

جَائِزَةُ الْحُسَيْنِ
بْنِ عَبْدِ اللَّهِ الثَّانِي
لِلْعَمَلِ التَّطَوُّعِيِّ

AL HUSSEIN BIN ABDULLAH II
AWARD FOR VOLUNTARY WORK



النادي الطبي
Medical Club



Radiology

Subject: MSK CASES

Group no: D11

Done by: Hala Yaseen



هَذَا خُلِقَ اللَّهُ فَأَرْوِيهِ مَاذَا خُلِقَ الذِّينَ مِنْ دُونِهِ بَلِ الظَّالِمُونَ فِي ضَلَالٍ مُبِينٍ

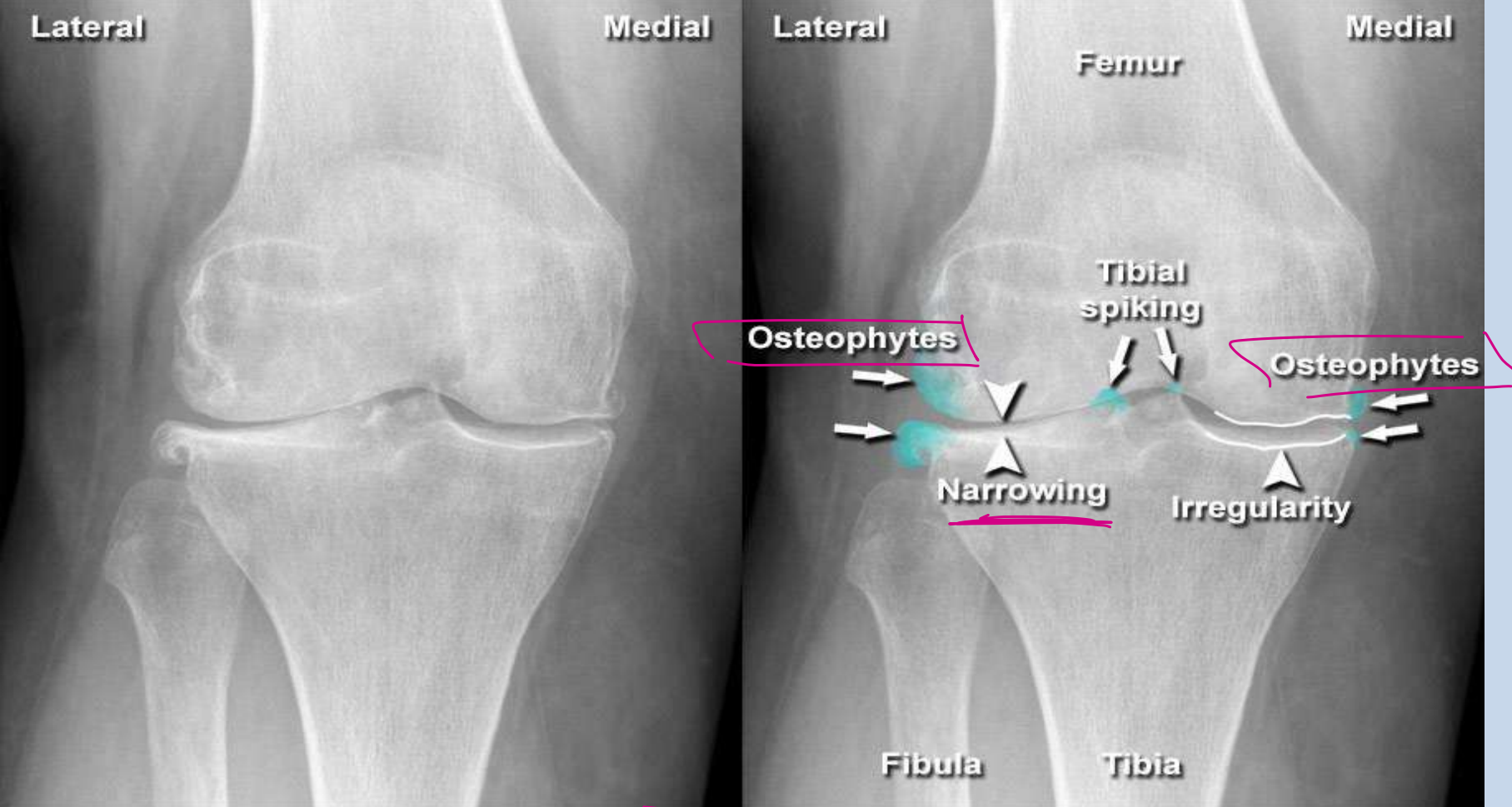
MUSCULOSKELETAL SYSTEM CASES

Dr. SHATHA TARAWNEH
MD, JBR.

CASE 1

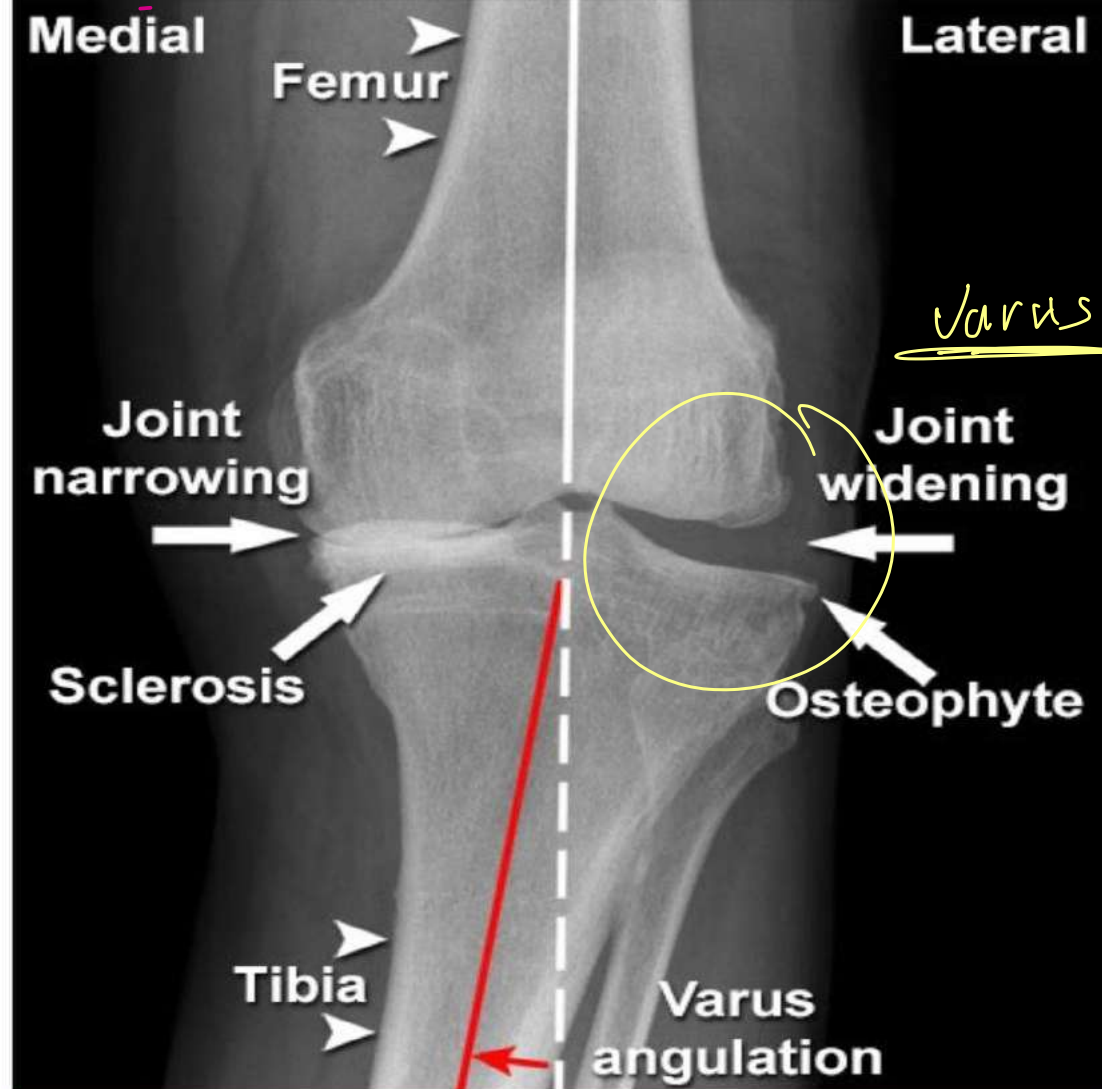
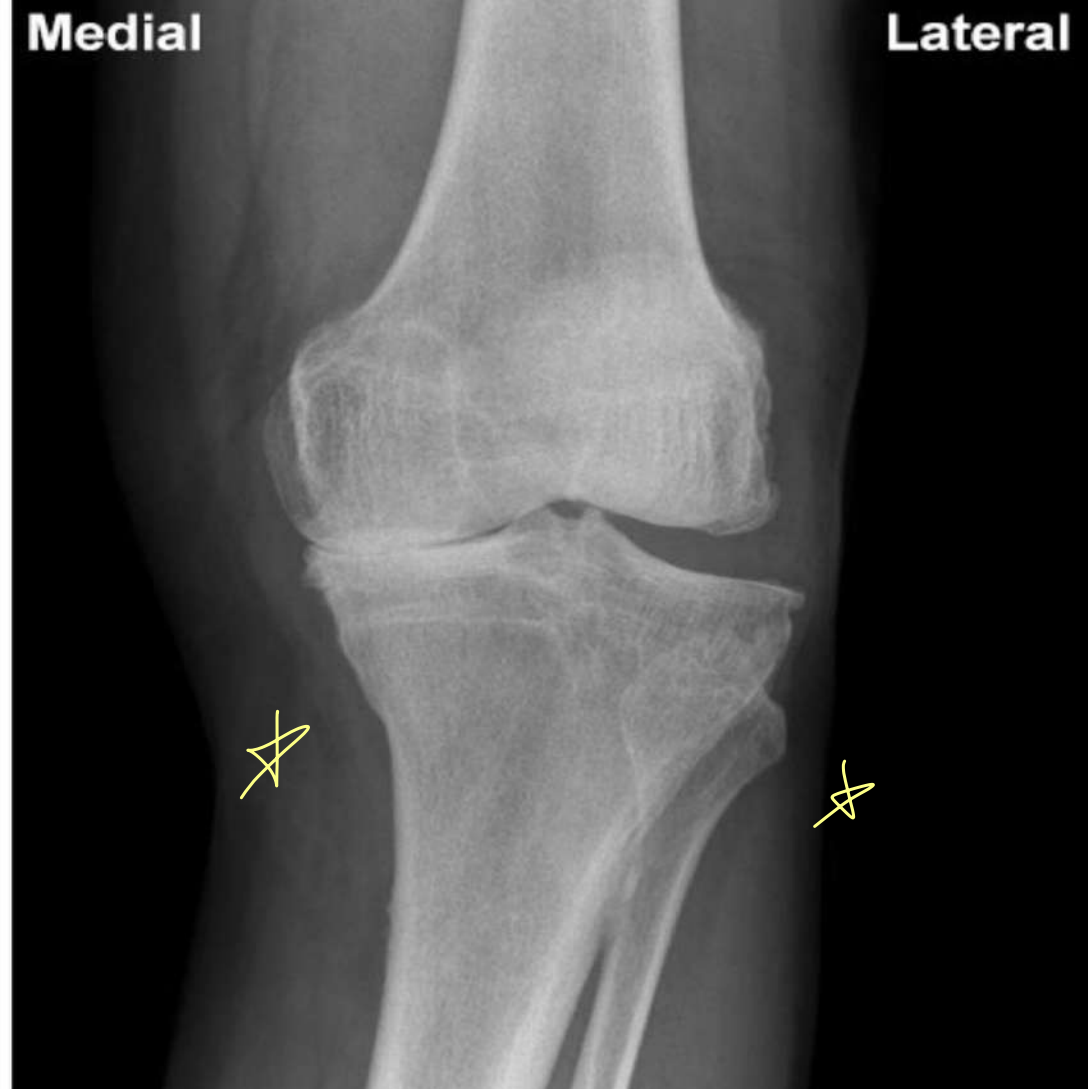


