

At least it is only fractured and not broken...Radiological Case Studies

Skin, Bones, Hearts & Private Parts

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SAINT LOUIS  
UNIVERSITY

# Top 5 fractures

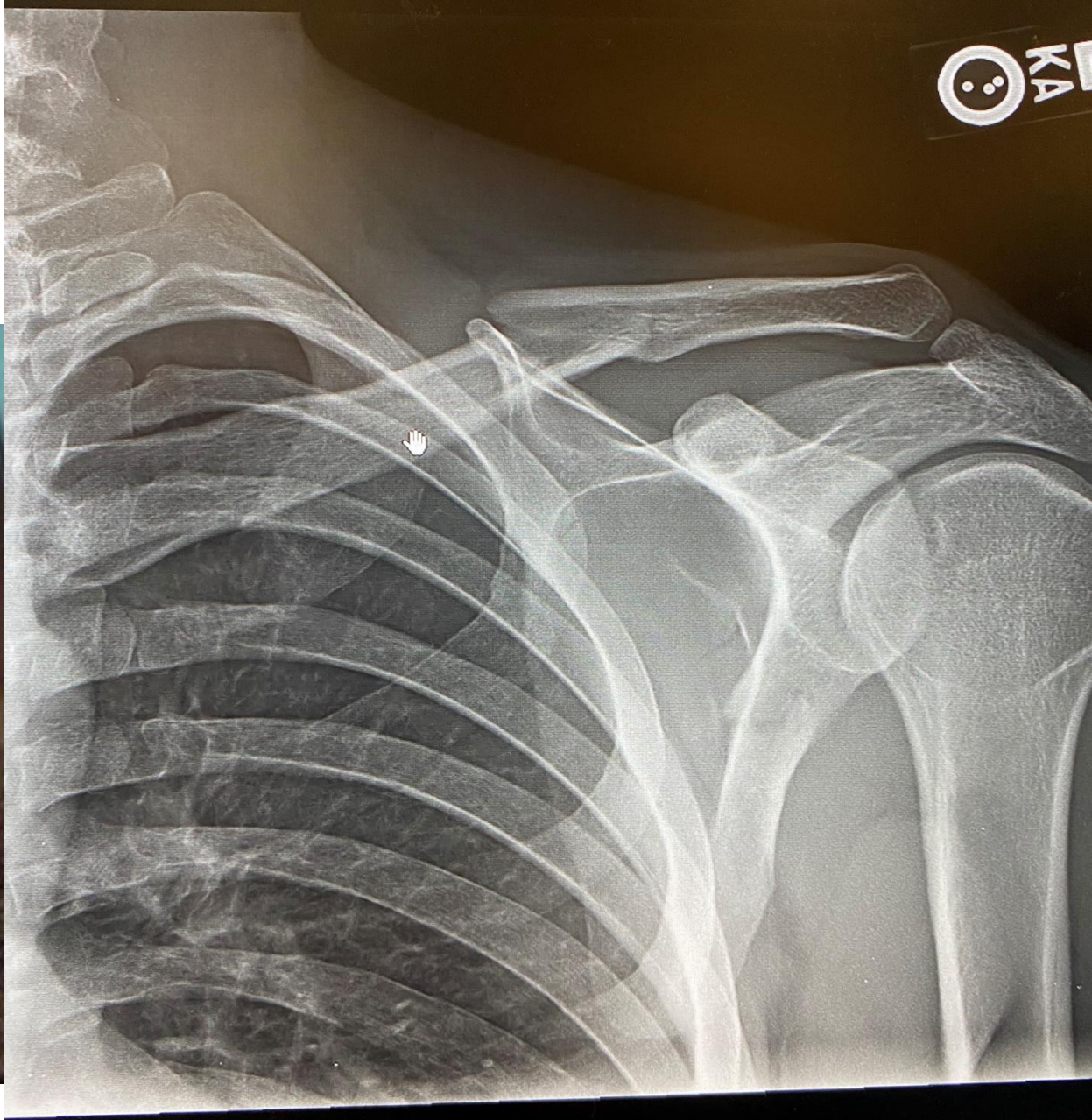
1. Clavicle
2. Forearm / Proximal Humerus
3. Wrist / Distal radius
4. Hip
5. Ankle

Honorable mentions go out to fingers, toes, and hands !

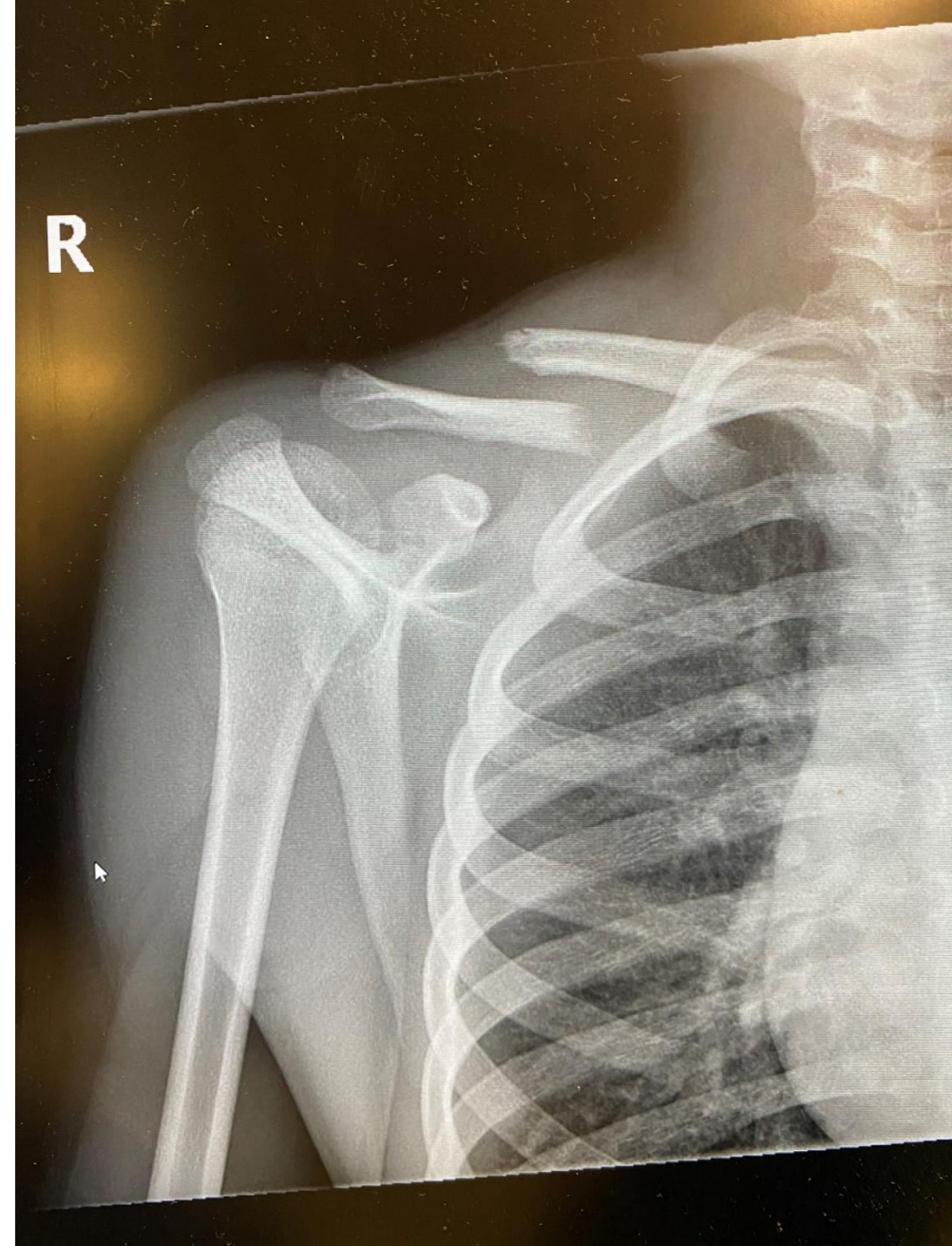
# Audience Poll

- What is the most common bone to fracture?
- A. Metatarsal
- B. Vertebral Body
- C. Clavicle
- D. Distal Radius

What do you see ?



