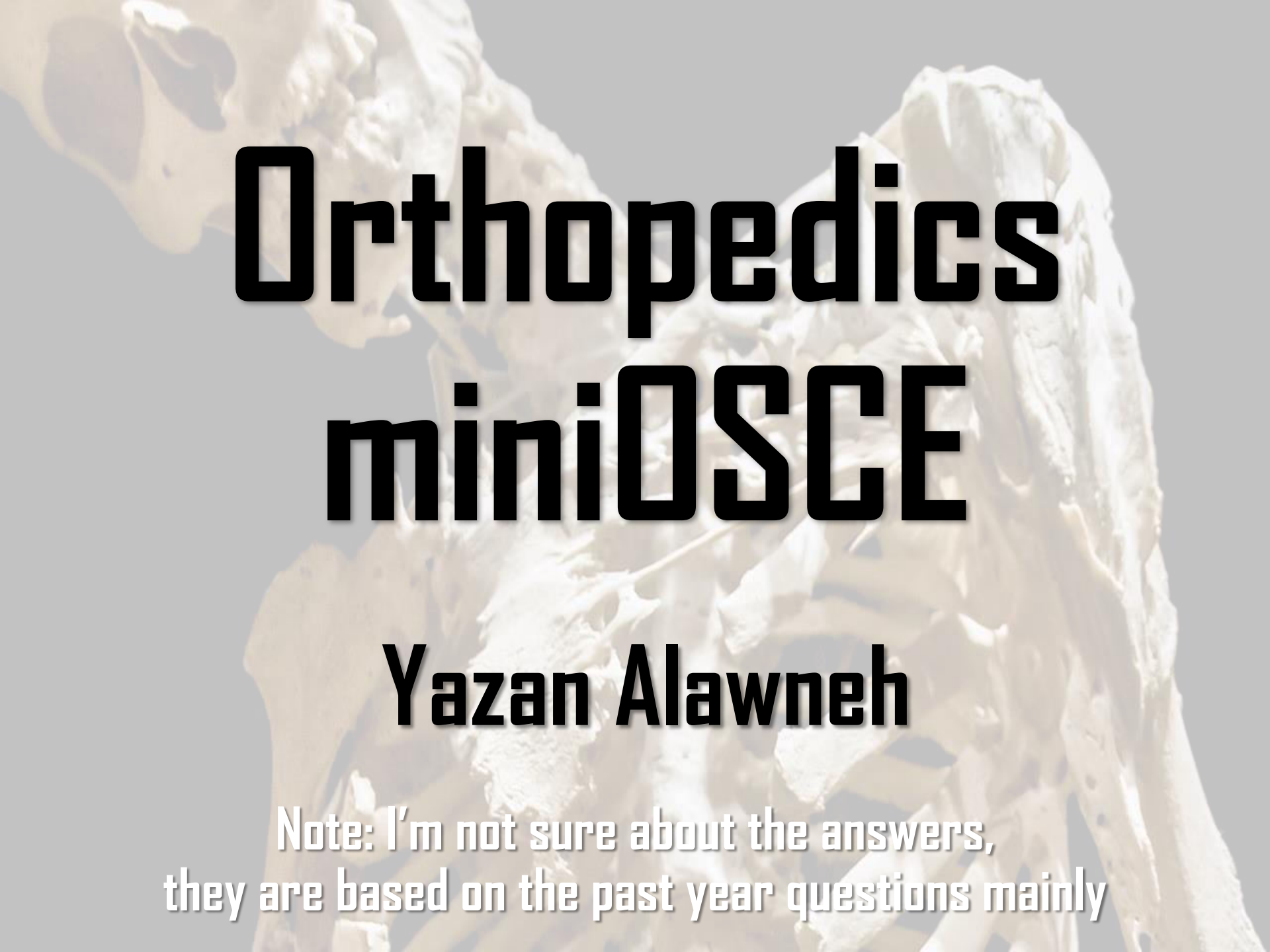


Orthopedics miniOSCE

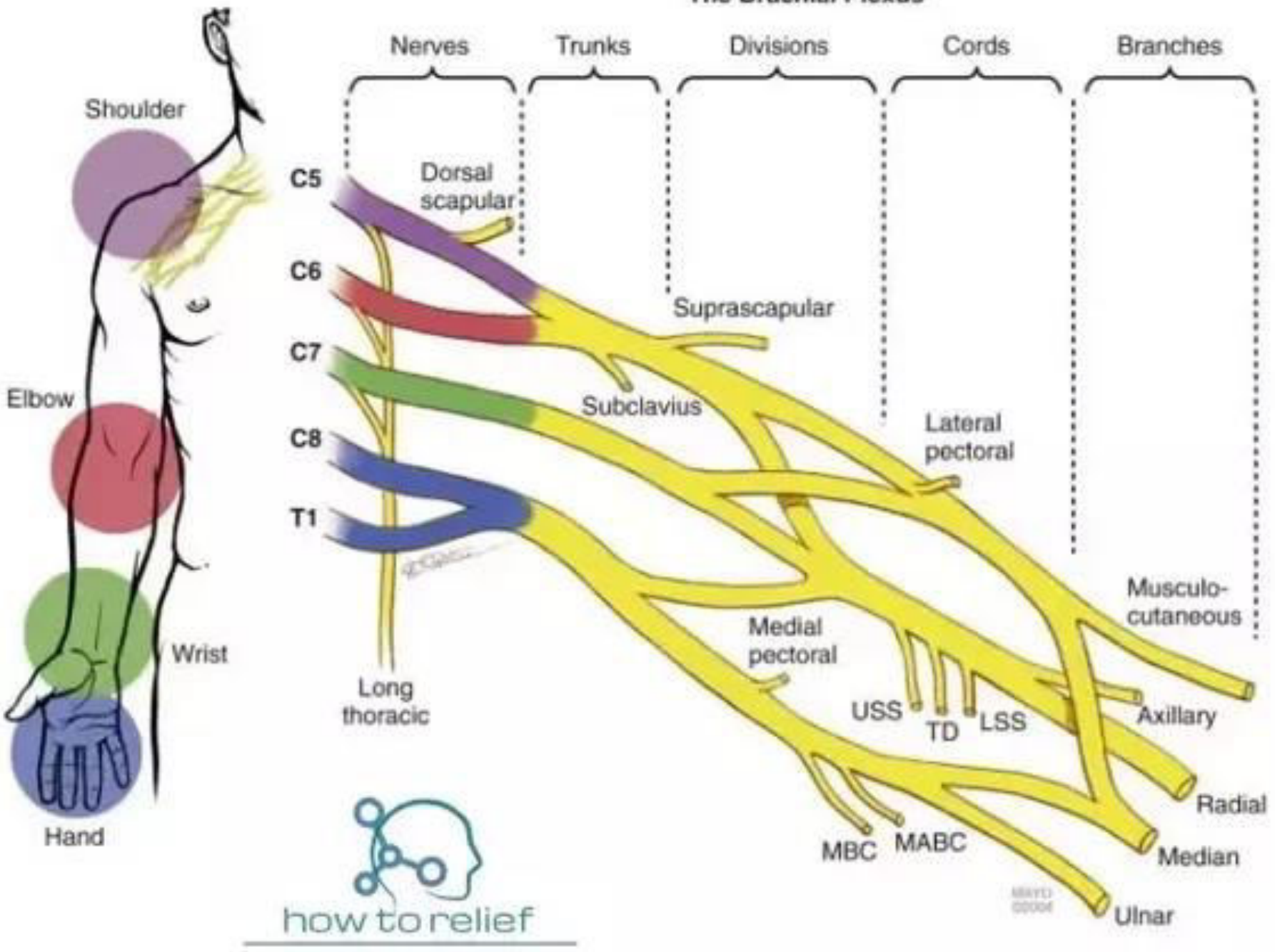
Yazan Alawneh

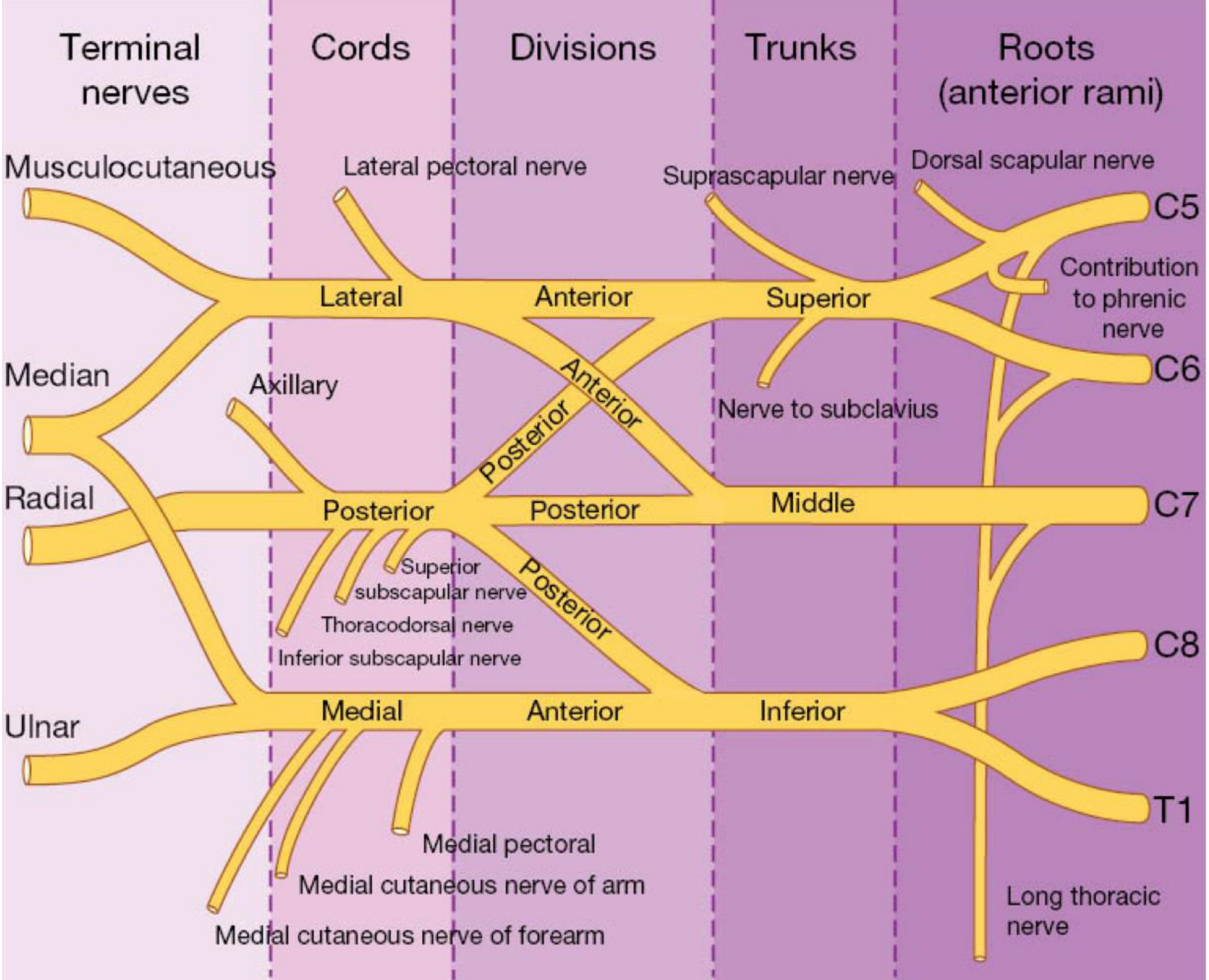
Note: I'm not sure about the answers,
they are based on the past year questions mainly

Injury	Nerves at risk	Clinical signs
Shoulder Dislocation	Axillary	Loss of deltoid contraction Numbness over regimental badge
Humerus (arm) Fracture	Radial	Wrist drop Numbness over the back of hand
Supracondylar Elbow Fracture	Median (Anterior Interosseous nerve)	Loss of thumb and index flexion Inability to make the OK sign
Elbow Medial Condyle	Ulnar Nerve	Claw Hand
Forearm Fracture	Radial (Posterior Interosseous nerve)	Fingers and thumb drop (at knuckles) Deviated wrist extension
Monteggia fracture and dislocation	Radial (Posterior Interosseous nerve)	Fingers and thumb drop (at knuckles) Deviated wrist extension
Hip Dislocation	Sciatic	Foot drop Numbness over the back of foot
Knee Dislocation	Common peroneal nerve	Foot drop Numbness over the back of foot

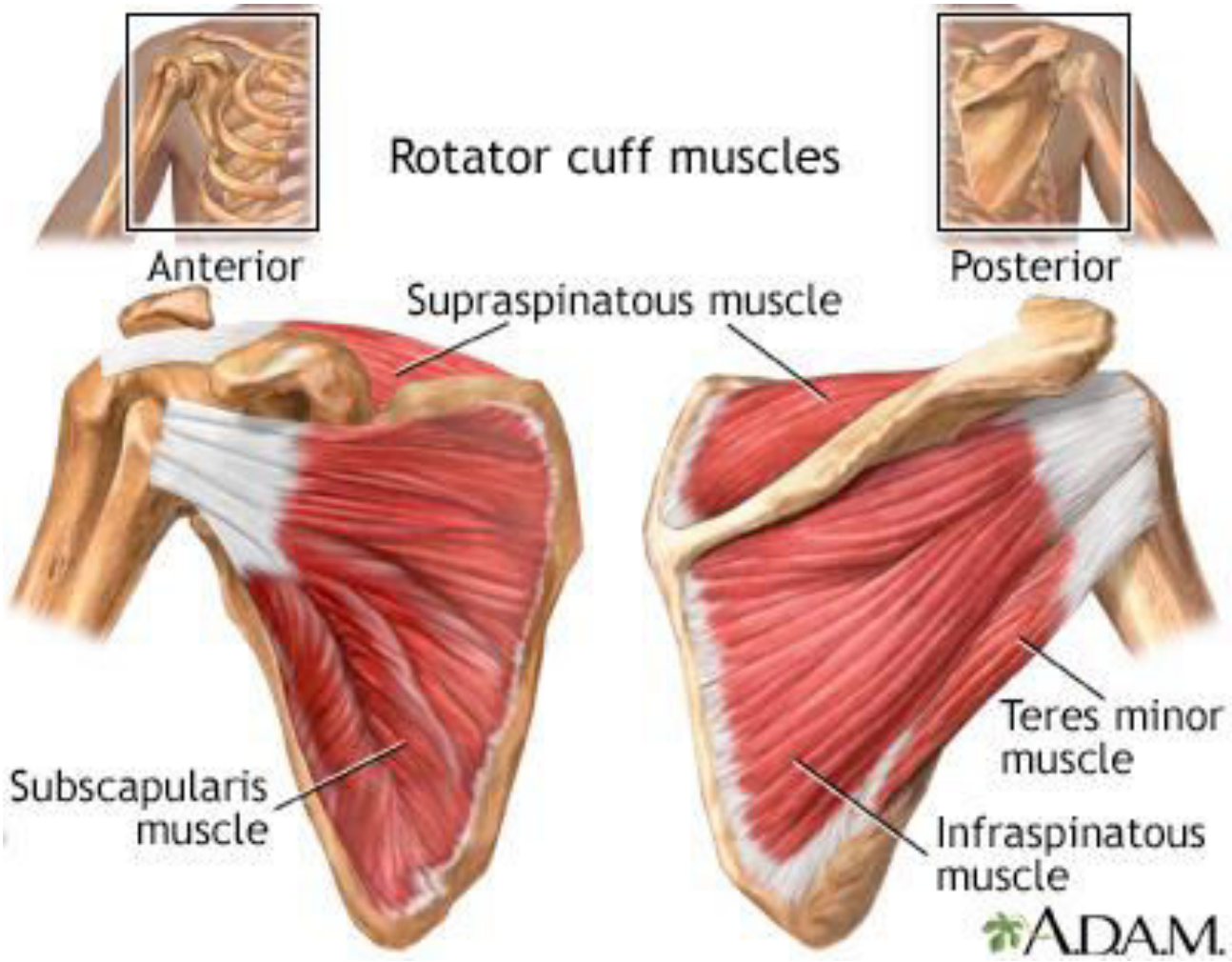
Injury	Artery Affected
1st Rib Fracture	Subclavian Artery
Shoulder Dislocation	Axillary Artery
Humeral Supracondylar Fracture	Brachial Artery
Elbow Dislocation	Brachial Artery
Pelvic Fracture	Presacral and the internal iliac
Femoral Shaft	Femoral Artery
Femoral Supracondylar Fracture	Popliteal artery! (based on dr. Kefah, Saeed)
Knee Dislocation	Popliteal Artery
Proximal Tibial Fracture	Popliteal or Its Branches


SHOULDER


The Brachial Plexus
Nerves
Trunks
Divisions
Cords
Branches
Shoulder
Elbow
Wrist
Hand
C5
C6
C7
C8
T1
Dorsal scapular
Long thoracic
Suprascapular
Subclavius
Lateral pectoral
Medial pectoral
Musculo-cutaneous
Axillary
Radial
Median
Ulnar
USS
TD
LSS
MBC
MABC
how to relief


Terminal nerves
Cords
Divisions
Trunks
Roots (anterior rami)
Musculocutaneous
Lateral pectoral nerve
Suprascapular nerve
Dorsal scapular nerve
C5
Contribution to phrenic nerve
Lateral
Anterior
Superior
C6
Median
Axillary
Anterior
Posterior
Nerve to subclavius
Radial
Posterior
Posterior
Middle
C7
Superior subscapular nerve
Thoracodorsal nerve
Inferior subscapular nerve
Posterior
C8
Ulnar
Medial
Anterior
Inferior
T1
Medial pectoral
Medial cutaneous nerve of arm
Medial cutaneous nerve of forearm
Long thoracic nerve

Supraspinatous	Initiate abduction	Suprascapular nerve
Infraspinatous	External rotation	Suprascapular nerve
Teres minor	External rotation	Axillary nerve
Subscapularis	Internal rotation	Subscapular nerve



