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A Hospital-based Investigation of Patterns of Acetabular Fractures

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ABSTRACT

Introduction: The greatest alternative for a satisfying functional outcome is a firm anatomical reduction, particularly of the weight-bearing dome. The fracture management outcome analysis contains the majority of information on the epidemiological characteristics of acetabular fractures.

Aim: This study aimed to assess the acetabular fractures and their injury patterns.

Methodology: Patients with acetabular injuries (n=70) were hospitalised and collected prospectively. The collected information was based on patients' ages, gender, fracture site and surgical patterns with its complications. A cross-sectional study. This study was conducted at Sheikh Khalifa Medical City Ajman, United Arab Emirates from April 2020 to April 2021.

Results: A total of seventy people were examined for this study. The left-side acetabulum was fractured in 40 individuals (57.14 %), while the right-side acetabulum was fractured in 30 patients (42.85 %). Car accidents accounted for n=39 (55.71 %), with motorcycle accidents accounting for n=22 (31.42 %) and falls accounting for n=9 (12.85 %). According to the Letournel classification, the most common fracture pattern was an anterior column with posterior Hemi transverse n=25 (35.71%), charted by posterior wall fractures n=16 (22.85%), and transverse type n=14 (20 %). The most prevalent fracture was the distal end, which accounted for n=8 (11.42 %), followed by pelvic injuries, which accounted for n=6 (8.5 %).

Conclusion: This study concluded that the left side of the body was shown to be more affected. The posterior Hemi transverse was the most prevalent injury pattern. The most pervasive surgical consequences were injuries to the sciatic nerve. The fracture of the distal end of the radius was the most pervasive related injury.

Key Words: Acetabular Fracture, Fracture Pattern, Epidemiology, Complications, Injuries, Affected.

INTRODUCTION

Acetabular fractures are complicated fractures that necessitate a high level of competence, particularly surgical intervention. The greatest alternative for a satisfying functional outcome is a firm anatomical reduction, particularly of the weight-bearing dome.¹ High-energy trauma-induced Acetabular fractures occur in three people out of every 100,000.² A fall is the most common mechanism of injury in older patients (>60 years), although it is mainly secondary to a traffic accident in younger patients.³ The occurrence of acetabular fractures differs by the nation due to local and global demo-

graphic variables, cultural variances, and vocational preferences, potentially altering exposure to higher energy trauma and trauma mechanisms.⁴

The fracture management outcome analysis contains the majority of information on the epidemiological characteristics of acetabular fractures. They indicate demographic differences as well as evolving patterns in the presentation of acetabular fractures. Letournel⁵ and Matta's⁶ famous series provide significant data on the prevalence of several forms of acetabular fractures.⁷

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For orthopaedic surgeons, acetabulum fractures have always been a difficulty. The treatment of an acetabular fracture demands a good understanding of the three-dimensional architecture of the innominate bone.⁸ The difficulty was exacerbated by the lack of a thorough and widely accepted acetabular fracture classification, and fracture evaluation was further hampered by the fact that radiographic imaging was confined to a single anteroposterior pelvic view.⁹

A standard radiograph of the pelvis in the anteroposterior (AP) view is enough to detect a hip dislocation. Anterior-posterior (AP) and oblique (Judet) views are the best ways to assess acetabular fractures, although they are more accurately delineated and categorized for pre-operative planning. By using a CT scan of the pelvis, both a 2Dimensional and 3Dimensional CT scan can help diagnose an acetabular fracture.¹⁰ There is currently no national data on these fractures. The purpose of this study was to observe the cause and injury patterns of acetabular fractures in a tertiary care hospital

METHODOLOGY

In this cross-sectional study, data was gathered from our hospital. Permission was taken from the ethical review committee of the institute. Data were obtained prospectively from patients (n=70) hospitalised for acetabular injuries between April 2020 to April 2021. In this study, we included all adult patients who had acetabular fractures. A thorough history and general examination were conducted to rule out any medical issues. Pelvis X-rays, AP view, and CT scan was performed with 3D reconstruction. Two blinded observers confirmed the Letournel classifications. This classification method was employed during the study period to detect injury patterns. We looked over patients' medical records, age, gender, fracture side affected, injury mechanism, fracture patterns, and related injuries. For the data entry and analysis, SPSS version 21 was used. The records were stated as frequency and percentages, means and standard deviations, and percentages.

