

CASE REPORT

# Bilateral Simultaneous Asymmetrical Traumatic Hip Fracture Dislocation with Femur Shaft, Sacrum and Unstable L3 Fracture: A Case Report and Literature Review

Ahmet Özgür YILDIRIM<sup>1</sup>, Yunus DEMİRTAŞ<sup>1</sup>, Özdamar Fuat ÖKEN<sup>1</sup>, Murat GÜLÇEK<sup>1</sup>, Ahmet UÇANER<sup>1</sup>

<sup>1</sup> Department of 1<sup>st</sup> Orthopedics and Traumatology, Ankara Numune Teaching and Research Hospital, Ankara, Turkey

## ABSTRACT

*Traumatic bilateral simultaneous asymmetrical hip dislocation is a rare condition. To the best of our knowledge, there is no previously reported case of bilateral asymmetrical traumatic hip dislocation with bilateral acetabular fractures concomitant with femoral shaft, femoral head avulsion and sacrum and unstable L3 vertebral fracture. A 26-year-old previously healthy male was struck by a motor vehicle from behind and slipped under another vehicle after falling onto the road. His limbs were in an abnormal position. Radiographs showed bilateral asymmetrical hip dislocation with accompanying acetabular fractures and femoral head avulsion fractures. There was a femoral shaft fracture on the left side. Closed reduction of both hips was carried out. The computed tomographic scans of both hips revealed a concentric location with accompanying bilateral acetabular fractures. A vertical lateral fracture line from the anterior to posterior column was seen on L3 corpus vertebrae and sacrum on the computed tomographic scans. A closed reduction and intramedullary fixation of the ipsilateral femur fracture was performed. An open reduction and internal fixation of the left acetabulum was then undertaken. Short segment posterior fixation was performed on the L3 vertebral fracture. In conclusion, bilateral asymmetric traumatic hip dislocation with bilateral acetabular fractures concomitant with femoral shaft, L3 burst and sacrum fracture is a rare and serious injury. Patients require intensive care unit and multidisciplinary treatment because of the extent of the trauma. Following the immediate emergency part of the treatment, the definitive treatment must be planned with great care.*

**Key words:** Asymmetrical hip dislocation, Femur fracture, Lomber fracture, Sacrum fracture, Early surgery

Received: November 29, 2012 • Accepted: January 07, 2013

## ÖZET

### Bilateral Simultane Asimetrik Travmatik Kalça Kırıklı Çıkığı Birlikteliğinde Femur Cisim, Sakrum ve İnstabil L3 Vertebra Kırığı: Olgu Sunumu ve Literatür İncelemesi

*Travmatik bilateral simultane asimetrik kalça çıkığı nadir bir durumdur. Literatürde bilateral asetabulum kırıkları, femur cisim, femur baş avülsiyon, sakrum ve L3 vertebra kırıklarıyla birliktelik gösteren bilateral asimetrik kalça çıkığı olgusuna rastlamadık. Motorlu bir araç çarpması sonucu başka bir aracın altında sürüklenen 26 yaşında erkek hasta acil servisimize getirildi. Alt ekstremiteleri anormal pozisyondaydı. Radyografilerde bilateral asimetrik kalça çıkığı ile birlikte asetabulum ve femur başı avülsiyon kırıkları mevcuttu. Sol alt ekstremitesinde femur cisim kırığı vardı. Her iki kalçaya kapalı redüksiyon uygulandı. Hastanın çekilen bilgisayarlı tomografisinde kalçaların konsantrik redükte olduğu ve asetabulum kırıkları tespit edildi. Tomografi kesitlerinde sak-*

rum ve L3 vertebra cisminde vertikal kırık hattının ön kolondan arka kolona doğru uzandığı görüldü. Femur kırığı kapalı redüksiyon ve internal fiksasyon yöntemiyle, sol asetabulum açık redüksiyon ve internal fiksasyon yöntemiyle ve L3 vertebra kırığı kısa segment posterior fiksasyonla cerrahi olarak tedavi edildi. Sonuç olarak bilateral asimetric travmatik kalça çıkığı birlikteliğinde femur cisim, L3 patlama ve sakrum kırıkları nadir görülen ciddi yaralanmalardır. Bu hastalar travmanın ciddiyetinden dolayı yoğun bakımda ve multidisipliner bir yaklaşımla tedavi edilmelidir. Acil tedavisi tamamlanan hastanın kesin tedavisi ciddi bir planlama eşliğinde yapılmalıdır.

