

## 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.

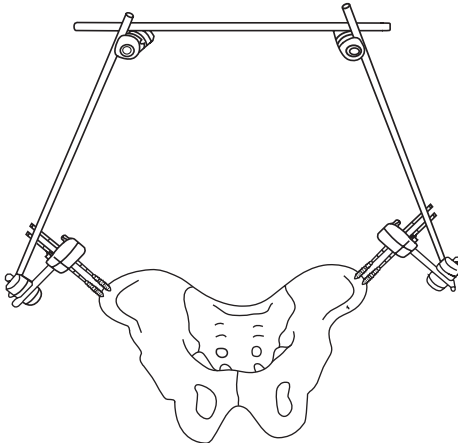


Fig. 21-1. Pelvic external fixator placement.

**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.