

Bilateral asymmetrical hip dislocation: a case report and literature review

Mohammadsajad Mirhoseini

Alborz University of Medical Sciences

Omid Kohandel Gargari (✉ kohandelgargar@gmail.com)

Alborz University of Medical Sciences <https://orcid.org/0000-0002-8182-0582>

Research Article

Keywords: Hip dislocation, Asymmetrical bilateral hip dislocation, traffic accidents

Posted Date: June 21st, 2022

DOI: <https://doi.org/10.21203/rs.3.rs-1750932/v1>

License:   This work is licensed under a Creative Commons Attribution 4.0 International License. [Read Full License](#)

Abstract

Background

Asymmetrical bilateral dislocation of hip is dislocation of both hips in different directions, one hip dislocates anteriorly and the other one dislocates posteriorly. 90 percent of all hip dislocations are unilateral and posterior. Asymmetrical bilateral dislocations are very rare. there is no study comparing asymmetrical bilateral dislocation and unilateral dislocations in detail. AVN (Avascular necrosis) is the most important complication of hip dislocation and the time interval between injury and reduction is crucial to avoid avascular necrosis.

Case presentation:

We are reporting a case of asymmetrical bilateral dislocation of the hip in a 60 years old man after falling from 6 meters height. 4 hours after injury, the patient was transferred to the operation room, and the dislocation was close reduced

Literature review:

A literature review was done to compare sexual distribution, mechanism of dislocation, and associated fractures between patients with asymmetrical bilateral dislocation of hip (n = 103) and unilateral dislocation of hip (n = 105). The results revealed that the female to male ratio is almost the same in both groups, although most patients were male in our population (81%). Traffic accidents are the most common cause of dislocation. Nevertheless, the odds of this mechanism are about 2 times larger in patients with asymmetrical bilateral dislocation (OR = 0.46). Fractures were more common among patients with asymmetrical bilateral dislocation, and the most common associated fractures included: Acetabulum (52.8%), posterior edge (21.3%), femur neck (18.5%), femur head (3.7%), and pelvis (3.7%).

Conclusion

Associated fractures are more common among patients with asymmetrical bilateral hip dislocation so have higher risk for long-term complications.

Background

Hip dislocations account for 2–5% of all joint dislocations [1] and 90% of hip dislocations are posterior. Asymmetrical bilateral dislocations are a pattern of injury in which both hips are dislocated, one of them is dislocated posteriorly and the contralateral hip is dislocated anteriorly. Bilateral dislocations are rare and reported to account for 1.25% of all hip dislocations and asymmetrical bilateral dislocations are very rare[2, 3]. The number of reported cases of asymmetrical bilateral hip dislocation is increasing over the last century [2], and there is no study about the mechanism of dislocation or sexual distribution of asymmetrical bilateral dislocation and other possible differences between this type of dislocation and other types. Car accidents are the most common cause of hip dislocation and the most common associated fractures with hip dislocation are fractures of proximal femur and acetabulum[4, 5]. The time interval between injury and reduction of dislocation is crucial to prevent AVN which is the most important complication of hip dislocation and this time must be less than 6 hours[4].

Case Presentation

The patient is a 60 years old male with no history of previous hip trauma or ligament laxity. After falling from 6 meters, he was sent to the Imam Hasan Hospital, Nazarabad, Iran. After initial assessments and hip CT(Computed tomography)-scan, without any Therapeutic interventions, the patient was referred to the Madani Hospital of Karaj, Iran. Further assessments and review of the CT scans revealed a posterior dislocation of the right hip and anterior dislocation of the left hip (Figure1). The extremities were swelled, and there was no sign of neural or vascular damage, and the capillary filling was normal. The patient was alert; chest X-ray, head, and neck CTs were normal. 4 hours after injury, the patient was immediately admitted to the operation room, and after anesthetizing, a closed pelvic reduction operation was done by an orthopedic surgeon. A Post-reduction CT scan was asked to confirm the success of hip reduction (Figure2). The operation was successful, and the head of the femur was located correctly in the acetabulum fossa.

