Fractures of the Acetabulum: Urgent Surgery?

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2023 San Francisco Trauma Course

I have something to disclose.

Detailed disclosure information is available via:

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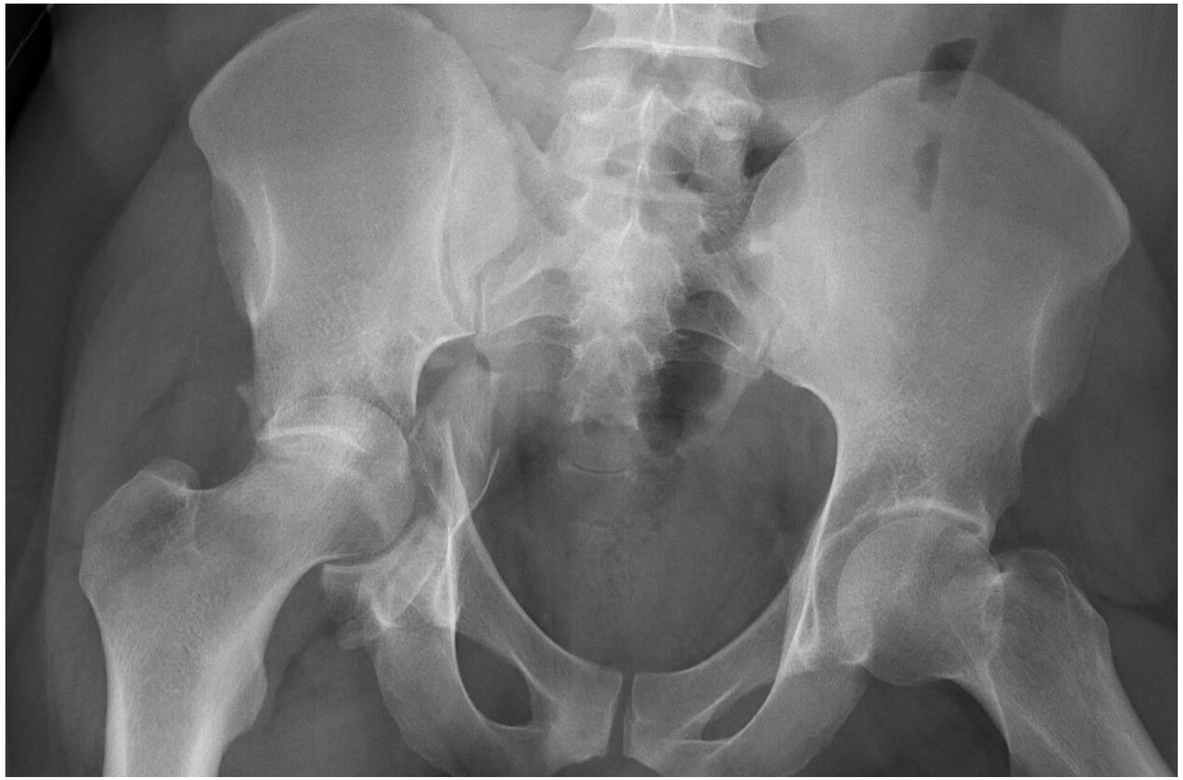
MW – 44 yo man, HSMVC

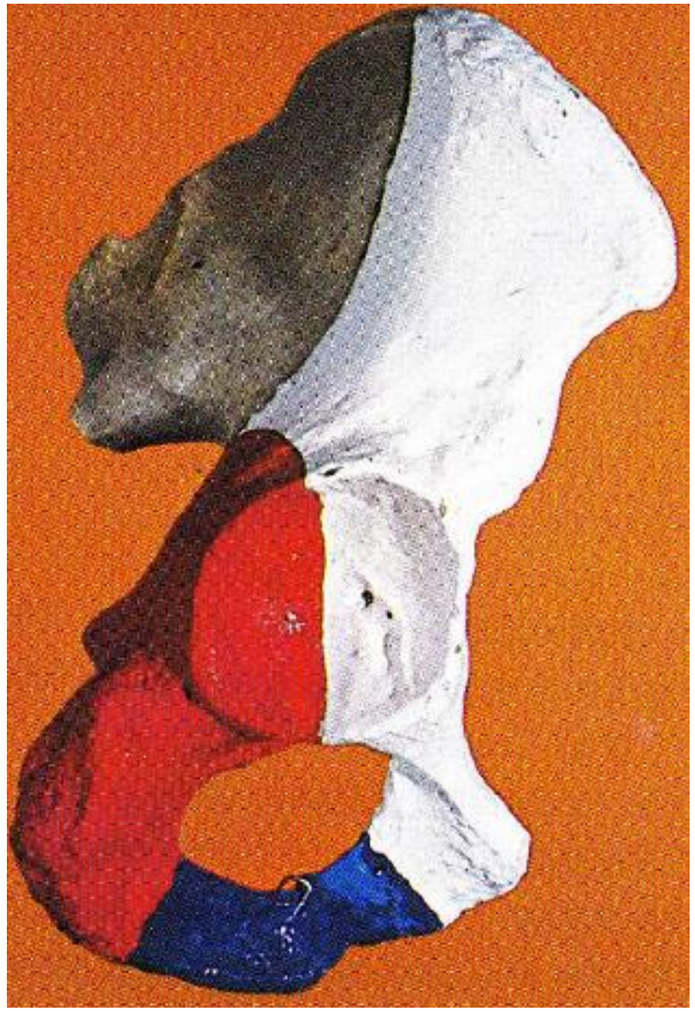


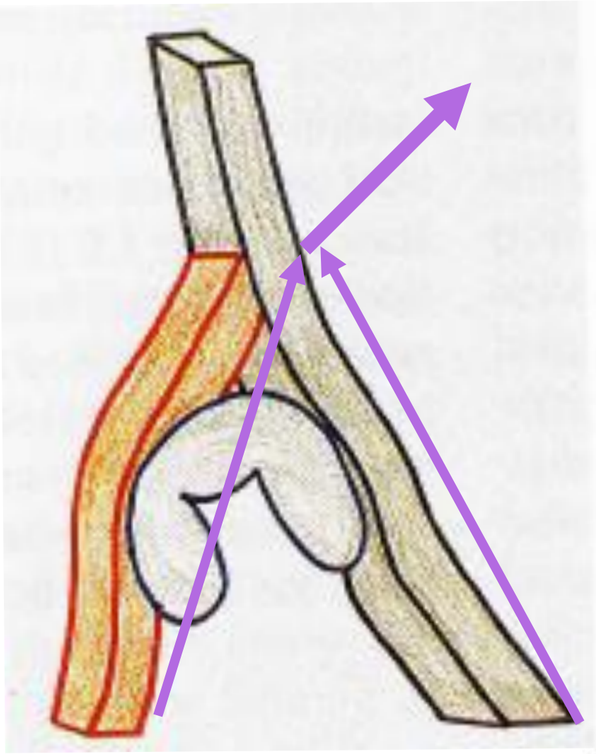
Sciatic nerve palsy, smashed wrist,
lactate 2.0