- **What is your Dx ?**

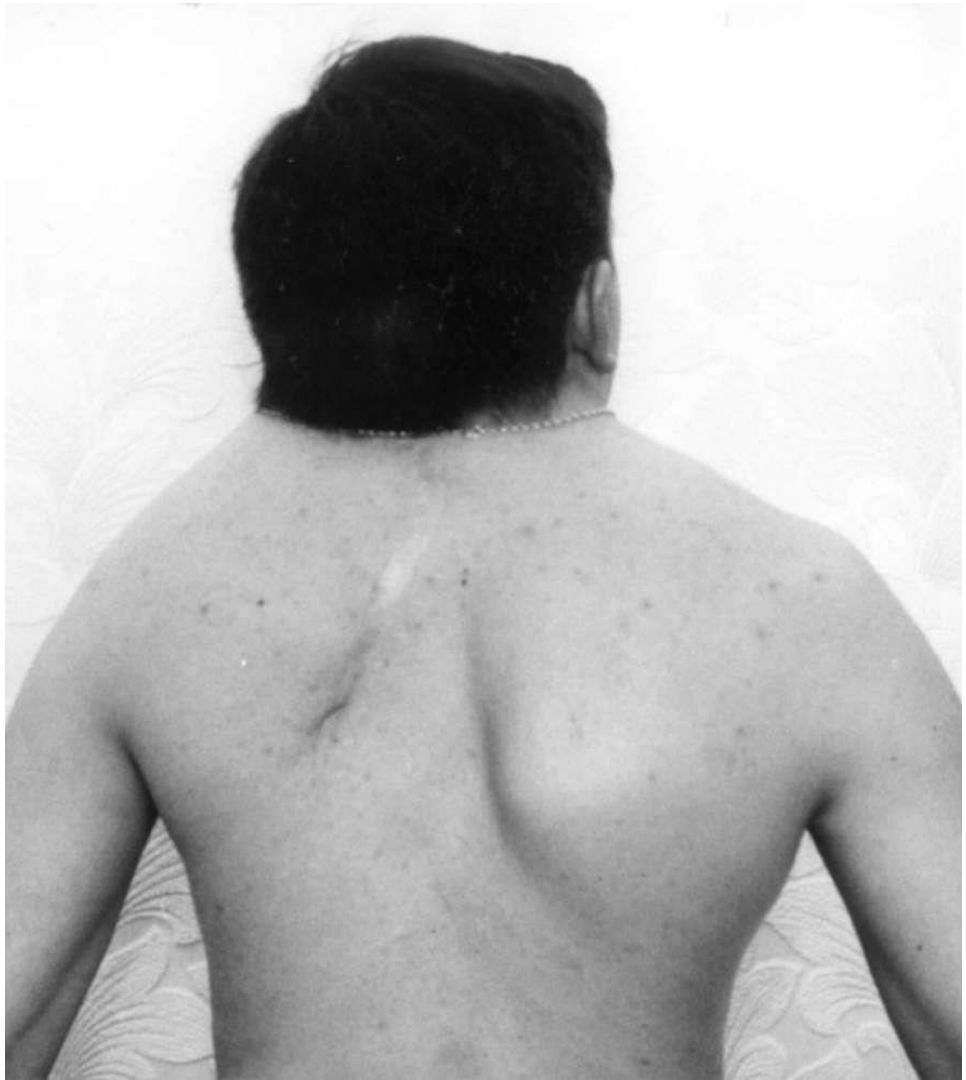
  - Winged scapula

- **The affected nerve is ?**

  - Long thoracic nerve

Springle Shoulder

Klippel Feil



Anterior Shoulder Dislocation

Anterior Shoulder Dislocation

Acromioclavicular Dislocation

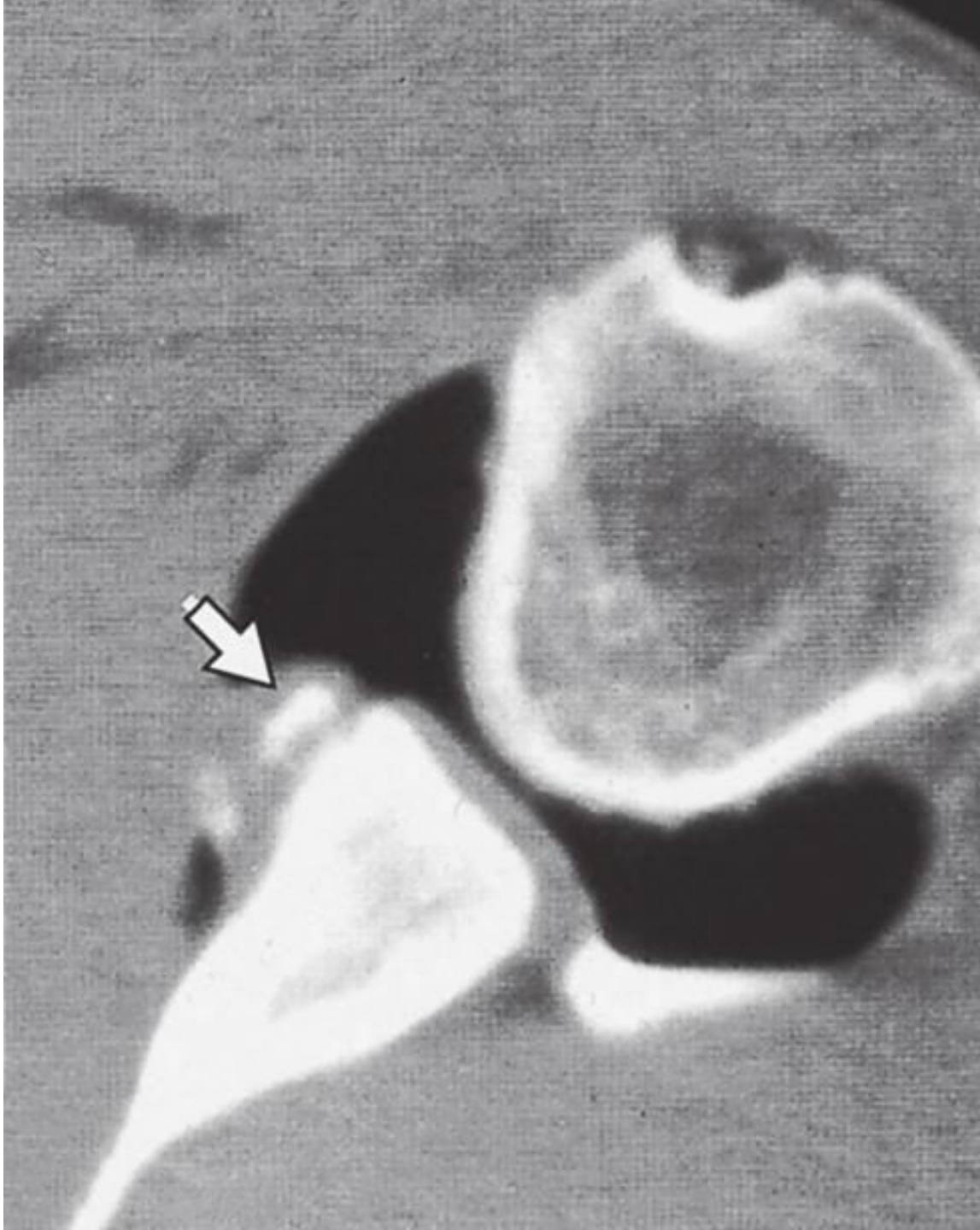
Hill-Sach Sign

Cause: recurrent dislocation

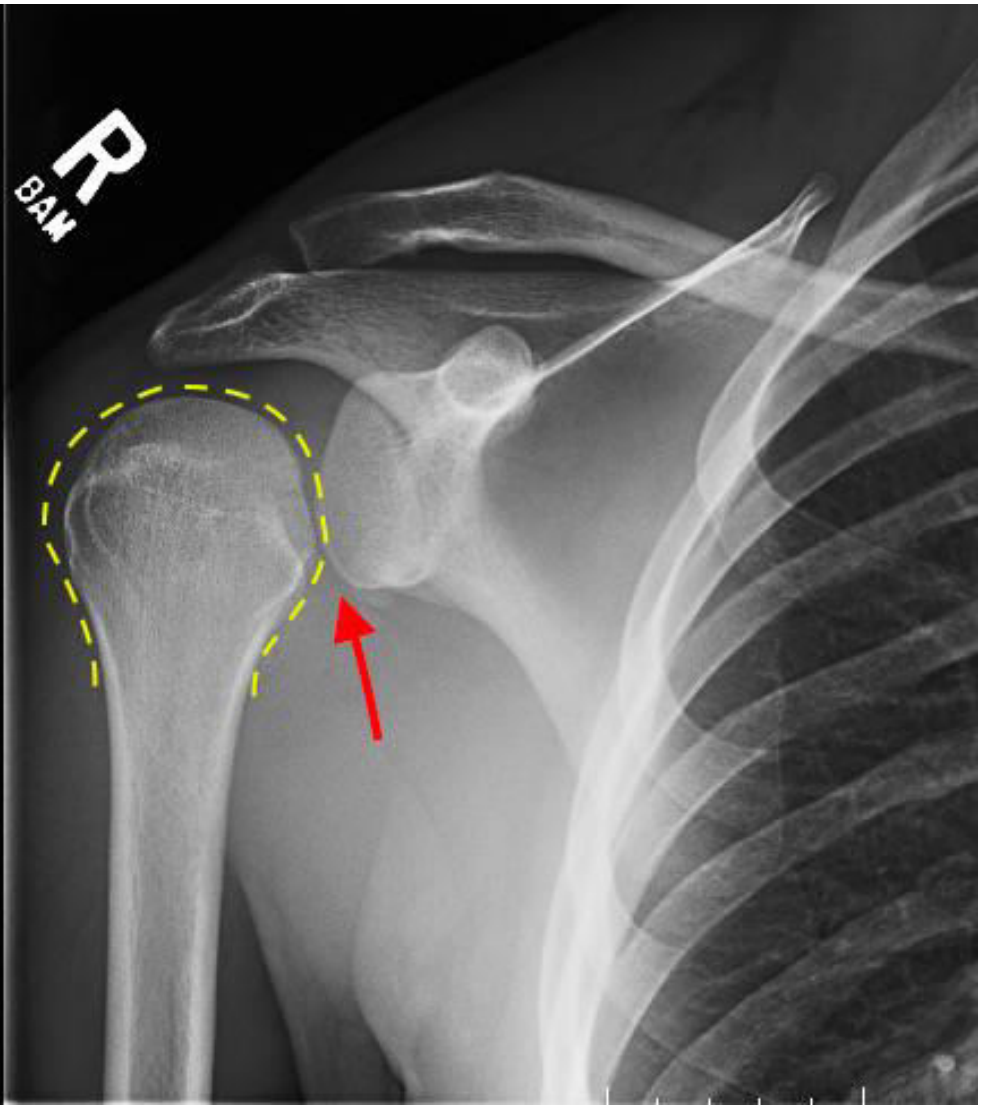
Bankart Lesion

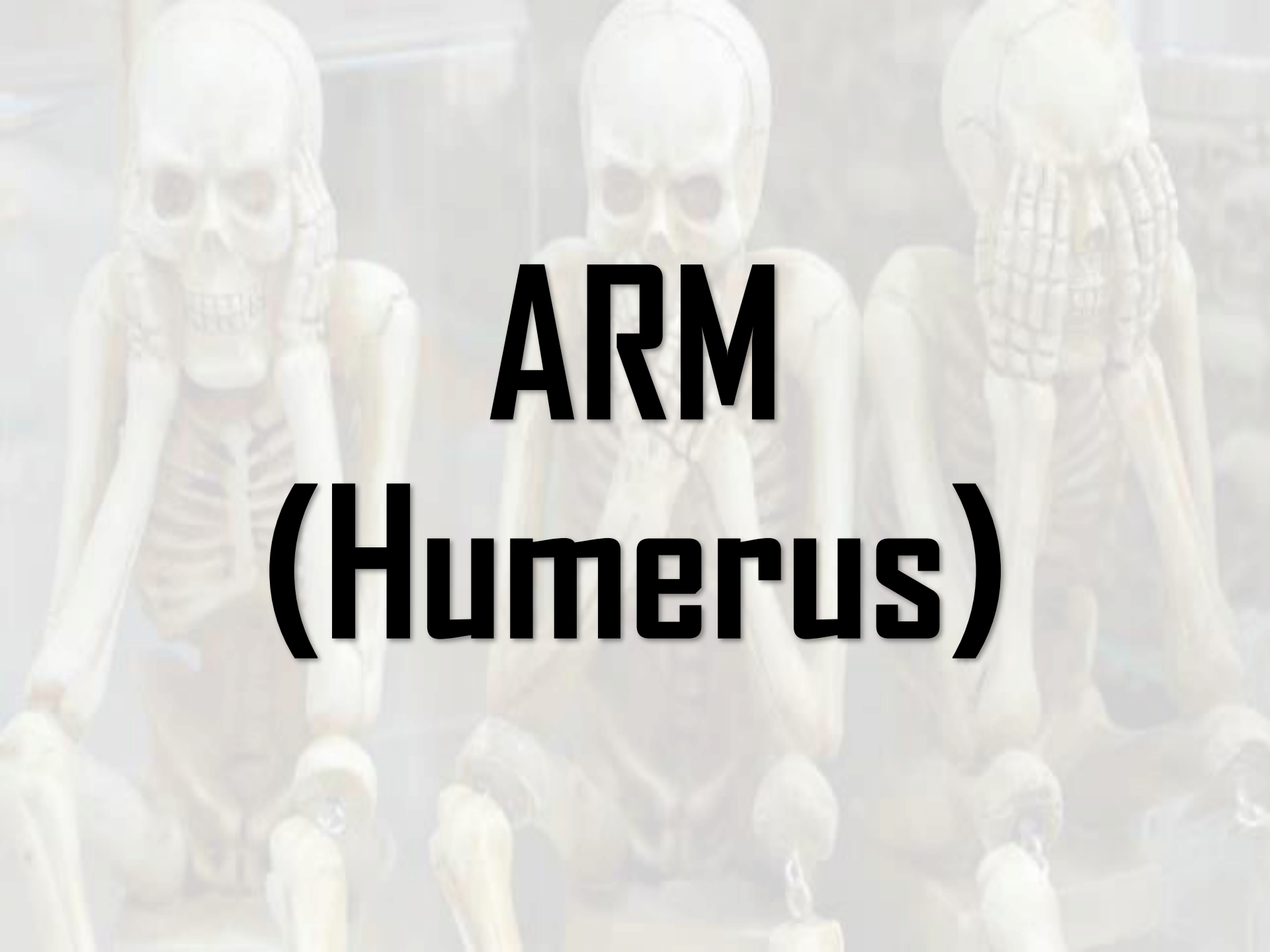
CT scan: damage to glenoid labrum

Cause: recurrent dislocation



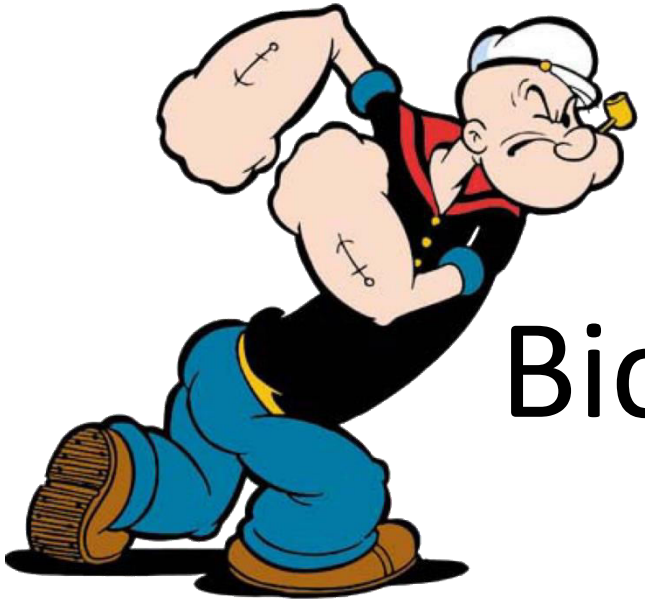
Light Bulb sign
Posterior Dislocation




ARM
(Humerus)

YOU MAY NOT THINK IT'S FUNNY,

BUT I FOUND THIS HUMERUS.

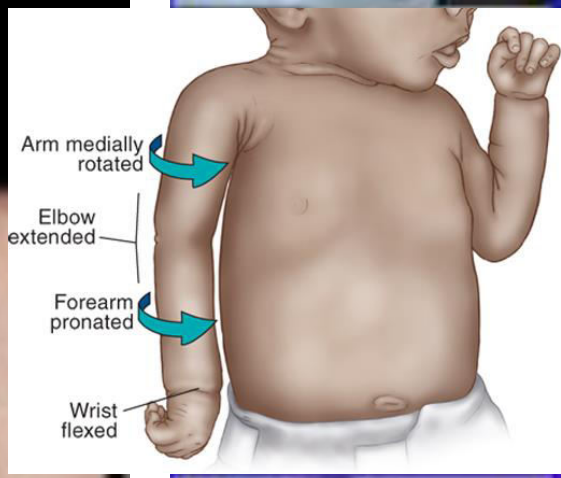


Popeye sign
Biceps Tendon Rupture

Erbs palsy

"causes paralysis of the abductors and external rotators of the shoulder and the forearm supinator's, The arm is held to the side, internally rotated & pronated"

Waiter Tip Position



Describe the displacement:

-Anterolateral translation (100%)

-Posteromedial angulation

-Lengthening of the limb

-No rotation.

Describe the displacement:

mid shaft fracture of the humerus with
- shortening about 2 cm
- lateral translation and
- medial angulation
- without rotation

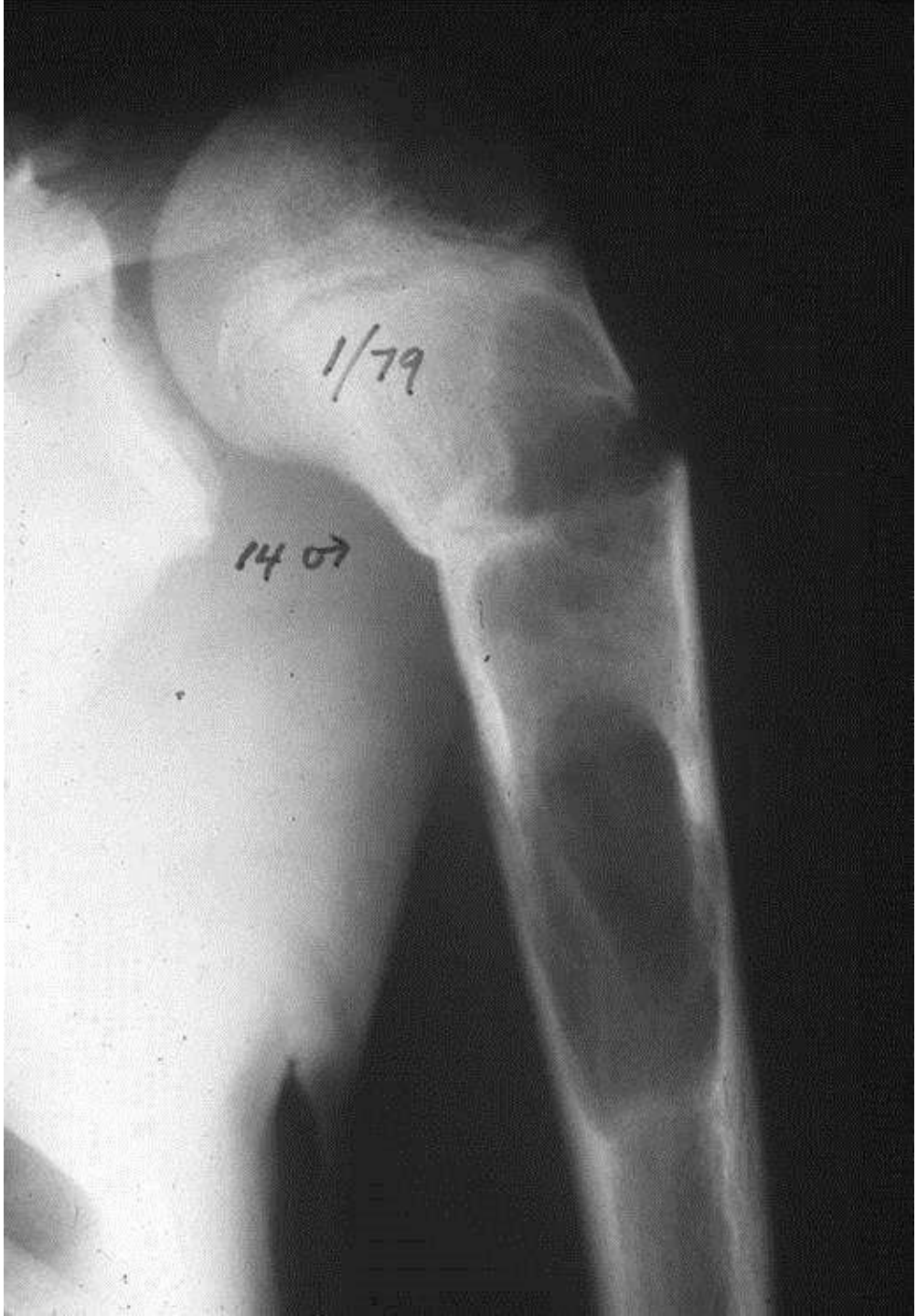
What is your diagnosis?

Pathological facture
Due to tumor mostly

What is the most common nerve to be injured in humeral shaft fractures:

Radial nerve

Mnemonic: **ARM**:
Proximal (Shoulder dislocation) – **A** – Axillary nerve
Shaft – **R** – Radial nerve
Distal (Supracondylar) – **M** – Median nerve



Dx:

- Humeral shaft fracture

- Spiral

- **Most common complication:**
Radial nerve injury

Describe the displacement:

Lengthening


ELBOW

What is the diagnosis of this condition?

Cubitus varus (vara)

What is the cause of this condition?

- malunion of supracondylar fracture / supracondylar fracture of the distal humerus

What is the diagnosis?

Cubitus valgus

What is the cause?

Non union of lateral condyle

Most Common complication:

Ulnar nerve

Name the deformity can happen as a result of non-union of this fracture?

Cupitus Valgus

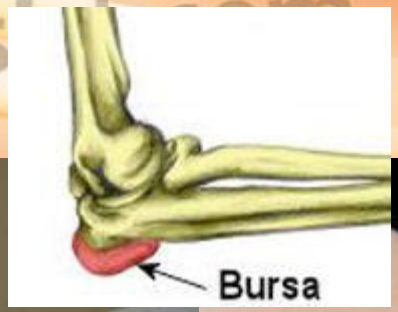

Tennis Elbow
also called **lateral epicondylitis**, causes pain on the outside of the elbow.
Golfer's Elbow
also called **medial epicondylitis**, causes pain on the inside of the elbow

What Is the name of this test ? & for what ?

Tennis elbow test , lateral epicondylitis

Students Elbow or Olecranon Bursitis

It is a condition where there is swelling, redness and inflammation of the bursa that protects the bone at the posterior side of the elbow.



Diagnosis:
Humeral Supracondylar Fracture

What is the most commonly injured structure:
Median nerve
Brachial artery

Where is the dislocation:
Posterior

- What is the Fracture ?
Supra-Condylar fracture

- Where is the displacement?
Posterior Displacement

Supracondylar fracture

Posterior Elbow Dislocation

Posterior Elbow Dislocation

Bicondylar fracture

What is this?

Lateral condylar fracture of the elbow treated by Percutaneous Pinning with K-Wires

What is the fracture?
Medial Epicondylar Fracture
Cause? Avulsion of the flexors

Medial Epichondylar fracture

Lateral Condyle Fracture

What is the fracture ?

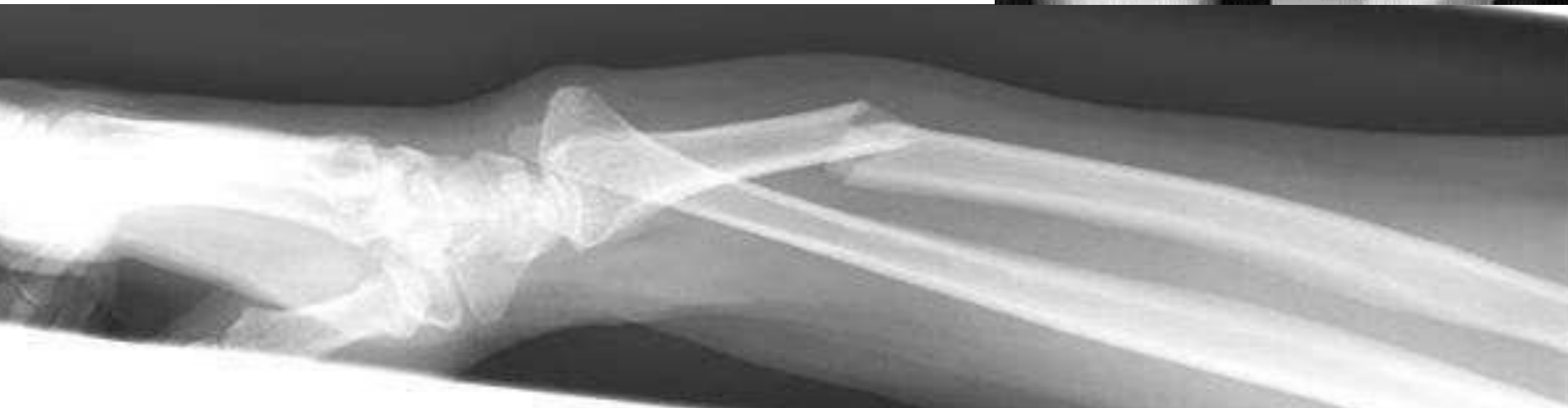
Olecranon fracture


FOREARM

What is your Dx?

Galeazzi fracture

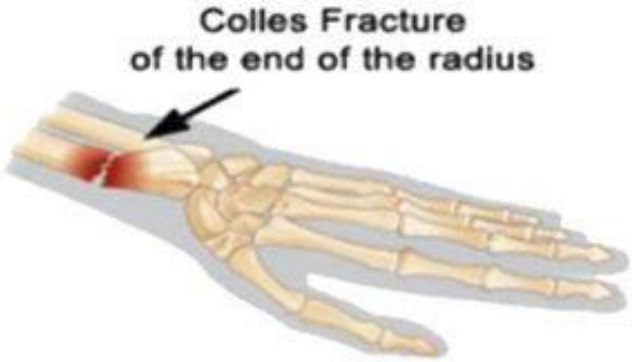
“ fracture of distal radius with dislocation of distal radioulnar joint ”

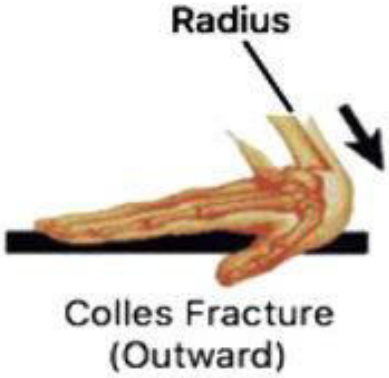


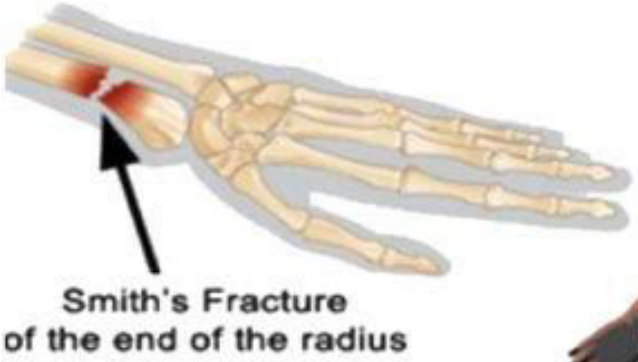
- What is the Fracture?

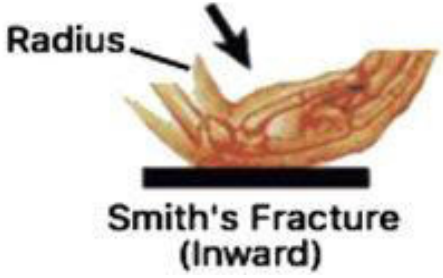
Monteggia fracture (Ulnar fracture with proximal radio-ulnar joint dislocation)

- Treated/Managed by ORIF


Colles Fracture
of the end of the radius


Radius
Colles Fracture
(Outward)

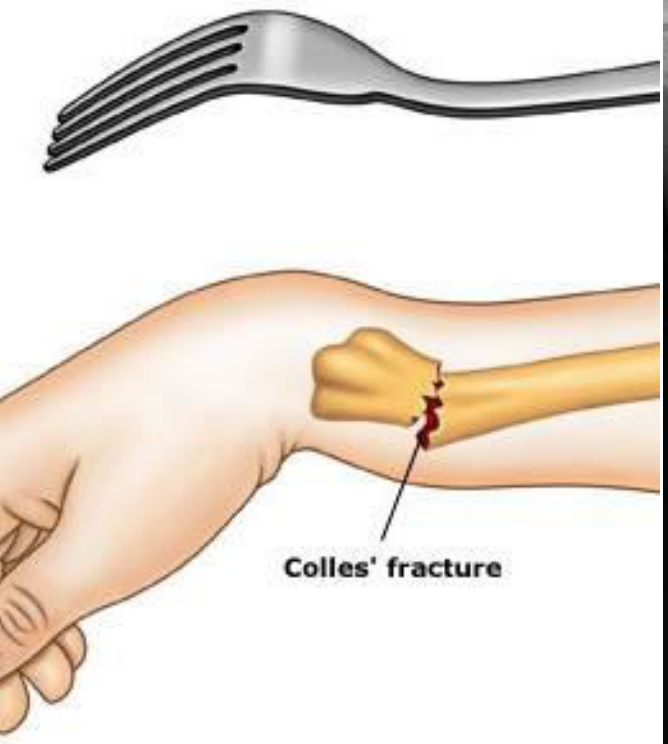

Smith's Fracture
of the end of the radius


Radius
Smith's Fracture
(Inward)

- What is the Fracture ?

Colles Fracture (fracture of the distal forearm in which the broken end of the radius is bent backwards (dorsally))

- What Deformity does it cause ? Dinner fork deformity



- What is the Fracture ?

Smiths Fracture (reversed Colle's) "fracture of the distal forearm in which the broken end of the radius is bent forwards (ventrally)"

- What Deformity does it cause ?

Garden Spade deformity

Describe the fracture:

- Dx?

Ulnar Fracture

- Type ?

Segmental

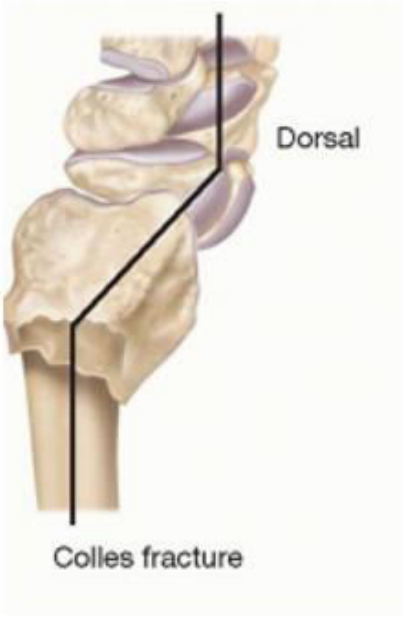
- Displacement?

