High energy pelvic injuries

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Disclosures

• No financial disclosures or conflicts of interest

Outline

• Pelvic ring anatomy
• Classify pelvic ring injuries
• Morbidity and Death rates
• Acute Management – [wrap ‘em up, warm ‘em up, squirt ‘em, divert ‘em.]
• Subacute management
• Definitive treatment – [ORIF]
Pelvis

• Two innominate bones and sacrum held together by ligaments
  – 3 bones, 3 joints
• Transmits force between the lower extremities and spine
AP pelvis

- Pubic symphysis
- Pelvic brim
- Iliac wing
- Obturator ring & foramen
- Sourcil
- AW
- AC
- PW
- PC
- “tear drop”
- Sacrum
- Neuroforamina
Video deleted
Classifications

- Orthopaedic Trauma Association (OTA)/AO
- Bucholz
- Tile
  - Based on direction of instability
- Young and Burgess
  - Based on direction of force of injury

Young and Burgess

Morbidity & …

- Hemorrhage – pelvis and intra-abdominal
- Visceral injuries – GI, GU
- Vascular injuries
- Neurological injuries
- Sexual dysfunction – dyspareunea, ED
Mortality

- 15-40% mortality rate in high energy
- High energy pelvic injury associated
  - Closed head injury
  - Chest injury
  - Abdominal & retroperitoneal injury
  - Vascular injury

Sources of pelvic bleeding

- Fracture surfaces
- Venous disruption
- Arterial

Acute Management

- Wrap ‘em up
- Warm ‘em up
- Squirt ‘em
- Divert ‘em

- Routt ML
Wrap ‘em up

- Circumferential compression = pelvis splint
- Reduce volume & motion = stabilize clots

Binder placement

- Commercial binders / bed sheets
- Placed at the top of the greater trochanters
- No fabric wrinkles on skin
- Cut holes for access
- Double binders?
Still HD unstable

- CT findings determine
- Intra-abdominal bleeding = OR
- No intra-abdominal bleeding – Angio or OR

Angio vs. Ex Lap
Definitive treatment

- Depends on stability of the pelvis
- Stable – non-op
- Unstable – benefit from fixation

Treatment options

- Nothing
- Traction
- Cast
- External fixation
- Internal fixation
- Amputation
Treatment options

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Traction

• High incidence of complications — DVT, pressure ulcers, pneumonia, pin tract infections, nonunion
• Bed bound
• 6 weeks minimum
• Poor reduction
• Medically infirm only

External fixation

• Anterior frames
• Posterior frames
Internal fixation

- Recent advances improve outcomes
  - Not always good outcomes
- Goal is anatomic reduction and stable fixation
- Anterior ring fixation
- Posterior ring fixation
Emerging techniques

- Internal external fixator
Complications

- Death
- Malunion
- Chronic pain
- Neurovascular injury
- VTE / PE
Outcomes

• 25-40% high pelvic fractures die
  – Open pelvic fractures on higher end
• 33% cannot return to previous job
  – 17% no longer work
• 35% neurological injury

Conclusions

“Wealth is not in gold, but in health.”

Conclusions

• Don’t fracture your pelvis
• Life threatening injuries
• Acute management can save lives
• Pelvic fracture have life long consequences