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Study of functional outcomes of surgical management of acetabular fractures

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Abstract

The incidence of acetabular fractures is on the rise with the increase in the high velocity road traffic accidents. The goal of the surgical management of acetabular fractures is pain free motion and stability to permit vocational and day to day activities without the propensity for future degenerative changes. Aim of the study was to prospectively analyze the functional and radiological outcome and complications of Surgically Managed Acetabular Fractures. Study was carried out at New Civil hospital Surat from January 2017- September 2018. A total of 25 patients were enrolled for the study. A minimum follow-up period of 6 months was required for these patients. At the end of the study only 13 patients were available for assessment/evaluation. Majority (46.2%) of the patients in our study were young adult between the age group of 18-30 years. 76.9% of the patients were operated within 7 days of injury. Incidence of both elementary (53.8) and associated types (46.2) of fracture was almost equal. Posterior dislocation was present in 3(23.1%) patients. 11(84.6%) had excellent functional out come as per criteria described by matta harris hip score at 6 months. 9 patient (69.2%) had near anatomical reduction after reduction. Relationship between Score and reduction was statistically significant. ($p = 0.04$). The goal of the surgical treatment was to produce a functional mobile painless joint that continues to function till the rest of life for the patient which is best achieved by anatomical reduction of fractures and stable fixation, the most important factor that determines the outcome.

Keywords: Acetabular fracture, harris hip score, matta criteria

Introduction

Acetabular fractures were treated conservatively during the early days. The literature of 1950s and 1960s discussed inconclusive recommendations for the optimal treatment for the acetabular fractures [1, 2]. It was only after the extensive works by Judet and Letournel that acetabular fractures were seen with clarity. Their publication gave a clear understanding about the basic surgical anatomy, defining the injury via appropriate radiographic assessment and determining a suitable treatment plan [3]. The subsequent studies by Letournel and Judet and Matta [4] emphasized the importance of anatomical reduction (less than 2mm of displacement) of fracture fragments to attain best results with hip congruity and stability. Residual displacement of more than 2 mm may lead to poor functional result and early post-traumatic arthrosis the time interval between injury and the surgery is also critical as the “delayed management of acetabular fractures increases the difficulty of operative treatment and may result in a significant reduction in good to excellent results” [5]. The surgery for acetabular fractures is complex and technically demanding and there are chances of serious complications even in the hands of experienced surgeons. The initial displacement of the fracture is an important determinant of outcome after surgical treatment.

Objectives

To prospectively analyse the functional and radiological outcome and complications of surgically Managed Acetabular Fractures in adults.

Material and Method

Total 25 patients were included in the prospective study

Inclusion criteria

1. Age group >18 years of either sex.
2. The patients with unstable fracture dislocation of hip either anterior or posterior and no co-existing hip osteoarthritis.
3. Fracture of acetabulum with or without associated other fractures. Confirmed by clinical examination, X rays and CT scan.

Exclusion criteria

1. Patients with preoperative ipsilateral sciatic nerve injury, hemiplegia.
2. Patients who did not give informed consent.
3. Patients unfit for surgery.
4. Patients with other coexisting hip pathologies

25 patients operated for acetabular fracture Between January 17to September18 were included in this prospective study with a minimum follow up period of 6 months. Physical examination and radiological evaluation using pelvis ap view and judet view radiograph and CT scan with 3D reconstruction was done and findings recorded, after hemodynamic stabilisation and anaesthetic fitness patients were taken for surgery. All procedures were performed by surgeon trained and experienced in acetabular surgeries. Intraoperative surgical data was recorded in term of blood loss, surgical approach, time and accuracy of reduction and consequence of hip joint and damage to articular cartilage. Any complications intra operative or post-operative were recorded.

Post-operative follow up

Post-operatively all the patients were assessed with plain X-rays AP view, obturator oblique view, and iliac oblique view to assess the fracture reduction. Serial radiographs [all the three standard views] were scheduled at 1 month, 3 months, 6 months.

Functional outcome was assessed by the Grading system of Harris Hip Score.

The radiographs were assessed by the criteria described by Matta. The reduction of the fracture was evaluated by measuring the residual post-operative displacements on the three plain radiographs. The reduction was graded as anatomical (0-1mm displacement, imperfect (2-3 mm of Displacement), or poor (>3 mm of displacement). Using SPSS ver 19 software range, frequencies, percentages, means, standard deviations, chi square and student t test and ‘p’ values were calculated. A ‘p’ value less than 0.05 denotes significant relationship.

