Can posterior hip fracture-dislocation occur in indoor football (futsal)? A report of two cases

Faisal Nor Yasin¹ and Vivek Ajit Singh²

¹University Malaya Medical Centre, Orthopaedics, Lembah Pantai, Kuala Lumpur, 50603, Malaysia
²University Malaya, Orthopaedics, Lembah Pantai, Kuala Lumpur, 50603, Malaysia

Abstract

Hip fracture-dislocation is extremely rare in sports and is most frequently seen after road traffic accidents. This injury is associated with considerable long-term disability and rapidly progressive joint degeneration. This case report illustrates two cases of hip fracture dislocation that occurred while playing recreational indoor football (futsal). Futsal is a fast-emerging recreational sport in Malaysia and we are now beginning to see high-impact injuries rarely encountered in recreational sports. Therefore, futsal cannot be taken lightly and it is important to take adequate precautions to prevent serious injuries when participating in such sports.

BACKGROUND

Football is one of the most popular sports in Malaysia and in the world. Futsal is a form of football that is played indoors on a court consisting of a hard surface; therefore, the pace of the game is faster than in standard football. In Malaysia it is a popular recreational sport amongst the professionals. Numerous epidemiological studies have shown the incidence of football injuries to be 10–35/1000 game hours and it is estimated that every player will have one performance-limiting injury a year.¹,² The most common injuries are contusions, sprains and/or strains in the thigh, knee and ankle. Fractures are relatively uncommon, accounting for 4–9% of acute injuries.¹,² Hip fracture-dislocation is thus extremely rare and only a few cases have been reported in the literature.

Posterior hip fracture-dislocation is almost always due to high-energy trauma and more than two-thirds are seen in road traffic accidents. The first large clinical series of patients with hip dislocations was published in 1938.³ It noted that most of the reported dislocations were sustained by front seat occupants striking their knees against the dashboard and the femur is driven posteriorly. Following this initial report, Thompson and Epstein, Steward and Milford, and Brav et al all described mechanisms, treatments and complications related to hip dislocations.¹

This is a rare presentation of two case of posterior hip fracture-dislocation that occurred in a recreational indoor football (futsal) player. From our literature search, we realise that this is the first time such an injury due to futsal has been reported.

CASE PRESENTATION

Case 1

The first case is a 50-year-old man who suffered an injury to his right hip while playing futsal. He accidentally stepped on the ball when he was dribbling the ball against his opponent. This caused a sudden halt and internal rotation of the hip. He immediately fell down due to acute pain and was unable to stand up or bare weight on the right leg after the fall. He was brought in to our accident and emergency unit and radiographs were taken. The radiographs showed right hip dislocation (posterior) associated with femoral head fracture (fig.1). The hip fracture-dislocation was reduced within 6 hours of the injury under sedation in
the emergency room and there was no sciatic nerve injury post-reduction. Plain radiographs and CT of the pelvis taken after the reduction revealed that the fractured femoral head was rotated inside the hip joint (fig 2). The anterior and posterior walls of the acetabulum were intact. The injury was classified as Pipkin type-I according to the Pipkin classification system of posterior hip dislocation associated with femoral head fractures.3

An open reduction and internal fixation of the femoral head with screw fixation was performed using a standard posterior (Kocher-Langenbeck) approach. He had uneventful postoperative course and discharged with non-weight bearing instruction for 3 months.

**Case 2**

The second case is a 22-year-old man who also sustained a similar injury while playing futsal. He accidentally twisted his right leg when tackling for the ball. His right hip went into extreme internal rotation. He felt his right hip suddenly giving way and experienced intense pain over the hip. He was unable to ambulate after that. The dislocation was reduced under sedation in the emergency room. Plain radiographs and CT scan revealed a small comminuted fracture of the posterior wall of the right acetabulum and displaced femoral head fracture (figs 3, 4 and 5). The injury was classified as Pipkin type IV. The femoral head was fixed using a screw fixation through posterior approach (fig 6). The acetabular wall was not fixed as it was just a small piece of fracture and the hip was relatively stable during surgery after fixation of the femoral head. Postoperatively the patient was kept on traction for 2 weeks before commencing physiotherapy. He was discharged with a non-weight-bearing instruction for 3 months.

**OUTCOME AND FOLLOW-UP**

On 3 months’ follow-up, both patients were allowed full weight-bearing and at the latest follow-up (2 years following the injury) both the patients are asymptomatic and there was no early signs of osteoarthritis. They are back to employment but have not resumed futsal.

