ACETABULAR FRACTURES

Adnan Sheikh
Mahadevaswamy Siddaiah
Marcos Sampaio
Ryan Foster
Zaid Jibri
Kawan Rakhra

Musculoskeletal section
Dept. of Medical Imaging
University of Ottawa
Disclosure Statement

Neither I nor my immediate family have a financial relationship with a commercial organization that may have a direct or indirect interest in the content of this presentation.
Discuss pelvis osseous anatomy

Imaging modalities

Acetabular fractures classification

Imaging findings

Review complications
ACETABULAR FRACTURES

- High-velocity trauma
- MVA, Fall
- Associated injuries
- Insufficiency fracture - Osteoporotic patients
The most common mechanism of acetabular fracture is either dash board or direct pelvic injury. In dash board injury, the forces are transmitted into the acetabulum through the femur, therefore commonly associated with knee injuries like PCL and patellar fracture. Direct injuries are associated with other pelvic fractures. Since most of the dash board injuries occur in a sitting position, it is not uncommon to have posterior hip dislocation and femoral neck and shaft fractures.
The sciatic buttress connects the acetabulum and the SI joints to rest of the axial skeletal. Fracture of the sciatic buttress is seen in both column fracture, resulting in what is called the spur sign (arrow).
IMAGING

- Radiographs - AP, Judet views
- Computed Tomography (CT)
- Magnetic Resonance Imaging
  - MR Venography
- Ultrasound
  - For DVT’s
Iliopectineal line = Anterior column
Ilioischial line = Posterior column
LEFT OBTURATOR OBLIQUE

- Left obturator ring is seen en face
- Anterior column and posterior wall of the left acetabulum are profiled
LEFT ILIAC OBLIQUE

- Left iliac oblique view of the pelvis
- Left iliac wing is demonstrated en face
- Left posterior column and anterior wall is seen in profile
The orientation of the dominant fracture line on the axial CT image at the level of the acetabular roof define the type of acetabular fracture.
### Judet and Letournel Classification

<table>
<thead>
<tr>
<th>WALL</th>
<th>COLUMN</th>
<th>Transverse</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anterior Wall</td>
<td>Anterior Column</td>
<td>Transverse</td>
</tr>
<tr>
<td>Posterior Wall</td>
<td>Posterior Column</td>
<td>Transverse / Posterior Wall</td>
</tr>
<tr>
<td>Transverse / Posterior Wall</td>
<td>Anterior Column / Posterior</td>
<td>“T” - Shaped</td>
</tr>
<tr>
<td></td>
<td>Hemitransverse</td>
<td></td>
</tr>
<tr>
<td>Posterior Column &amp; Wall</td>
<td>Posterior Column &amp; Wall</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Both Column</td>
<td></td>
</tr>
<tr>
<td>WALL</td>
<td>COLUMN</td>
<td>TRANSVERSE</td>
</tr>
<tr>
<td>------------------</td>
<td>------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>Posterior Wall</td>
<td>Both Column</td>
<td>Transverse</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Transverse / Posterior Wall</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“T” - Shaped</td>
</tr>
</tbody>
</table>

The above 5 fractures account for 90% of all Acetabular fractures
POSTERIOR WALL FRACTURE

Posterior wall fracture commonly associated with posterior hip dislocation

CT showing dominant fracture line with oblique orientation
BOTH COLUMN FRACTURE

- Has 4 components
- Iliac bone fracture
- Anterior column fracture
- Posterior column fracture
- Pubic ramus fracture
BOTH COLUMN FRACTURE
BOTH COLUMN FRACTURE

Fracture line extends to iliac bone
CT showing dominant fracture line with transverse orientation
Anterior and posterior column fracture
Pubic ramus fracture
TRANSVERSE FRACTURE WITH POSTERIOR WALL

- Posterior Wall
- Anterior and Posterior column fracture
TRANSVERSE FRACTURE WITH POSTERIOR WALL

Intact iliac bone  CT showing dominant fracture line with sagittal orientation  Posterior wall fracture
ANTERIOR COLUMN / POSTERIOR HEMITRANSVERSE FRACTURE

- Iliac bone
- Anterior column
- Posterior Wall
- Pubic ramus
Imaging findings similar to both column fracture. The presence of two dominant fracture line on the axial images at the level of the acetabular roof CT help to differentiate from both column fracture.
COMPLICATIONS

• Immediate
  - Injuries to the sciatic, femoral or superior nerves

• Post-surgical
  - Nerve injuries
  - Infection
  - DVT

• Late complications
  - Heterotopic ossification
  - Osteonecrosis
  - Chondrolysis
  - Posttraumatic arthritis

Intra-articular hardware
Heterotrophic ossification
CHONDROLYSIS

Loss of joint space
No osteophytes
TAKE HOME POINTS

WALL = OBLIQUE
COLUMN = CORONAL
TRANSVERSE = SAGITTAL
TAKE HOME POINTS

- Ilioischial and Iliopectineal line – Both column & Transverse fracture
- Iliac blade – Both column & Anterior Column/Posterior Hemitransverse
- Rami – Column & "T"- shaped
- Assess sciatic nerve
ACETABULAR FRACTURES

Adnan Sheikh
Mahadevaswamy Siddaiah
Marcos Sampaio
Ryan Foster
Zaid Jibri
Kawan Rakhra

Musculoskeletal section
Dept. of Medical Imaging
University of Ottawa