

INTERESTING X-RAYS

Seemingly insignificant but clinically relevant

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INTERESTING X-RAYS



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INTERESTING X-RAYS: PELVIS AND HIP

INTERESTING X-RAYS



GANZ LESION

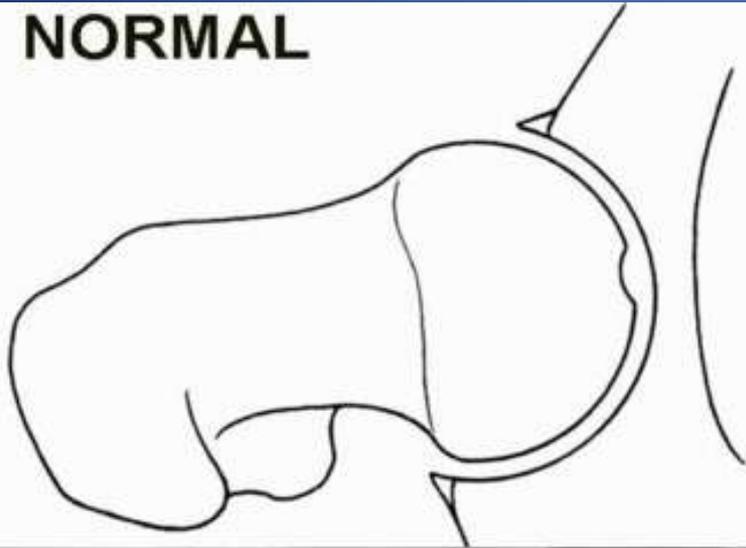


GANZ LESION

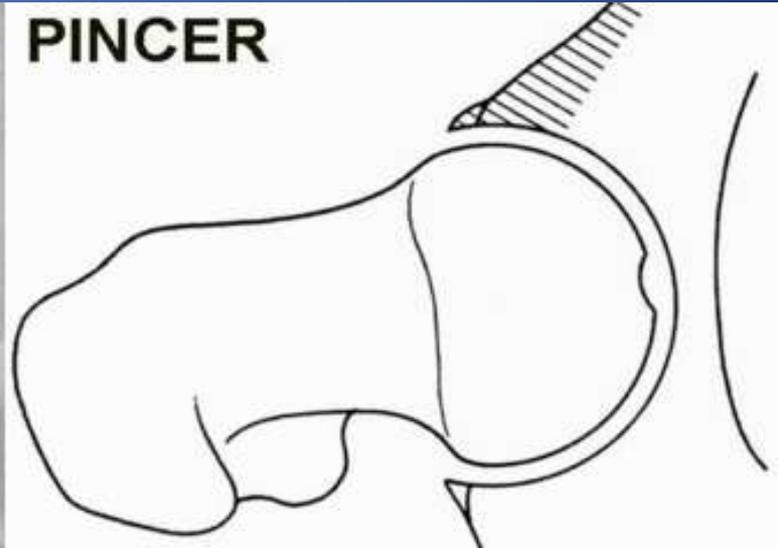
- Femoro-acetabular Impingement (FAI) occurs due to an oversized femoral head/neck junction, an enlarged acetabular cup, or a combination of the two
- May be symptomatic with activities involving flexion and internal rotation in susceptible people (eg hockey goalie stance, basketball defensive stance, martial arts kicking)
- This can be due to extremes of movement (Ballet dancers), developmental hip disorders, and Cam lesions
- Sub-clinical slipped capital femoral epiphyses, mal-union of femoral neck fractures, and decreased femoral anteversion are described causes of cam impingement.
- ? Activity related esp during immature skeleton