Learning Objectives

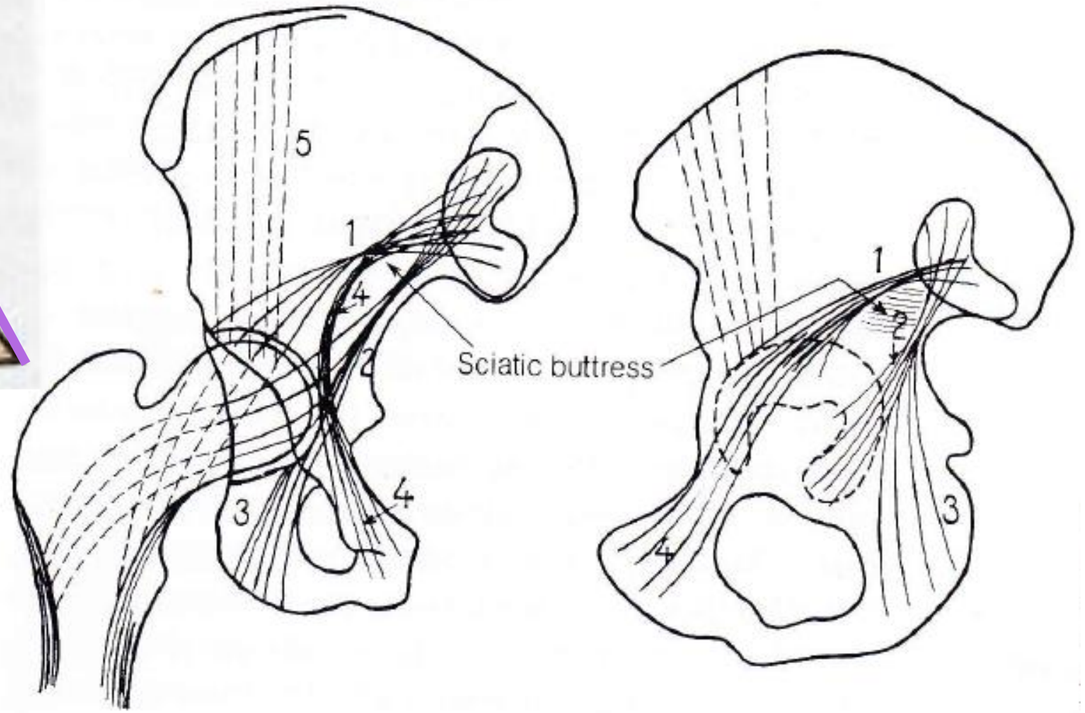
- Understanding anatomy allows radiographic evaluation of injury
- Consider indications for operative repair based on instability and displacement
- Define *optimal* timing of treatment

