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Case Report

Bilateral Asymmetrical Hip Dislocations after Falling from Height: A Case Report and Literature Review

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Abstract

Background: Hip dislocations, constituting 2-5 percent of all joint dislocations, predominantly present as posterior dislocations. Bilateral hip dislocations are rare, accounting for 1.25% of cases. Associated fractures often involve the proximal femur and acetabulum.
Case Report: A 60-year-old man with no prior hip trauma history sustained bilateral hip dislocations after a 6-meter fall. Initial assessments and a hip computed tomography (CT) scan confirmed posterior dislocation of the right hip and anterior dislocation of the left hip. The patient underwent a successful closed pelvic reduction operation four hours post-injury, as confirmed by a post-reduction CT scan.
Conclusion: The study, encompassing 11 relevant studies and 208 patients, predominantly men (81%), revealed that asymmetrical bilateral hip dislocations were exceptionally rare (0.01-0.02 percent). Contrary to expectations, this study challenges the presumed stronger association of traffic accidents with bilateral dislocations, presenting a statistically significant association between the type of dislocation and trauma mechanism. Associated fractures, such as acetabulum fractures in unilateral cases and posterior edge fractures in bilateral cases, varied. Avascular necrosis (AVN), a common complication, was not observed in the current case, where reduction occurred within the critical 6-hour timeframe. This report contributes valuable insights into the characteristics and associations of asymmetric bilateral hip dislocations, emphasizing the importance of prompt intervention to mitigate complications. Further research is needed to validate these findings and explore underlying patterns in this rare clinical scenario.

Keywords: Hip Dislocation; Hip Joint; Closed Fracture Reduction

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Background

Hip dislocations account for 2-5 percent of all joint dislocations. 90% of hip dislocations are posterior. Bilateral dislocations are very rare and are reported to account for 1.25% of all hip dislocations (1). In a study of 104 cases, 53% of cases were right posterior, and 47% were right anterior and left posterior. It is very crucial not to miss associated injuries. The most common fractures associated with hip dislocation are proximal femur and acetabulum fractures. The primary approach to preventing avascular necrosis (AVN) complications involves initiating early intervention within a six-hour timeframe.

Here, we are reporting a rare case of a 60-year-old man, devoid of previous hip trauma, who experienced bilateral hip dislocations following a significant fall. Hip dislocations account for 2-5 percent of all joint dislocations (2). Ninety percent of hip dislocations are posterior. Bilateral dislocations are very rare, reported to account for only 1.25% of all hip dislocations. In a study of 104 cases, 53% were right posterior, and 47% were right anterior and left posterior. Detecting associated injuries is crucial. The most common fractures associated with hip dislocation are proximal femur and acetabulum fractures. The primary approach to preventing AVN complications involves initiating early intervention within a six-hour timeframe (3).

Case Report

The patient was a 60-year-old man with no history of previous hip trauma or ligament laxity. After falling from a height of 6 meters, he was admitted to Imam Hasan Hospital, Nazarabad, Iran. Following initial assessments and a hip computed tomography (CT) scan, without therapeutic interventions, the patient was referred to Madani Hospital, Karaj, Iran, a trauma center. Further assessments revealed a right hip posterior dislocation and anterior dislocation of the left hip (Figure 1).

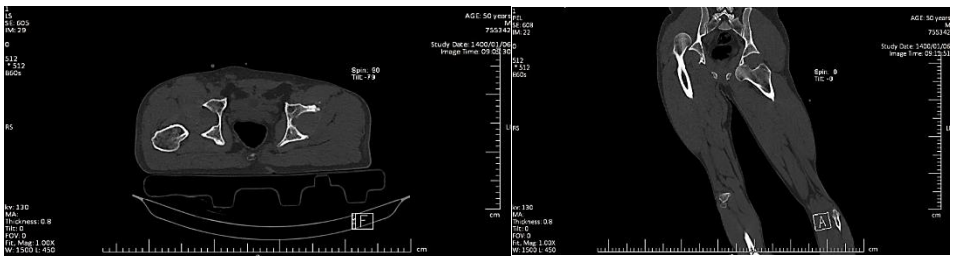

Figure 1. Coronal and transverse views of hip computed tomography (CT) scan before reduction

The extremities were swollen, and there were no signs of neural or vascular damage; capillary filling was normal. The patient was alert; chest X-ray and head and neck CTs were normal. Four hours after injury, the patient was immediately admitted to the operating room, where a closed pelvic reduction operation was performed by an orthopedic surgeon. A post-reduction CT scan was requested to confirm the successful reduction of the hips (Figure 2). The operation was successful, and the head of the femur was properly located in the acetabulum fossa.