Literature Review

In order to compare unilateral and asymmetrical bilateral dislocations of hip, we searched PubMed and Google scholar for case reports and case series of bilateral asymmetrical hip dislocation and unilateral hip dislocation. 11 studies (3 case series and 8 case reports) and 208 patients (103 bilateral dislocations and 105 unilateral dislocations) were found. The characteristics of these studies are summarized in Table1. We extracted the following data from these studies: number of participants, age, sex, type of dislocation, mechanism of dislocation, and associated fractures. All data was imported to IBM SPSS V26.0.01. P-values greater than 0.05 are significant, and the confidence interval is 95%.

SEXUAL DISTRIBUTION:

Most of our patients were male (81%), sexual distribution of included patients is presented in Figure3. Among female patients, 48.7% had unilateral dislocation and 51.3% had asymmetrical bilateral dislocation. These percentages were 50.9% and 49.1% among male patients respectively. There was no significant association between gender and type of dislocation ($P=0.807018$, $CI=95\%$) in our population and these two variables are independent.

MECHANISM:

Mechanisms of dislocation in our population included traffic accidents(71.4% of all cases), pedestrian accidents(11.7% of all cases), fall(3.6% of all cases), weight from above(7.1% of all cases), work injuries(5.1% of all cases) and sports injuries(1% of all cases). Table2 shows the distribution of cases. The most common mechanism was traffic accidents (79% of unilateral dislocations and 63.5% of bilateral dislocations). A Chi-square test was done to measure the association between type of dislocation and mechanism of trauma. The test rejected the null hypothesis (H_0 =No association between type of dislocation and mechanism of dislocation) and the P-value was 0.000197 ($CI=95\%$). Traffic accidents are the most common mechanism of dislocation in both unilateral and bilateral dislocations but a case of unilateral dislocations is more likely to be due to a traffic accident ($OR= 0.46$) than another case with bilateral dislocation. this finding is opposite for fall($OR=2.68$) and pedestrian injuries($OR=1.72$). Figure 4 demonstrates the distribution of different mechanisms.

ASSOCIATED FRACTURES:

Associated fractures were reported in 108 patients (26 with unilateral dislocation and 81 with asymmetrical bilateral dislocation). Fractures are more common in patients with asymmetrical bilateral dislocation ($p<0.05$). The most

common fractures include: Acetabulum(52.8%), posterior edge (21.3%), femur neck (18.5%), femur head (3.7%) and pelvis (3.7%). Table3 shows different kinds of associated fractures with both bilateral and unilateral dislocations. The most common fracture among patients with asymmetrical bilateral dislocation was acetabulum fracture (n=55, 67.1% of unilateral dislocation patients who had associated fracture) and posterior edge fractures were the most frequent fracture within patients with unilateral dislocation. (n=21, 80.8% of bilateral dislocation patients who had associated fracture).

Discussion

Asymmetric bilateral hip dislocations are very rare and account for 0.01%-0.02% of all joint dislocations. Asymmetric Hip dislocations are more common among men and the most common cause of this dislocation is vehicle accidents because the hip is a very stable joint and a high energy trauma is required to dislocate it.[2, 6]. Buckwalter et al. published a review of reported cases of asymmetrical bilateral dislocation of the hip. They collected case reports from 1845 to 2015 and mentioned that the number of case reports is increasing during the last century. We used their finding and added case reports published from 2015 to 2021. One of the findings of this study is that although these patients are mostly male, the male to female ratio is similar in both bilateral and unilateral dislocations. We also found that the association between terrific accidents and unilateral hip dislocation seems to be stronger than bilateral dislocations. A possible bias for this study is the lower rate of traffic accidents in some cases that belong to the study of Buckwalter [2]et al. reported in the 1800s and early 1900s. our data suggest that associated fractures are more common among patients with asymmetrical bilateral dislocation this could be because of the high energy that is required to dislocate both hips. The current study is the first study to report these findings about asymmetrical hip dislocation so it is not possible to compare our findings with other studies.

The most common complication of hip dislocation is AVN, the time interval between injury and reduction is crucial. The risk of AVN increases when the interval is longer than 6 hours [3]. This time was 4 hours in our case and no sign of AVN was present in follow-up.

Conclusion

Bilateral dislocations are more likely to be associated with fractures and to protect these patients from further complications the intervention must be performed as soon as possible. Study of causes, complications and associated fractures of asymmetrical bilateral dislocation of hip could help us diagnose these patients earlier and employ better preventive strategies and treatment interventions.

