

Asymmetrical Bilateral Traumatic Hip Dislocation with Posterior Column Acetabulum Fracture, Report of a Rare Case

Mohammadmahdi Omidian ^a, Mohammad Mahdi Sarzaeem ^a, Mohsen Latifpoor ^a, Shahram Sayadi ^b, Alireza Manafi Rasi ^{a*}

^a Department of Orthopedic and Trauma Surgery, Shahid Beheshti University of Medical Sciences, Tehran, Iran; ^b Anesthesiology Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran

*Corresponding Author: Alireza Manafi Rasi, Department of Orthopedic and Trauma Surgery, Shahid Beheshti University of Medical Sciences, Tehran, Iran; E-mail: drmanafi54@yahoo.com

Submitted: 2021-08-24; Accepted: 2021-9-15; Doi: <https://doi.org/10.22037/jcpr.v6i4.34954>

Abstract

Asymmetrical traumatic bilateral hip dislocations are rare in comparison to unilateral dislocations. In the present case report, we presented a 20-year-old man suffering from the asymmetrical traumatic bilateral hip dislocation, anterior dislocation on the left side, and posterior dislocation associated with acetabulum fracture on the right side. Both dislocations were closely reduced in the operating room, and skeletal traction was applied to the right side due to the instability. A week later, the acetabular fracture went through the open reduction and internal fixation via the posterior Kocher-Langenbeck approach. The 4-year follow-up of the patient was favorable.

Keywords: Acetabulum Fracture; Dislocation; Hip; Trauma

Please cite this paper as: Omidian M, Sarzaeem MM, Latifpoor M, Sayadi S, Manafi Rasi A. Asymmetrical Bilateral Traumatic Hip Dislocation with Posterior Column Acetabulum Fracture, Report of a Rare Case. J Clin Physio Res. 2021; 6(4): e51. Doi: <https://doi.org/10.22037/jcpr.v6i4.34954>

Introduction

Hip dislocations almost always occur as a result of a high energy trauma and up to 90 percent of these dislocations are posteriorly displaced (1, 2). Bilateral hip dislocation, as a rare clinical occurrence, accounts for less than 2 percent of all cases of hip dislocation (3, 4). To add to this scarcity, asymmetrical traumatic bilateral hip dislocation has been only reported in 34 cases in English medical literature (5).

We herein presented a case of asymmetrical traumatic bilateral hip dislocation with left-sided anterior dislocation and right-sided posterior dislocation associated with posterior column and posterior wall fracture of the acetabulum.

Case Report

A 20-year-old gentleman was referred to the emergency department of Emam Hossein Hospital, Tehran, Iran institute complaining of bilateral severe hip pain five hours after a high-

velocity motor vehicle accident (MVA). During the initial trauma survey, he was found to be hemodynamically stable with no obvious signs of head trauma (Glasgow Coma Scale (GCS): 15/15). On the physical examination, both lower extremities had a gross deformity, with left-sided abduction and external rotation as well as right-sided adduction and internal rotation deformities. The range of motion of both hips was thoroughly restricted in passive and active movements. Neurovascular examination of both lower limbs revealed normal distal arterial pulses with sensory functions and intact motor.

An anteroposterior pelvic projection was obtained and a posteriorly dislocated right hip associated with acetabular fracture and a left anterior-inferior hip dislocation were uncovered (Figure 1).

The patient was urgently transferred to the operating room, and both hips were reduced by the closed means under general anesthesia. The left hip was reduced first using the Allis maneuver and then the right-sided reduction was reduced with the modified Allis maneuver. The right hip was unstable after the



Figure 1. Anteroposterior X-ray of the pelvis showing bilateral hip dislocations with an associated right acetabular fracture



Figure 2. The post-reduction X-ray showing satisfactory reduction of both hips

reduction; therefore, the distal femoral skeletal traction was applied. Post-reduction radiographs revealed a satisfactory reduction of both hips (Figure 2). Also, a post-reduction CT scan showed a comminuted right posterior column and wall acetabular fracture with retained intraarticular fragments (Figure 3).

Internal fixation of the right acetabular fracture was carried out seven days later during the course of admission through the posterior Kocher–Langebeck approach. The intra-articular fragments were also removed and articular reduction was directly visualized. Two lag screws were placed in the wall fragment and then the posterior column. Finally, the wall was fixed using pre-contoured 3.5-mm pelvic reconstruction plates with proximal and distal screws in the ilium and ischium respectively (Figure 5).