GANZ LESION

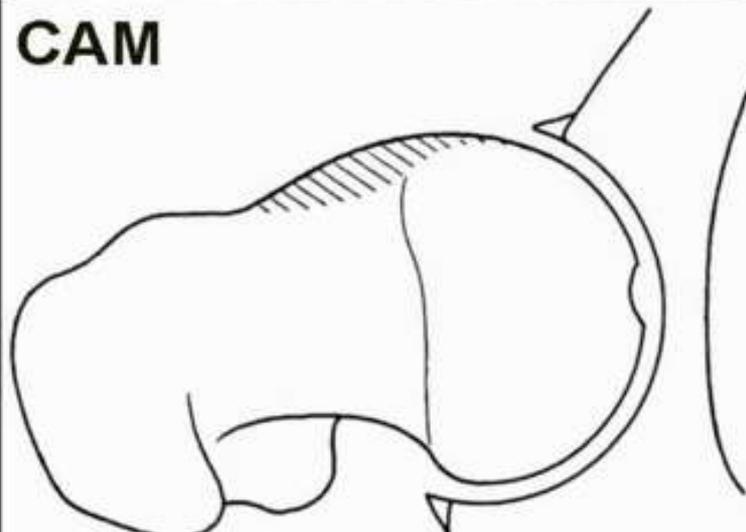
NORMAL



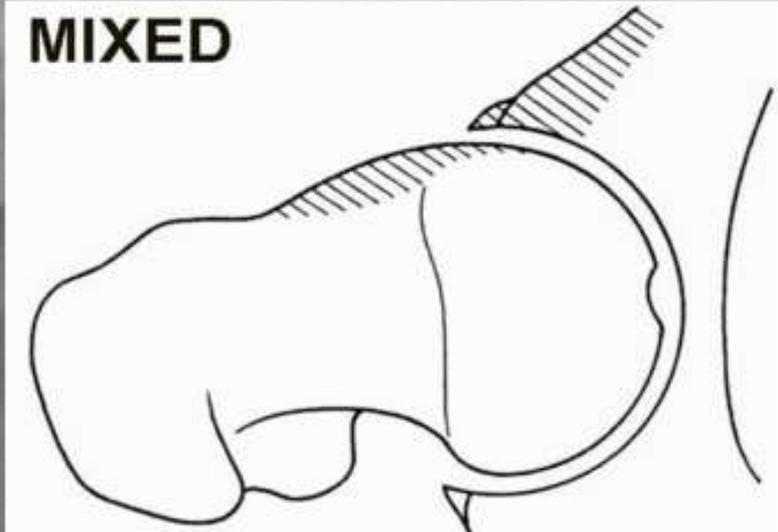
PINCER



CAM



MIXED



FAI

- Leads to articular cartilage degeneration and labral tears
- Arthroscopies to treat labral tears only result in temporary symptomatic relief, but usually symptoms recur due to not changing the mechanical cause for the problem

FAI

- Treatment is:
 - Cut off the bump / pincer
 - Clean up the joint surface
- Initially OPEN procedure (requiring hip dislocation)
- Now done by some surgeons arthroscopically
- Not a lot of published research
 - Indication that in professional athletes, most (93%) are able to return to sport post surgery and remain at that level for at least the next 18/12 (78%)
 - Other studies show similar results in a mix of patients = 80%+ get back to pre-morbid activity and are able to continue for at least the 2-3 years of the studies (data only from last 5-6 years)
 - Patients with less favourable outcomes almost always had extensive OA at time of arthroscopy

INTERESTING X-RAYS: KNEE

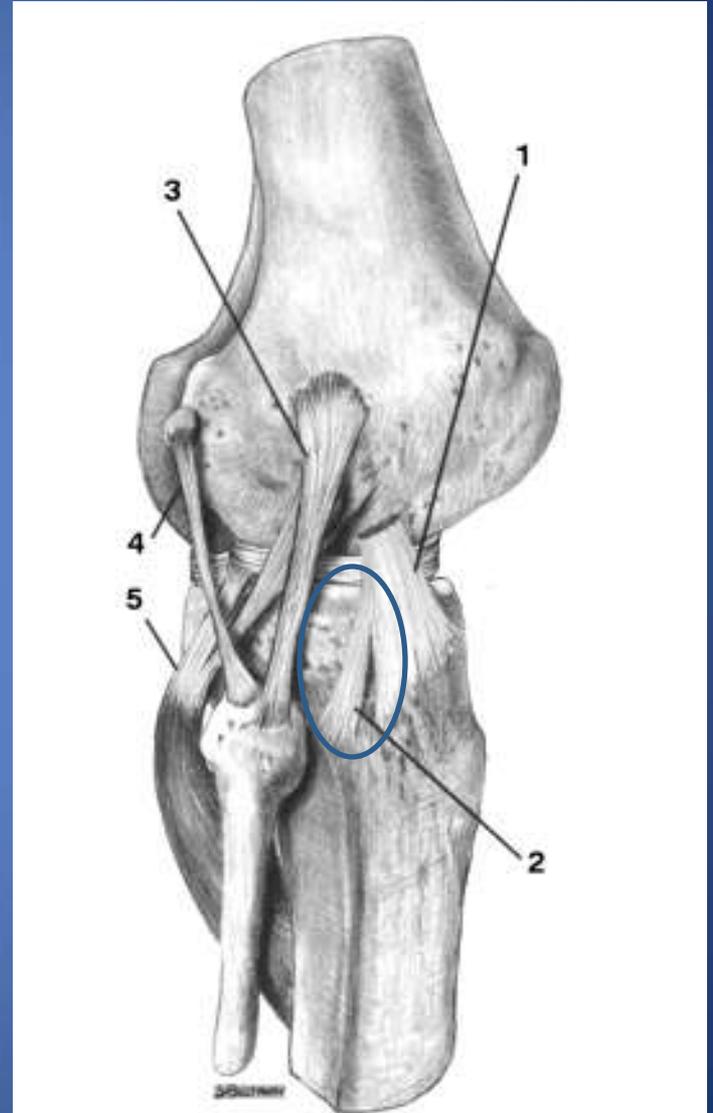
INTERESTING X-RAYS

- Ottawa Knee Rule for patients presenting with acute knee injuries:
 - Patients require an x-ray if they have any of the following:
 - Are over 55 years of age
 - Have isolated patellar tenderness
 - Have tenderness over the head of the fibula
 - Have less than 90 degrees of flexion
 - Are unable to weightbear for 4 steps both initially and in the ED

INTERESTING X-RAYS



SEGOND FRACTURE



SEGOND FRACTURE

- The Segond fracture (or lateral capsular sign) is a scale-like bone fragment of the lateral tibial plateau, which corresponds to the distal insertion point of the lateral capsular ligament or lateral meniscotibial ligament.
- This distal osseous avulsion of the meniscotibial ligament is named after Paul Segond, who first described it and who published a very detailed report in 1879 concerning a bloody articular effusion.