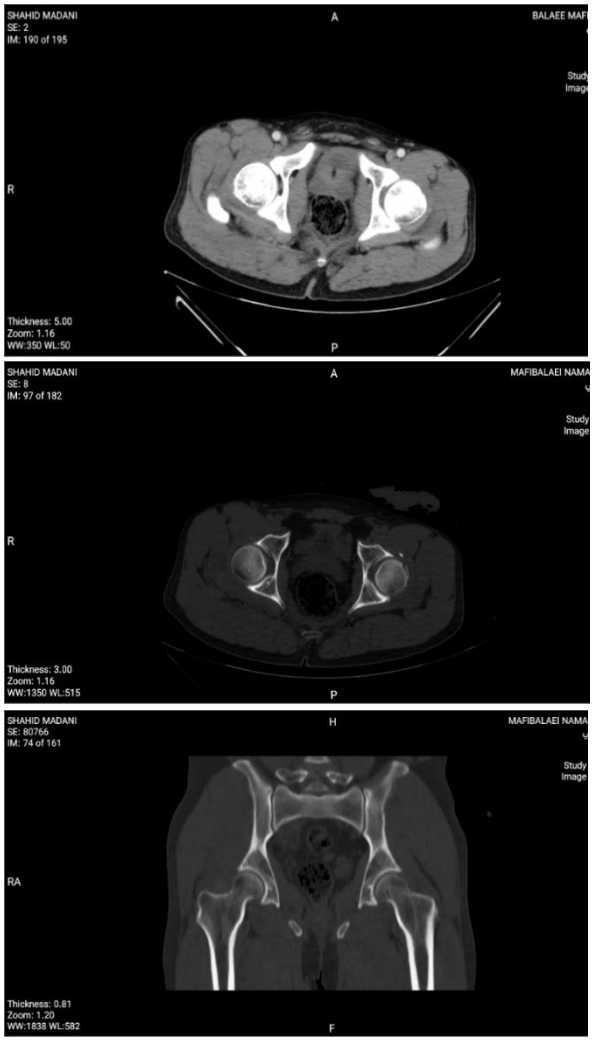

Figure 2. Computed tomography (CT) scans after the operation

To compare unilateral and asymmetrical bilateral dislocation of the hip, a database search for case reports and case series was conducted. Eleven studies (3 case series and 8 case reports) involving 208 patients (103 bilateral dislocations and 105 unilateral dislocations) were found eligible. The characteristics of these studies are summarized in table 1.

The following variables were analyzed:

Gender: Most patients were men (81%). 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. The chi-square test revealed no significant association between gender and type of dislocation [P = 0.807, confidence interval (CI) = 95%] in our population, indicating independence between these variables.

Mechanism: The mechanisms of dislocation included traffic accidents (71.4%), pedestrian accidents (11.7%), falls (3.6%), weight from above (7.1%), work injuries (5.1%), and sports injuries (1%). Traffic accidents were the most common mechanism (79% of unilateral dislocations and 63.5% of bilateral dislocations) (Figure 3). A chi-square test rejected the null hypothesis (H0 = no association between type of dislocation and mechanism of dislocation) with a P-value of 0.0001, indicating an association between the type of dislocation and the trauma mechanism (Table 2).

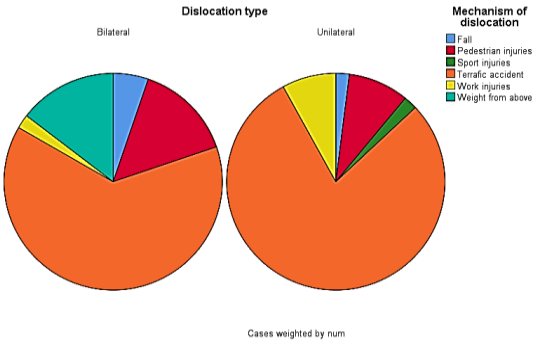

Figure 3. Distribution of mechanism of dislocation in both groups

Associated Fractures: Associated fractures were reported in 108 patients (26 with unilateral dislocation and 81 with bilateral dislocation). The most common fractures included acetabulum (52.8%), posterior edge (21.3%), femur neck (18.5%), femur head (3.7%), and pelvis (3.7%) (Table 3).

Discussion

Asymmetric bilateral hip dislocations are rare and account for 0.01-0.02 percent of all joint dislocations. Asymmetric hip dislocation is more common among men, and the most common cause of this dislocation is vehicle accidents because the hip is a very stable joint, and high-energy trauma is required to dislocate it.