**Anahtar kelimeler:** Asimetrik kalça çıkığı, Femur kırığı, Lomber kırık, Sakrum kırığı, Erken cerrahi

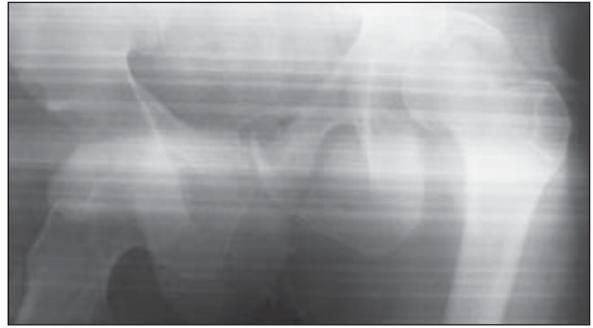
Geliş Tarihi: 29 Kasım 2012 • Kabul Ediliş Tarihi: 07 Ocak 2013

## INTRODUCTION

Traumatic bilateral simultaneous asymmetrical hip dislocation is a rare condition, of which there are 25 reported cases in the English literature<sup>[1]</sup>. Three cases of ipsilateral acetabular fractures and one case of bilateral acetabular fractures have been reported<sup>[2,3]</sup>. To the best of our knowledge, there is no previously reported case of bilateral asymmetrical traumatic hip dislocation with bilateral acetabular fractures concomitant with femoral shaft, femoral head avulsion and sacrum and unstable L3 vertebral fracture.

## CASE REPORT

A 26-year-old previously healthy male was struck by a motor vehicle from behind and slipped under another vehicle after falling onto the road. He arrived at our hospital two hours after the injury. Physical examination revealed blood pressure of 50/20 mmHg, heart rate of 143 beats/min and filiform, respiratory rate 31/min and body temperature of 36.1°C. Breathing was abnormal because of the costal fractures. A bilateral thoracostomy was applied and peritoneal lavage was positive. Bladder catheterization showed clear urine. His limbs were in an abnormal position with the right lower limb flexed, abducted and externally rotated at the hip. The left lower limb was flexed, adducted and internally rotated at the hip. There was crepitation on the left femur and the left extremity was shorter than the right. There was sciatic nerve palsy on the left side. After completing the airway and cardiac resuscitation, the patient was taken to the operating theater by the general surgery department. Radiographs taken in the operating room showed bilateral hip dislocation with accompanying acetabular fractures and femoral head avulsion fractures (Figure 1). The femoral head was displaced anteriorly on the right side and posteriorly on the left side. There was a femoral shaft fracture on the left side (Figure 2). Widening on the anteroposterior X-ray and lateral compression on the lateral X-rays of the L3 corpus



**Figure 1. Anteroposterior radiograph of dislocated hips.**



**Figure 2. Anteroposterior radiograph of femur shaft fracture.**

vertebrae were noted. A laparotomy revealed splenic laceration and rupture of the diaphragm. A nephrectomy was carried out because of left renal hemorrhage. A splenectomy was performed and rupture of the diaphragm was restored. Closed reduction of both hips was carried out under general anesthesia using the Bigelow technique. The right hip was stable but