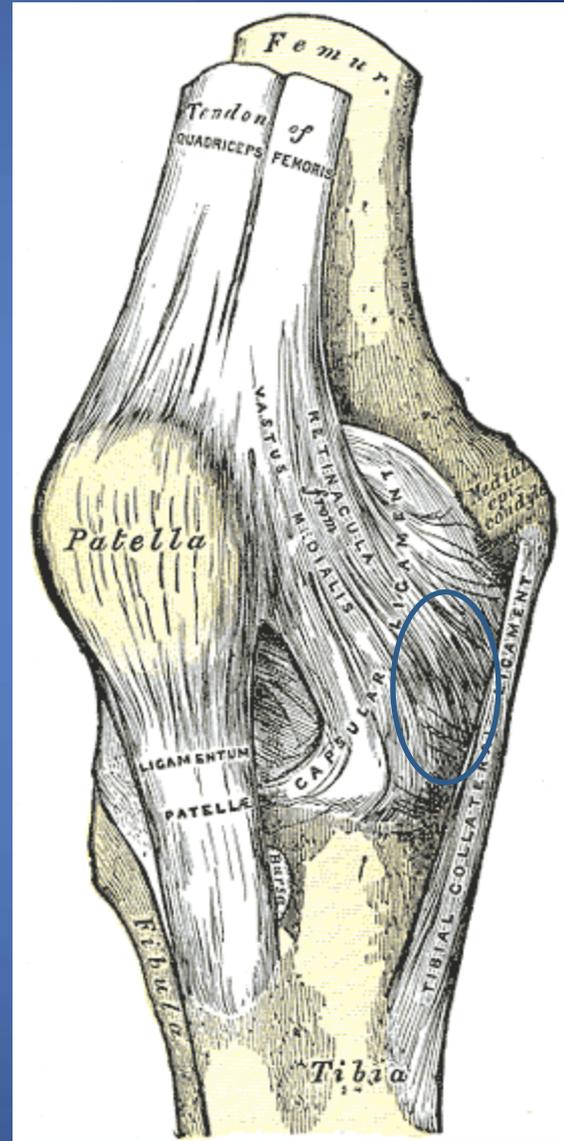
SECOND FRACTURE

- Hess et al (1994):
 - Of 151 patients with ACL lesions, 9% had Second Fractures, whereas control group there was <1%
- Goldman et al (1988):
 - 75–100% Correlation with ACL rupture and 66-75% association with meniscal tears

INTERESTING X-RAYS



REVERSE SEGOND FRACTURE



REVERSE SEGOND FRACTURE

- The Reverse Segond fracture is a scale-like bone fragment of the medial tibial plateau, which corresponds to the distal insertion point of the deep capsular component of the medial collateral ligament.
- This injury is associated with Posterior Cruciate Ligament tears, avulsion #s from the posterior tibial spine and tears of the medial meniscus
- Less reports in the literature