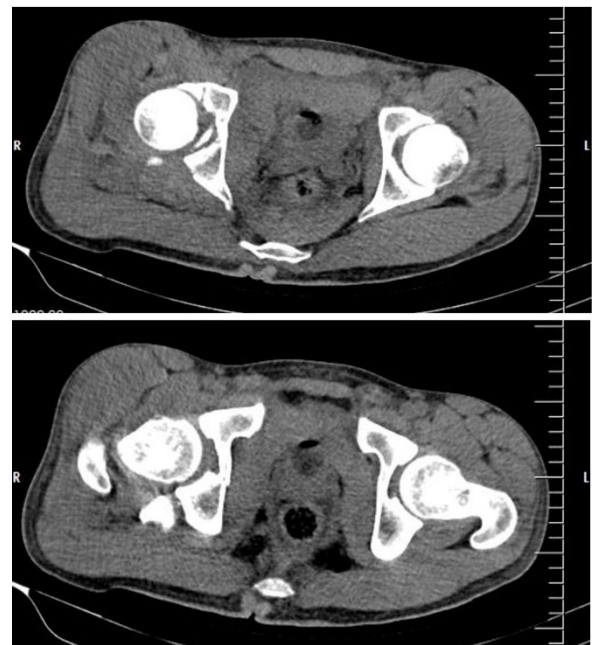


Figure 3. Axial CT showing right acetabular fracture with intra-articular fragments

Postoperative X-rays (Figure 4) and CT scan (Figure 5) confirmed acceptable reduction of the right acetabulum and removal of the intra-articular fragments.

The early postoperative period was uneventful. The patient remained non-weight bearing for 12 weeks and returned to his normal activity at 6 months. He was also followed for a four-year period with regular visits at 6 weeks, 3 months, 6 months, 1 year post-operatively, and then yearly thereafter by taking pelvic radiographs (Figure 6). He is currently pain-free and use no walking assistance devices with a normal range of motion of his left hip and near-normal range of his right side.

Discussion

Comprising less than five percent of all joint dislocations, traumatic hip dislocations are relatively uncommon (6). Automobile and motorcycle high-velocity accidents constitute the main mechanism of energy transfer in up to 60 percent of hip dislocation cases (3, 7).

The femoral head may dislocate anteriorly, posteriorly, or inferiorly relative to the acetabulum. With a prevalence of more than 85 percent, posterior hip dislocations are the most commonly diagnosed type and mainly occur when a flexed knee is rapidly decelerated as seen in “dashboard injuries”.

The most frequently associated fracture with posterior hip dislocation is the posterior-wall acetabular fractures (8, 9). The less common anterior hip dislocations, which constitute less



Figure 4. Post-operative X-rays showing both congruent hips

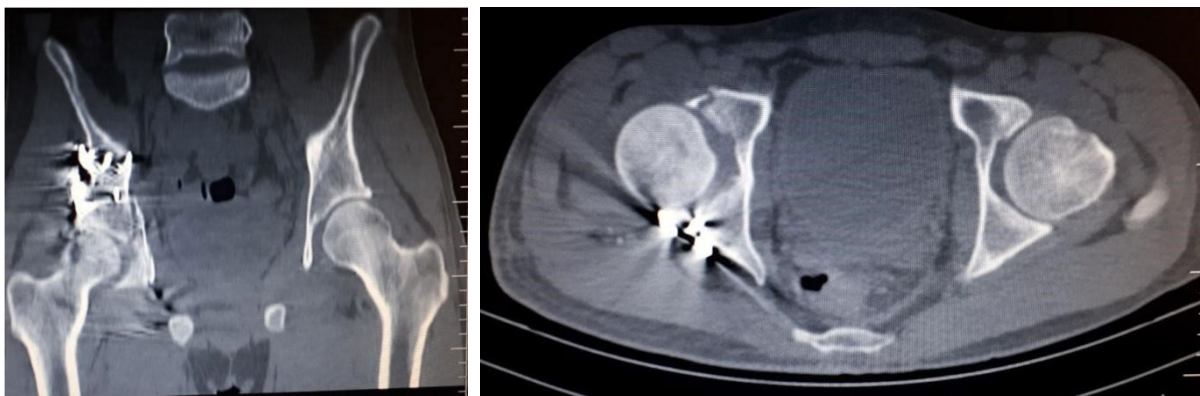


Figure 5. Post-operative coronal and axial CT showing acceptable reduction and removal of the intra-articular fragments