OSTEOARTHRITIS



1 Osteophytes - Knee

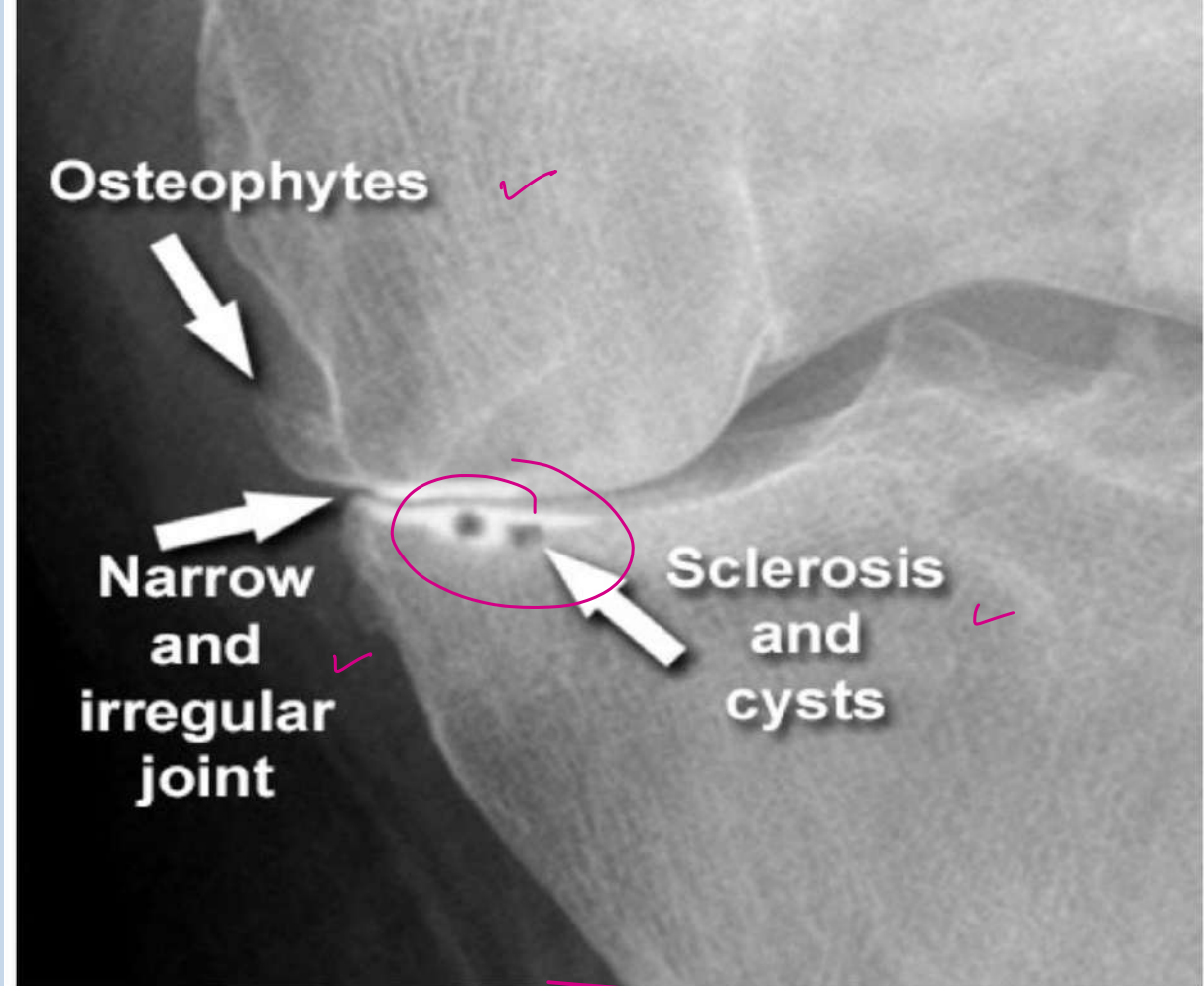
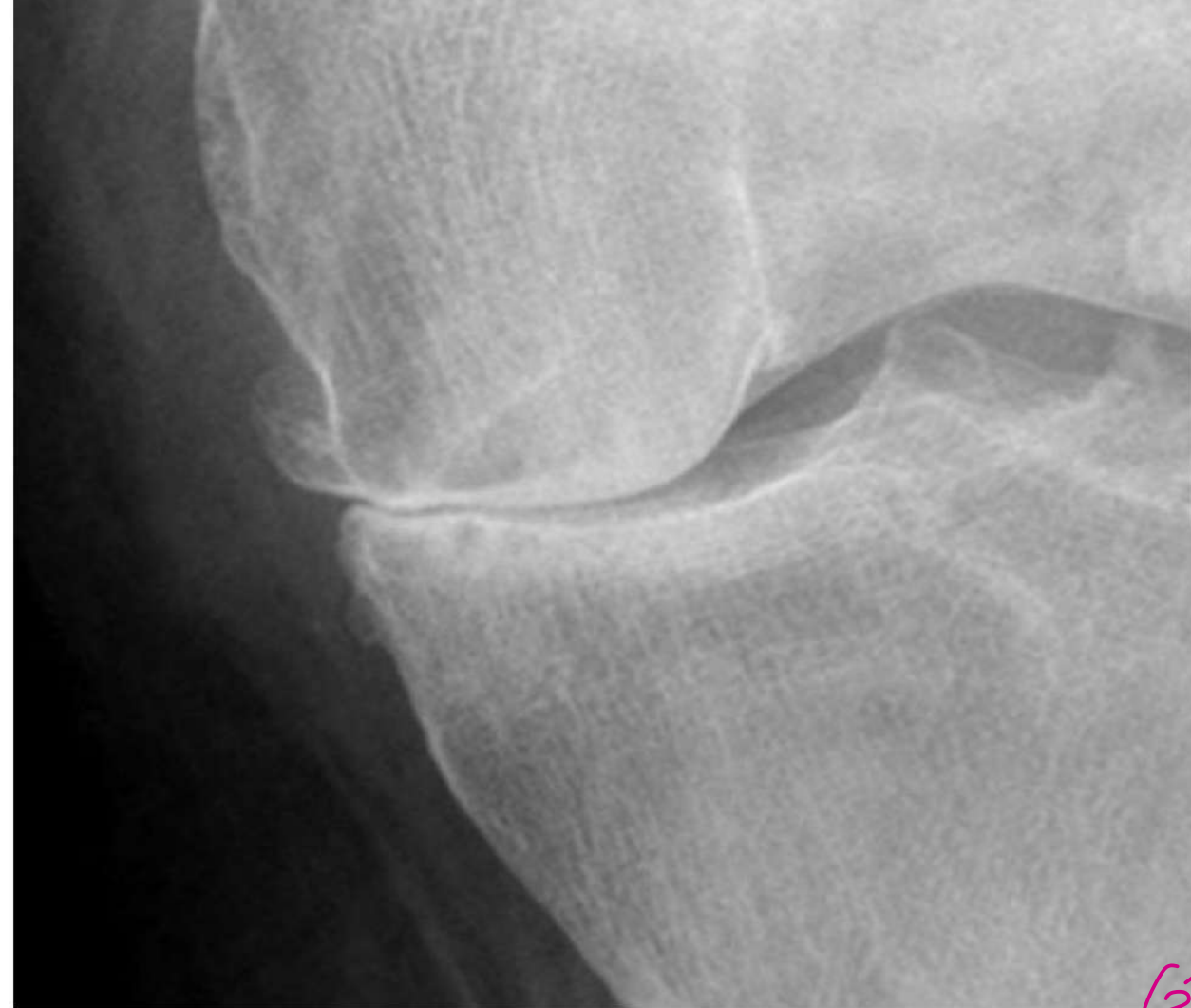
- ♦ The formation of osteophytes (bone spurs) is a common feature of osteoarthritis
- ♦ This AP view of the knee shows osteophytes of the tibia and femur
- ♦ Small osteophytes have also formed at the tibial spines (tibial spiking)
- ♦ The knee joint spaces are narrowed and irregular
- ♦ See an example of a normal knee X-ray.



2

Joint space narrowing

- ◆ The medial side of the knee joint is severely narrowed such that the femur and tibia are touching
- ◆ The lateral side of the joint is widened and there is abnormal (varus) angulation of the tibia
- ◆ Increased density indicates articular surface sclerosis



③

Articular surface cortical irregularity and/or sclerosis

- ◆ The joint space is narrowed and the cortical surface is irregular
- ◆ Increased density of the articular surface indicates sclerosis

④

- ◆ Small sub-cortical cysts have formed

CASE 2

Inversion injury to ankle. Unable to bear weight. AP and lateral views.

☒ Injury

☐ No injury

AP



Lateral





✱



AP is also view



5th metatarsal base fracture.

5th metatarsal base fractures are occasionally seen on a lateral ankle view in patients with suspected ankle fractures.

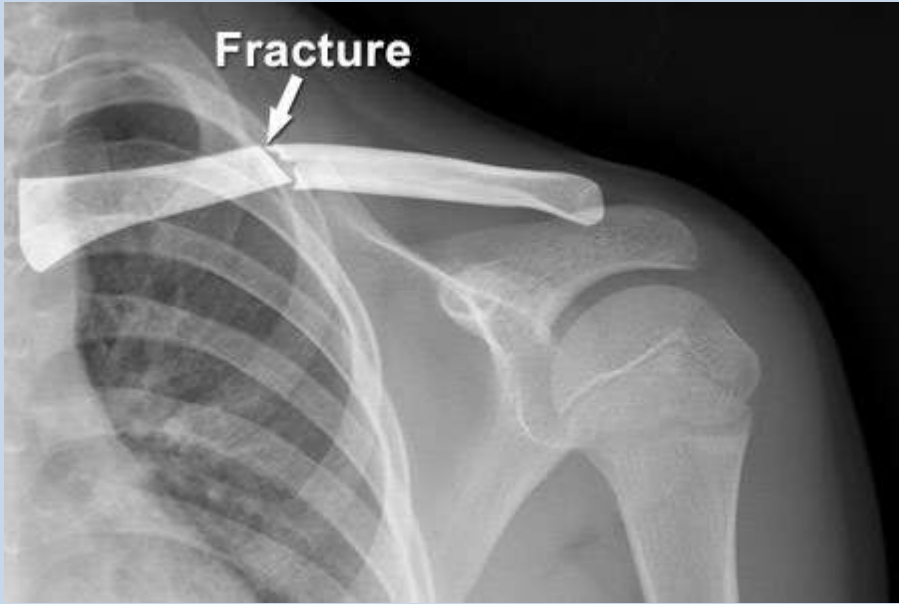
CASE 3



Fall on outstretched hand. Pain and restricted shoulder abduction. 2 AP clavicle views.

☐ Injury

☐ No injury



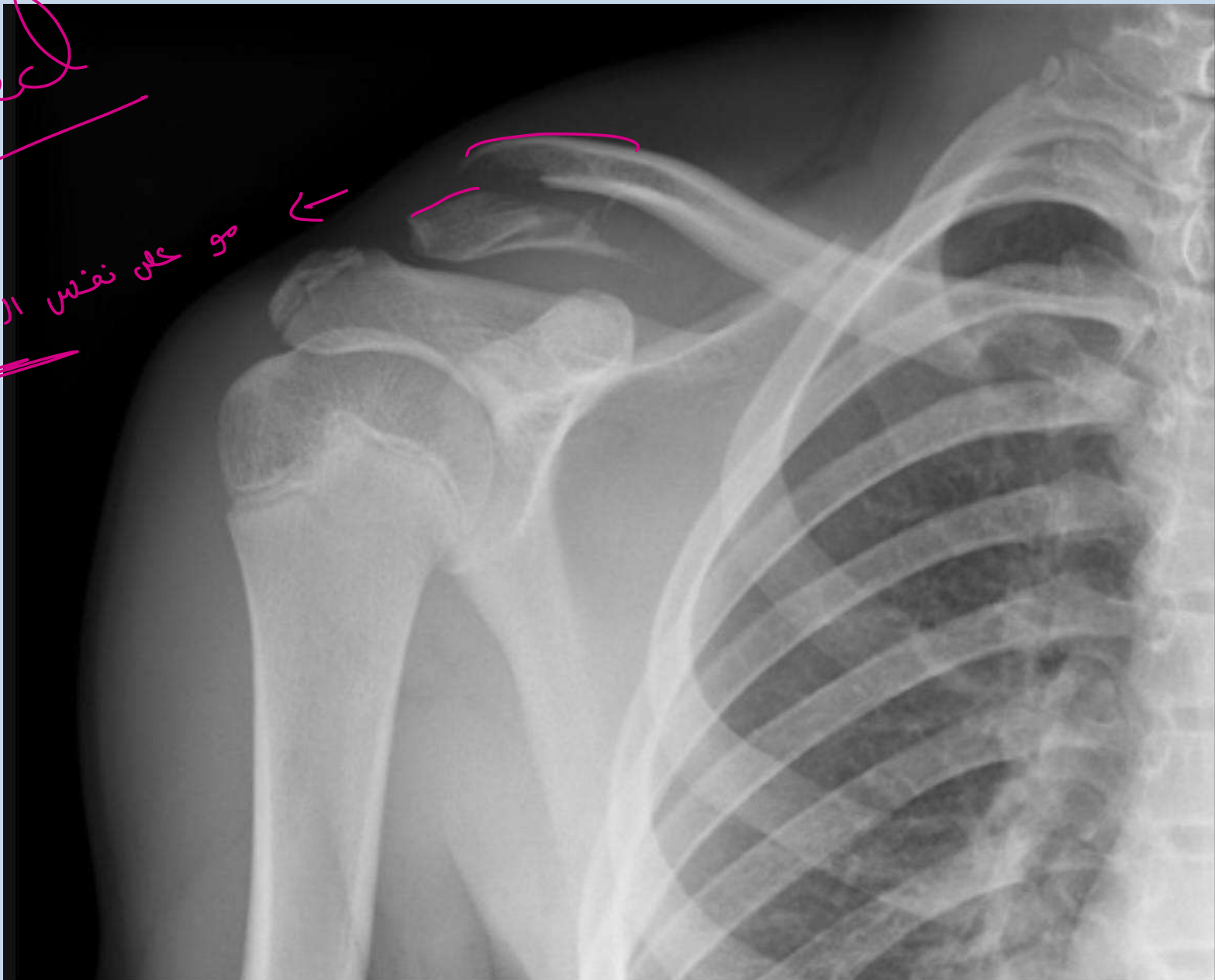
undisplaced

Clavicle fracture.