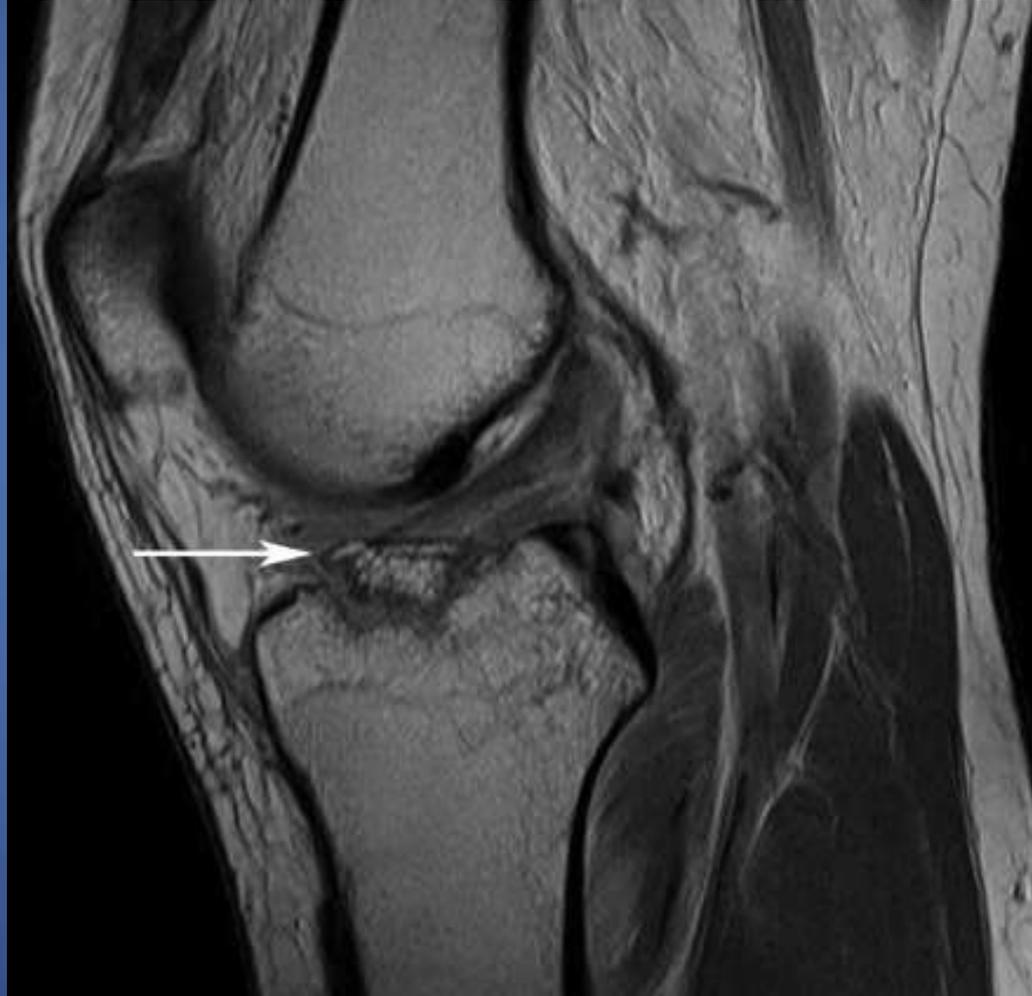
INTERESTING X-RAYS



TIBIAL SPINE FRACTURE



TIBIAL SPINE FRACTURE



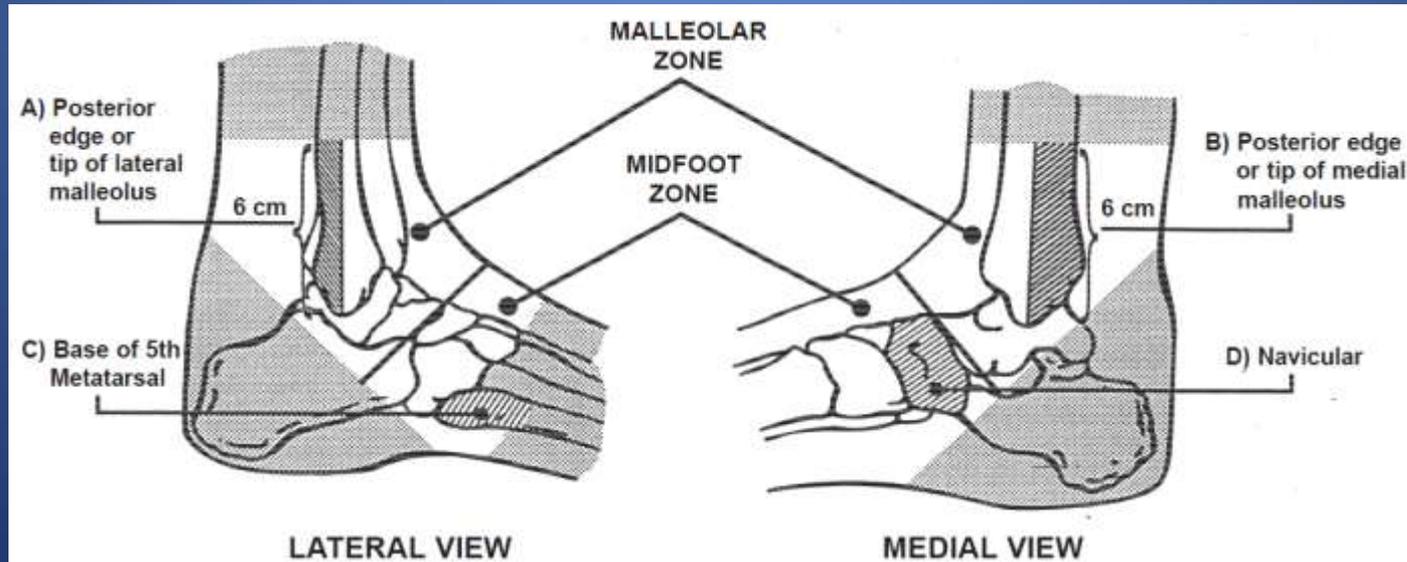
WHAT'S WRONG WITH THIS KNEE?