- Fall onto shoulder or outstretched hand (FOOSH)
- Remember to check for other injuries.. Shoulder, elbow, neck, wrist
- Ice
- Sling (some like Fig 8)
- Gentle activity OK
- Mid shaft most common
- Occasionally require operative management



# Case

Fell on a tucked arm. Pain “upper arm” ?

- What is the Diagnosis ?
- A. anterior dislocation
- B. Posterior dislocation
- C. Proximal humerus fracture
- D. Proximal humerus fracture and dislocation?



# Answer is C

- Common fracture of older population from ground level fall
- 4-6% of all fractures
- 2x more common females
- Third most common non-vertebral fracture in the elderly
- Treat with sling/ immobilizer for minimally displaced fractures.
- Arthroplasty for moderate severe to complex fractures (including displaced fractures)

What do you see?

What is a concern about this injury?

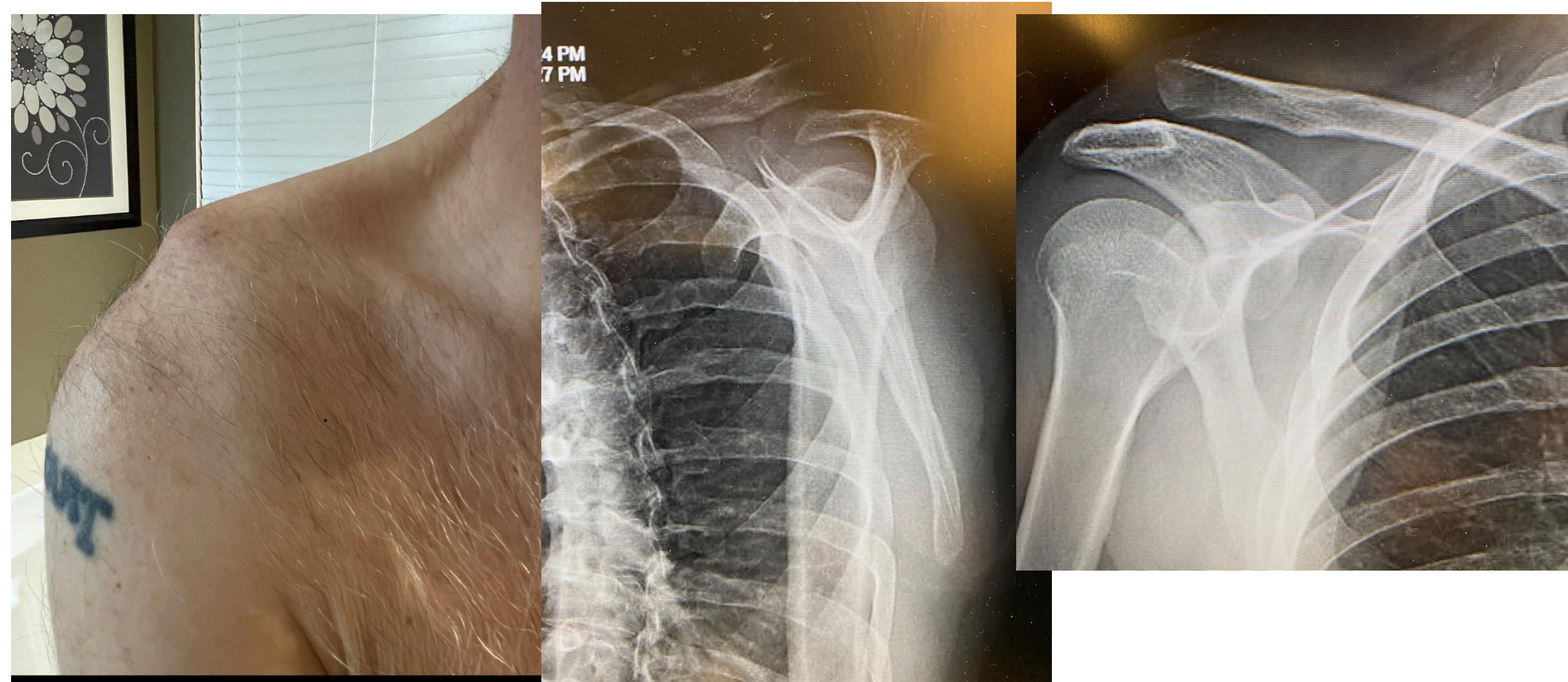
This is a 42 y/o with fall standing height  
No other injuries other than “my arm hurt”





- Axillary nerve injury: a branch off the brachial plexus. Assist with Abduction of the shoulder
- Common injuries that cause axillary nerve problem
  - Shoulder dislocation
  - Fracture of surgical neck or humerus
- Common findings
  - Shoulder / arm weakness
  - Numbness tingling in the arm
  - Limp hanging arm

45 y/o fell over handlebars on a pedal bike and presents to the ER with a “dislocated shoulder” as his chief complaint. He is neurovascular intact in the affected extremity. You notice an obvious deformity. What do we see here??



# 32 y/o fell and complains of elbow pain

- Radial head/ neck fractures are very common from fall (especially backwards outstretched).
- Pain increased with supination
- Pain increased with extension
- Will present flexed at 90 with palm to abdomen.
- Increased risk of decreased ROM
- Look for sail sign.