Translation +
Angulation +
shortening

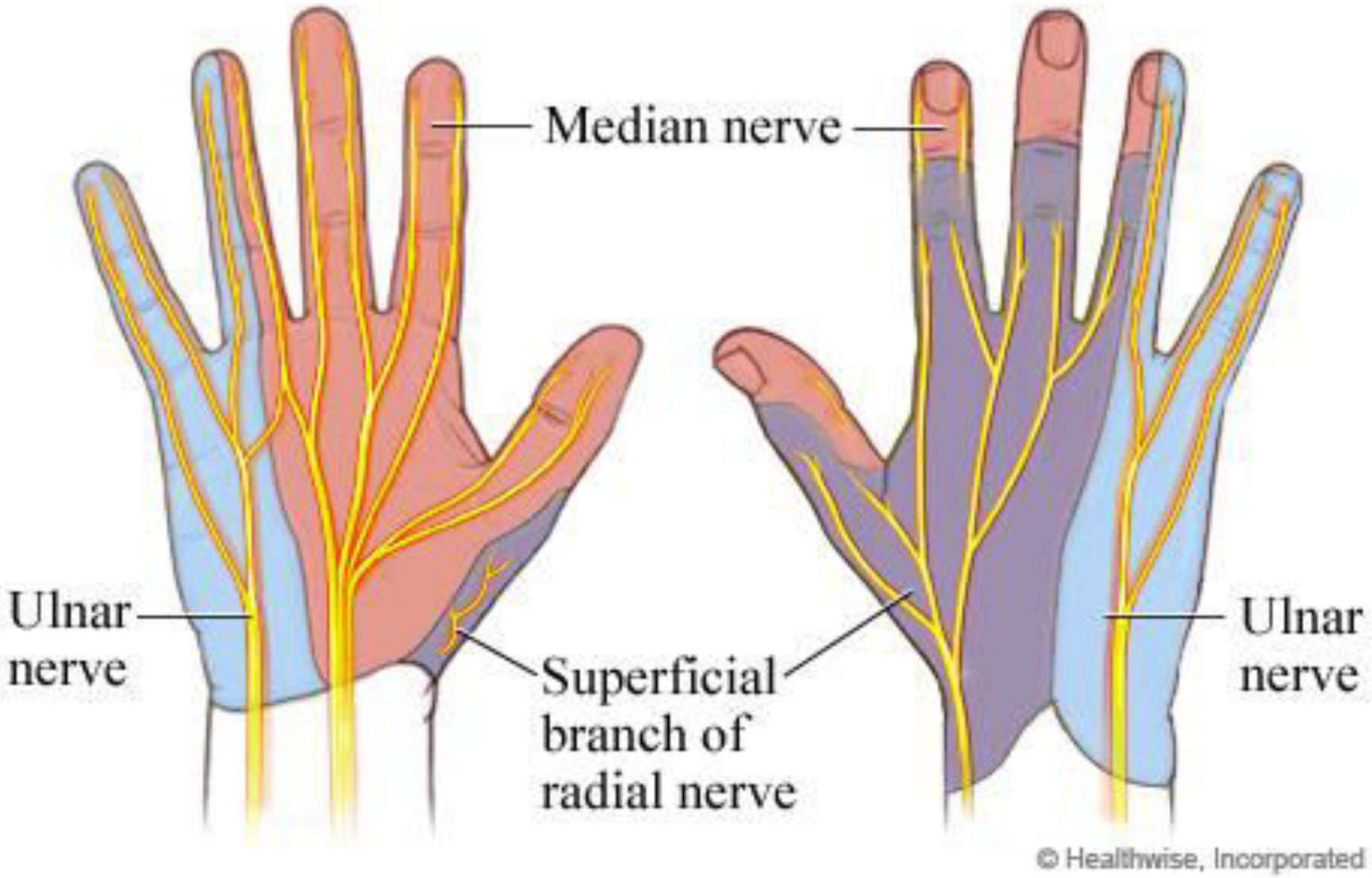
Green-Stick Fracture In both Ulna and Radius

Dx? Barton fracture

Barton fractures extend through the dorsal aspect to the articular surface but not to the volar aspect. Therefore, it is similar to a Colles fracture. There is usually associated dorsal subluxation/dislocation of the radiocarpal joint

COLLE'S FX	SMITH'S FX	BARTON'S FX	CHAUFFEUR FX
• falling on **hyperextension** • **dorsal angulation** • **apex volar** • **dorsal displacement**	• falling on **flexed wrist** • **volar angulation** • **apex dorsal** • **volar displacement**	• Fx w\ either dorsal or volar displacement • the whole wrist displaces w\ the fractured piece	• Fx of the **radial styloid** • AP X-ray shows intact lunate facet *(unlike barton's)*
 Colles fracture	 Smith (reverse Colles) fracture		 Chauffeur's fracture palmer

WRIST, HAND AND FINGERS


Median nerve
Ulnar nerve
Superficial branch of radial nerve
Ulnar nerve
© Healthwise, Incorporated

Nerve Palsies

Ulnar

Claw Hand

Median

Pointing finger

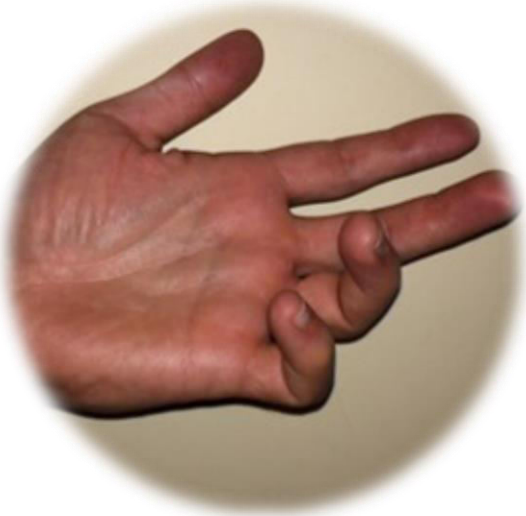
Ape Hand

Radial

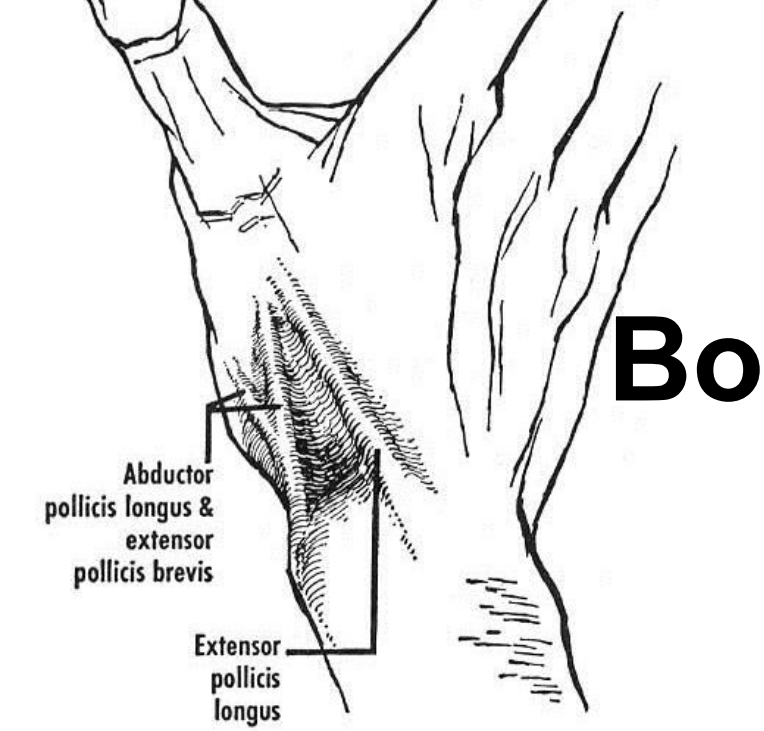
Wrist Drop

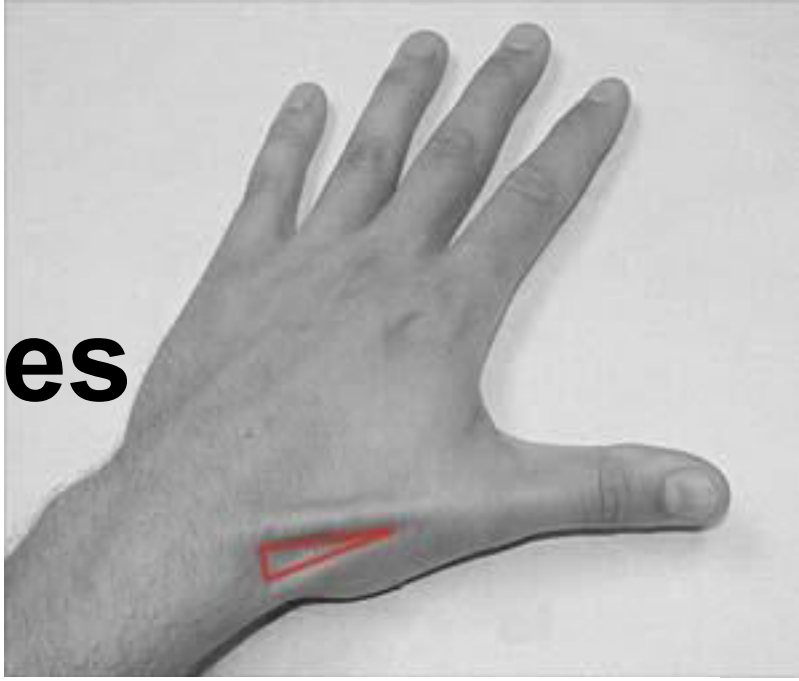
Mnemonic: DR.CUMA

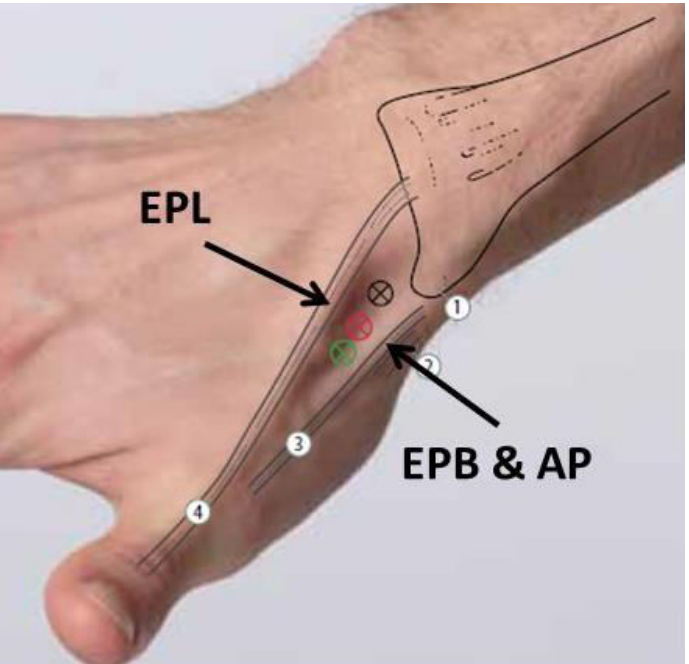
Drop
Radial
Claw
Ulna
Median
Ape

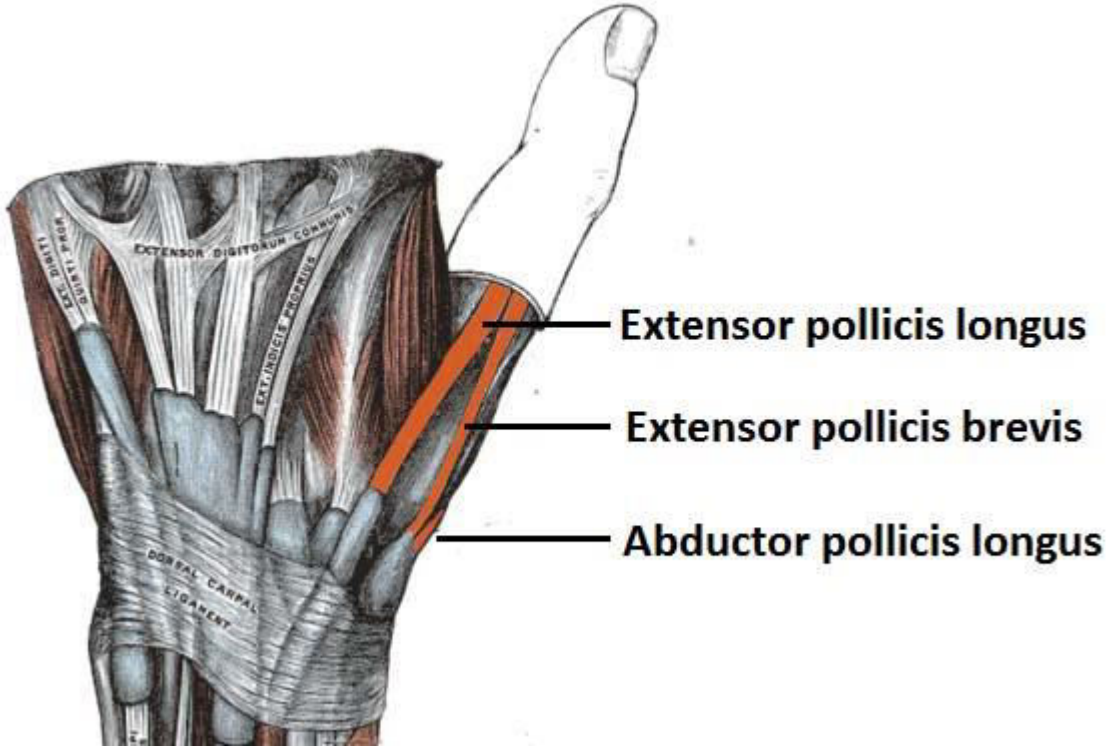


Snuff Box Boundaries

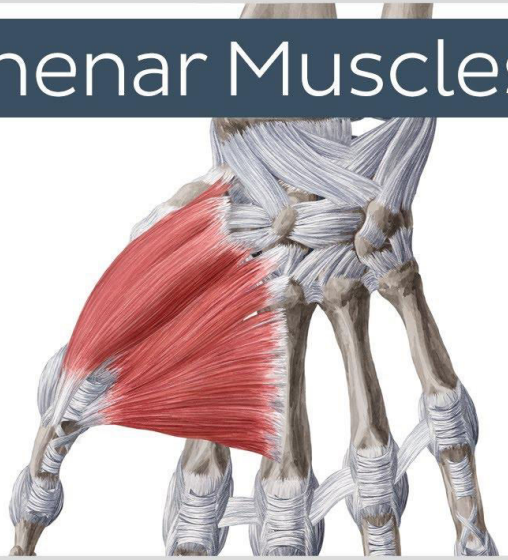




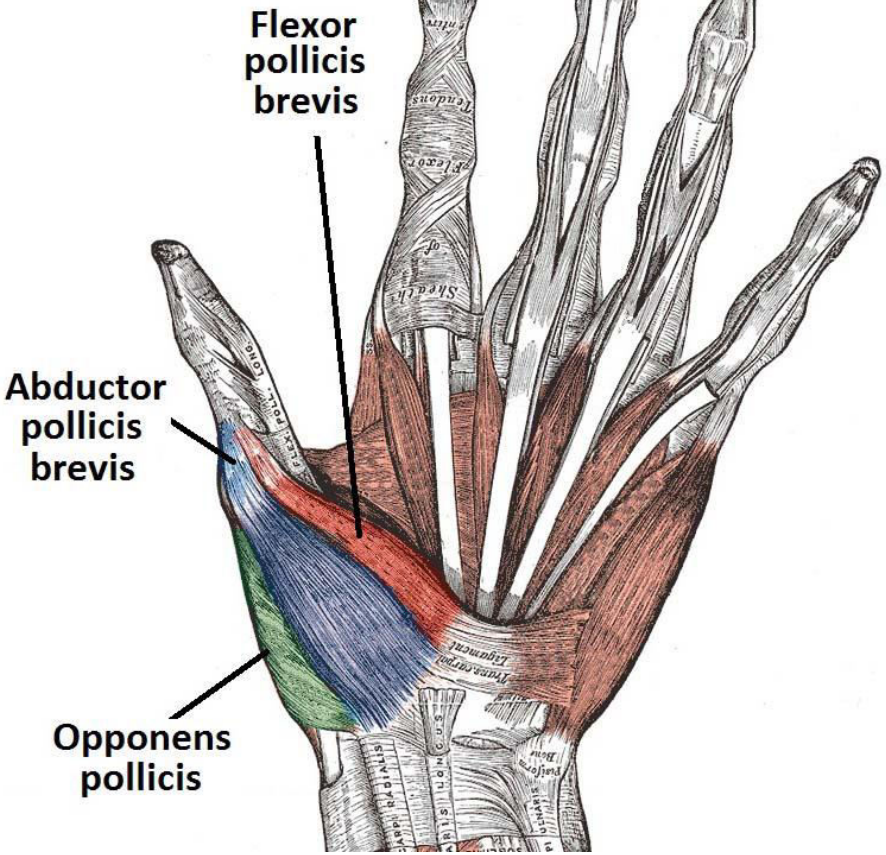


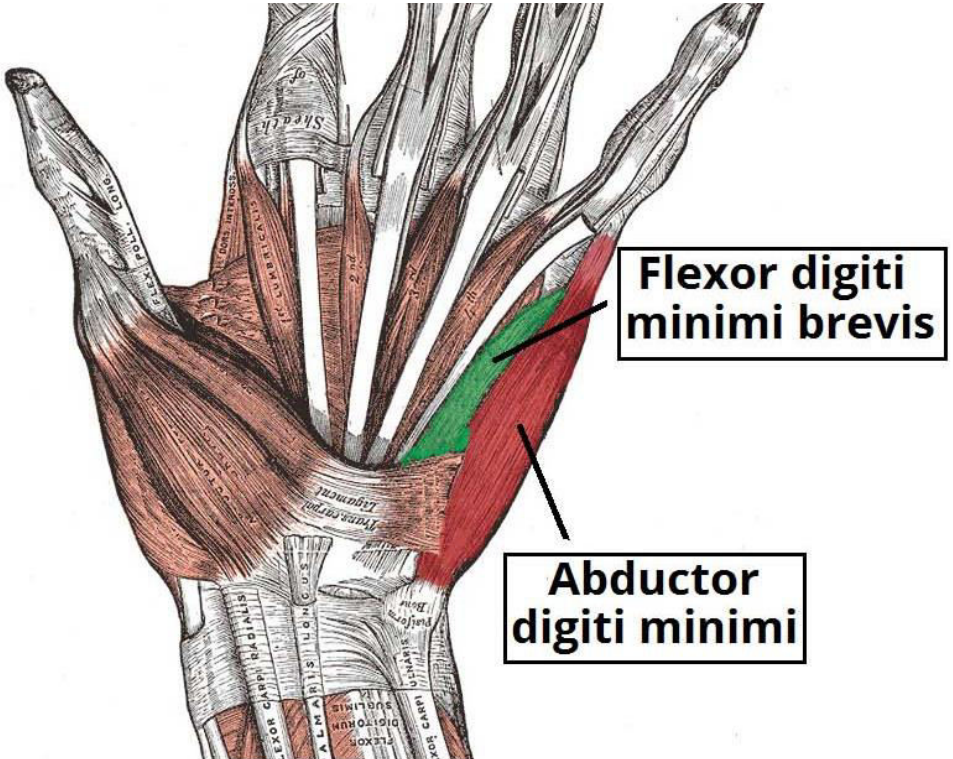


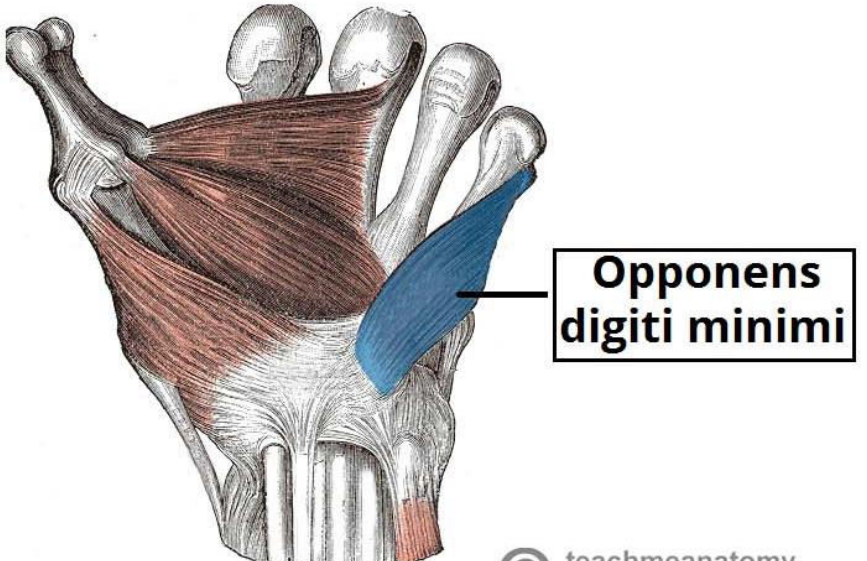
Thenar Muscles



K



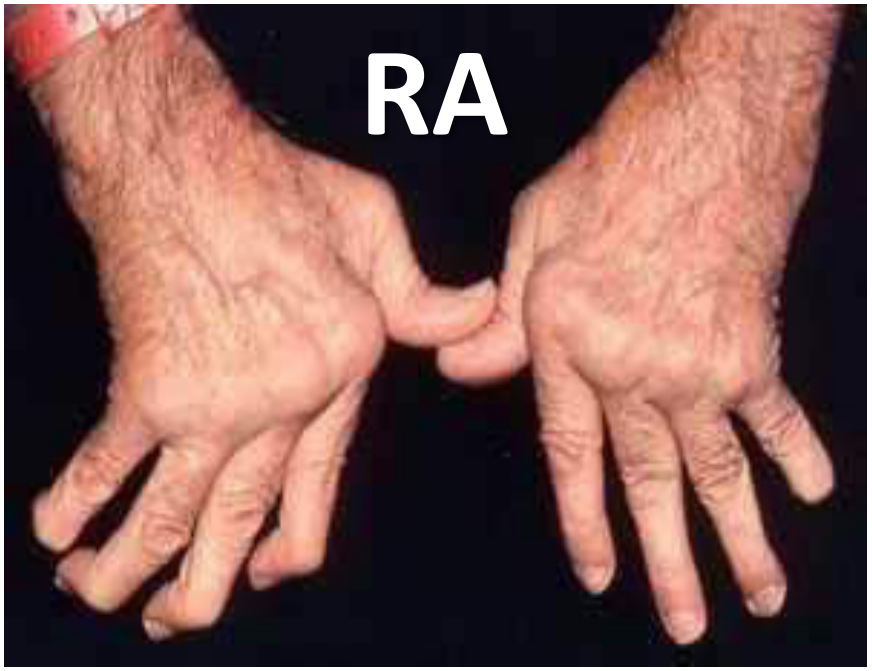




Radial Club Hand

Dx? Syndactyly

Dx? Polydactyly


RA


RA


OA


OA


RA
R


GOUT

Dx?

TB of wrist joint

- **She** – **S**caphoid
- **Looks**- **L**unate
- **Too** - **T**riquetral
- **Pretty** - **P**isiform

Memorize the hand bones!!

- **Try** – **T**rapezium
- **To** - **T**rapezoid
- **Catch** - **C**apitate
- **Her** - **H**ammate

What is the name of the bone pointed with the red Arrow?

Capitate

Dx?

