

Pelvic injury

Fifth Year – Tikrit Medical College

Orthopedic Surgery Lecture

Dr.Omar I. Mahmood
Omar.m@tu.edu.iq

Objectives

- **Anatomical Review Of Pelvic Ring Stability**
- **Mechanism Of Injury In Pelvic Ring Fracture**
- **Classification Of Pelvic Ring Fracture (Young And Burgess)**
- **Clinical /Emergency Approach In Pelvic Ring Fracture**
- **Radiological Assessment Of Pelvic Ring Fracture**
- **Management**
- **Complications**

pelvic bones function

1. transmit Weight to both limbs.
2. Protection of pelvic viscera.

Types of pelvic injury

1. pelvic ring fractures.
2. acetabular fractures.
3. isolated fractures (intact pelvic ring).
4. sacrococcygeal fractures.

1-pelvic ring fractures.

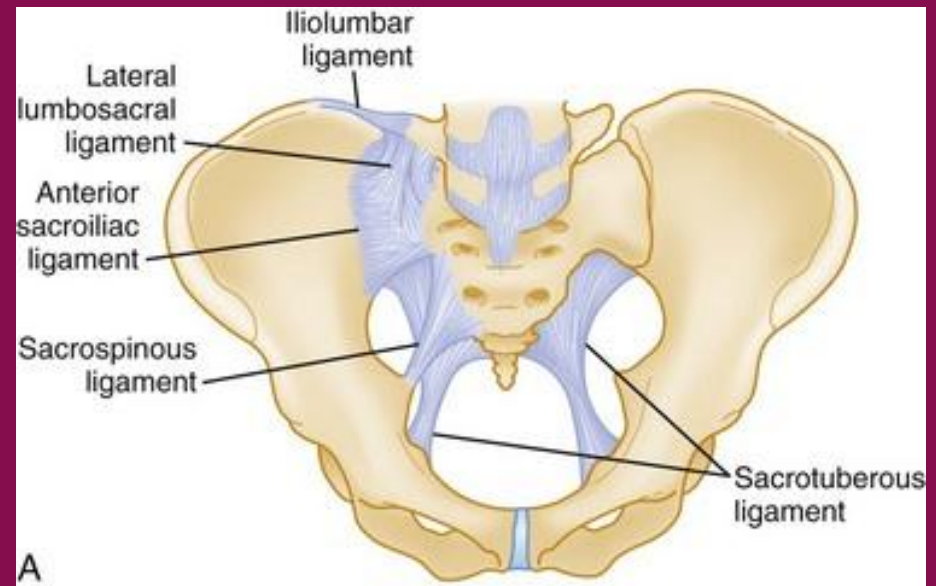
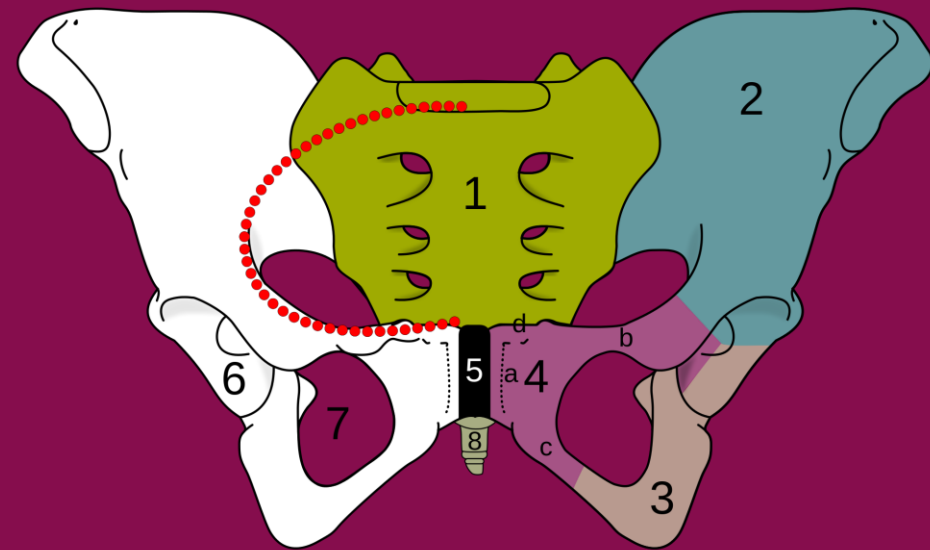


rigid bony ring ... any break in a point within that ring is associated with injury at another point of the ring except:-