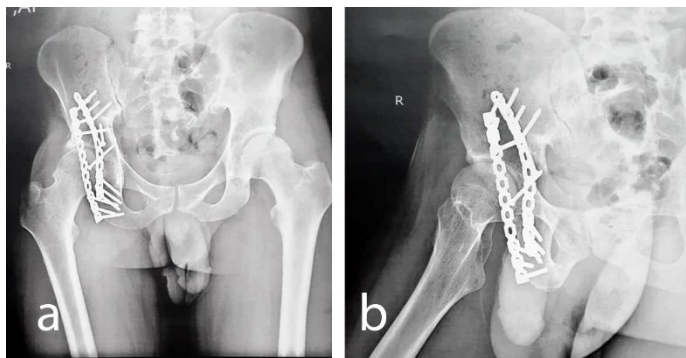


Figure 6. AP (a) and oblique (b) X-rays four years after the surgery

than 12 percent of cases, are usually inferior, however superior dislocations also take place. Forceful abduction and external rotation are believed to be the injury mechanism in anteroinferior dislocations (8, 9).

Only about 1.25 percent of hip dislocations are bilateral, which comprises about 0.05% of all hip joint dislocations (5, 10-12). First described by Anderini in 1845 (13), cases' presenting with bilateral asymmetric hip dislocations associated with acetabulum fractures has been scantily reported in the literature (9, 14-20).

In a total of 204 traumatic hip dislocations analyzed by Thompson and Epstein (21), less than 10 bilateral dislocations were identified.

Sahin *et al.* (20) reported a case of bilateral asymmetric hip dislocation with bilateral acetabular fractures. However, unlike our case, the fractures were nonoperatively managed with a fair outcome. Mortazavi *et al.* (22) reported a similar case, but with bilateral femoral head (Pipkin) fractures that unlike our case was operated via anterior hip approach. In a 32-year-old patient reported by Pathinathan *et al.* (23), the bilateral hip dislocations were irreducible and went through emergent open reduction.

We believe that adduction and internal rotation of the right hip and abduction and external rotation of the left hip resulted in such fracture-dislocation pattern in our case.

Despite the distinguished signs and symptoms, bilateral traumatic hip dislocations are reported to be missed in as many as half the patients in the initial survey. This is believed to be due to the failure to attain one of the so-called "big three films" in the multiple trauma patients that underwent the anteroposterior pelvic radiograph (24). Upon initial diagnosis, complementary imaging including Judet oblique views can help identify

associated acetabular fractures or intra-articular fragments which may cause a subsequent incongruent reduction.

Although being very informative, a pre-reduction CT scan is often considered not necessary because of the potential delay in the time-sensitive joint reduction. After the emergent reduction, obtaining a pelvic CT scan especially with three-dimensional reconstructions of the bony structures plays an important role in the definitive treatment planning and fixation of patients with complex acetabular fractures. As with our case, CT also helped detect intra-articular fragments too small to be identified on a plain X-ray (9, 25-29).

We used more common Allis maneuver to reduce the right hip but the anteriorly dislocated hip joint on left side was reduced by adding an adduction force to the maneuver along with mediolateral traction. As it is less frequently encountered, reducing the anterior hip dislocation is more difficult than posterior dislocation (30, 31). This added lateral traction to the conventional Allis maneuver extricates the trapped femoral head from the soft tissues about the obturator foramen in cases of anteroinferior dislocation. Dudkiewicz *et al.* (32) reported that a routine post-reduction CT must be obtained in all cases of hip dislocation to assess congruency and to rule out the presence of possible unnoticed bony fragments. In our patient, CT revealed a posterior wall and column fracture with incongruent reduction and intraarticular loose fragment on the right side and congruent reduction on the left side without any fragments.

Many previous studies recommended applying traction, either skeletal or skin, to the dislocated hip after reduction for a duration of three to eight weeks (16, 33), although some authors opposed such prolonged duration of immobilization. We kept the index case on 15 pounds of distal femur skeletal traction for one week before the surgery.

