

Orthopedic Pearls & Pitfalls

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Introduction

- Why are you here?
- General Tips
- Pearls and Pitfalls
- Summary of really important stuff

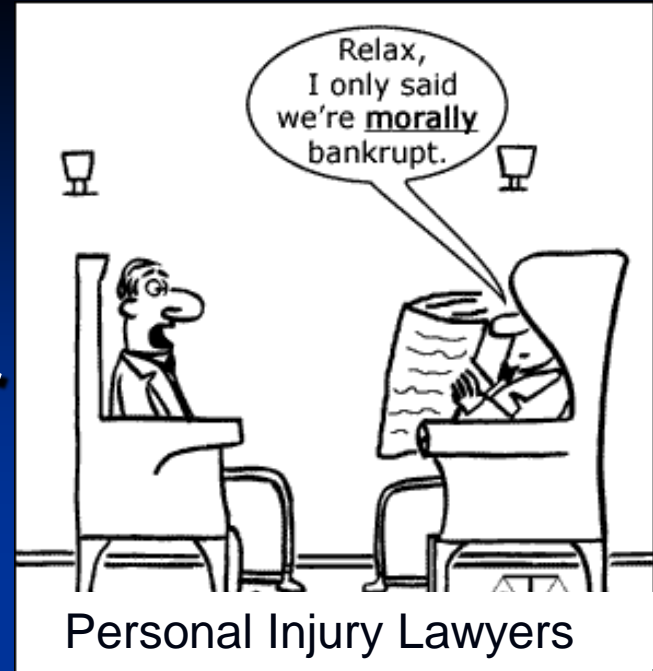
Who Cares?

- MISSED INJURIES = bad for patients
- MISSED INJURIES = \$\$\$\$\$

- Gwynne, Barber and Tavener:

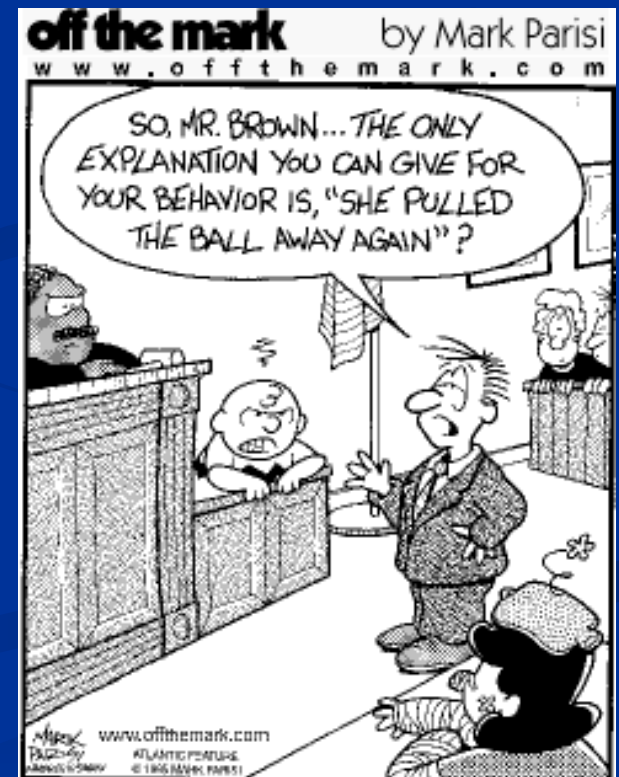
Journal of Accident Emerg Med 1997

- 105 consecutive negligence claims in the United Kingdom
- 54 claims involved missed fractures

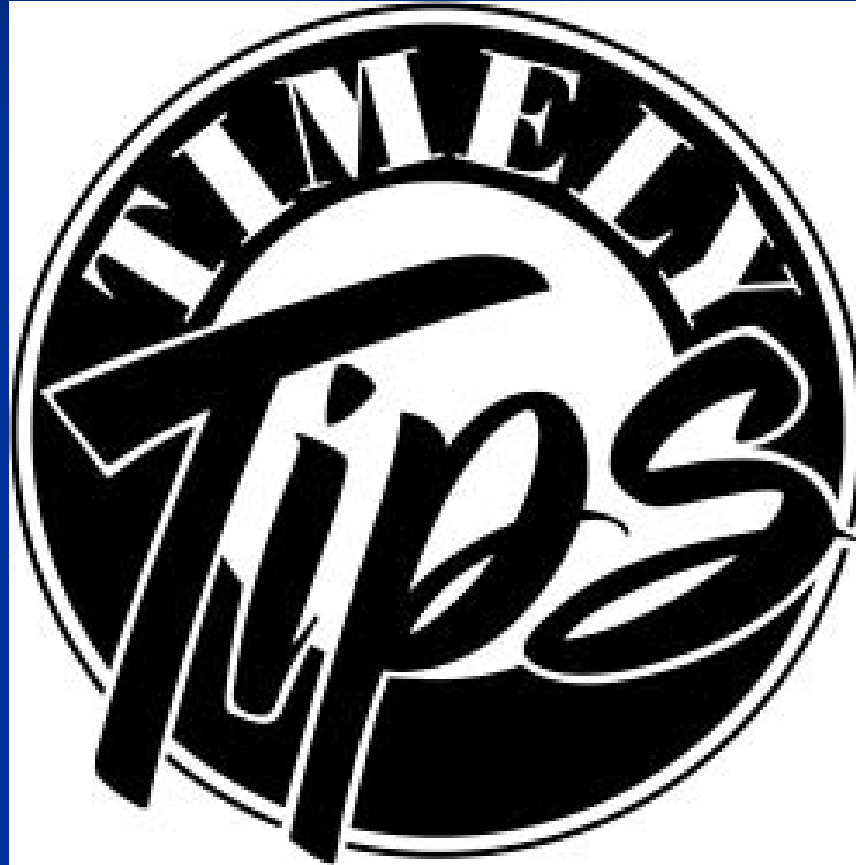


Who Cares?

- Karcz et al: Am J Emerg Med 1996
 - 549 Malpractice claims against EPs in Massachusetts
 - 17% involved fractures
 - 35% payed out

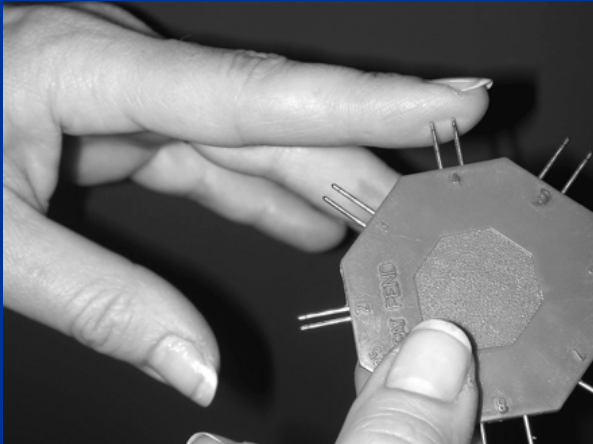


General Tips



Tip #1

- Do good sensory and motor exam BEFORE using anesthetic.
- 2 point discrimination is the gold standard
 - 4-5 mm in fingers



Tip #2

- Get at least 2 views – and often 3



- Get at least 2 views – and often 3



Tip #3

- If you would think ligamentous injury in an adult, think growth plate injury in a kid.



Tip #4

■ Splinting is good

Be liberal with plaster.

- Relieve pain
- Prevent fracture displacement
- Satisfy patients/parents
- Assure follow-up.



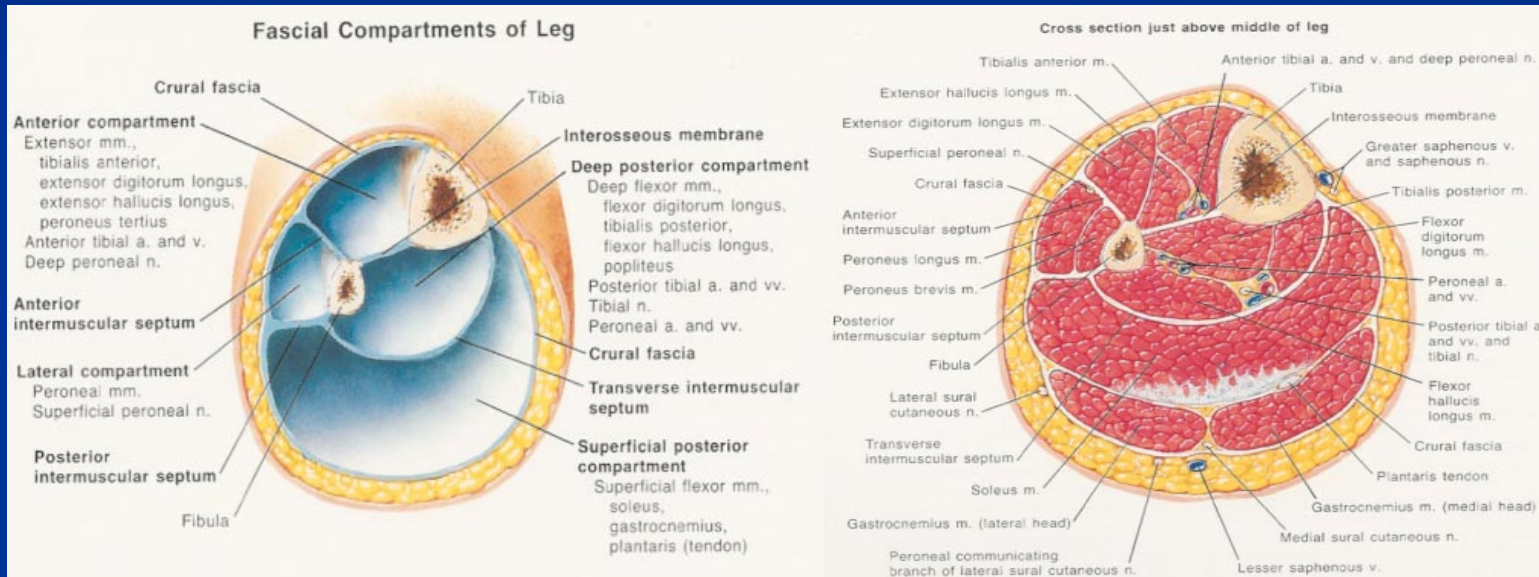
Tip #5

- Remove cast for any symptoms under it.



