

William Herring, M.D. © 2002

Pelvic Trauma

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Pelvic Fractures

Stable Fractures (2/3)

- Solitary ischial ramus fracture
- Unilateral fractures —both rami
- Iliac wing fracture (Duverny 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 fxs)**
- **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-Duverny 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

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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

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Ruptured Bladder

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

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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**

Ilioischial 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

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Acetabular Fractures

- **20% of pelvic fractures involve acetabulum**
- **CT best way of evaluating acetabular fxs**

Acetabular Fractures

Classification

- **Posterior rim fracture**
- **Transverse acetabular fracture**
- **Anterior column fracture**
- **Posterior column fracture**

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

Acetabular Fractures

Posterior Column Fracture-Walther Fx

- Fracture through ilioischial line
- May be associated with central dislocation of femoral head

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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