

Acetabular Fractures Study Notes

An **acetabular fracture** refers to a break in the acetabulum, which is the socket portion of the hip's ball-and-socket joint. The acetabulum forms the pelvic side of the hip joint, articulating with the femoral head to allow smooth hip movement.

Mechanism of Injury

Acetabular fractures typically result from high-energy trauma that forces the femoral head into the pelvis. Common mechanisms include:

- **Lateral impact:** Such as a fall from a height, where a blow strikes the side of the hip.
- **Anterior impact:** A direct blow to the front of the knee, often seen in "dashboard injuries" during car accidents, sometimes accompanied by femoral fractures.

Clinical Presentation

Patients with acetabular fractures may present with:

- Bruising and abrasions over the thigh or buttock area.
- Skin injuries including **degloving** (shearing of the skin from underlying tissue).
- **Morel-Lavallée lesions**, which are closed soft tissue injuries caused by separation of skin and subcutaneous tissue.
- Posterior column fractures of the acetabulum often associate with posterior hip dislocations and may cause **sciatic nerve injury**, manifesting as sensory or motor deficits in the affected leg.

Investigations

Accurate imaging is essential for diagnosis and treatment planning:

Radiographs

A minimum of four X-ray views are recommended:

- **Anteroposterior (AP) pelvic view**
- **Pelvic inlet view**
- **Two 45° oblique views:**
 - Iliac oblique view (visualizes the posterior column and anterior wall)
 - Obturator oblique view (visualizes the anterior column and posterior wall)

Additional Imaging

- **CT scan** is often used to assess fracture complexity, displacement, and involvement of the articular surface or associated fractures.

Management

Management of acetabular fractures is divided into **emergency**, **conservative**, and **operative** approaches.

Emergency Management

The initial goals are to:

- Manage and stabilize the patient's overall condition, including treating shock.
- Reduce hip dislocations promptly to prevent neurovascular damage.
- Apply **traction to the distal femur** to maintain alignment and reduce pain.
- Stabilize the patient over several days before definitive management.

Conservative Management

Conservative (non-surgical) treatment may be appropriate in selected cases:

Indications include:

- Minimally displaced fractures (<3 mm displacement) involving the weight-bearing zone of the acetabulum.
- Displaced fractures sparing the superomedial weight-bearing dome or involving less than 20% of the roof, such as distal anterior column or distal transverse fractures.
- Both-column fractures preserving congruency of the hip joint due to intact labrum and limited displacement.
- Elderly patients or those with significant comorbidities contraindicating surgery.

Matta and Merritt criteria guide conservative management success:

1. Hip congruency is maintained after traction release.
2. The weight-bearing portion of the acetabular roof remains intact.
3. No associated posterior wall fractures on CT scan.

Treatment:

- Closed reduction followed by longitudinal traction (with possible lateral traction) maintained for 6 to 8 weeks to offload the articular cartilage and allow healing.
- Encouragement of gentle hip movement and exercises during this period.
- After traction removal, partial weight-bearing with crutches is initiated for another 6 weeks.

Operative Management

Surgery is indicated for fractures with instability, displacement, or incongruence of the hip joint.

Timing of surgery:

- Surgery can be delayed for 4 to 5 days in cases such as unstable hips or fractures causing

significant distortion of joint congruency.

- Immediate surgery is necessary if:
 - Closed reduction fails to stabilize the joint.
 - The joint redislocates after reduction.

Surgical technique:

- **Open Reduction and Internal Fixation (ORIF)** is the standard, using lag screws and buttressing plates contoured intraoperatively to stabilize the fracture.
- Early post-operative mobilization is encouraged with hip movement started as soon as possible. Partial weight-bearing with crutches typically begins 7 days post-op.
- Rehabilitation exercises continue for 3 to 6 months, with full functional recovery sometimes taking over a year.

Additional care:

- Deep vein thrombosis (DVT) prophylaxis is critical due to immobilization and trauma.

Complications

Potential complications include:

- **Iliofemoral venous thrombosis (DVT)** due to immobility and trauma.
- **Sciatic nerve injury**, with variable prognosis: complete recovery in ~50%, partial in 40%, and no recovery in 10%.
- **Myositis ossificans** (heterotopic bone formation), preventable with prophylactic indomethacin when anticipated.
- **Avascular necrosis (AVN)** of the femoral head, resulting from disrupted blood supply.
- **Loss of joint mobility** and secondary **osteoarthritis**, often due to joint incongruity or cartilage damage.