Timely reduction of a dislocated hip might play an essential role in the progression of late complications such as osteonecrosis of the femoral head. Many studies recommend that a reduction, either closed or open, performed within 6 hours of dislocation may reduce the risk of subsequent avascular necrosis of the femoral head (9, 27, 34-36). In our case, both hips were reduced within 6 hours of trauma and the long-term outcome of the patient was favorable.

Conclusion

Although asymmetrical bilateral hip dislocation is a rare entity, it is considered an orthopedic emergency. Missed or prolonged dislocations may result in debilitating complications such as avascular necrosis of the femoral head and subsequent arthritis.

Thus, early diagnosis with timely management of the dislocation is essential for the long-term prognosis of such injuries.

Acknowledgment

None

Conflict of interest:

None

Funding support:

None

Authors' contributions:

All authors made substantial contributions to the conception, design, analysis, and interpretation of data.

References

1. DE LEE JC. Fractures and dislocations of the hip. Fractures in adults. 1996.
2. Sanders S, Tejwani NC. Asymmetric Bilateral Hip Dislocation after Motor Vehicle Accident. Bulletin of the NYU hospital for joint diseases. 2008;66(4).
3. Epstein HC. Traumatic dislocations of the hip. Clinical Orthopaedics and Related Research (1976-2007). 1973;92:116-42.
4. Fang Y, Pei F-x, Yang T-f, Wang G-l, Liu L. Traumatic asymmetrical bilateral hip dislocation: a case report and literature review. Joint Diseases and Related Surgery. 2011;22(3):177-9.
5. Hamilton Jr DA, Wright Jr RD, Moghadamian ES, Bruce BT, Selby JB. Bilateral asymmetric hip dislocation: A case series and literature review of a rare injury pattern. Journal of Trauma and acute care Surgery. 2012;73(4):1018-23.
6. Shannak A. Bilateral traumatic dislocation of the hips with ipsilateral femoral fracture. Clinical orthopaedics and related research. 1987(215):126-9.
7. Upadhyay S, Moulton A. The long-term results of traumatic posterior dislocation of the hip. The Journal of Bone and Joint Surgery British volume. 1981;63(4):548-51.
8. Phillips A, Konchwalla A. The pathologic features and mechanism of traumatic dislocation of the hip. Clinical Orthopaedics and Related Research®. 2000;377:7-10.
9. Schwartz SA, Taljanovic MS, Ruth JT, Miller MD. Bilateral asymmetric hip dislocation: case report and literature review. Emergency radiology. 2003;10(2):105-8.
10. Endo S. Traumatic bilateral obturator dislocation of the hip joint. Injury. 1991;22(3):232-3.
11. Altay M, Yagmurlu F, Heybeli M, Muratli H, Tabak Y, BİCİMOĞLU A. Simultaneous asymmetric bilateral traumatic hip dislocation: a case report. Acta orthopaedica et traumatologica turcica. 2003;37(2):182-6.
12. Kundu ZS, Mittal R, Sangwan S, Sharma A. Simultaneous asymmetric bilateral hip dislocation with unilateral fracture of femur—peculiar