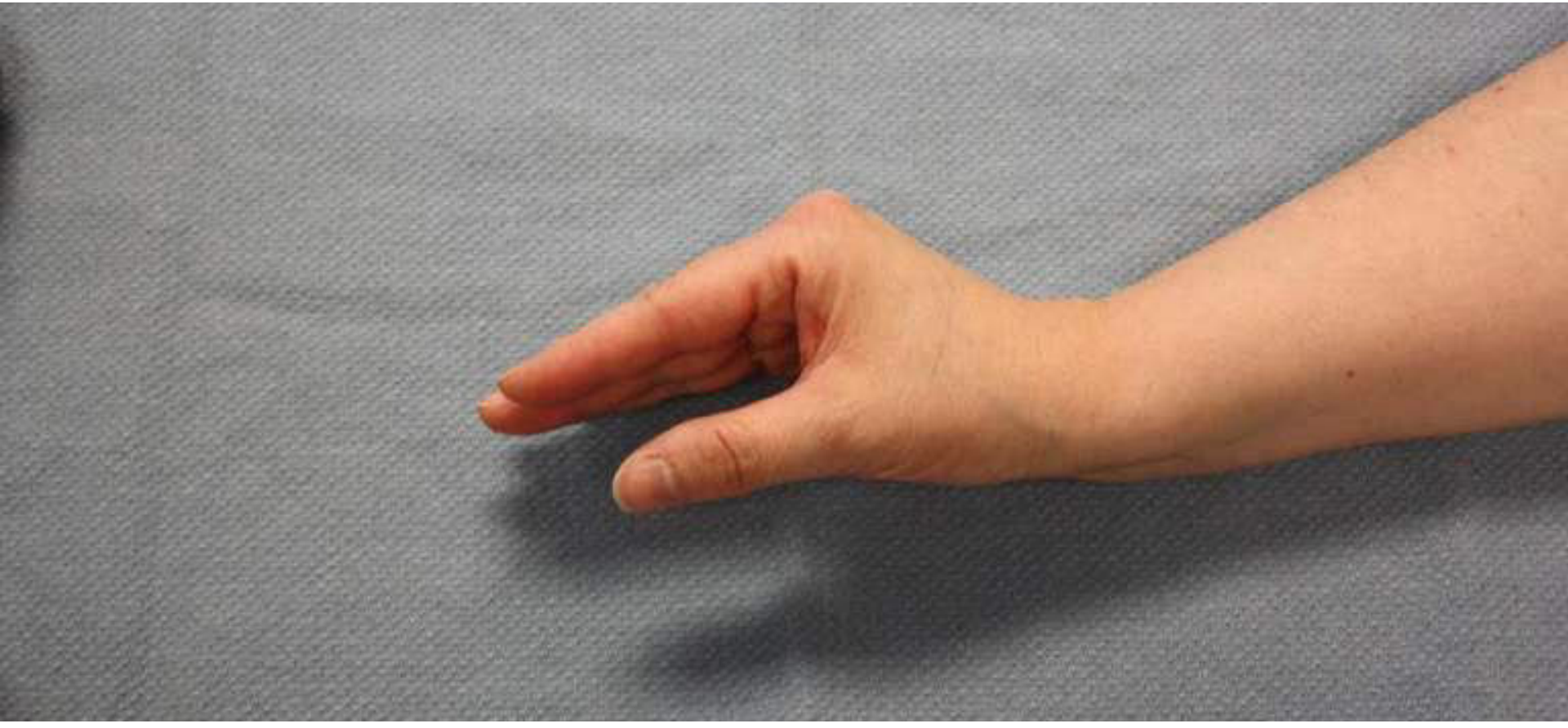
Distal interphalangeal joint dislocation

- **What is the muscle responsible for this movement ?**

Lumbricals

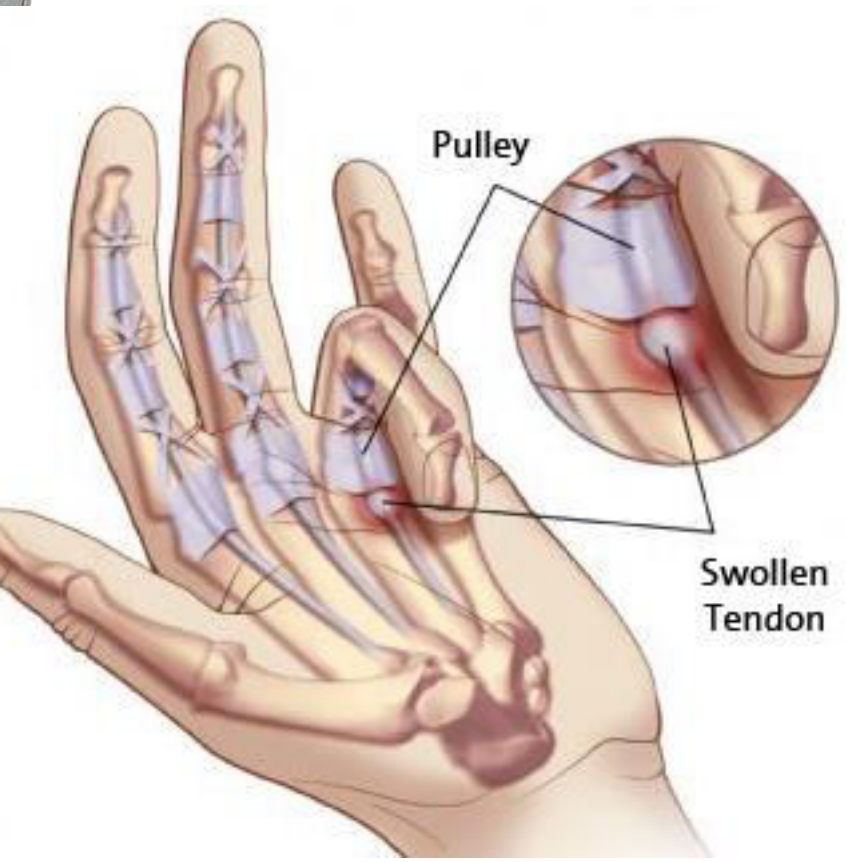
- **Supplied by which nerve ?**

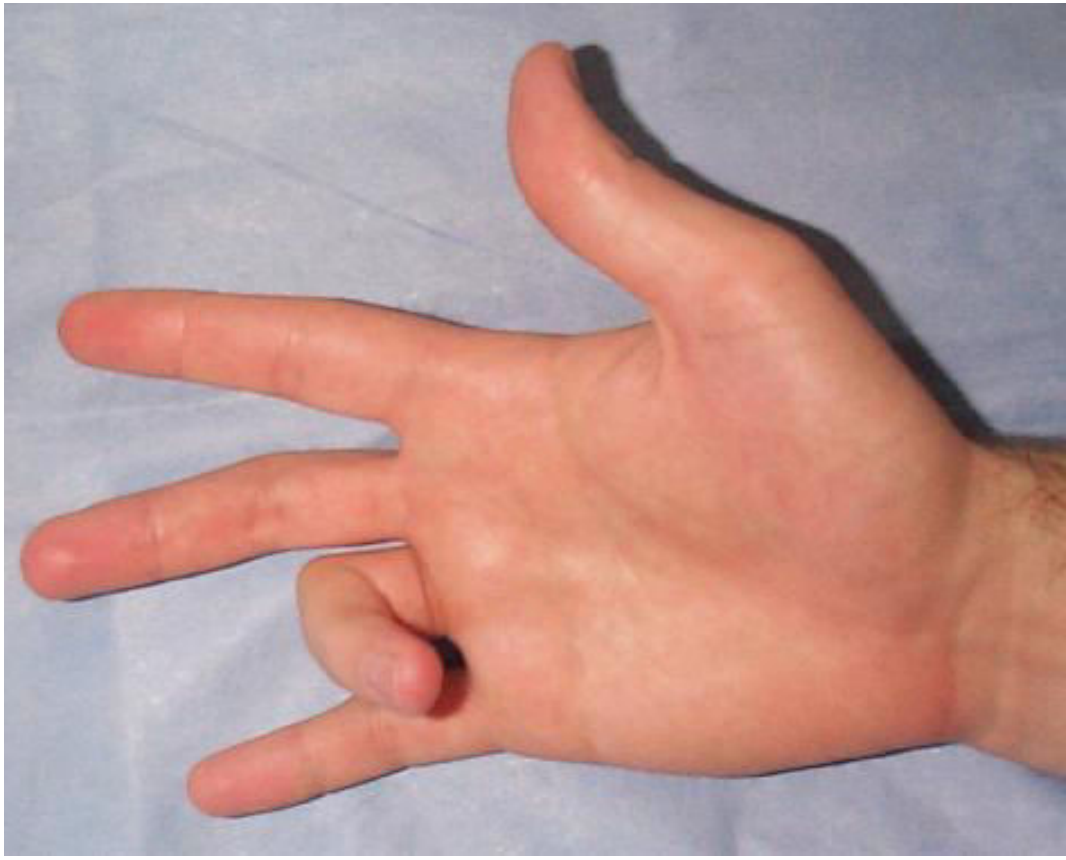
by Ulnar nerve



Trigger finger

is a condition that causes pain, stiffness, and a sensation of locking or catching when you bend and straighten your **finger**. The condition is also known as “stenosing tenosynovitis.” The ring **finger** and thumb are most often affected by **trigger finger**





What is the salter harris type of this fracture ?

Type 3

mnemonic:

Type 1 – **S**traight across

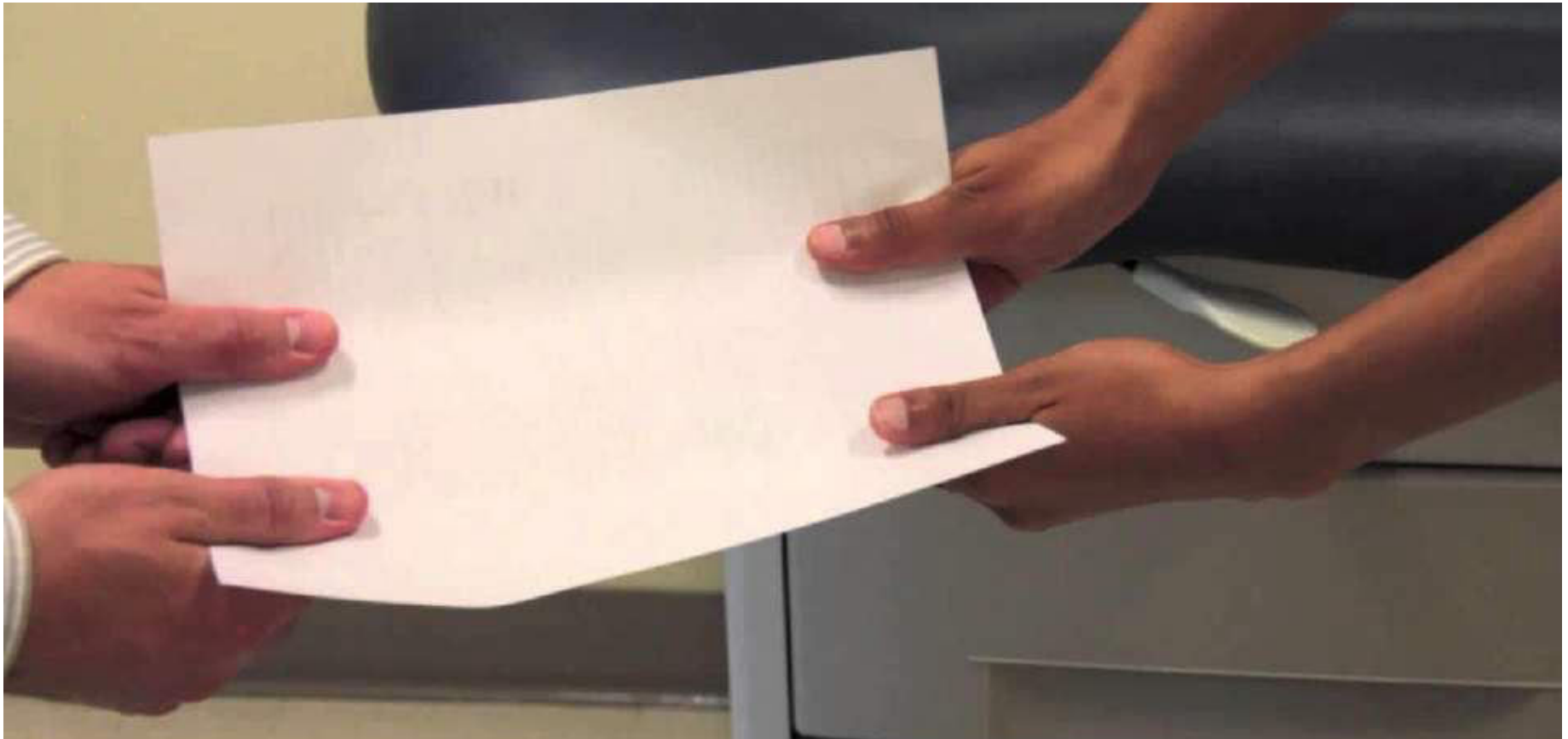
Type 2 - **A**bove

Type 3 – **L**ower/below

Type 4 – **T**wo or through

Type 5 – **ER**rasure of growth plate or cRush

- **What is this sign?** Froment's Sign
  - **For which nerve?** Ulnar nerve



Dx? Dupuytrens Contracture

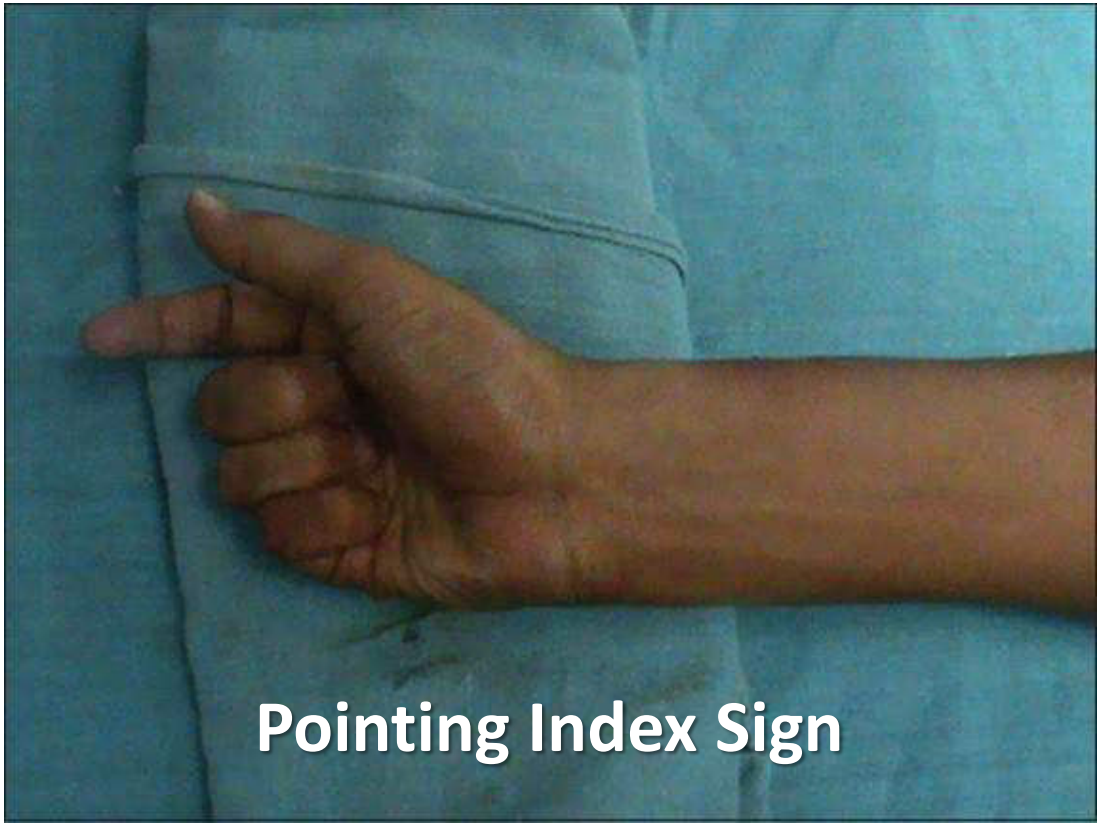
Dx?

Kienbock's disease (AVN of the lunate – lunate density)

Kienbocks

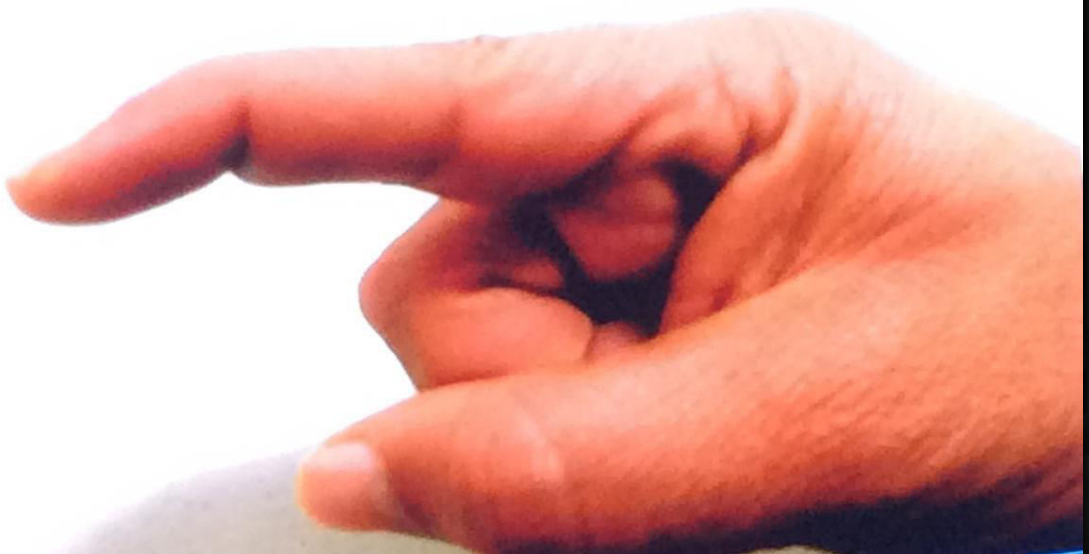
Cut injury at forearm result in this picture which most likely nerve injury?

Median nerve injury

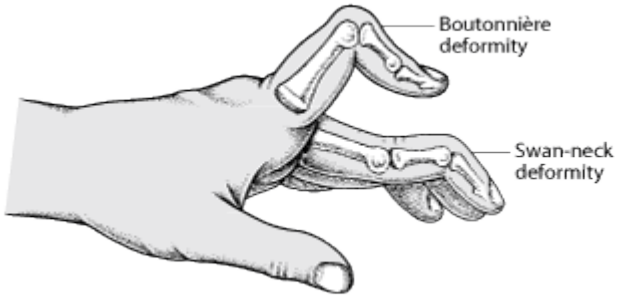


Dx?

Mallet finger
(Extensor Tendon Avulsion)

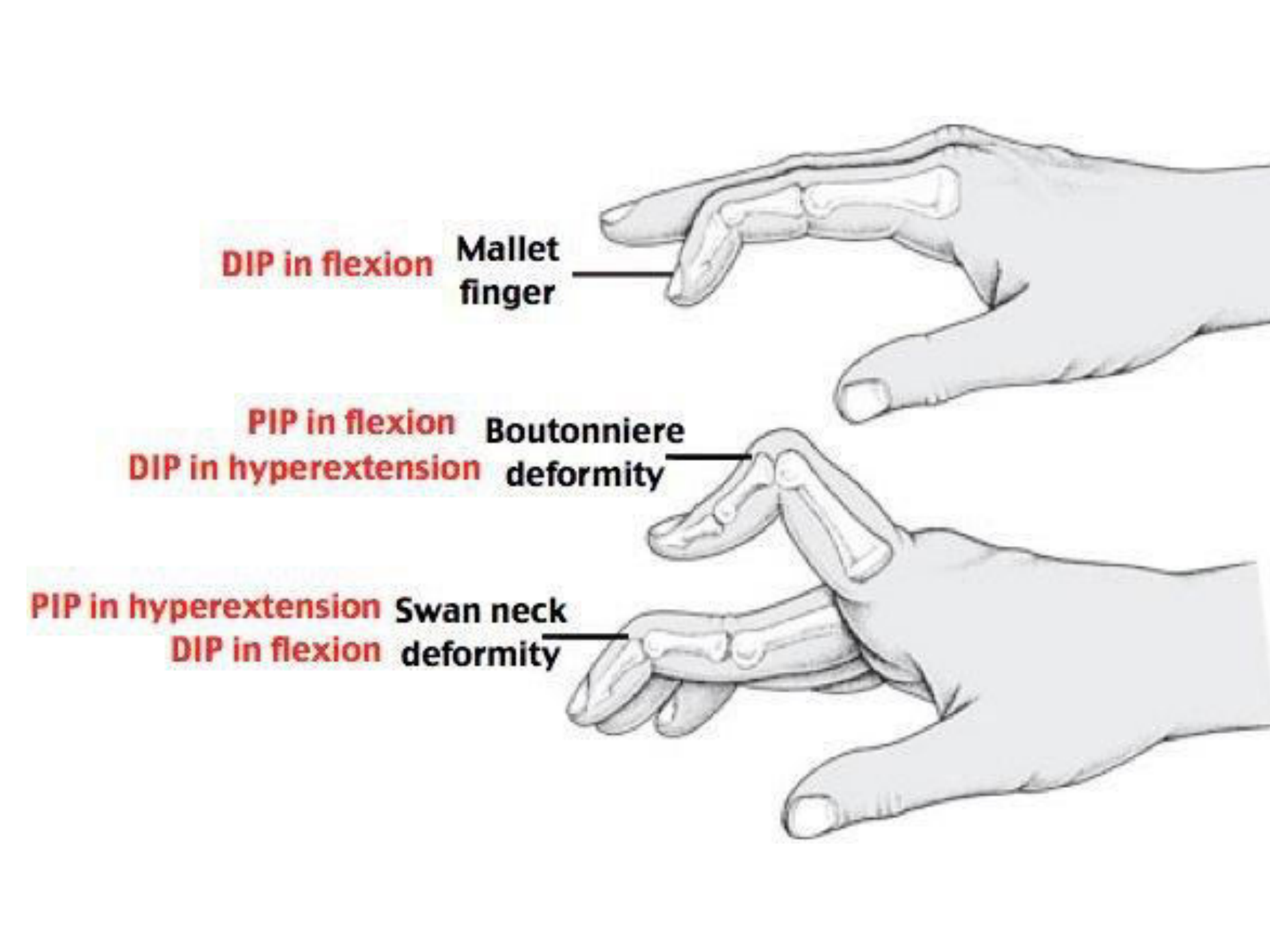



Boutonniere deformity


Boutonnière deformity
Swan-neck deformity


Boutonniere deformity


Swan neck

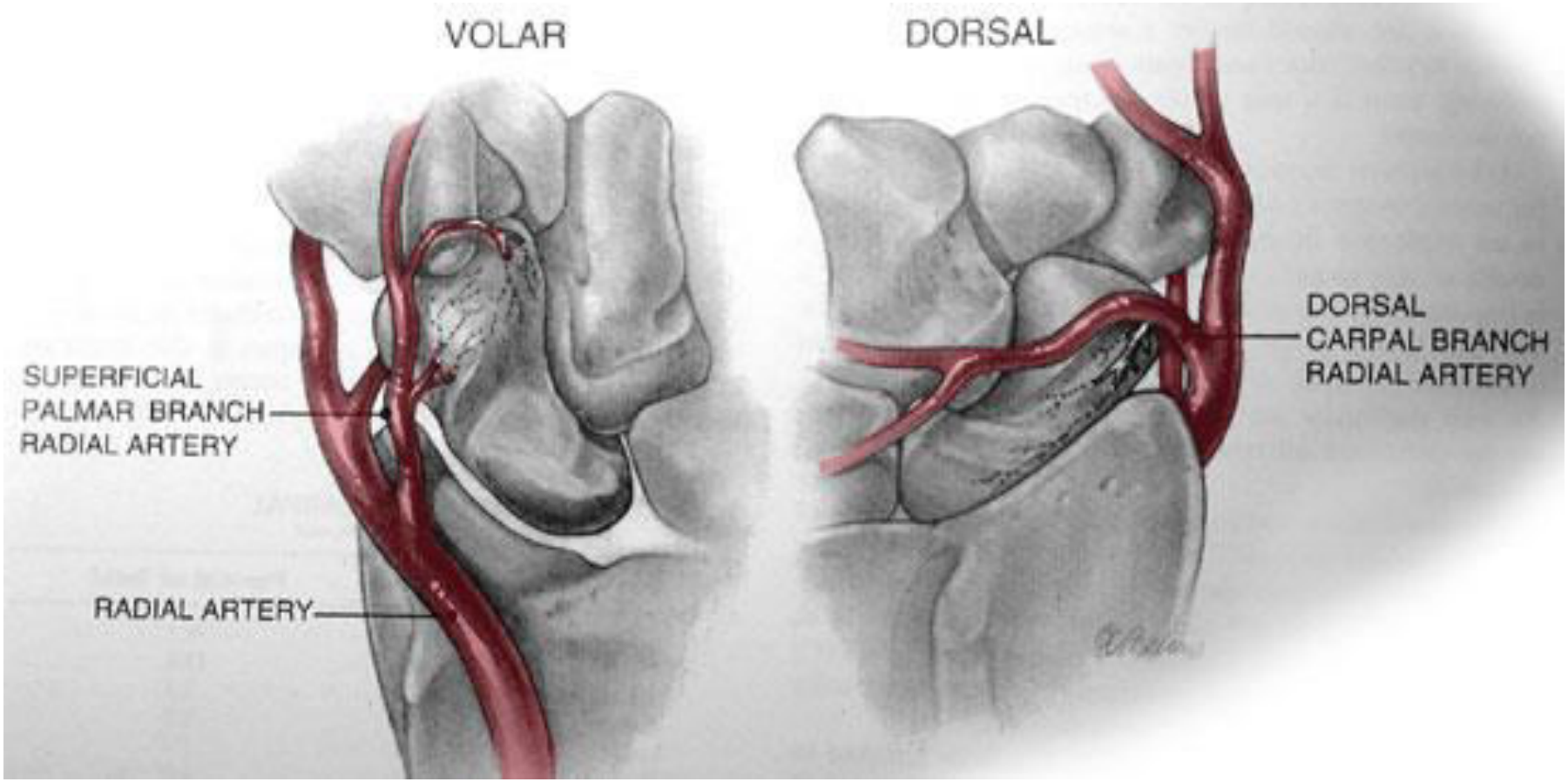

DIP in flexion
Mallet finger
PIP in flexion
DIP in hyperextension
Boutonniere deformity
PIP in hyperextension
DIP in flexion
Swan neck deformity

