

Pelvic Injuries

Introduction

- Injuries of the pelvis are an uncommon battlefield injury.
- **Blunt injuries** may be associated with major hemorrhage and early mortality.
- **Penetrating injuries** to the skeletal pelvis are usually associated with abdominopelvic organ injury.

Blunt Injuries

- Patterns and mechanisms are the same as those seen in civilian blunt trauma.
 - Lateral compression injuries are marked by internal rotation or midline displacement of the hemipelvis.
 - Anterior posterior injuries demonstrate external rotation of the hemipelvis.
 - Vertical shear injuries have cephalad displacement of the hemipelvis.
- Increasing degrees of displacement in any direction are associated with greater risk of hemorrhage.
 - Anterior posterior injuries with complete disruption of all sacroiliac ligaments represent an internal hemipelvectomy and have the greatest potential for hemorrhage.

Early pelvic stabilization can control hemorrhage and reduce mortality. This is particularly true in an austere environment with limited blood replacement products and other treatment resources.

- Open injuries require early recognition and prompt treatment to prevent high mortality due to early hemorrhage and late sepsis.

- **Diagnosis.**
 - Physical examination demonstrates instability of the pelvis when manual pressure is applied to the iliac crests.
 - Leg length difference, scrotal or labial swelling/ ecchymosis, or abrasions over the pelvis raise suspicion for pelvic ring injury.
 - **Perineum, rectum, and vaginal vault must be evaluated for lacerations to rule out an open injury.**
 - Radiograph (AP pelvis, and when possible, inlet and outlet views) confirm the diagnosis. Computed tomography (CT) defines the location of injury more accurately.
 - Bladder and urethral injuries are suspected when blood is present at the meatus or in the urine, or when a Foley catheter cannot be passed. Retrograde urethrogram and cystography confirm the diagnosis.
- **Treatment.**
 - Hemorrhage control.
 - ◆ Mechanical stabilization.
 - ◇ Tying a sheet or placing a binder around the pelvis at the level of the greater trochanters.
 - ◇ Bean bags or sand bags.
 - ◇ Lateral decubitus positioning with the affected side dependent.

External fixator placement in the iliac crests allows for the most direct control of the pelvis.

- ◆ Angiography is a useful adjunct, but is not usually available in the deployed environment.
- ◆ As a last resort, retroperitoneal packing may be attempted, but will expend tremendous resources and is often unsuccessful.
- Open blunt injuries require:
 - ◆ Immediate hemorrhage control by packing.
 - ◆ Aggressive and thorough debridement.
 - ◆ Pelvic stabilization.
 - ◆ Diverting colostomy in the presence of wounds at risk for fecal soilage.

- o Definitive internal pelvic stabilization (plates, screws, among others) is done outside of the combat zone.

Missile and fragmentation wounds can cause fracture of the pelvis.

- **The pelvis usually remains stable.**
- **The colon, small intestine, rectum, and the genitourinary tracts must all be assessed for associated injury.**
- **Major hemorrhage can result from injury to the iliac vessels.**

Penetrating Injuries

- Evaluation.
 - o Diagnosis of associated injuries may require exploratory laparotomy.
 - o Fractures should be assessed with radiographs and CT scans, when available, to **rule out extension into the hip and acetabulum.**
- Treatment.
 - o Control hemorrhage.
 - o Control hollow visceral injury.
 - o Debride wounds and fractures.

For combined hollow-viscus and acetabulum /hip joint injuries, the joint is contaminated and must be explored and treated as described in Chapter 24, Open Joint Injuries.

- **Technique of pelvic external fixator placement (Fig. 21-1).**
 - o Prep the iliac crests.
 - o Place a 2-cm horizontal incision over the iliac crest, 2 fingerbreadths proximal or medial ventral to the anterior superior iliac crest.
 - o Bluntly dissect to the iliac crest.
 - o To determine the angle of the pelvis, first slide a guide pin between the muscle and the bone along the inner table of the iliac wing, no deeper than 3–4 cm.

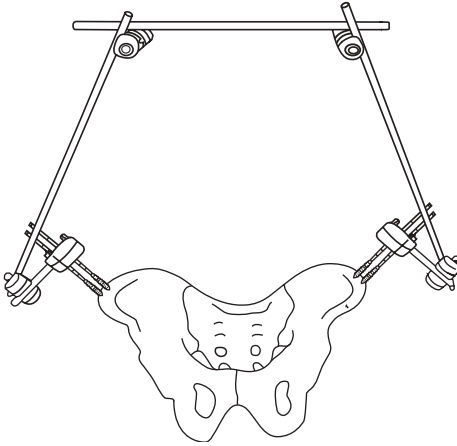


Fig. 21-1. Pelvic external fixator placement.

Failure to properly determine the angle of the iliac wing leads to inadequate fixation and may cause significant complications.

- o Locate the junction of the middle and medial thirds of the thickness of the iliac crest with the tip of a 5-mm external fixator pin.
- o Paralleling the guide pin, begin drilling the pin into the crest.
- o Drill between the inner and outer tables to a depth of about 4 cm, aiming generally towards the greater trochanter. **Only gentle pressure should be applied once the pin threads have engaged, to allow for the pin to guide itself between the tables.**
- o A second pin is inserted 1–2 cm more posteriorly on the crest.
- o Check the stability of each pin. If unsatisfactory, attempt reinsertion by aiming between the tables.
- o Place pins in the contralateral iliac crest in the same manner.
- o Reduce the pelvis by applying pressure on the pelvis (**not the pins!**) and connect the external fixator pins with bar(s) across the abdomen and pelvis to maintain reduction.