Περιοχική παθολογία ΠΔΚ & Άκρο Πόδι: Τενοντοπάθειες - Σύνδρομα Πρόσκρουσης

Μαρία Τιμ. Τζαλονίκου
Ακτινοδιαγνώστης

3ο Θερινό Σχολείο Ακτινολογίας Μυοσκελετικού, 23-25/10/2020, ΗΡΑΚΛΕΙΟ, ΚΡΗΤΗ

Outline

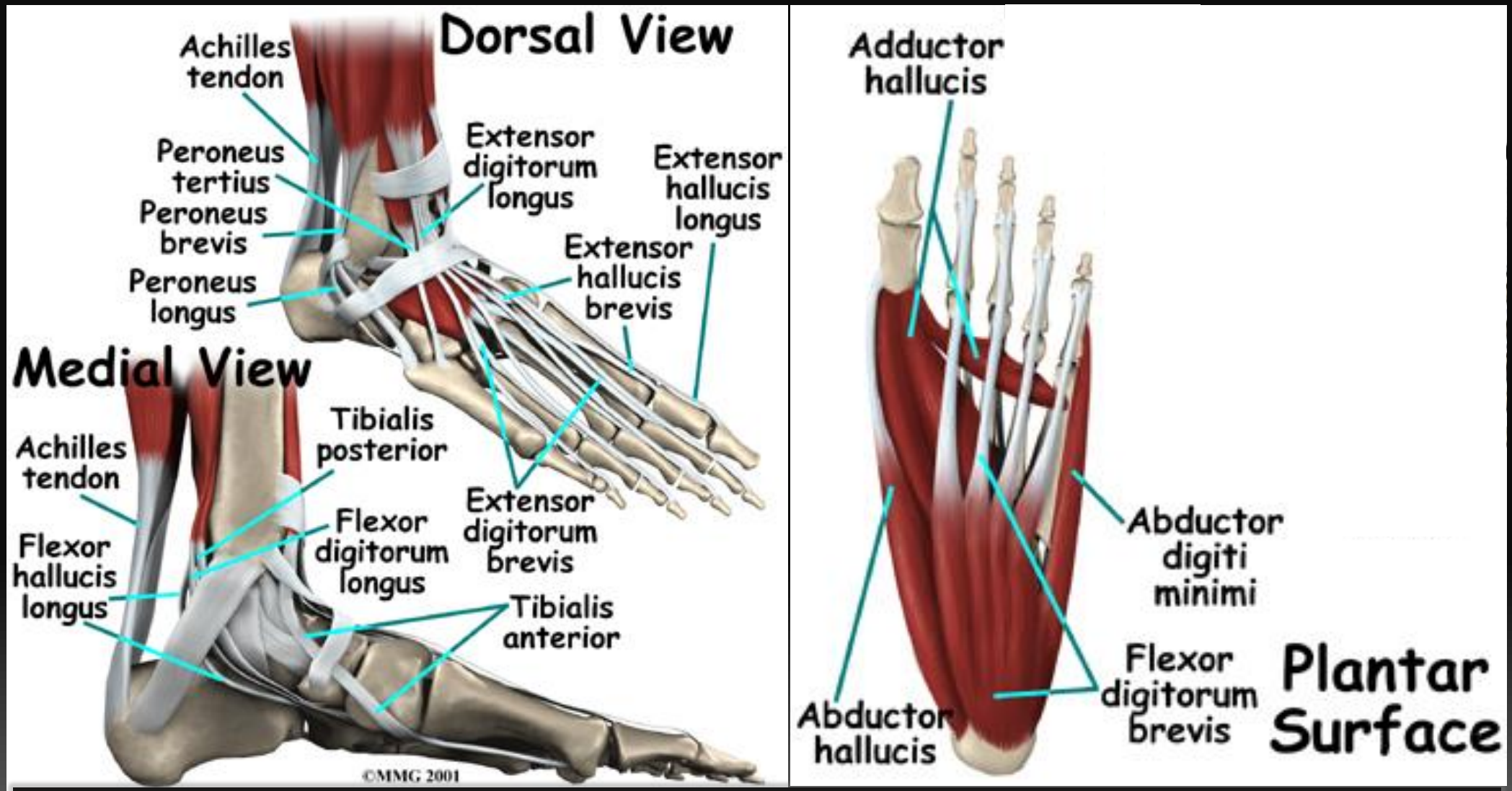
- Tendons about the ankle & in the foot:

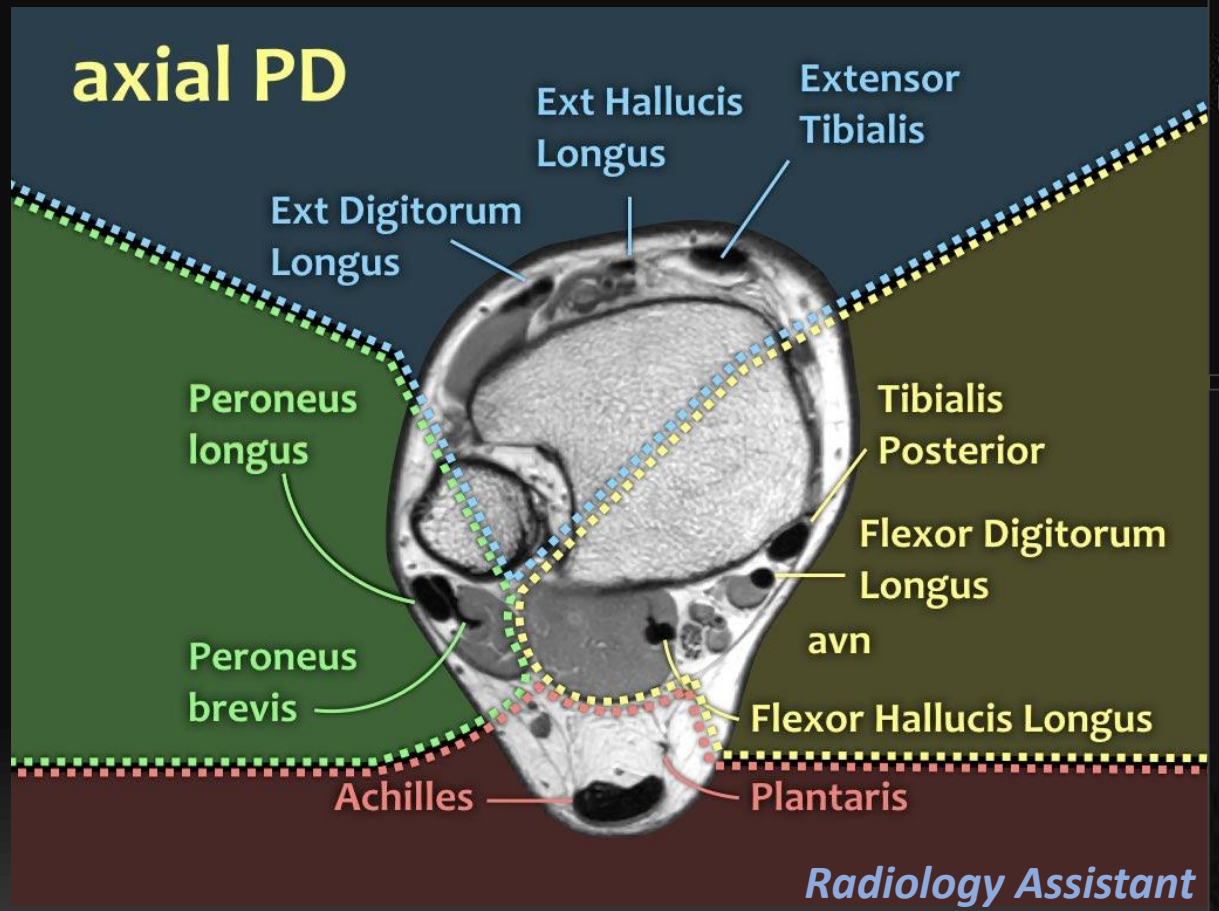
  basic anatomy & characteristic pathology

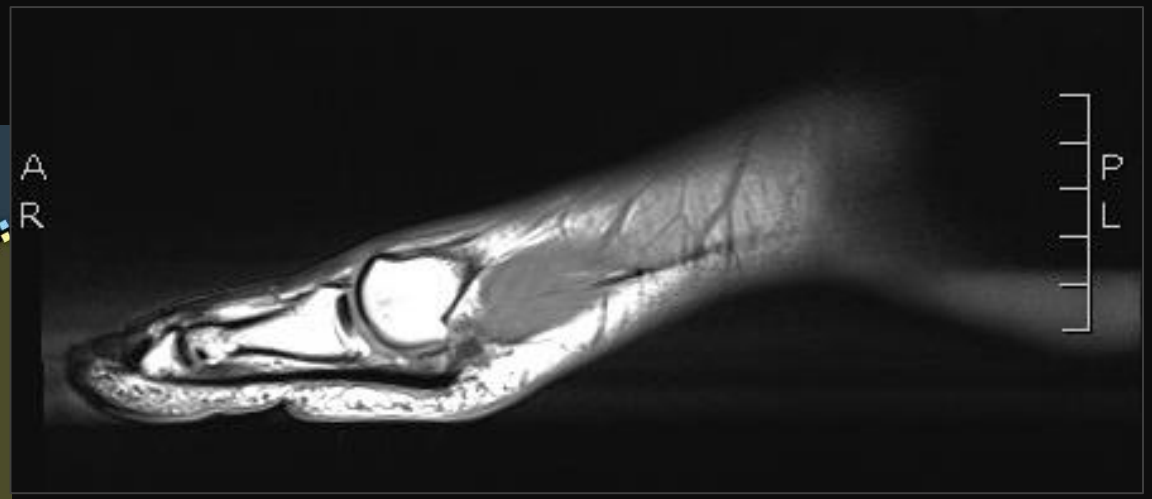
- Ankle Impingement Syndromes &

  relevant regional anatomy

Tendons


Dorsal View
Achilles tendon
Peroneus tertius
Peroneus brevis
Peroneus longus
Extensor digitorum longus
Extensor hallucis longus
Extensor hallucis brevis
Medial View
Achilles tendon
Flexor hallucis longus
Tibialis posterior
Flexor digitorum longus
Extensor digitorum brevis
Tibialis anterior
©MMG 2001
Adductor hallucis
Abductor digiti minimi
Flexor digitorum brevis
Abductor hallucis
Plantar Surface


