

## Case Report

# Functional outcome of complex acetabular fractures by combined anterior and posterior approach in a single sitting: a case report

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### ABSTRACT

Complex acetabular fractures described by Judet and Letournel present with a formidable diagnostic and therapeutic challenge. Simultaneous anterior and posterior exposures of the acetabulum are a safe and are useful alternative to other extensile exposures and can be performed with similar morbidity. The advantages of simultaneous anterior and posterior approaches over extensile exposures include less morbidity, less hospital stay, early mobilisation and avoidance of soft tissue contracture. The combined approach is most useful in transverse, transverse posterior wall fractures with wide anterior displacement, T type fractures with significant anterior-inferior displacement, or both column fractures with posterior wall involvement. 23-year-old male came with chief complaints of pain and swelling at right hip since 3 days. He had history of fall from train and then referred to us for further management. clinical and radiological assessment was done. Approachment of the case was done with combined anterior and posterior incision in single sitting. It provided excellent clinical and radiological outcome. Complex acetabular fracture is a challenging entity. Association of these fractures with complex anatomy, delicate soft tissue handling and extensive blood loss makes it more difficult to manage. Combined anterior and posterior approaches of acetabulum in a single sitting can be used as safe alternative to step wise extensile approaches used routinely. Outcomes associated with single sitting are good as its associated with lesser morbidity of patient, early functional mobility and less hospital stay. Though it's not devoid of its own complications decision must be taken depending upon the condition of the patient and surgeon's choice.

**Keywords:** Complex acetabular fractures, Combined approach, Plate fixation, Recon plate

### INTRODUCTION

While there is a consensus that complex acetabular fractures require anatomical reduction and stable fixation for their management, there is no agreement on the surgical approaches to be used for achieving that goal. Invariably two surgical approaches are needed for management of such fractures. Whether these approaches should be performed in different anesthetic sittings or in the same sitting, sequentially or simultaneously, is debatable. Anatomical reduction of articular surfaces combined with rigid internal fixation and early

mobilisation is accepted gold standard treatment of displaced complex acetabular fractures.

These fractures require operative treatment which is very challenging.<sup>1-3</sup> Most acetabular fractures can be operated upon with a single surgical approach, but it is not always possible to do so in complex fractures. This specially holds true for fractures involving two columns.<sup>4</sup> For complex acetabular fractures, combined anterior and posterior approaches in same anaesthetic sitting have been routinely used. Staged procedures are often associated with complications such as increased rates of

infections, delayed rehabilitation, higher rates of ectopic ossification and prolonged abductor weakness.<sup>5-7</sup>

### CASE REPORT

A 23-year-old male patient came with chief complaints of pain and swelling in right hip since 3 days. Patient had history of fall from train 3 days back. Primary stabilization was done with pelvic bracing. Signs and symptoms were assessed to check for hip dislocation. Urinary catheterization was done look for any signs of hematuria. After primary stabilisation the patient was sent for the plain radiographs of pelvis with both hips with bilateral full length femur. Jude's view was done to know the extent of the fracture line. On clinical examination pain, tenderness and global restriction of movement at hip joint were noted. On plain radiographs complex acetabulum fracture was identified and CT scan of pelvis was done to confirm the diagnosis. After clinical and haematological examination, patient was explained regarding surgical management required for the due fracture. Locking recon plating by combined anterior and posterior approach was planned. Under all aseptic precautions patient was kept in floppy position, and fracture site was exposed from both anterior and posterior approach. Fracture site was identified after soft tissue separation and reduction was obtained with the help of reduction forceps. Reduction was confirmed under c-arm fluoroscopy and fixation of fracture with recon locking plate with locking screw was done. Wound wash was given and Soft tissue was closed in layers. Procedure was uneventful. Local wound examination was done on post operative day 5 and patient was discharged on day 12 after complete suture removal. Patient was advised nil weight bearing for 6 weeks and was asked for follow up on 24 day, 36 days and 45 days respectively. Follow up X-rays were taken with subsequent visits. Partial weight bearing was started after 45 days followed by complete weight bearing. Patient being student by profession went back to his routine life without any complication.



**Figure 1: Preoperative radiographs of acetabulum, (A) a.p., judet, (B) inlet and (C) outlet views.**

### DISCUSSION

Acetabular fractures result from either high-energy trauma such as motor vehicle accidents, or low-energy trauma such as falls, especially in the elderly. Data from meta-analysis had reported that 80.5% of acetabular

fractures result from motor vehicle accidents and 10.7% result from falls.<sup>8-12</sup>



**Figure 2: Immediate post-operative X-rays.**

The fracture classification system developed by Judet and Letournel was the most widely accepted system; it differentiated fractures into ten types, five elementary fractures and five associated fractures based on observations from plain radiographs.<sup>12-14</sup>