- **Dx?**
  Scaphoid fracture

- **Complication:**
  AVN

Scaphoid blood supply:

- Dorsal carpal branch (branch of radial)
- Superficial palmar arch (branch of volar radial)



Dorsal intercalated segmental instability (DISI)

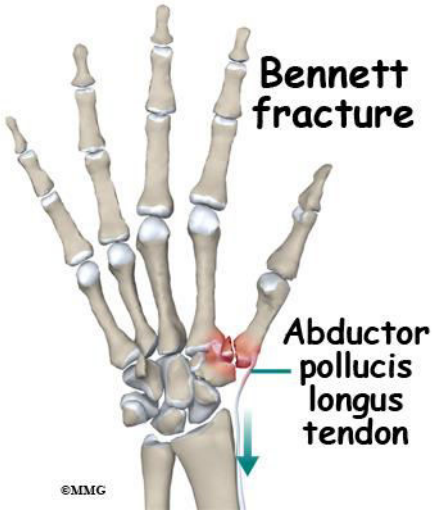
widening of scapho-lunate interval
(Terry-Thomas Sign)

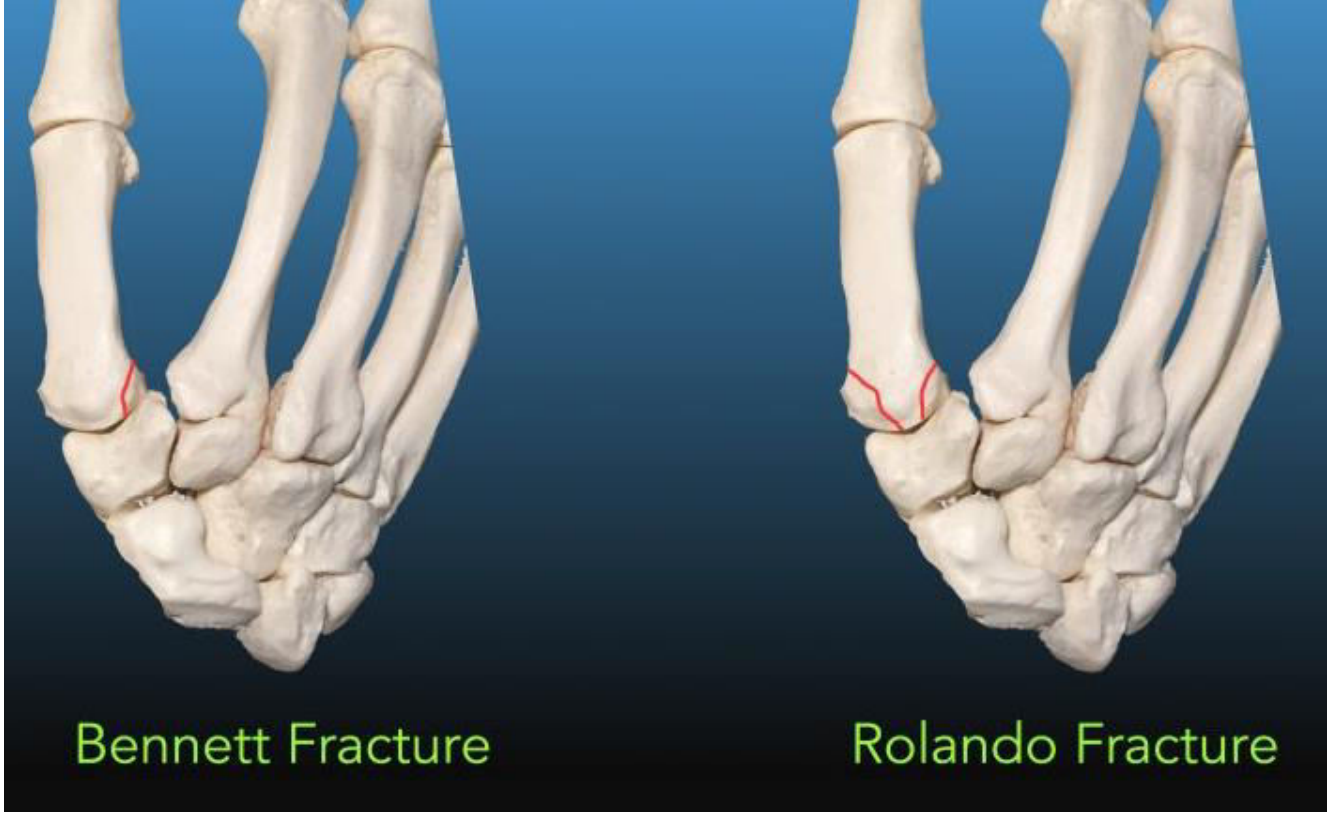
Dx? Rolando fracture

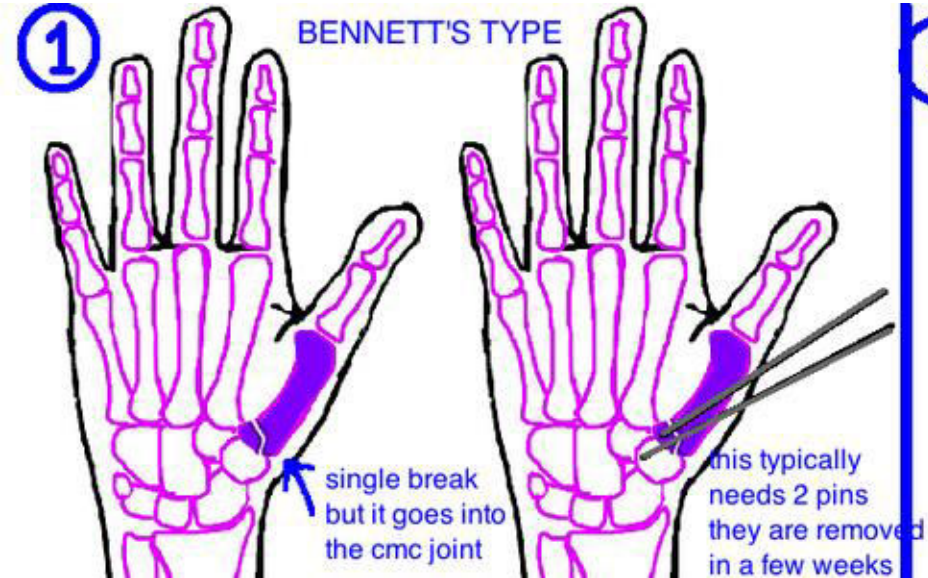
(comminuted fracture of the base of the 1st phalanges)

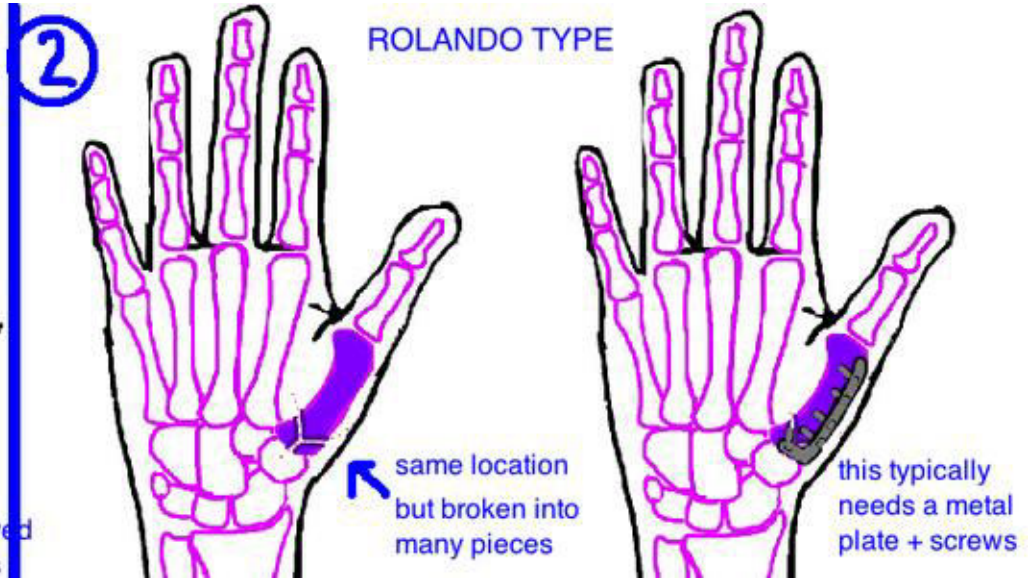
Dx? Bennets fracture

(**Bennett fracture** is a **fracture** of the base of the first metacarpal bone which extends into the carpometacarpal (CMC) joint)


Bennett fracture
Abductor pollucis longus tendon
©MMG

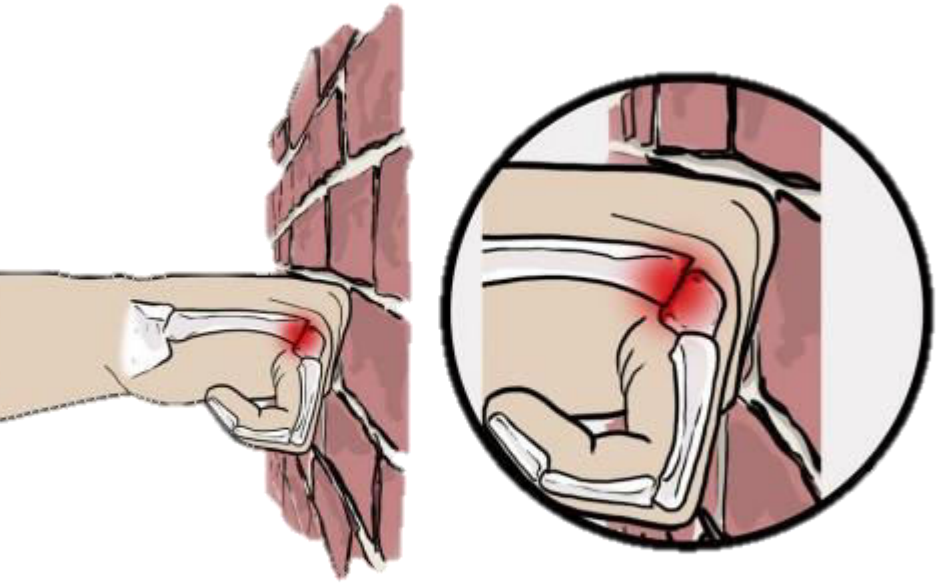

Bennett Fracture
Rolando Fracture


1
BENNETT'S TYPE
single break but it goes into the cmc joint
this typically needs 2 pins they are removed in a few weeks

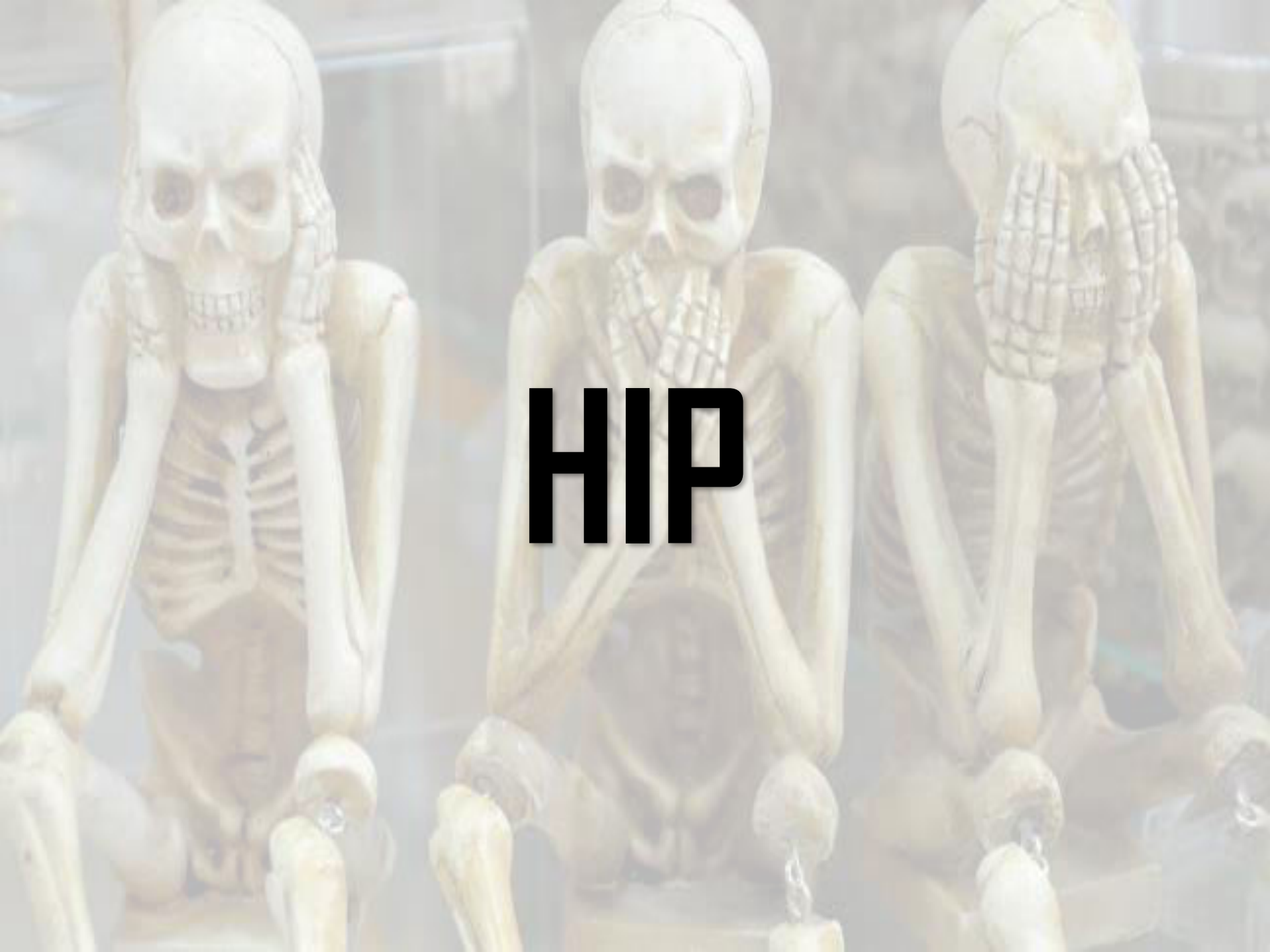

2
ROLANDO TYPE
same location but broken into many pieces
this typically needs a metal plate + screws

Boxer's Fracture

* break in the neck of the 5th metacarpal mostly *



Dx? Madelung's Disease

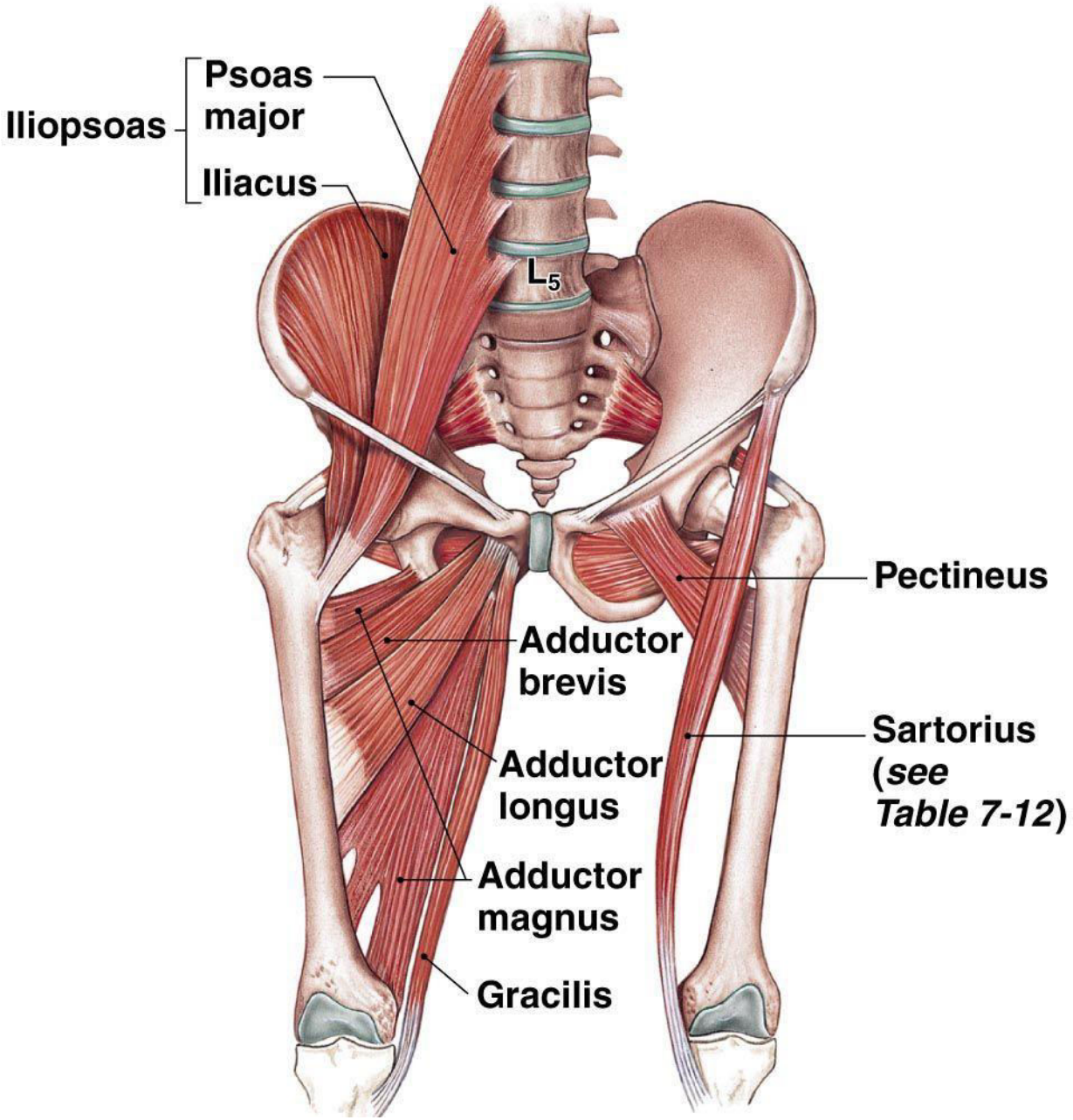

HIP

The **hip abductor** muscles include the
- gluteus medius,
- gluteus minimus, and
- tensor fascia lata (TFL)

Nerve supply: *Superior gluteal nerve*
(branch of the sacral plexus)

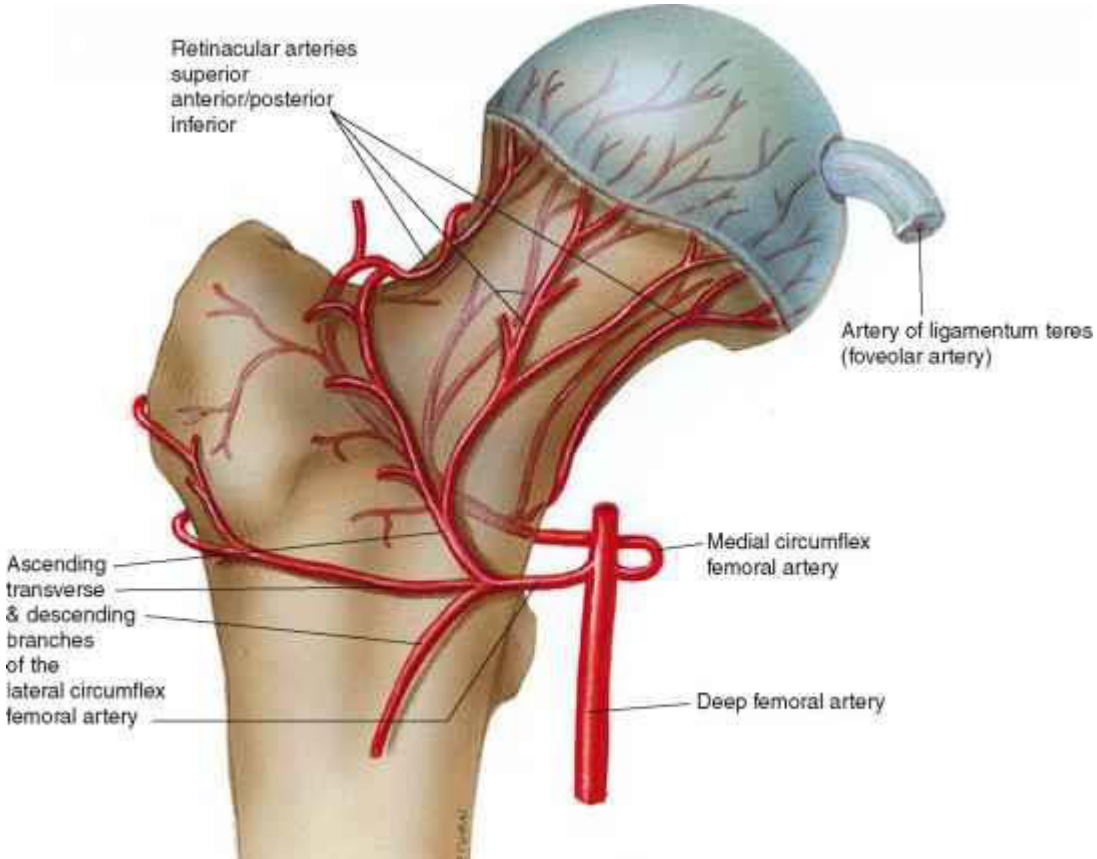
The **hip adductors** muscles include:
- adductor longus, and brevis, and magnus
- gracillis
- obturator externus

Nerve supply:
Obturator nerve
(branch of lumber plexus)



The **Femoral Head** blood supply:

- extracapsular arterial ring (LCFA, MCFA)
- ascending cervical branches
- artery to ligamentum teres: obturator artery or MCFA



