Simultaneous anterior and posterior traumatic dislocations of both hips are very rare. Only 33 cases have been previously reported in the English language literature. Although they were all due to high-energy injuries, they were hemodynamically stable and had a stable pelvic ring. We report a unique case of asymmetrical hip dislocations with an unstable pelvic ring and hemodynamic instability.

A 40-year-old man was injured in a high-energy motor vehicle accident. He was hemodynamically unstable when he presented in the emergency department. Radiographs showed asymmetrical dislocations of both hips with an unstable pelvic ring. Under general anesthesia, he had...
closed reduction of the dislocations of both hips, followed by temporary stabilization with an external fixator. Transcatheter arterial embolization was performed to stop active pelvic bleeding. Delayed open reduction and internal fixation was performed 12 d later with anterior and posterior plates. The patient recovered well with an uneventful post-operative course. Asymmetrical bilateral hip dislocations with pelvic ring instability caused by trauma, as presented in this case, is very rare and potentially life threatening. Prompt treatment can give a good outcome.

**Key words:** Asymmetrical bilateral hip dislocations; Unstable pelvic ring; Hemodynamic instability

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**Core tip:** Simultaneous anterior and posterior traumatic dislocations of both hips are very rare. We report a unique case of asymmetrical hip dislocations with an unstable pelvic ring and hemodynamic instability. Given the severity of the associated complications, every effort should be made to ensure prompt diagnosis and immediate therapy. Attention must be paid to early rescue procedures, including initial circulation support and elimination of bleeding, as well as joint reduction and rapid stabilization of the pelvic ring.

**INTRODUCTION**

Traumatic hip dislocation is a severe injury with the potential for significant complications and long-term patient morbidity. Hip dislocation accounts for 2%-5% of all joint dislocations[1]. About 90% of hip dislocations are posterior while bilateral ones are very rare constituting 0.025%-0.05% of all dislocations[2]. Associated fractures are common and may complicate management. Prompt reduction and early definitive surgical therapy are recommended.

**CASE REPORT**

A 40-year-old man suffered a high-energy motor vehicle accident when he was hit by a car whilst a pedestrian. He presented to the emergency department conscious but with hemodynamic instability. On examination there was a right sided gluteal hematoma. His right lower limb was flexed, adducted, and internally rotated; his left lower limb was flexed, abducted and externally rotated. There was no neurovascular deficit. Radiographs showed asymmetrical dislocations of both hips, with the left hip dislocated anteriorly and the right hip dislocated posteriorly (Figure 1). Computed tomography (CT) with 3-D reconstruction imaging further showed a longitudinal sacral fracture in zone II and detachment of the symphysis pubis along with a displaced fracture of the superior pubis ramus on the left side (Figure 2).

Under a general anaesthetic he had closed reduction of the hip dislocations. The pelvis was temporarily stabilized with an external fixator (Figure 3). Transcatheter arterial embolization was performed to stop active bleeding from small branches of three arteries: the right superior and inferior gluteal arteries and the left inferior gluteal artery. Thereafter the patient was immobilized on a bed, with skin traction applied to both lower limbs although this treatment is now not used widely. Twelve days later, the external fixator was removed and the pelvic ring fractures were treated with open reduction and internal fixation (ORIF) with anterior and posterior plates and screws (Figure 4).

The patient was discharged 35 d later and he has an uneventful recovery after hospital discharge. At 12 mo after his injury he had recovered completely with normal ranges of movements at both hip joints with no evidence of avascular necrosis, traumatic arthritis or...
Traumatic asymmetrical hip dislocation is rare. We performed a literature review of papers in English. We found only 33 cases with complete data on injury and treatment; the data are summarized in Table 1. The mean age was 30 years; and all except seven were male. All of the previously reported cases of asymmetrical hip dislocations were caused by high-energy impact: Motor vehicle collision (MVC) (26 cases) [3–24], a motorcycle accident (2 cases) [25,26], being hit by a falling object (1 case) [27], a fall (3 cases) [28–30], and a plane crash (1 case) [31]. The concomitant injuries included femoral shaft fractures, femoral head fractures, and acetabular fractures and pubic ramus fractures. Only one patient had pelvic instability [31]; none was hemodynamically unstable. The treatments were very similar: closed reduction in 17 cases [3–6,12–15,19,20,22–25,28,30,31]; closed reduction with delayed ORIF in 14 cases [7–10,16–18,21,26,27,29], and closed reduction with open surgery but without internal fixation in two cases [11,17].