RESULTS

In this study n=62 (88.5%) were male, and only n=8 (11.42%) were female (As shown in Table 1). The population studied had a mean age of 32.41 years, ranging from 18 to 65 years. Car accidents were the most common cause of acetabular fractures, accounting for n=39 (55.71 %), followed by motorcycle accidents n=22 (31.42 %) and falls n=9 (12.85 %). The average hospital stay before surgery was 9.5 days, and the average hospital stay after surgery was 10.54 days. The left side of the acetabulum was more usually impacted by a fracture, with n=40 (57.14 %) of the patients having a fracture on the left side and n=30 (42.85 %) having a fracture

on the right side. (As shown in Table 1). In this study, ten (14.28 %) patients had sciatic nerve lesions, 15 (21.42 %) patients had infections, and eight (11.42 %) patients had pulmonary thromboembolism. According to the Letournel classification, the most common fracture pattern was an anterior column with posterior Hemi transverse n=25 (35.71%), followed by posterior wall fractures n=16 (22.85%) and transverse type n=14 (20%) (As shown in Figure 1). The most prevalent related injury was a fracture of the distal end of the radius, which accounted for n=8 (11.42 %), followed by pelvic injuries, which accounted for n=6 (8.5 %)

Table 1: Characteristics of the study participants

Characteristics	No. of patients n=70	%
Average age	32.4±12.8 years	
Gender		
Male	62	88.5
Female	8	11.42
Mode of injury		
Car accidents	39	55.71
Motorcycle accidents	22	31.42
Falls	9	12.85
Side effected		
Left-side	40	57.14
Right-side	30	42.85

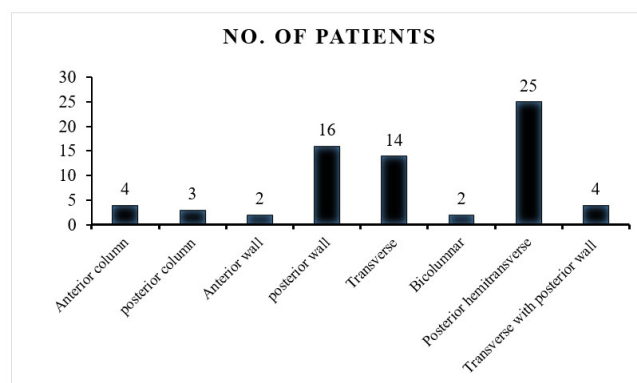


Figure 1: Fracture pattern in acetabular fractures

DISCUSSION

The current study observed the epidemiology of acetabular fractures and their injury patterns. According to this study, road traffic accident is the major cause of acetabular fractures. The mean age was 32.4±12.8 years, comparable to the Indian research⁹. In a study done in Lahore, Pakistan, Na-deem et al. reported that the average age of the patients was 31 years, which was similar to our study.¹¹

In our study, the majority of individuals who had an acetabulum fracture were male. This backs up previous research, which indicated a higher frequency of the disease in males. In our study, the male to female ratio was 8.3, similar to other regional studies.^{9,11} Nonetheless, this ratio was not consistent with the research conducted in the industrialised world.¹² Due to cultural differences, women are likely to be less exposed to outdoor activities, including two-wheeler motorcycle riding. Another study performed in Pakistan reported that RTA was the most common mode of injury in nearly ninety percent of the cases, remaining patients suffering from a fall from height.¹³

Furthermore, the results of our study demonstrated that the left side of the acetabulum was more usually impacted by a fracture, with $n=40$ (57.14 %) of the patients having a fracture on the left side and $n=30$ (42.85 %) having a fracture on the right side. It was impossible to pinpoint a reason for the prevalence of left-sided fractures, but given that both sides could be injured, we believe this difference is insignificant.

A study performed in Qatar reported similar findings. This study concluded that the acetabular fracture rate was 2/100,000 per year. Males accounted for 93.2 percent of the total. At the time of injury, the average age was 36 years, and motor vehicle crashes were the most prevalent cause of injury, occurring in nearly half of the patients. Primary acetabular fractures accounted for 73.6 percent of injuries, whereas related fractures accounted for 26.4 percent. The most prevalent pattern was posterior wall fractures (25.2 percent). In 21.3 percent of patients, there was an associated posterior hip dislocation. The incidence of post-traumatic sciatic nerve palsy (7%), which was present at the time of injury, was shown to be lower. There were no incidences of death recorded.¹⁴

According to our findings, the most prevalent form of fracture was AN anterior column with a posterior Hemi transverse pattern. Atif et al. cover the mechanism of injury, evaluation ideas, and concomitant injuries in acetabular fractures. They also discuss decision-making and preoperative planning and non-operative therapy considerations.¹⁵

As can be seen from the rising incidence over time, high-energy impacts are increasingly causing traffic accidents. Vehicle accidents were found to be the cause of the greater rate of acetabular fractures, precisely as Kumar¹⁰ found in their research. Our study examination observed that sciatic nerve lesions, infections, and pulmonary thromboembolism were most common.

