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CASE REPORT

Asymmetrical traumatic bilateral hip dislocations with hemodynamic instability and an unstable pelvic ring: Case report and review of literature

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Author contributions: Huang K accountable for the execution of the case report, the integrity and analysis of the data and the writing of the manuscript; Giddins G accountable for the process of analyzing the case and writing the manuscript; Zhang JF accountable for the conception and execution of the case report; Lu JW is the senior author who is the treating surgeon of the patient; Wan JM, Zhang PL and Zhu SY contributed substantially to the process of analyzing the case and writing the manuscript; all authors read and approved the final manuscript.

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Abstract

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

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.

Huang K, Giddins G, Zhang JF, Lu JW, Wan JM, Zhang PL, Zhu SY. Asymmetrical traumatic bilateral hip dislocations with hemodynamic instability and an unstable pelvic ring: Case report and review of literature. *World J Clin Cases* 2018; 6(5): 94-98 Available from: URL: http://www.wjgnet.com/2307-8960/full/v6/i5/94.htm DOI: http://dx.doi.org/10.12998/wjcc.v6.i5.94

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

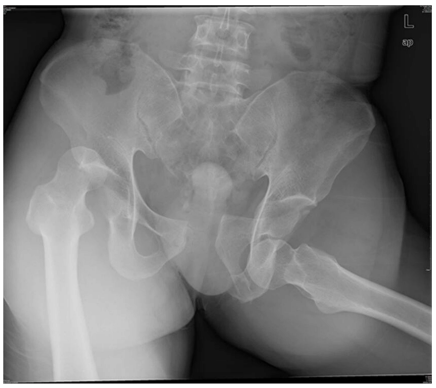

Figure 1 A X-ray showing asymmetrical dislocations of both hips, with the left dislocated anteriorly and the right dislocated posteriorly.

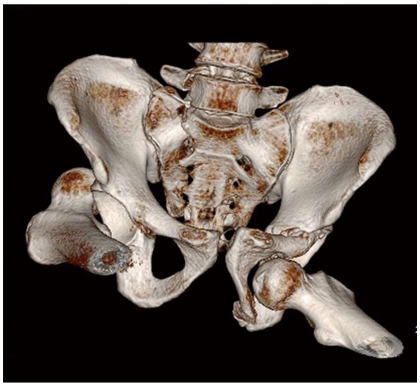

Figure 2 Computed tomography with 3-D reconstruction imaging showing a longitudinal sacral fracture in zone II and detachment of the symphysis pubis along with a displaced fracture of the superior pubis ramus on the left side.

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 left superior pubis ramus (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