Tip #6

Think of compartment syndrome



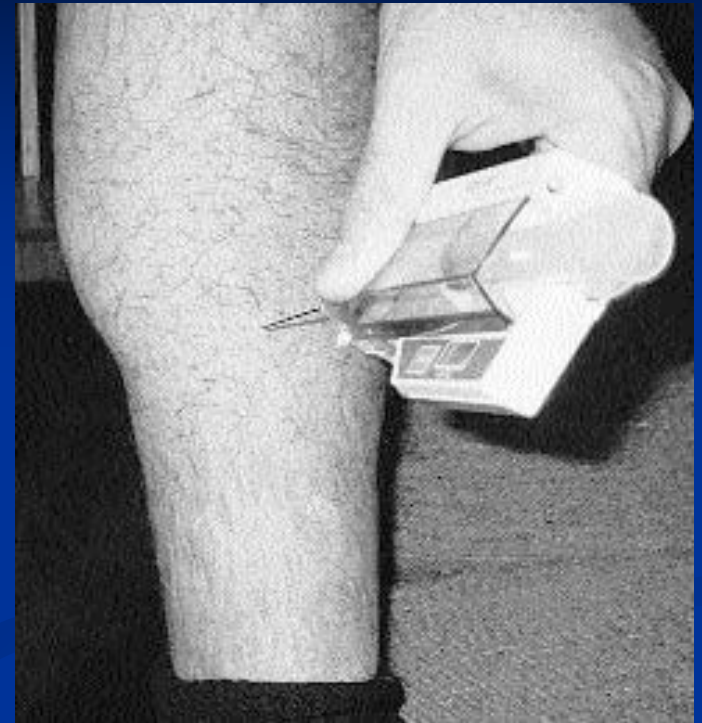
- External compression
 - Cast, burn
- Internal compression
 - Edema, hematoma

■ 5 P's

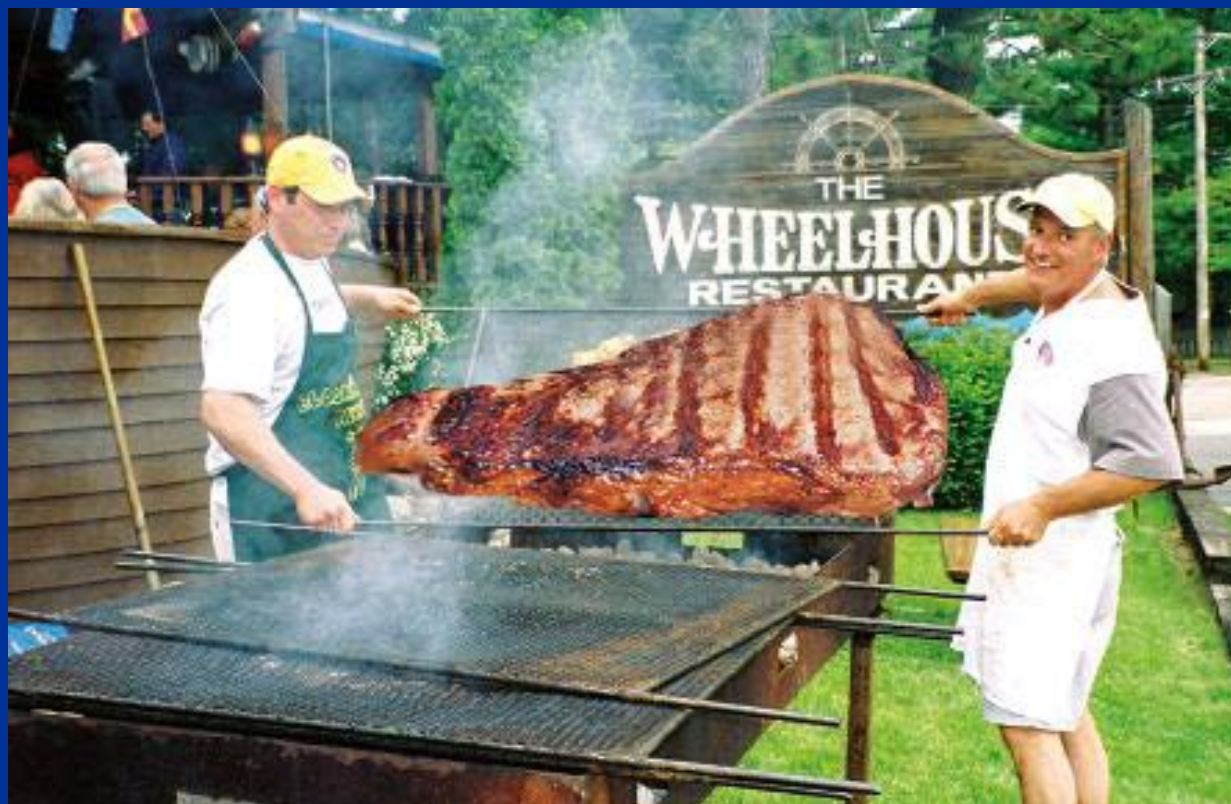
- Pain (earliest)
- Paresthesia (most reliable)
- Paresis
- Pallor
- Pulselessness (too late)

■ Pressures

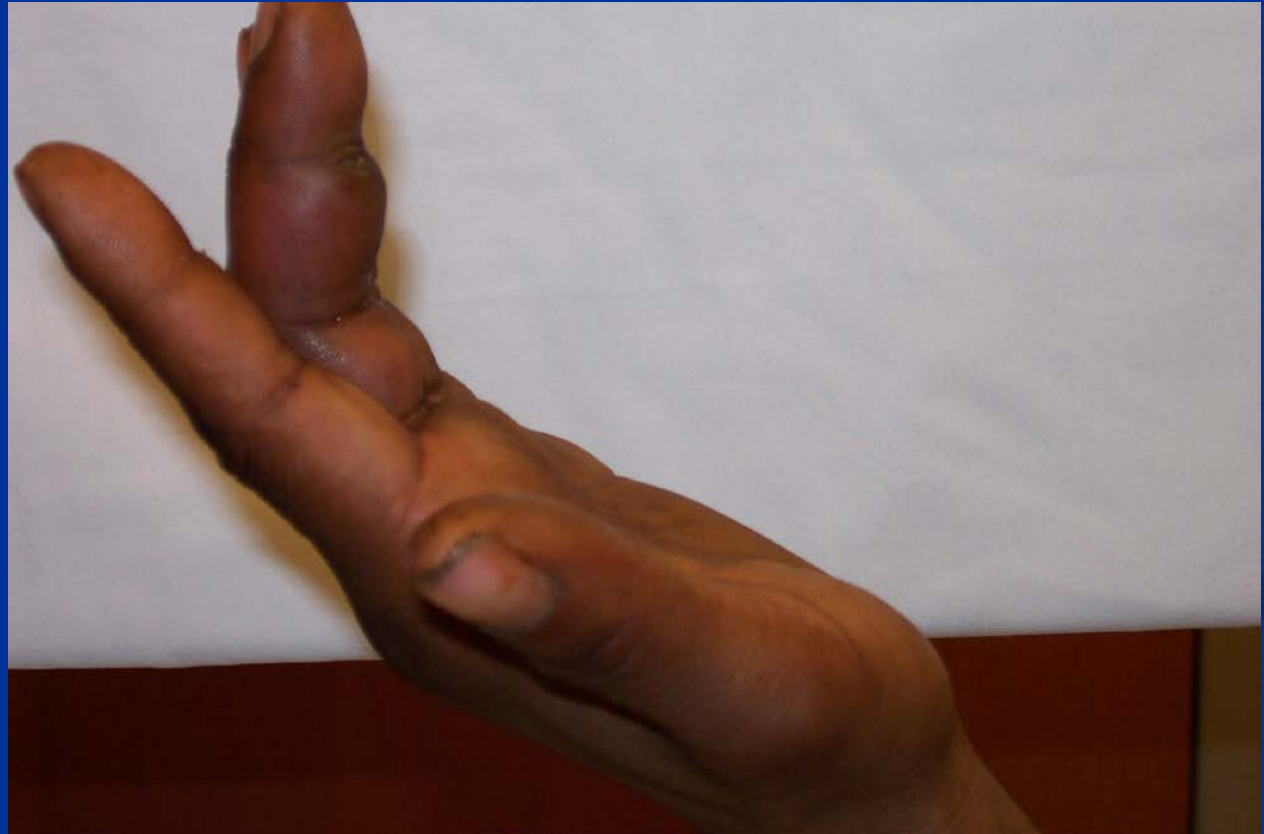
- 0-10 mm Hg normal
- >20 compromised cap flow
- >30 ischemic necrosis of
 muscles/nerves



■ Now the meat!



- 45 yo male c/o
finger pain



■ Flexor Tenosynovitis

Kanavel's signs

- 1) held in flexion
- 2) pain with passive extension
- 3) fusiform swelling
- 4) tenderness along tendon sheath

Tx is surgical & abx

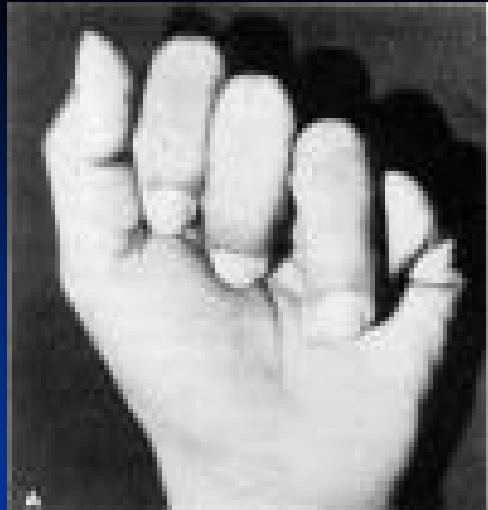


- 14 yo male was in a fight at school. C/o hand pain.



