Unstable Pelvic Ring Injury

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RAD 4014 MSK Radiology
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Patient NB

• 45 y/o F w/ R hemipelvis pain s/p MVC
  • PMH: Anxiety
  • PSH: None
  • Meds: Clonazepam
  • All: None

• PE:
  • Vitals: P: 124; BP: 110/70; RR: 18; SpO2: 100
  • Pelvis: R hemipelvis tender to lateral compression, no laxity noted
  • Extremities: NVI
### ACR Appropriateness Criteria

**Variant 2:** Major blunt trauma. Hemodynamically stable. Not otherwise specified. Initial imaging.

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Appropriateness Category</th>
<th>Relative Radiation Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>CT whole body with IV contrast</td>
<td>Usually Appropriate</td>
<td>🟢🟢🟢🟢🟢</td>
</tr>
<tr>
<td>Radiography trauma series</td>
<td>Usually Appropriate</td>
<td>🟢🟢🟢</td>
</tr>
<tr>
<td>US FAST scan chest abdomen pelvis</td>
<td>Usually Appropriate</td>
<td>O</td>
</tr>
<tr>
<td>CT whole body without IV contrast</td>
<td>May Be Appropriate</td>
<td>🟢🟢🟢🟢</td>
</tr>
<tr>
<td>Fluoroscopy retrograde urethrography</td>
<td>Usually Not Appropriate</td>
<td>🟢🟢🟢</td>
</tr>
<tr>
<td>MRI abdomen and pelvis without and with IV contrast</td>
<td>Usually Not Appropriate</td>
<td>O</td>
</tr>
<tr>
<td>MRI abdomen and pelvis without IV contrast</td>
<td>Usually Not Appropriate</td>
<td>O</td>
</tr>
</tbody>
</table>

[https://acsearch.acr.org/docs/3102405/Narrative/](https://acsearch.acr.org/docs/3102405/Narrative/)
AP Pelvis

L zone 2 sacral fracture
R superior pubic ramus fx

R inferior pubic ramus fx
R superior ramus fx

L zone 2 sacral fracture
Normal Anatomy

- Pelvic brim
- Anterior – pubic crest
- Lateral – arcuate line (of ilium)
- Posterior – Sacral ala

https://radiopaedia.org/articles/pelvis-1?lang=us

Netter’s Concise Orthopaedic Anatomy
Normal Anatomy (continued)

1. Anterior acetabular wall
2. Posterior acetabular wall
3. Acetabular roof
4. Iliopectineal line
   1. Anterior column fx
5. Ilioschial line
   1. Posterior column fx
6. Radiographic U (teardrop)
   1. Bony ridge on floor of acetabulum

https://radiopaedia.org/articles/acetabular-fracture?lang=us
Pelvic Inlet

Infrapubic Angle

>90° Female

Pelvic Brim

Patient NB - Inlet

https://radiopaedia.org/articles/pelvis-1?lang=us
Classification – Young & Burgess

AP Compression

Lateral Compression/VS

Source: Netter’s Concise Orthopaedic Anatomy
Patient NB

- T-bone MVC mechanism
- Unstable pelvis
  - Unable to support physiologic forces without abnormal deformation
  - Movement upon stress fluoroscopy
- Pretzel analogy
- LC mechanism
  - Binder?

L zone 2 sacral fracture
Treatment

AP

Iliosacral Screws

Anterior Column Screw

Inlet
• Patient recovered from surgery
  • Pelvis Stable
• MHOSH – Bone Bx
  • Infarcted bone
Cost of Imaging

<table>
<thead>
<tr>
<th>Study</th>
<th>Average Cost</th>
<th>Average Insured Patient Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>CT Pelvis/Abdomen w/ Contrast</td>
<td>$7,998</td>
<td>$480</td>
</tr>
<tr>
<td>Pelvis 1-2 Views</td>
<td>$719</td>
<td>$111</td>
</tr>
</tbody>
</table>

https://www.memorialhermann.org/patients-caregivers/pricing-estimates-and-information/
Take Home Points

• Ring made of sacrum + 2 innominate bones
• Young & Burgess classification system commonly used
  • Doesn’t fit every case
• Assess for vascular injury
  • Leading cause of death overall
References

• Netter’s Concise Orthopaedic Anatomy
• https://radiopaedia.org/articles/acetabular-fracture?lang=us
• https://radiopaedia.org/articles/pelvis-1?lang=us
• https://acsearch.acr.org/docs/3102405/Narrative/
• https://www.memorialhermann.org/patients-caregivers/pricing-estimates-and-information/
Questions?