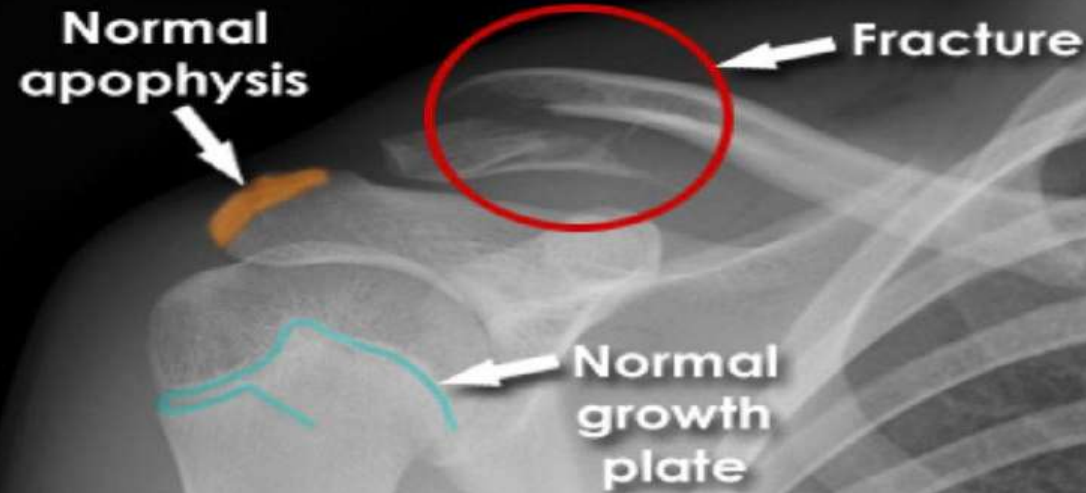
Displaced

alignement de la tête de la humerus ←



Tension/effacement des bords/haute fixation

Clavicle fracture - Displaced



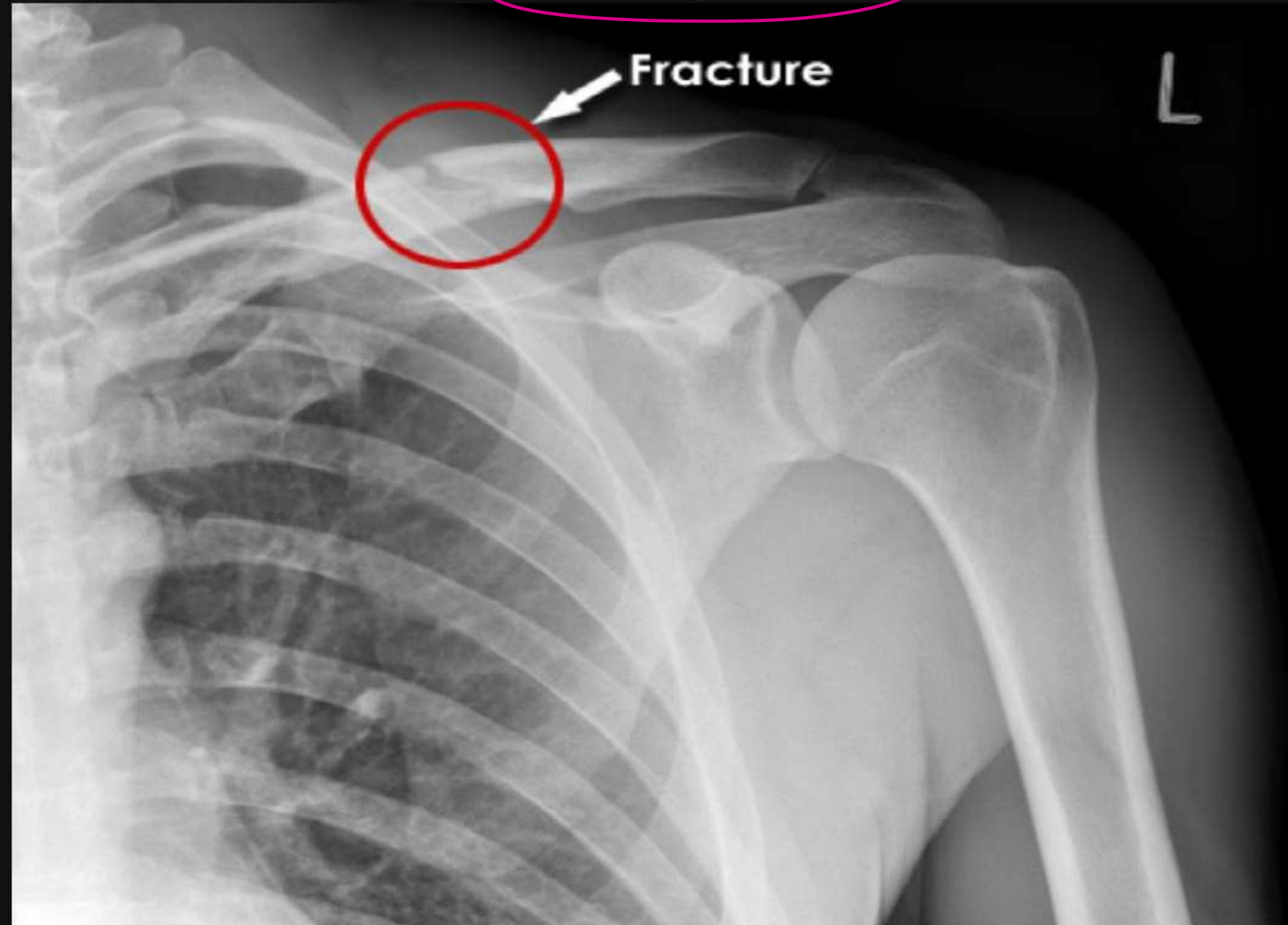
Tap on/off image to show/hide findings

Clavicle fracture - Displaced

- The distal component of this clavicle fracture is inferiorly displaced - pulled down by the weight of the arm
- The unfused growth plates of the proximal humerus and the acromial apophysis should not to be mistaken for fractures



Clavicle fracture - Undisplaced



Tap on/off image to show/hide findings

Clavicle fracture - Undisplaced

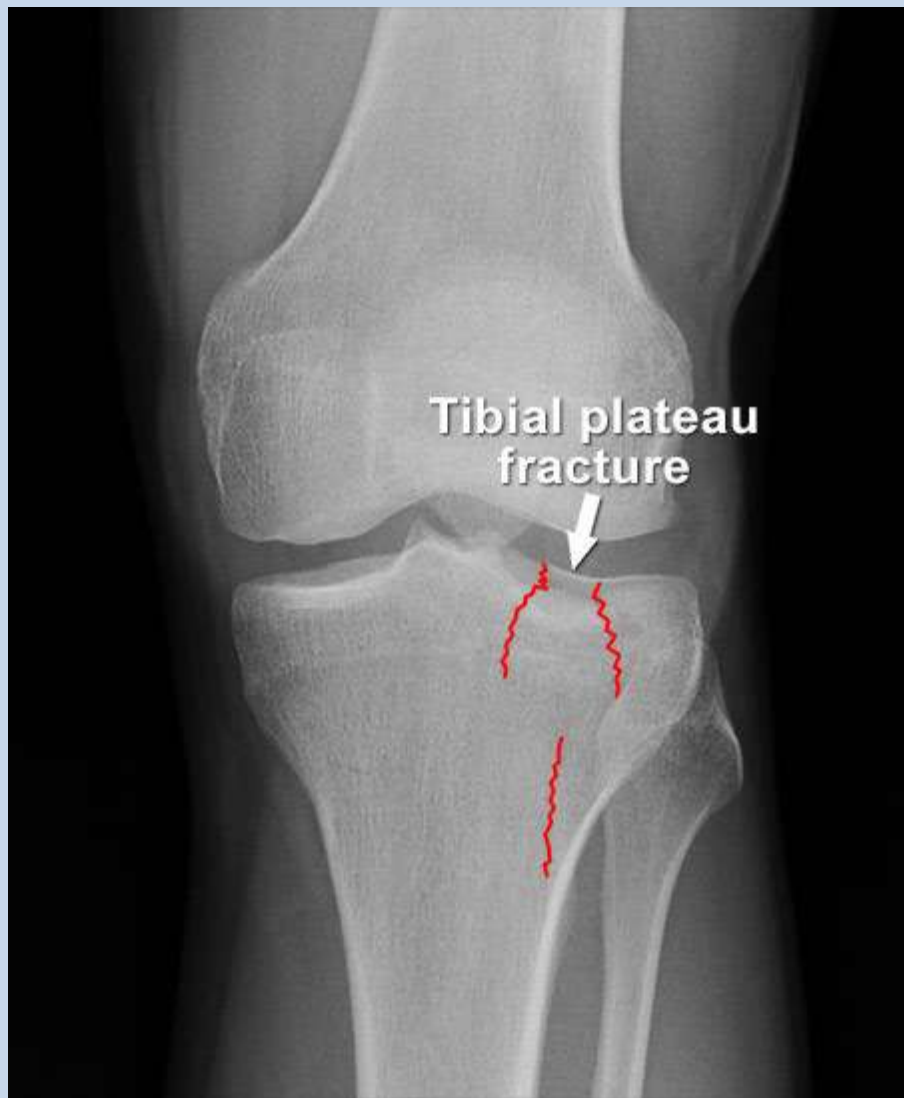
- ◆ The distal component of this clavicle fracture remains aligned with the proximal clavicle

CASE 4



Fall with direct trauma to knee. Pain, swelling and reduced knee movement. AP and horizontal beam lateral views.

- ☒ Injury
- ☐ No injury



Tibial plateau fracture with lipohaemarthrosis (fat and blood in the joint).

lipid + blood
effusion

CASE 5

*Normal
elbow*



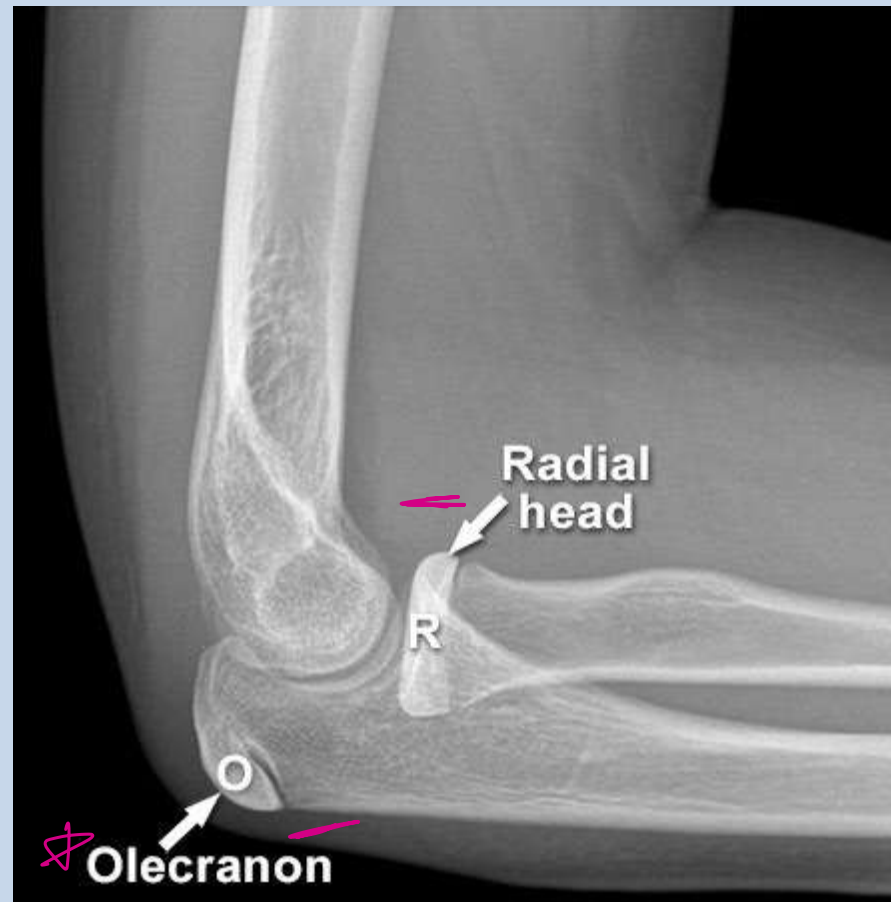
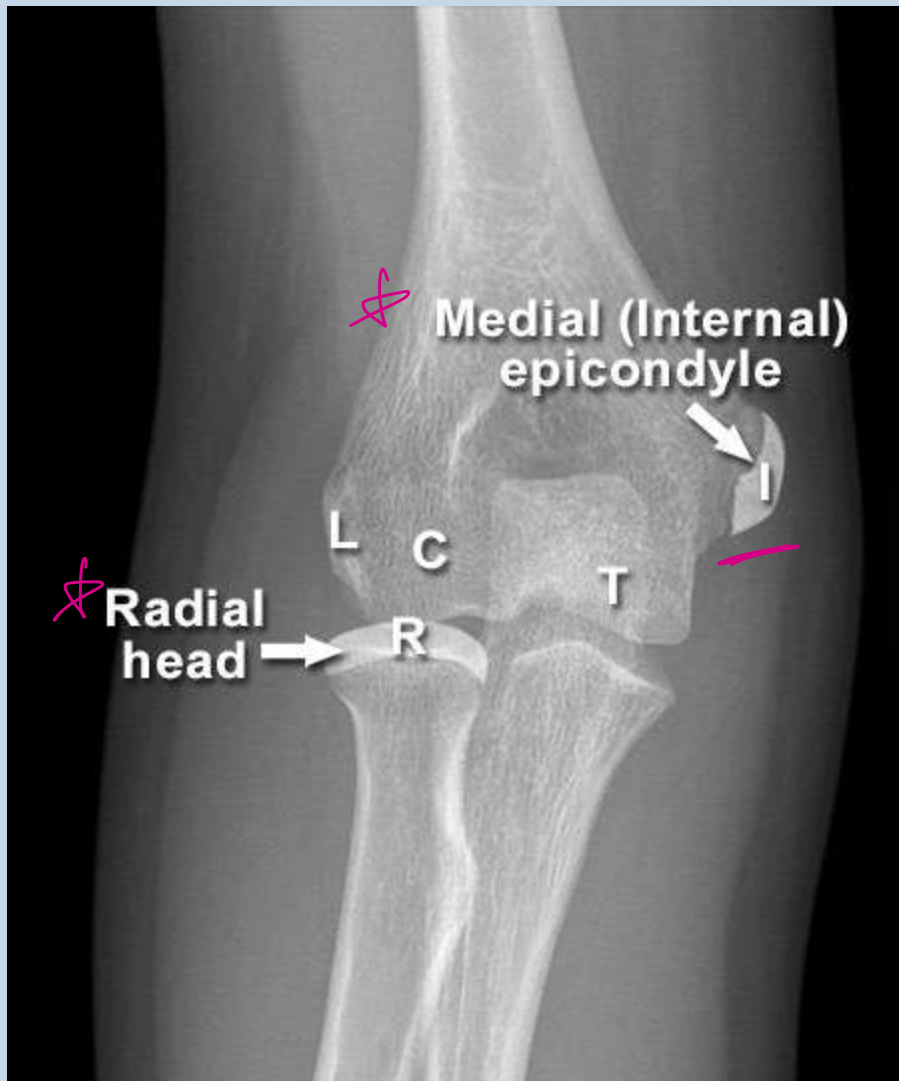
14-year-old boy. Fall onto elbow. Pain and reduced movement. AP and lateral views.

☐

Injury

☐

No injury

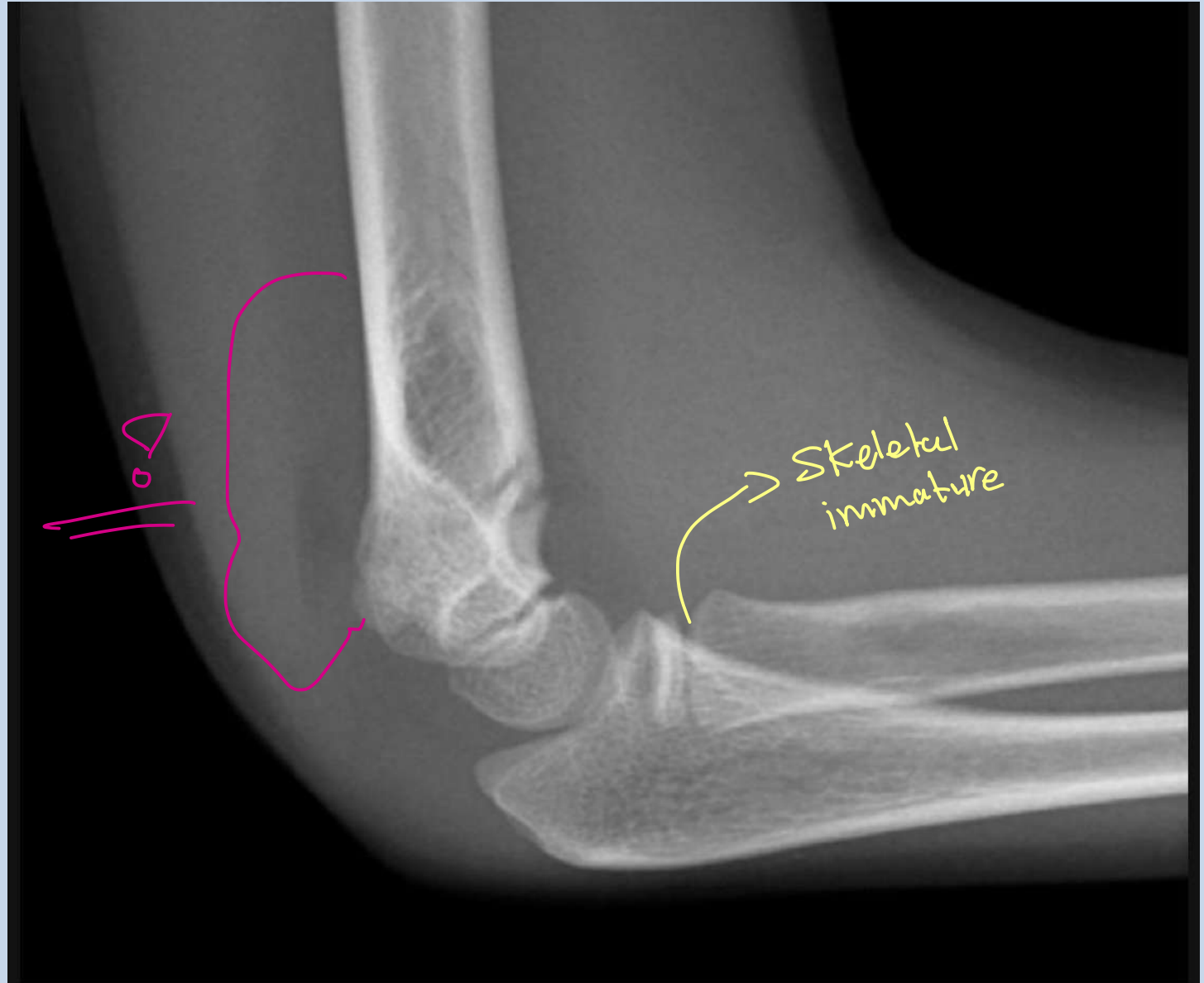


Normal elbow.