Abbreviations

AVN

Avascular necrosis

CT

Computed tomography

References

1. Abdulfattah Abdullah, A.S., A. Abdelhady, and A. Alhammoud, *Bilateral asymmetrical hip dislocation with one side obturator intra-pelvic dislocation. Case report.* Int J Surg Case Rep, 2017. **33**: p. 27–30. DOI: <https://doi.org/10.1016/j.ijscr.2017.02.012>

2. Buckwalter, J., B. Westerlind, and M. Karam, *Asymmetric Bilateral Hip Dislocations: A Case Report and Historical Review of the Literature*. Iowa Orthop J, 2015. **35**: p. 70–91.
3. Dwyer, A.J., et al., *Complications after posterior dislocation of the hip*. Int Orthop, 2006. **30**(4): p. 224–7.
4. Dawson-Amoah, K., et al., *Dislocation of the Hip: A Review of Types, Causes, and Treatment*. Ochsner J, 2018. **18**(3): p. 242–252. DOI: <https://doi.org/10.31486/toj.17.0079>
5. Alonso, J.E., et al., *A review of the treatment of hip dislocations associated with acetabular fractures*. Clin Orthop Relat Res, 2000(377): p. 32–43. DOI: <https://doi.org/10.1097/00003086-200008000-00007>
6. Lima, L.C., et al., *Epidemiology of traumatic hip dislocation in patients treated in Ceará, Brazil*. Acta Ortop Bras, 2014. **22**(3): p. 151–4. DOI: <https://doi.org/10.1590/1413-78522014220300883>

Declarations

Ethics approval and consent to participate:

Consent to participate was obtained from the patient.

Consent for publication:

Consent to publication was obtained from the patient.

Availability of data and material

All data generated or analyzed during this study are included in this published article

Competing interests

The authors declare that they have no competing interests

Funding

Not applicable

Authors' contributions

MM collected patient's data and OKG designed and performed the analysis of the literature review section, and wrote the manuscript.

Acknowledgements

We thank Dr. Nami Mohammadian Khonsari for reviewing and editing this manuscript.

Tables

Table1. Characteristics of included studies.

Study type	1 st author	Age	Female	Male	Type of dislocation	Number of cases
		Mean	Number	Number		
Case report	Abdulfattah [1]	32.00	1	0	Bi	1
	Alshammari [2]	19.00	0	1	Bi	1
	Cobar [3]	23.00	1	0	Bi	1
	Giaretta [4]	23.00	0	1	Bi	1
	Hoffman [5]	20.00	0	1	Bi	1
	Pathinathan [6]	32.00	0	1	Bi	1
	Rufer [7]	53.00	0	1	Bi	1
	Sahito [8]Case1	30.00	0	1	Bi	1
	Sahito Case2	32.00	0	1	Bi	1
Case series	Buckwalter [9]	32.90	18	76	Bi	94
	Lima [10]	34.40	4	39	Uni	43
	Sahin [11]	34.50	15	47	Uni	62
Total		33.53	39	169		208

“Uni” stand for unilateral dislocation of hip and “Bi” stand for asymmetrical bilateral dislocation of hip.