INTERESTING X-RAYS: FOOT AND ANKLE

INTERESTING X-RAYS

- Ottawa Ankle Rule for patients presenting with midfoot pain:
 - Patients require an x-ray if they have pain in the midfoot and any of the following:
 - Tenderness of the base of the 5th metatarsal
 - Tenderness of the navicular
 - Are unable to weightbear for 4 steps both initially and in the ED



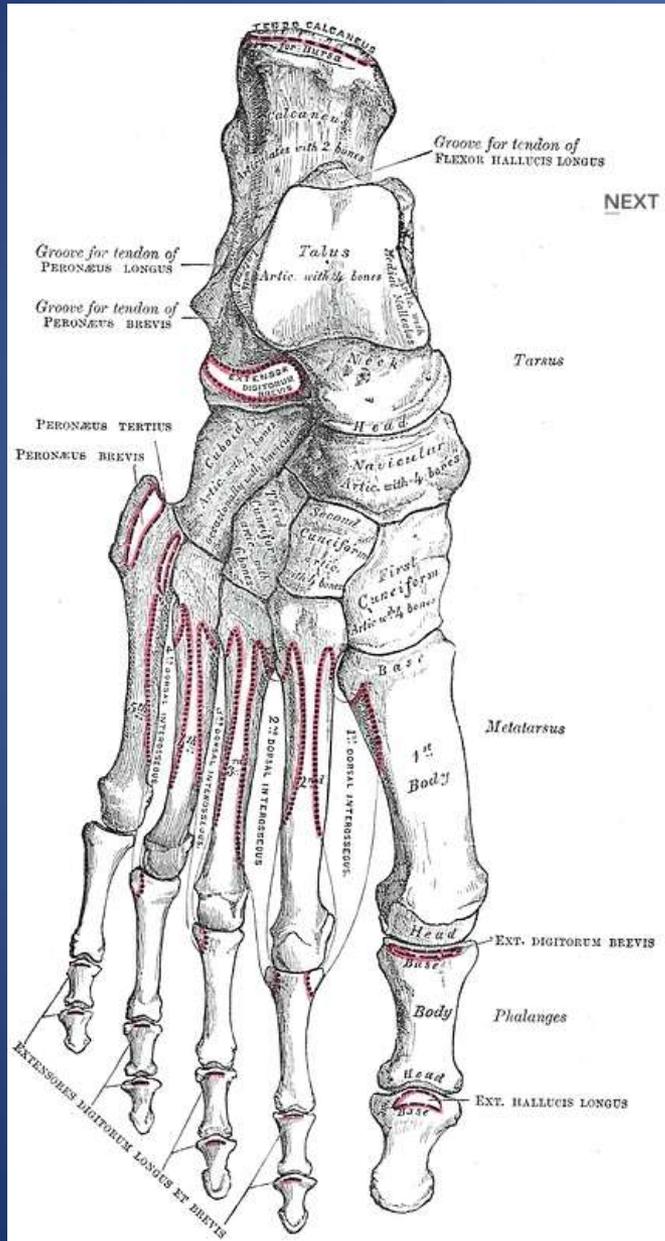
INTERESTING X-RAYS



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5th METARSAL AVULSION



5th METATARSAL AVULSION

- Small fractures and those which are minimally displaced are typically managed symptomatically as per a severe ankle sprain, with weightbearing permitted as tolerated

INTERESTING X-RAYS



JONES FRACTURE

- This injury was first described in 1902 by Sir Robert Jones and is a fracture of the proximal diaphysis (or diaphyseal junction) of the 5th metatarsal
- Description varies – but consistently referred to as a transverse fracture within 1.5cm to 3cm from the tubercle of the base of the 5th MT. The fracture may through or just distal to the intermetatarsal joint.



JONES FRACTURE

- Displacement of this fracture tends to increase with continued weight bearing.
- 35-50% of patients with this fracture develop persistent nonunions requiring bone grafting and internal fixation.
- Initial therapy must include immobilization without weight bearing

JONES FRACTURE

Smith et al, 1992

- The intraosseous blood supply to the fifth metatarsal tuberosity arose from numerous metaphyseal vessels penetrating the nonarticular surfaces of the tuberosity in a random, radiate pattern.
- The blood supply to the proximal diaphysis was derived primarily from the nutrient artery, which gave rise to longitudinal intramedullary branches.
- The arterial supply to the tuberosity joined the supply of the proximal diaphysis in the area just distal to the tuberosity, corresponding to the region of poor prognosis for fracture healing.
- This suggests that a relative lack of blood supply following a proximal diaphyseal fracture may contribute to delayed union and nonunion.