An epidemiological study with a high sample size is required to draw meaningful results and conduct further research. Countries that maintain a close eye on their patient referral system and refer troublesome fractures to regional apex trauma centres for better care may be able to contribute more

to epidemiological research by anticipating national demographic heterogeneity in fracture presentation.

The current study has certain limitations. It was a single-centred study. The sample size was small. We did not assess the outcomes of the patients.

CONCLUSION

This study concluded that males had a higher percentage of acetabular fractures, and the left side was more afflicted. Car accidents caused the majority of these fractures. It was impossible to find a link between higher accident rates and various months of the year. The Hemi transverse was the most prevalent injury pattern. The most prevalent surgical consequences were injuries to the sciatic nerve. The fracture of the distal end of the radius was the most prevalent related injury.

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Conflict of interest

None

Permission

Permission was taken from the ethical review committee of the institute

REFERENCES

1. Jain M, Kumar P, Tripathy SK, Behera II S, Rana R, Das SJC. Clinico-radiological outcomes of using Modified Stoppa approach for treating acetabular fractures: An Institutional Review. 2020;12(4).
2. Trikha V, Ganesh V, Cabrera D, Bansal H, Mittal S, Sharma VJJOCO, et al. Epidemiological assessment of acetabular fractures in a level one trauma centre: a 7-Year observational study. 2020;11(6):1104-9.
3. Laird A, Keating JFJTJOB, Volume JSB. Acetabular fractures: a 16-year prospective epidemiological study. 2005;87(7):969-73.
4. Zhang R, Yin Y, Li A, Wang Z, Hou Z, Zhuang Y, et al. Three-column classification for acetabular fractures: introduction and reproducibility assessment. 2019;101(22):2015-25.
5. Letournel E, Judet R. Fractures of the acetabulum: Springer Science & Business Media; 2012.
6. Matta JM, Mehne DK, Roffi RJCO, Research R. Fractures of the acetabulum. Early results of a prospective study. 1986(205):241-50.
7. Ahmed M, Abuodeh Y, Alhammoud A, Salameh M, Hasan K, Ahmed GJIO. Epidemiology of acetabular fractures in Qatar. 2018;42(9):2211-7.
8. Halwai MA, Manzoor QW, Wani MI, Mir BAJJOO. The epidemiology and fracture patterns of acetabular fractures in a tertiary care centre of North India: A hospital-based study. 2019;5(2):18-21.
9. Jindal K, Aggarwal S, Kumar P, Kumar VJJOCO, trauma. Complications in patients of acetabular fractures and the factors affecting the quality of reduction in surgically treated cases. 2019;10(5):884-9.

10. Kumar M, Ahmed M, Hussain G, Saleem M, Sahar K, Bux MJRMJ. Frequency of posterior wall acetabular fracture in patients presenting with posterior hip dislocations. 2020;45(2):347-9.
11. Keerio NH , Valecha NK , Qureshi MA , Ahmed I, Noor SS, Tunio ZH . Which is the best treatment option for open book pelvic fractures! Internal fixation or External fixation. JPUMHS;2020;10(03)105-108. <http://doi.org/10.46536/jpumhs/2020/10.02.236>.
12. Briffa N, Pearce R, Hill A, Bircher MJTJOB, volume JSB. Outcomes of acetabular fracture fixation with ten years' follow-up. 2011;93(2):229-36.
13. Munshi N, Abbas A, Gulamhussein MA, Mehboob G, Qureshi RA. Functional outcome of the surgical management of acute acetabular fractures. J. Acute Dis.. 2015;4(4):327-30.
14. Ahmed M, Abuodeh Y, Alhammoud A, Salameh M, Hasan K, Ahmed G. Epidemiology of acetabular fractures in Qatar. International orthopaedics. 2018;42(9):2211-7.
15. Atif M, Hasan OH, Baloch N, Umer M. A comprehensive basic understanding of pelvis and acetabular fractures after high-energy trauma with associated injuries: Narrative review of targeted literature. 2020.