Dx? Bilateral Protrusion Acetabuli

Causes: Paget, RA, Osteomalacia, Trauma

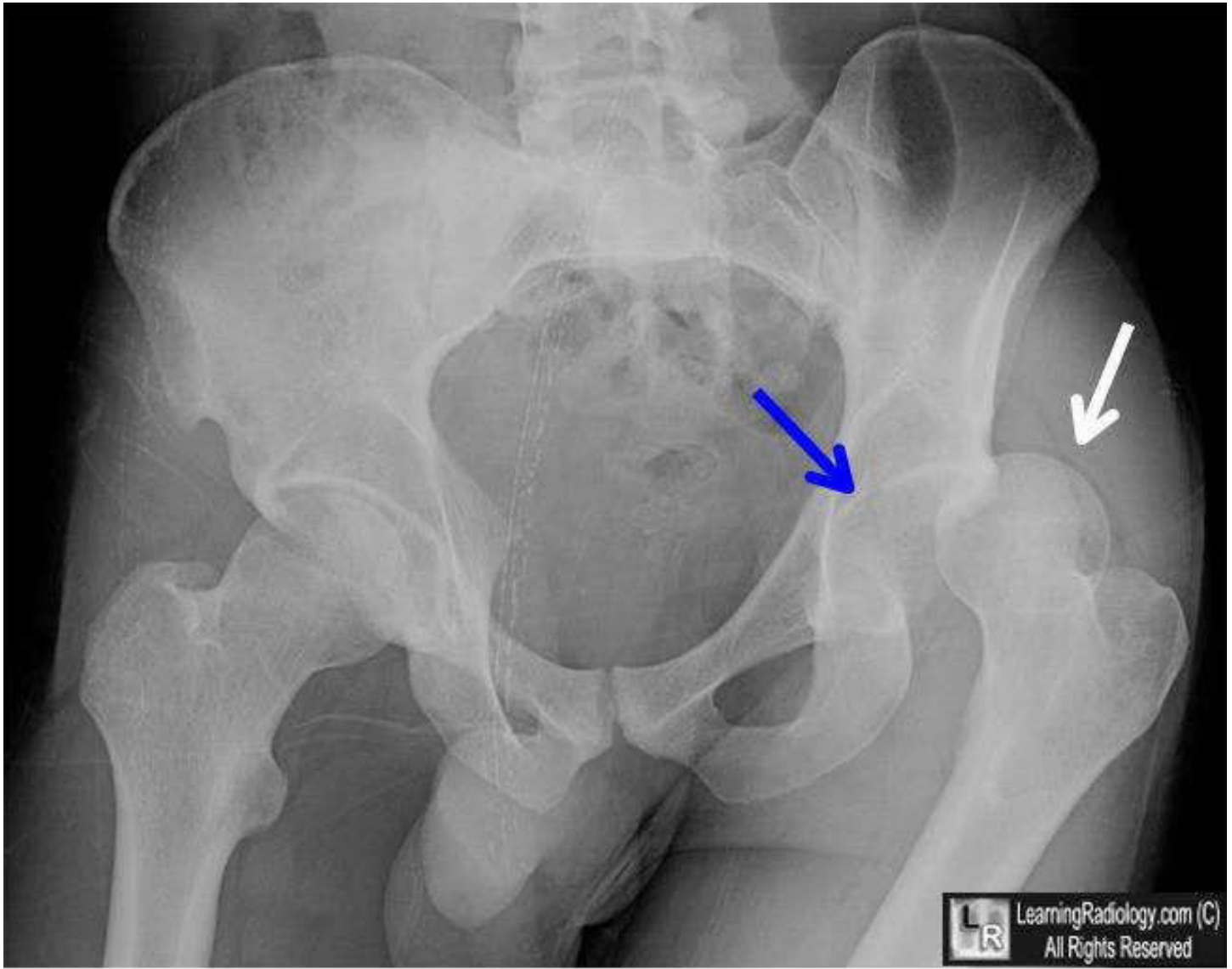
Dx? Bilateral Protrusion Acetabuli

Causes: Paget, RA, Osteomalacia, Trauma

Dx? Hip Dislocation

(Left Hip, Posterior Dislocation)

Left Femoral head dislocation Posteriorly



What is nerve that is commonly injured according to the pic ? **Sciatic nerve**

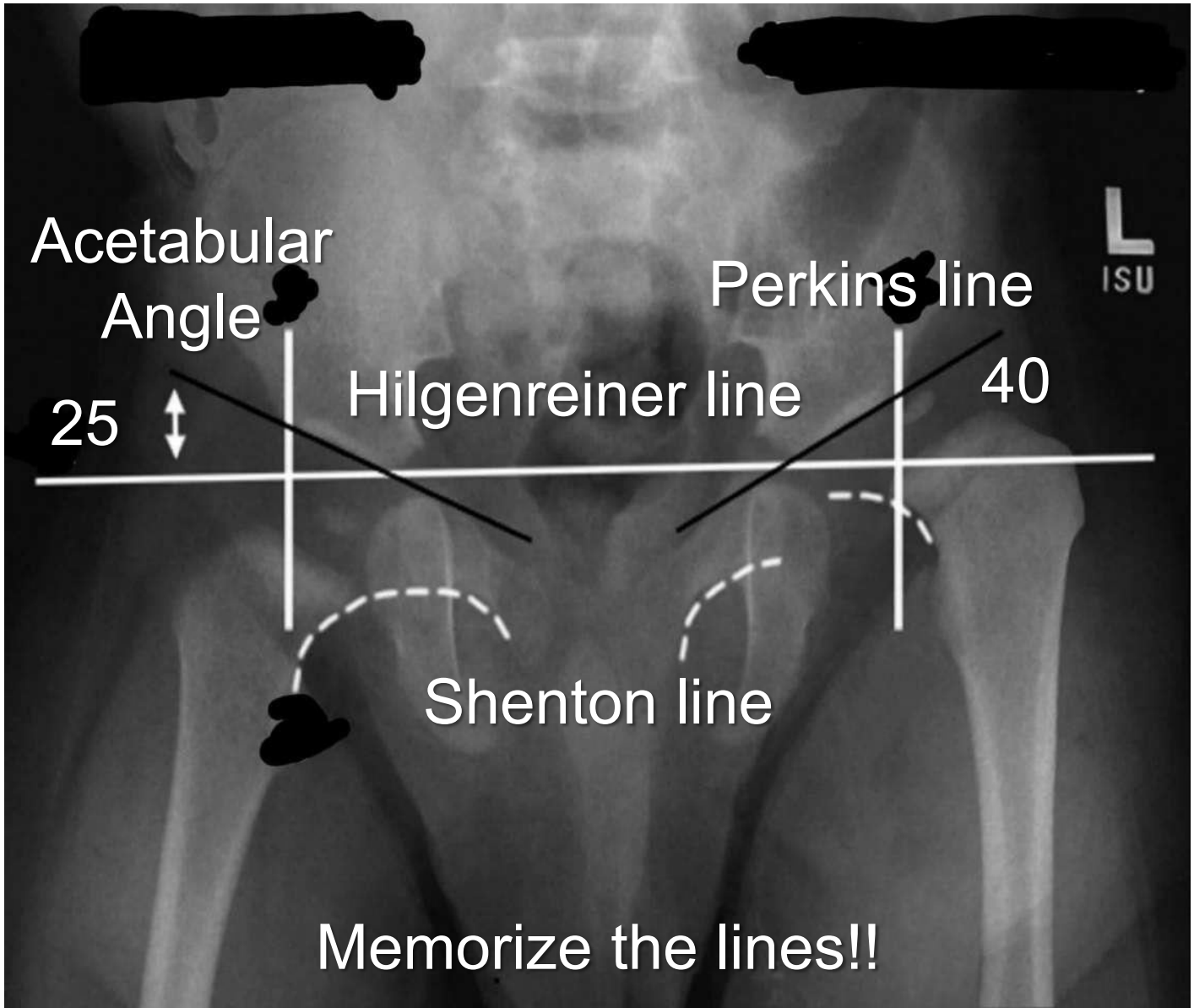
Dx? Right Acetabular Dysplasia

Dx? Acetabular Dysplasia

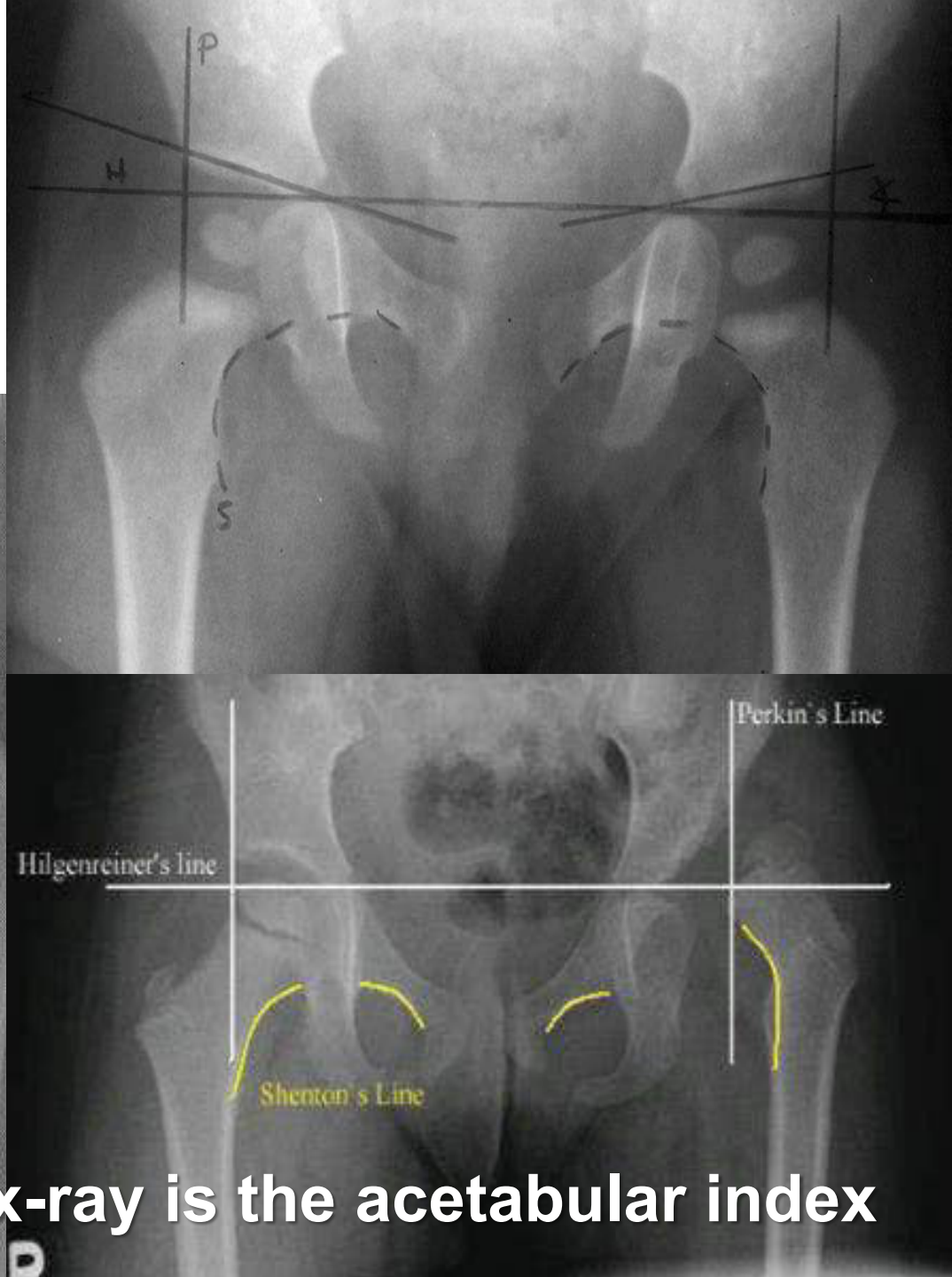
Dx? Hip Subluxation

Dx? DDH of the Left Hip

(Developmental Dysplasia of the Hip)



DDH



Note: the best sign on x-ray is the acetabular index

DDH

Left Sided

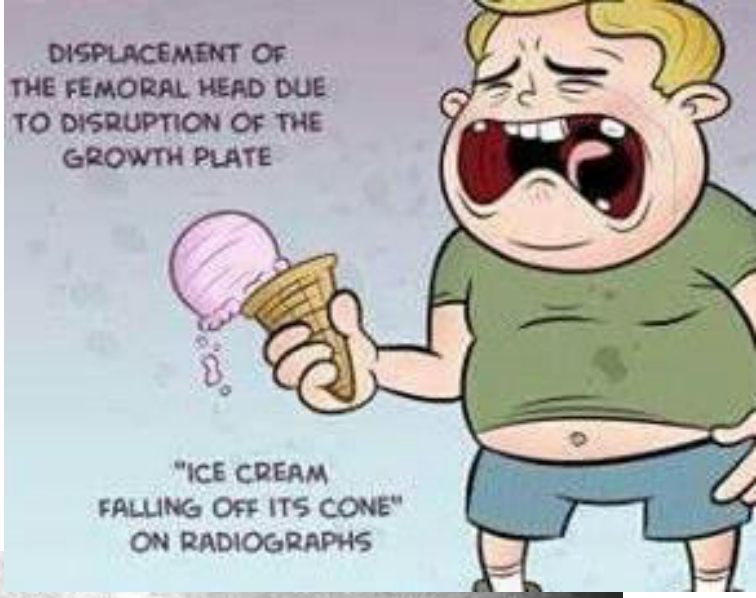
Right Sided

Coxa Vara

Coxa Valga

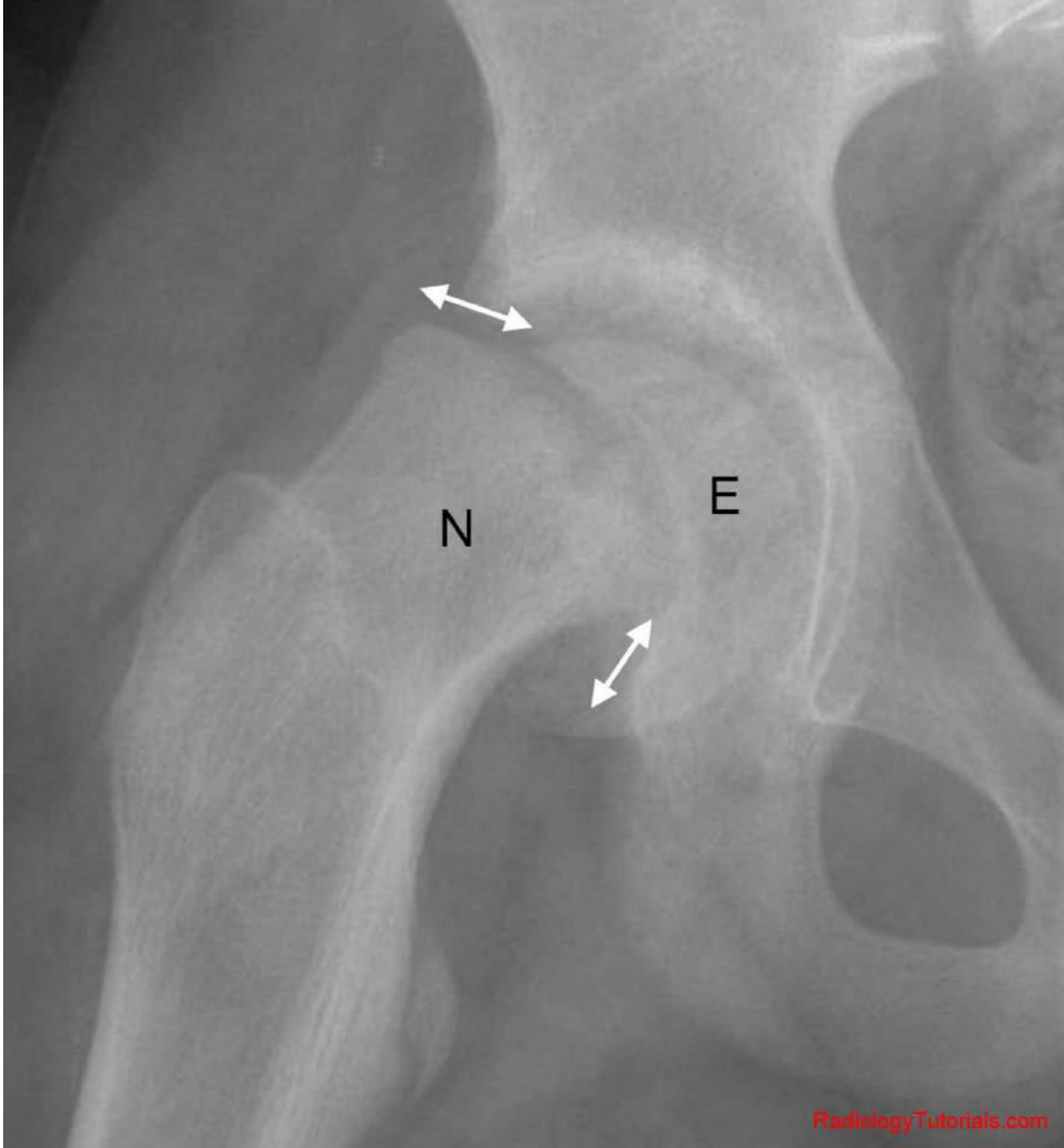
Dx?

Bilateral Slipped Capital Epiphysis

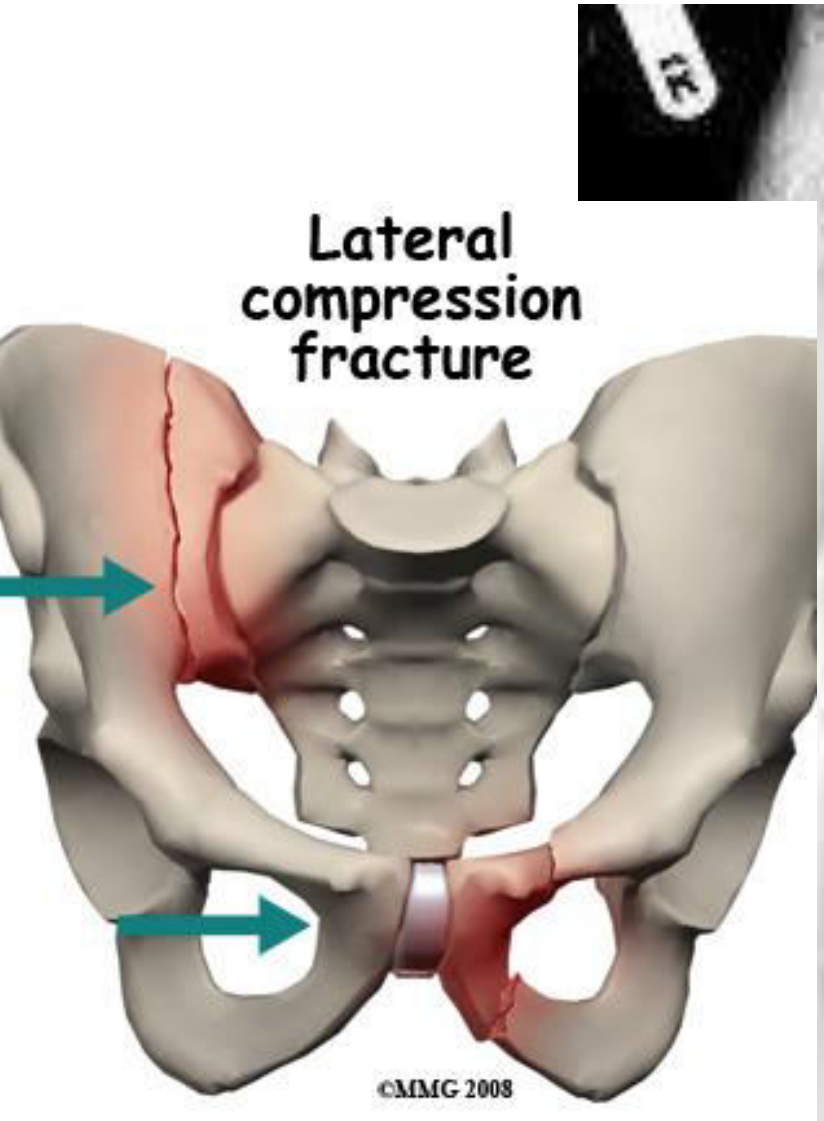


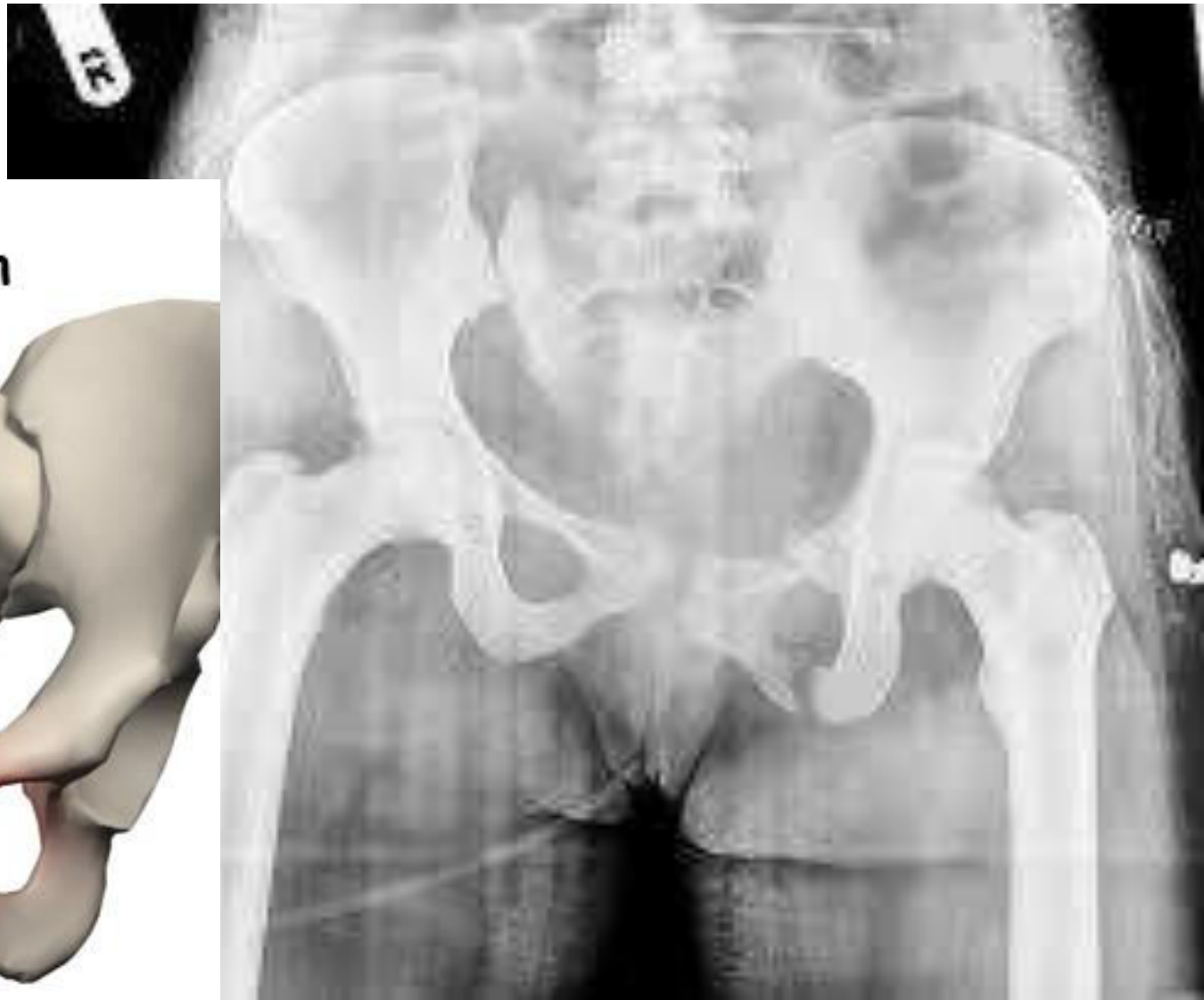
Dx?

Right
Slipped
Capital
Femoral
Epiphysis



Lateral Compression



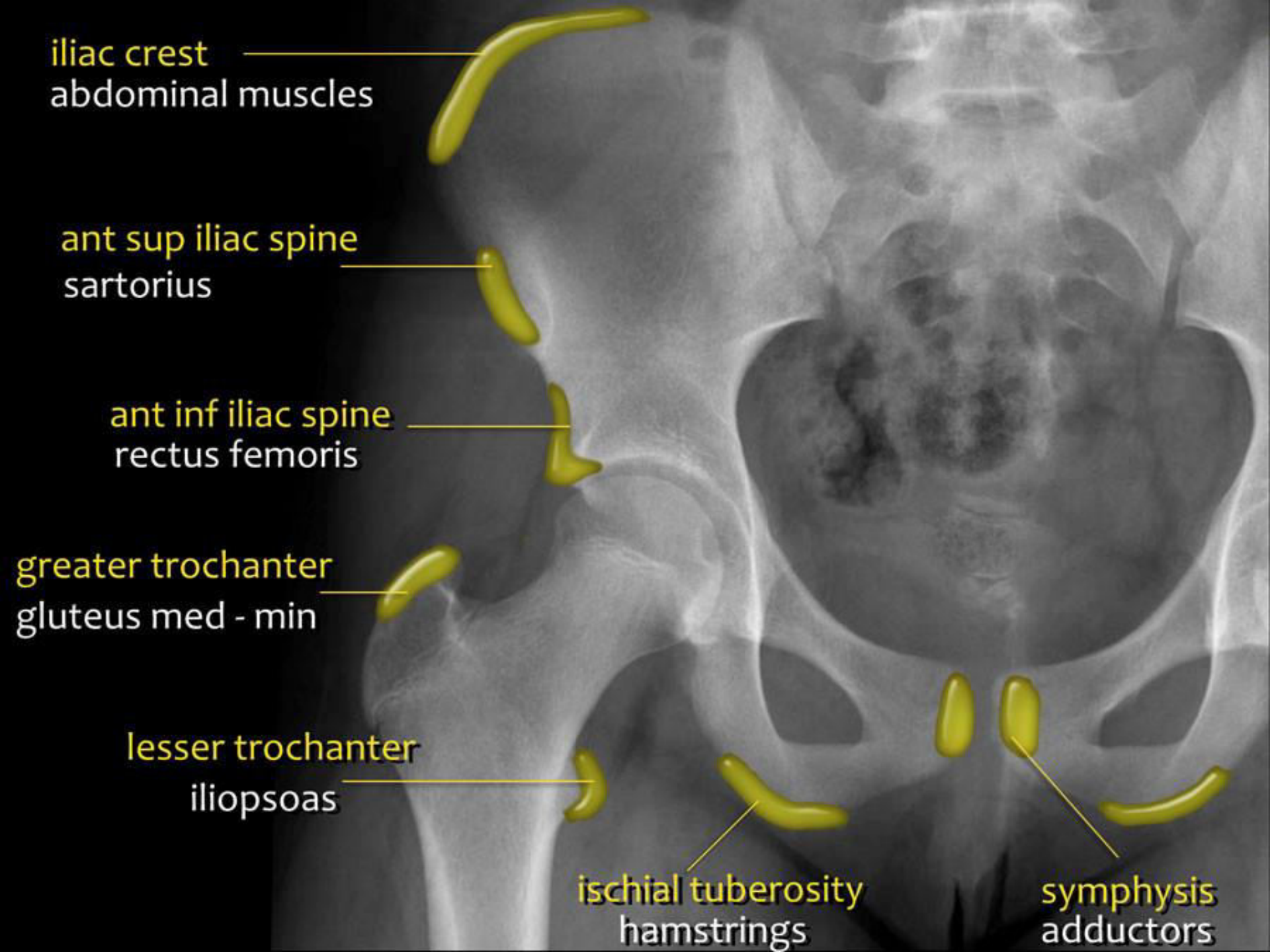


Dx? Perthes Disease

(AVN of the femur head)

Dx? Perthes Disease

(AVN of the femur head)


iliac crest
abdominal muscles
ant sup iliac spine
sartorius
ant inf iliac spine
rectus femoris
greater trochanter
gluteus med - min
lesser trochanter
iliopsoas
ischial tuberosity
hamstrings
symphysis
adductors

Dx?
Avulsion fracture of the ischial tuborisity

Contraction of which muscle can cause this fracture?
Hamstring muscles

Dx?