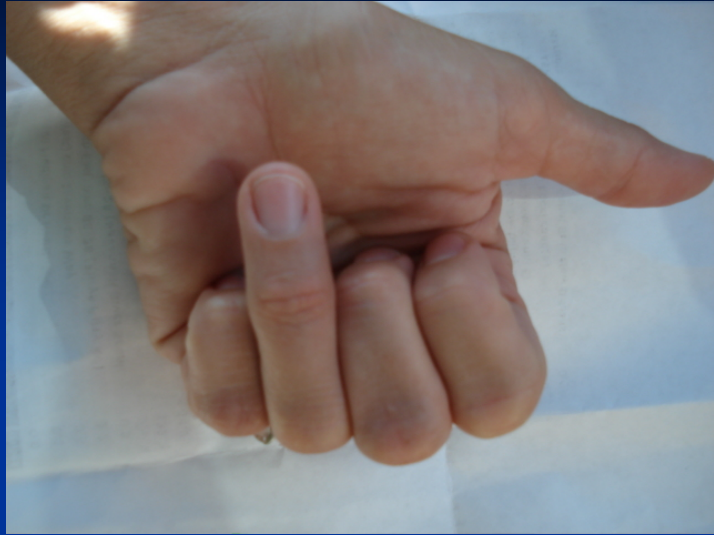
■ Boxer's Fracture

- Flexion deformity up to 45 deg is acceptable
- NO ROTATIONAL DEFORMITY
- Treat with buddy-tape (to maintain rotational reduction)
- Ulnar gutter splint



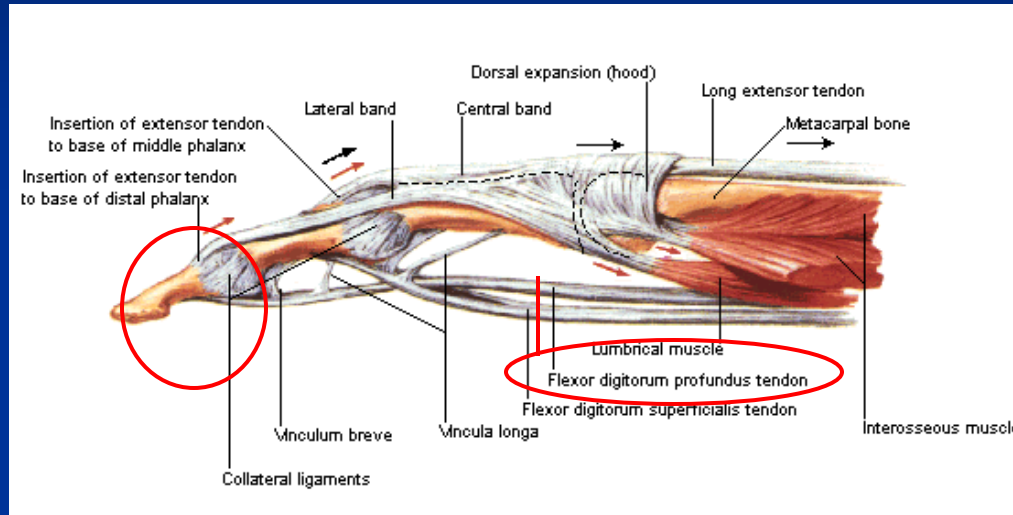


- 25 yo rugby player c/o finger pain after a tackle.



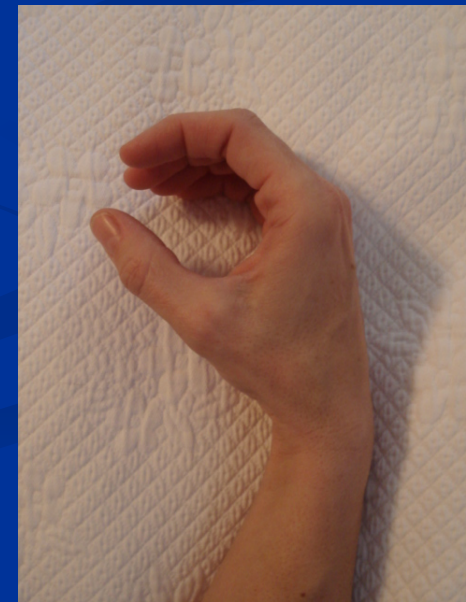
FDP rupture

- “Rugby jersey” injury

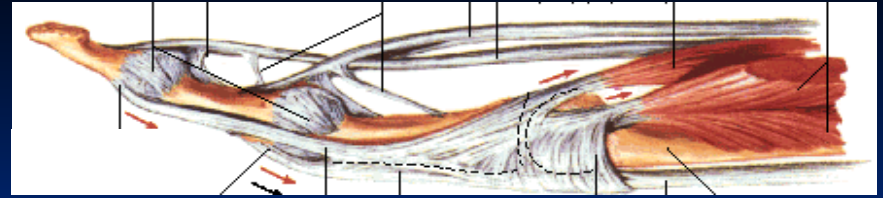


- All should be considered surgical candidates

- Splint and f/u <7d

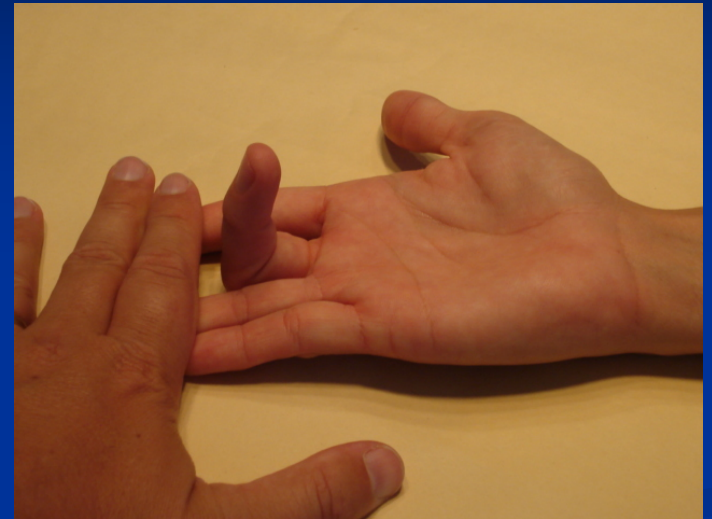


FDS/FDP exam



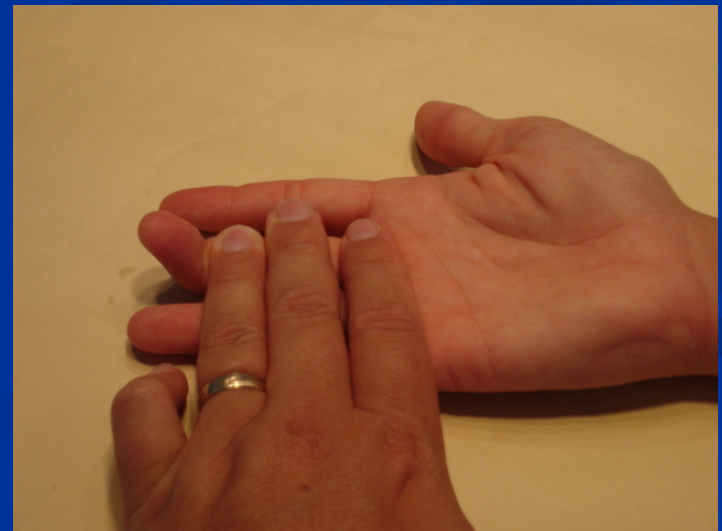
■ FDS

- Hold all other fingers in extension
- Flex PIPJ of finger to be tested



■ FDP

- Hold PIPJ in extension
- Flex DIPJ





- This gentleman c/o jamming his finger.