axial PD
Ext Hallucis Longus
Extensor Tibialis
Ext Digitorum Longus
Peroneus longus
Tibialis Posterior
Flexor Digitorum Longus
avn
Peroneus brevis
Flexor Hallucis Longus
Achilles
Plantaris
Radiology Assistant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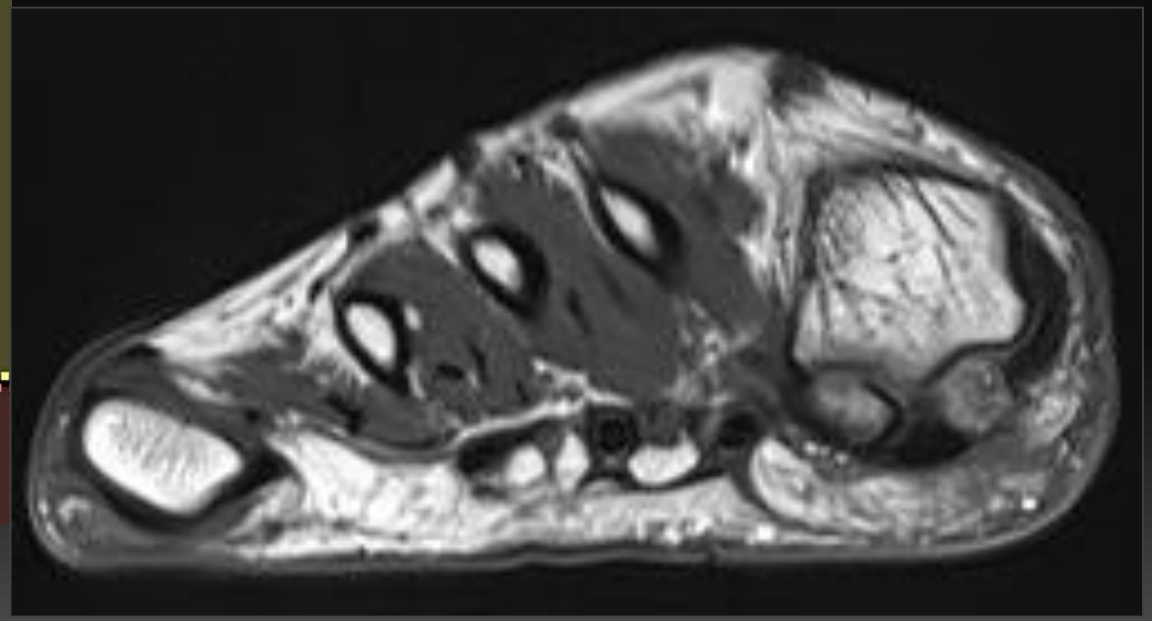