Displaced Intra-capsular fracture

Dx?

Right Femur Inter-trochanteric fracture (Type 2)

Displaced
slightly comminuted
Lesser trochanter fracture
Varus

Most common Complication?

Malunion,
Bleeding,
Soft tissue injury

Dx? Right inter-trochanteric fracture

Most common complication? Malunion, failure of fixation

Dx?

Inter-trochanteric fracture

Most common Complication?

Malunion

Dx? Avulsion IAIS Fracture

Dx?
Femur neck fracture

Treatment?
ORIF

Complication?
- Non union
- AVN

Dx?

Femur neck fracture

Complication?

- Non union
- AVN

Combined Fracture

Dx?
Fractures of the pelvic ring (open book injury)

what is the direction of the force causing this?
Anteroposterior compression + lateral rotation

Dx?
Open book
Fracture

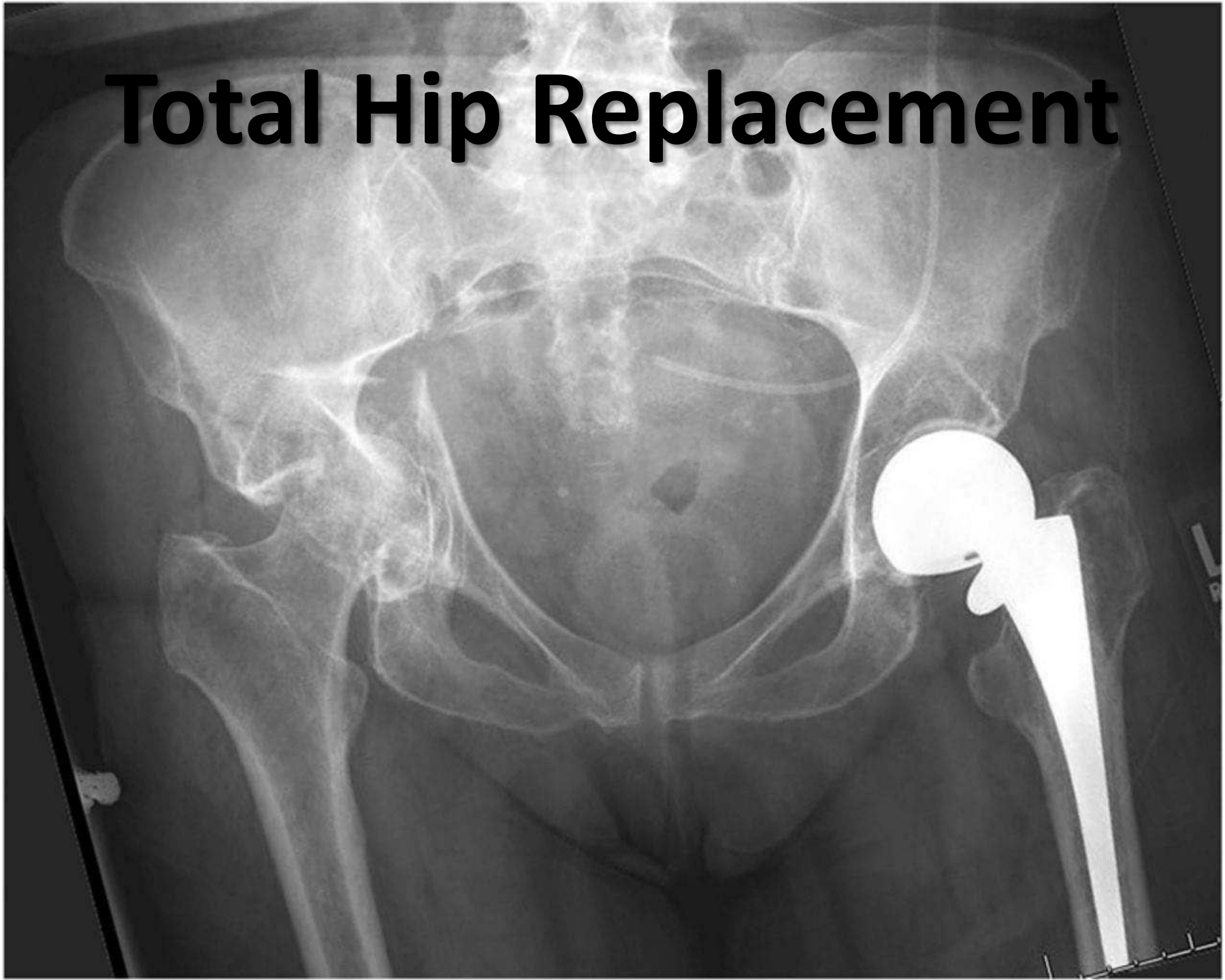
Force Direction?
Anteroposterior
Compression

Complications?
Bleeding,
Soft tissue injury

Dx? Open book fracture

What does it indicate ? AP compression

Total Hip Replacement



FEMUR (THIGH)

Name the site and the pattern of this fracture:

Left femoral shaft fracture Segmental or Segmental comminuted
(comminuted alone is wrong)

What is the name of this fracture?
femoral shaft fracture

What structure is commonly injured with this fracture?
femoral artery

Dx? Supracondylar femur fracture
Displacement? Translation, Angulation
What vessel at risk? Popliteal artery

Describe the displacement?

Lateral translation and shortening

Dx?

malunion

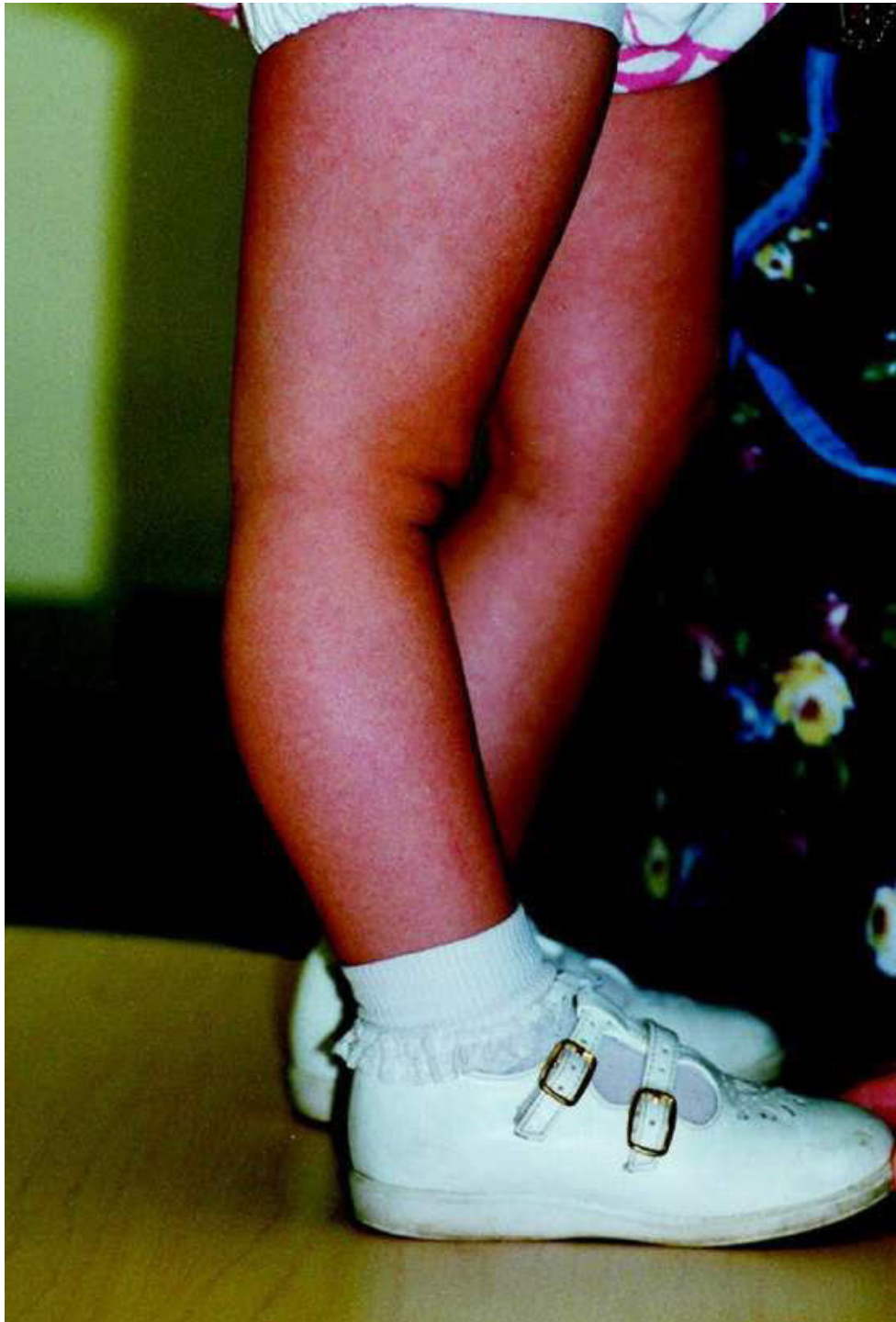

KNEE

Name the Test? Lachman test

The Purpose of the Test? To Examine the ACL

Dx?

Generalized Joint Laxity



Dx?

Genu Recurvatum

Dx?

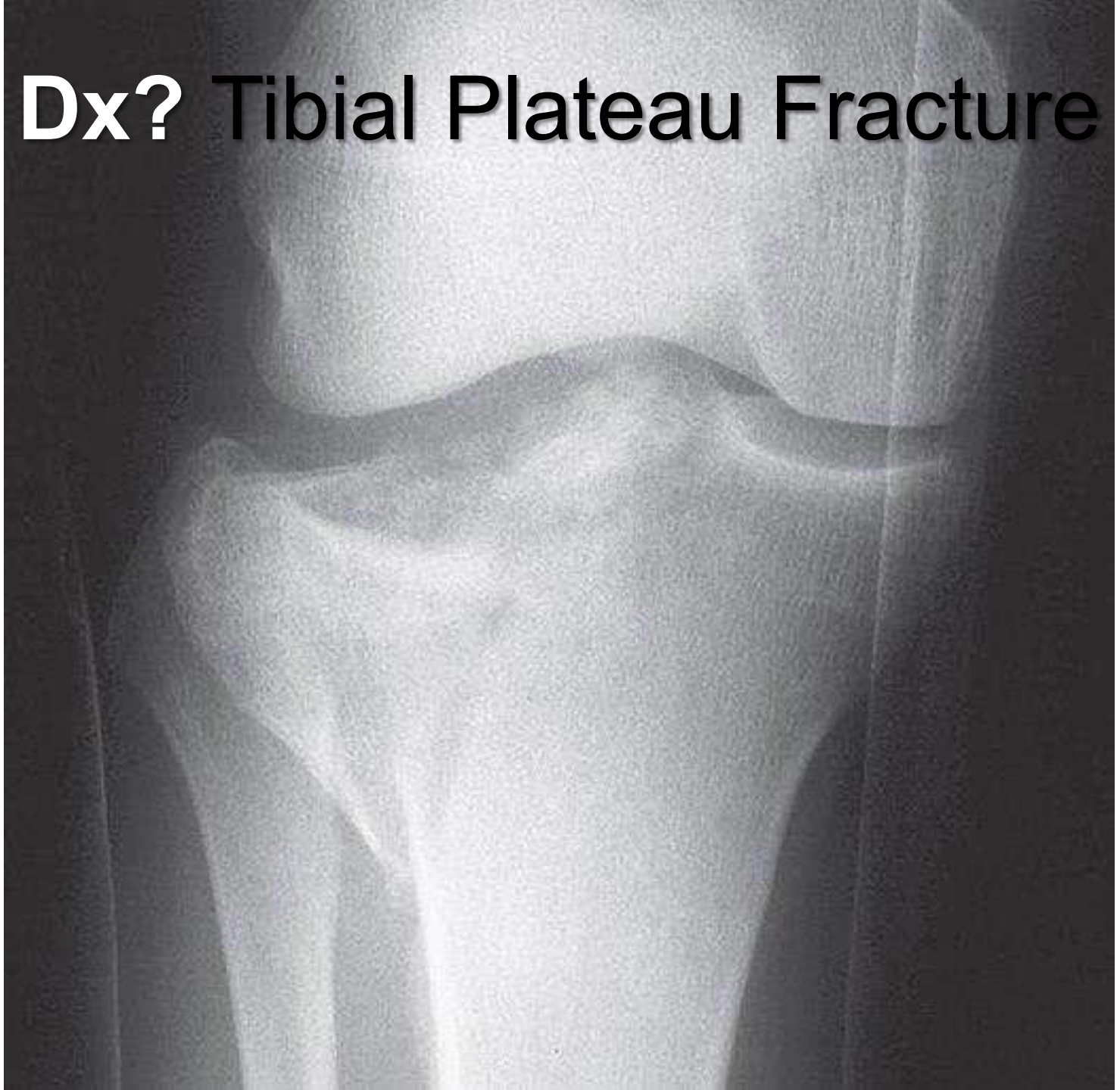
Genu Valgum

"Knock-Knee"

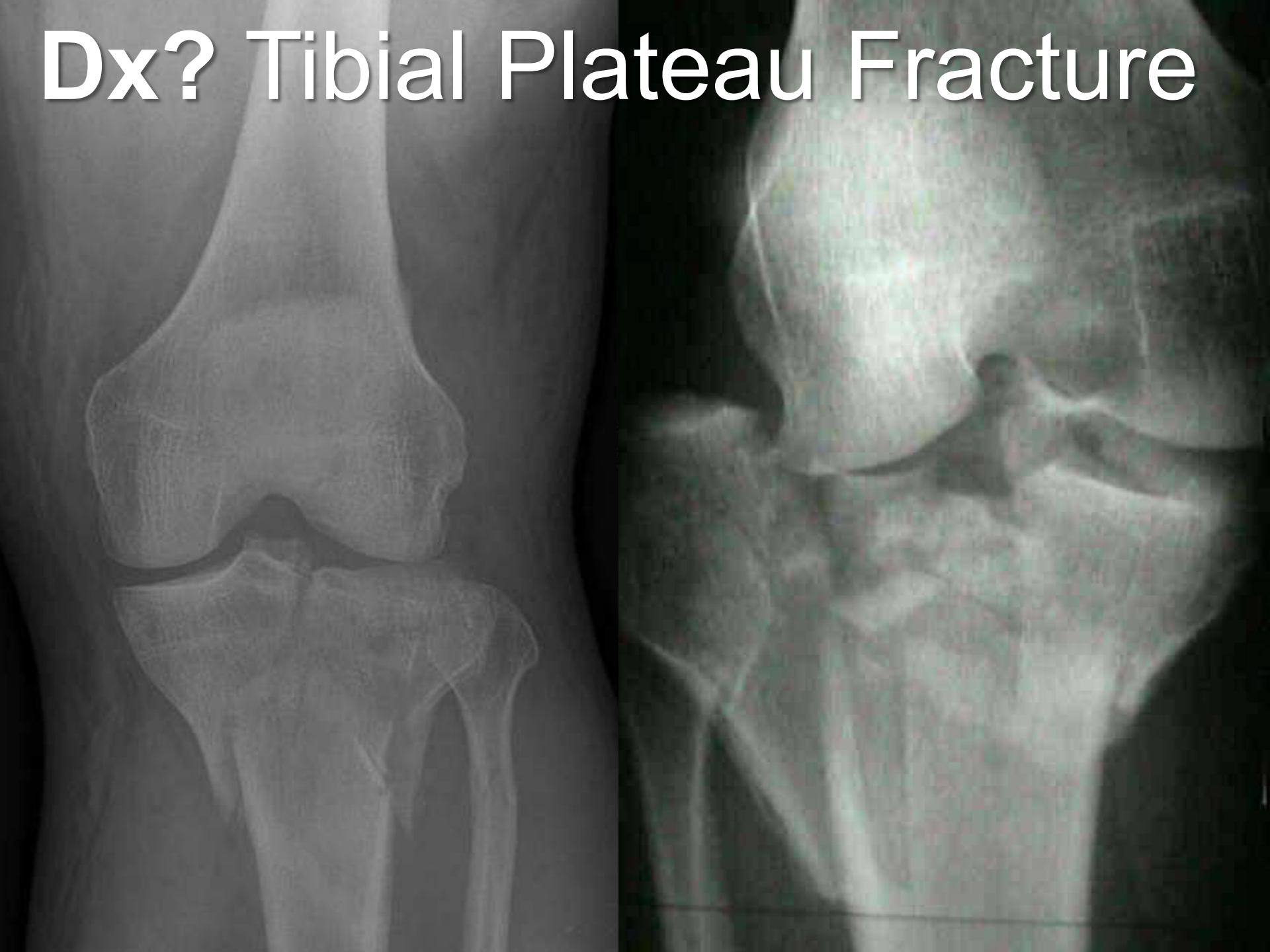
Dx?

Genu Varus

"Bow-legged"


Dx? Tibial Plateau Fracture

Dx? Tibial Plateau Fracture



Dx?

Lateral patellar dislocation

Dx?
Osgood-Schlatter Disease (OSD)

(apophysitis of the tibial tubercle)

Dx?

Loose body in the knee

Dx?

Osteochondritis dissecans
(OCD or OD)

Dx?

OA of the knee

Typical changes seen in OA:

- Joint space narrowing
- Sclerosis
- Cyst formation
- Osteophytes


Figure 4
RA
OA
A
B


LEG

Dx?
Transverse fracture of the tibia and fibula

Description:

- Transverse
- Shortening
- 100% Anteromedial Translation
- Posterolateral Angulation (about 20 degree)
- No Rotation

Dx?

Comminuted mid shaft fracture of tibia with fibular fracture

Dx?

Hypertrophied nonunion fracture of the tibia

Causes?

movement,
wrong reduction
Inadequate immobilization
Inadequate stabilization

Dx?

Atrophic non-union

Causes?

vascular causes (e.g.**impaired** blood supply) or metabolic causes (DM or smoking)

(a) (b) (c) (d) (e)

30.32 Fractured tibia and tibula – late complications
(a) *Hypertrophic non-union*: the exuberant callus formation and frustrated healing process are typical. (b) *Atrophic non-union*: there is very little sign of biological activity at the fracture site. (c) *Malunion*: treated, in this case, by gradual correction in an Ilizarov fixator (d,e).

ANKLE & FOOT

Cutaneous innervation of the foot

- Saphenous nerve ❶
- Deep peroneal nerve ❷
- Superficial peroneal nerve ❸
- Medial plantar nerve ❹
- Lateral plantar nerve ❺
- Calcaneal branch (tibial nerve) ❻
- Sural nerve ❼

Dorsal surface

Plantar surface

Dx? Congenital Talipes Equinovarus (Club-foot)

TTT:

Conservative (poonseti) serial casting

Description:

plantar flexion supination medial rotation, except the body of talus

Dx?

Pes Cavus

Dx?

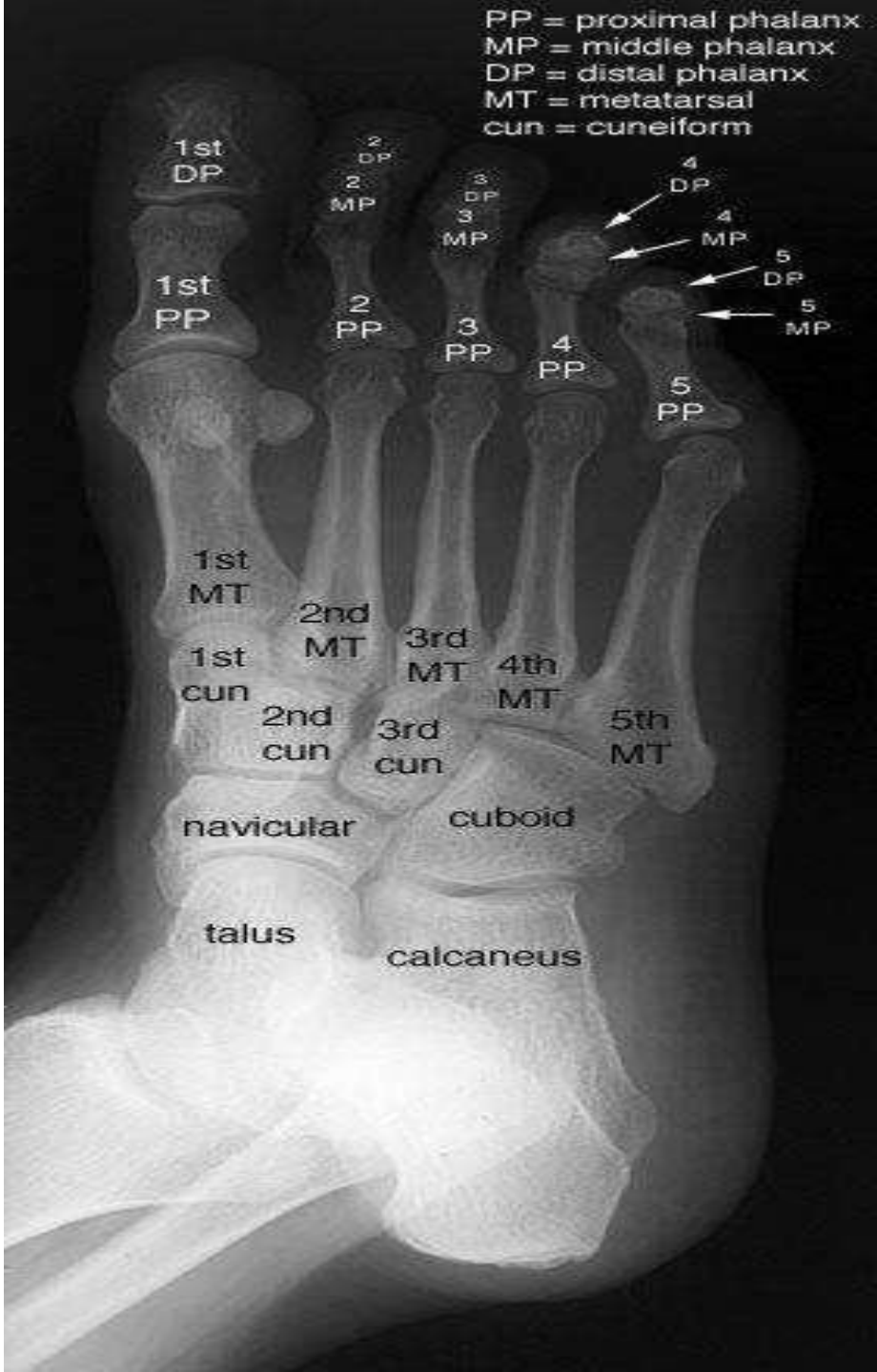
Pes Planus Valgus

Dx?

Congenital Convex Pes Vulgus

Dx?
Hallucus Valgus

Memorize The Foot Bones!