Columns of the Acetabulum

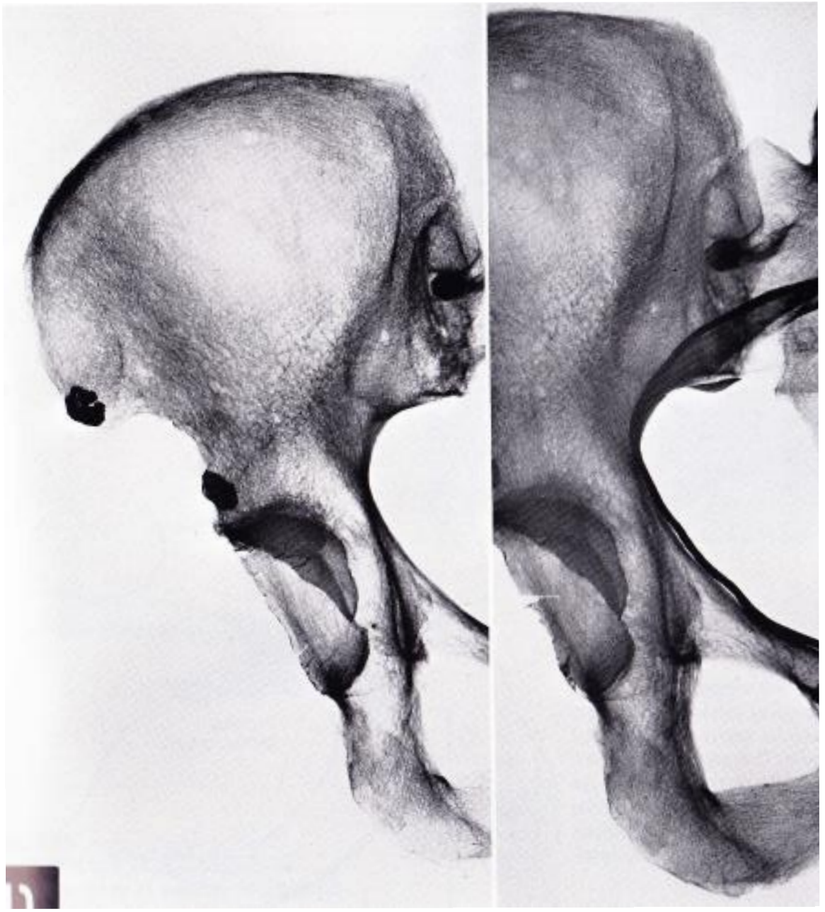




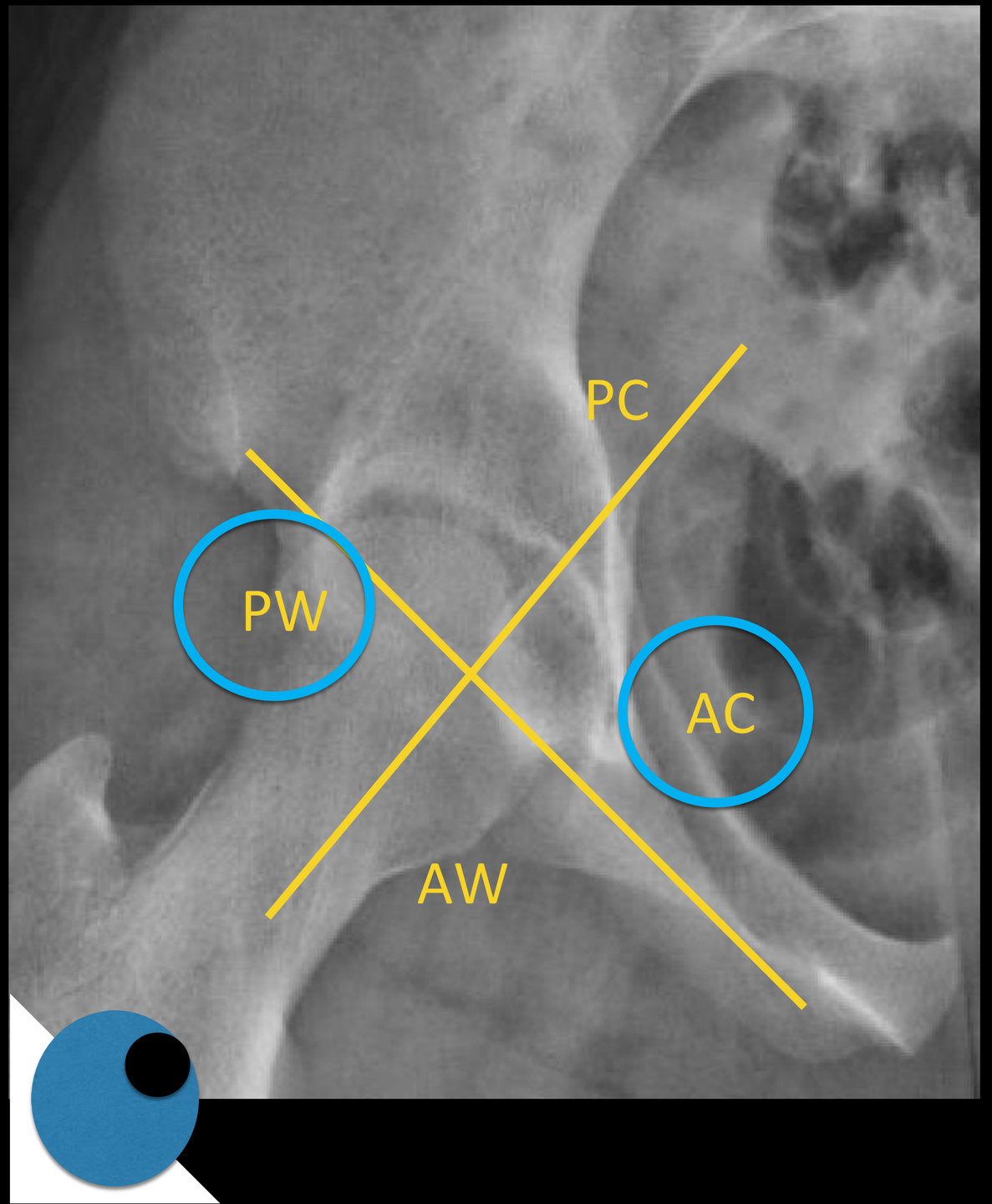
Letournel and Judet1974

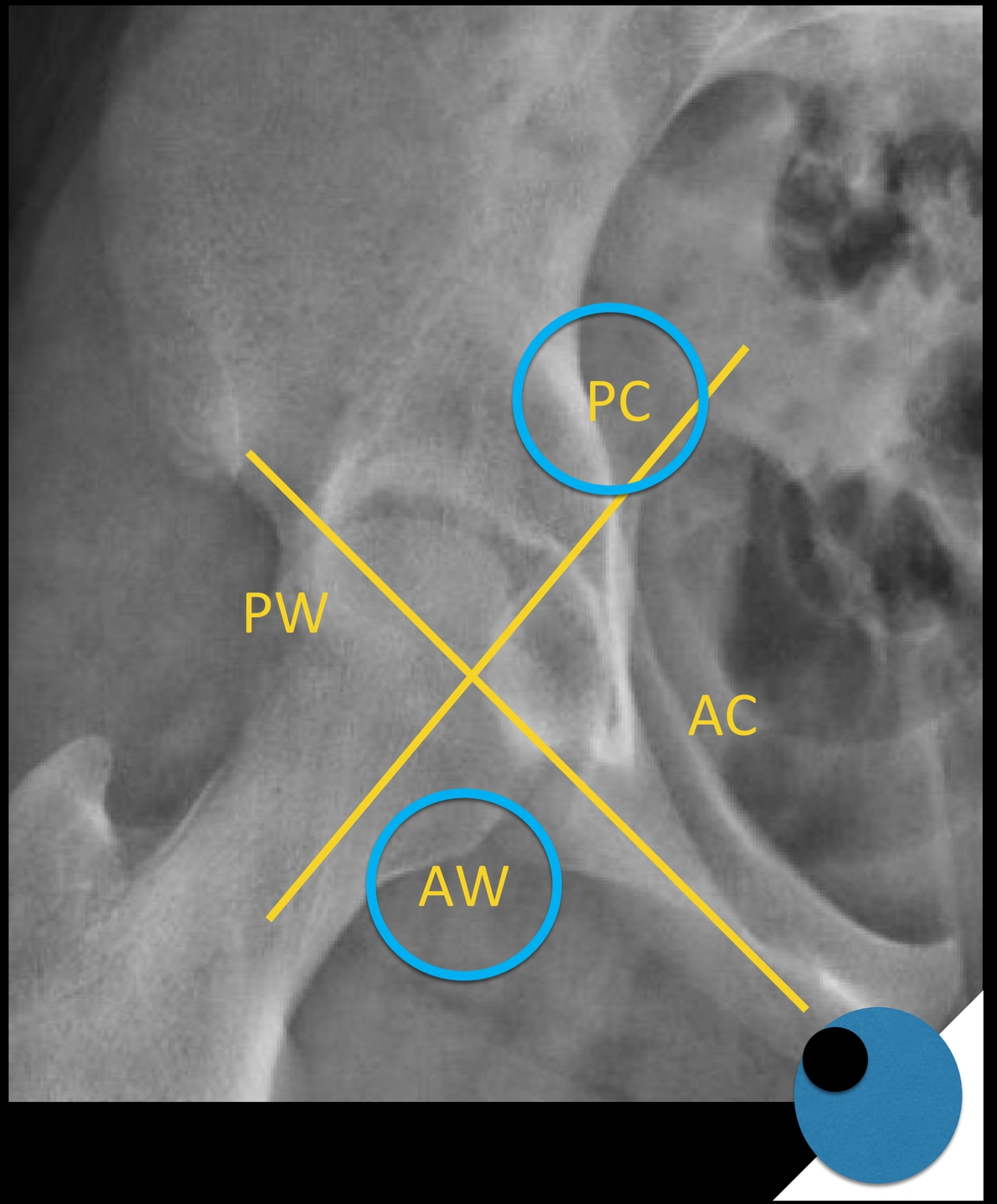