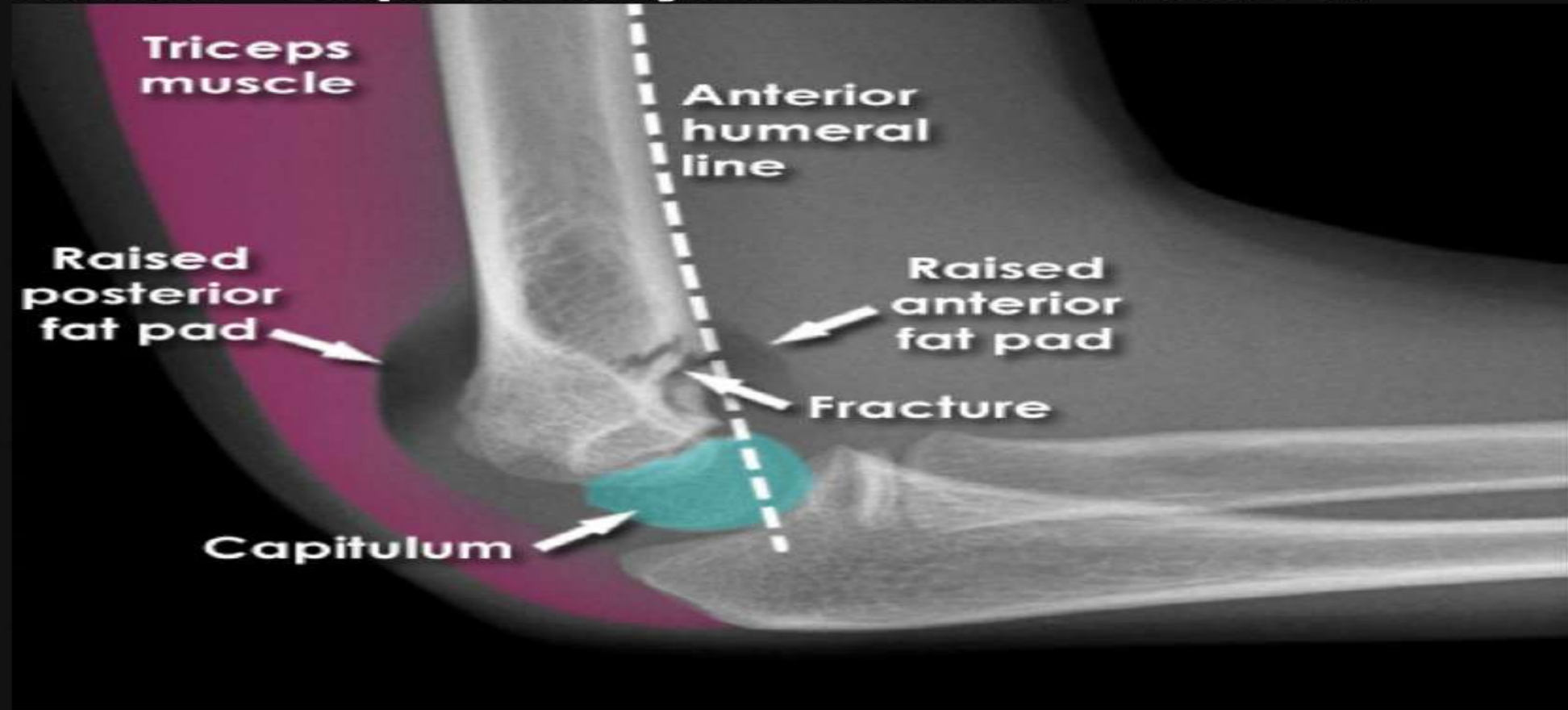
The radial head (R), medial (internal) epicondyle (I), and olecranon (O) ossification centres are still visible – **they have not yet completely fused**.

The ossification centres of the capitulum (C), trochlea (T), and lateral epicondyle (L) **have already fused**.

CASE 6



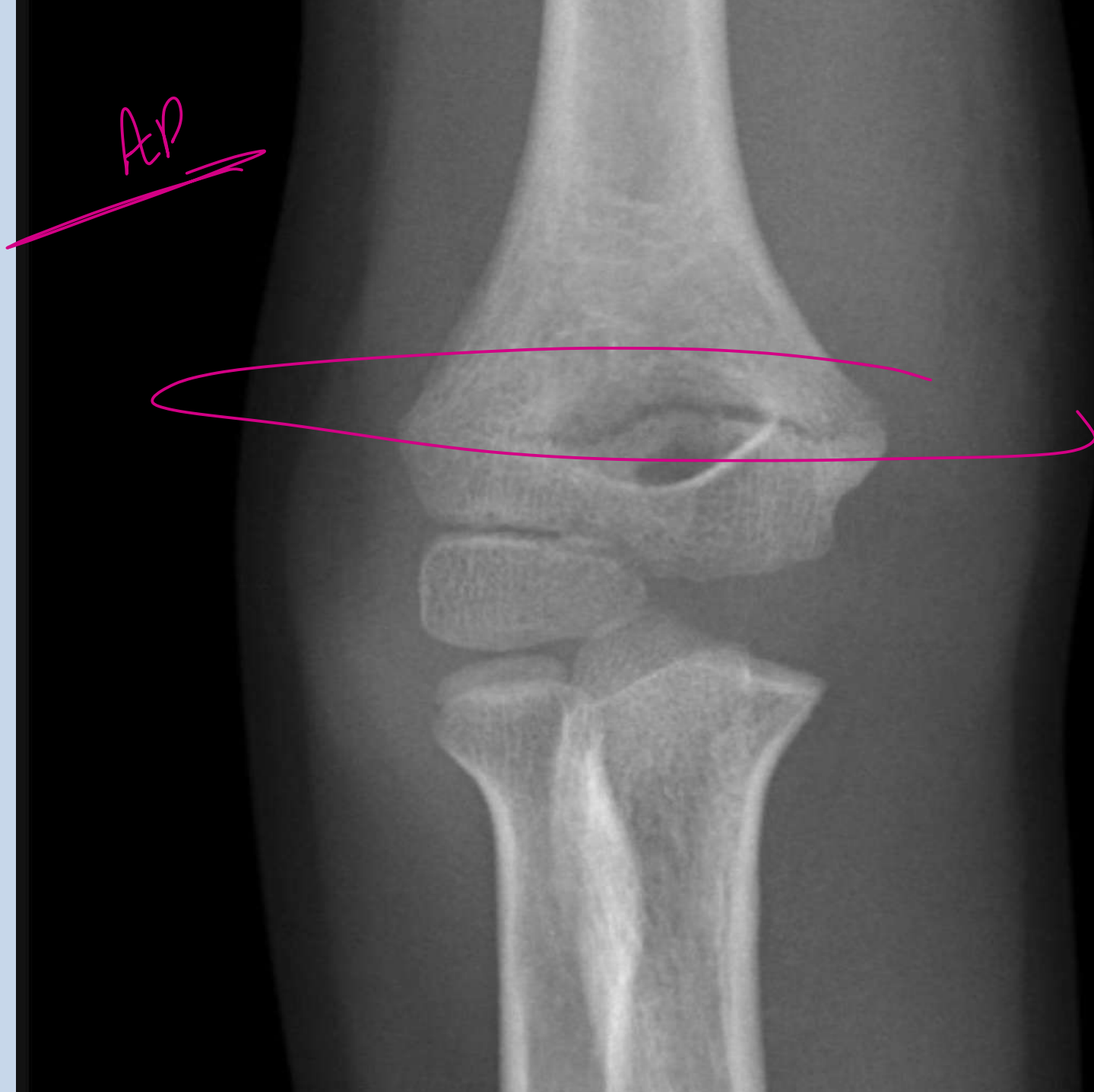
Elbow - Supracondylar fracture - Lateral

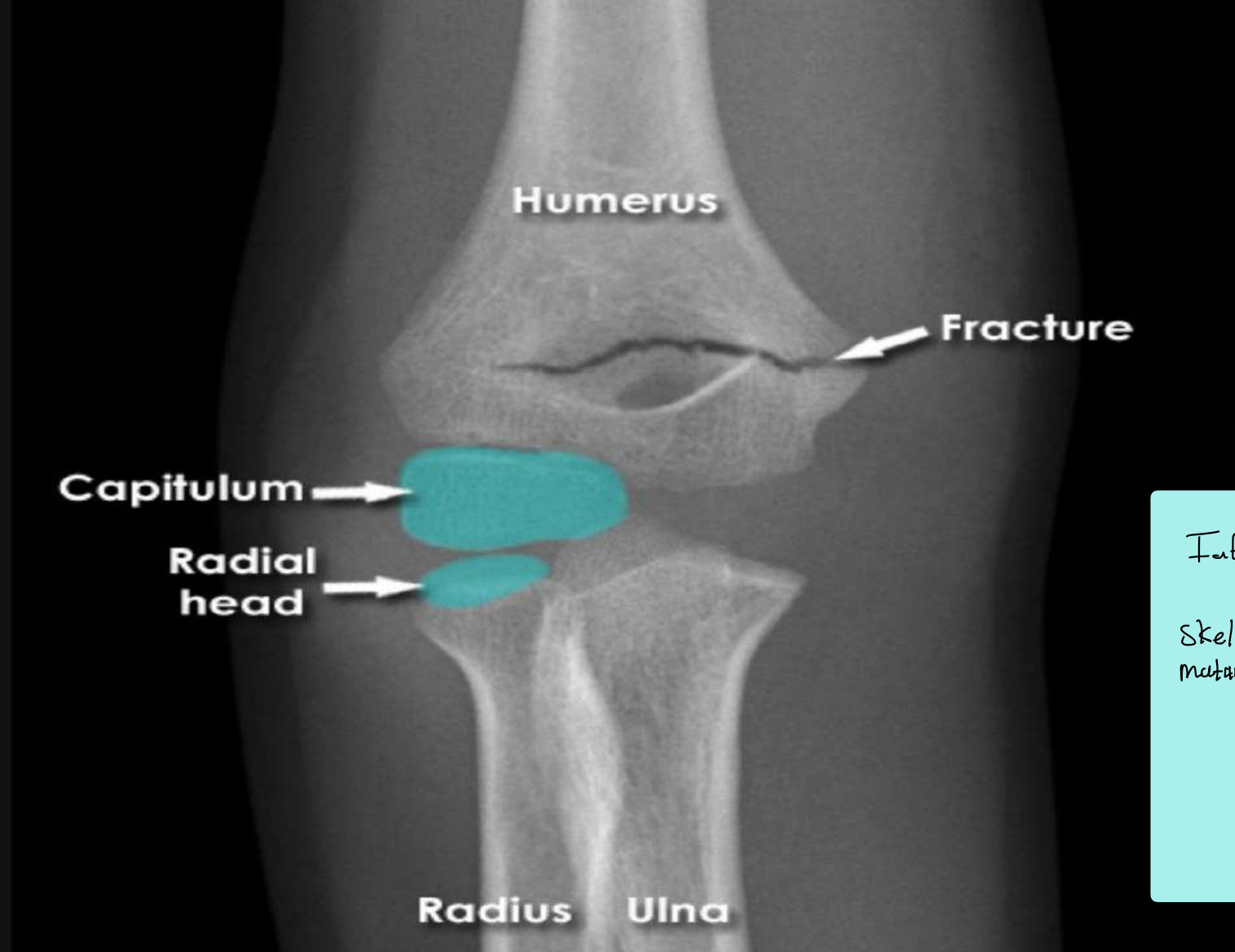


Tap on/off image to show/hide findings

Elbow - Supracondylar fracture - Lateral

- ◆ This is the commonest elbow fracture in children
- ◆ A joint effusion raises the anterior and posterior fat pads, indicating intra-capsular injury✚
- ◆ Less than one third of the capitulum of the humerus lies in front of the anterior humeral line
- ◆ The distal fracture fragment is pulled posteriorly by the triceps muscle





