLE 1. Thompson–Epstein classification of posterior hip dislocation

Type I	With or without minor fracture
Type II	With single large fracture of the posterior acetabular rim
Type III	With a comminuted fracture of the posterior rim of the acetabulum with or without a major fragment
Type IV	With fracture of the acetabular rim and floor
Type V	With fracture of the femoral head



FIGURE 3. A) Twelve-month follow-up anteroposterior pelvic radiograph; B) 12-month follow-up lateral pelvic radiograph

An anatomic classification includes also anterior hip dislocation, which can be further divided as superior (pubic and sub spinous) or inferior (obturator and perineal) (12). In anterior superior hip dislocation, the limb appears in extension and external rotation. On the other hand, in anterior inferior dislocation, the hip appears in flexion, abduction and external rotation. However, these presentations are quite uncommon.

The current literature includes only a small number of cases regarding a rare type of pure native hip joint dislocation. Most of them derive as a consequence of a high-energy impact, such as anterior superior and anterior inferior (or luxatio erecta femoris) patterns, whereas low-energy anterior dislocations are extremely rare (13). In addition, the vast majority of low-energy dislocations are often associated with concomitant peri-articular fractures, as they mainly occur in osteoporotic elderly individuals (14, 15). These findings strengthen further the rarity of our case, since no other concomitant injury was observed in our patient.

It is a known fact that the hip is an inherently stable joint with a ball-and-socket formation, supported by strong ligaments and thus strenuous to dislocate (16). Early closed reduction as a way of treatment is often undemanding and can lead to excellent results. However, in rare cases this maneuver might be obstructed by either residual bone incarceration from the femoral head and the acetabulum or soft tissue interference. In such a case, modified maneuvers have been proposed to achieve a satisfactory outcome (17).

Early diagnosis and management of hip dislocation may determine the final outcome. Delayed reduction of more than 12 hours, increases the likelihood for post-traumatic complications. Even after an early and successful reduction, it is crucial to evaluate the stability of the hip and a

new neurovascular examination should be performed. In addition, it is important not to ignore that dislocations associated with acetabular ring fractures pose a high risk of deep vein thrombosis (DVT) (18).

Moreover, patients with a posterior hip dislocation are prone to sciatic nerve entrapment (19). In such case, a thorough neurological reassessment is mandatory, in order to adjust the course of the treatment appropriately. It is also important to remind that ipsilateral knee injuries may as well be present in patients with posterior hip dislocation. Lastly, future complications include post traumatic arthritis, heterotopic ossification of the abductor muscles, avascular necrosis of the femoral head, sciatic nerve dysfunction and recurrent dislocations (20). □

CONCLUSION

Despite being an uncommon pattern of hip injury in the elderly, since the vast majority of patients in this age group arrive to the orthopedic emergency with femoral neck fractures or fracture dislocations of the hip joint, our case report highlights the need for a meticulous clinical examination and early intervention in order to avoid any future complications. Furthermore, we would like to emphasize the importance of a close follow-up after the initial treatment. In this case, one year post-traumatically, our patient had returned to her daily activities without any restrictions. □

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