Standard Radiography and Surface Anatomy



Letournel and Judet 1974


PC
PW
AC
AW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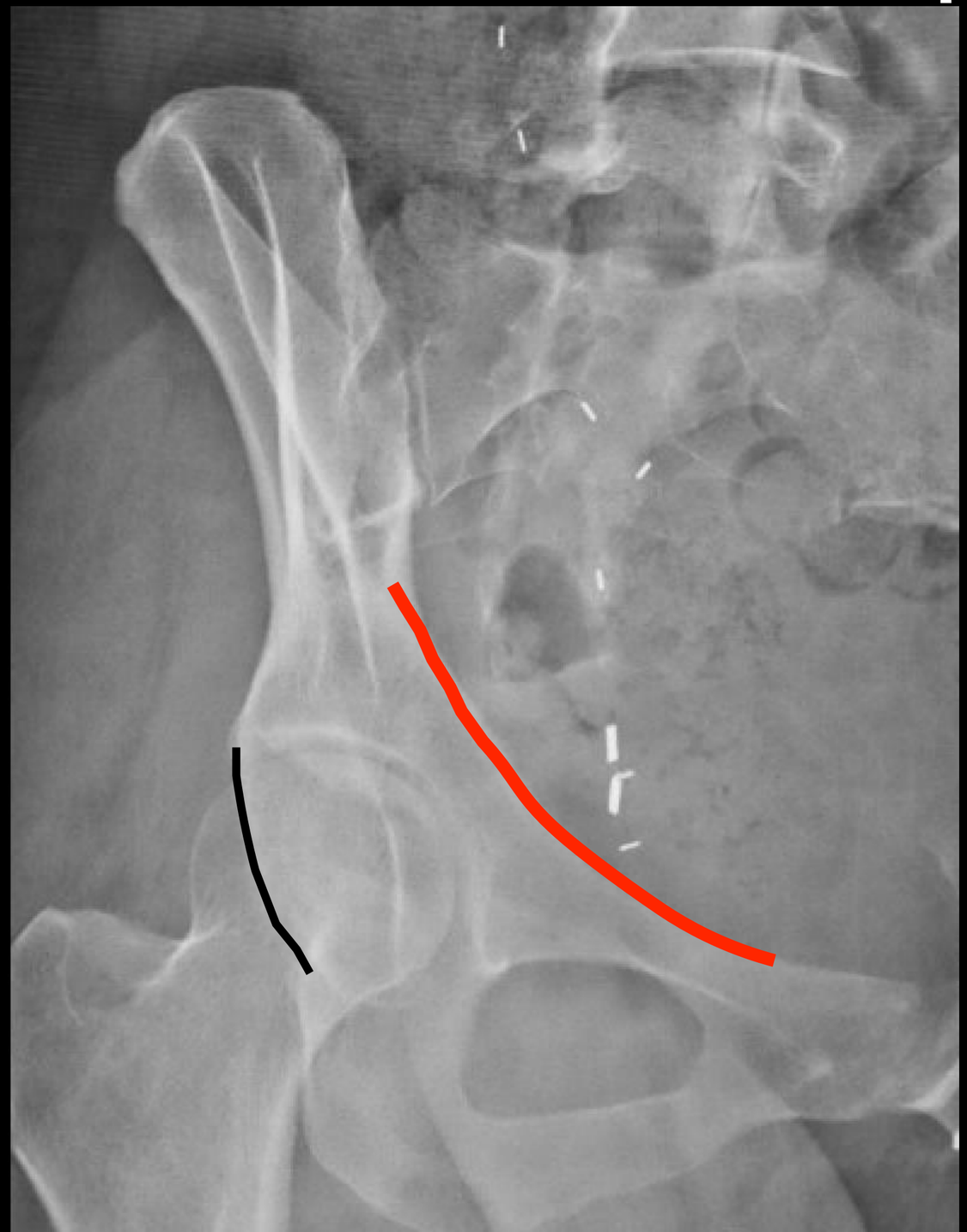