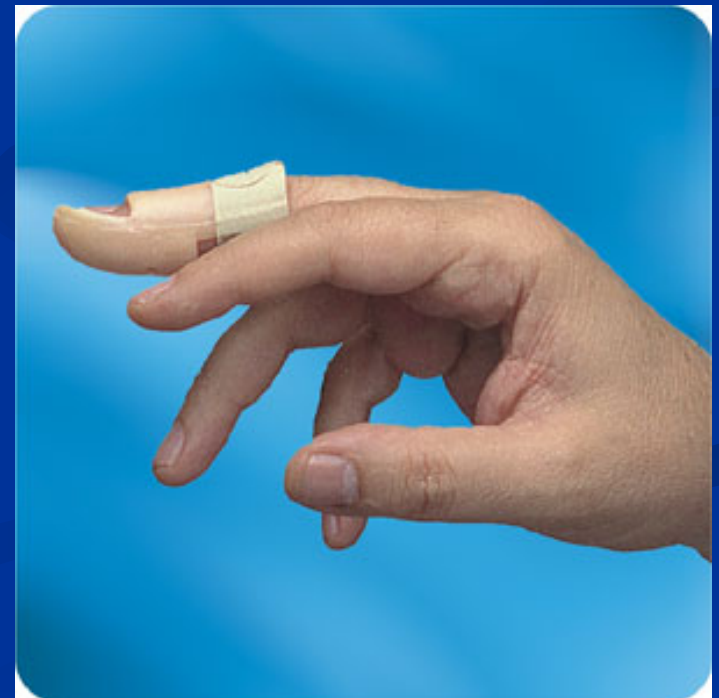


**Mallet
finger**

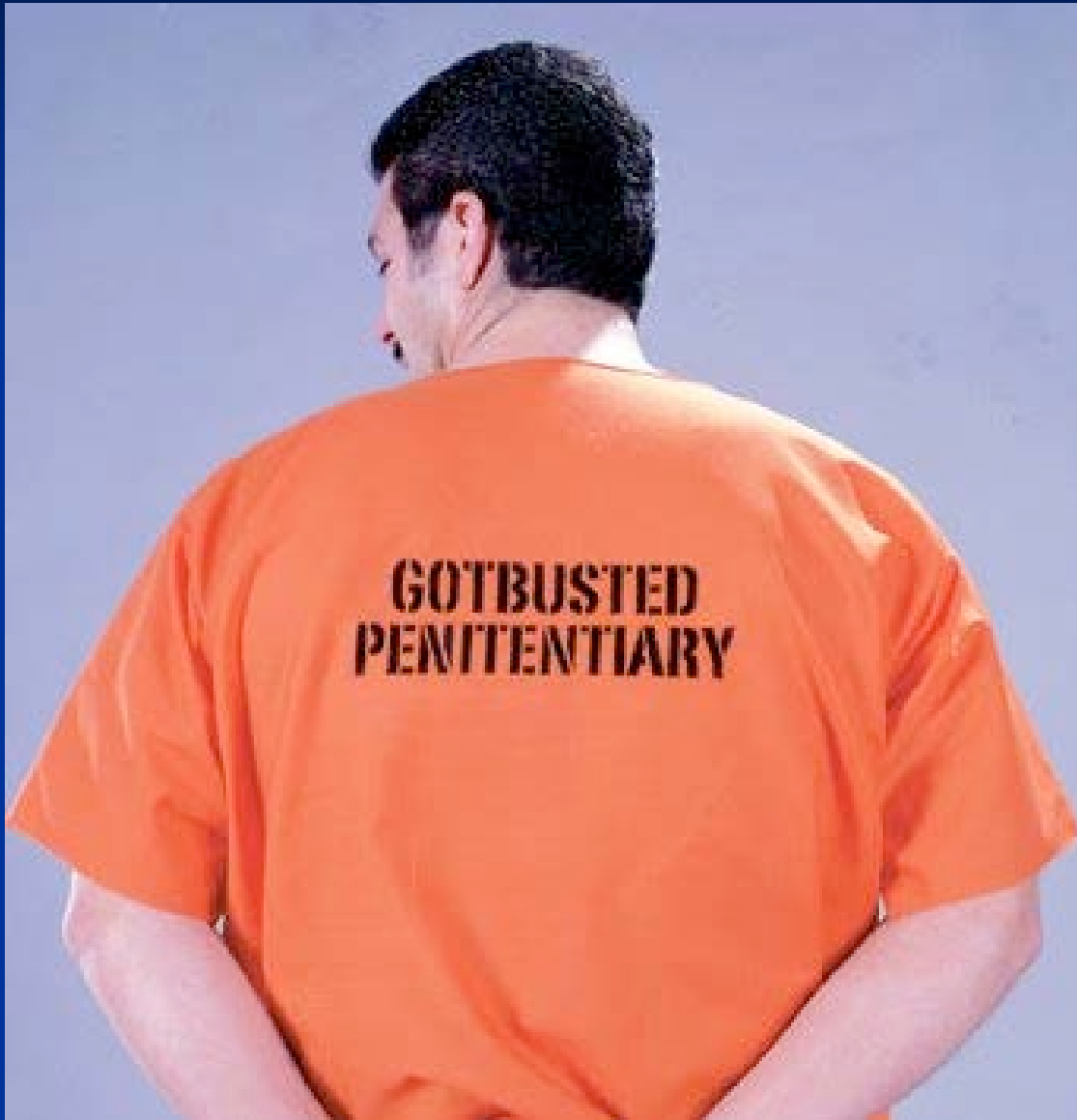




Immobilize in extension
for 8 weeks
If untreated can develop
a.....
Refer to hand



A prisoner presents stating he fell and cut his hand:



■ Fight Bite



- Patients may lie!
- Depth of penetration is often greater than appreciated, (skin, tendon, capsule).
- Infection is a frequent sequela.

ALL should get copiously irrigated and receive antibiotics

- 23 yo male crane operator was working on the crane when a hydraulic line sprang a leak.
- c/o minimal pain



Prognostic Factors

- material injected
 - grease (fibrosis)
 - paint (necrosis)
- site of injection:
 - digits: tendon sheath - poor prognosis
 - palm: not governed by fascial planes, better prognosis

All go to the OR

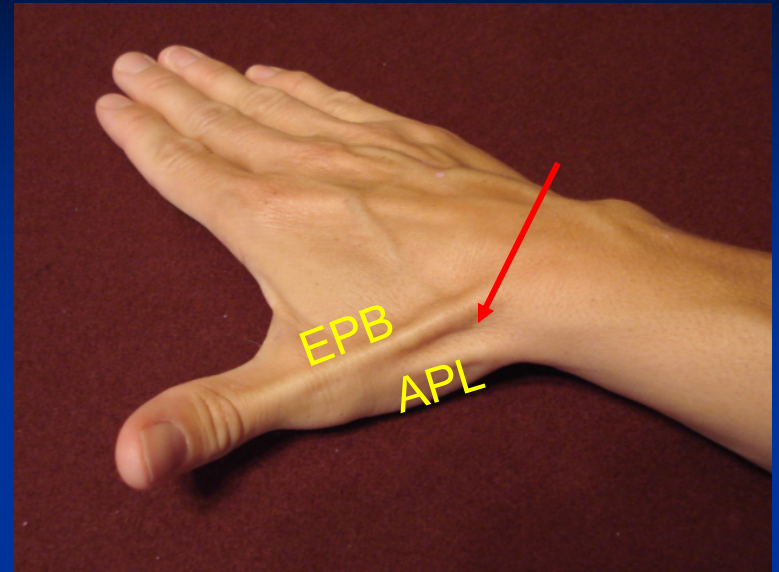


22 yo female c/o right
wrist pain s/p FOOSH





- Examine snuff box- if tender, then assume scaphoid fx and do thumb spica with f/u



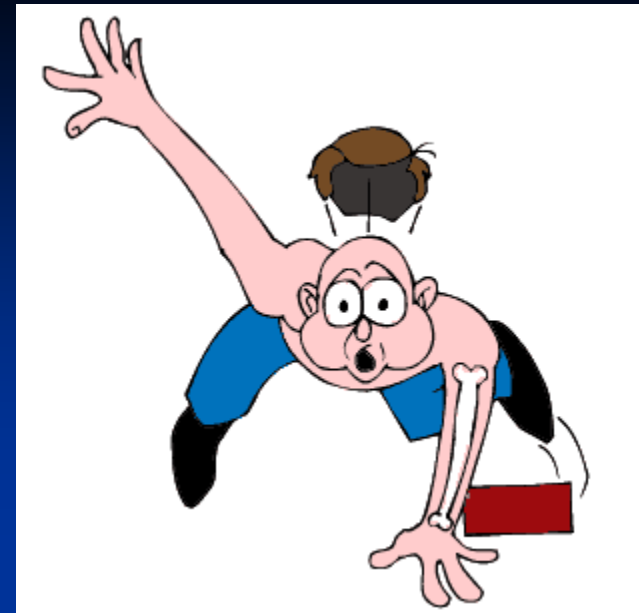
- 36 yo female s/p FOOSH





Tx: early reduction and then surgery
Check for acute carpal tunnel syndrome

- Another FOOSH





- Colles'- don't miss acute carpal tunnel
- 0 to 15 degrees of dorsal angulation OK. Otherwise reduce
- Beware volar abrasions as being open fx's
- Sugar tong splint



What's this?



■ Monteggia:

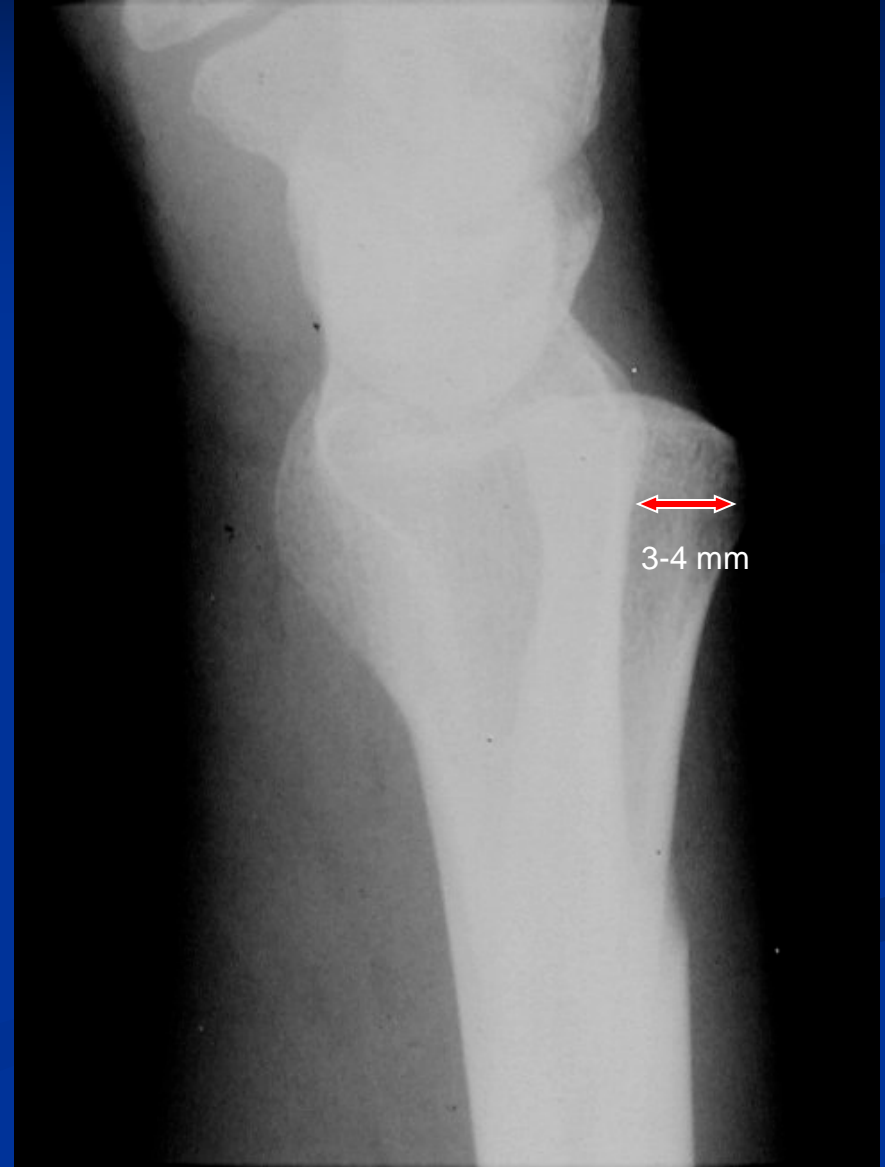
- Up to 50% miss rate (1940)
- Usually FOOSH with pronation but can be direct blow to ulna
- posterior interosseus N (deep branch of radial N) –b/c near radial head
- get weakness in extension of fingers or thumb

So what's this then?