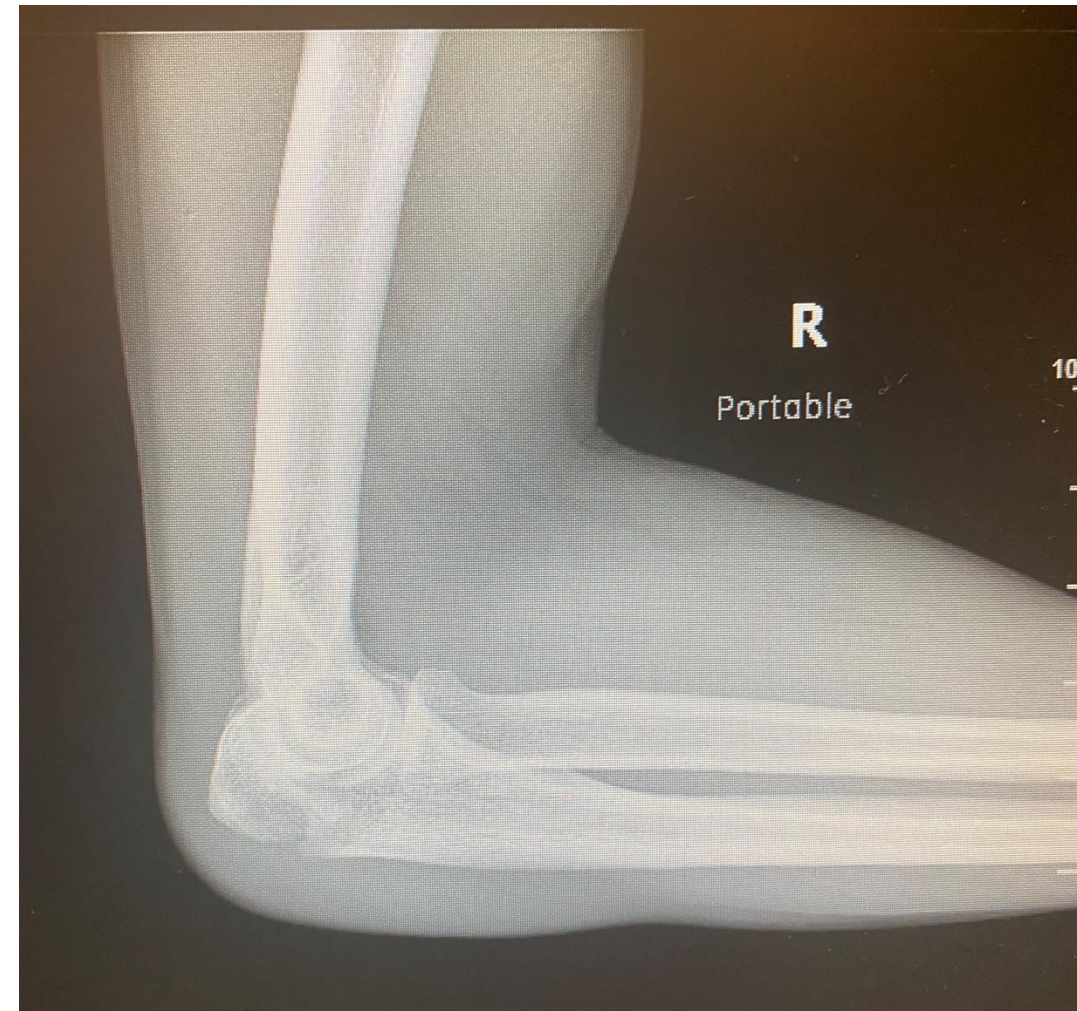


Look for  
sail  
sign??

Look at  
radial  
head and  
neck  
region??



# What do you see??



# 12 y/o fell off bike and presents with arm pain

- One of the most common Peds fracture 40%
- Any other injury
- Neurovascular intact
- Pain control
- NPO status
- Closed reduction with casting for most. Surgery generally for near skeletal maturity or severe angulation



# What do you see?



- A. Metacarpal fracture
- B. Distal radius fracture
- C. Ulna fracture
- D. Both distal radius and ulna fracture

- FOOSH
- 17% of adult fractures
- Younger adults higher energy mechanism
- Older adults lower (standing height fall)
- Half intra-articular

What do you see??

Fall with wrist pain. No prior injury



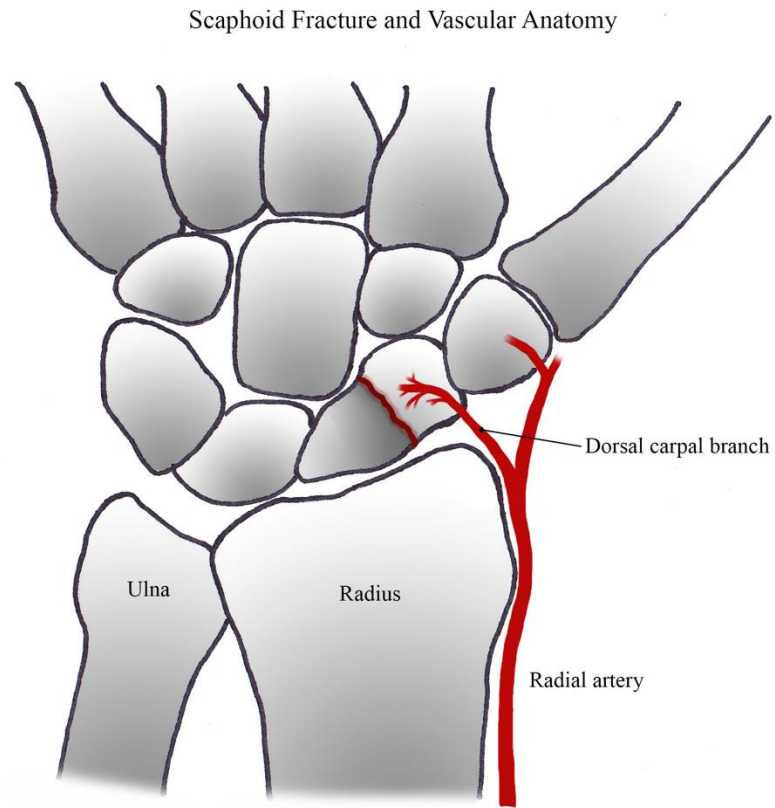
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- A. Fracture distal radius
- B. Fracture lunate
- C. Fracture scaphoid
- D. Negative for fx



Scaphoid/ navicular fracture of the wrist is at high risk for AVN  
Most common carpal bone to fracture  
FOOSH injury  
May need CT or MRI to confirm  
65% are waist fracture



Heather Young 6/7/2015



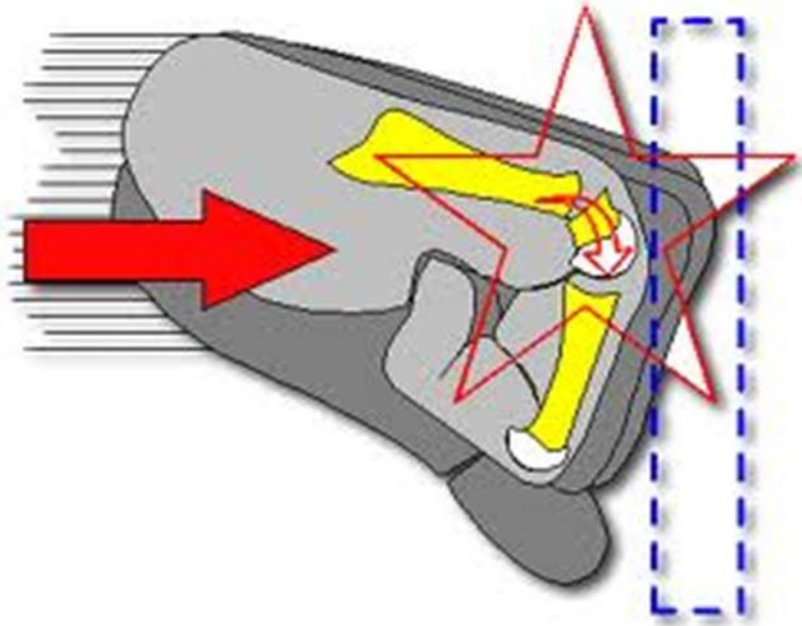
18 y/o boy mad at his girl friend and hits a locker!

What do you see?

- A. Wrist fracture
- B. No fracture
- C. Distal metacarpal fracture 5<sup>th</sup>



Angry teenager with fracture of the 5<sup>th</sup> metacarpal (boxer fracture)



Pleasant 45 y/o caught finger in clothes and has now deformity and pain

What do you see?

- A. Fractured 5<sup>th</sup> finger
- B. Fractured metacarpal
- C. PIP dislocation
- D. Negative X-ray



Same unlucky patient 2 years later.. Can we just pull it back into place?

What do you see?

- A. Fractured proximal 5<sup>th</sup> finger
- B. Fractured metacarpal
- C. PIP dislocation
- D. Negative X-ray



What is the smallest bone in the human body?

- A. Hyoid
- B. distal phalanx
- C. Stapes/ Stirrup
- D. Obecalp (small bone in the skull)

78 y/o fall from standing height  
Pain in the left groin  
unable to bear weight  
Pain with internal external range of motion  
Neuro-vascular intact

What do you see?