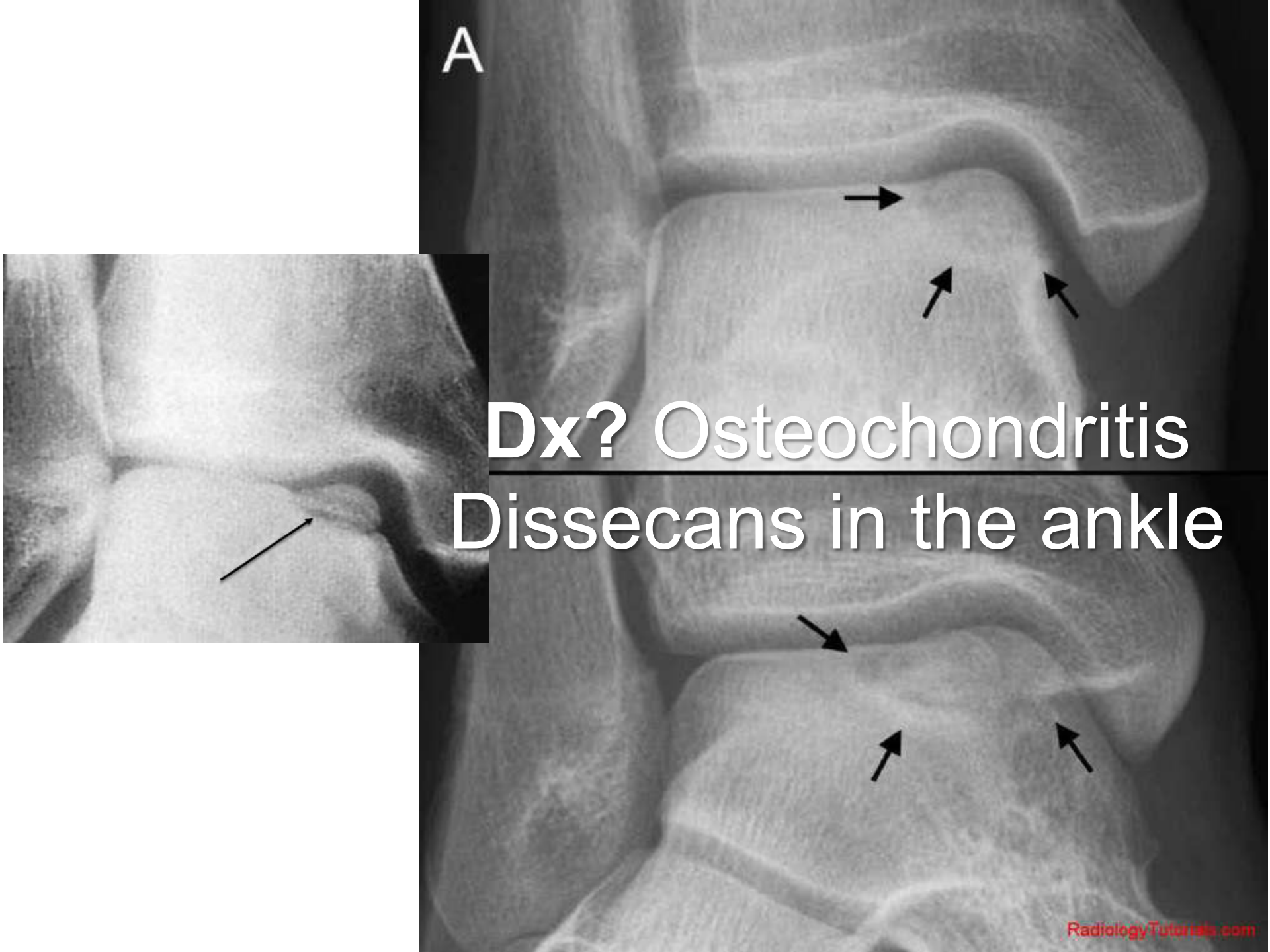


Name The Bone?

Navicular Bone

Dx?

Sever Disease
(Apophysitis of calcaneus)


A
Dx? Osteochondritis
Dissecans in the ankle
RadiologyTutorials.com

Dx? Köhler Disease

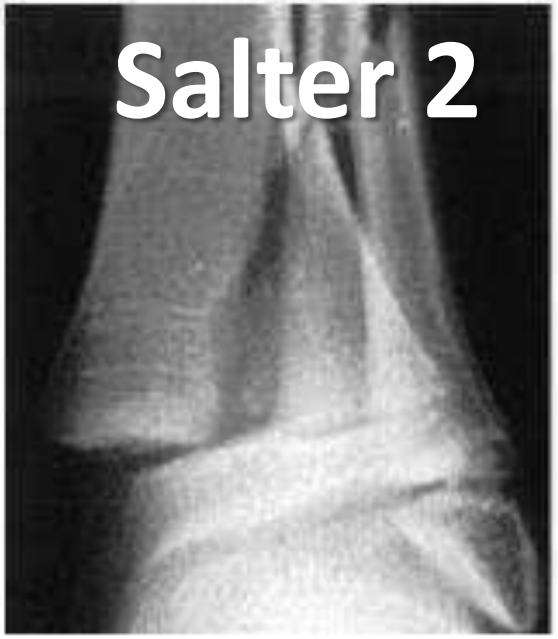
“navicular bone osteochondritis”

Dx?

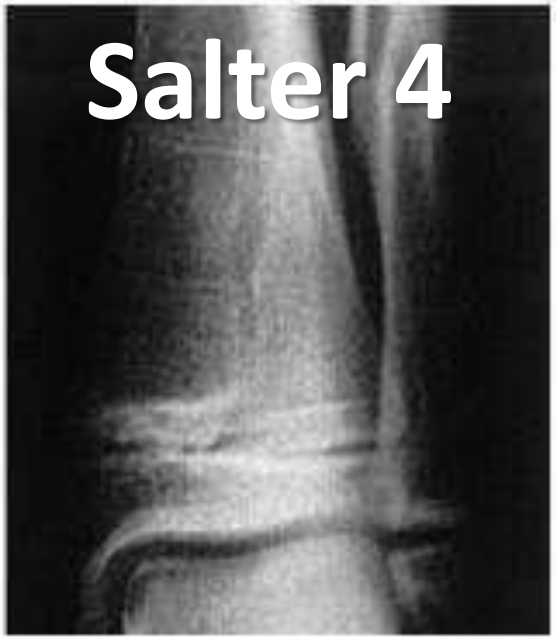
Bimalleolar Ankle Fracture

Dx?

Pilon Fracture



(a)



(b)

(c)

(e)

(f)

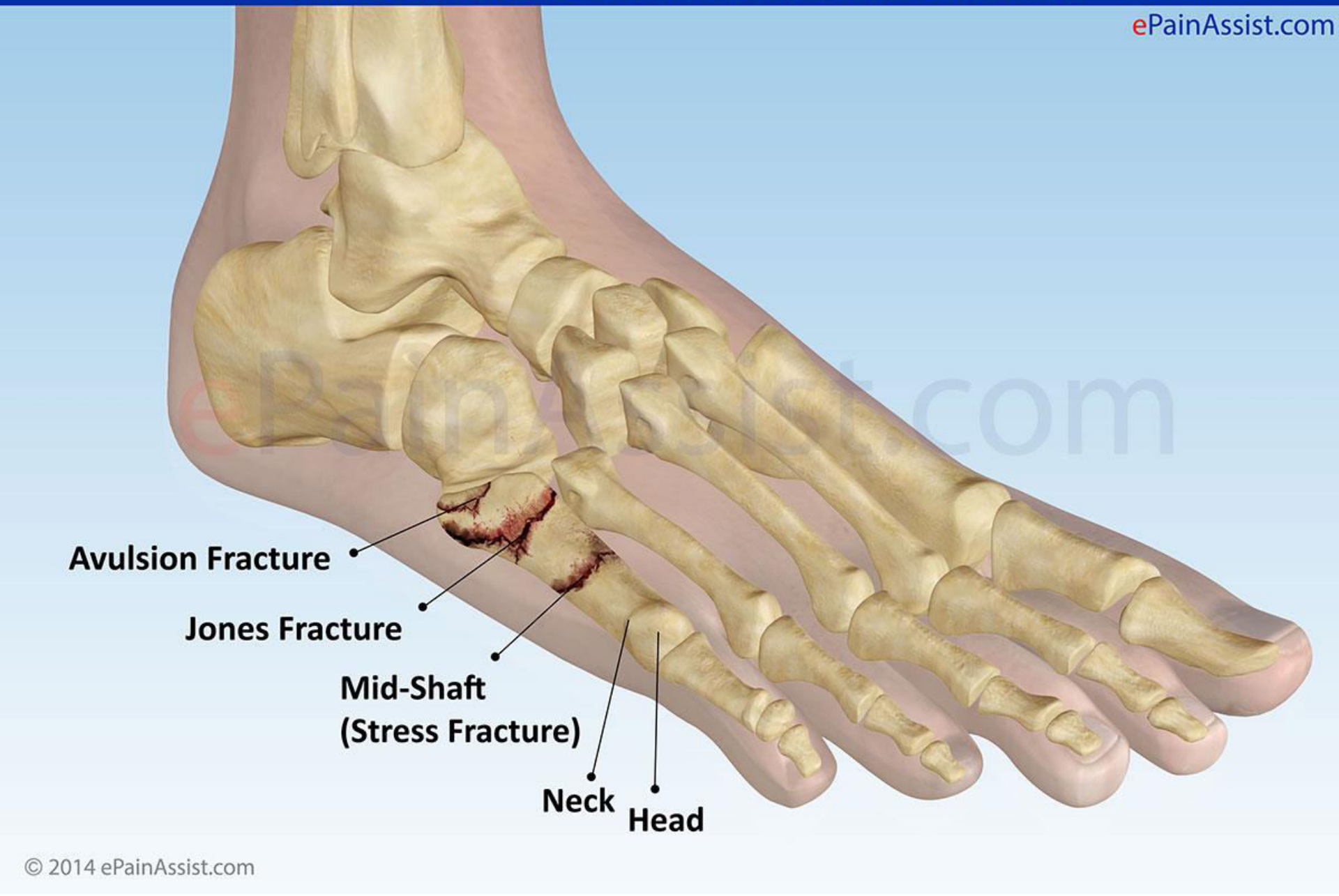
Dx?

Avulsion of the 5th Metatarsis bone


Dx?
Calcaneus
Fracture


Dx?
Talus
Fracture
AVN

Jones Fracture or 5th Metatarsal Fracture



Jones Fracture

"caused by a twisting injury in the peroneal brevis and peroneal longus tendons, this leads to avulsion of the bone in the lateral side"

March Fracture

"a type of stress fracture that is caused by repeated minor trauma to the area, it can be mistaken with malignancy on X-ray"

March Fracture

Lisfranc Fracture

“injury to the metatarsal bones at the level of the tarsus, it is named after Lisfranc who was napoleon’s personal doctor. We also Lisfranc joint & tendon.

Treatment is anatomical reduction

Normal Foot

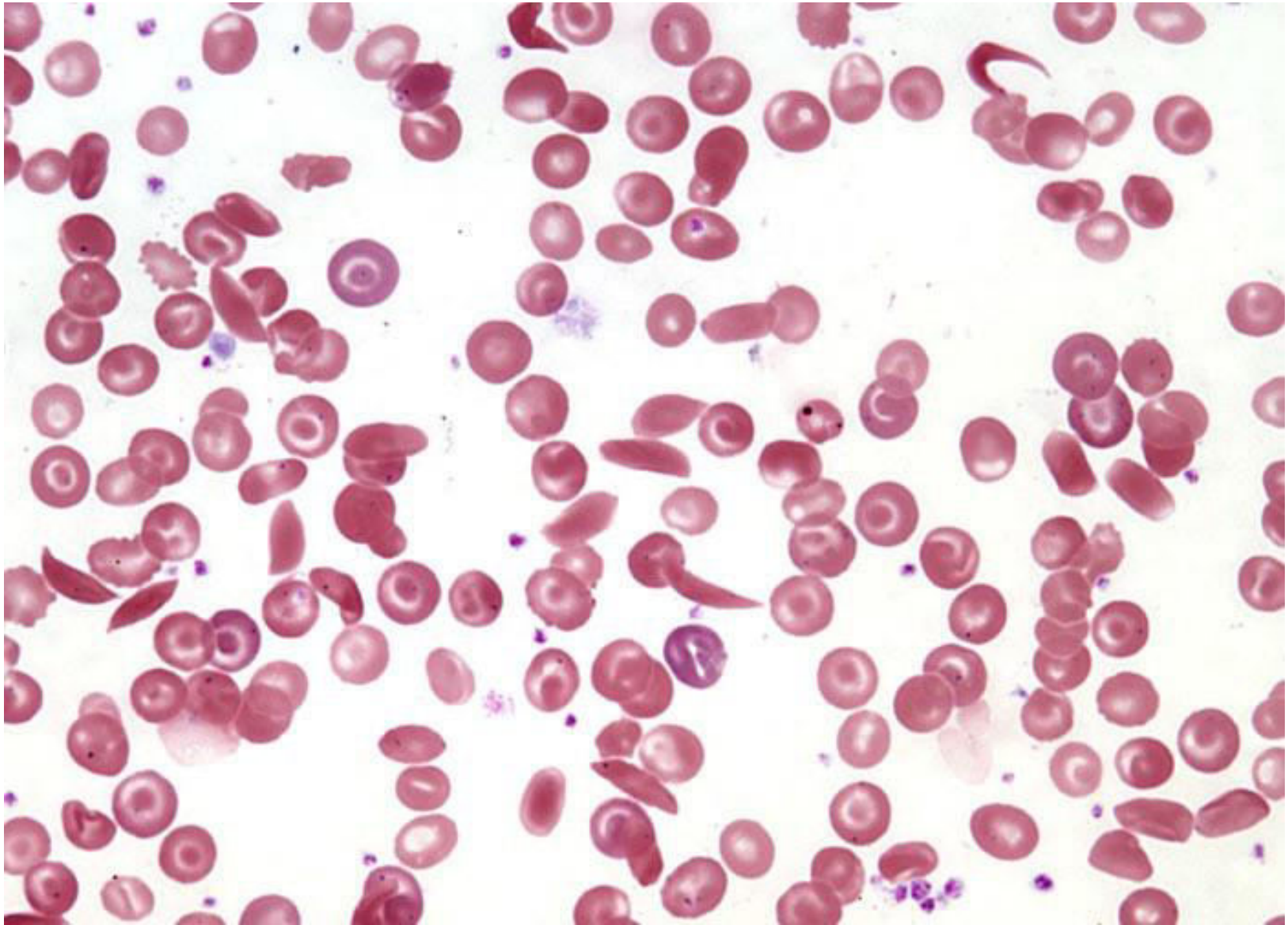
Dislocation of Metatarsal Bones

Lisfranc Injury or Lisfranc Fracture

There is trauma or injury to the foot resulting in displacement of either one or all of metatarsal bones from tarsus.

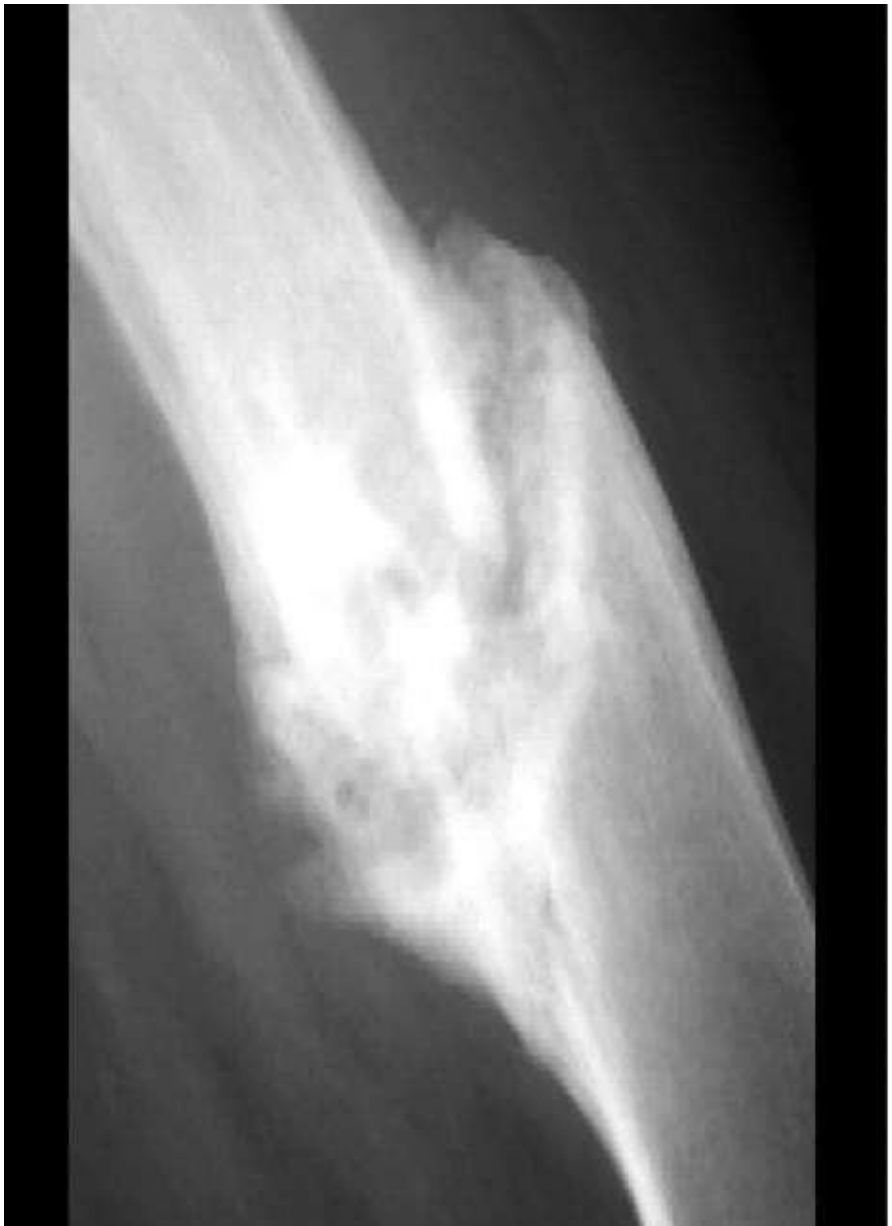

OTHERS

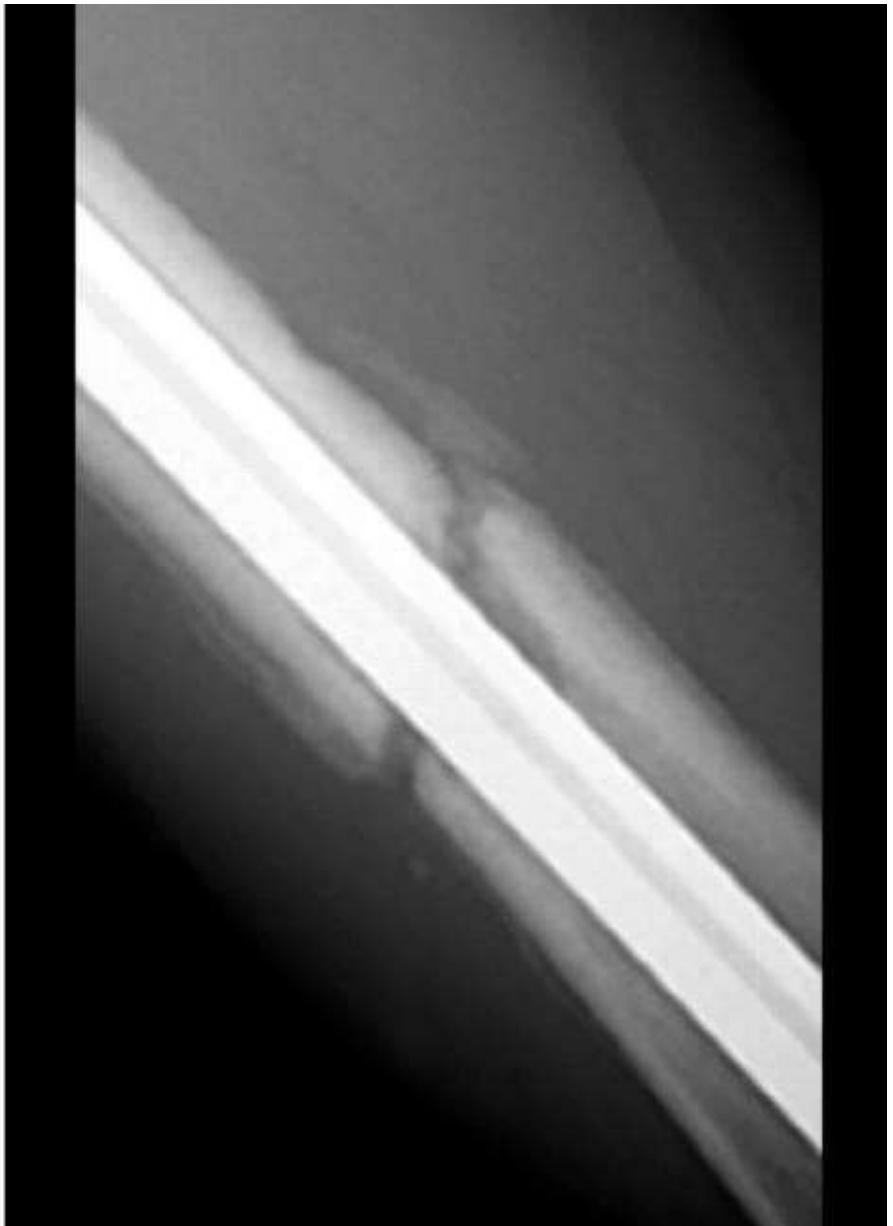
- **What is most common pathogen to cause osteomyelitis in sickle cell patients?** Salmonella



Scoliosis

Non Union - Treated by a Nail





45 years old, sustained humerus fracture 9 months ago, this is the x-ray now

A- what is the diagnosis of this complication?

Non-atrophic Non-union

B- what is the cause of this condition?

They have given rise to the acronym **CASS**:

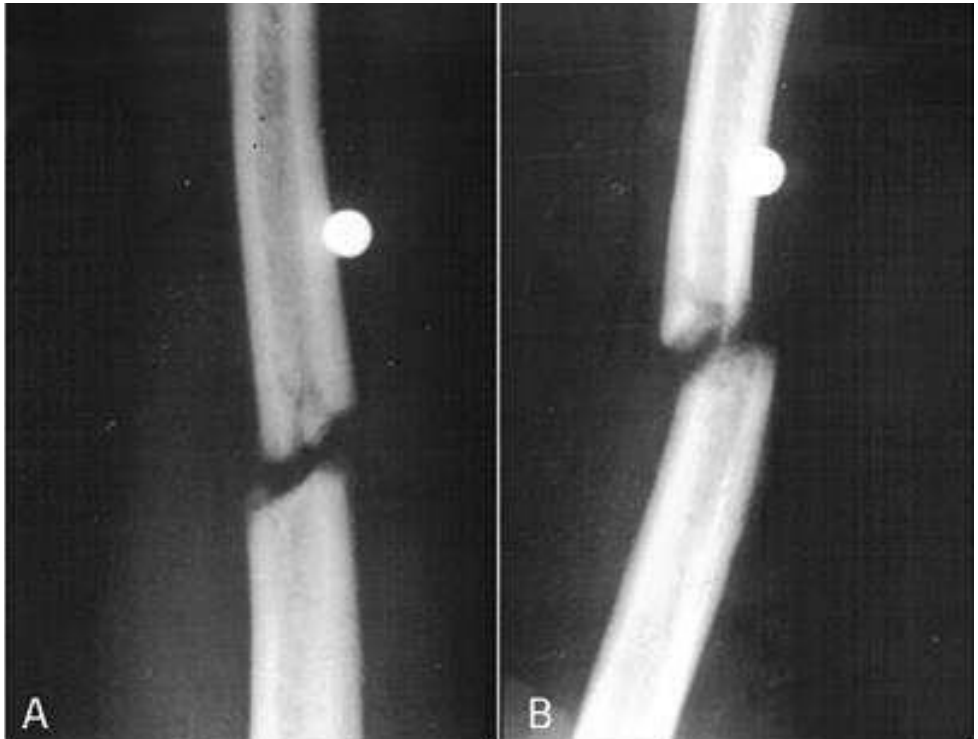
Contact – Was there sufficient contact between the fragments?

Alignment – Was the fracture adequately aligned, to reduce shear?

Stability – Was the fracture held with sufficient stability?

Stimulation – Was it sufficiently 'stimulated'? (e.g. by encouraging weight bearing).

There are, of course, also biological and patient related reasons that may lead to non-union: Poor soft tissues (from either the injury or surgery), Local infection associated drug abuse, anti-inflammatory or, immunosuppressant meds, Non-compliance




Good Luck!!
دعواتكم..