CASE REPORT

Bilateral Asymmetric Hip Dislocations with Vascular Compromise: A Case Report

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Received: 7 August 2020 / Accepted: 3 September 2020 / Published online: 15 September 2020
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Abstract

Bilateral asymmetric hip dislocations are rare injuries and associated vascular compromise is even rarer. We report a unique case of bilateral asymmetric hip dislocations with vascular compromise, due to mechanical arterial compression by the anteriorly dislocated femoral head on one side. Prompt closed reduction re-established the blood flow. Operative intervention was done subsequently to remove intra-articular loose bodies in the hip on the same side. At 6-month follow-up, patient had good functional outcome and no radiographic evidence of complications.

Keywords Bilateral asymmetric hip dislocations · Vascular compromise

Introduction

Bilateral asymmetric hip dislocations are uncommon injuries constituting approximately 0.01–0.02% of all joint dislocations [1]. In this injury, one hip dislocates posteriorly, and the contralateral hip dislocates anteriorly. There have been multiple reports of this injury with discussions focusing on the mechanism of the injury, treatment, and outcomes. We report a unique case of bilateral asymmetric hip dislocations with vascular compromise on one side. This is only the second case with such a pattern of injury being reported in the literature.

Case Report

A 20-year-old man, was an unrestrained front passenger in a motor vehicle traveling at high speeds and had a head-on collision with another vehicle. The patient was shifted to our hospital and after initial assessment and stabilisation, the patient was transferred to the orthopaedic department. The

patient complained of pain in bilateral hips. His left lower limb was shortened, internally rotated and adducted with no distal neurovascular deficit. The right lower limb appeared slightly longer than the left, externally rotated and abducted, which was pale, cold to touch, with no pulses in the popliteal, dorsalis pedis and posterior tibial arteries and delayed capillary refill time with no distal neurological deficit. The deformity was akin to a windswept deformity of the lower limbs. An anterior–posterior radiograph of the pelvis with bilateral hips was taken and revealed bilateral asymmetric hip dislocations, with anterior dislocation of the right hip and posterior dislocation of the left hip (Fig. 1). The patient did not have any other associated injury apart from the bilateral hip dislocations.

Under sedation, closed reduction of both hips was done. Upon reduction, the deformities in both the limbs were corrected with a return of palpable pulses in the popliteal, dorsalis pedis, and posterior tibial arteries on the right side with no new neurovascular deficit on both sides. The capillary refill time returned to 2 s on the right side. The reduction was confirmed on an AP radiograph of the pelvis with bilateral hips, taken immediately post reduction (Fig. 2). Stress examination was performed and hip stability was confirmed. This reduction was achieved within approximately 3 h from the time of injury. Bilateral skin traction was applied to the lower limbs with 10 lb weight. The patient was put on observation, and during this period, he had bilaterally symmetric pulses in the legs. The patient was not put on any anticoagulant or anti platelet therapy.

The study was performed at Department of Orthopaedics, GMC, Patiala, Punjab, India.

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Fig. 1 An anterior–posterior radiograph of the pelvis with bilateral hips, showing anterior dislocation of the right hip and posterior dislocation of the left hip

Fig. 2 An anterior–posterior radiograph of the pelvis with bilateral hips, showing bilateral symmetric reduction of the hips. Fracture of the right femoral head, at the head and neck junction is also seen

A CT scan of the pelvis with bilateral hip was done 3 days later showing a small fracture of the posterior wall of the left acetabulum with minimal displacement of 7 mm and the right femoral head appeared irregular in contour especially on its superolateral aspect with a few fracture fragments lying in the femoroacetabular joint space, with the largest fragment being of size 6*5 mm (Fig. 3a, b).

The patient was taken to the operating room to address the intra-articular loose bodies in the right hip joint. The posterior wall fracture on the left side was treated conservatively. Under combined spinal anaesthesia, patient was made to lie in a lateral decubitus position. A modified Gibson approach with Ganz trochanteric osteotomy was used to dislocate the femoral head. Fracture fragments were small, unfixable, and

Fig. 3 a, b Coronal and Axial section of the CT scan, respectively, showing fracture of the femoral head and intra-articular fracture fragments in the right hip and fracture of the posterior acetabular wall in the left hip

majorly involved the extra-articular non-weight-bearing part of the femoral head, at the head and neck junction, and were, hence, removed (Fig. 4a, b). The acetabular cavity was thoroughly washed and all the loose bodies were removed. The hip joint was relocated and capsule repaired using non-absorbable sutures. The trochanteric osteotomy was fixed using two cannulated cancellous screw and the wound was closed in layers (Fig. 5).