1. Abdulfattah Abdullah, A.S., A. Abdelhady, and A. Alhammoud, *Bilateral asymmetrical hip dislocation with one side obturator intra-pelvic dislocation. Case report.* Int J Surg Case Rep, 2017. **33**: p. 27-30. DOI: <https://doi.org/10.1016/j.ijscr.2017.02.012>
2. Alshammari, A., et al., *Asymmetric bilateral traumatic hip dislocation: A case report.* Ann Med Surg (Lond), 2018. **32**: p. 18-21. DOI: <https://doi.org/10.1016/j.amsu.2018.06.008>
3. Cobar, A., et al., *An unusual case of traumatic bilateral hip dislocation without fracture.* J Surg Case Rep, 2017. **2017**(5): p. rjw180. DOI: <https://doi.org/10.1093/jscr/rjw180>
4. Giaretta, S., et al., *Asymmetric bilateral hip dislocation in young man: a case report.* Acta Biomed, 2019. **90**(1-s): p. 183-186. <https://doi.org/10.23750/abm.v90i1-S.8067>
5. Hoffman, A. and B.C. Taylor, *Asymmetric Bilateral Hip Dislocations with a Pulseless Left Lower Extremity: A Case Report.* JBJS Case Connect, 2019. **9**(4): p. e0479. DOI: <https://doi.org/10.2106/jbjs.cc.18.00479>
6. Pathinathan, K., N. Marage, and N. Fernando, *Bilateral irreducible asymmetrical fracture-dislocation of the hip: A case report and literature review.* Int J Surg Case Rep, 2021. **81**: p. 105803. DOI: <https://doi.org/10.1016/j.ijscr.2021.105803>
7. Rufier, B., et al., *Bilateral Hip Dislocation: An Indicator for Emergent Full-Body Computed Tomography Scan in Polytraumatized Patients? A Case Report and Review of the Literature.* J Emerg Trauma Shock, 2018. **11**(1): p. 53-56. DOI: https://doi.org/10.4103/jets.Jets_12_17
8. Sahito, B., et al., *Bilateral asymmetrical hip dislocations with acetabulum fractures; a case report.* Trauma Case Rep, 2021. **32**: p. 100453. DOI: <https://doi.org/10.1016/j.tcr.2021.100453>
9. Buckwalter, J., B. Westerlind, and M. Karam, *Asymmetric Bilateral Hip Dislocations: A Case Report and Historical Review of the Literature.* Iowa Orthop J, 2015. **35**: p. 70-91.
10. Lima, L.C., et al., *Epidemiology of traumatic hip dislocation in patients treated in Ceará, Brazil.* Acta Ortop Bras, 2014. **22**(3): p. 151-4. DOI: <https://doi.org/10.1590/1413-78522014220300883>

11. Sahin, V., et al., *Traumatic dislocation and fracture-dislocation of the hip: a long-term follow-up study*. J Trauma, 2003. **54**(3): p. 520-9. DOI: <https://doi.org/10.1097/01.ta.0000020394.32496.52>

Table 2 Association between mechanism of dislocation and dislocation type.

Mechanism of dislocation	Odds Ratio	Dislocation type		Total
		Bilateral (Number)	Unilateral (Number)	
Fall	2.68	5(2.5%)	2(1%)	7
Pedestrian injuries	1.72	14(7.1%)	9(4.5%)	23
Sport injuries		0(0%)	2(1%)	2
Terrafic accident	0.46	61(31.1%)	79(40.3%)	140
Work injuries	0.24	2(1%)	8(4%)	10
Weight from above		14(7.1%)	0(0%)	14
Total		96(48.9%)	100(51.1%)	196

Bilateral dislocation is assumed as event to calculate OR(odds ratio). P-value = 0.000197 (CI=95%)

Table 3. Associated fractures with asymmetrical bilateral and unilateral dislocations.

Dislocation type		Type of fracture					Total
		Acetabulum	Femur head	Femur neck	Pelvis	Posterior edge	
Asymmetrical Bilateral	Count	55	2	19	4	2	82
	% within Dislocation type	67.1%	2.4%	23.2%	4.9%	2.4%	100.0%
	% of Total	50.9%	1.9%	17.6%	3.7%	1.9%	75.9%
Unilateral	Count	2	2	1	0	21	26
	% within Dislocation type	7.7%	7.7%	3.8%	0.0%	80.8%	100.0%
	% of Total	1.9%	1.9%	0.9%	0.0%	19.4%	24.1%
Total	Count (Percentage)	57(52.8)	4(3.7)	20(18.5)	4(3.7)	23(21.3)	108(100)

Figures

Figure 1

Coronal and transverse view of hip CT scan before reduction

SHAHID MADANI
SE: 80766
IM: 74 of 161

H



Figure 2

CT scans of patient after operation.