Traumatic hip dislocations are often due to high-impact forces, such as those that occur in a motor vehicle collision (MVC). The hip position at injury defines the direction of dislocation. The most frequent cause of bilateral hip dislocations is unrestrained front-seat passengers [25,32]. During the rapid deceleration of the vehicle the body pivots forward on fixed feet and the knees strike the dashboard, transmitting the dislocating force to the hip joints. When the passenger holds the leg in abduction and external rotation, an anterior dislocation occurs. In contrast, if the passenger holds the leg

**DISCUSSION**

| Author          | Year | Age | Sex | Mode of injury | Concomitant fracture | Hemodynamic status | Treatment   |
|-----------------|------|-----|-----|----------------|----------------------|--------------------|-------------|
| Civil et al [21] | 1981 | 59  | M   | MVC            | Mandible fracture    | Stable             | CR          |
| Nadkarni et al [24] | 1991 | 22  | M   | MVC            | Right iliac fracture | Stable             | CR          |
| Bansal et al [21] | 1991 | 32  | M   | MVC            | Right acetabular fracture | Stable | CR          |
| Gittins et al [21] | 1991 | 28  | M   | MVC            | Maxillofacial fracture | Stable | CR          |
| Shukla et al [21] | 1993 | 25  | M   | MVC            | Left acetabular fracture | Stable | CR ORIF    |
| Mapa et al [21] | 1996 | 21  | M   | MVC            | Shaft fracture of the femur | Stable | CR ORIF    |
| Kaleli et al [21] | 1998 | 28  | M   | MVC            | Right acetabular fracture | Stable | CR ORIF    |
| Martinez et al [21] | 2000 | 36  | M   | MVC            | Left acetabular fracture | Stable | CR+ORIF    |
| Duszkiewicz et al [21] | 2000 | 18  | M   | MVC            | Fractures of the second to fifth metacarpals | Stable | CR+Open reduction |
| Agarwal et al [21] | 2000 | 22  | M   | MVC            | Comminution of the posterior lip of the left acetabulum | Stable | CR          |
| Lam et al [21] | 2001 | 18  | M   | MVC            | None | Stable | CR          |
| Devgan et al [21] | 2004 | 37  | M   | MVC            | None | Stable | CR          |
| Lopez-Sanchez et al [21] | 2006 | 19  | F   | MVC            | None | Stable | CR          |
| Sahin et al [21] | 2007 | 45  | M   | MVC            | Bilateral acetabular fractures | Stable | CR ORIF    |
| Pascarella et al [21] | 2008 | 23  | M   | MVC            | Bilateral femoral head fractures | Stable | CR+Open surgery |
| Sah et al [21] | 2008 | 19  | F   | MVC            | Bilateral acetabular wall fractures | Stable | CR ORIF    |
| Sanders et al [21] | 2008 | 31  | M   | MVC            | None | Stable | CR          |
| Okcay et al [21] | 2012 | 28  | M   | MVC            | Bilateral acetabular fractures | Stable | CR          |
| Hamilton et al [21] | 2012 | 30  | M   | MVC            | Fracture of the left acetabulum | Stable | CR ORIF    |
| La et al [21] | 2013 | 36  | M   | MVC            | Left acetabular fracture | Stable | CR          |
| Buckwalter et al [21] | 2015 | 23  | F   | MVC            | None | Stable | CR          |
| Abdullah et al [21] | 2017 | 32  | F   | MVC            | Fracture of left superior and inferior pubic rami | Stable | CR          |
| Loupasis et al [21] | 1998 | 27  | M   | Motorcycle accident | None | Stable | CR          |
| Schwartz et al [21] | 2003 | 24  | M   | Motorcycle collision | Fractures of the right femoral shaft, right femoral head and left acetabulum | Stable | CR+ORIF |
| Fang et al [21] | 2011 | 31  | M   | Hit by a falling object | Fractures of the right acetabulum, right superior and inferior pubic rami and left superior pubic rami | Stable | CR+ORIF |
| Hill et al [21] | 1990 | 24  | M   | Fall injury | Right femoral head fracture | Stable | CR          |
| Usuu et al [21] | 2012 | 57  | M   | Fall injury | Posterior wall fracture of the left acetabulum | Stable | CR ORIF    |
| Kanojia et al [21] | 2013 | 45  | M   | Fall injury | None | Stable | CR          |
| Sinha et al [21] | 1985 | 38  | M   | Plane crash | Fracture-diastasis of the symphysis pubis and diastasis of the left sacroiliac joint | Stable | CR          |