**Figure 3: Follow-up X-rays showing complete healing of fracture.**

Adequate treatment of acetabular fractures requires an accurate definition of the type of fracture, the degree of comminution, and the presence of intraarticular debris.<sup>15</sup> Classifying acetabular fractures is challenging, yet vitally important to selecting the best surgical strategy and approach.<sup>16,17</sup> In spite of the large variety of different techniques available for their treatment. Acetabular fractures still posed a formidable challenge to the orthopaedic surgeon with a close relationship having been observed between degree of reduction, radiological findings and clinical results. The combined approaches were indicated in most of the both column fractures. Although KL approach affords good access to posterior column, the indirect access to anterior part depends on the type and site of fracture of anterior column, degree of comminution, involvement of quadrilateral plate and surgeon's comfort. Standard ilioinguinal approach provided complete access to the anterior column and wall. In cases of non comminuted anterior column fracture ilioinguinal approach provided easy sliding of a contoured reconstruction plate. This provided adequate access in most cases without exposure of femoral nerve, external iliac vessels and lymphatic channels of inguinal canal additionally. An intact recurs abdominis was postulated to offer additional benefits of early functional

recovery. Decision making about the approach to be used first depended largely on the preoperative planning and clear understanding of the fracture pattern. The column which had a greater amount of comminution should be addressed first in presence of dislocation; approach giving direct access to the dislocation must be used first. We didn't try to reduce the fracture with single approach and opened the fracture with both the approaches simultaneously. Quality of the reduction had been reported as the most important predicting factor which affects the clinical and radiological outcome and predict occurrence of post traumatic arthritis. The reduction was evaluated post operatively which was congruent and anatomical. The use of two approaches had its own disadvantages the patient was not fully supine and prone and it took time for surgeon to adopt to this position of the patient, especially in heavily built individuals. Blood loss and longer duration of surgery were other complications associated.

## CONCLUSION

Combined anterior and posterior approaches of acetabulum in a single sitting can be used as safe alternative to step wise extensible approaches used routinely. Outcomes associated with single sitting are good as it is associated with lesser morbidity of patient, early functional mobility and less hospital stays. Though it's not devoid of complications decision must be taken depending upon the condition of the patient and surgeons' choice.

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## REFERENCES

1. 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(11):1632e45.
2. Matta JM, Merritt PO. Displaced acetabular fractures. Clin Orthop Relat Res. 1988;(230):83e97.
3. Meena UK, Tripathy SK, Sen RK, Aggarwal S, Behera P. Predictors of post-operative outcome for acetabular fractures. Orthop Traumatol Surg Res. 2013;99(8): 929e35.
4. Grubor P, Krupic F, Biscevic M, Grubor M. Controversies in treatment of acetabular fracture. Med Arch. 2015;69(1):16e20.
5. Crenshaw AH. Surgical techniques and approaches. In: Azar FM, Beaty JH, Canale ST, eds. Campbell's operative Orthopaedics. 13th ed. Philadelphia PA, USA: Elsevier; 2017:86e92.
6. Griffin DB, Beaulé PE, Matta JM. Safety and efficacy of the extended ilio-femoral approach in the treatment of complex fractures of the acetabulum. J Bone Joint Surg Br. 2005;87(10): 1391e6.
7. Wey J, DiPasquale D, Levitt L, Quitkin H. Operative treatment of acetabular fractures through the extensile Henry approach. J Trauma. 1999;46(2):255e60.
8. Dakin GJ, Eberhardt AW, Alonso JE. Acetabular fracture patterns: associations with motor vehicle crash information. J Trauma. 1999;47(6):1063-1071.
9. Giannoudis PV, Grotz MR, Papakostidis C. Operative treatment of displaced fractures of the acetabulum: a meta-analysis. J Bone Joint Surg Br. 2005;87(1):2-9.
10. Scheinfeld MH, Dym AA, Spektor M. Acetabular fractures: what radiologists should know and how 3D CT can aid classification. Radiographics. 2015;35(2): 555-77.
11. Alton TB, Gee AO. Classifications in brief: Letournel classification for acetabular fractures. Clin Orthop Relat Res. 2014; 472(1):35-8.
12. Judet R, Judet J, Letournel E. Fractures of the acetabulum: Classification and surgical approaches for open reduction preliminary report. J Bone Joint Surg Am. 1964;46(8):1615-75.
13. Letournel E. Acetabulum fractures: classification and management. Orthoped Trauma Direct. 2007;5(5):27-33.
14. Vas WG, Wolverson MK, Sundaram M, et al. The role of computed tomography in pelvic fractures. J Comput Assist Tomogr. 1982;6(4):796-801.
15. Kim JJ, Kim JW, Oh HK. The submuscular sliding plate technique for acetabular posterior wall fractures extending to the acetabular roof. Orthop Traumatol Surg Res. 2014;100(8):967-70.
16. Elmadağ M, Güzel Y, Acar MA. The Stoppa approach versus the ilioinguinal approach for anterior acetabular fractures: a case control study assessing blood loss complications and function outcomes. Orthop Traumatol Surg Res. 2014;100(6):675-80.
17. Fishman EK. Protocols for helical CT of the musculoskeletal system. Helical (spiral) computed tomography: a practical approach to clinical protocols. New York, NY: Lippincott-Raven; 1998: 149-78.

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