- A. Negative x-ray
- B. Pubic rami fracture
- C. Acetabular fracture
- D. Intertrochanteric fracture

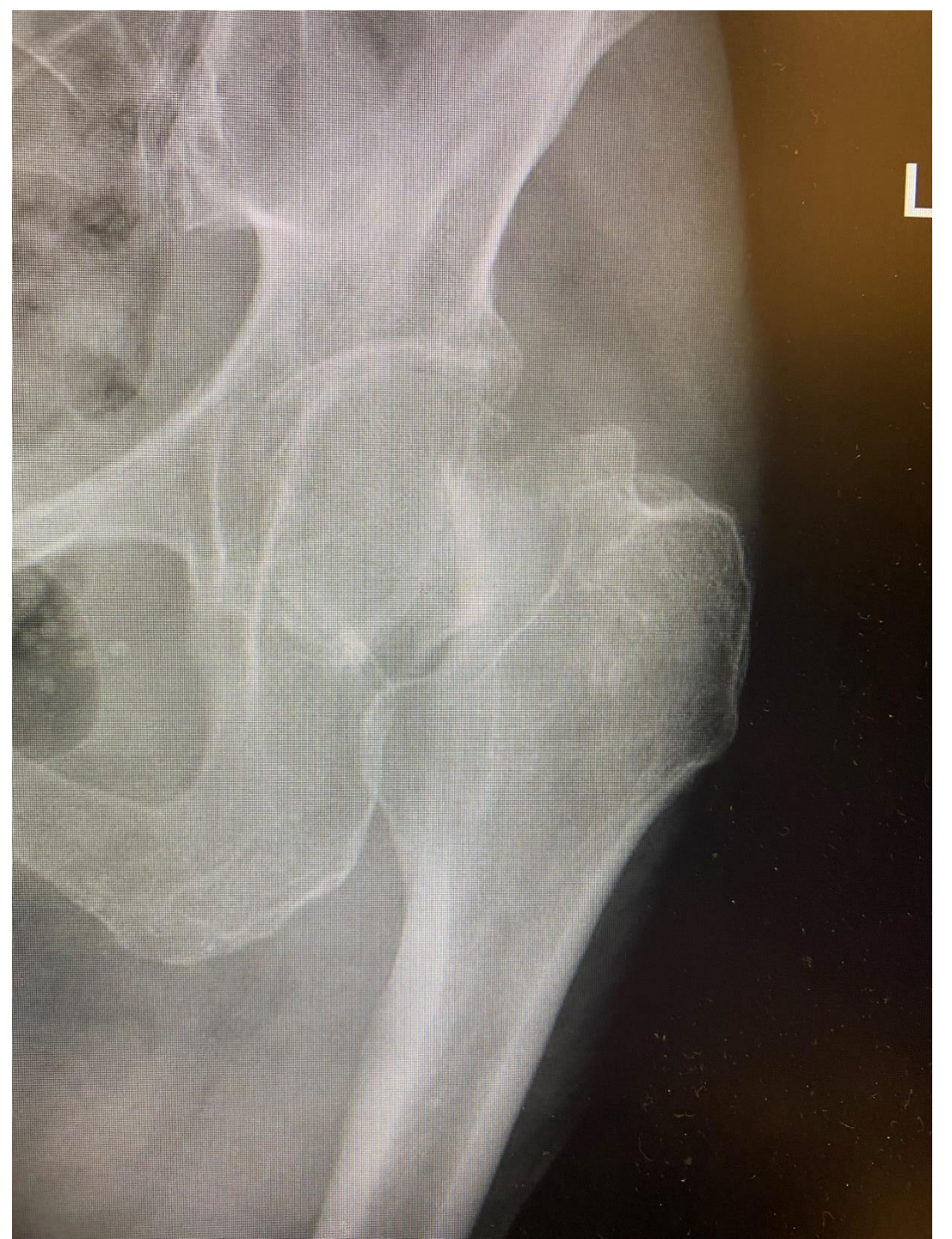
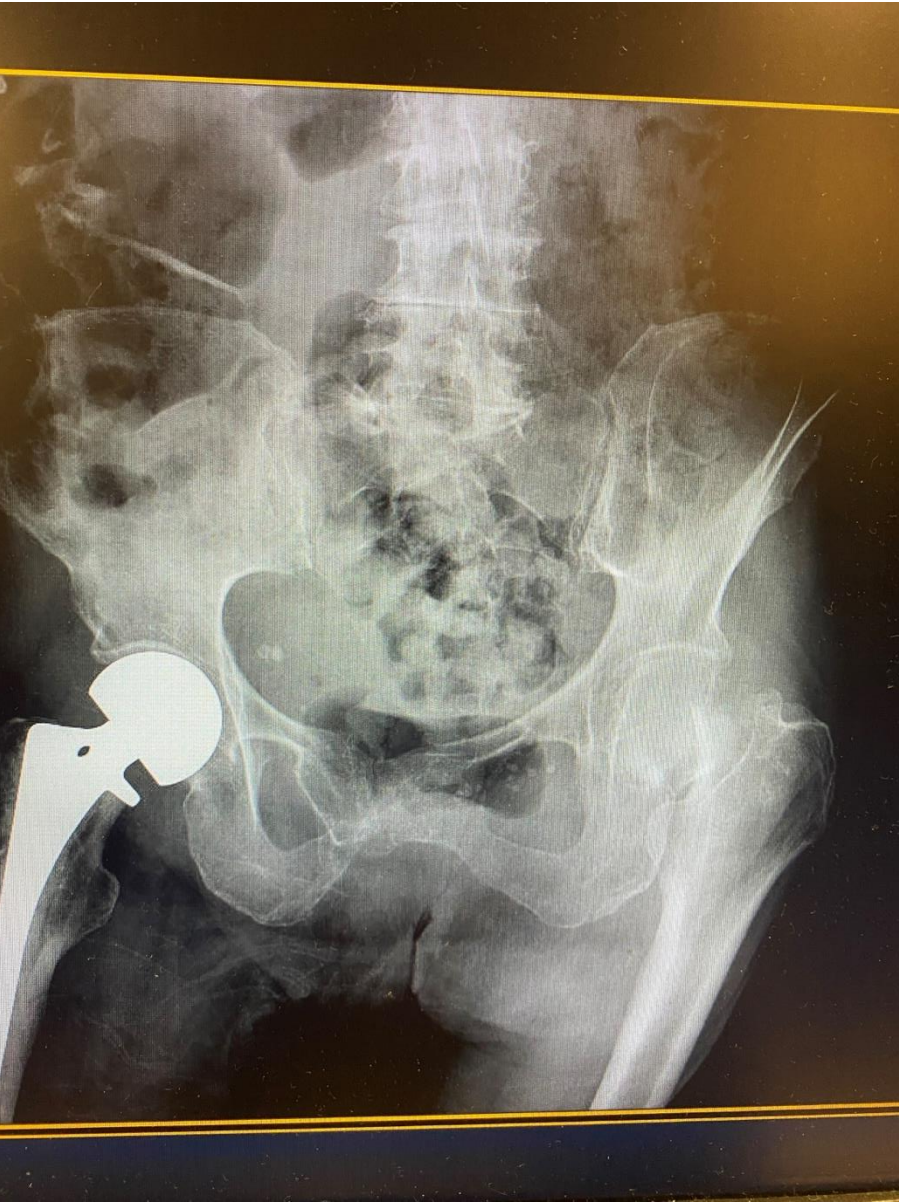


# Left IT fracture

- Common Hip fracture location in elderly following a fall ground height
- More common in females
- More common than Femoral neck fractures
- Treat surgically with DHS (dynamic hip screw) vs Nail depending on patient and exact location of fracture.
- Increase risk of mortality in first year
- Increased rates of PNA, UTI, DVT, & Decub



What do you see??



Few More FN FX



# What Do You See?

- A. Hip fracture
- B. Normal X-ray hip
- C. Pubic rami fracture
- D. Dislocation of hip prosthesis



What do you see?