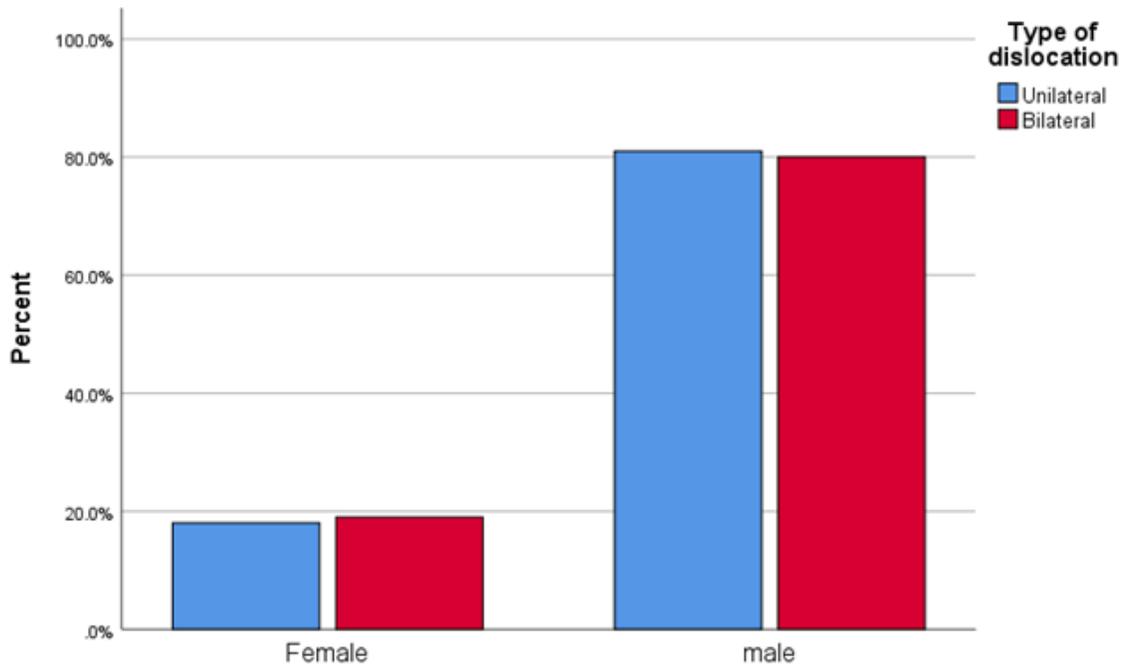


Figure 3

Sexual distribution of included participants.

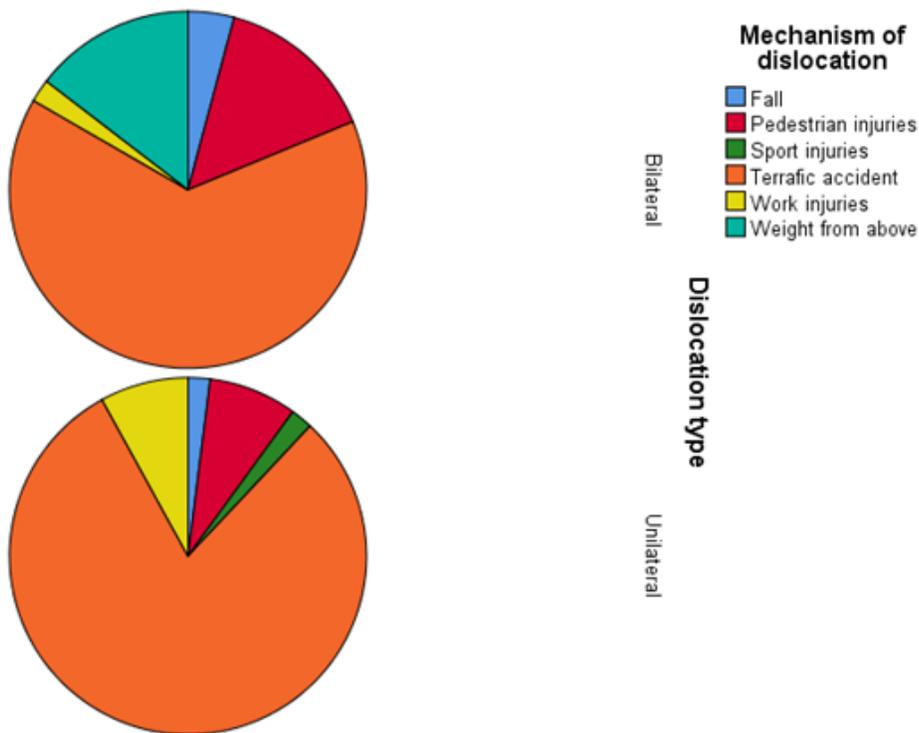


Figure 4

Pie chart of mechanism of dislocation for patients with unilateral and asymmetrical bilateral dislocations