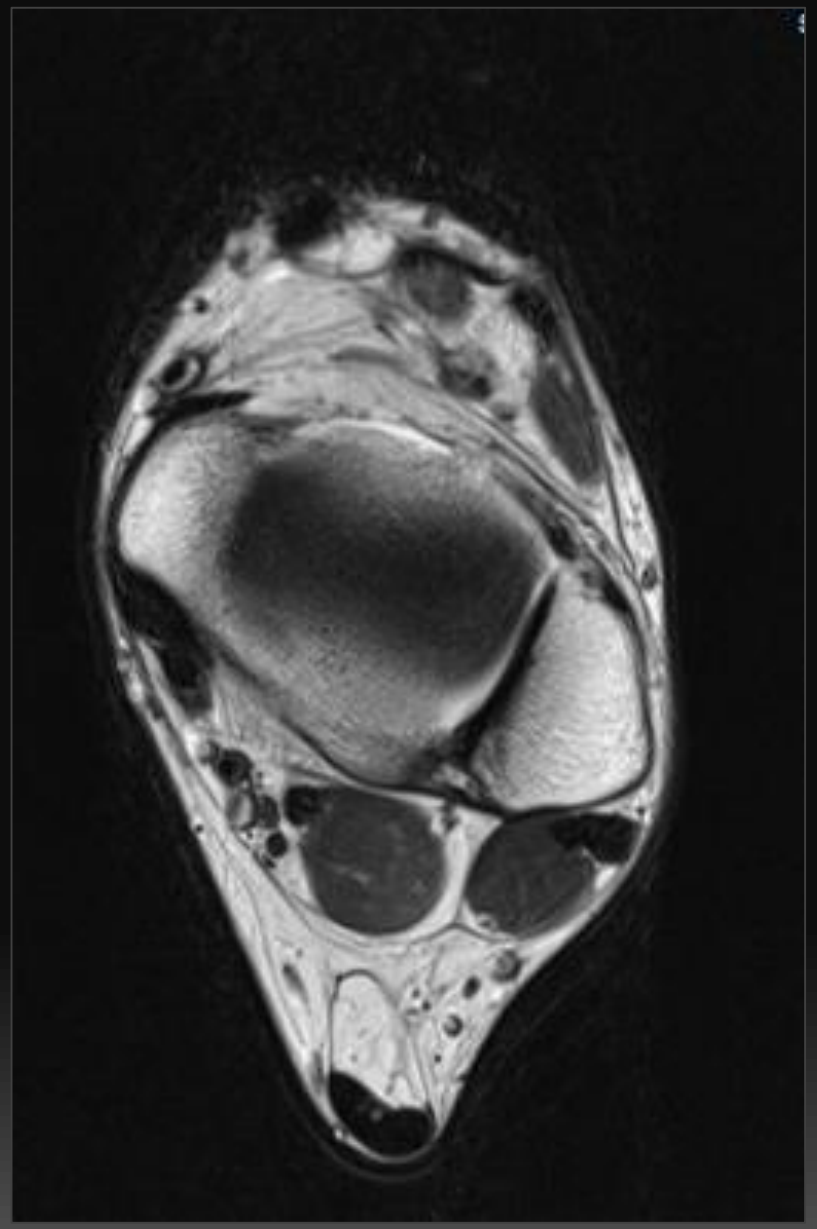


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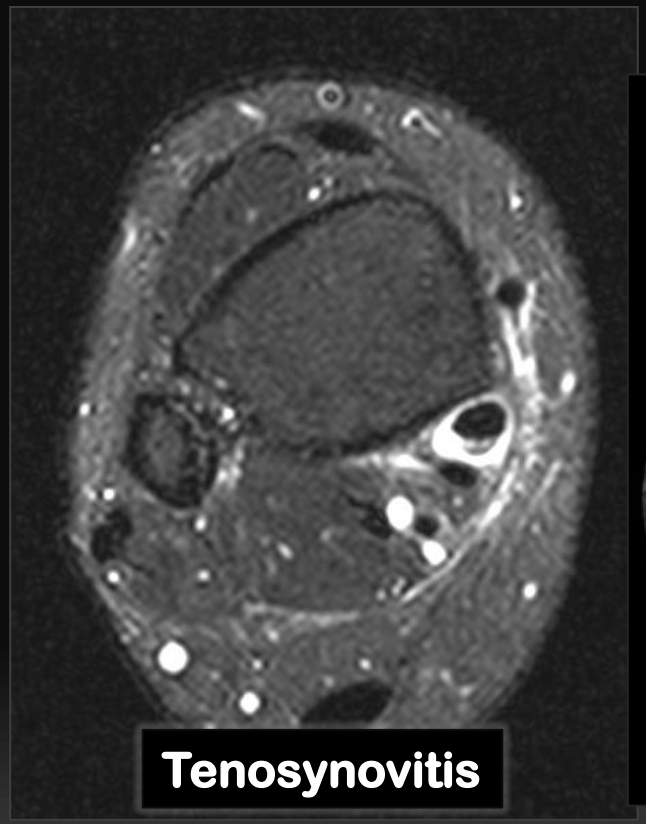