MVC: Motor vehicle collision; CR: Closed reduction; ORIF: Open reduction and internal fixation.
in adduction and internal rotation, a posterior dislocation occurs. For asymmetrical dislocations to occur, i.e., one anterior and one posterior, it is believed that forces in two opposite directions are needed[17,30]. We believe that this might have been the injury mechanism in our case, although the patient could not recall what had happened at the time of injury. This is the first case to simultaneously involve three serious traumatic conditions in the same patient: Asymmetrical bilateral hip dislocations, an unstable pelvic ring and hemodynamic instability.

In conclusion, the case presented here represents an unusual, severe combination of injuries resulting from a high-speed motor-vehicle accident; this very rare clinical condition can be life threatening. Despite recent advances in the management of hemorrhagic shock, the mortality associated with hemodynamically unstable pelvic injuries remains high. Given the severity of the associated complications, every effort should be made to ensure prompt diagnosis and immediate therapy. The optimal management of a patient presenting with asymmetrical hip dislocations, hemodynamic instability is disputed. Attention must be paid to early rescue procedures, including initial circulation support and elimination of bleeding, as well as joint reduction and rapid stabilization of the pelvic ring.

**ARTICLE HIGHLIGHTS**

**Case characteristics**
The patient presented with severe pain in both hips with hemodynamic instability.

**Clinical diagnosis**
On examination his right lower limb was flexed, adducted, and internally rotated, his left lower limb was flexed, abducted and externally rotated; he was hemodynamically unstable.

**Differential diagnosis**
The differential diagnosis included proximal femoral and acetabular fractures. Only investigations primarily radiographs could clarify the diagnosis.

**Laboratory diagnosis**
The blood tests showed a normal haemoglobin and early inflammatory response which combined with his low blood pressure implied appreciable internal bleeding.

**Imaging diagnosis**
Radiographs showed asymmetrical dislocations of both hips, with the left hip dislocated anteriorly and the right hip dislocated posteriorly; computed tomography imaging also showed a longitudinal sacral fracture and left superior pubis ramus fracture.

**Pathological diagnosis**
Dislocations and fractures.

**Treatment**
He was given circulatory support with intravenous fluids and a blood transfusion, and rapid stabilization of his pelvic ring and arterial embolization to reduce haemorrhage.

**Related reports**
Only 33 cases of asymmetrical bilateral hip dislocations have been previously reported in the English language literature. Although they were all due to high-energy injuries, they were hemodynamically stable and had a stable pelvic ring. We report a unique case of asymmetrical hip dislocations with an unstable pelvic ring and hemodynamic instability.

**Term explanation**
MVC: Motor vehicle collision; ORIF: Open reduction and internal fixation.

**Experiences and lessons**
Given the severity of the associated complications, every effort should be made to ensure prompt diagnosis and immediate therapy. Attention must be paid to resuscitation, including initial circulation support, reduction of bleeding through pelvic stabilization and arterial embolization and subsequent joint reduction and fracture stabilization.

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