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## Functional outcome of the surgical management of acute acetabular fractures

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## ABSTRACT

**Objective:** To assess the functional outcome of early surgical management of displaced acetabular fractures and the complications associated with the procedure.**Methods:** This is a case series study and data was collected using specialized performance. The study included 75 patients and the sampling technique was a non-probability purposive type. Patients presenting with close displaced acetabular fractures of more than 2 mm within 10 days of injury were included. However, elderly patients presenting after 10 days of injury, with evidence of local infection, severe osteoporotic bone and comorbid such as chronic obstructive pulmonary disease were not included in the study. New acetabular scoring system was used for assessing outcome of patients.**Results:** A total of 75 patients were operated on. Union was achieved in anatomical position in 66 (88%) patients and in malposition in 9 (12%) patients. Excellent results were obtained in 18 (24%) patients, good results in 41 (54.6%), fair results in 12 (16%), and poor results in 4 (5.4%) patients. Postoperative complications included infection [5 (6.7%)], heterotopic ossification [3 (4%)], sciatic nerve injury [10 (13.3%)], avascular necrosis [3 (4%)] patients.**Conclusions:** Patients with displaced acetabular fractures should be referred to specialised centres. Early surgical intervention and experienced management is a prime factor in achieving good results.

## 1. Introduction

Most acetabular fractures occur primarily in young adults in the setting of significant high velocity trauma secondary to either a motor vehicle accident or a high-velocity fall. Force exerted on the femur, passes through the femoral head, and is transferred to the acetabulum. The direction and magnitude of the force as well as the position of the femoral head determine the pattern of acetabular injury. The anatomical and radiographic classification plays an important role and acts as a first step in decision making for the mode of treatment<sup>[1]</sup>. Once the acetabular fracture is classified, appropriate therapy may be planned and implemented. Associated injuries, which are often life threatening are also important as 50% of patients often have

multiple traumatic injuries and are often missed<sup>[2]</sup>. Fracture of the extremities, head injuries, chest, abdomen and pelvic ring injuries are the most commonly associated ones<sup>[3]</sup>.

In our set-up, the incidence of displaced acetabular fractures is on the rise due to increased incidences of automobile and occupational injuries. Among different treatment options, operative treatment for these fractures is a safe and acceptable method of management. Currently, surgical treatment has evolved to be the treatment of choice as restoration of joint congruity is of paramount importance to reduce the incidence of post-traumatic osteoarthritis of the hip joint<sup>[4]</sup>. The main purpose of surgical treatment is to achieve precise anatomic reduction and stable fixation to attain a painless, mobile and stable hip joint and to minimize the incidence of complications along with early mobility. The long term results of operative treatment are influenced by numerous factors including fracture type and/or dislocation, femoral head status, intra-articular osteochondral fragments, injury duration, reduction quality, age of the patient, comorbidity present, associated musculoskeletal complications and surgical approach<sup>[5,6]</sup>.

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Fractures of the acetabulum occur at all ages. Low energy fractures occur in the elderly people with osteopenia while high energy acetabulum fractures are more common in middle age groups. Rehabilitation program is dependent on type of surgery, age of the patient, and associated injuries. These patients have profound functional deficits compared with the normal population. Anatomical reduction alone is not sufficient to restore function<sup>[7]</sup>.

The objective of the study was to assess the functional outcome of early surgical management of displaced acetabular fractures and the complications associated with the procedure.

## 2. Materials and methods

This case series study was conducted in the Department of Orthopaedics, Jinnah Postgraduate Medical Center, Karachi for a period of 2 years (17/01/2010–17/02/2012). A total of 75 patients were included using non-probability purposive sampling technique.

Patients included in the study were all those who presented with close displaced acetabular fractures of more than 2 mm diagnosed radiologically within 10 days of injury (Figure 1). However, elderly patients with severe osteoporotic bone, local infection and other co-morbidities such as asthma, COPD at the time of injury, open fractures or those with involved gunshot injuries presenting after 10 days of onset were excluded from the study.



**Figure 1.** 18 years old male, presented with a Bi-columnar fracture of the acetabulum secondary to RTA.

This is an X-ray pelvis, AP view, showing disruption of the iliopectineal and ilioischial lines with ilio-acetabular dissociation.

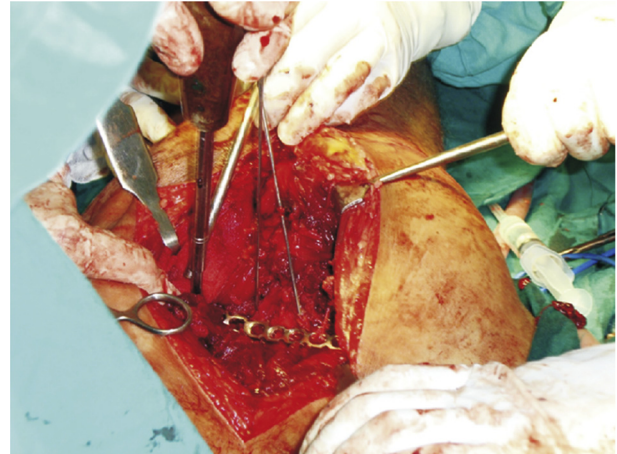
Data collection procedure was prospective and non-randomized. Informed verbal consent was taken. Clinical and radiological assessment as well as post-operative complications were recorded in a proforma especially prepared for this. Pre-operative and post-operative X-rays were done in all patients undergoing acetabular surgery.

The patients were followed up for up to 3 months post-operatively. At each visit, the patient was examined clinically and radiologically. Clinical examination included checking range of movement (ROM) at the hip joint, status of ambulation and adequate muscle strength especially quadriceps, hamstrings and gluteus. The radiological examination was done at different intervals to look for adequacy of fixation and any complications.

Postoperatively all the patients were placed in skeletal traction for 3 weeks and discharged from the hospital after 8 (10–12)

days with instructions for range of motion and muscle strengthening exercises. Non weight bearing ambulation was started at 6 weeks post-op and full weight bearing at 3 months.

Fractures of the posterior lip, posterior column, transverse fractures and T fractures were approached through the Kocher Langenback approach (Figure 2) and fractures involving the anterior column were approached through both Kocher Langenbeck and ilioinguinal. No case was treated with extensile screws (Figure 3).



**Figure 2.** Kocher Langenbeck approach, Recon Plates used for fixation.



**Figure 3.** Surgically fixed with Recon Plates, 2nd day post-op.

This is an X-ray of the pelvis, AP view, showing a posterior column acetabular fracture fixed with recon plate through Kocher Lagenbeck approach and an avulsion fracture of greater trochanter which has been stabilized with two cancellous screws with washer.

## 3. Results

A total of 75 patients were operated on and all 75 patients were available for review and evaluation of results. Mean age of

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