MUGR



Galeazzi

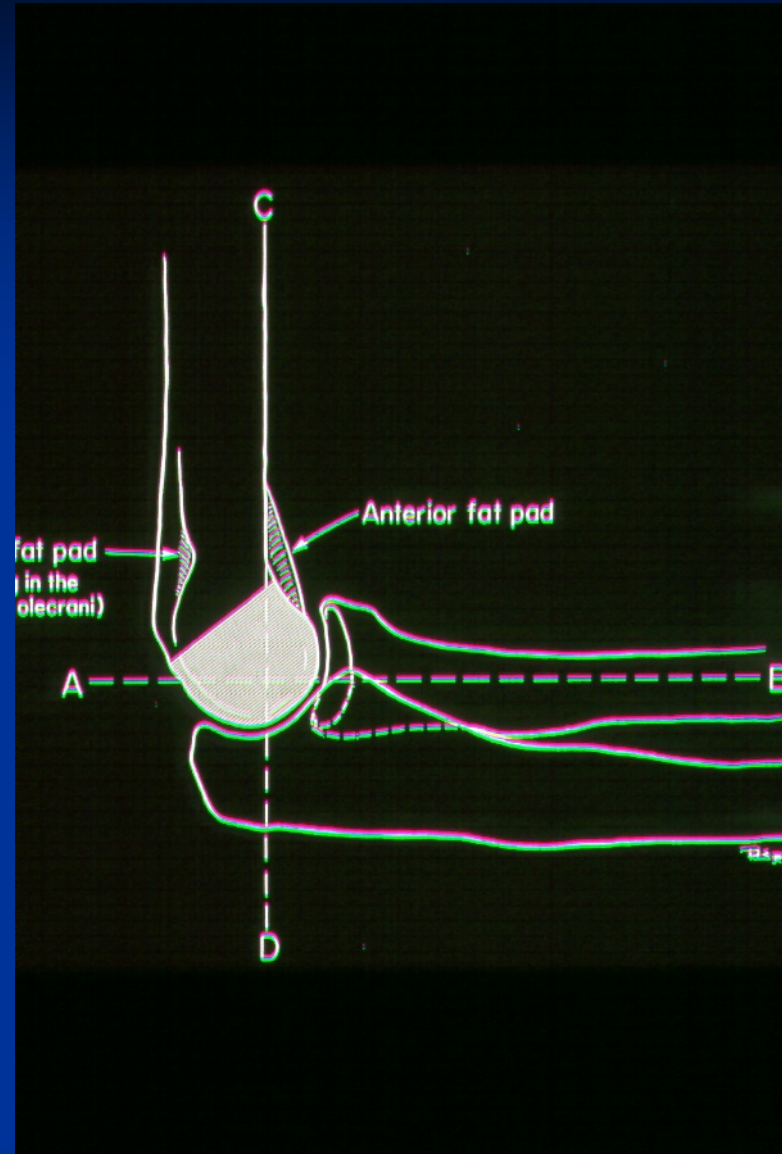


■ Galeazzi:

- 3 x more common than Monteggia
- Up to 50% miss rate (1940)
- Surgery is usually needed for good outcome
- Injury at the distal radioulnar joint may be just ligamentous

- If a child has swelling at the elbow – something is wrong
 - Nursemaids don't usually swell
 - Supracondylar fx
 - Lateral condyle fx (need surgery)

- Get a good lateral
- Look at lines and fat pads

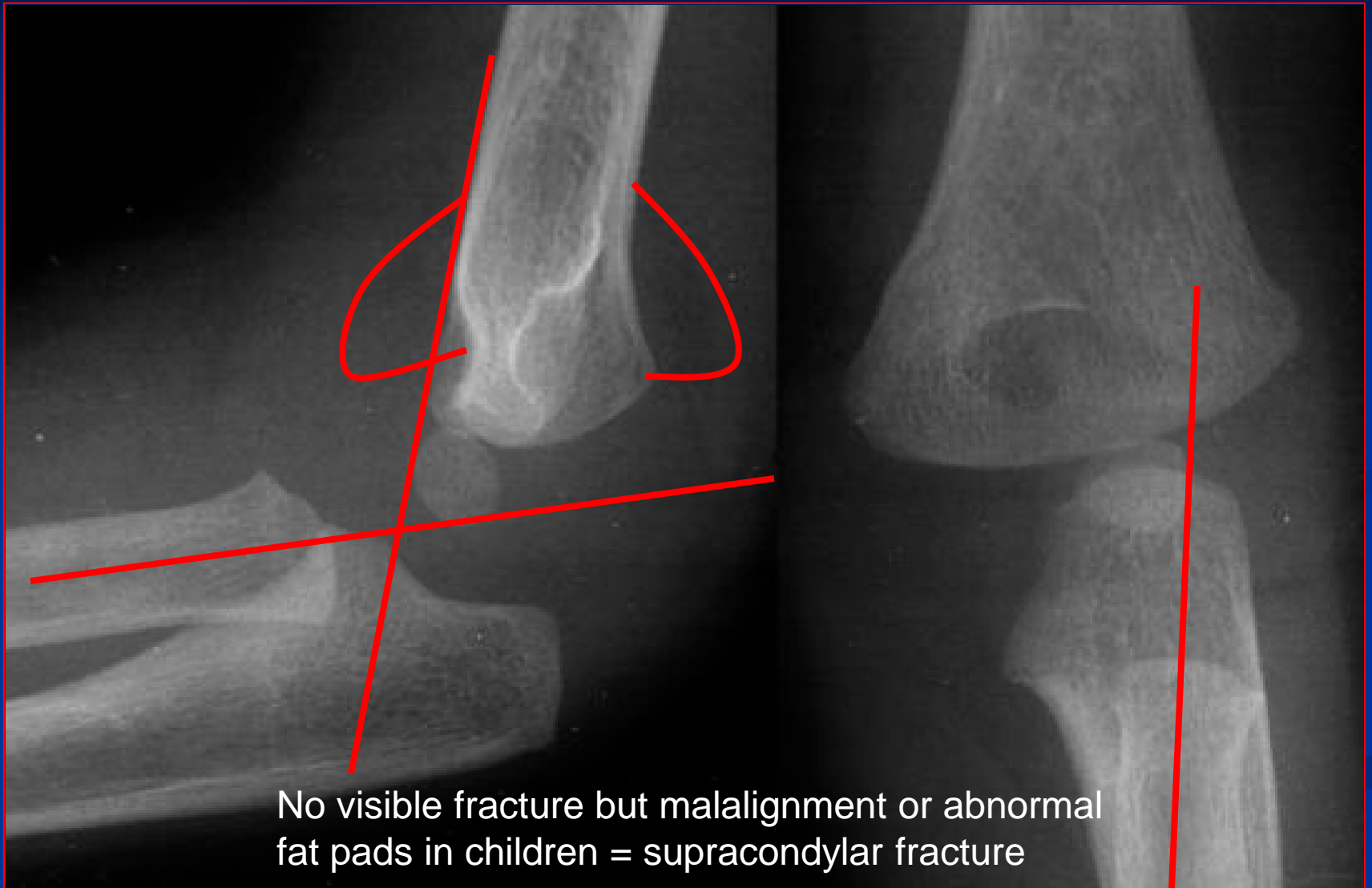


- 8 y/o fell off skateboard



Supracondylar fracture





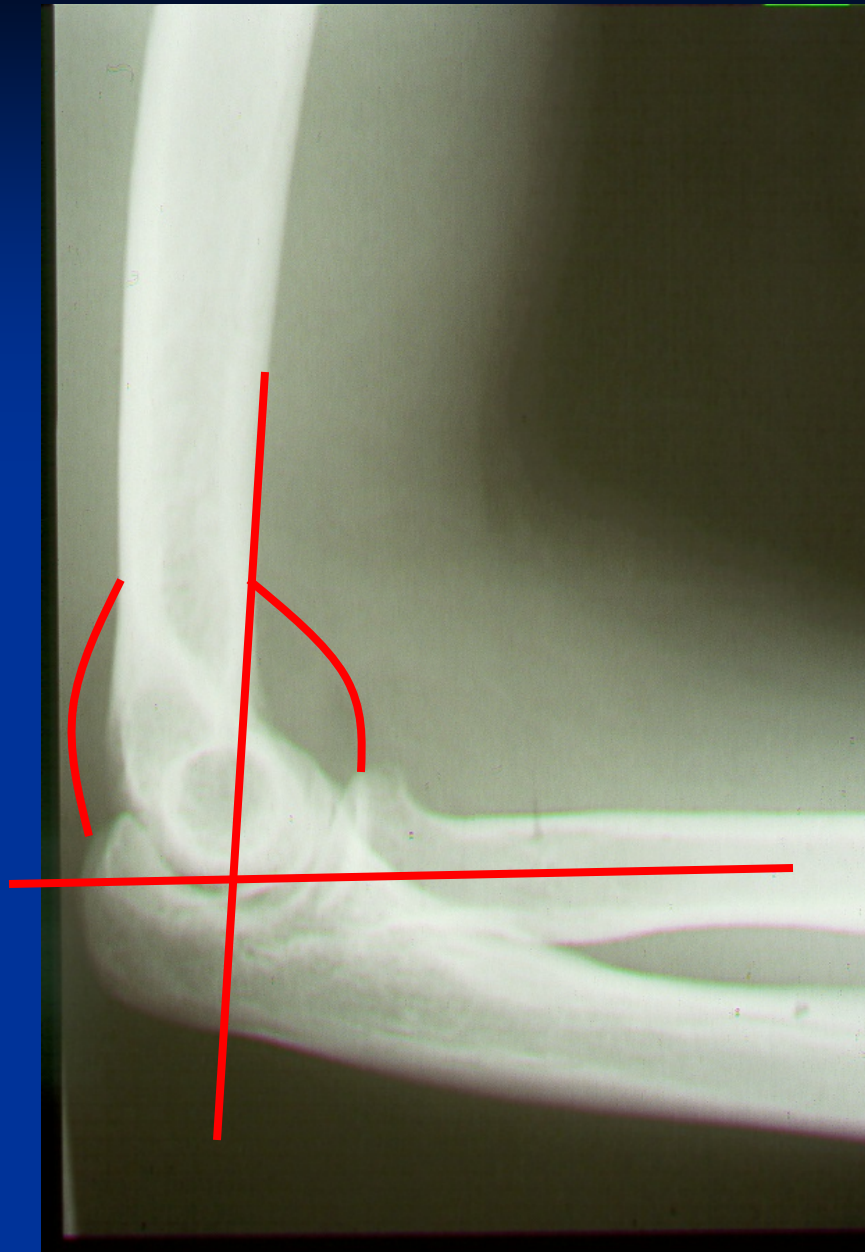
Supracondylar Fracture Outpt. Referral Criteria

Looks like an elbow
Active finger motion
Anterior humeral line
hits capitellum
Orthopedic evaluation
within 5 days



FOOSH?