Tap on/off image to show/hide findings

Elbow - Supracondylar fracture - AP

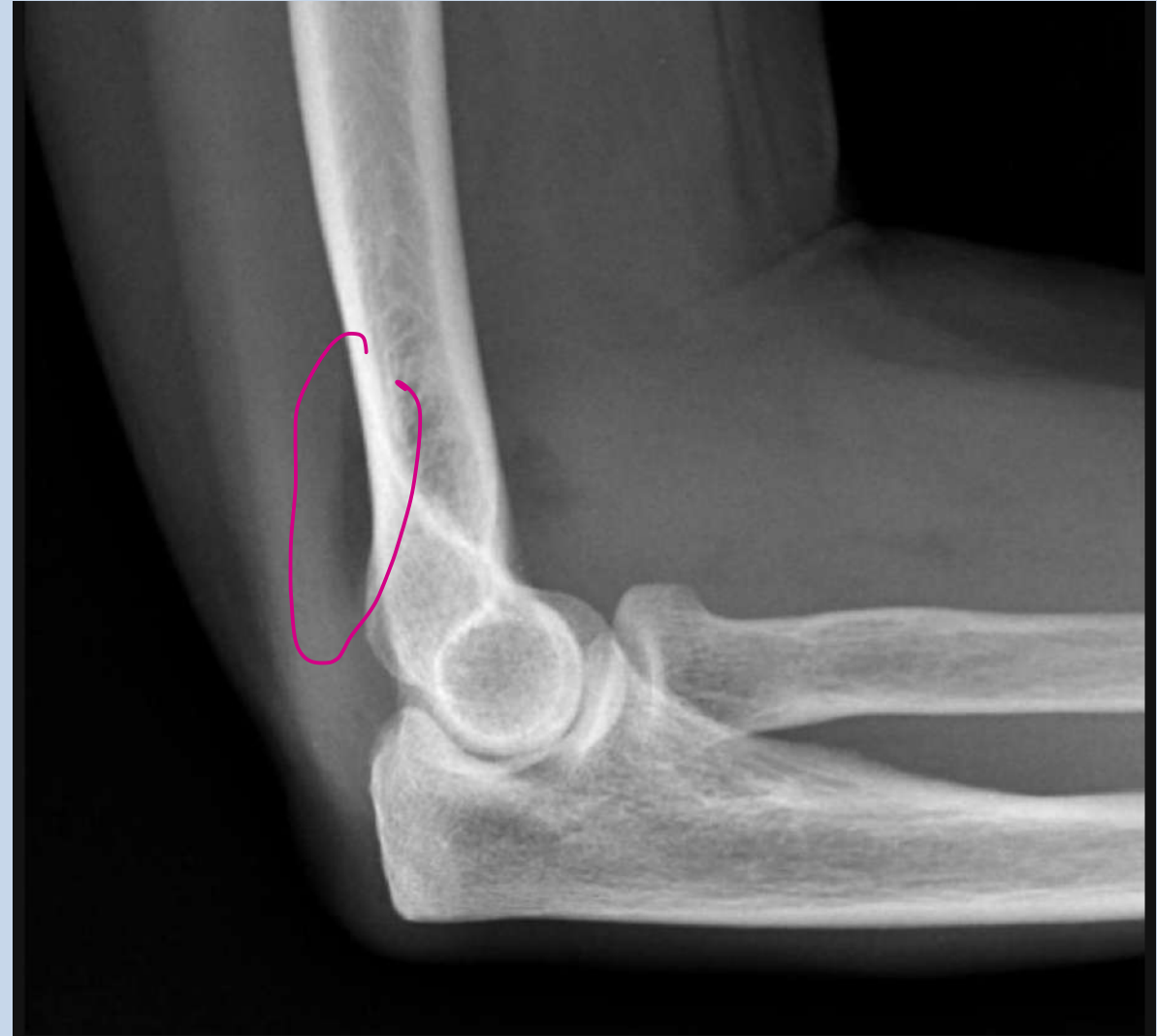
- ◆ The fracture line is also seen clearly on the AP image in this case

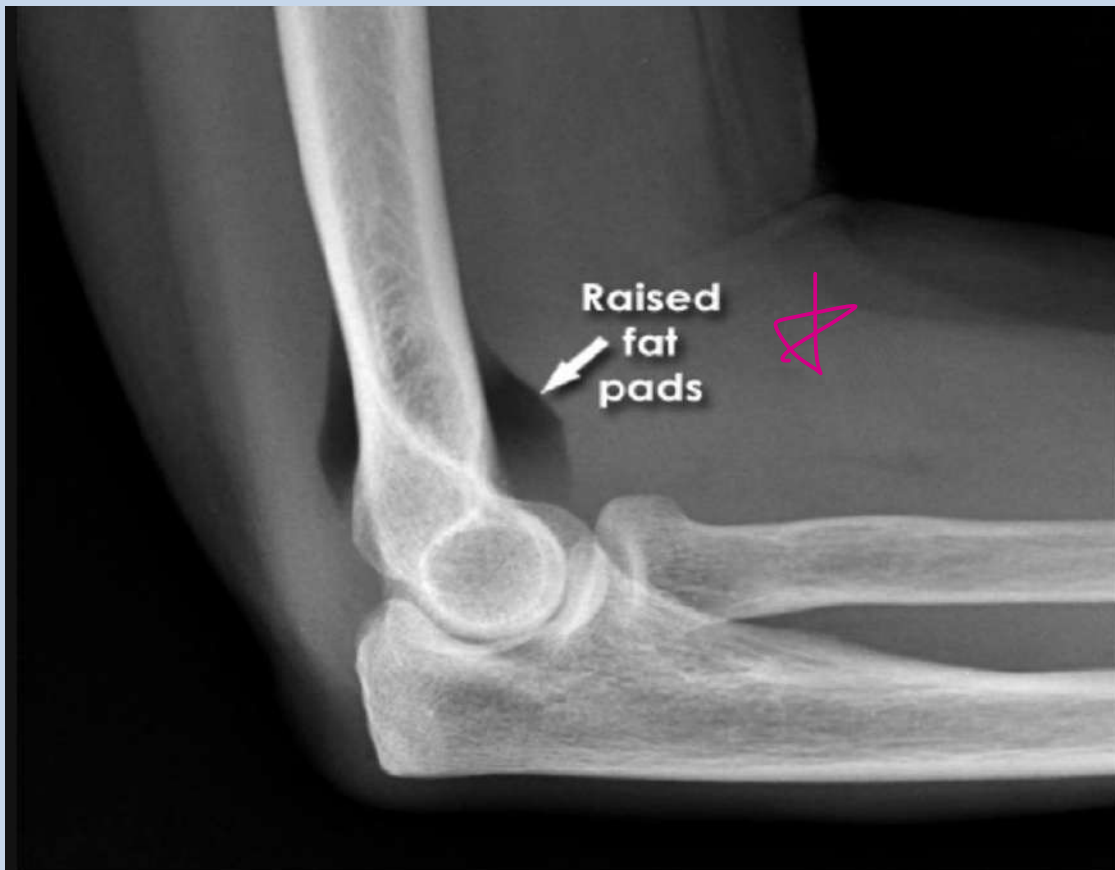
fat pads at elbow

Skeletal maturity {
→ yes → adult →
Radial head fracture
→ No → child →
Supracondylar fracture

CASE 7

*skeletal
mature*





Tap on/off image to show/hide findings

Radial head fracture - Fat pads - Lateral

- ◆ This is the commonest elbow fracture in adults
- ◆ The fracture line is not visible on the lateral view in this case
- ◆ The effusion - indicated by raised fat pads - is the only visible sign of injury and in the context of trauma should be taken to indicate an undisplaced intra-capsular fracture

Radial head fracture - AP



Tap on/off image to show/hide findings

Radial head fracture - AP

- ◆ (Same patient as image above)
- ◆ The AP view shows a fracture line which extends to the articular surface of the radial head

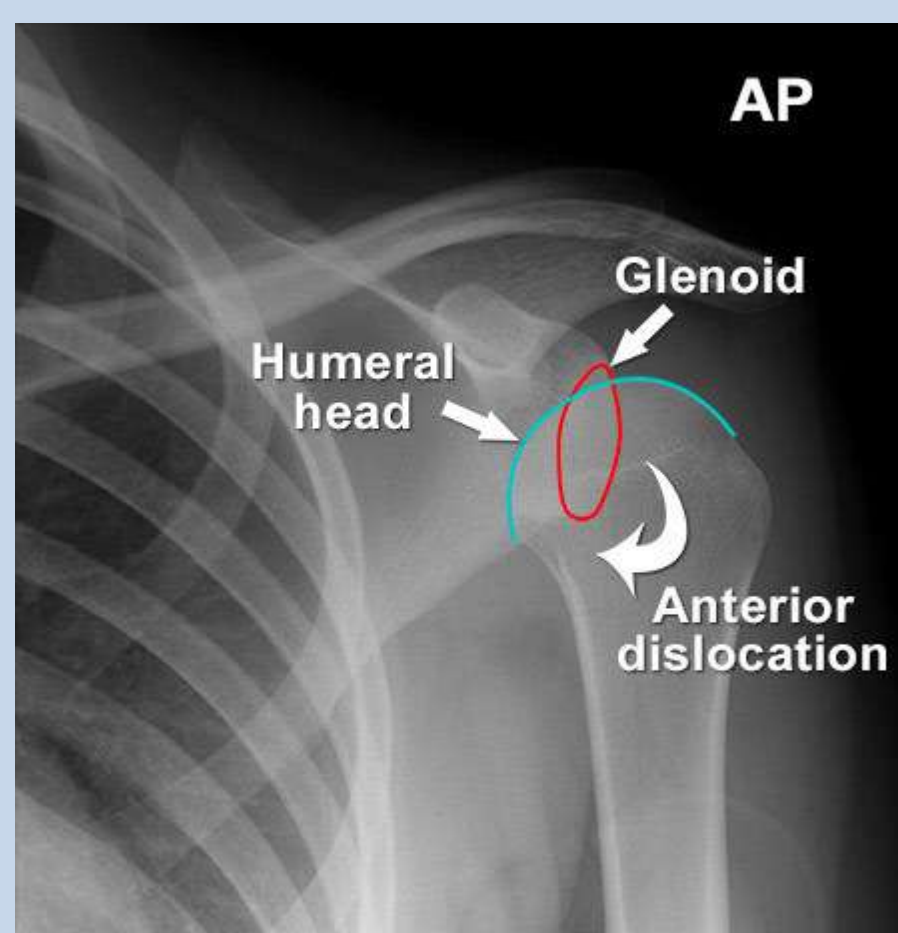
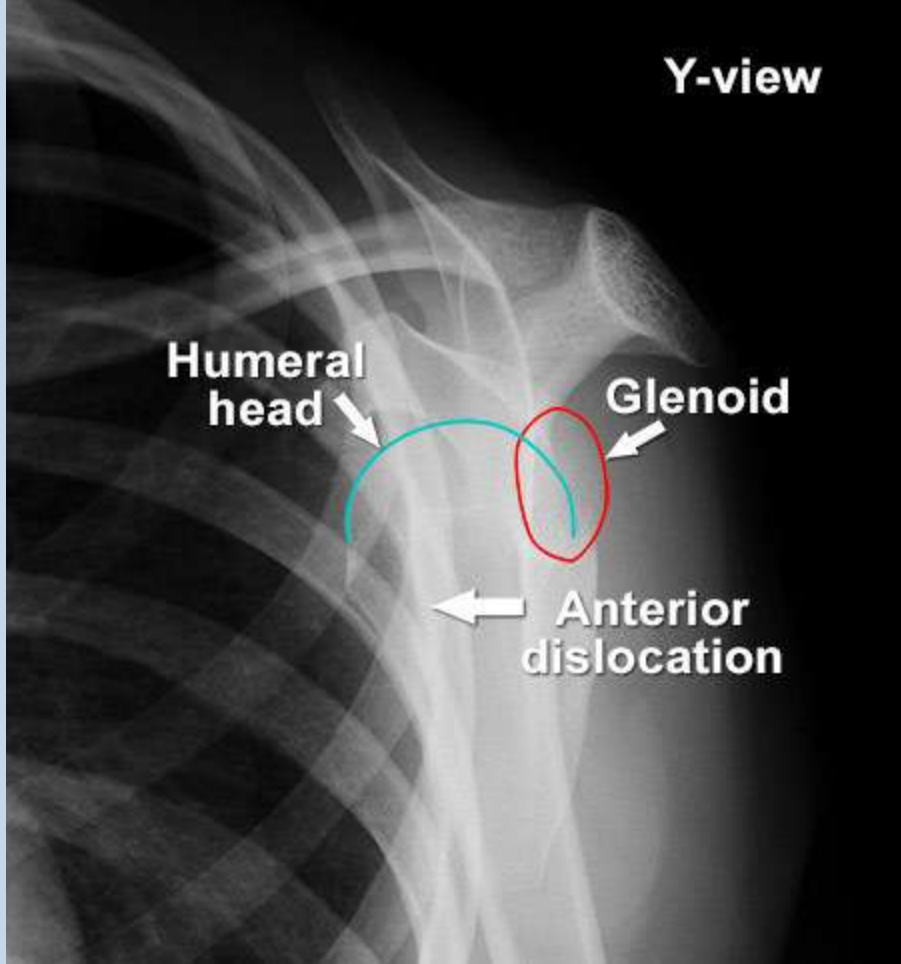
CASE 8



Injury to shoulder. Pain and reduced movement.

☒ Injury

☐ No injury



Anterior dislocation. / most common

The humeral head is located anterior and inferior to the glenoid fossa of the scapula. This is the typical appearance of an anteriorly dislocated glenohumeral joint.

CASE 9



لازم اطلاع کیا ہو
انفلاقہ
تلف
بھونڈ
لکیر
نورمال

Twisting injury to foot. Pain and inability to weight bear. DP and oblique views.

- ☒ Injury
- ☐ No injury



Lisfranc injury.

The DP views shows the second metatarsal bone is not aligned with the intermediate cuneiform. A small bone fragment is seen on the lateral side of the second metatarsal base.

Lateral shift of the second metatarsal base indicates injury to the Lisfranc ligament.

✱ This injury can be disabling if not identified.

The oblique image shows normal alignment and no bone abnormality.

