Adult Traumatic Inferior Hip Dislocation after Falling from a Height: A Report of Case

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Abstract

Inferior dislocation of hip joint is a rare clinical entity. Closed reduction maneuver could be challenging, especially if the attending surgeon is not familiar with specific anatomy associated with this injury. Herein, we reported a 22-years-old man brought to the Emergency department with history of accidentally falling from a height of 13 meters. He was managed with multidisciplinary approaches as a multiple trauma. He was complaining of severe hip pain. His right hip joint was flexed, externally rotated, and abducted. His pelvis was stable and the lower extremities had normal symmetric pulses. On radiologic examination, there was no associated hip fracture. He was brought to operating room for closed reduction under general anesthesia. Although traumatic hip dislocations usually have high morbidity and mortality rates due to multiple organ damages, patient was discharged 6 days after admission and advised to keep toe touch weight bearing for the next six weeks during walking. Therefore, a detailed evaluation on emergency presentation, a multi-disciplinary approach, and early diagnosis of inferior hip dislocation could be life-saving for such patients.

Keywords: Accidental falls; Hip dislocation; Hip injuries; Multiple trauma

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Introduction

Inferior dislocation of hip, also known as Luxatio erecta femoris, is considered a rare clinical entity which usually occurs secondary to high-velocity trauma (1). Based on a literature review of previous case reports on 2017 (2), till then a total of 13 cases were reported in adult group (one of which was a bilateral inferior hip dislocation) (3), and two were open dislocation (4, 5), and only two cases were reported in pediatric age group (6, 7). According to previous reviews conducted on this entity (2, 8), inferior hip dislocation has been reported to occur following high-energy trauma and commonly seen with a concomitant femoral head or neck fracture (1). Previous studies have reported inferior hip dislocation after falling while running, sports related trauma, motor car accident, falling from a height, a bicycle, and also a tree branch (1, 8). There are 2 types of injury mechanisms which might lead to inferior hip dislocation. The obturator type involves a force applied to an abducted hip, which is then flexed and externally rotated to dislocate the femoral head to lie anteriorly and inferiorly to the obturator foramen; the thigh can be in varying degrees of flexion and abduction (8). The ischial type involves a force applied to flexed hip and knee, with the femur in extreme flexion (*i.e.* parallel to the long axis of the body, but with little or no abduction or external rotation of the thigh); the femoral head is dislocated inferiorly and lies next to the ischium. The ischial type is more common than the obturator type (8). Inferior hip dislocation treatment consists of closed reduction under sedation or general anesthesia with axial traction while gradually extending the thigh with additional internal rotation maneuvers, followed by immobilization for 2 to 6 weeks and then gradual returning to normal weight bearing (8). Herein, we presented a traumatic case of 22-years-old male workman with an isolated inferior hip dislocation after accidentally falling from a height due to less common mechanism aforementioned (obturator type).

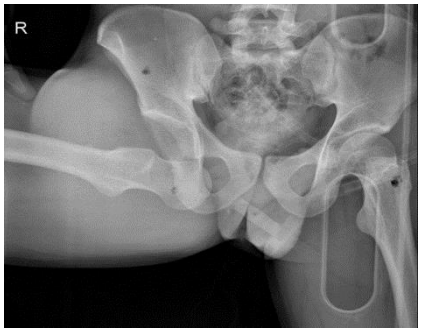

Figure 1. Pelvic antero-posterior view, luxetio erecta of right hip joint

Figure 2. Pelvic antero-posterior view, congruent right hip joint after reduction

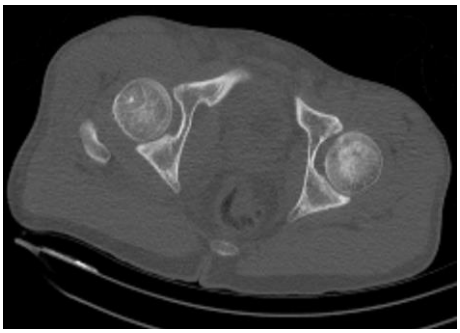

Figure 3. Post reduction pelvic axial CT scan, congruent hip joint without any associated fractures

Case Report

A 22 years old male, healthy construction worker accidentally fell down from a height of 13 meters. Details of the injury mechanism were not available, but according to his thigh position, it seemed to be obturator type. The patient was brought to Emergency department of Shohada Tajrish hospital. He was managed with multidisciplinary approach as multiple trauma. He was complaining of abdominal pain and severe right hip pain. In physical examination, severe tenderness was found in abdominal region, there was an open wound in his left arm, he was conscious with Glasgow Coma Score of 15 (9) and had no sign of respiratory distress. There was a 1cm long lacerated wound with no active bleeding on distal lateral aspect of left upper limb. Left elbow was also dislocated. His right lower limb was flexed, externally rotated, and abducted. The pelvis was stable and lower extremities had normal symmetric pulse. There was no external bleeding or neurovascular deficit.