- mode of trauma in a case. *European Journal of Orthopaedic Surgery & Traumatology*. 2003;13(4):255-7.
13. Andreini V. Breve cenno intorno ad un caso di simultanea lussazione di ambedue i femor in un istesso individuo. *Gazzetta Toscana: Delle Scienze Medio-Fisiche*. 1845;7:102-3.
 14. Martínez AA, Gracia F, Rodrigo J. Asymmetrical bilateral traumatic hip dislocation with ipsilateral acetabular fracture. *Journal of orthopaedic science*. 2000;5(3):307-9.
 15. Ashraf T, Iraqi AA. Bilateral anterior and posterior traumatic hip dislocation. *Journal of orthopaedic trauma*. 2001;15(5):367-8.
 16. Lam F, Walczak J, Franklin A. Traumatic asymmetrical bilateral hip dislocation in an adult. *Emergency Medicine Journal*. 2001;18(6):506-7.
 17. Papanikolaou A, Pliotopoulos A, Darmanis S, Antoniou N. Bilateral traumatic asymmetric hip dislocation: case report. *European Journal of Orthopaedic Surgery & Traumatology*. 2000;10(4):269-71.
 18. Donnelly M, Mullett H, Moore D. Bilateral asymmetric traumatic hip dislocation in adolescence: a report of two cases and review of the literature. *European Journal of Orthopaedic Surgery & Traumatology*. 2005;15(2):166-9.
 19. Agarwal S, K Singh G, Jain U, Jyoti G. Simultaneous anterior and posterior traumatic dislocation of the hip. *Archives of orthopaedic and trauma surgery*. 2000;120(3):236-8.
 20. Sahin O, Ozturk C, Dereboy F, Karaeminogullari O. Asymmetrical bilateral traumatic hip dislocation in an adult with bilateral acetabular fracture. *Archives of orthopaedic and trauma surgery*. 2007;127(8):643-6.
 21. Thompson Vp, Epstein Hc. Traumatic dislocation of the hip: a survey of two hundred and four cases covering a period of twenty-one years. *JBJS*. 1951;33(3):746-92.
 22. Mortazavi SJ, Mazzoehy H, Ghasemi MA, Khan FMY. Asymmetric Bilateral Hip Fracture-Dislocation: A Case Report and Literature Review. *Journal of Orthopedic and Spine Trauma*. 2019:53-5.
 23. Pathinathan K, Marage N, Fernando N. Bilateral irreducible asymmetrical fracture-dislocation of the hip: A case report and literature review. *International Journal of Surgery Case Reports*. 2021;81:105803.
 24. Shukla PC, Cooke SE, Pollack Jr CV, Kolb JC. Simultaneous asymmetric bilateral traumatic hip dislocation. *Annals of emergency medicine*. 1993;22(11):1768-71.
 25. Alonso JE, Volgas DA, Giordano V, Stannard JP. A review of the treatment of hip dislocations associated with acetabular fractures. *Clinical Orthopaedics and Related Research*. 2000;377:32-43.
 26. Borrelli Jr J, Goldfarb C, Catalano L, Evanoff BA. Assessment of articular fragment displacement in acetabular fractures: a comparison of computerized tomography and plain radiographs. *Journal of orthopaedic trauma*. 2002;16(7):449-56.
 27. Yang EC, Cornwall R. Initial treatment of traumatic hip dislocations in the adult. *Clinical Orthopaedics and Related Research*. 2000;377:24-31.
 28. Kickuth R, Laufer U, Hartung G, Gruening C, Stueckle C, Kirchner J. 3D CT versus axial helical CT versus conventional tomography in the classification of acetabular fractures: a ROC analysis. *Clinical radiology*. 2002;57(2):140-5.
 29. Adam P, Labbe J, Alberge Y, Austry P, Delcroix P, Ficat R. The role of computed tomography in the assessment and treatment of acetabular fractures. *Clinical radiology*. 1985;36(1):13-8.
 30. Dlabach JA, Crockarell JR. Acute dislocations. In: Canale ST, editor. *Campbell's Operative Orthopaedics* 3. 10th ed. Philadelphia, Pa, USA: Mosby; 2003 p. 3173-6.
 31. Solomon L, Warwick D, Nayagam S. *Injuries of the hip and femur. Apley's System of Orthopaedics and Fractures*. 8th ed. New York, NY, USA: Arnold; 2001. p. 681-4.
 32. Dudkiewicz I, Salai M, Horowitz S, Chechik A. Bilateral asymmetric traumatic dislocation of the hip joints. *Journal of Trauma and Acute Care Surgery*. 2000;49(2):336-8.
 33. Kaleli T, Alyüz N. Bilateral traumatic dislocation of the hip: simultaneously one hip anterior and the other posterior. *Archives of orthopaedic and trauma surgery*. 1998;117(8):479-80.
 34. Brooks RA, Ribbans WJ. Diagnosis and imaging studies of traumatic hip dislocations in the adult. *Clinical Orthopaedics and Related Research*. 2000;377:15-23.
 35. Rodríguez-Merchán EC. Osteonecrosis of the femoral head after traumatic hip dislocation in the adult. *Clinical Orthopaedics and Related Research*. 2000;377:68-77.
 36. Hougaard K, Thomsen P. Traumatic posterior dislocation of the hip-prognostic factors influencing the incidence of avascular necrosis of the femoral head. *Archives of orthopaedic and traumatic surgery*. 1986;106(1):32-5.