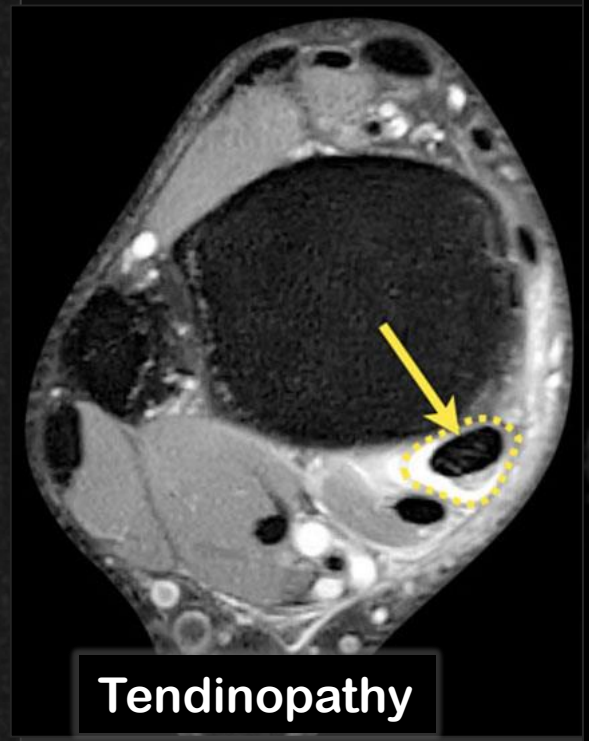
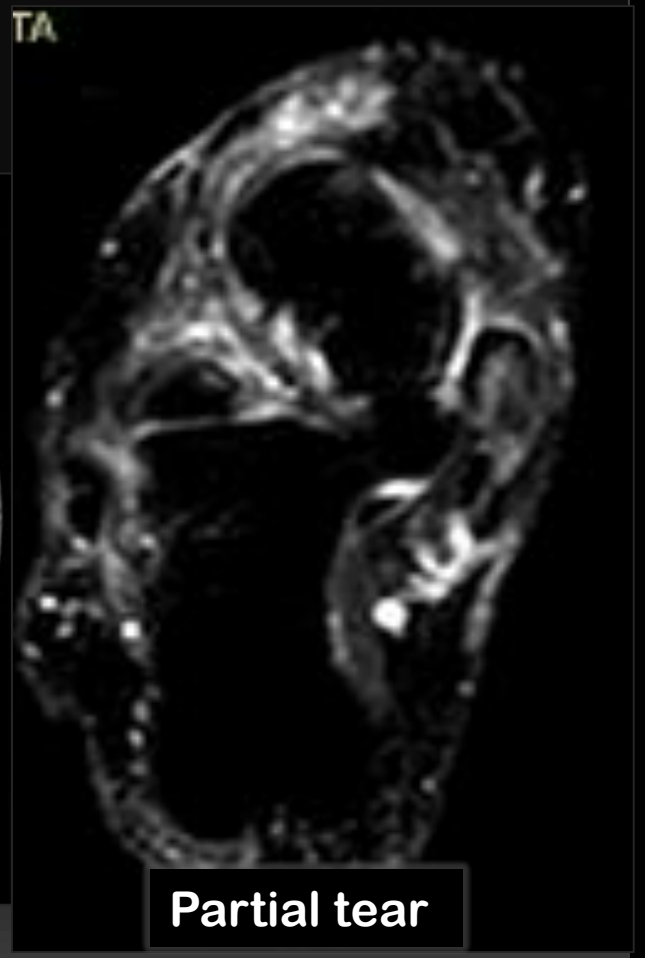
Study date:
Study time