Radiological assessment including antero-posterior pelvic view was obtained (Figure 1) that showed inferior dislocation of right femoral head with no associated fracture. Another concomitant injury was open fracture of right distal humerus type C2 according to classification of American orthopedic (AO) association (10). Focused Assessment with Sonography for Trauma (FAST) was performed (1) that showed multiple lacerations of spleen extending to hilum of spleen confirmed by abdominopelvic computed tomography (CT). Cervical spine and brain CT scans were also ordered and were normal. Thoracoabdominal CT scan showed multiple fractures in left seventh rib, body of T7, and transverse process of L1, L3, and L4.

The patient was transferred to operating room within five hours after the incident and the operations were conducted by a team of endovascular and orthopedic surgeons. The patient underwent exploratory laparotomy, splenectomy, and closed reduction of right hip joint in supine position under general anesthesia. The right hip was reduced in two steps; first, by traction in the line of deformity which brought the hip out of the pelvis and became posterior hip dislocation. Afterwards, posterior dislocation was reduced using Allis maneuver (8). Afterwards, knee and hip joints were flexed and then the knee was pulled upwards and the leg was rotated internally and externally until the femoral head was stabilized in the acetabulum. Reduction was successful on the first attempt. Post reduction, stability, and congruency of the hip joint were assessed by physical examination of range of motion and also C-Arm radiography (Figure 2).

Post reduction pelvic radiograph and CT scan showed the hip joint was stable and congruent. Follow up MRI was then ordered that showed no sign of avascular necrosis or intra-articular pathology of hip joint (Figure 3).

The right distal humerus fracture was also reduced and fixed in a separate operation during hospital admission. Afterwards, his shoulder was fixed in arm sling for the next three weeks. The exercises of range of motion were started after this period of time. Patient was discharged 6 days after admission and advised to toe touch weight bearing for the next six weeks during walking (8). Strict immobilization may lead to intra-articular adhesions and arthritis; therefore it should be avoided (3). He was also advised to avoid extremes ranges of motion for 4 to 6 weeks for capsular and soft tissue healing. Our rehabilitation protocol after reduction was toe touch weight bearing, avoidance of hip flexion past 90°, hip abduction, and extreme ranges of motion. After an averaged follow-up of 6 and 12 months, patient was ambulatory and did not have any residual pain or deformity related to hip dislocation according to the history and physical examination taken.

Discussion

Inferior dislocation of hip is considered a rare form of hip dislocation. It occurs after forceful and extreme flexion of the hip joint due to high energy trauma (2). Most patients also suffer from concomitant femoral head or neck fractures and also other interior organ damages, besides inferior hip dislocation. Our patient did not have any associated hip fracture, rather a distal humerus fracture of his right upper extremity and multiple lacerations of spleen were found after exploring laparotomy. On physical examination, usually the greater trochanter was prominent, and hip joint was presented with varying degrees of flexion, abduction, and external rotation, indicating an associated fracture. Right extremity of the patient was also hyper abducted, flexed, and externally rotated before reduction attempt.

Management of inferior hip dislocation is usually easily done through closed reduction under sedation or general anesthesia by maintaining traction toward the head while gradually extending the thigh, sometimes with additional internal rotation (1). Herein, we also did the same reduction technique which was successful at first attempt. After reduction, the patient was usually advised to be immobilized for 6 weeks by toe touch weight bearing to reduce reaction forces in hip joint. There have been no associated fractures or neurovascular complications in reports of previous studies (1, 2) and neurovascular examination of our case was also normal. Prognosis of surgical reduction after inferior hip joint dislocation was reported excellent in previous case reports, except one study which reported repeated dislocation after 10 months because of falling from a wall (9). We followed the patient through one year, he was ambulatory and did not have any residual pain or deformity related to hip dislocation.

Conclusion

Although inferior hip dislocations are rarely seen, increasing the numbers of vehicle accidents and traumatic events are now the main reason of increasing its rate in comparison with previous years. Concomitant extremity fractures with additional neurovascular injuries may lead to mortality. A careful evaluation results in early diagnosis and also a multidisciplinary approach with rapid application of imaging tools could be life-saving for such patients in trauma centers. Successful closed reduction is usually achieved under general anesthesia and prognosis after reduction is excellent. The present study has aimed to familiarize orthopedic surgeons with this rare injury mechanism, its various subtypes, reduction techniques, and prognostic factors to determine outcomes after inferior hip dislocation reduction.

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All authors made substantial contributions to the conception, design, analysis, and interpretation of data.

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