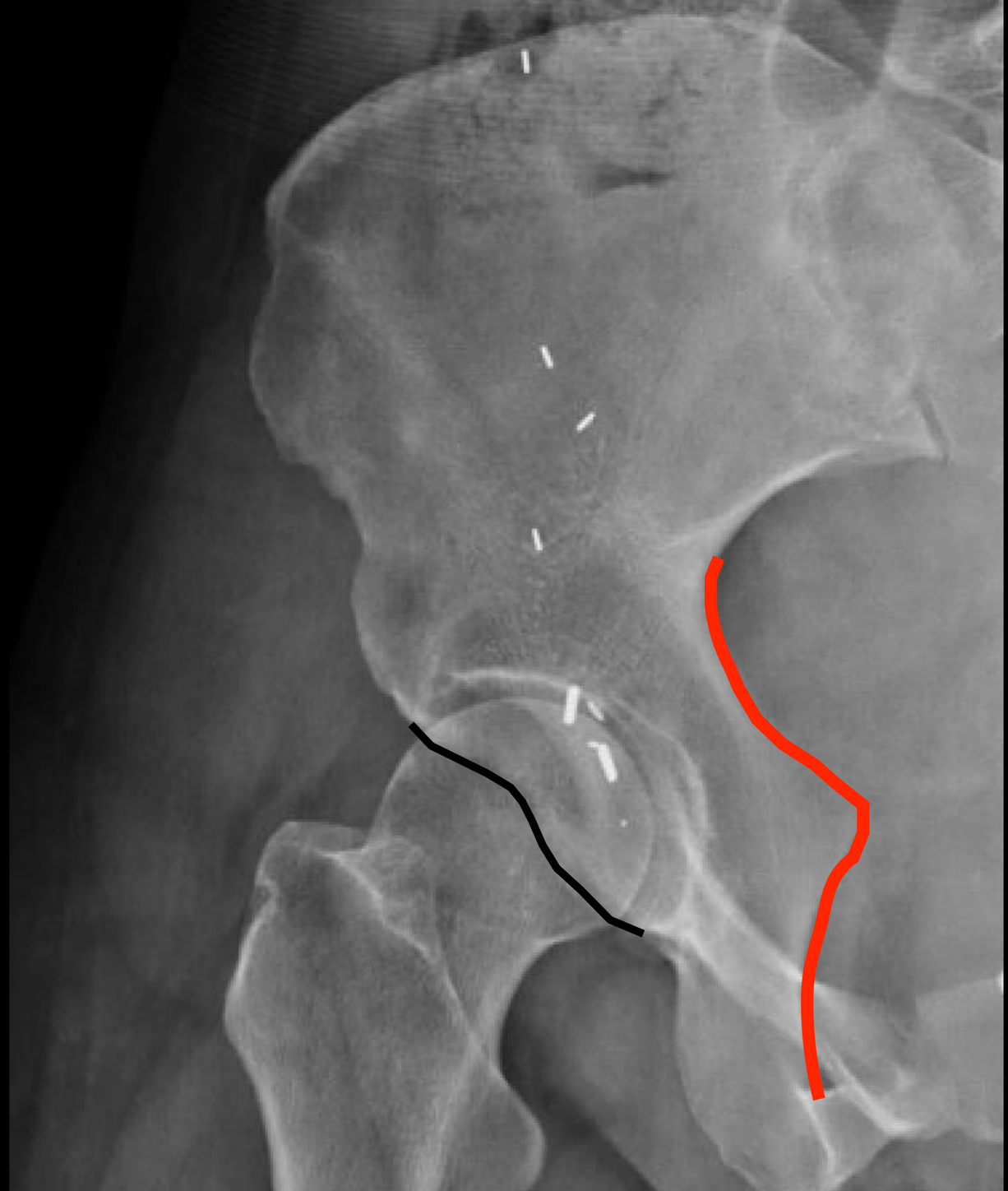
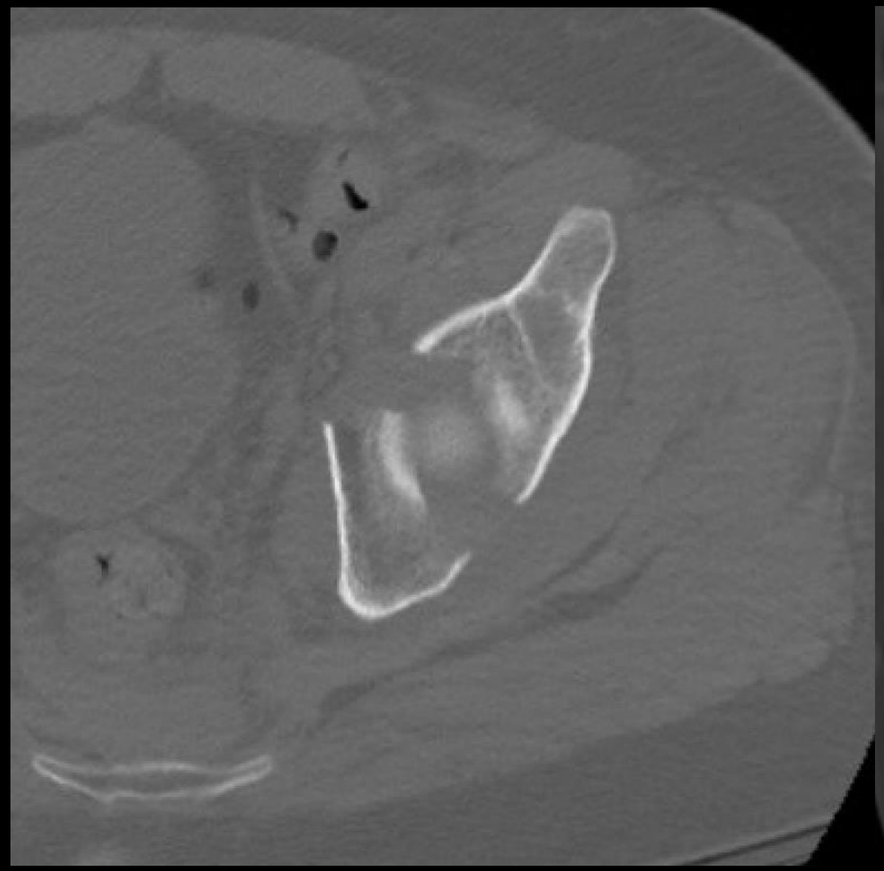
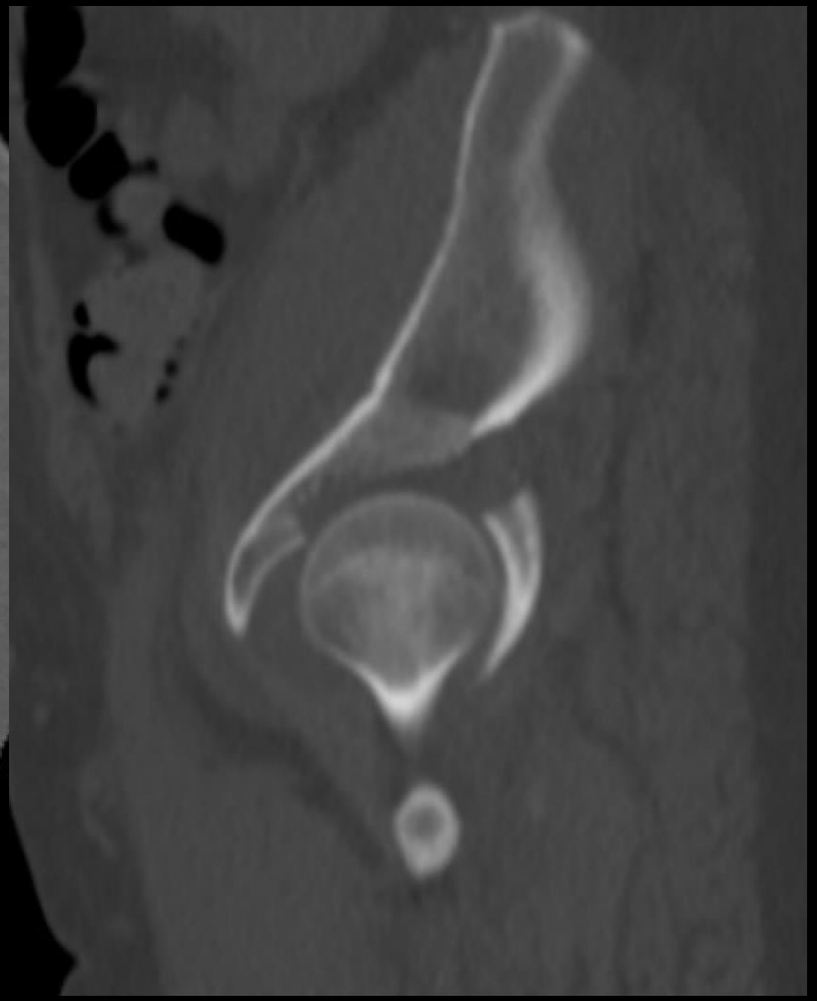
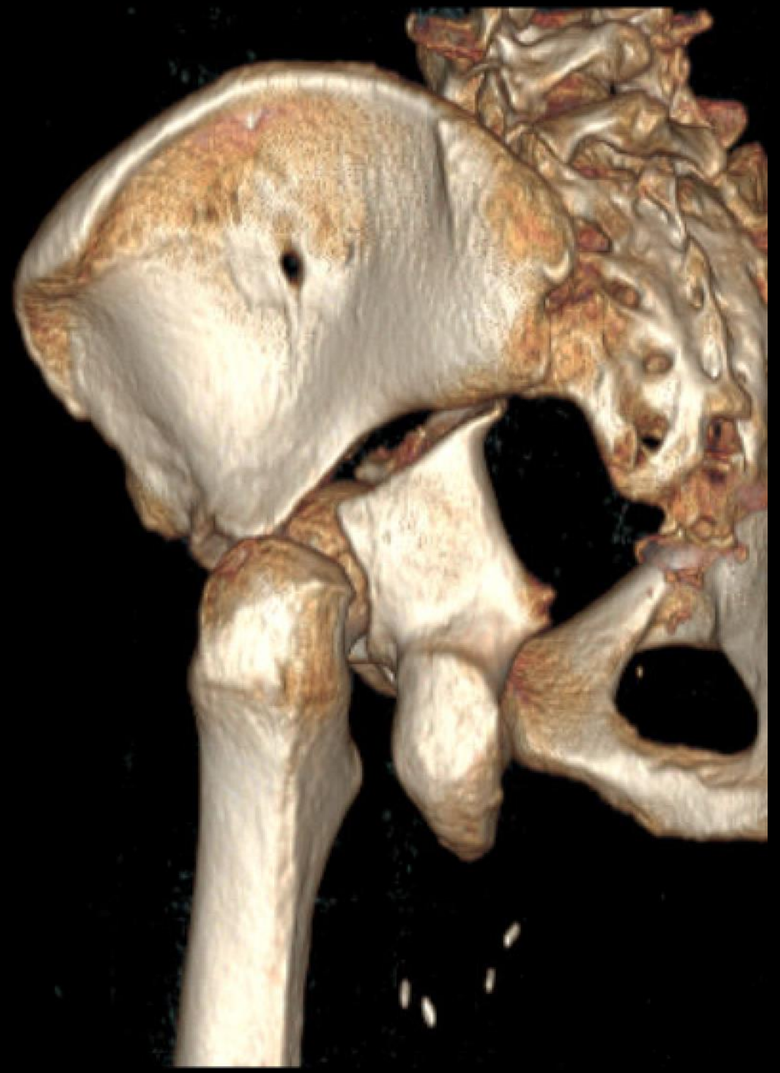