CASE 10



OA



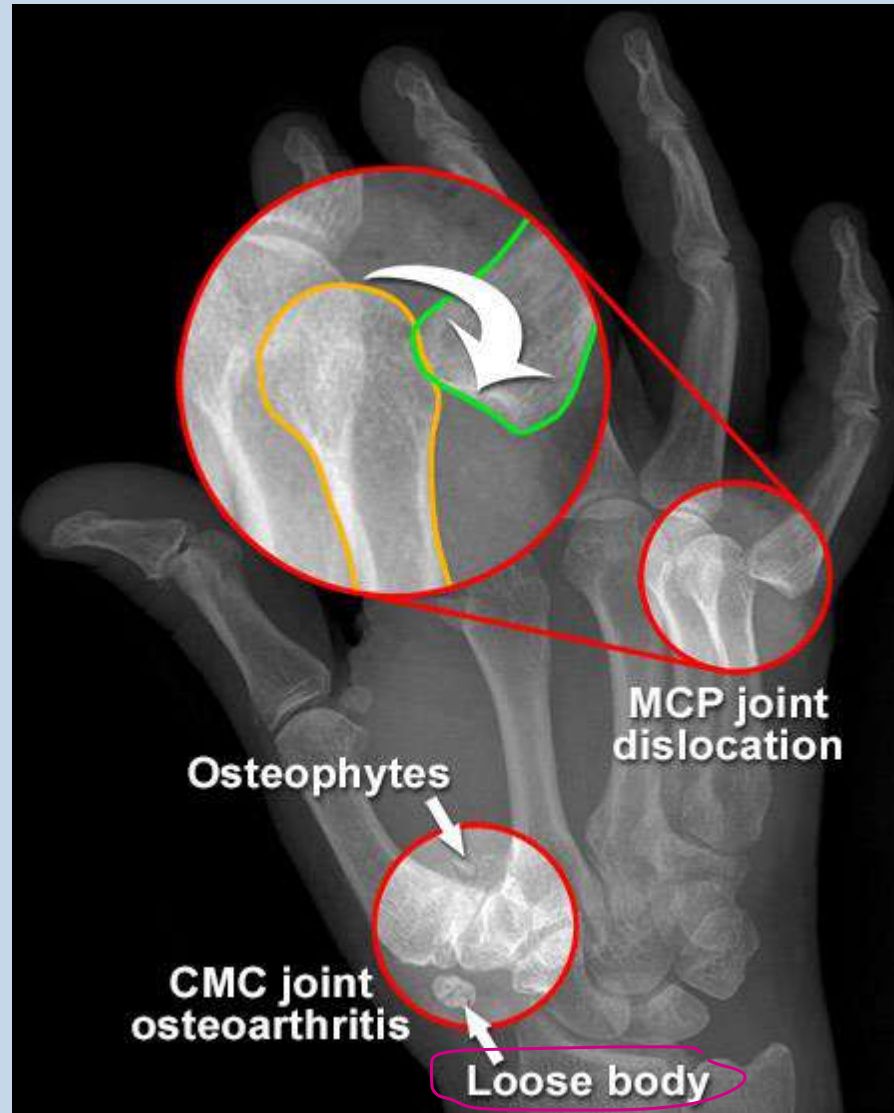
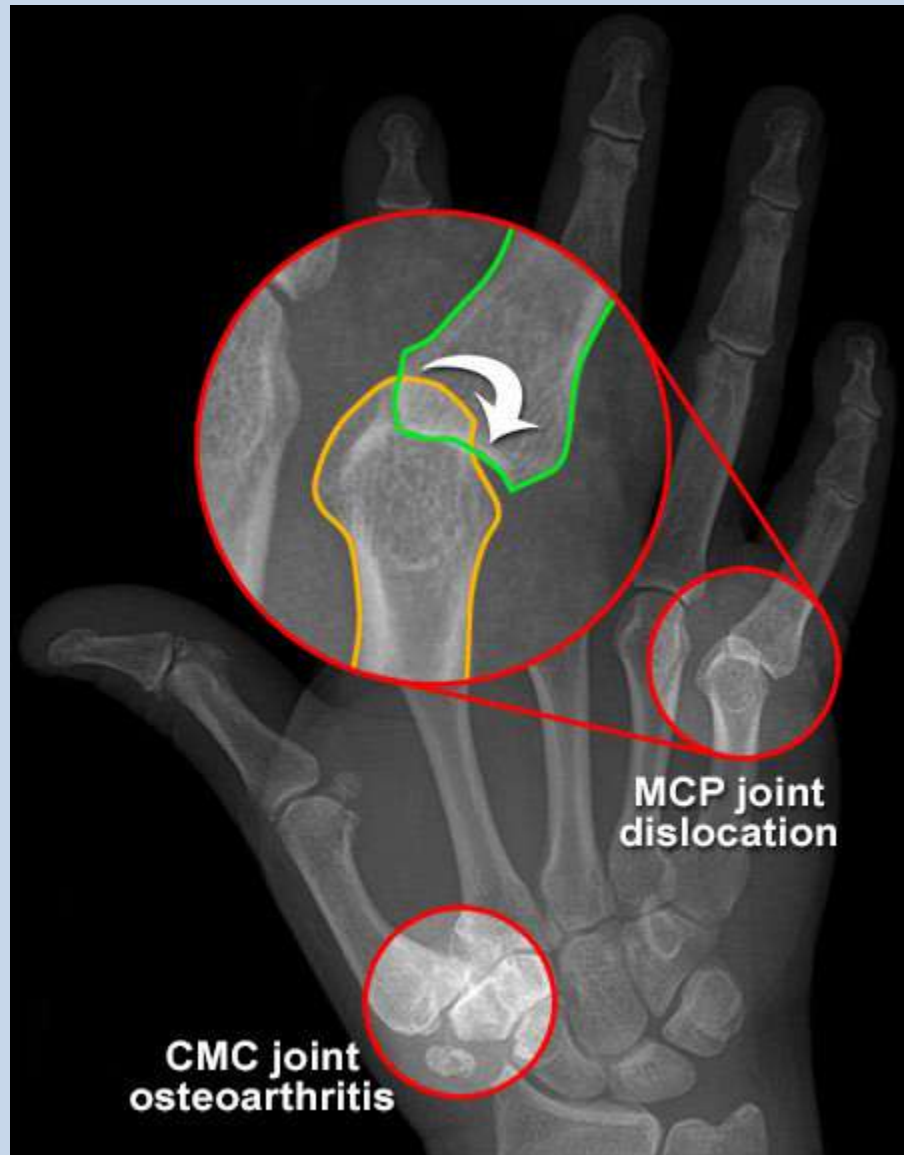
Injury to finger. DP and oblique views.

☐

Injury

☐

No injury



- ✦ Little finger metacarpophalangeal dislocation.
- ✦ Longstanding osteoarthritis of the thumb carpometacarpal joint (CMC joint) *Sclerosis + osteophytes*

CASE 11

✧ 65 year old M, hand pain, what could cause this?



↓
bone plug
into vls
overhanging edges

→ Tophi

GOUT



Initial hand films showed punched-out erosions with sclerotic borders primarily involving the 5th digit of the left hand.

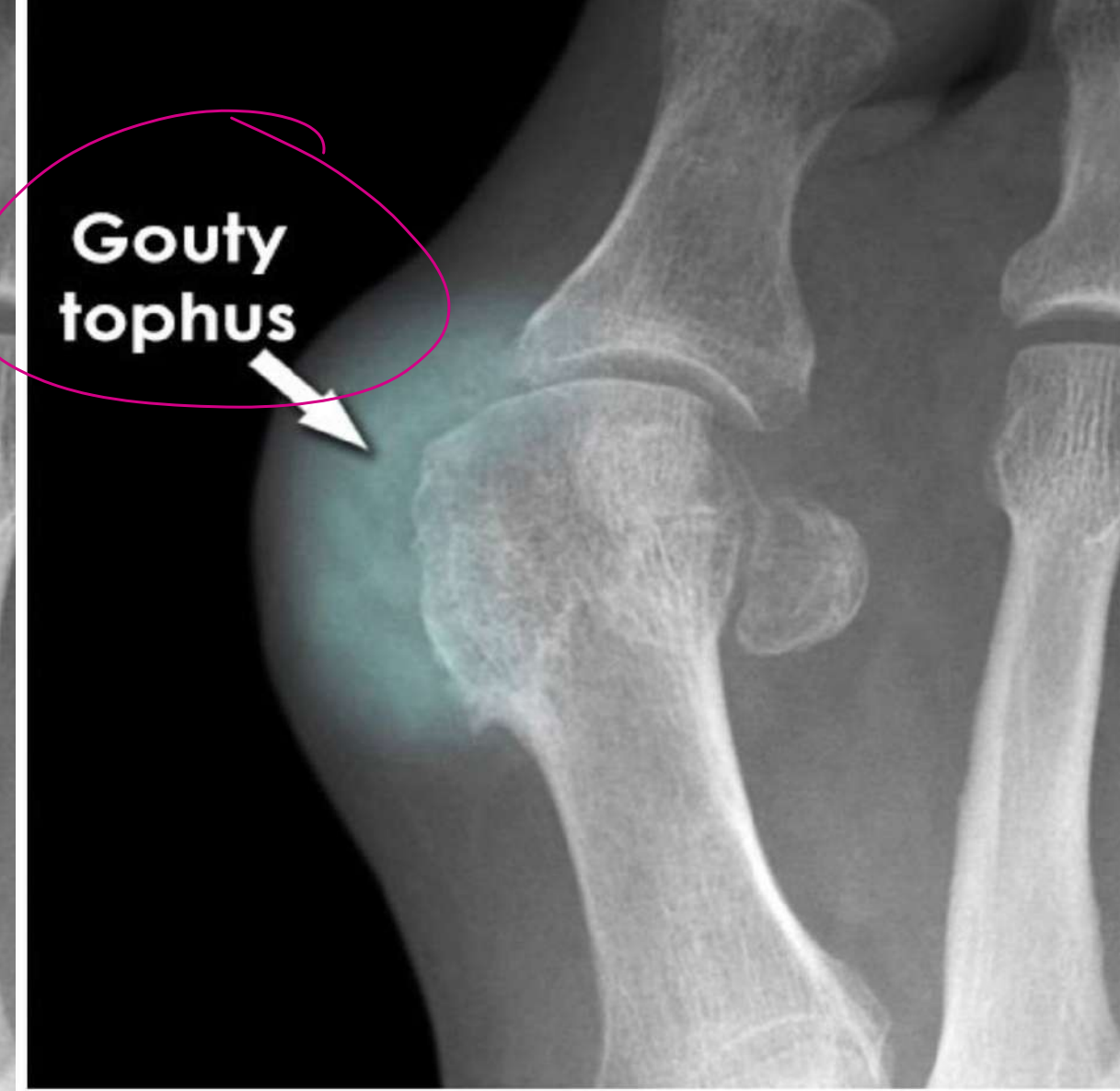
-Subsequent films, particularly the finding of a **soft**

tissue mass over a destroyed 1st MTP, make the case even more clear-cut.

- CHARACTERISTIC Radiologic features of Gout:

1. Tophi ✱
2. Normal mineralization
3. Joint space preservation
4. Punched-out erosions with sclerotic borders ✱
5. Overhanging edge of cortex ✱
6. Asymmetrical polyarticular distribution
7. Distributed feet > ankles > hands > elbows





Gouty tophi

- ◆ Speckled increased density of peri-articular soft tissue is due to deposition of monosodium urate crystals within a gouty tophus

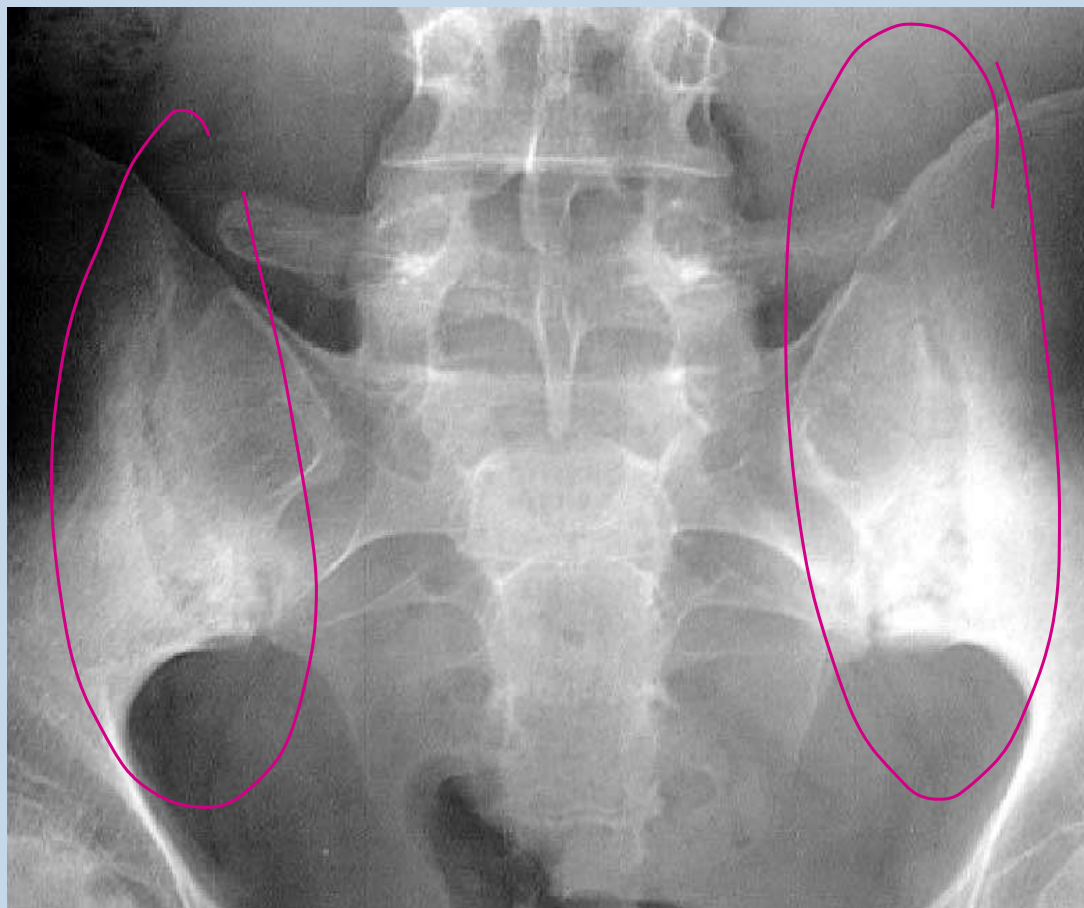
CASE 12

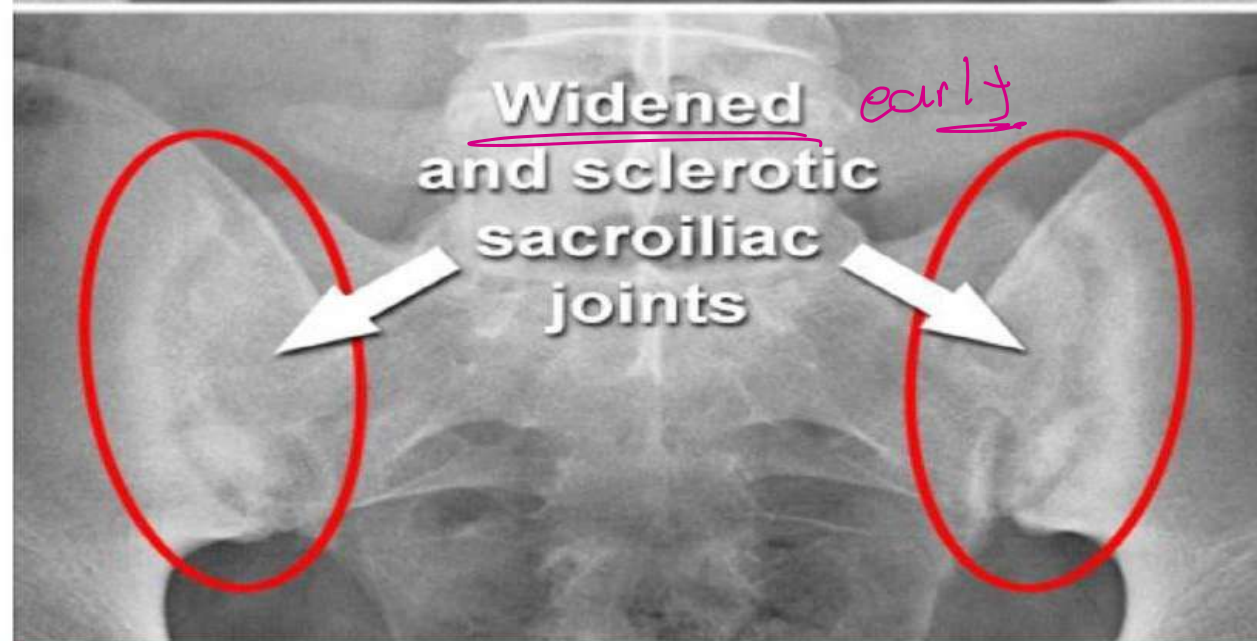


39 y/o, right hip pain, findings?