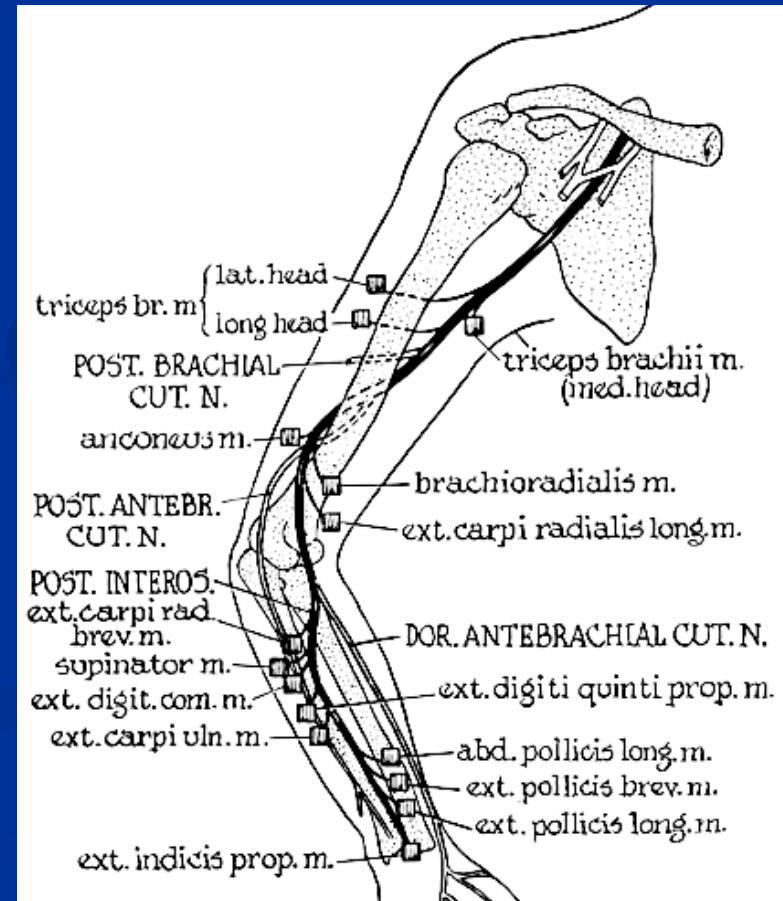
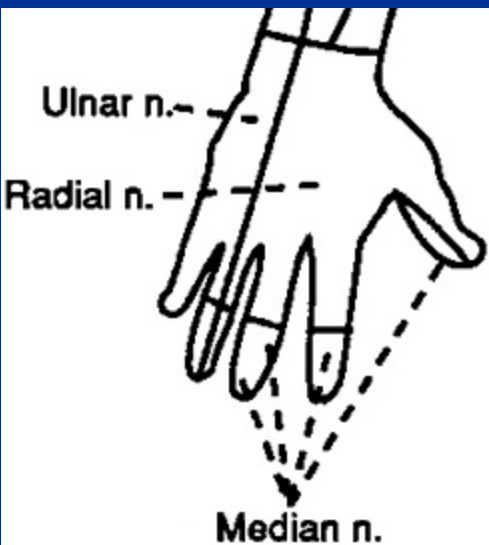


■ Radial Head Fracture

- Elbow pain after fall on outstretched arm.
- Injection of anesthetic can facilitate assessment of motion to assure no mechanical block.
- Treat non-displaced fractures with a sling and early mobilization.

■ Humerus

- Very forgiving
- Just don't miss Radial N injury
- Get wrist drop and sensory loss over radial n distribution





- 43 y/o sustains burn to L arm and c/o L upper extremity pain.



- Posterior dislocation may be relatively asymptomatic can do minor ADLs
- Inability to rotate palm up
- Don't immobilize shoulder more than 14 days



Anterior shoulder dislocation



- 52 yo diabetic c/o foot pain after stepping in a hole



- Lisfranc fracture/dislocation –
 - Get weight bearing view if subtle
 - Plantar ecchymosis bad sign even if x-rays neg
 - Look for alignment of 2nd metatarsal on AP and 4th metatarsal on oblique x-rays

- Frequently missed.
- Needs surgery.

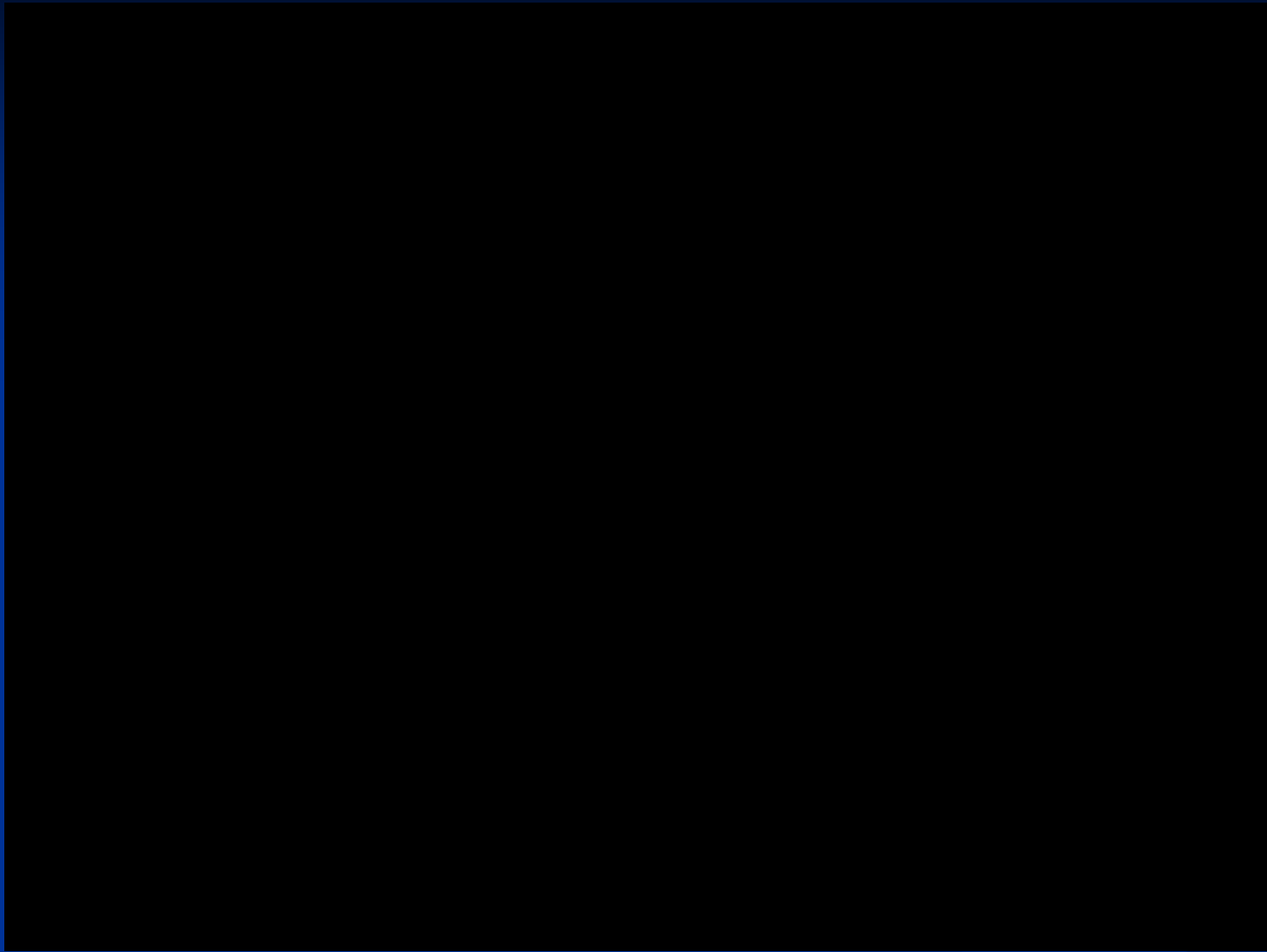


- Medial borders of 2nd MT and middle cuneiform on AP



- Medial borders of 4th MT and cuboid on oblique





- This Darwin award competitor c/o heel pain.



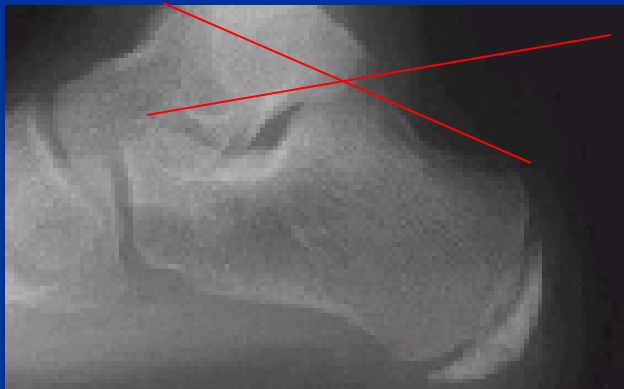
■ Calcaneus Fracture

- Frequently mistaken for ankle sprain because of “negative” x-rays.
- Look for heel tenderness and subtle X-ray findings.



■ Bohler's angle

- 20-40 deg is normal





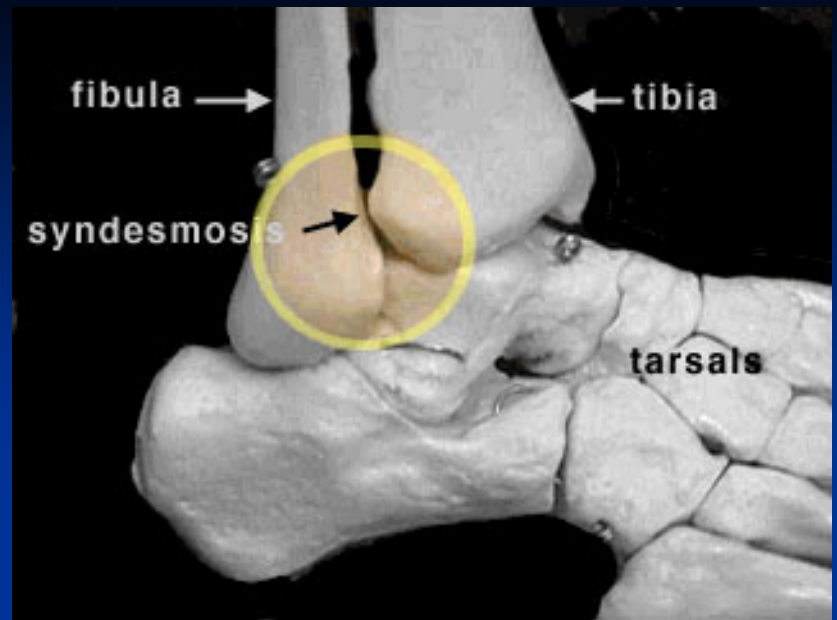
This nuclear physicist presents with ankle pain.



