Pelvic Fracture

Uncommon injury in children (represents 1–2 % of pediatric fractures). Often treated non-operatively depending on age and displacement. Surgery mainly needed for high-energy trauma or in older patients.

Overview

- Low-energy mechanism: avulsion of apophysis
- High-energy mechanism: motor vehicle accident or peds struck
- More commonly lateral compression (vs. adults with more AP compression)
- Higher rate of single-bone fractures
- Lower rate of hemorrhage secondary to plasticity of bones, thicker cartilage
    - May be associated with: (*requires co-evaluation with trauma team*)
        - CNS or abdominal visceral injury
        - Femoral head fx/dislocation
        - GU injury

History

- Mechanism of injury?
- Other sites of pain (abdomen, back, extremities)?

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Physical Exam

- Skin intact, tenderness, ecchymosis
- Full trauma survey (often done in conjunction with trauma team) including rectal/GU survey
- Stability of pelvis to compression (AP, lateral, rotational)
- LE neuro exam (Appendix A)

Diagnosis

Imaging

- XR Pelvis: AP, inlet/outlet views
- CT pelvis without contrast—often needed as radiographs may underestimate injuries
- MRI—occasionally indicated to evaluate apophyseal injuries

Classification

Tile Classification—describing stability

Type A: stable (rotationally and vertically)
Type B: rotationally unstable; vertically stable
Type C: unstable (rotationally and vertically)

Torode/Zieg Classification—describing location

Type I: avulsion fx
Type II: iliac wing fx (usually from a direct blow)
Type III: ring fx with no segmental instability (pubic rami/symphysis fractures)
Type IV: ring fx with segmental instability (bilateral rami, straddle injuries, SI joint disruption)

  - Before closure of triradiate cartilage (14 in boys, 12 in girls), iliac wing is weaker than pelvic ligaments leading to more pubic rami and iliac wing fractures.
  - After closure, more likely to sustain fractures of acetabulum, diastasis of pubic symphysis, SI joint separation.

Treatment

Non-operative

- **Treatment:** Protected weight bearing → physical therapy → gradual return to activities
  - Generally less than 2 cm of displacement
- **Indications:** Generally indicated for most nondisplaced or type I/II injuries
- **Treatment:** Bedrest
- **Indications:** Type IV fracture with less than 2 cm of displacement
- **Treatment:** Consider spica casting
  - May use skeletal or Buck's traction
- **Indications:** Young patients who have trouble with weight-bearing restrictions

Surgery

- **Treatment:** Usually done in the first 24–48 h after injury
  - ORIF
  - External fixation—vertical shear patter with hemodynamic instability
- **Indications:**
  - More than 2 cm of displacement, intra-articular, triradiate cartilage displacement
  - Older children, high-energy (comminuted/displaced) fractures, open fractures, neurovascular compromise, associated injuries

References

Banerjee S et al. Paediatric pelvic fractures: 10 years experience in a trauma centre. Injury. 2009;40(4):410–3.
Holden CP et al. Pediatric pelvic fractures. J Am Acad Orthop Surg. 2007;15(3):172–7.