Pelvic Trauma
## Pelvic Fractures

### Stable Fractures (2/3)

- Solitary ischial ramus fracture
- Unilateral fractures — both rami
- Iliac wing fracture (Duverney Fracture)
- Isolated sacral fracture
### Pelvic Fractures
#### Stable and Unstable

- **Stable fractures**—single breaks in ring or peripheral fxs (66%)
  - Result of moderate trauma, e.g. falls
- **Unstable fractures**—fxs of both anterior and posterior arches (33%)
  - Result of severe trauma, e.g. MVAs
### Stable Pelvic Fractures

**Solitary Fractures of Ischial Ramus**

- Most common pelvic fracture (40% of all pelvic fx)
- Most common stable fracture
- Usually seen in osteoporotic females
Stable Pelvic Fractures
Unilateral Fractures of Both Rami

- If distracted, look for other pelvic ring fractures
Stable Pelvic Fractures
Iliac Wing Fracture - Duverney Fracture

- Due to direct lateral compression
- Often associated with paralytic ileus
- Can perforate bowel and be open fracture
Stable Pelvic Fractures
Isolated Sacral Fractures

- Usually transversely oriented
- Difficult to detect
- Lateral view may show angulation
# Pelvic Fractures

## Unstable Fractures (1/3)

- Malgaigne Fracture
- Straddle Fracture
- Pelvic Dislocation
- Bucket Handle Fracture
### Unstable Fractures

**Malgaigne Fracture**

- Most common unstable pelvic fracture (14% of all pelvic fxs)
- Vertical shearing involves both anterior & posterior arches
- Results in double vertical fractures
- Most commonly through pubic rami and sacrum
Sacral Fractures
Associated with Other Fxs

- Usually vertically oriented
- Check symmetry of sacral lines
Unstable Fractures
Straddle Fracture

- Bilateral fractures of all pubic rami
- Fracture fragments are usually elevated
- Associated with urethral and bladder injuries in 20%
Unstable Fractures
Pelvic Dislocation

- Severe trauma
- “Sprung Pelvis” usually associated with GU injury
- Normal SI=1-4mm
- Normal symphysis=5mm
Unstable Fractures
Bucket Handle Fracture

- Fracture of anterior arch and contralateral posterior arch
- Rare
Pelvic Trauma

Urethral Injury

- Usually involves membranous or prostatic urethra
- Should be suspected in straddle fracture or pelvic dislocation
- Retrograde urethrogram should be performed prior to insertion of Foley
Pelvic Trauma

Ruptured Bladder

- Should be suspected with straddle fractures and sprung pelvis
- Most common rupture is extraperitoneal (80%)
- Use retrograde cystogram to demonstrate rupture
Pelvic Trauma

Ruptured Bladder

- Extraperitoneal rupture
  - Contrast will remain adjacent to bladder

- Intraperitoneal rupture
  - Dome is torn and contrast flows freely
Pelvic Trauma
Soft Tissue Clues

- Displacement or obliteration of obturator internus fat plane
- Similar findings with iliopsoas and gluteal fat planes
- Pelvic hematomas may displace bladder or ureters
Iliopubic Line

- Anterior Column
- Anterior aspect of acetabulum runs from ilium to pubis
Iliioischial Line

- Posterior Column
- Posterior aspect of acetabulum runs from ilium to ischium
Roentgenographic “U”
The Teardrop

- “Teardrop” should not be located medial to ilioischial line
- Displacement of “teardrop” may be sign of occult acetabular fx
Pelvic Trauma
Acetabular Fractures

- 20% of pelvic fractures involve acetabulum
- CT best way of evaluating acetabular fxs
<table>
<thead>
<tr>
<th>Acetabular Fractures Classification</th>
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<tbody>
<tr>
<td>- Posterior rim fracture</td>
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<tr>
<td>- Transverse acetabular fracture</td>
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<tr>
<td>- Anterior column fracture</td>
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<tr>
<td>- Posterior column fracture</td>
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</table>
Acetabular Fractures
Posterior Rim Fractures

- Most common acetabular fx (33%)
- Occurs with posterior dislocation of hip
- Typically in MVAs with forces through femoral shaft
Acetabular Fractures

Transverse Acetabular Fractures

- Separates innominate bone into two halves
- Look for break in both iliopubic and ilioischial lines
- May be associated with central dislocation of femoral head
**Acetabular Fractures**

**Anterior Column Fracture**

- Fracture through iliopubic line
- May be associated with central dislocation of femoral head
<table>
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<td>Posterior Column Fracture - Walther Fx</td>
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- Fracture through ilioischial line
- May be associated with central dislocation of femoral head
Pelvic Trauma
Avulsion Fractures

- Usually occur in athletic individuals
  - Ischial tuberosity (hamstrings)
  - Anterior inferior iliac spine (rectus femoris)
  - Anterior superior iliac spine (sartorius)
  - Iliac crest (abdominal muscles)
## Avulsion Fractures
### Ischial Tuberosity

- Occurs at insertion of hamstrings
- Usually seen in sprinters, hurdlers, gymnasts, long jumpers
- Looks enlarged when healed
Avulsion Fractures
Anterior Inferior Iliac Spine

- Occurs at insertion of rectus femoris
Avulsion Fractures
Anterior Superior Iliac Spine

- Occurs at insertion of sartorius
Avulsion Fractures

Iliac Crest Avulsion Fracture

- Occurs at insertion of abdominal muscles
Pelvic Trauma
Complications

- Hemorrhage
  - Usually from laceration of hypogastric artery
- Urinary tract injury
  - Ruptured urethra or bladder
Pelvic Trauma
Complications

- Sacral plexus/sciatic nerve injuries
  - Especially with fxs of posterior arch
- Infection
  - Retroperitoneal abscess may form in open fxs
## Ruptured Urethra

### Classical Triad

- Blood on external meatus
- Distended bladder
- Inability to void