75 y/o female with groin pain after fall

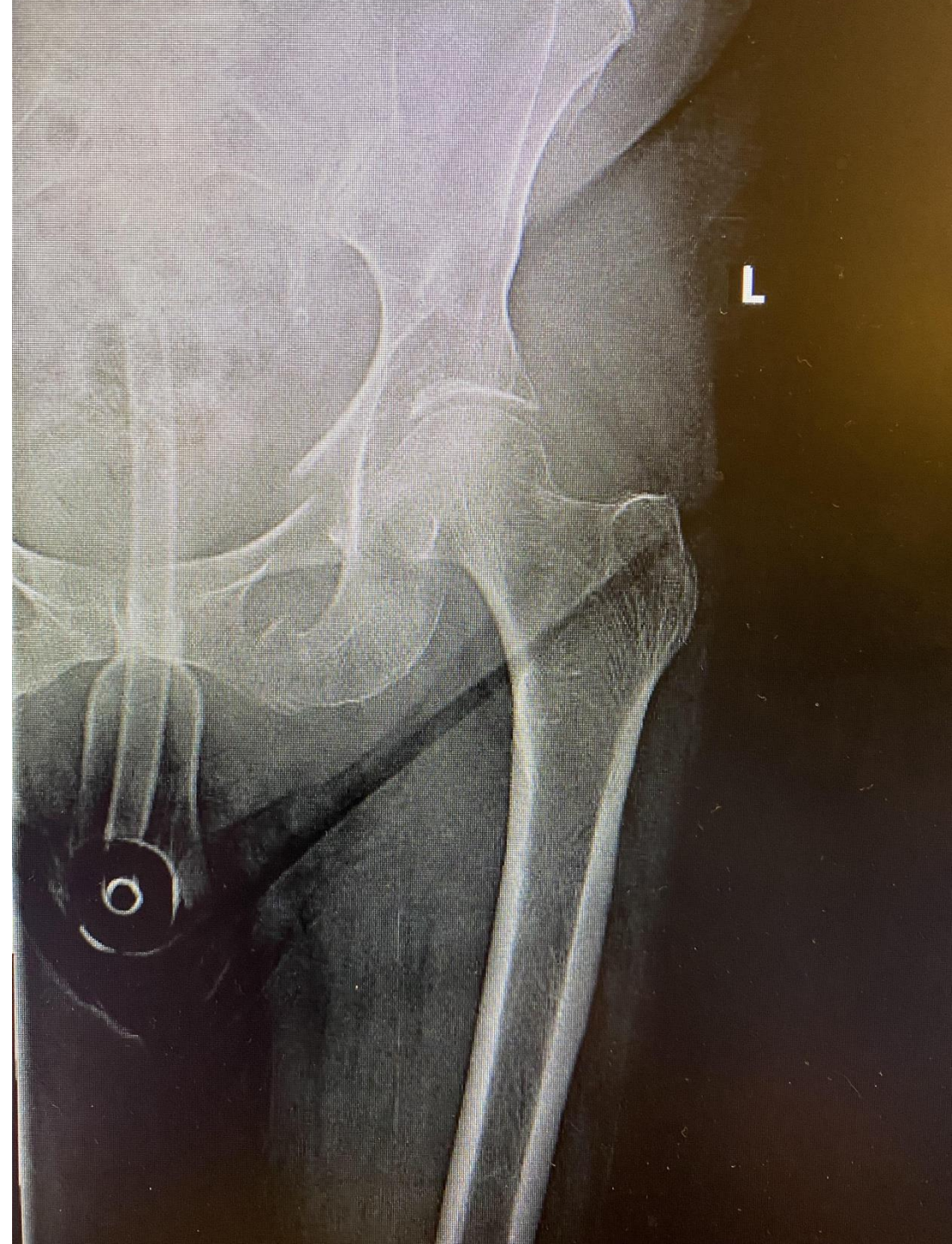
No shortening or rotation

Neurovascular intact

Very painful with movement

What do YOU see?

- A. Femoral neck fracture
- B. IT fracture
- C. No fracture
- D. Superior pubic rami fracture

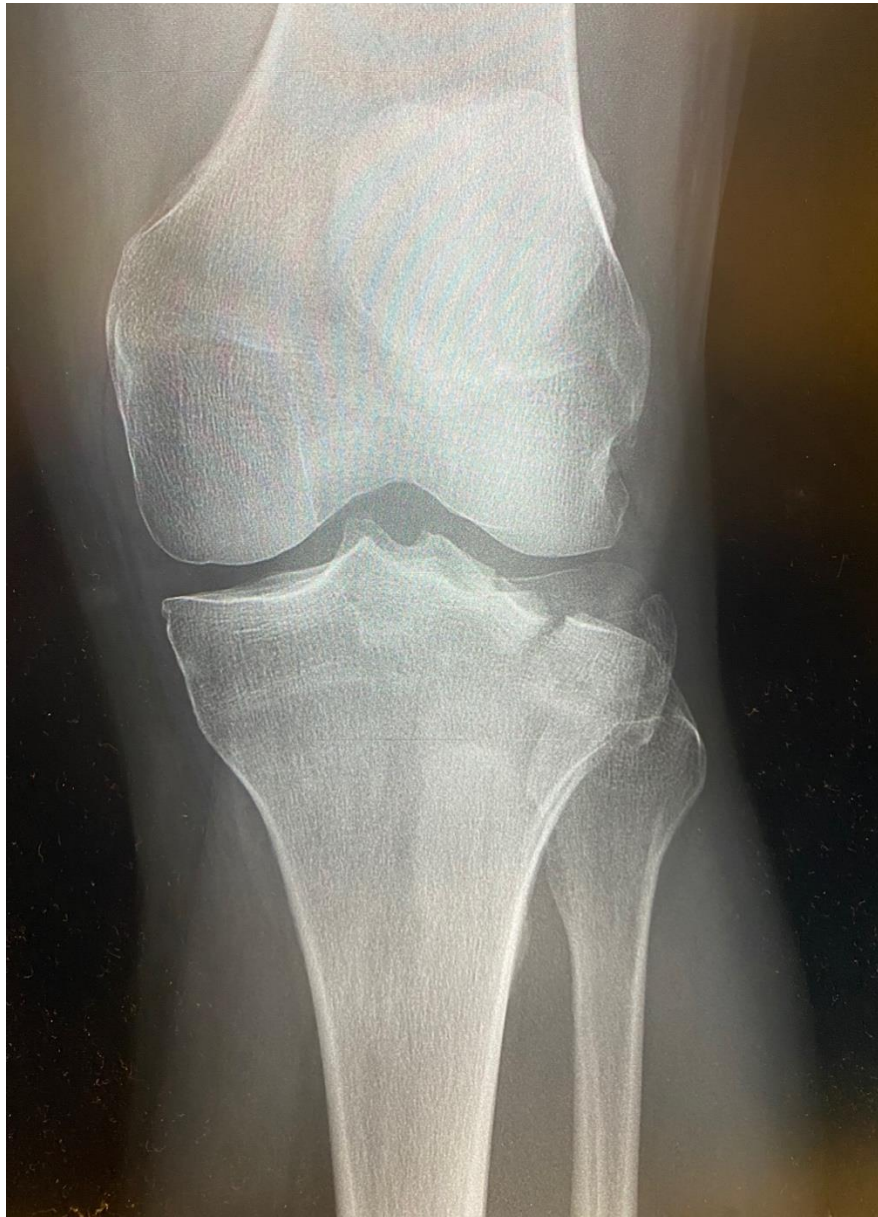


## Superior Pubic rami fracture

- Stable fracture
- Often affects both superior and inferior at the same time (ring)
- Pain control
- Wheel walker with WBAT

Patient fell onto there knee. Unable to bear weight.  
Moderate swelling and significant pain. What do YOU see?