Computed Tomography







Weight bearing dome

“Roof arc angle”

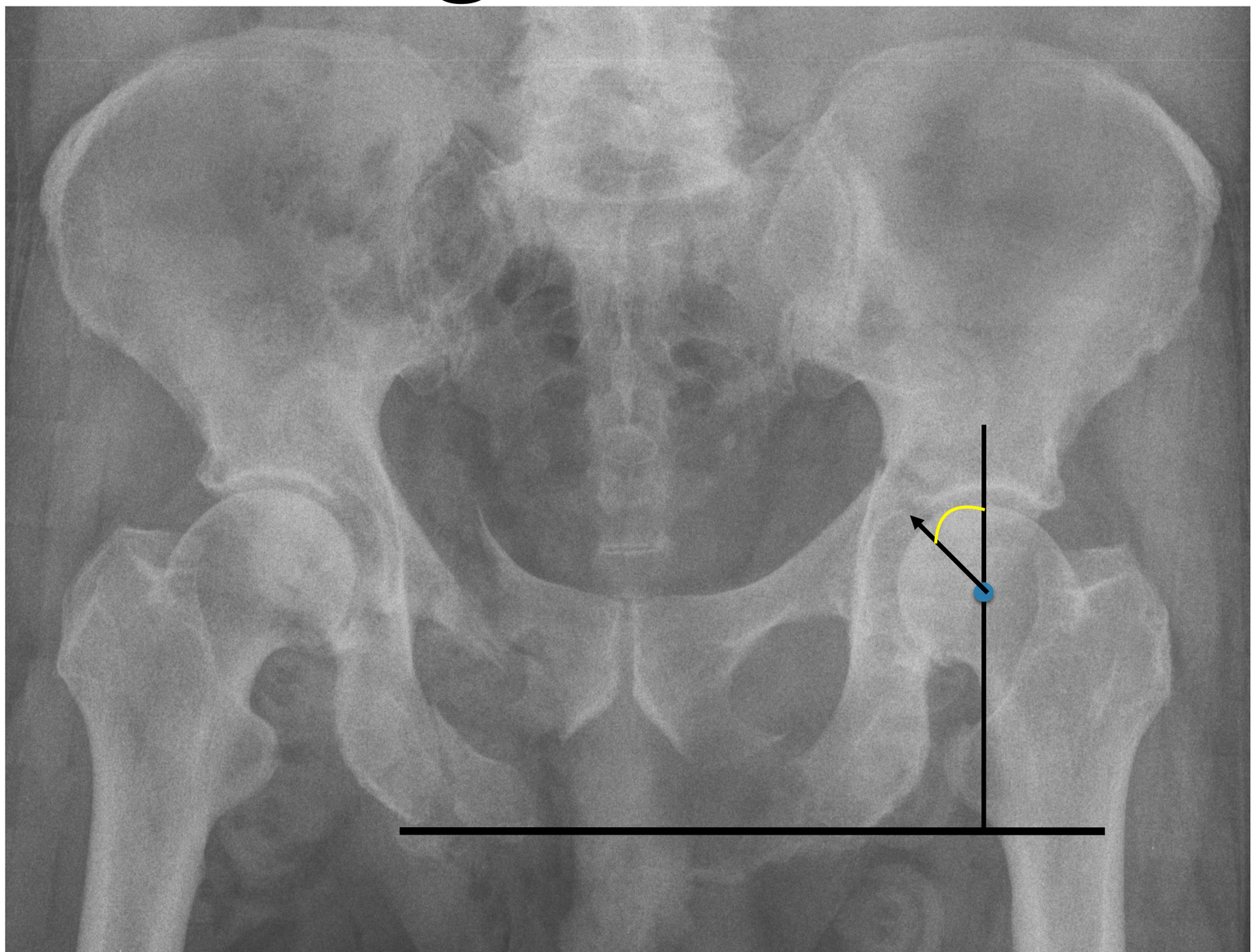
Attempt to identify important area of acetabulum through which the majority of the joint reactive force is transmitted (Matta 1986)

< 45 Weight Bearing Dome

3 standard views

Not necessary with subluxation

Not applicable to ABC, PW

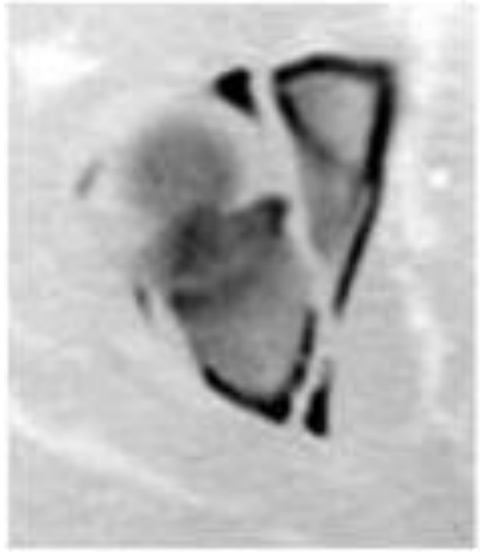


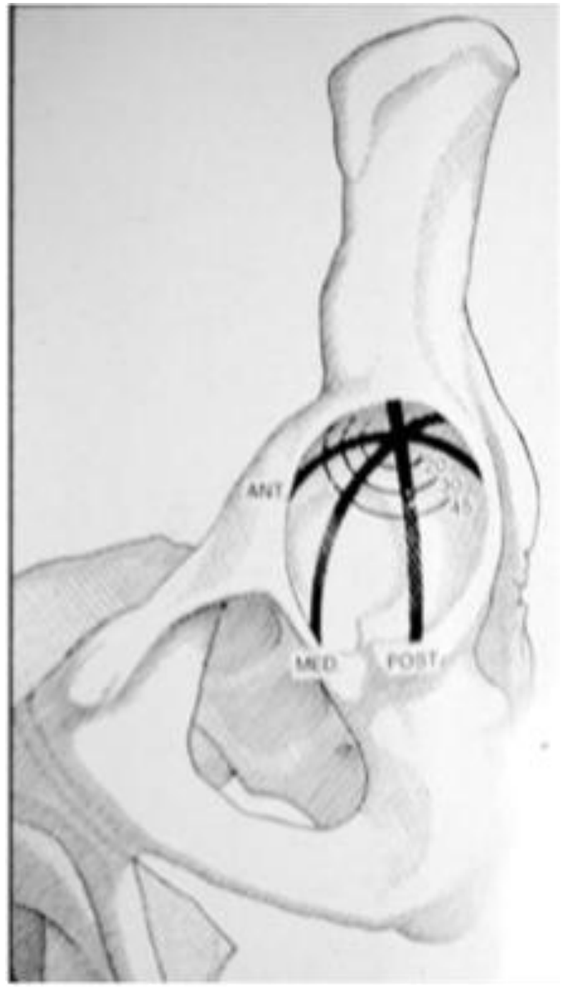
Roof arcs revisited . . .