Table 1. Characteristics of included studies

Study type	Author	Mean age (year)	Women	Men	Type of dislocation	Number of cases
Case report	Abdulfattah Abdullah et al. (5)	32.00	1	0	Asymmetrical bilateral	1
	Alshammari et al. (6)	19.00	0	1	Asymmetrical bilateral	1
	Cobar et al. (7)	23.00	1	0	Asymmetrical bilateral	1
	Giaretta et al. (8)	23.00	0	1	Asymmetrical bilateral	1
	Hoffman & Taylor (9)	20.00	0	1	Asymmetrical bilateral	1
	Pathinathan et al. (10)	32.00	0	1	Asymmetrical bilateral	1
	Rufer et al. (11)	53.00	0	1	Asymmetrical bilateral	1
	Sahito et al. (12), Case 1	30.00	0	1	Asymmetrical bilateral	1
	Sahito et al. (12), Case 2	32.00	0	1	Asymmetrical bilateral	1
Case series	Buckwalter et al. (5)	32.90	18	76	Asymmetrical bilateral	94
	Lima et al. (4)	34.40	4	39	Unilateral	43
	Sahin et al. (13)	34.50	15	47	Unilateral	62
Total		33.53	39	169		208

Table 2. Association between the mechanism of dislocation and dislocation type [bilateral dislocation is assumed as the event to calculate the odds ratio (OR)]*

Mechanism of dislocation	OR		Dislocation type		Total
			Bilateral	Unilateral	
Falling	2.68	Number	5	2	7
		Expected count	3.4	3.6	7.0
		Percent	71.4	28.6	100
Pedestrian injuries	1.72	Count	14	9	23
		Number	11.3	11.7	23.0
		Expected count	60.9	39.1	100
Sport injuries		Percent	0	2	2
		Count	1.0	1.0	2.0
		Number	0	100	100
Traffic accident	0.46	Expected count	61	79	140
		Percent	68.6	71.4	140.0
		Count	43.6	56.4	100
Work injuries	0.24	Number	2	8	10
		Expected count	4.9	5.1	10.0
		Percent	20.0	80.0	100
Weight from above		Count	14	0	14
		Number	6.9	7.1	14.0
		Expected count	100	0	100
Total	Count	96	100	196	
	Expected count	96.0	100.0	196.0	
	% within the mechanism of dislocation	49.0	51.0	100	

*: 5 cells (41, 7%) have an expected count of less than 5. The minimum expected count is 98.
OR: Odds ratio

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 increased (5). We used their findings and added case reports published from 2015 to 2021. The most important finding of this study is that although these patients are mostly men, the male-to-female ratio is similar in both bilateral and unilateral dislocations. We also found that the association between traffic accidents and unilateral hip dislocation seemed 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 et al. that were reported in the 1800s and early 1900s. The current study is the first study to report these findings about asymmetrical hip dislocation; therefore, 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. In our case, this time was 4 hours, and no sign of AVN was present in follow-up.

Asymmetric bilateral hip dislocations represent a rare clinical entity, comprising only 0.01-0.02 percent of all joint dislocations. Typically, they occur more frequently among men, with high-energy trauma, particularly vehicular accidents, being the predominant cause due to the biomechanical stability of the hip joint (4, 5). Buckwalter et al. conducted a comprehensive review encompassing reported cases from 1845 to 2015, illustrating an increasing trend in documented cases over time (5). Our study builds upon their findings by incorporating case reports published between 2015 and 2021.

Our analysis revealed a similar male-to-female ratio in both bilateral and unilateral hip dislocations. However, while traffic accidents emerged as the leading mechanism for both types of dislocations, a stronger association was noted for unilateral dislocations. This observation suggests potential differences in the biomechanics or circumstances surrounding unilateral versus bilateral hip dislocations, warranting further investigation.

One notable limitation of our study pertains to the potential for bias stemming from variations in reported trauma mechanisms over time. Historical cases, documented in the 1800s and early 1900s, may not accurately reflect contemporary trends due to advancements in transportation safety and infrastructure. Consequently, caution must be exercised when interpreting these findings in the context of evolving societal and technological landscapes.

Despite this limitation, our study contributes novel insights into the epidemiology and characteristics of asymmetric bilateral hip dislocations, serving as a valuable reference for clinicians and researchers alike. To our knowledge, this is the first study to comprehensively analyze asymmetrical hip dislocations within the contemporary literature, providing a foundation for future investigations.

AVN remains a primary concern following hip dislocations, with the risk significantly elevated after a six-hour interval. In our case, reduction was achieved within four hours, mitigating the risk of AVN. This underscores the critical importance of prompt intervention in minimizing complications associated with hip dislocations (14).

Conclusion

Our study sheds light on the epidemiology, mechanisms, and associated risks of asymmetric bilateral hip dislocations. While further research is warranted to elucidate the underlying factors contributing to these injuries, our findings underscore the imperative of timely management to optimize patient outcomes.

Table 3. Type of fracture cross-tabulation

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

Conflict of Interest

The authors declare no conflict of interest in this study.

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