Post-operatively, there was no neurovascular deficit and bilateral skin traction was continued for 2 weeks. After 3 weeks since the time of injury, traction was removed and gradual movement of the hips was started. The patient was mobilised a week later. The patient achieved full weight-bearing without assistance at about 6 weeks. The patient is still under follow-up with good results. The patient had no pain, no restrictions of hip movements, no neurovascular sequel, and no radiographic evidence of complications in both the hips, at 6-month follow-up (Fig. 6a–c).

Fig. 4 **a** Intra operative image of the right femoral head showing osteochondral fracture involving the non-weight-bearing part at the head and neck junction. **b** Fracture fragments removed from the hip

Fig. 5 Immediate post-operative AP radiograph of the pelvis with bilateral hips

Discussion

The earliest published case report of bilateral asymmetric hip dislocations appeared in the literature in 1845 [3]. Ever since, 104–150 cases of bilateral asymmetric hip dislocations have been reported in the literature and, thus, are an uncommon injury pattern [1, 4].

In our review of literature, only 1 other case with a similar injury pattern of bilateral asymmetric hip dislocations with a vascular compromise has been reported. In that case also, the pulsation returned in the pulseless leg immediately after the reduction of the anterior hip dislocation. No surgical treatment was required post reduction and the patient did not have any neurovascular sequel [2].

Anterior hip dislocation with vascular compromise is a rare, limb-threatening injury and requires immediate reduction. Sequel requiring amputation has been reported in the literature [5, 6].

The vascular compromise occurs due to the mechanical compression of the femoral artery by the anteriorly dislocated femoral head. After successful closed reduction, the compression is released and blood flow is re-established. If closed reduction fails or despite the reduction, the extremity remains pulseless and limb viability is in question, operative intervention should be done immediately.

In the case of an arterial injury, the critical time factor for the restoration of circulation and limb salvage has been established as 6–8 h [7, 8].

In our case, we were able to achieve closed reduction, within approximately 3 h and distal pulses became palpable immediately post reduction. Operative intervention was necessary to remove intra-articular loose bodies in the hip.

In conclusion, an early closed reduction and re-establishment of the blood flow to the extremity are the most important factors in achieving good outcome in a case of bilateral asymmetric hip dislocation with vascular compromise.

Fig. 6 a–c Follow up AP radiograph of the pelvis with bilateral hips, Lateral radiograph of right and left hip, respectively, showing a well healed trochanteric osteotomy on right side and no signs of AVN bilaterally

Funding No funding was received.

Compliance with Ethical Standards

Conflicts of interest The authors declare that they have no conflicts of interest.

Ethical standard statement All procedures performed in the study involving the human participant were in accordance with the ethical standards of the institutional ethical committee and with the 1964 Helsinki declaration and its later amendments.

Informed consent Written informed consent to participate in the study was collected from the patient. Patient was informed that data concerning the case would be submitted for publication and he agreed.

References

1. Buckwalter, J., Westerlind, B. A., & Karam, M. (2015). Asymmetric hip dislocations: a case report and historical review of the literature. *Iowa Orthopaedic Journal*, 35, 70–91.
2. Hoffman, A., & Taylor, B. C. (2019). Asymmetric bilateral hip dislocations with a pulseless left lower extremity: a case report. *JBJS Case Connect*, 9(4), e0479.
3. Andreini, V. (1845). Breve cenno intorno ad un caso di simultanea lussazione di ambedue i femor in un itesso individuo. *Gazetta Toscana Delle Scienze Medio-Fisiche*, 7, 102–103.
4. Paša, L., Veselý, R., & Kelbl, M. (2017). [Bilateral asymmetric traumatic dislocation of hip joints]. [Article in Czech]. *Acta Chirurgiae Orthopaedicae et Traumatologiae Cechoslovaca*, 84(1), 66–69.

5. Nerubay, J. (1976). Traumatic anterior dislocation of hip joint with vascular damage. *Clinical Orthopaedics and Related Research*, 116(129), 132. **(129Y132)**.
6. Holt, G. E., & McCarty, E. C. (2003). Anterior hip dislocation with an associated vascular injury requiring amputation. *Journal of Trauma*, 55(135), 138. **(135Y138)**.
7. Miller, H. H., & Welch, C. S. (1949). Quantitative studies on the time factors in arterial injuries. *Annals of Surgery*, 130, 428–438.
8. Green, N. E., & Allen, B. L. (1977). Vascular injuries associated with dislocation of the knee. *J Bone and Joint Surgery American*, 59, 235–239.

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