Observations and Results: A total of 25 patients were enrolled for the study. A minimum follow up period of 6 months was required for these patients. At the end of the study only 13 patients were available for assessment/evaluation.

Table 1: Age wise distribution of participants

Age	No.	Percentage
18-30	6	46.2
31-45	2	13.4
46-60	3	23
61-75	2	13.4

Majority (almost half) of the patients in our study were young

between the age group of 18-30 years.

More than three fourth of the patients were operated 10 (76.9%) presented within 7 days of injury.

Most common cause of acetabular fracture in our study was RTA which contribute around 69.2 % of patients.

Table 2: Types of fracture

Fracture type	Cases	
No.	Percentages (%)	
Elementary type		
Anterior wall	1	7.7
Anterior column	2	15.4
Posterior WALL	2	15.4
Posterior column	2	15.7
Elementary type total	7	53.8
Associated type		
Both column	1	7.7
Associated type total	6	46.2
Total	13	

Posterior dislocation present in 3 (23.1%) of the patients. Out of 13 patients, 8 (61.5 %) had associated injuries in other body region.

Table 3: Radiological reduction

Reduction	Cases	
No.	Percentages	
Anatomical	9	69.2
Imperfect	4	30.8
Poor	0	0
Total	13	

Radiological assessment done on basis of plain radiographs, PBH and Judet views. More than two third patient 9 (69.2%) had anatomical reduction.

Table 4

Reduction	Harris Hip Score (Mean ± SD)
Anatomical	95 ± 6.6
Imperfect	88.5 ± 5.9
Poor	0
P	0.04 Significant

Table 5: Harris Hip Score

Harris hip score	Cases	
No.	Percentages (%)	
Poor (0-69)	0	0
Fair (70-79)	1	7.7
Good (80-89)	1	7.7
Excellent (90-100)	11	84.6
Total	13	

Relationship between Harris hip Score and reduction was statistically significant. (p = 0.04)

Discussion

All over the world trend has changed from conservative management to early operative management for acetabular fractures. Thanks to the early work of Letournel and Judet in 1950s and later on work of Matta et al elaborated approaches and precise surgical techniques for reduction and fixation of such fractures. In our study most of the patients were young adults with male predominance. Almost 2/3rd sustained the fracture in RTA. It may be inferred that the population who were at risk are those who are mobilizing daily for day to day

work for earning. Age, gender and mode of injury were not found to be statistically significant for radiological and functional outcome of acetabular fractures as per our study. These findings were in concurrence with U.K. Meena *et al.* study findings [6]. Most of the patients sustained acetabular fracture which were elementary type, which were reduced and fixed by using ilio-inguinal approach. This findings correlate with our study results. For the management of anterior wall/column and posterior hemi transvers etc. fractures, Ilioinguinal approach can be used as single approach. The use of single exposure for even both columns fracture with indirect reduction of the opposite column is currently recommended as the morbidity associated with extensile approaches was found to be very high.

The average bloods loss was more with ilioinguinal approach than KL approach. No iatrogenic sciatic nerve injury was observed in our study. One patient had post op inguinal hernia on the side of fracture in our study. The variables such as initial injury to the articular surface, residual intra articular step, lost vascularity to the femoral head are the important factors that determine the outcome, including the degenerative changes in the hip joint [7] the anatomical reduction of the fracture is the single most important factor which determines the functional outcome. In our study also radiographic congruity correlated well with the functional outcome. The infection rate in our study was 7.7 % which was higher than that reported in other series 0-3% [4, 8, 9]. In a study done by Suzuki *et al.* [10] the surgical site infection was 5.2% superficial and deep infections combined, which is less than our study. The cause may be due to delayed interval between injury and surgery, more soft tissue stripping and longer duration of surgery or small sample size. In our study none patient had plate breakage or posterior dislocation of hip post operatively. Another factor which closely correlated with the outcome was the time interval between injury and fracture fixation [4, 11]. 77.8% of the patients who had earlier surgery had good anatomical reduction and functional outcome. When operated within 7 days fracture reduction manipulation were easier as less reactive callus formation and soft tissue adherence. From 7-14 days 3 patients were operated, this delay was due to other systemic injuries like perivascular hematoma, abdominal, chest trauma and head injury which were given priority over acetabular fracture fixation. When more than 15 days delay this factors such as fracture stickiness, soft tissue adherence may impart difficulty in anatomical reduction. In our study all cases were operated within 15 days of injury. These findings correlate with the findings of U.K Meena *et al.* [12]. Mean delay of surgery in our study was 6.2 ± 4 days; In our study; 3 posterior dislocation of Hip were operated but functional outcome was not affected. The delayed complication such as avascular necrosis of femoral head, secondary arthrosis of the hip joint or heterotopic ossification were not seen may be due to short follow up period. No prophylaxis for DVT and heterotrophic ossification were given in our study. Associated injuries had no significant effect on functional outcome in our study which was different from Moed *et al.* [13] who concludes that associated injury have significant negative effect on functional outcome.

