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Original Article

A retrospective analysis of percutaneous SI joint fixation in unstable pelvic fractures: Our experience in armed forces

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ABSTRACT

Background: Unstable posterior pelvic and sacroiliac joint injuries are challenging fractures mostly managed conservatively in our military hospitals till date. We carried out a retrospective analysis of early fixation of these fractures at our hospital and compared it with the existing literature as regards its safety and efficacy.

Methods: A retrospective analysis of all patients admitted and managed by internal fixation for unstable posterior pelvic fractures was carried out for evaluation of its efficacy and safety. All patients with unstable posterior pelvic fractures were managed by early closed reduction percutaneous sacroiliac fixation using a radiolucent fracture table and image intensifier after a CT evaluation.

Results: A total of 24 patients were admitted with pelvic fractures, out of which 18 who had posterior pelvic ring injuries requiring fixation were included in the study. 21 percutaneous SI screws were inserted in 17 patients. All patients had satisfactory initial reduction as per Starr's criteria and recovered to their full – pre-injury functional status without any major intra-/postoperative complications, at a minimum of 12 months of follow-up.

Conclusion: Unstable pelvic fractures must be managed by early reduction internal fixation to reduce morbidity and mortality arising out of such injuries. Closed reduction percutaneous fixation of these injuries is a safe procedure to be carried out in our set-up equipped with radiolucent fracture table and image intensifier by trained surgeons. The management of these injuries is likely to become easier in future with the advent of navigational aids in management of complex pelvic and acetabular fractures.

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Introduction

In view of the increasing incidence of high energy trauma worldwide, unstable pelvic fractures have become much more common than in the past.[1,2] Exponential increase in the number of motor vehicles and inadequate and improper transport infrastructure has led to phenomenal increase in the number of patients with high velocity road traffic accidents presenting with unstable pelvic fractures. Most of these fractures are a component of poly-trauma and are associated with high mortality and morbidity.

Despite being proven that anatomical reduction leads to better outcome, in the past, most of these fractures were managed conservatively.[3] Open reduction and internal fixation, which were used traditionally, were fraught with complications, with most of them being wound related, like wound breakdown and pelvic haematoma due to the extensile surgical approach, wound infections, bowel injury and incisional hernia. They were also associated with other complications, including iatrogenic nerve injury and large volume blood loss, both primary and secondary.[4]

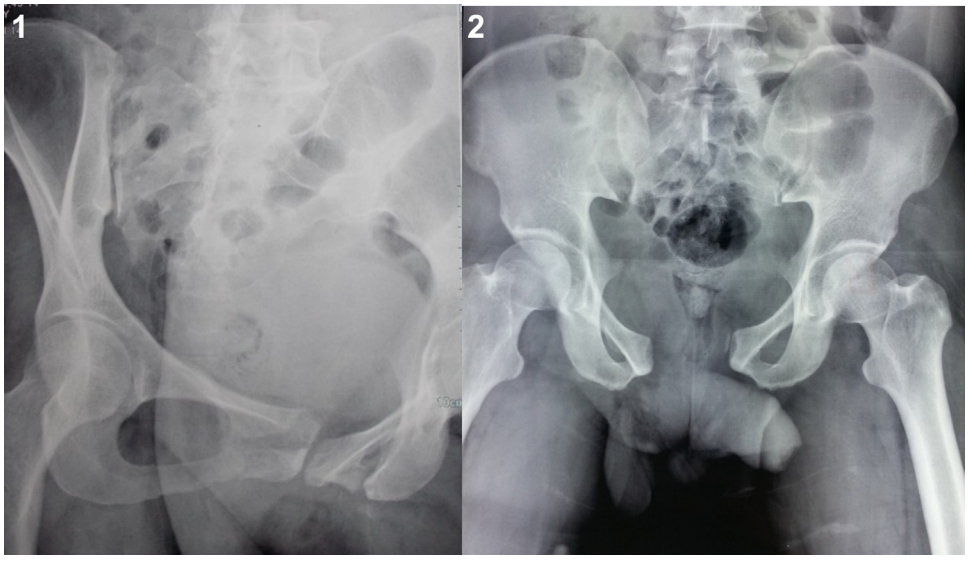
Percutaneous sacroiliac (SI) joint fixation was first described by Routt et al.[5,6] The work of Judet et al. were invaluable in their contribution of evolution of pelvic surgery.[7,8] In recent times, percutaneous sacroiliac joint fixation for posterior pelvic dislocations and sacral fractures has become popular and widespread in view of its minimally invasive nature, comparable biomechanical stability to other modes of internal fixation and finally excellent functional outcomes. Availability of image intensifier and good quality instrumentation has made the surgery safer and quicker to perform especially in patients of poly-trauma. Percutaneous fixation is associated with certain complications like L5 and S1 nerve root injury, misplaced screws, hardware failure and iliac vessel injury. The complications previously reported are neurological injury, with rates reported between 0% and 8%, and misplaced screws between 2% and 12%.[4,7]

There are definite advantages of early percutaneous reduction and internal fixation of injuries involving fractures/fracture dislocations in posterior pelvic ring. These include quick surgery, minimal blood loss in an already compromised patient, early pain relief, improved nursing care by early mobilisation, early weight bearing ambulation and definite reduction in long-term low back ache. We carried out a retrospective analysis of percutaneous SI joint fixations carried out in patients admitted between 2011 and 2015 at our tertiary care hospital and compared it with the existing literature as regards its safety and efficacy.

Material and methods

All patients admitted at our institution with pelvic fractures were included in the study and a retrospective analysis was carried out. Following initial resuscitation, all patients were offered damage control surgical and orthopaedic procedures, as per institutional protocol. Once stabilised, a CT scan in addition to digital radiographs were obtained and patients with AO Type B and C injuries were offered surgery. All patients were operated on a radiolucent table with image intensifier guidance. A radiolucent orthopaedic table was used and the patients positioned such that the image intensifier could clear the base of the table to allow inlet and outlet view visualisation in addition to AP and lateral views (Figs. 1–4). Initial closed reduction was done by manual traction on ipsilateral lower limb to align the hemi-pelvis in acceptable alignment. If this procedure failed, a 5 mm stainless steel Steinmann pin was inserted into ipsilateral iliac bone to be used as joystick for aiding reduction of fracture/dislocation. Fifteen patients were operated in supine position and three in prone position. Prone position was used in patients requiring an isolated posterior pelvic fracture fixation.

As per the standard AO technique, the entry point was determined on the lateral view in the S1 segment just below the iliac cortical density. Once the entry point was established,



Figs. 1 and 2 – Preop radiograph images of pelvis obturator oblique and AP with right SI joint dislocation and pubic diastasis.