INTERESTING X-RAYS



LIS FRANC INJURY



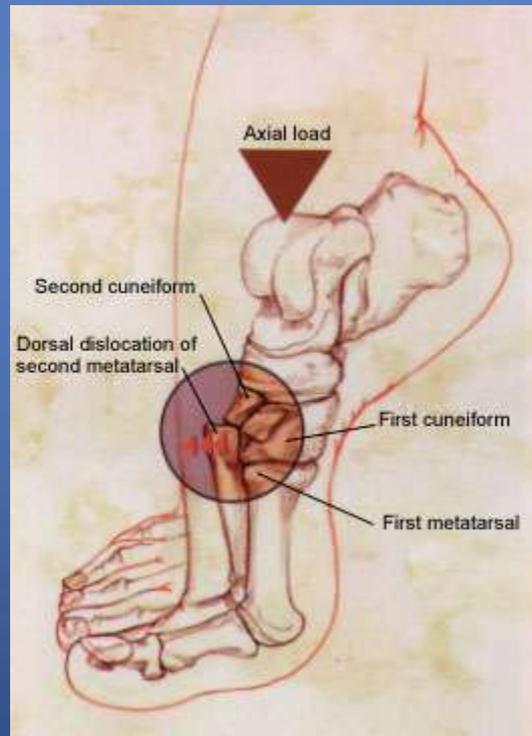
LIS FRANC INJURY



LIS FRANC INJURY

Mechanism

- Classically, fall from horse while riding, with foot trapped in stirrup.
- These days, common where foot is strapped in over the metatarsals, such as in activities like windsurfing, or stepping into a hole