- 1. fractures in children.. Elastic bone***
- 2. Direct trauma.***

The stability of this ring is maintained by the integrity of

1. two innominate hip bones
 2. symphysis pubis
 3. sacroiliac ligaments (anterior and posterior sacroiliac ligaments)
- the posterior sacroiliac ligament is the most important structure.**



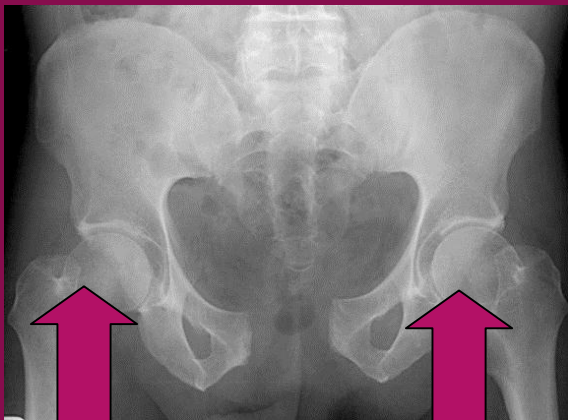
Mechanisms of injury

1- AP compression: frontal collision (RTA) leads to **open book fracture**.

2- Lateral compression: side on impact, roll over accidents leads to **closed book fractures**.

3- Vertical shear: FFH (standing) severely unstable fracture.

4- Complex injuries: more than one mechanism.



Open book



Closed book



Vertical shear

Clinical approach

History of major trauma.

Multiple injured patient.

Shock.

Associated pelvic visceral injury
(bladder, urethra , rectum, vessels etc
..)

Local signs (echymosis, tenderness,
inability to stand, swelling).

Remember to do PR and PV

Do neurovascular examination of
both lower limbs

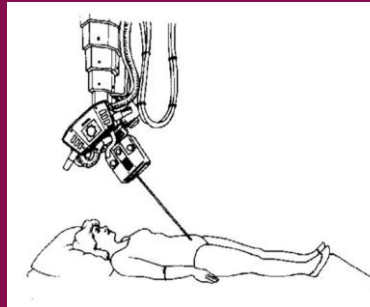
Imaging:

X- ray:- for pattern of injury and displacement

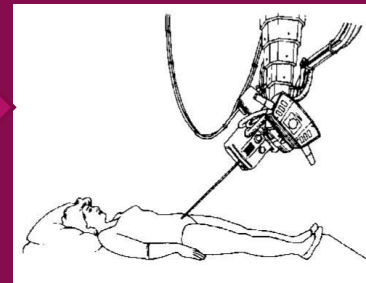
•AP view



•Pelvic inlet view



•Pelvic outlet view



CT scan:-

show the exact picture of the fracture and displacement pattern



Young-Burgess Classification of pelvic ring fracture



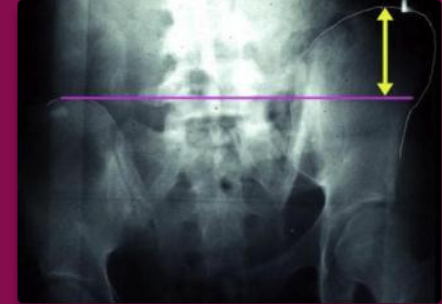
APC

**antero posterior
compression**



LC

**Lateral
compression**



Vertical shear

Management of pelvic fracture

- Resuscitation .. ABC
- PRBC:FFP:Platelets ideally should be transfused 1:1:1
- **pelvic binder/sheet**
 - initial management of **open** book fracture
 - **Avoid in closed book fracture .. Visceral injury**
- **external fixation as external tamponade**
 - unstable ring injury with ongoing blood loss
 - Open book fracture



Definitive treatment of pelvic ring fracture

1. Nonoperative .. weight bearing as tolerated

- ❑ APC1 widening of symphysis < 2.5 cm with intact posterior pelvic ring
- ❑ isolated pubic ramus fracture

2. Operative .. ORIF ..

- ❑ symphysis opening > 2.5 cm
- ❑ SI joint displacement > 1 cm
- ❑ displacement or rotation of hemipelvis