**DISCUSSION**

Hip fracture-dislocations are usually caused by high-energy trauma and are uncommon in any sports. Hip dislocations (with or without associated acetabular fractures) have been reported in basketball, biking, American football, gymnastics, jogging, rugby and skiing. Only five cases have been reported in football (outdoor or indoor).4,5

In 1970, Lamke investigated 110 traumatic hip dislocations and found that only 6 (5.5%) occurred during sporting activities.4 In a latest review, Chudik found that hip dislocations during sporting activities represent only 2–5% of all hip dislocations.6

The mechanism of hip fracture-dislocations is dependent on the amount and direction of applied force, the quality of bone at both the proximal femur and the acetabulum, and the position of the hip during the injury. Letournel demonstrated through vector analysis the relationship of the position of the leg and pelvis to the type of injury sustained.3 In the classic dislocation seen in the unrestrained car driver, at the time of rapid deceleration, the body pivots forward on the fixed foot, the knee strikes the dashboard with the hip and knee flexed to 90°. This force delivered in this position tends to force the femoral head out posteriorly, usually without a fracture. With less flexion of the hip at the time of impact, the femoral head strikes either the posterior or the postero-superior aspect of the acetabulum leading to a fracture dislocation. Femoral head fractures, impaction and osteochondral injuries occur as the femoral head exits the acetabulum.

The most commonly reported mechanism for posterior hip fracture-dislocation in sport is either a forward fall on the knee with a flexed hip or a blow from behind when the athlete is down on all four limbs.6 In this case report, the patients did not have any forceful contact. The first case had a sudden halt and internally rotated leg at the time of injury and the second case twisted his leg while tackling the ball. The force involved in hip dislocation during sports activities is minimal compared with the classic hip dislocation seen in road traffic accident. However, the same prognostic factors that determine the functional outcome in more severe hip injuries apply to these patients.
Traumatic dislocations of the hip with or without associated acetabular fractures are major injuries. They represent an orthopaedic emergency demanding urgent reduction if complications such as avascular necrosis of the femoral head, sciatic nerve injury, post-traumatic arthritis and myositis ossificans are to be avoided. The incidence of avascular necrosis (AVN) of the femoral head greatly increases when the time from injury to reduction is more than 6 hours.\cite{3,5} AVN following hip dislocations has been reported to occur in 1–17% of injuries.\cite{3} Post-traumatic arthritis is the most frequent long-term complication of the hip dislocations.

Upadhay and colleagues reported a 14-year follow-up of 74 cases of apparently uncomplicated hip dislocations with no associated fractures.\cite{3} In their series, 16% of patients developed traumatic arthritis and 8% developed arthritis secondary to AVN. The incidence of traumatic arthritis becomes dramatically higher when dislocations associated acetabular fractures are included. Upadhay and Moulton report the incidence of traumatic arthritis to be as high as 88% in this group. Epstein also reported much higher rates of traumatic arthritis in these patients. Most authors also agree that associated acetabular fractures treated by open reduction and internal fixation usually have a good to excellent results when anatomic reduction was obtained.\cite{3,5,7} Indications for operative management include articular displacement more than 2 mm, intraarticular fragments, unstable hip after closed reduction, irreducible hip, vascular injuries and ipsilateral femoral fractures.\cite{3,2}

Posterior hip fracture-dislocations of the femoral head are not common in football or other sporting activities. Sometimes, operative intervention is required to achieve anatomical reduction and, hopefully, a favourable outcome. In our case, operative stabilisation led to a congruent joint reconstruction without any post-operative complications. Although this type of injury is extremely rare, it should be noted as the potentially serious long-term sequelae and associated loss of playing time especially for the professional athlete can be devastating. Futsal or indoor football is fast becoming a popular sport especially amongst the white collar professionals. As it is played on hard surface (usually on cement court), the impact during injuries are considerably more severe; therefore, the possibility of encountering serious injuries is also very high. We believe that as the popularity of this sport grows, we will come across many more unusual high impact injuries in this group of players; therefore, more precautions and care should be taken in this sport.

**LEARNING POINTS**

- More high-impact injuries can be expected as futsal becomes more popular among the urban professionals.
- Posterior hip fracture-dislocation is a devastating injury and if not recognised early can lead to long-term complications.
- Injuries resulting from futsal should be taken seriously and managed as a high-impact injury.

**Footnotes**

**Competing interests:** none.

**Patient consent:** Patient/guardian consent was obtained for publication.

**REFERENCES**


**Figures and Tables**

**Figure 1**

Radiograph shows posterior right hip dislocation with infra fovea fracture of the right femoral head.

**Figure 2**

Pelvic AP radiograph view after reduction of the right hip shows the fracture piece rotated within the femoral head. This is confirmed by the CT image, which shows the fracture piece has rotated 180 degrees.
Shows anterior-posterior and lateral views of radiographs after open reduction and internal fixation of the femoral head with screw fixation.

**Figure 4**

Radiograph on the right shows posterior right hip dislocation with infra fovea fracture of the right femoral head and fracture of the posterior wall of the acetabulum. The radiograph is the post-reduction film that shows small piece over the superior aspect of the head representing the posterior lip of the acetabulum and irregular right femoral head.

**Figure 5**

CT showing the fracture fragment of the right femoral head. There is slight comminution of the right posterior wall.

**Figure 6**
Radiographs after open reduction and internal fixation of the femoral head with screw fixation in both anterior-posterior and lateral views.