-ve RF

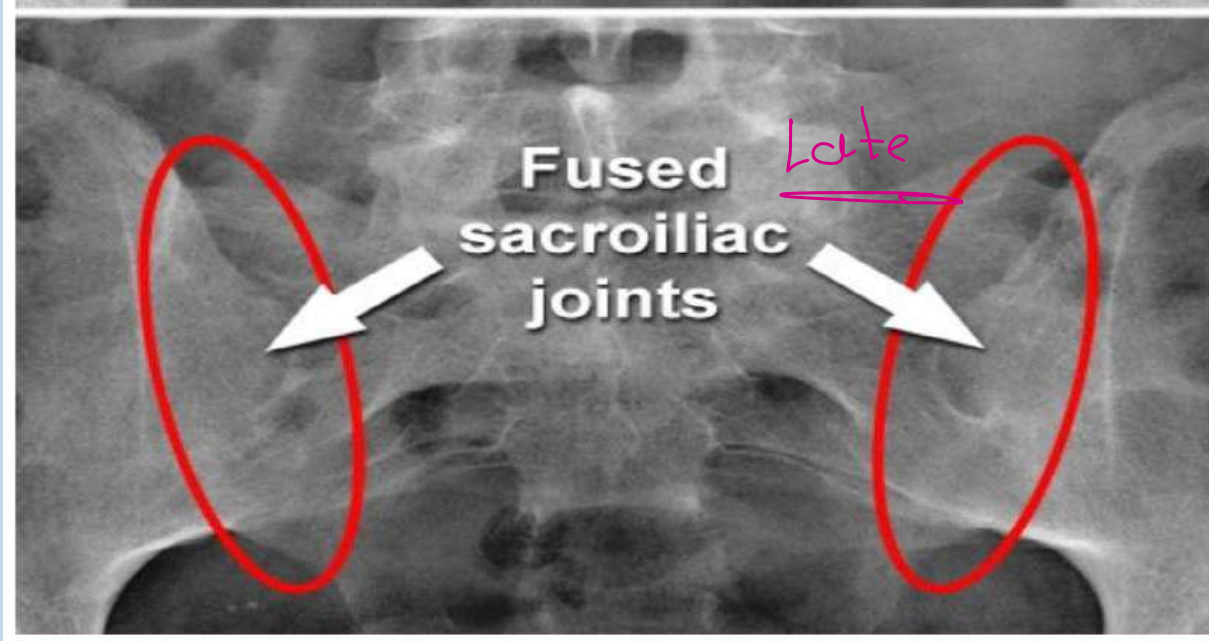
loss of
joint space





Sacroiliitis – X-ray

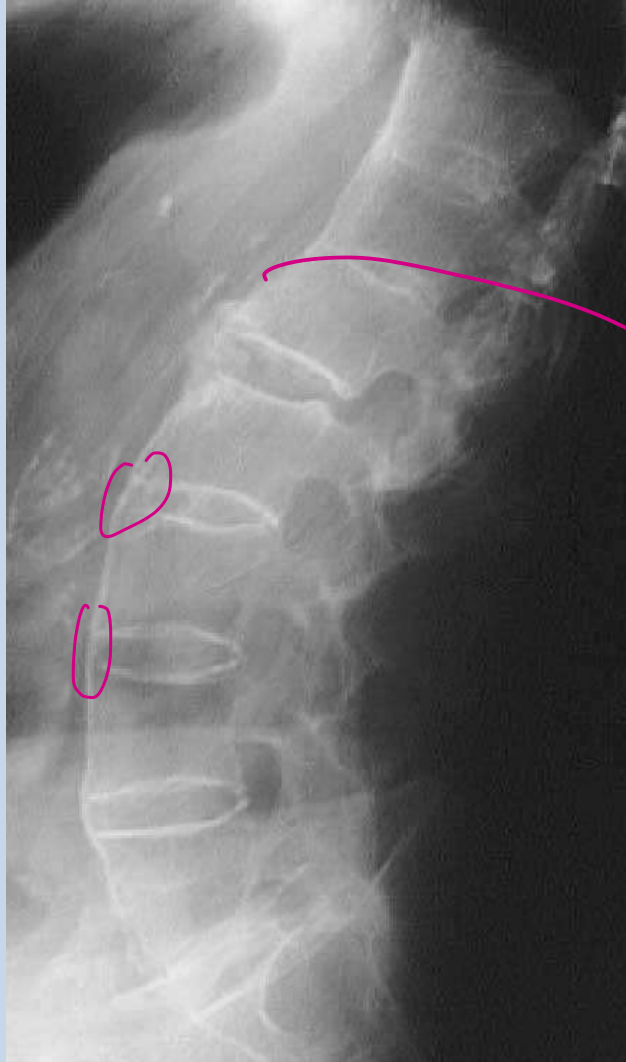
- ◆ Normal sacroiliac joints shown for comparison
- ◆ As sacroiliitis progresses the sacroiliac joints may widen and the articular surfaces become sclerotic



Sacroiliac joint fusion – X-ray

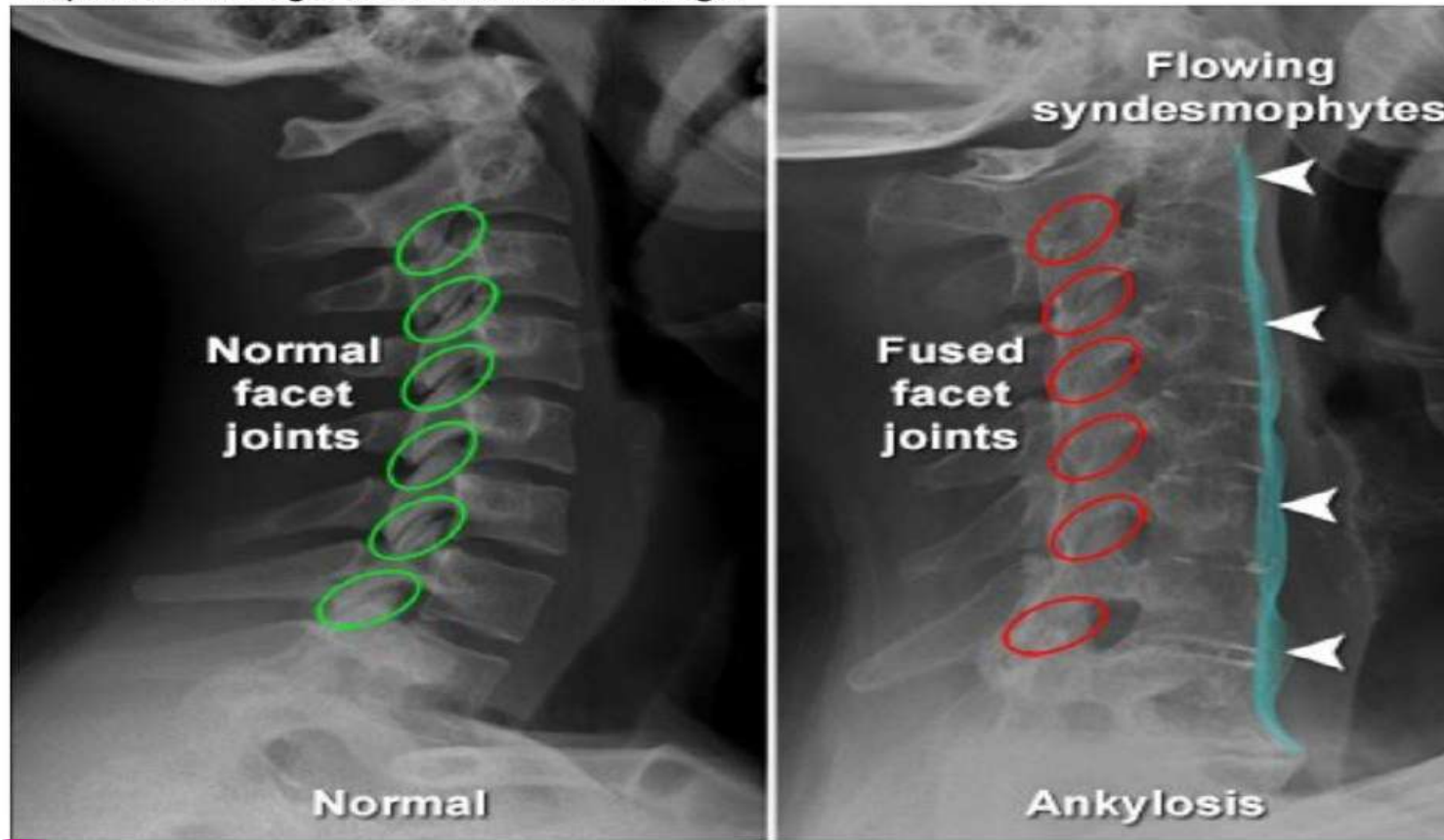
- ◆ Normal sacroiliac joints shown for comparison
- ◆ On the lower image the sacroiliac joints are not visible due to ankylosis (joint fusion)

Next Step → Spine imaging



Ankylosis – Bamboo spine

Tap on/off image to show/hide findings



Ankylosis – Bamboo spine

- ◆ Normal C-spine shown for comparison
- ◆ Flowing syndesmophytes are seen fusing the cervical spine vertebral bodies anteriorly leading to the classic 'bamboo spine' sign – the fused spine resembles bamboo
- ◆ In this patient the facet joints of the spine have also fused

ANKYLOSING SPONDILITIS

- Initial images (pelvis) showed erosions of the right hip joint and bilateral sacroileitis that is symmetric

- DDx: AS (favored because of bilateral SI joint disease); Psoriatic

arthritis, Reiter's syndrome

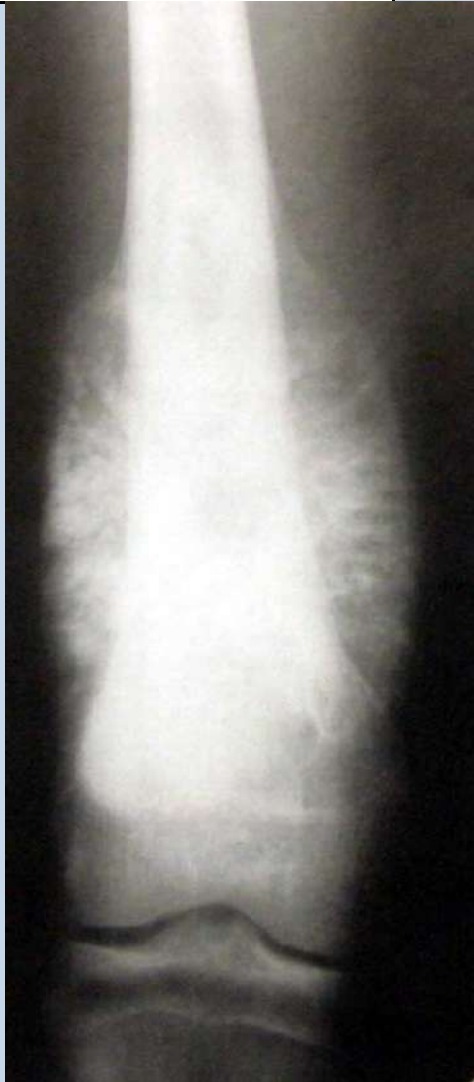
- Spine image then showed significant **enthesopathy** and development of a **pseudarthrosis**

- In the late-stage, the spine is ankylosed (fused), and can break like a long bone



CASE 13

18 month old , calf pain

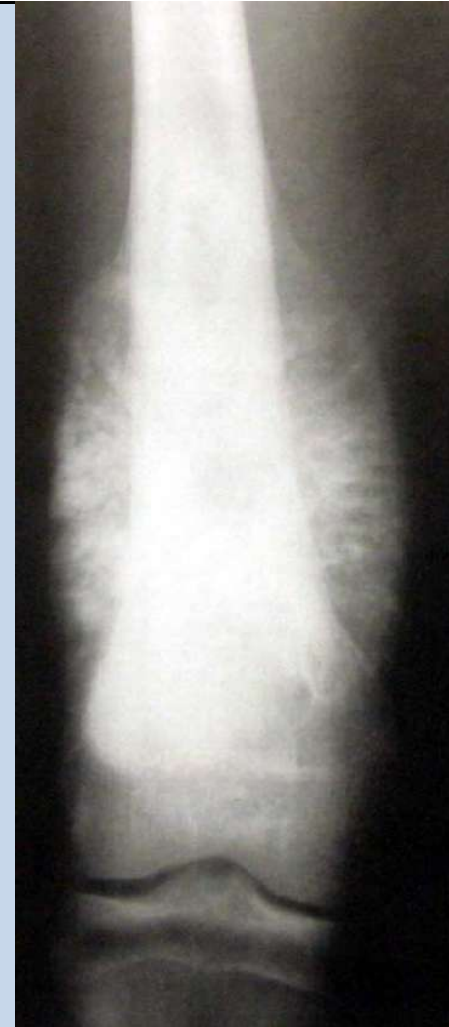


OSTEOSARCOMA

- Initial image showed a highly aggressive lesion in the distal femur, complete with a Codman's triangle, sunburst periosteal *aggressive* reaction, and new bone formation.

- Bone scan shows (not unexpectedly) intense metabolic activity, and MRI verifies the intra-osseous extent of the tumor.

- DDx: Osteosarcoma, metastasis; less likely Ewing's sarcoma, lymphoma



benign ✓
narrow zone
of transition ✓



aggressive ✓



CASE 15

35 yo F, s/p fall; ankle pain



Findings, Dx? Any
Further Imaging Needed
/ Recommended?