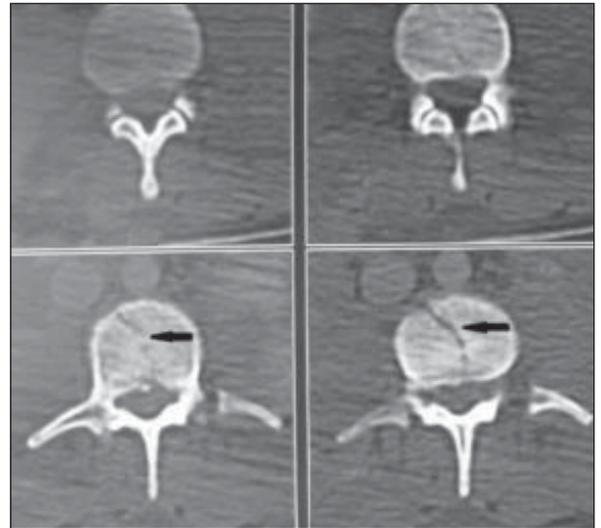
the left hip was unstable at 90° flexion. Bilateral tibial tubercle traction was applied. Post-reduction films showed concentric reduction of the hips (Figure 3). The operation was undertaken by general surgeons and urologists. The patient was taken to the radiology department after the operation and stabilization of the cardiopulmonary system. The sciatic nerve was good on the second examination after the reduction. The computed tomographic (CT) scans of both hips revealed a concentric location with accompanying bilateral acetabular fractures (Figure 4). There were no intraarticular fragments in either hip. A displaced posterior wall fracture on the left side and non-displaced anterior wall fracture on the right side were seen on CT scans. A vertical lateral fracture line from the anterior to posterior column was seen on L3 corpus vertebrae. The fracture line involved both the anterior and middle columns of the spine (Figure 5). Although there was no compression of more than 50% on the lateral radiographs, an unstable fracture of the L3 vertebra was confirmed. There was a sacrum fracture of the anterior part of the sacrum on the sacroiliac joint line, which was thought to be stable (Figure 6). During his five-day stay in the intensive care unit



**Figure 3. Anteroposterior radiograph of the hips after reduction.**



**Figure 4. Computed tomographic scan of the hips.**



**Figure 5. Computed tomographic scans of the L3 vertebrae.**



**Figure 6. Computed tomographic scan of the sacrum.**

and later in the trauma ward, the patient remained stable. A closed reduction and intramedullary fixation of the ipsilateral femur fracture was performed in the lateral supine position. After this step, an open reduction and internal fixation of the left acetabulum was then undertaken using the Kocher-Langenbeck approach in the prone position (Figure 7). The approach of femoral nail insertion was interlinked to the Kocher-Langenbeck approach at the beginning of the second step of the operation. The range of motion was good for both hips, and there were no intraarticular fragments of the femoral head or acetabulum. Short segment posterior fixation was performed on the L3 vertebral fracture in the third step of the operation (Figures 8,9). Conservative treatment was applied to the right acetabulum, femoral head and sacrum. Skeletal traction was applied with 5 kilograms for four weeks. Three months after the injury, the patient regained full range of motion in both hip joints and the left knee joint.



**Figure 7. Anteroposterior radiograph of the hips postoperatively.**



**Figure 8. Anteroposterior radiograph of lumbar vertebrae postoperatively.**

### DISCUSSION

Traumatic bilateral hip dislocations are rare injuries, comprising 1.25% of all traumatic hip dislocations<sup>[4]</sup>. Bilateral asymmetrical traumatic hip dislocations are extremely rare. Some cases of pure dislocations or dislocations associated with acetabular and femoral fractures have been reported in the literature<sup>[5-7]</sup>. To the best of our knowledge, there is no previously reported case of bilateral asymmetrical traumatic hip dislocation with bilateral acetabular fractures concomitant with femoral shaft, sacrum and unstable L3 vertebral fracture. The cases presented in the literature are usually related to motor vehicle injuries. The mechanism may be from direct force from the femur shaft to the hip in different hip positions<sup>[1]</sup>. In our case, the patient was struck by a car from behind and slipped under another car after falling to the road. Therefore, the position of the hips and the extremities when the injury occurred was unknown. However, the force that affected the patient was very strong and extremely complex as there were not only extremity injuries, but also thoracic and abdominal trauma.



**Figure 9. Lateral radiograph of lumbar vertebrae postoperatively.**

The closed reduction of the right hip was straightforward because the right femur was intact. The reduction of the left hip was more difficult because of the ipsilateral femur fracture. Maqsood et al. recommend reduction with a Schanz screw to manipulate the proximal fragment<sup>[8]</sup>. Firstly, longitudinal traction was attempted to provide an opportunity for reduction without any other devices. The femoral head was reset to its true location and bilateral tibial traction was applied.