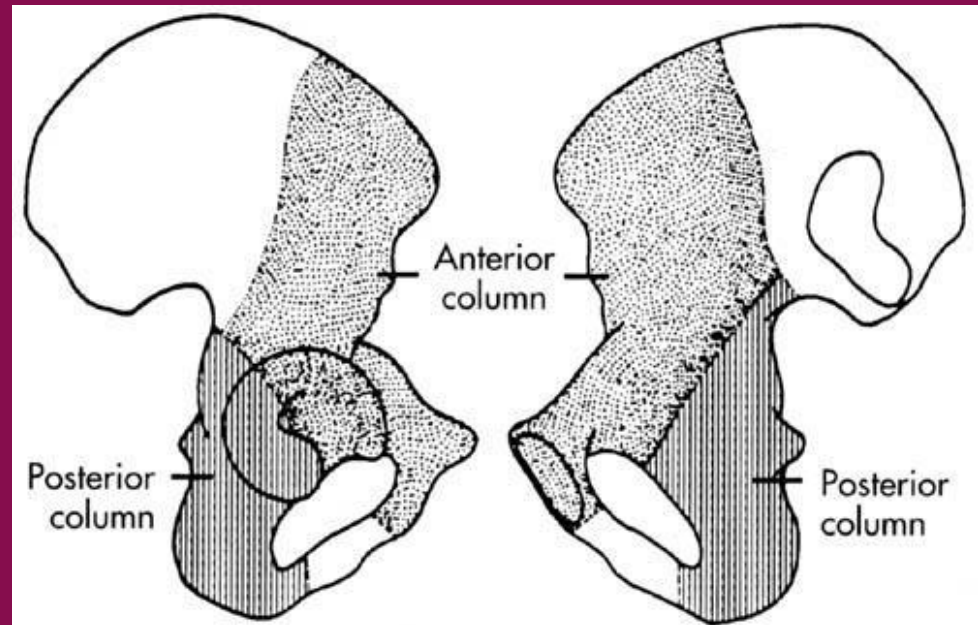
Complications

- Neurologic injury
- Visceral injury
- DVT and PE
- Urogenital Injuries
 - posterior urethral tear
 - bladder rupture
- Chronic instability
- Chronic pelvic pain

Acetabular Fractures

Anatomy

- The acetabulum is formed by the three pelvic bones (ilium, Ischium and pubis)
- acetabulum is supported by two columns of pelvic bone
 - posterior column
 - anterior column



Epidemiology

- **bimodal distribution**
 - high energy ... young patients
 - low energy (fall from standing height) elderly patients
- **posterior wall fractures are most common**
- **Associated conditions**
 - extremity injury (36%)
 - Sciatic nerve palsy (13%)
 - spine injury (4%)

6 radiographic landmarks of the acetabulum

iliopectineal line
(anterior column)

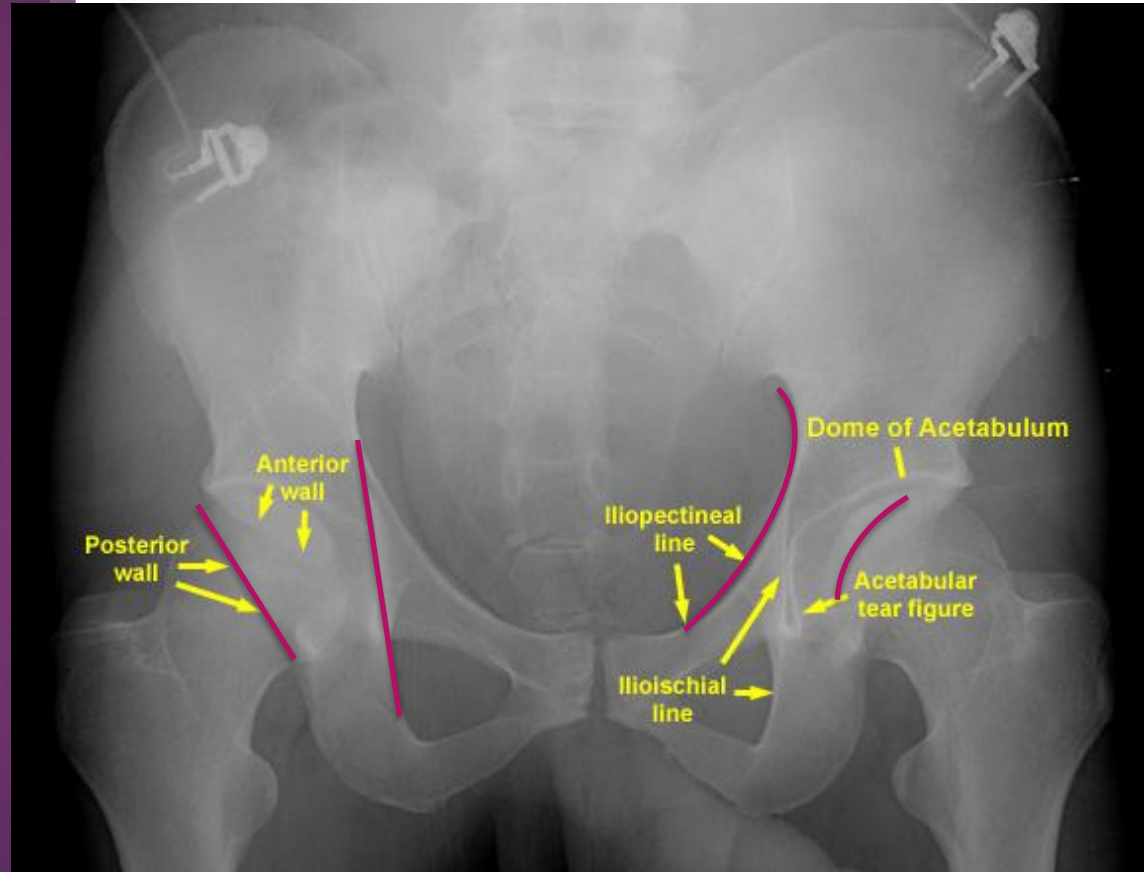
ilioischial line (posterior column)