- A. Tibial plateau fx
- B. Patella FX
- C. No Fracture
- D. Femoral condyle fx



## Tibial Plateau Fracture

- Tibial plateau fractures are periarticular injuries of the proximal tibia frequently associated with soft tissue injury.
- Diagnosis is made with knee radiographs but frequently require CT scan for surgical planning.
- Treatment is often surgical reduction and fixation in the acute setting versus delayed fixation after soft tissue swelling subsides.

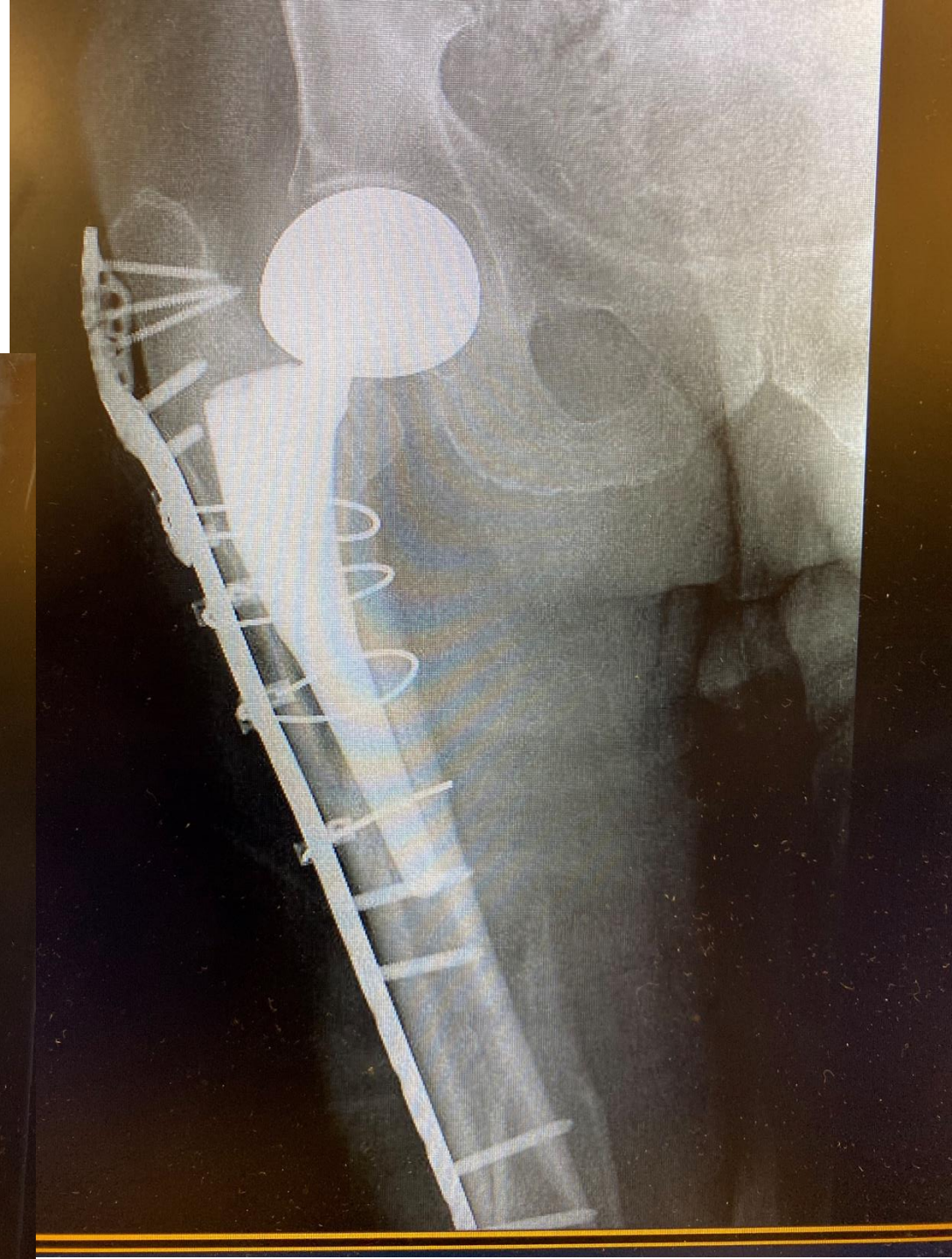




What do You see?



What do You see?



28y/o rolled ankle and  
has pain on the  
“outside”  
Able to bear weight

- What do You see?
- A. Medial Malleolus Fx
  - B. Lat Malleolus FX
  - C. Bi-Malleolus Fx
  - D. No Fracture



## Lateral Malleolus Fracture

- isolated medial malleolus fracture
- isolated lateral malleolus fracture
- bimalleolar and bimalleolar-equivalent fractures
- Be sure to palpate the proximal fibula (Maisonneuve Fx)
- Look at mortise view for ankle joint stability
- Unilateral lateral malleolus generally treated boot/ walking cast
- Medial requires surgery due to deltoid ligament disruption
- Bi & Tri malleolus require surgery for joint stabilization

Good example of  
tri-malleolar  
fracture (medial,  
lateral, and  
posterior tibia)

Very unstable  
injury



45 y/o fell out of deer stand with complaints of sever foot pain. Unable to walk after fall.

What do You see?

- A. Ankle Fx
- B. Calcaneus Fx
- C. No Fracture
- D. Talus Fx



## Calcaneus fracture

- Calcaneus fractures are the most common fractured tarsal bone and are associated with a high degree of morbidity and disability.
- Diagnosis is made radiographically with foot radiographs with CT scan often being required for surgical planning.
- Treatment is nonoperative versus operative based on fracture displacement and alignment, associated soft tissue injury, and patient risk factors
- vertebral injuries in 10%
- contralateral calcaneus in 10%

29 y/o rolled ankle and presents with complaints of foot pain.  
What do you see?

- A. No Fracture
- B. Phalanx fracture #5 digit
- C. Navicular fracture
- D. Base of the 5<sup>th</sup> proximal metatarsal fracture





## Base of the 5<sup>th</sup> Metatarsal Fracture

- Metatarsal fractures are among the most common injuries of the foot that may occur due to trauma or repetitive micro stress.
- Diagnosis is made with plain radiographs of the foot.
- Treatment may be nonoperative or operative depending on the specific metatarsal involved, number of metatarsals involved, and fracture displacement.
- 5th metatarsal most commonly fractured in adults
- 1st metatarsal most commonly fractured in children less than 4 years old
- 3rd metatarsal fractures rarely occur in isolation
- 68% associated with fracture of 2nd or 4th metatarsal
- Most treated non-operatively

68 y/o DM patient presents with foot pain, redness, warmth, swelling. No injury. Increased pain with ambulation. You also notice a 2.5 cm ulceration near the 5<sup>th</sup> MTP



What do you see?

- A. Vascular changes only
- B. Phalanx fractures
- C. Gas consistent with deep infection
- D. Gas and vascular changes



## Gas and Vascular changes

**Blue arrow**: vascular calcifications commonly seen with poorly controlled DM

**Green arrows**: gas seen with deep infection



What do You see??



Acute pain left great toe after hitting on furniture in middle of the night.