stress view

- Maisonneuve

- examine prox fib for all ankle injuries



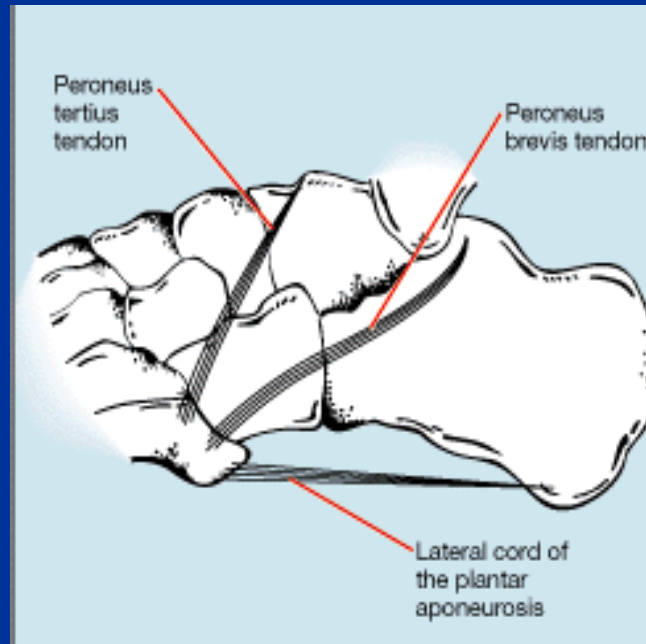
- 23 yo Lindy Hopper
c/o ankle sprain



- Always examine base of 5th metatarsal



Jones



Dancer's

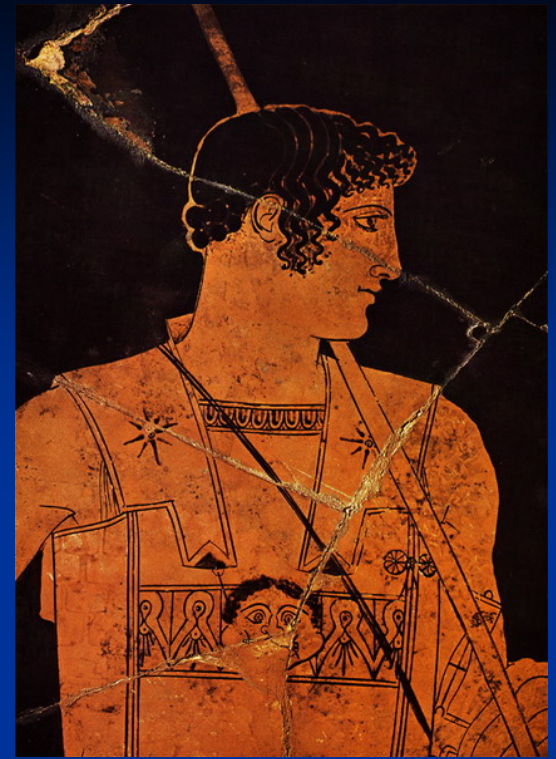


- 35 yo c/o “pop” in ankle during 1st game of beer league





- Thompson test



Tx: splint in gravity equinus
and f/u ortho



- If in doubt.....

Pretty much all ankle injuries can be splinted, made non-weight bearing and f/u ortho in a week.

The exception.....



Ankle fracture-dislocation

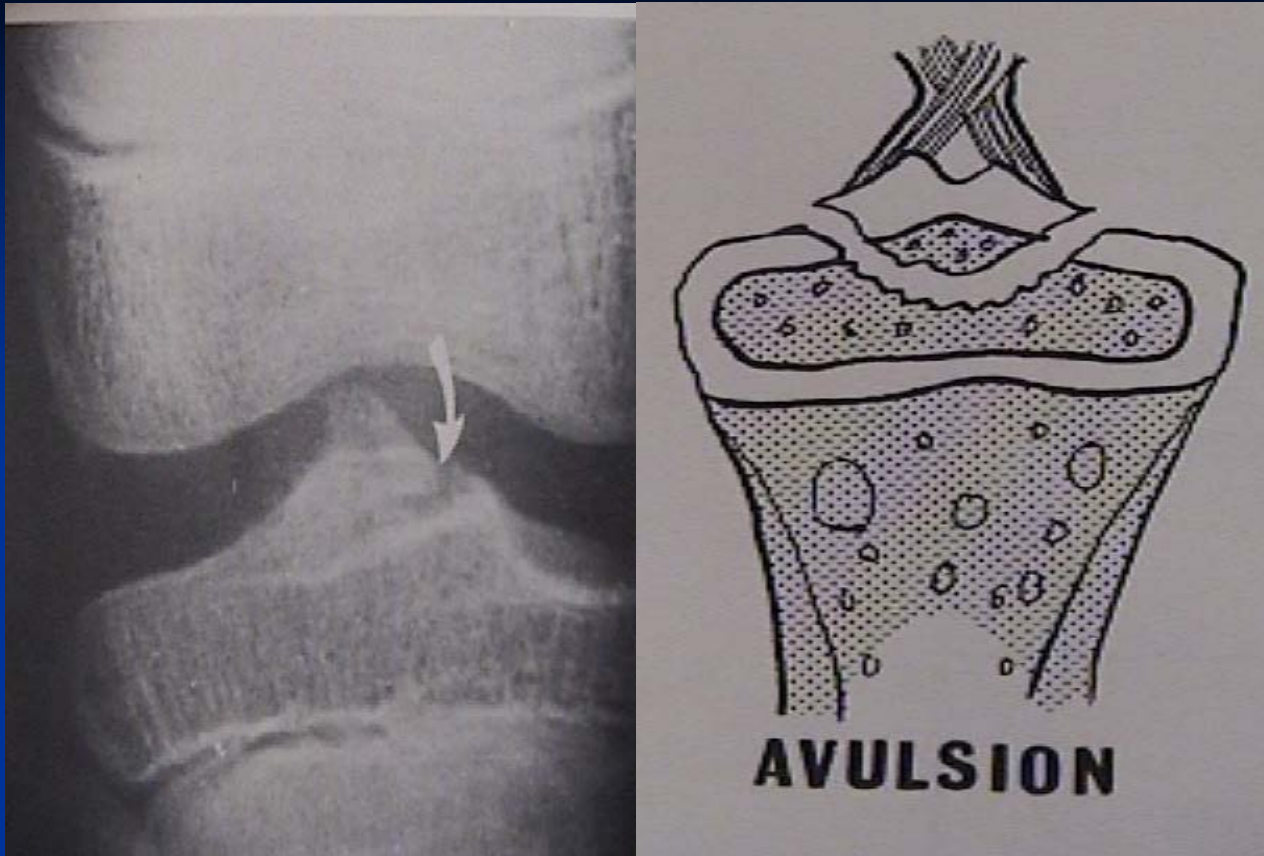


- 32 yo male got tackled playing football. Now has a little pain in the knee.



- 50-60% anterior
- 10-40% vascular injury
 - ½ will need amputation

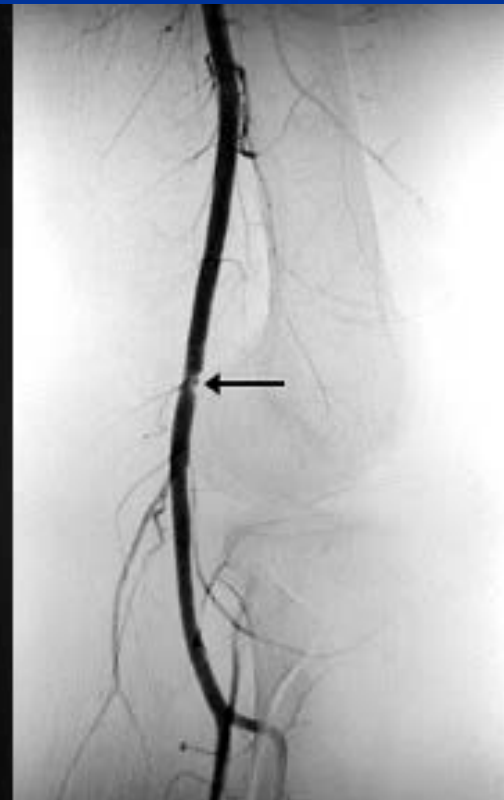




Beware mechanism plus an unstable knee.

Don't miss popliteal artery injury:

- If ischemia, or pulse deficit → OR (angio)
- If normal → ABI
 - $ABI > 0.9$ → observe
 - $ABI < 0.9$ → angio



■ Dislocation Summary

- High incidence of injury to popliteal artery.
- Watch for peroneal N. inj
- May spontaneously reduce
 - High suspicion for dislocation if gross instability of knee
- All patients need imaging of vascular supply vs. admission