Table 1 Previously reported cases of bilateral hip dislocation

Author	Year	Age	Sex	Mode of injury	Concomitant fracture	Hemodynamic status	Treatment
Civil *et al*[3]	1981	59	M	MVC	Mandible fracture	Stable	CR
Nadkarni *et al*[4]	1991	22	M	MVC	Right iliac fracture	Stable	CR
Bansal *et al*[5]	1991	32	M	MVC	Right acetabular fracture	Stable	CR
Gittins *et al*[6]	1991	28	M	MVC	Maxillofacial fracture	Stable	CR
Shukla *et al*[7]	1993	25	M	MVC	Left acetabular fracture	Stable	CR + ORIF
Maqsood *et al*[8]	1996	21	M	MVC	Shaft fracture of the right femur	Stable	CR + ORIF
Kaleli *et al*[9]	1998	28	M	MVC	Right acetabular fracture	Stable	CR + ORIF
Martínez *et al*[10]	2000	36	M	MVC	Left acetabular fracture	Stable	CR+ORIF
Dudkiewicz *et al*[11]	2000	18	M	MVC	Fractures of the second to fifth left metacarpals	Stable	CR + Open reduction
Agarwal *et al*[12]	2000	22	M	MVC	Comminution of the posterior lip of the left acetabulum	Stable	CR
Lam *et al*[13]	2001	18	M	MVC	None	Stable	CR
Devgan *et al*[14]	2004	37	M	MVC	None	Stable	CR
López-Sánchez *et al*[15]	2006	19	F	MVC	None	Stable	CR
Sahin *et al*[16]	2007	45	M	MVC	Bilateral acetabular fractures	Stable	CR + ORIF
Pascarella *et al*[17]	2008	23	M	MVC	Bilateral femoral head fractures	Stable	CR + Open surgery
		16	F	MVC	Right acetabular fracture	Stable	CR + ORIF
Sah *et al*[18]	2008	19	F	MVC	Bilateral acetabular wall fractures	Stable	CR + ORIF
Sanders *et al*[19]	2008	31	F	MVC	None	Stable	CR
Olcay *et al*[20]	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
		30	M	MVC	Bilateral acetabular fractures	Stable	CR + ORIF
		34	M	MVC	Fracture of the right acetabulum	Stable	CR + ORIF
		20	F	MVC	Right transverse posterior wall acetabular fracture	Stable	CR + ORIF
Lo *et al*[22]	2013	36	M	MVC	Left acetabular fracture	Stable	CR
Buckwalter *et al*[23]	2015	23	F	MVC	None	Stable	CR
Abdulfattah Abdullah [24]	2017	32	F	MVC	Fracture of left superior and inferior pubic rami	Stable	CR
Loupasis *et al*[25]	1998	27	M	Motorcycle accident	None	Stable	CR
Schwartz *et al*[26]	2003	24	M	Motorcycle collision	Fractures of the right femoral shaft, right femoral head and left acetabulum	Stable	CR + ORIF
Fang *et al*[27]	2011	31	M	Hit by a falling object	Fractures of the right acetabulum, right superior and inferior pubic rami and left superior pubic ramus	Stable	CR + ORIF
Hill *et al*[28]	1990	24	M	Fall injury	Right femoral head fracture	Stable	CR
Uslu *et al*[29]	2012	57	M	Fall injury	Posterior wall fracture of the left acetabulum	Stable	CR + ORIF
Kanojia *et al*[30]	2013	45	M	Fall injury	None	Stable	CR
Sinha[31]	1985	38	M	Plane crash	Fracture-diastasis of the symphysis pubis and diastasis of the left sacroiliac joint	Stable	CR

MCV: Motor vehicle collision; CR: Closed reduction; ORIF: Open reduction and internal fixation.

neurologic deficit.

DISCUSSION

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 fracture 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 are 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

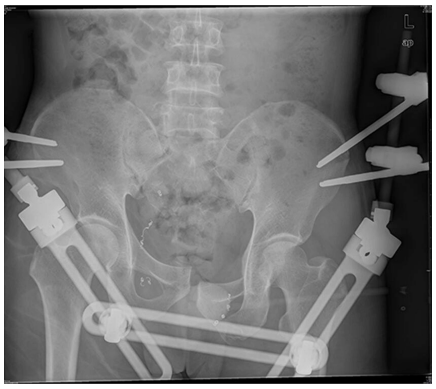

Figure 3 The pelvis was temporarily stabilized with an external fixator.

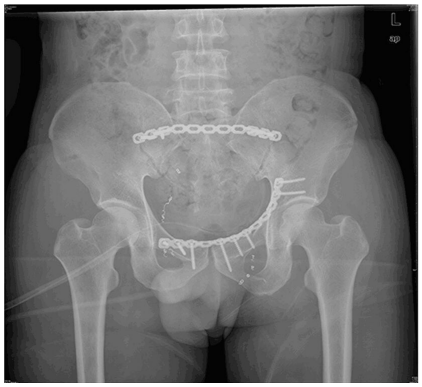

Figure 4 The pelvic ring fractures were treated with open reduction and internal fixation with anterior and posterior plates and screws.

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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