- What do you see?
- A. Sesamoid fracture
- B. 1<sup>st</sup> metatarsal fracture
- C. Proximal phalanx fracture
- D. No fracture

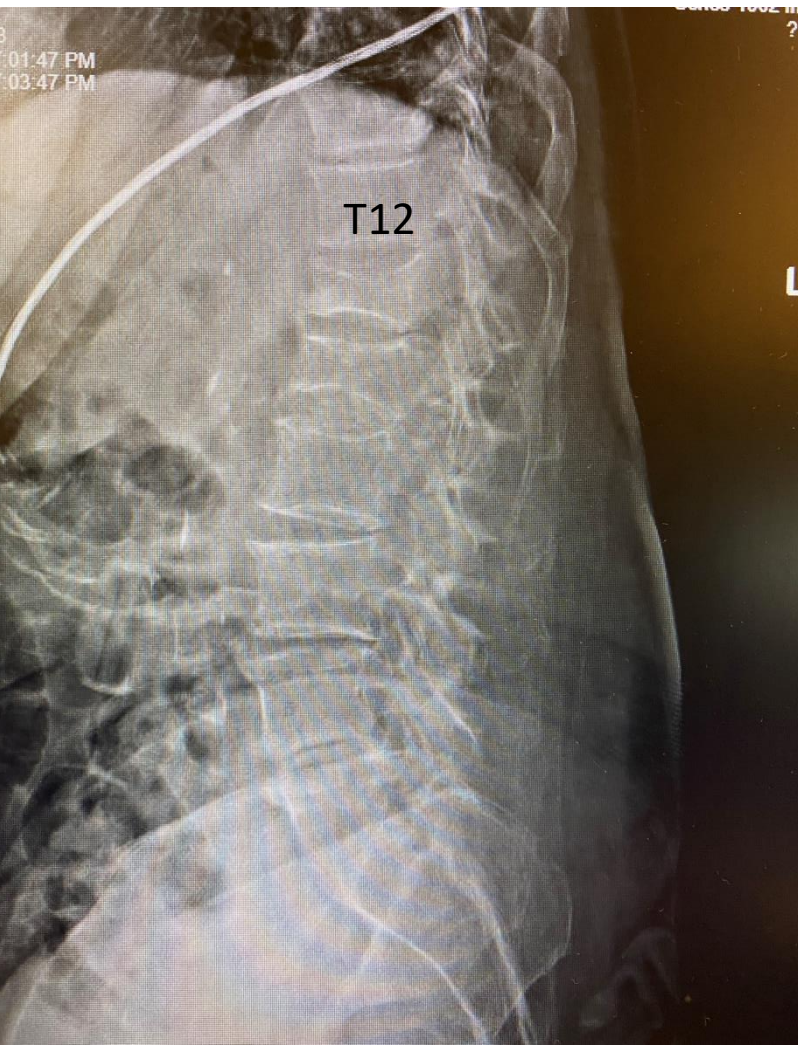
Little toe caught on corner walking through the house. Pain / swelling

What do you see?

- A. No fracture
- B. 5<sup>th</sup> metatarsal fracture
- C. 5<sup>th</sup> proximal phalanx fx
- D. Dislocation of the 5<sup>th</sup> digit



85y/o female to ER by EMS after bending over to pick up her small dog. Severe pain and unable to move so her husband called 911



What do you see?

- A. Lots of osteoarthritis
- B. Negative X-ray
- C. Vertebral compression fracture(s)
- D. Spondylolisthesis



This patient has L1 & L2 compression fractures presumed acute

- Osteoporotic Vertebral Compression Fractures are very common fragility fractures of the spine that affect up to 50% of people over 80 years old.
- Diagnosis can be made with lateral radiographs. Determining the acuity of a fracture requires an MRI or bones scan.
- Treatment is usually observation and pain management. Kyphoplasty is reserved for patients with recalcitrant symptoms after nonoperative treatment for 4-6 weeks fails. Assessment and management of osteoporosis is indicated in the presence of these injuries



What is the only bone in the body not connected to any another bone? Last one.... I promise!!!

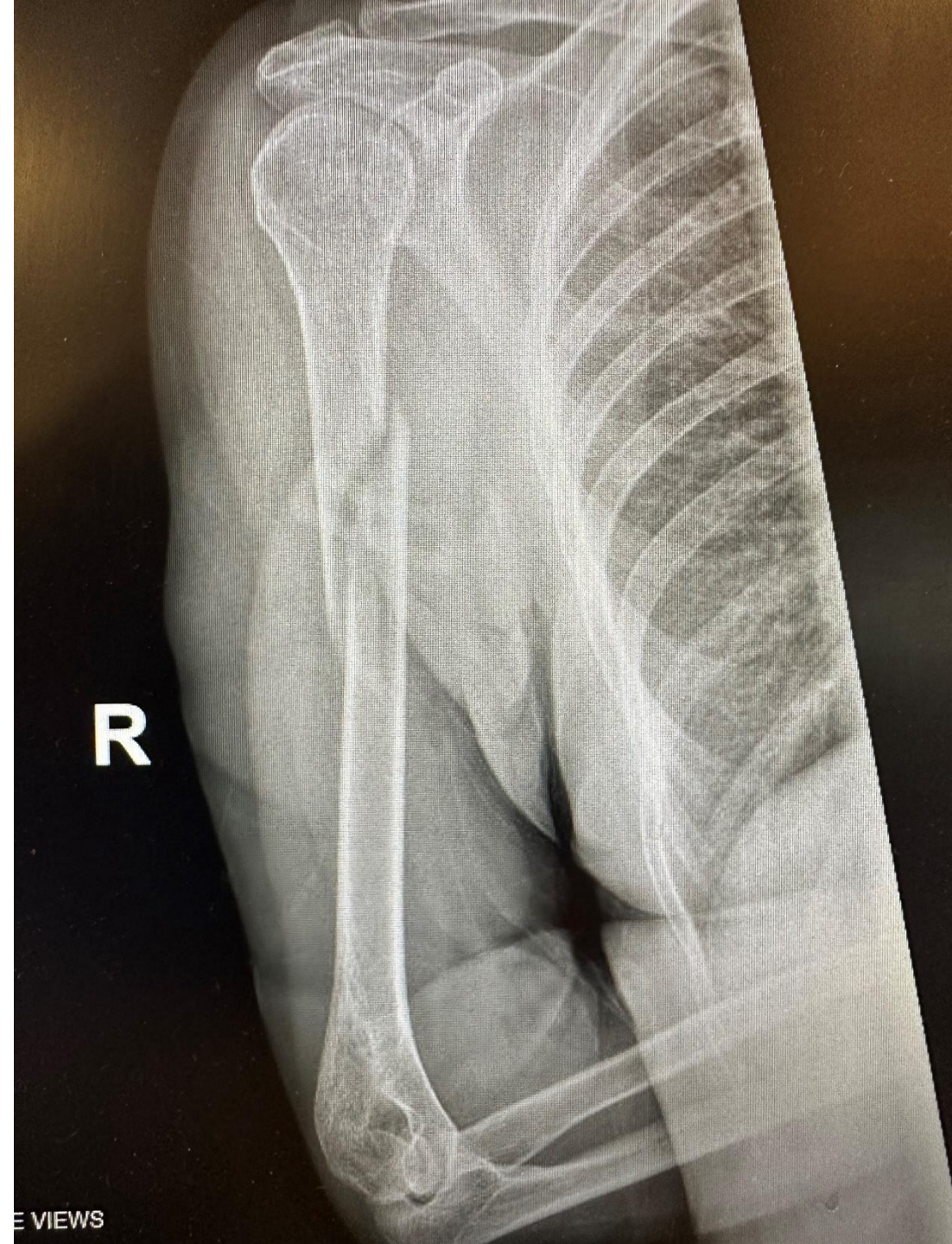
- A. Xyphoid
- B. Patella
- C. Hyoid
- D. Floating Ribs

Rapid Fire  
Just for fun...