- 27 yo rugby player c/o severe pain with walking after a tackle

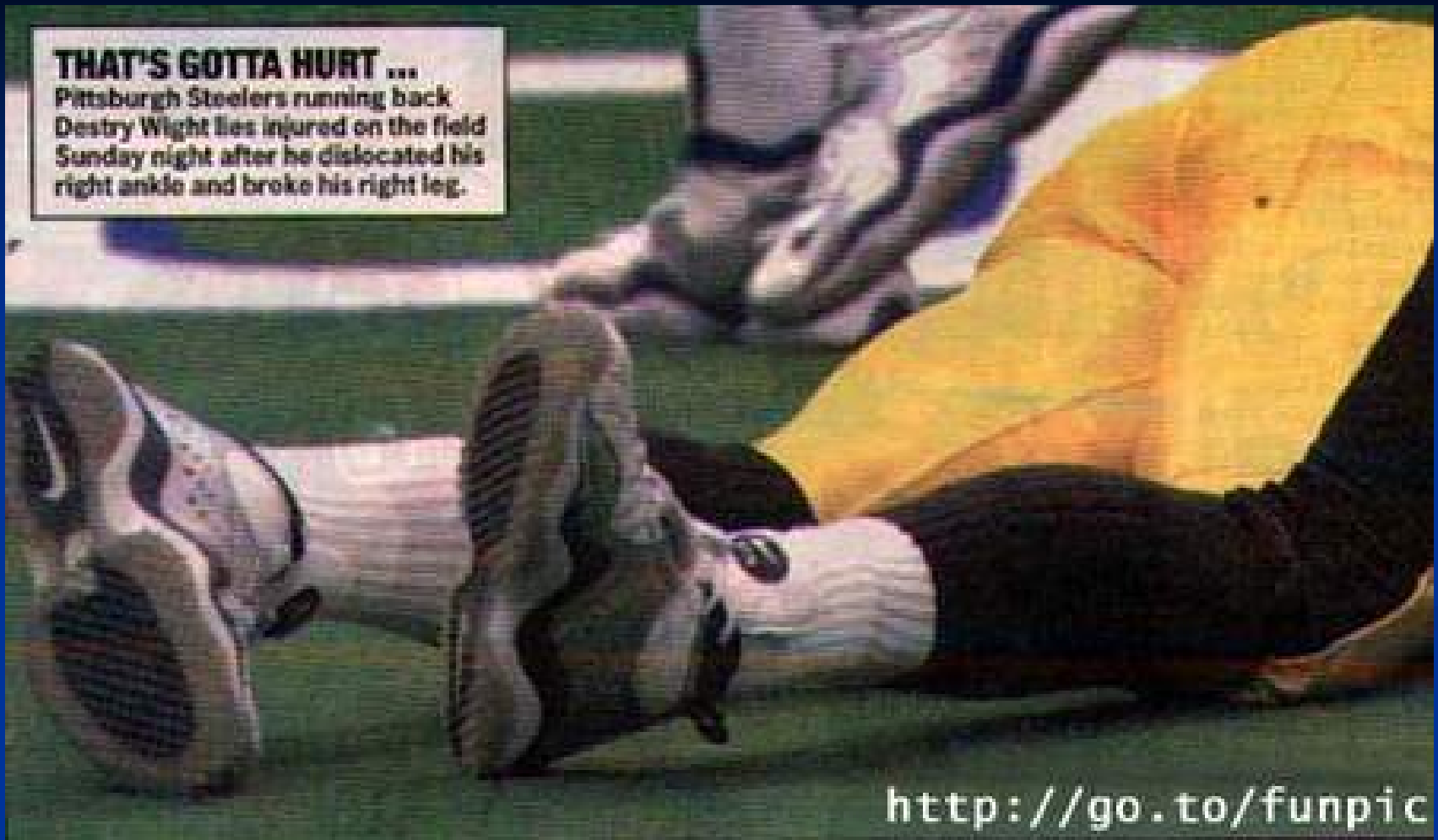


- Tibial plateau fx's
 - make sure joint space is even all the way across



THAT'S GOTTA HURT ...

Pittsburgh Steelers running back
Destry Wright lies injured on the field
Sunday night after he dislocated his
right ankle and broke his right leg.



<http://go.to/funpic>

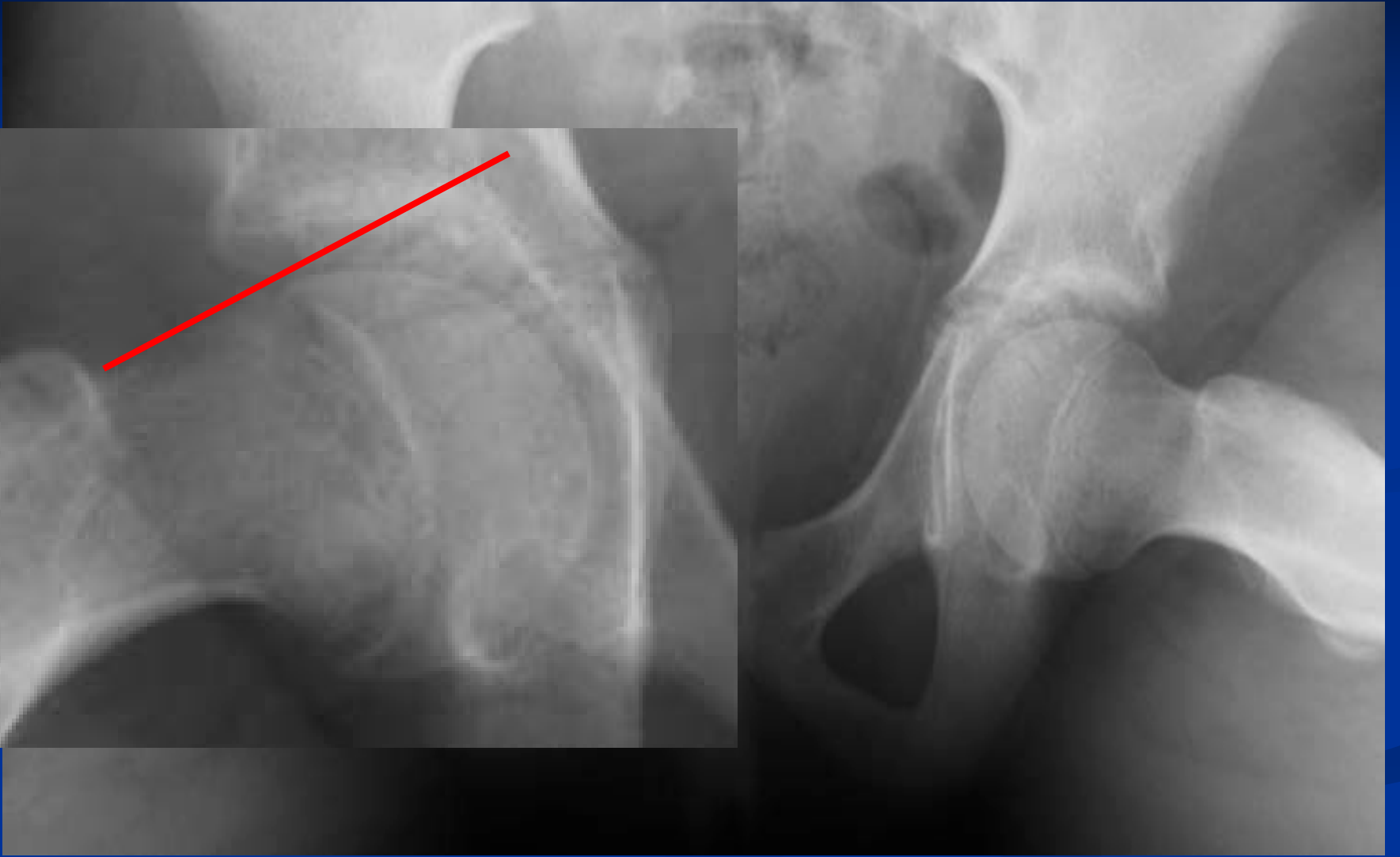
PITTSBURGH (AP) -- Pittsburgh Steelers rookie Destry Wright will likely miss the season after breaking his right leg and dislocating his ankle in Sunday night's preseason game at Dallas. 8-1-2000



- This 13 yo presents c/o R knee pain while roller blading



Klein's line



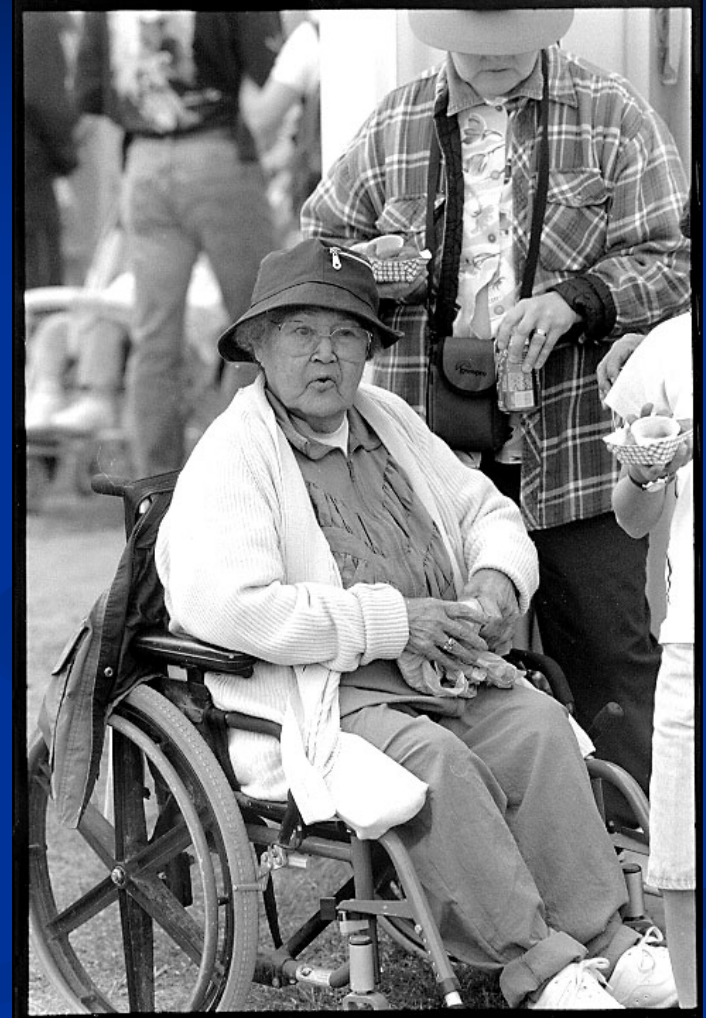


SCFE



- male, obese, active, 12-13 yo.
- 15% have pain in the distal thigh or knee.
- 30% are not diagnosed at first presentation
- A lateral x-ray is the most sensitive test
- **Strict non-weight bearing on the affected side should be enforced from the moment of diagnosis**

- Be wary of hip injuries in people c/o back pain in a wheel chair



- 27 yo female
s/p MVC.
- c/o L hip pain



Posterior Hip Dislocation



Anterior Hip Dislocation



Hip dislocation: emergency

- Need to be reduced ASAP (avascular necrosis)
- Anterior: 10-25 % - abducted, externally rotated, flexed
 - Reduced by longitudinal traction
- Posterior: 75-90% - adducted, internally rotated, shortened
 - Reduced by anterior traction while hip is flexed to 90 deg

- 2 yo female brought in because not walking.



■ TRANSIENT SYNOVITIS VS SEPTIC HIP

■ Four independent clinical predictors:

- History of fever (>38.4)
- Non weight bearing
- ESR > 40
- WBC > 12

■ 0 predictors.....	0.2% septic
■ 1 predictor.....	3% septic
■ 2 predictors.....	40% septic
■ 3 predictors.....	93% septic
■ 4 predictors.....	99% septic

Kocher, Zurakowski and Kasser: J Bone Joint Surg 1999

SUMMARY

- Orthopedic Emergencies
 - Hip dislocation (ASAP)
 - Ankle dislocation with tenting (1 hour)

- Orthopedic Urgencies
 - Open fractures (to OR in 6 hours)
 - Compartment syndrome
 - High pressure injection injuries

SUMMARY

- Other Important Things
 - Fat pads and lines on all elbow films
 - Look at joint space in tibial plateau injuries
 - Beware posterior shoulder dislocation
 - Always get a lateral view
 - Beware arterial injury in knee dislocations
 - Splint kids with joint tenderness

SUMMARY

- If in doubt:
 - Splint
 - Non-weight bearing
 - Follow-up with ortho
- Don't be afraid – it's not rocket science!

Questions?