Ankle & Foot Tendon Pathology


Tenosynovitis

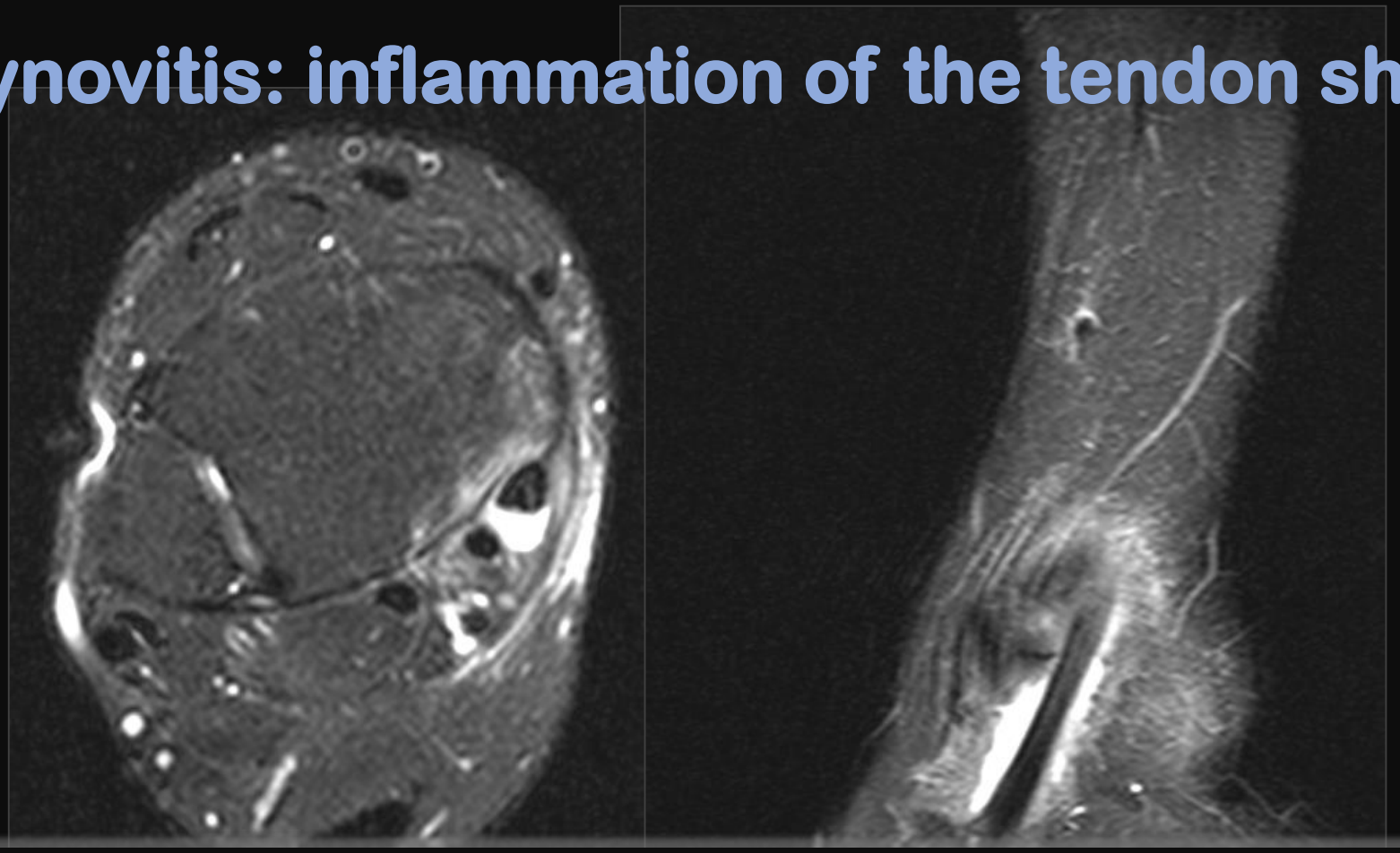

Tendinopathy



Partial tear

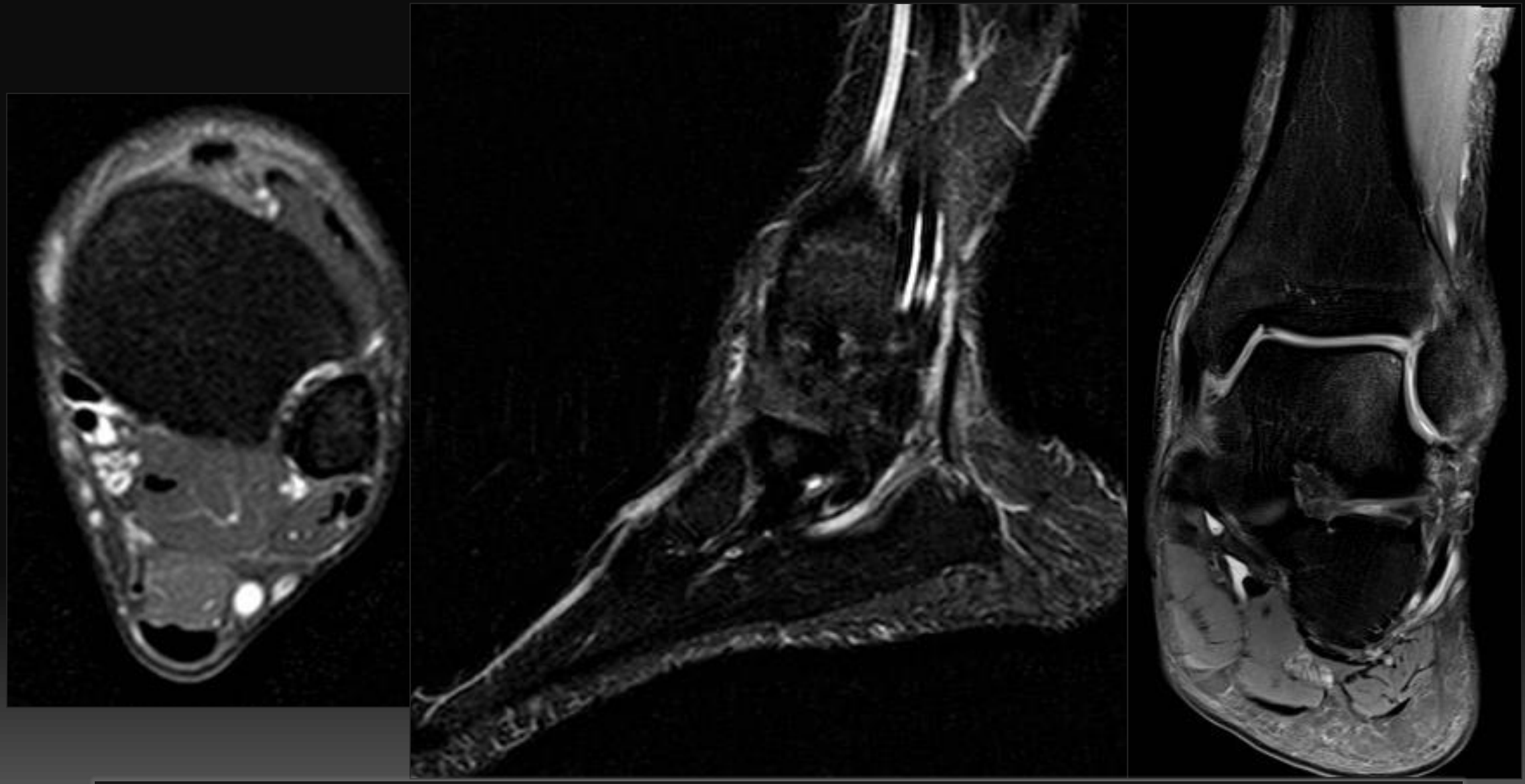

Complete tear

Tenosynovitis: inflammation of the tendon sheath



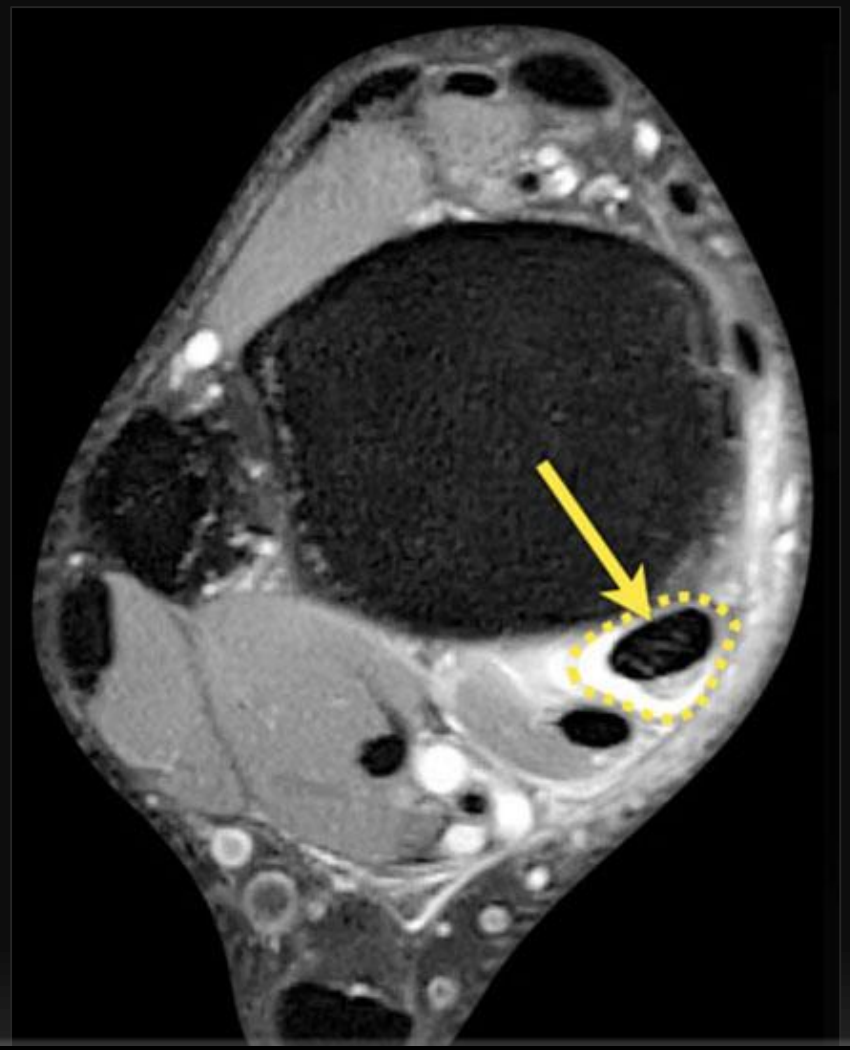