Next step → knee joint imaging



prox. fibular fracture

MAISONNEUVE FRACTURE



- 1st set of images showed ankle fractures involving the medial malleolus and posterior tibia. However, the widening between the distal tibia and fibula should also be noted (suggests tear of the interosseus membrane).
- Films of the proximal tibia confirm a spiral fracture of the proximal 3rd of the fibula (interosseus membrane is always torn to this point)
- Mechanism: Abduction and External rotation (forces talus laterally against the fibula); distal tibiofibular syndesmosis always ruptured
- Associated with: rupture of the deltoid ligament; one candidate initially shown only widening of ankle joint space

CASE 16

Lipoma



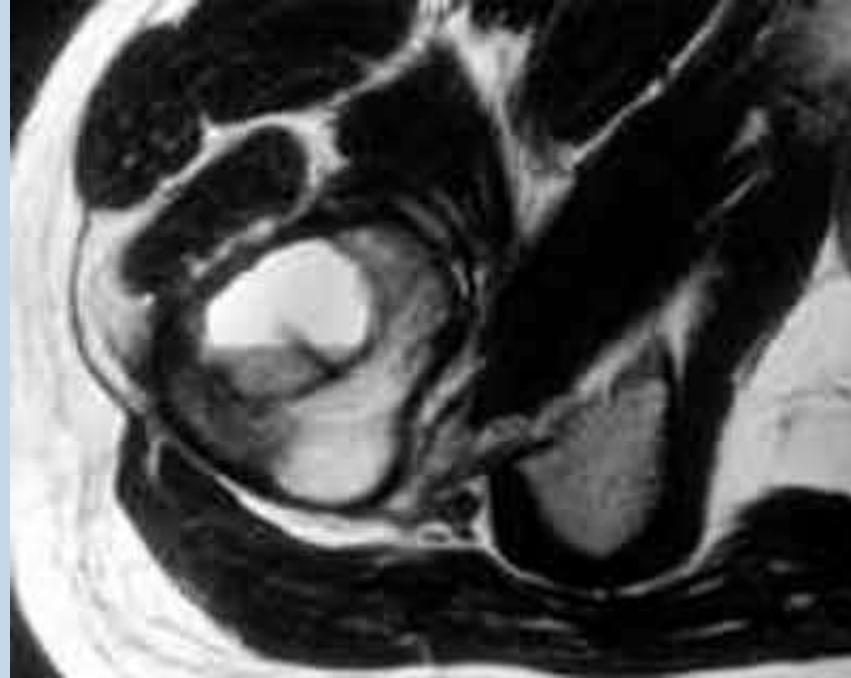
16 year old, ankle sprain

lesion ✓
non-aggressive ✓
intact cortex ✓
no periosteal reaction ✓

Bone cyst



→ Bony fragmentation

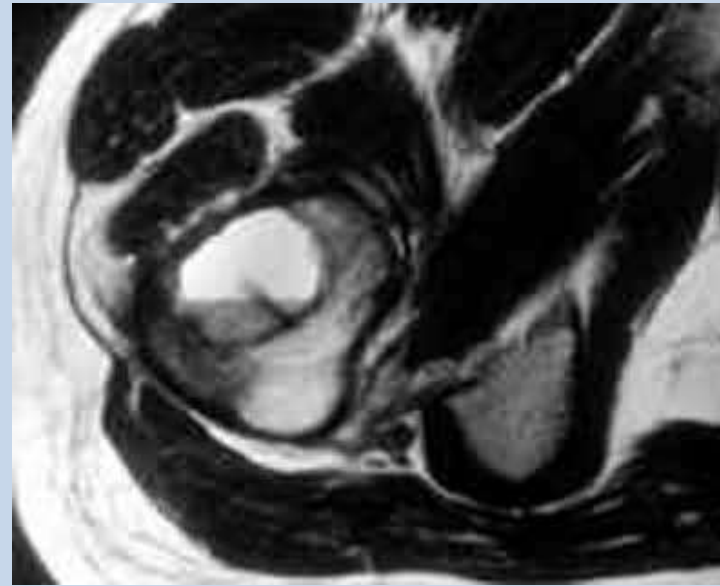


Lesion in
different
patient

SOLITARY (UNICAMERAL) BONE CYST



- Film showed a centrally-located, well-marginated lesion in a patient who is under 30 yo. **No internal matrix is visible**, and the location is "classic" for a Solitary bone cyst.
- **DDx:** **intraosseous lipoma**, ~~EG~~, ABC
- 80% of Solitary bone cysts occur in ages 3-19 yo; rare over 30 yo
- **Always** central in location (in any bone)
- Pathological fractures are relatively common (would be a reason to Rx)
- Rx: cortisone injection vs. curettage & marrow transplant



- 2nd case showed the **"fallen fragment"** sign. It is virtually **pathognomonic** when seen (although only occurs in 20%)
- MRI demonstrates the fluid-filled nature of this lesion, and also shows a fluid-fluid level (**DDx: Aneurysmal Bone Cyst**)
- The MRI also seems to confirm the intra-cyst **"fallen fragment"**
- Bone scan would show a photopenic area (unless fractured)
- Multiple theories on etiology: ? Trauma, ? Vascular anomaly

CASE 17

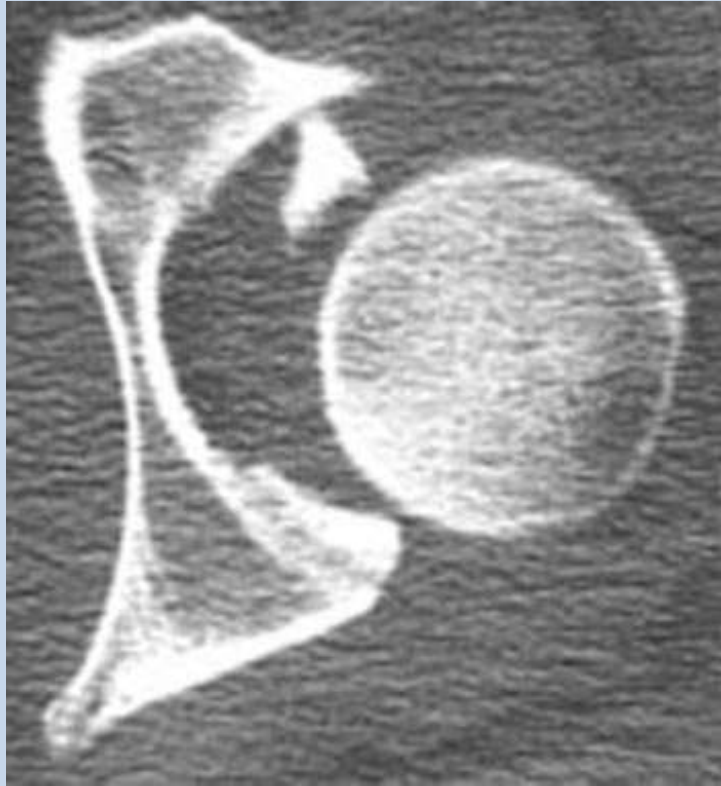
38 YO, POST- RTA





Post reduction film
Next step??

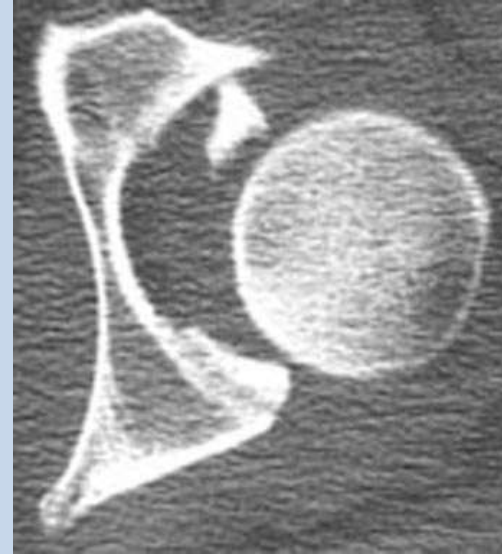
Next $\rightarrow$ CT ,



Most common posteriorly
 $\rightarrow$ we do CT $\rightarrow$ to look
for fragments

Findings, significance??

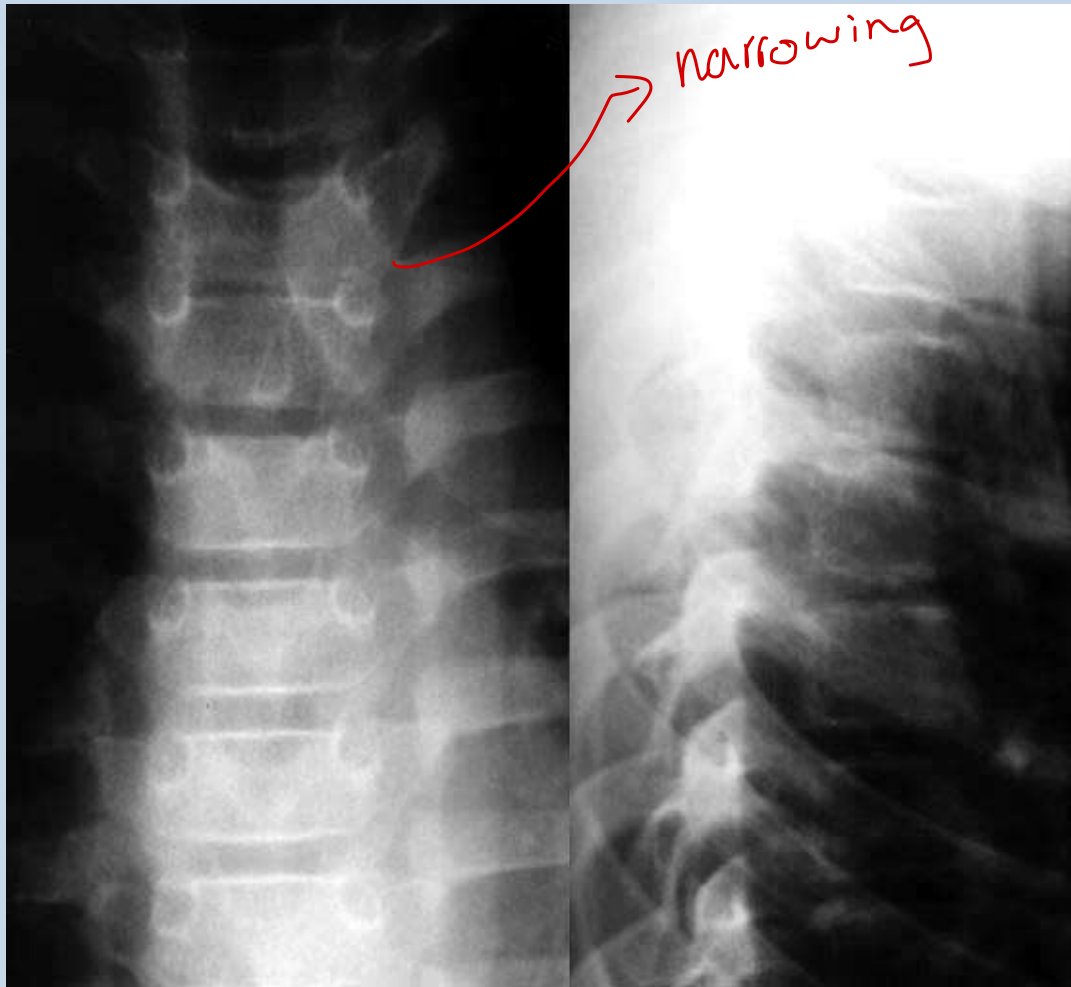
POSTERIOR HIP DISLOCATION



- Initial radiograph shows a posterior hip dislocation, subsequently relocated.
- However, CT allows one to see a fracture of the posterior rim of the acetabulum, which is subsequently trapped within the joint space
- The posterior hip dislocation is the most common type of hip dislocation (80-85%). Classically associated with the knee striking the dashboard in an MVA (also associated with femur Fx)
- An acetabular fracture with a trapped fragment in the joint will require **operative** management—this is why CT is mandatory. ⇐

CASE 18

8 year old, back pain,
fever



hypointensity



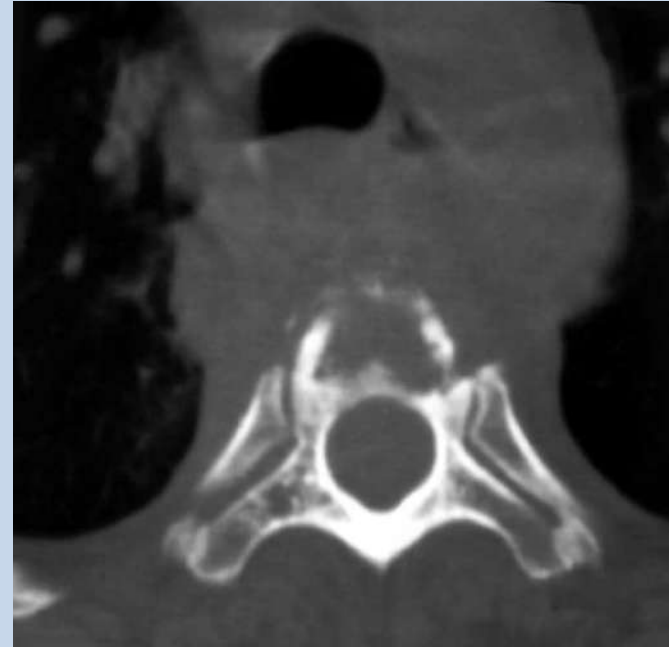
Edema
in BM

Different patient, similar
pathology

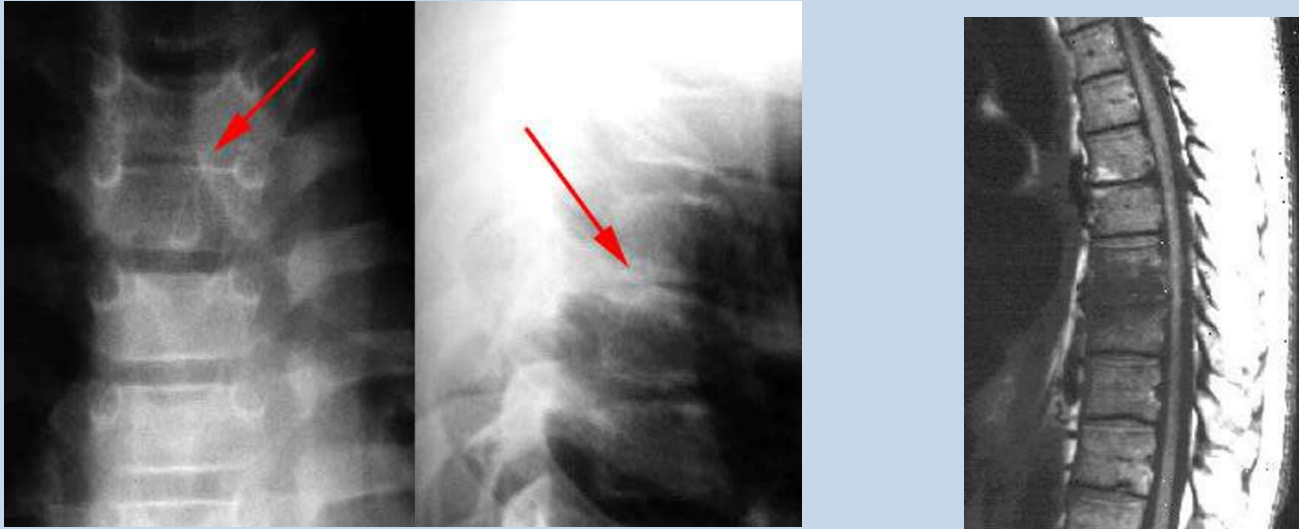
T₂



T₁



INFECTIOUS DISKITIS



- Initial radiographs were remarkable mainly for narrowing of the inter-vertebral disc space in the upper thoracic spine.
- MRI confirmed obliteration of the disc space with edema extending into the surrounding vertebral bodies, consistent with diskitis
- Final images (separate case) showed an epidural abscess as well as a paraspinal mass, suggestive of Pott's disease (tuberculosis)

THANK YOU