As compare to other contemporary studies, functional outcome using mean HHS 92 ± 5.7 versus Faizden Iqbal (82.36 ± 8.55) versus Shrestha *et al.* (78) versus Gupta *et al.* (74). A study with bigger sample size and longer duration of follow up is describable for better more significance conclusion. Study results indicated that age, gender, mechanism of injury,

time between injury and surgery, initial degree of displacement and quality of reduction had effect on functional as well as radiological outcome but the findings are not statistically significant. There was statistically significant correlation between radiological and functional outcome. (Figure 1) (Figure 2).

Case 1



Fig 1: Preoperative CT scan



Fig 2: 6 Month follow up X-Ray



Fig 3: 6 Month follow up of case study 1

References

1. Rowe CR, Lowell JD. Prognosis of fractures of acetabulum. JBJS Am, 43A:30-59.
2. Knight RA, Smith H. Central fractures of acetabulum. JBJS Am 1958; 40:A, 1-120.
3. Judet R, Judet J and Letournel E. Fractures of the acetabulum: Classification and surgical approaches for open reduction. JBJS Am. 1964; 46A:1615-1638.
4. Matta J. Fractures of the acetabulum: Accuracy of

- reduction and clinical results in patients managed operatively within three weeks after the injury JBJS Am. 1996; 78A:1632-1645.
5. Eric Johnson E, Joel Matta M, Jeffrey Mast W. Emile Letournel. Delayed reconstruction of acetabular fractures 21-120 days following injury. Clin Orthop Relat Res 1994; 305:20-30.
 6. Meena UK, Tripathy SK, Sen RK, Aggarwal S, Behera P. Predictors of postoperative outcome for acetabular fractures. Orthop Traumatol Surg Res. 2013; 99:929-35.
 7. Tile. Fractures of the acetabulum. In: Schatzker J, Tile M, editors. Rationale of operative fracture care. 2. Berlin Heidelberg New York: Springer, 1996.
 8. Matta JM, Merritt PO. Displaced acetabular fractures. Clin Orthop Relat Res. 1988; 230:83.
 9. Wright R, Barrett K, Christie MJ, *et al.* Acetabular fractures: Long term follow up of open reduction and internal fixation. J ortho trauma. 1994; 8:397-403.
 10. Suzuki T, Morgan SJ, Smith WR, Stahel PF, Gillani SA, Hak DJ. Postoperative surgical site infection following acetabular fracture fixation. Injury. 2010; 41:396-9.
 11. Letournel E. Acetabulum fractures: classification and management. Clin Orthop Relat Res. 1980; (151):81-106.
 12. Meena UK, Tripathy SK, Sen RK, Aggarwal S, Behera P. Predictors of postoperative outcome for acetabular fractures. Orthop Traumatol Surg Res. 2013; 99:929-35.
 13. Moed BR, Yu PH, Gruson KI. Functional outcomes of acetabular fractures. J Bone Joint Surg Am. 2003; 85A:1879-83.
 14. Matta JM. Fractures of the acetabulum: accuracy of reduction and clinical results in patients managed operatively within three weeks after the injury. J Bone Joint Surg Am. 1996; 78:1632-45.
 15. Shrestha D, Dhoju D, Shrestha R, Sharma V. Acetabular fracture: Retrospective analysis of thirty three consecutive cases with operative management. Kathmandu Univ Med J (KUMJ). 2014; 12:279-87.
 16. Gupta RK, Singh H, Dev B, Kansay R, Gupta P, Garg S. Results of operative treatment of acetabular fractures from the Third World--how local factors affect the outcome. Int Orthop. 2009; 33:347-52.