- MRI: large amount of fluid distending the tendon sheath
- complicated tenosynovitis: lower signal intensity areas (inflamed synovium - debris) on T2 wi amidst the high signal intensity fluid

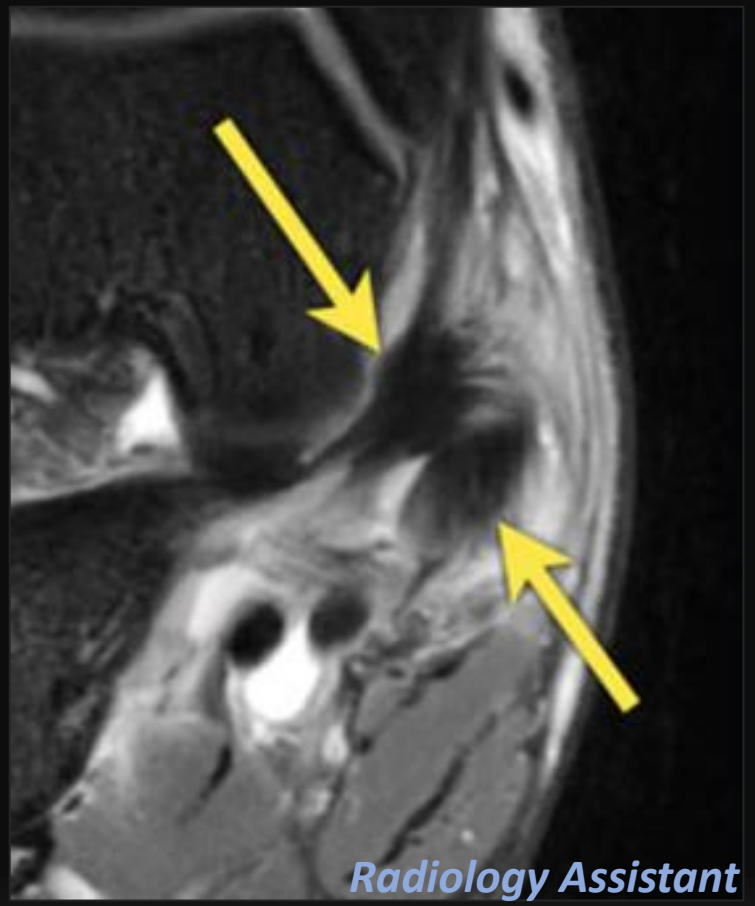
➢ *a small amount of fluid is normally seen within in the tendon sheath*