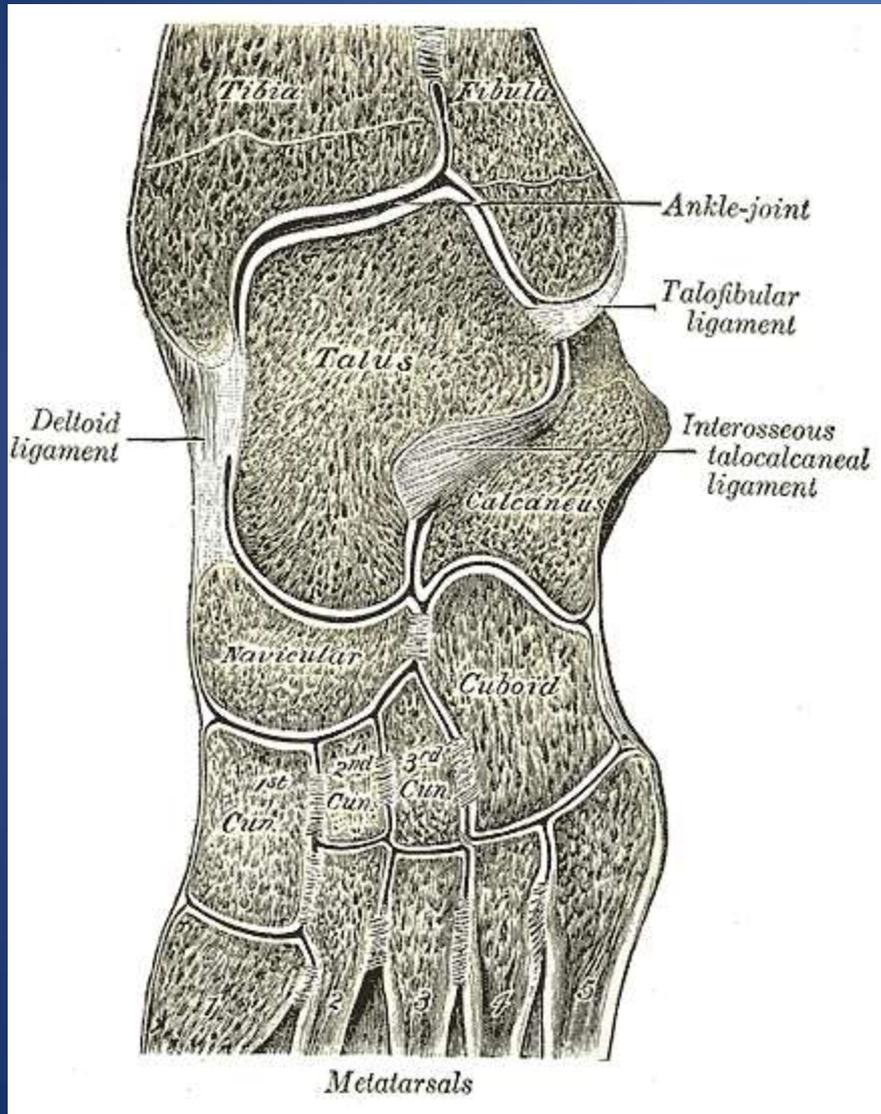


LIS FRANC INJURY

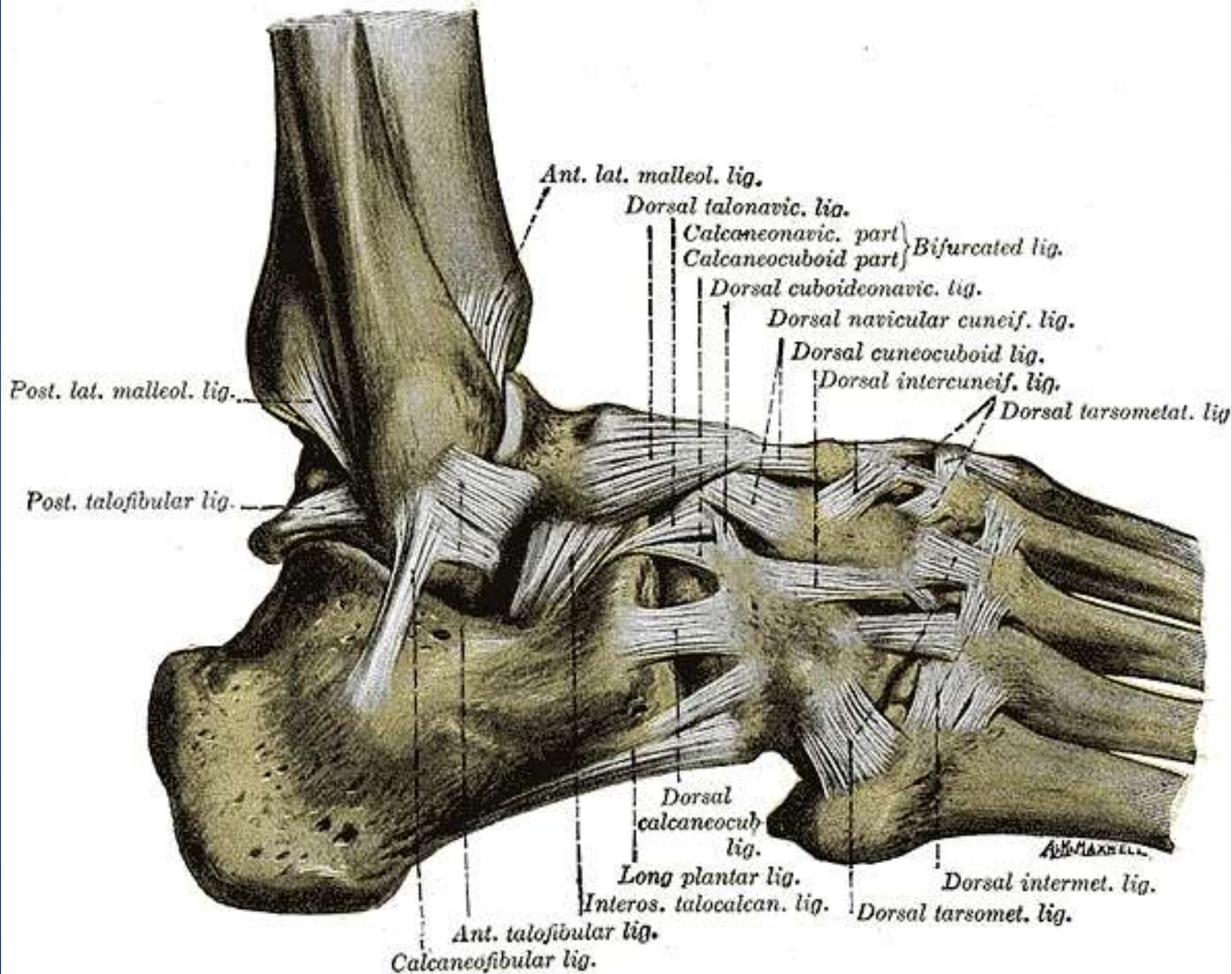
Ligamentous support

- Strongest ligament is the Lisfranc ligament (medial interosseous ligament) which runs from medial cuneiform to the base of the 2nd metatarsal. This is the primary ligamentous support between medial and middle foot

LIS FRANC INJURY



LIS FRANC FRACTURE



LIS FRANC INJURY

Complications

- Even minor subluxation can lead to arthritis, chronic pain, residual deformity, foot wear problems
- RSD/CRP
- Non union