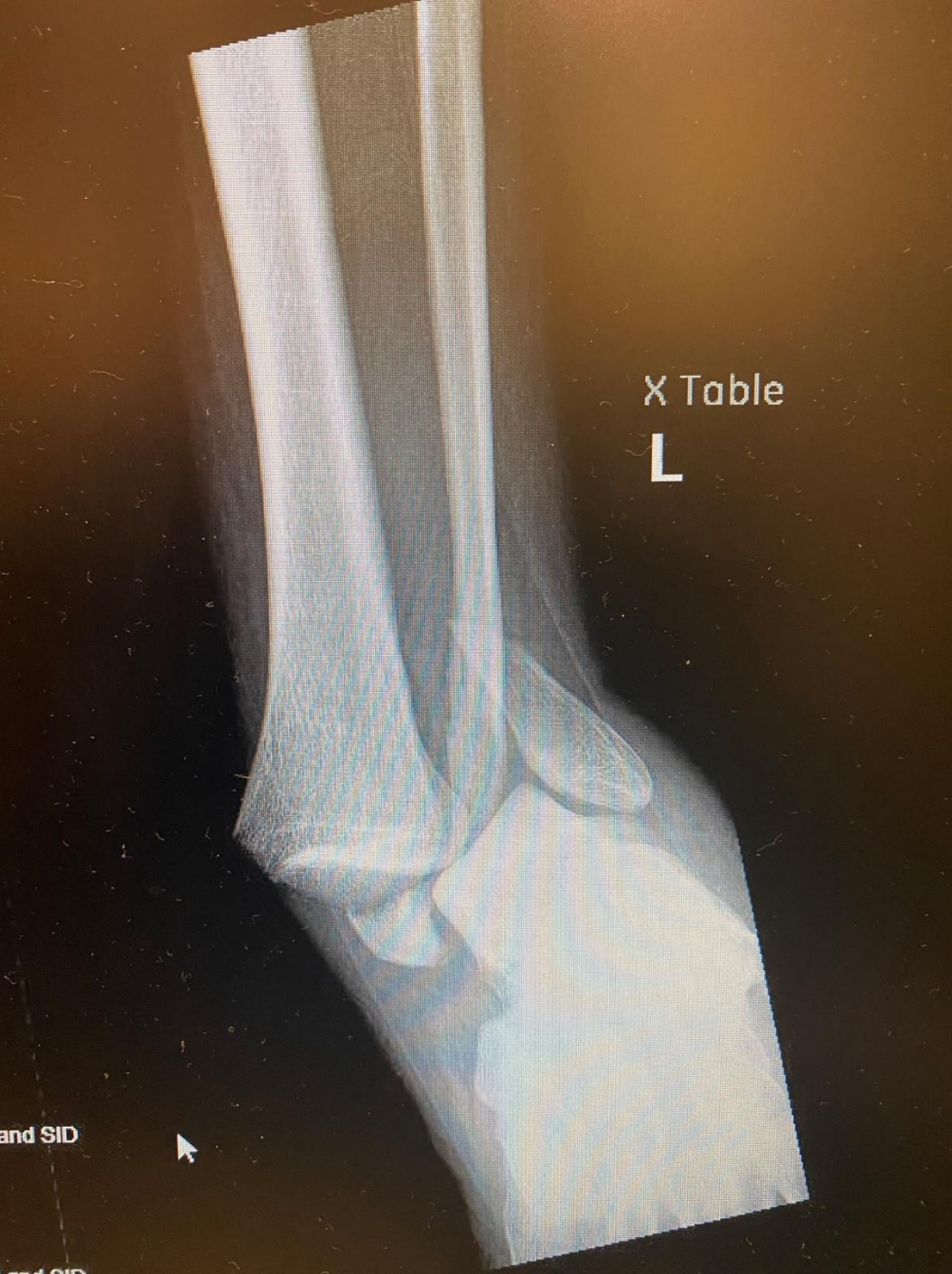




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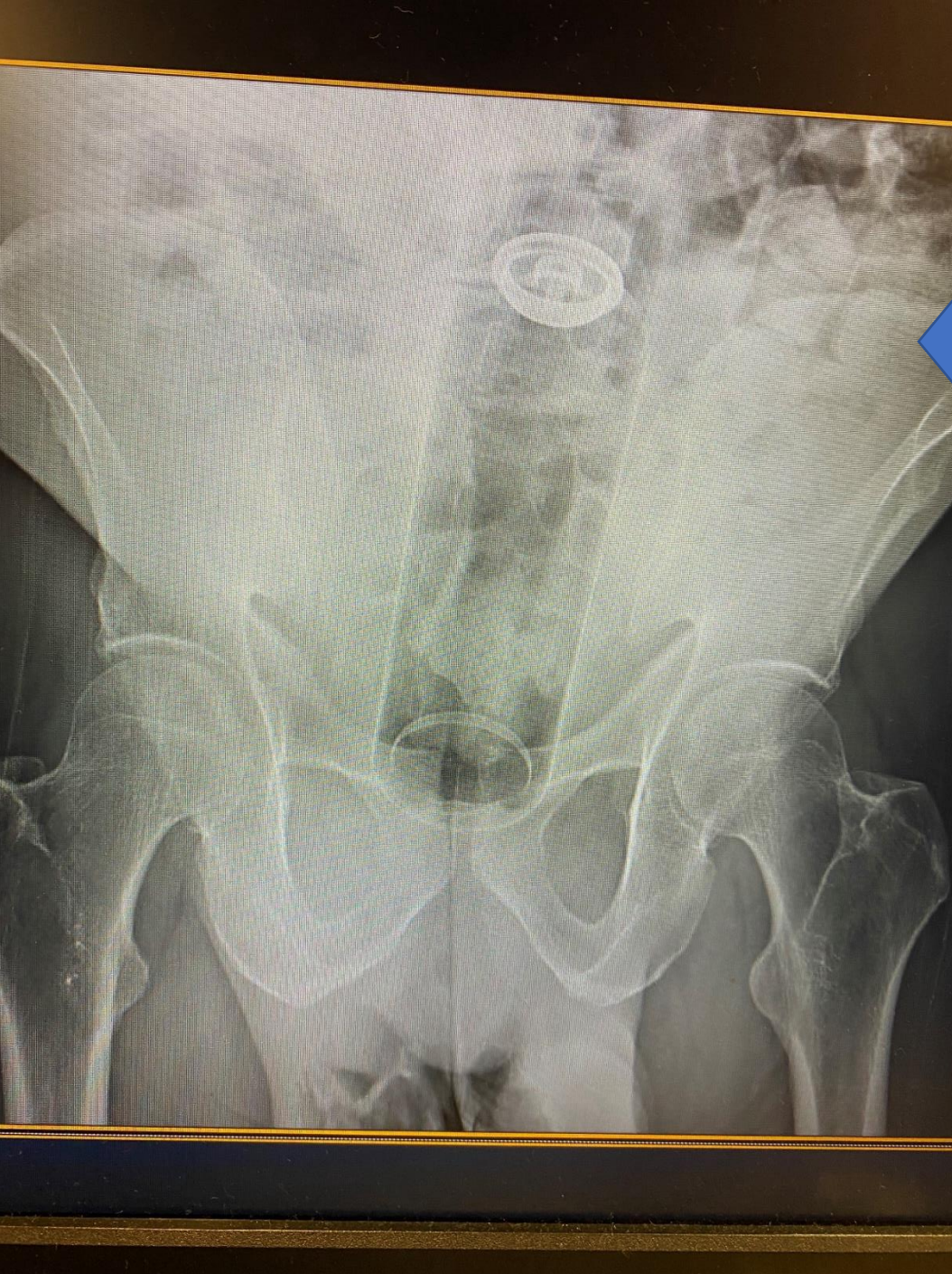
E VIEWS











What radiology talk would not be complete without a FB picture..

Thank you for your participation at Skin, BONES, hearts and PRIVATE PARTS



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