- Under static mechanical loading (transverse pattern)
  - Anterior roof arc 25deg (obturator oblique)
  - Posterior roof arc 70deg (iliac oblique)
  - Medial roof arc 45deg

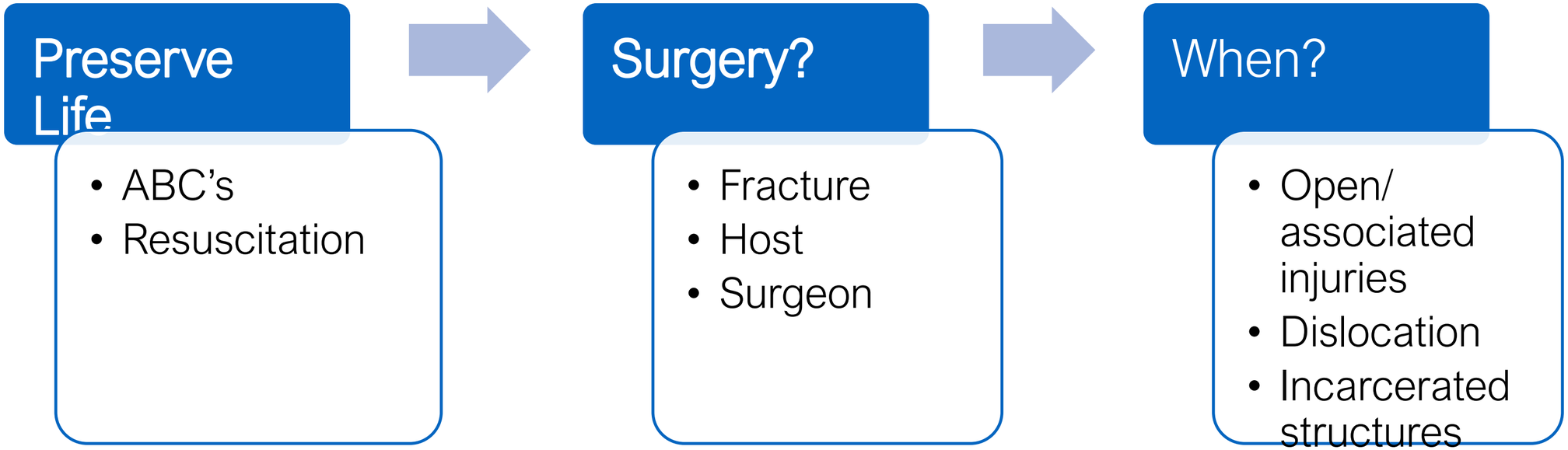
Roof arc by CT

- Top 10mm = 45deg roof arc from sub-chondral condensation





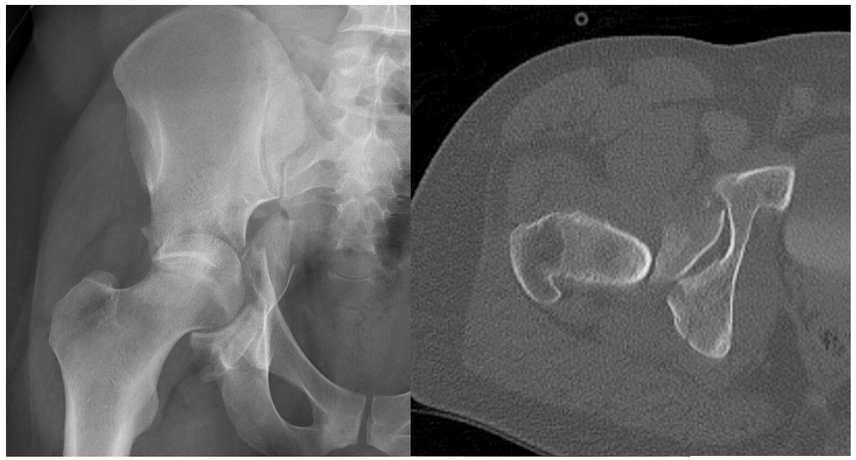
Decision Making



Operative Indications

Urgent

- Open Fracture
- Irreducible fracture dislocation
- Intra-articular structures

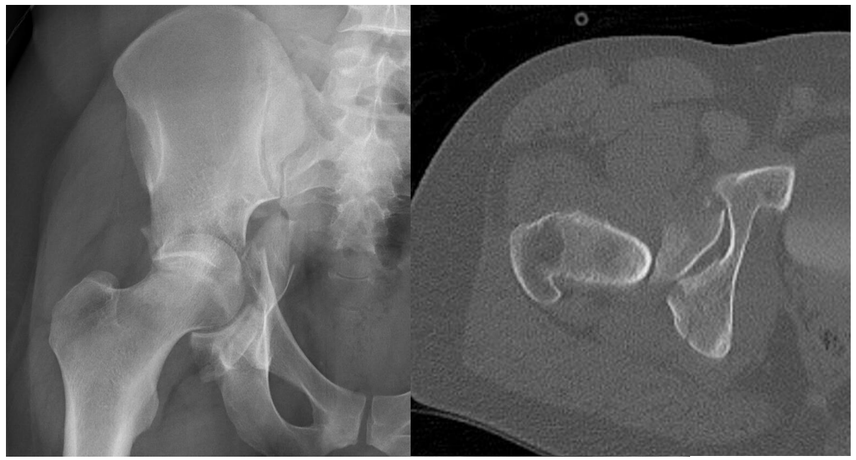


To OR

Operative Indications

Urgent

- Open Fracture
- Irreducible fracture dislocation
- Intra-articular debris



To OR

Less Urgent

- Instabilty
- Displacement

Traction

Operative Indications

- Loss of Congruence on any view
- Displacement > 2mm in the WBD (RA≤45deg)

