

# Minimally Invasive Percutaneous Plate Osteosynthesis Technique for Simple Anterior Acetabular Fractures

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## Abstract

High energy trauma has become so common, so are pelvi-acetabular fractures. Acetabular fractures are at time difficult fractures to treat because of their complex surgical approaches and the technically demanding fixation techniques to achieve the good anatomical reduction. To treat such challenging injuries they have long learning curve. However, all acetabular fractures are not that much complex, a few can be managed with a reasonably simple procedure without contemplating complex surgical exposures and fixation methods. This article we present “minimally invasive percutaneous plate osteosynthesis surgical technique,” which is simple yet safe and require to be of use in simple fractures in a simple way, acts as an addition to the standard surgical care. It reduces the surgical time and also with reduction of intraoperative complications, for the safe management of a specific group of anterior column fractures.

**Key words:** Fractures, Surgical care, Symphysis

## INTRODUCTION

The anatomic reduction and stable fixation remains the rationale for the surgical exposure and fixation of associated acetabular fractures,<sup>1</sup> and is not different for non-commuted displaced acetabular fracture patterns. However, the surgical approaches, the ability to achieve an anatomic reduction and the application of rigid internal fixation, the techniques are more complex. Various approaches have been advocated for different fracture patterns to achieve this goal. Commonly used are ilioinguinal approach for anterior and Kocher–Langenbeck approach for posterior exposures.<sup>2</sup>

## Background

The use of an extensive surgical exposure to visualize and reduce these fractures has been routinely recommended.

The extensile exposures especially anterior are associated with increased morbidity with respect to operative time, blood loss, infection, nerve injury, muscle weakness, and heterotopic ossification.

To minimize these complications a minimally invasive percutaneous plate osteosynthesis (MIPPO) surgical exposure utilizing indirect reduction techniques are utilized for the treatment of certain anterior acetabular fractures.<sup>3</sup>

## Procedure

The position and preparation are carried out in a standard procedure. The supine position and a bump under the same side buttock are kept. The bony landmarks are marked and the two small 1.5-2 inch incisions are planned along the standard incision line. First, one starting from the symphysis to pubis is given and it is carefully deepened. Identifying the lateral boarder of rectus, palpating the pubis in deeper plane gradually reach the pubis is not damaging any vital structures. Once over the pubis a subperiosteal dissection is carried out with a long curved 1 cm osteotome, abutting to the bone, gradually precede toward laterally and slight posteriorly. Once reach the midway or up to fracture site, the other side exposure is started with a one

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more 1.5-2 inch incision over the standard incision line at the iliac crest. After reaching to the iliac fossa, dissection continues subperiosteally make a tunnel with one more long curved osteotome along with pelvic brim to reach the opposite osteotome in the other side tunnel. Reduction of fracture is carried out by indirect reduction techniques using procedures, such as traction, rotations of hip, compression/distraction of pelvis according to fracture pattern. Once reduction is achieved, checked under image intensifier, a precontoured recon plate is inserted into the subperiosteal tunnel. Fracture is fixed on either side with 2 or 3 screws either side taking standard precautions. Wounds closed as usual (Figures 1-4).

## DISCUSSION

Among the commonly used surgical exposures, a posterior approach is a little simple and having less complications whereas anterior approach is more difficult, elaborative, and also time consuming, needs

long learning curve.<sup>4</sup> The anterior approach's incision and exposure transversely crosses the important vital structures, making it technically more challenging.<sup>5</sup> Moreover, its voyage in three different windows makes the exposure somewhat limited, leaving behind some area devoid of direct vision. Like exposure the fixation for acetabulum is cumbersome and risky at times.<sup>3</sup> The MIPPO technique described here is suitable for a specific set of fractures where we can get away with proper reduction and fixation without extensive exposure of tissue. The advantage is decreased morbidity with respect to operative exposure and time, decreased blood loss, easy to perform and more importantly it is extensible, and can be converted to standard exposure<sup>6</sup> any time, if it is not contented with reduction or fixation.

## CONCLUSION

The MIPPO technique is a useful procedure in a specific set of patients with anterior acetabular fracture. Though it has



Figure 1: Clinical photo of incisions

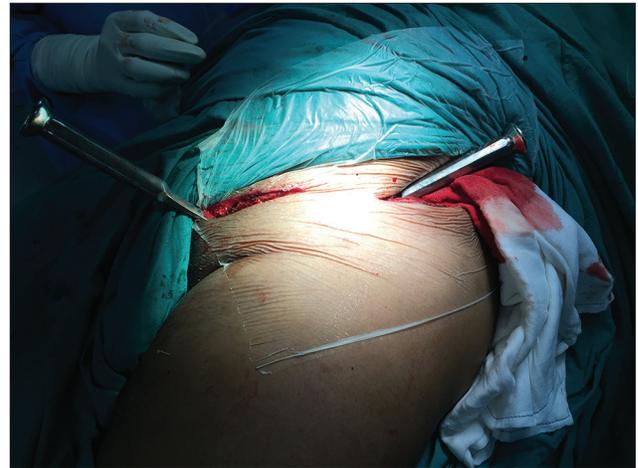


Figure 3: Clinical photo of making subperiosteal tunnel



Figure 2: C-arm image of making subperiosteal tunnel

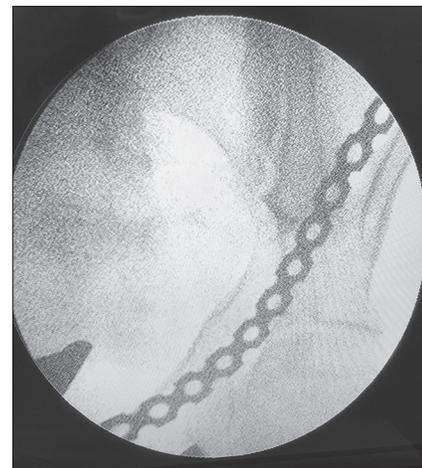


Figure 4: C-arm image of insertion of prebent plate

the disadvantage that it cannot be used in all cases, but has a definite advantage of less complications and extensibility. Careful planning and execution, readiness to convert to a standard approach are the key issues to success.

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