A hip dislocation is an orthopedic emergency<sup>[9,10]</sup>. The incidence of avascular necrosis of the femoral heads may increase with any delay<sup>[3,6]</sup>. Closed reduction was achieved in the emergency operating room prior to general surgery, and then the urologists completed their surgical procedures. After five days in the intensive care unit with skeletal traction, we aimed to carry out definitive surgery. In multi-fracture cases, the sequence of surgery is important. The left femur fracture fixation was done first to facilitate the posterior fixation of the ipsilateral acetabular wall fracture. Maqsood et al. used the same technique<sup>[8]</sup>. The order of the steps taken after the femoral fracture fixation was acetabulum and L3 vertebral fracture fixation in the prone position. We used the same Kocher-Langenbeck approach for the femur and acetabulum fracture. There was no severe compression on the lateral radiographs and it appeared stable on the X-rays, but anterior and middle column involvement was shown on CT scans. Levine et al. reported a case of severe lumbosacral trauma in which the radiological findings gave the false impression of stability<sup>[10]</sup>. The CT scans of our patients indicated the treatment choice for the L3 fracture. Chung et al. also described a lumbar burst fracture with these dislocations, for which posterior segmental fixation was achieved<sup>[9]</sup>. Posterior short segment fixation was achieved for the L3 fracture of our patient.

Heterotopic ossification is another problem with acetabular fractures and dislocations<sup>[10]</sup>. Indomethacin (75 mg/day) was continuously administered for six weeks after surgery. Three months after surgery, Brooker Grade I heterotopic ossification on the left hip was determined, which did not affect the hip function.

In conclusion, bilateral asymmetric traumatic hip dislocation with bilateral acetabular fractures concomitant with femoral shaft, L3 burst and sacrum fracture is a rare and serious injury. Patients require the intensive care unit and multidisciplinary treatment because of the extent of the trauma. Following the immediate emergency part of the treatment, the definitive treatment must be planned with great care.

## REFERENCES

1. Fang Y, Pei F, Yang T, Wang G, Liu L. Traumatic asymmetrical bilateral hip dislocation: a case report and literature review. *Ekleml Hastalik Cerrahisi* 2011; 22: 177-9.
2. Martinez AA, Garcia F, Rodrigo J. Asymmetrical bilateral traumatic hip dislocation with ipsilateral acetabular fracture. *J Orthop Sci* 2000; 5: 307-9.
3. Shukla PC, Cooke SE, Pollac CV Jr, Kolb JC. Simultaneous asymmetric bilateral traumatic hip dislocation. *Ann Emerg Med* 1993; 22: 1768-71.
4. Altay M, Yagmurlu F, Heybeli M, Muratli HH, Tabak Y, Bicimoglu A. Simultaneous asymmetric bilateral traumatic hip dislocation: a case report. *Acta Orthop Traumatol Turc* 2003; 37: 182-6.
5. Ashraf T, Iraqui AA. Bilateral anterior and posterior traumatic hip dislocation. *J Orthop Trauma* 2001; 15: 367-8.
6. Lam F, Walczak J, Franklin A. Traumatic asymmetrical bilateral hip dislocation in an adult. *Emerg Med J* 2001; 18: 506-7.
7. Pascaella R, Maresca A, Cappuccio M, Reggiani LM, Boriani S. Asymmetrical bilateral traumatic fracture dislocation of the hip: a report of two cases. *Chir Organi Mov* 2008; 92: 109-11.
8. Maqsood M, Walker AP. Asymmetrical bilateral traumatic hip dislocation with ipsilateral fracture of the femur. *Injury* 1996; 27: 521-2.
9. Chung KJ, Eom WS, Noh KC, Kim HK, Hwang JH, Yoon HS, et al. Bilateral traumatic anterior dislocation of the hip with an unstable lumbar burst fracture. *Clin Orthop Surg* 2009; 1: 114-7.
10. Levine RG, Kauffman CP, Reilly MC, Behrens FF. 'Floating pelvis'. A combination of bilateral hip dislocation with a lumbar ligamentous disruption. *J Bone Joint Surg (Br)* 1999; 81-B: 309-11.

## Address for Correspondence

Ahmet Özgür YILDIRIM, MD

Department of Orthopedics and Traumatology

Ankara Numune Teaching and

Research Hospital

Altindag, Ankara-Turkey

E-mail: aoyildirimmd@yahoo.com