anterior rim

posterior rim

teardrop

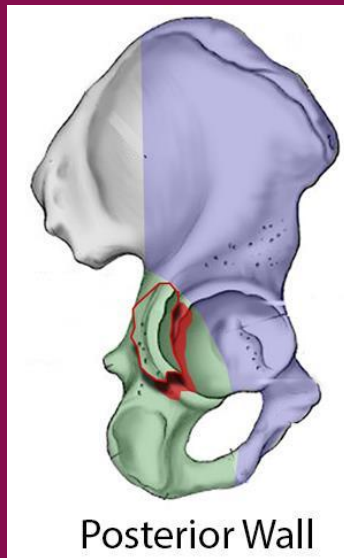
weight bearing roof



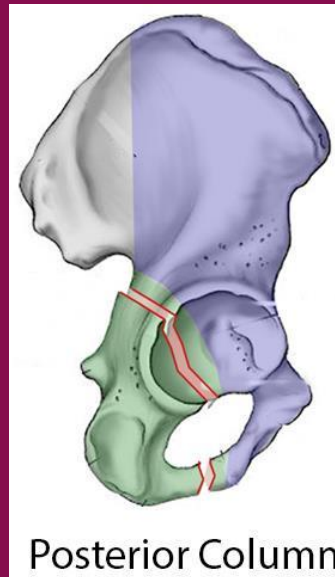
Judet and Iotournel classification of acetabular fracture