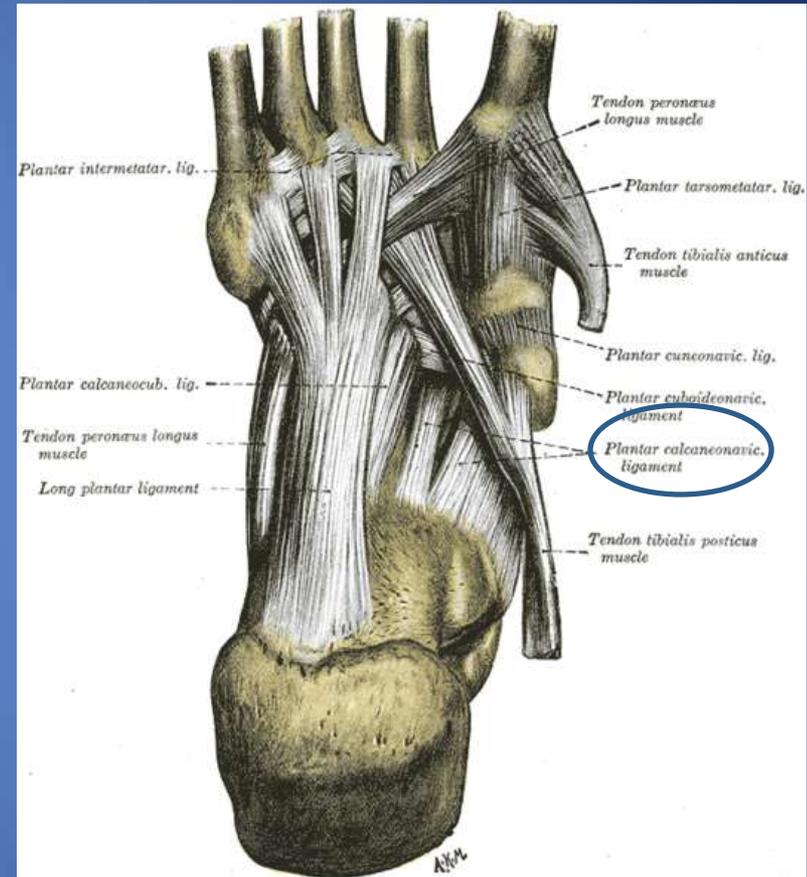


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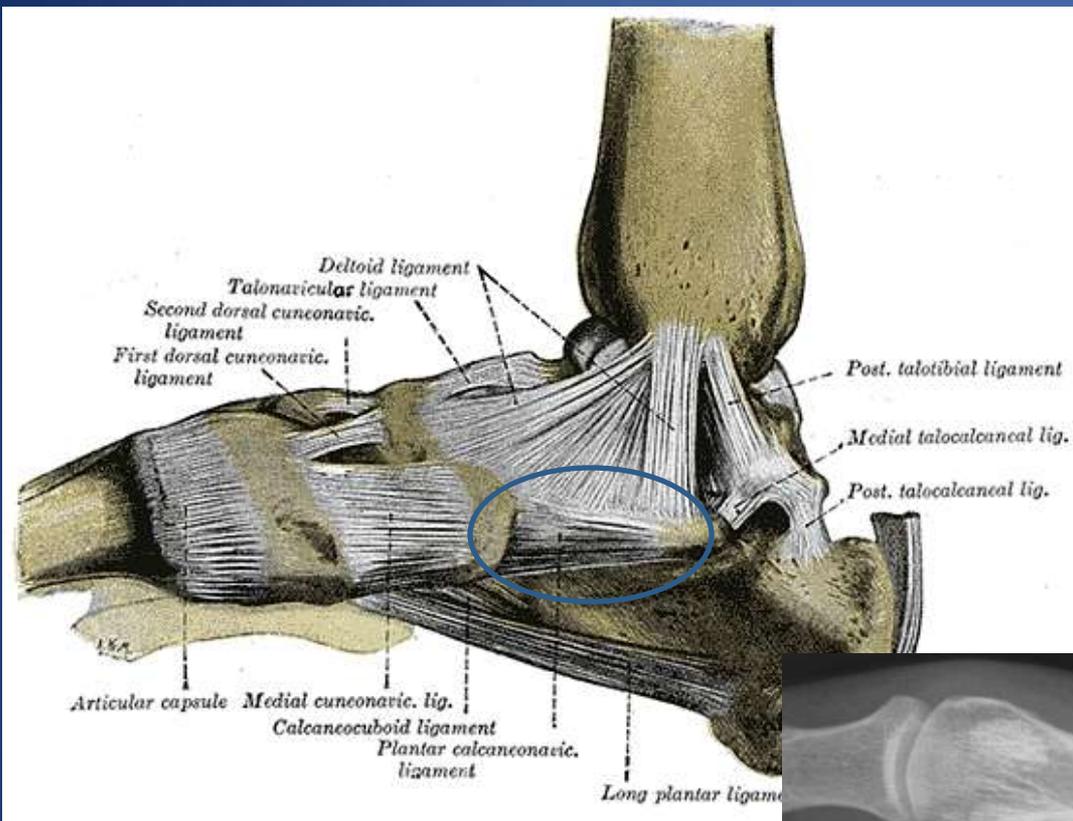


SPRING LIGAMENT AVULSION

- The plantar calcaneonavicular “spring” ligament is a broad and thick band of fibers, which connects the anterior margin of the sustentaculum tali of the calcaneus to the plantar surface of navicular.
- The spring ligament helps to maintain the medial longitudinal arch of the foot and by providing support to the head of the talus bears the major portion of the body weight.



SPRING LIGAMENT AVULSION



SPRING LIGAMENT AVULSION

- Rupture / avulsion of the spring ligament leads to collapsing of the medial longitudinal arch, chronic pain and difficulty with pushoff (foot has to supinate to turn into a rigid lever for pushoff)
- Damage best seen on MRI
- Management is usually surgical to repair the spring ligament or otherwise aggressive orthotics

REFERENCES

- Hess T, Rupp S, Hopf T, Gleitz M and Liebler J, 1994. Lateral tibial avulsion fractures and disruptions to the anterior cruciate ligament. *Clinical Orthopaedics and Related Research* 303:193-197
- Smith JW, Arnoczky SP, Hersh A, 1992. The intraosseous blood supply of the fifth metatarsal: implications for proximal fracture healing. *Foot Ankle* 13(3):143-52.
- Goldman A, Pavlov H and Rubenstein D, 1988. The Second fracture of the proximal tibia: a small avulsion that reflects major ligamentous damage. *AJR* 151:1163-1167