When in doubt —> Dynamic stress under anesthesia

Stability

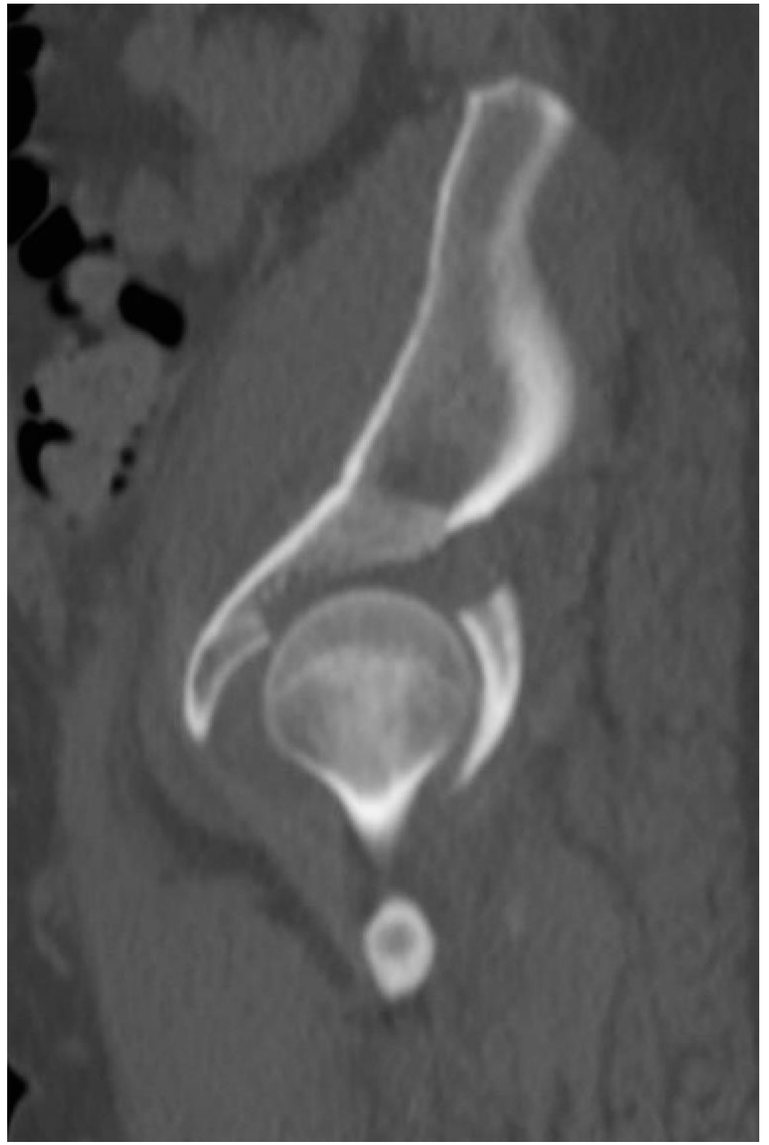
- Loss of **congruence** (joint symmetry)
- Dislocation of the femoral head is an indication for *urgent* reduction/surgery

Rowe 1961, Stewart 1954

Displacement

- Understand fracture location:

Fractures displaced through the “weight-bearing dome” negatively affect joint outcomes



Matta 1986, 1987; Letournel 1964; Heeg 1987

Skeletal Traction

Prevents on-going injury to cartilage

- Posterior wall fracture dislocation
- Medial subluxation (Transverse family and T-type)

Operate when:

- Patient is medically stable
- Surgeon understands the fracture and has developed a tactic
- Able operative team available (early referral!!!)

Further delays do not reduce blood loss or operative time!

Benefits of *Early* Surgery

Vallier *JTrauma* 2010 – 645 (251 pelvis, 359 acetabulum, 40 combined) with mean ISS 25.6

- **Early surgery (<24 hours)** significantly associated with **reduced complication**, ICU stay, ARDS, and MOF

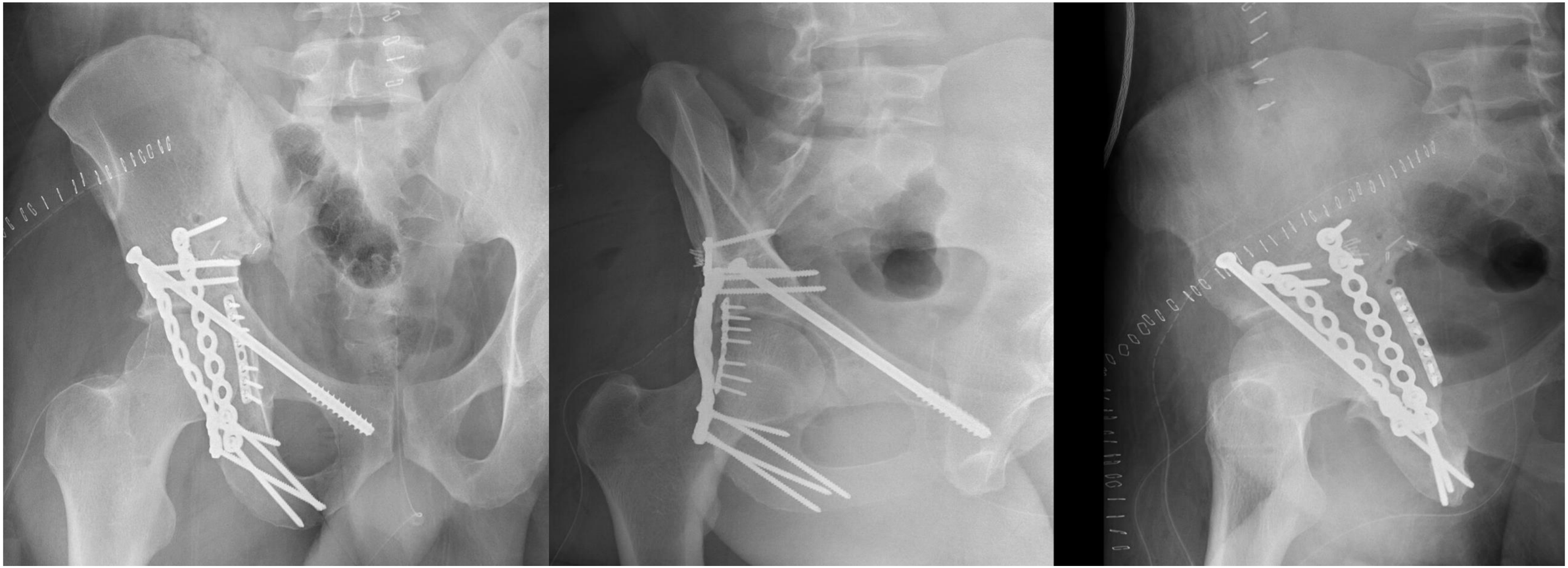
Dailey *JOT* 2014 – 288 PW, ABC, ACPHT acetabular fracture

- **Early surgery (≤48 hours)** ***not*** associated with greater EBL or OR time

Dailey *JOT* 2016 – 650 acetabular fractures

- Odds of obtaining an anatomic reduction **decreases** by **12% per day**.

MW – OR within 6 hours



Sciatic Nerve – Partial recovery
over 6 – 12 months

Take Home Points

- Know how to assess fracture pattern
- Urgent intervention indicated with open injuries, dislocations, and incarcerated structures
- Early surgery (within 24 to 48 hours) beneficial to most patients

End

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