A- elementary

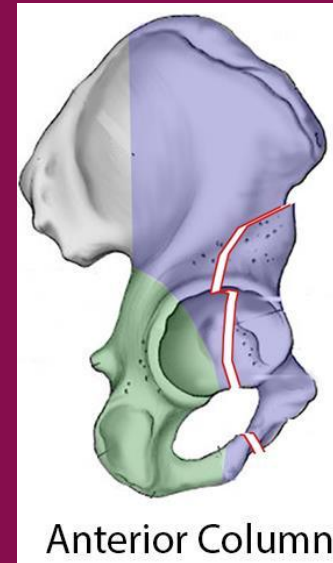
Posterior wall



Posterior column



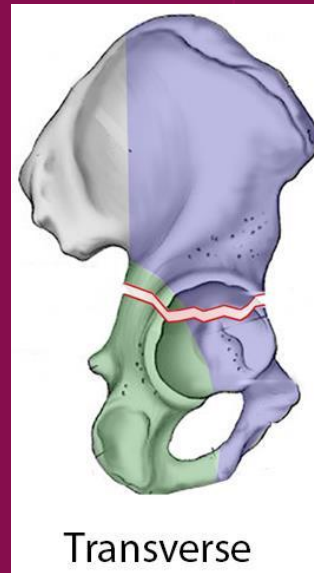
Anterior column



Jude and Letournel classification of acetabular fracture

A- elementary

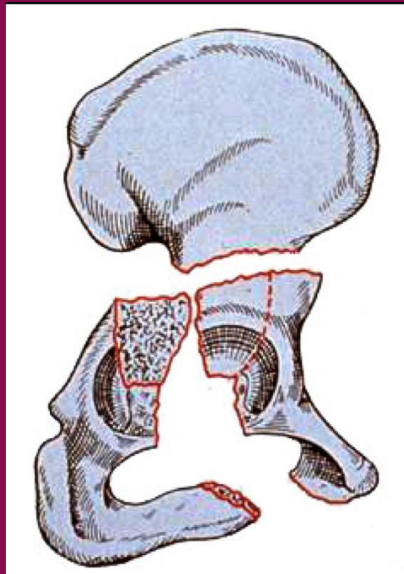
Transverse



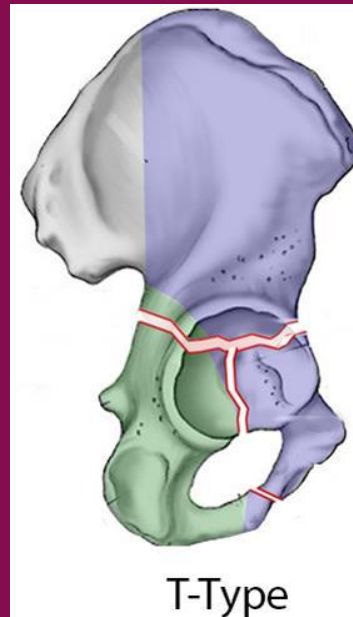
Jude and Letournel classification of acetabular fracture

B- Associated

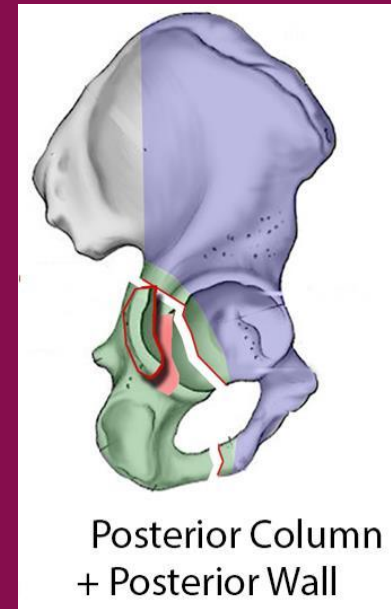
Associated Both Column



T Shaped



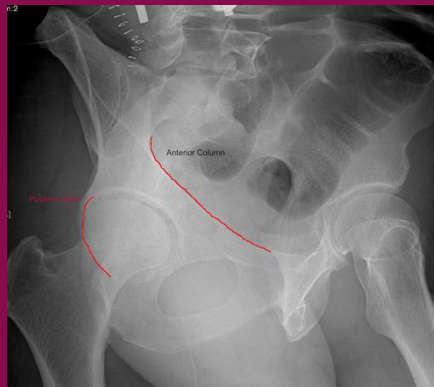
Post. column +
Post. Wall



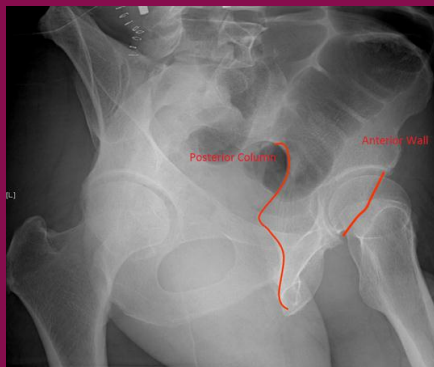
Radiographs

- AP pelvis
- Judet views (45 degree oblique views)

- obturator oblique



- iliac oblique



- inlet and outlet

CT scan

- define fragment size and orientation
- identify loose bodies
- look for articular gap or step-of



Treatment

1- Nonoperative .. Traction then protected weight bearing for 6-8 weeks in :

- minimally displaced fracture ($< 2\text{mm}$)
- $< 20\%$ posterior wall fractures
- femoral head remains congruent with weight bearing roof

Operative treatment ...ORIF in :

- displacement of roof ($>2\text{mm}$)
- posterior wall fracture involving $> 40-50\%$
- marginal impaction
- intra-articular loose bodies
- irreducible fracture-dislocation

Complications

- Post-traumatic DJD
- Heterotopic Ossification
- Osteonecrosis
- DVT and PE
- Infection
- Bleeding
- Neurovascular injury