Tendinosis

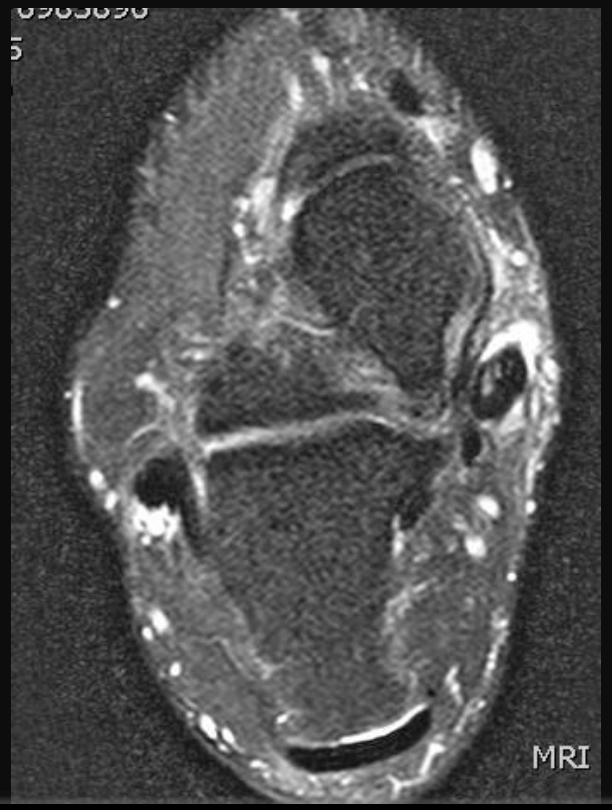
- Due to chronic repetitive microtrauma to tendon that exceeds its capacity to regenerate
- scar deposition and tendon degeneration
- Active individuals: increase in their activities increases trauma to tendons
- Advancing age: the tendon stiffens and loses its capacity to regenerate,
- tendinosis without change in activity levels
- Underlying arthropathies (ex. RA), and steroid injections into the tendon

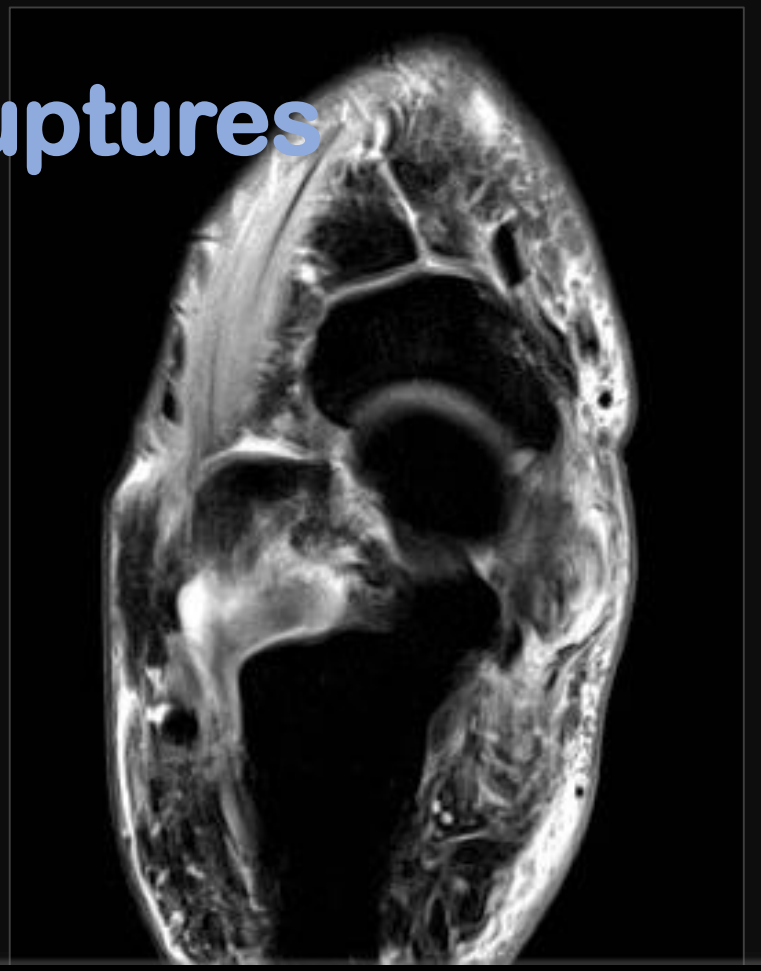




- MRI: intermediate T1/PD wi signal but normal/only minimally brighter on wi, the degenerated tendon may be thickened,
  tenosynovial fluid

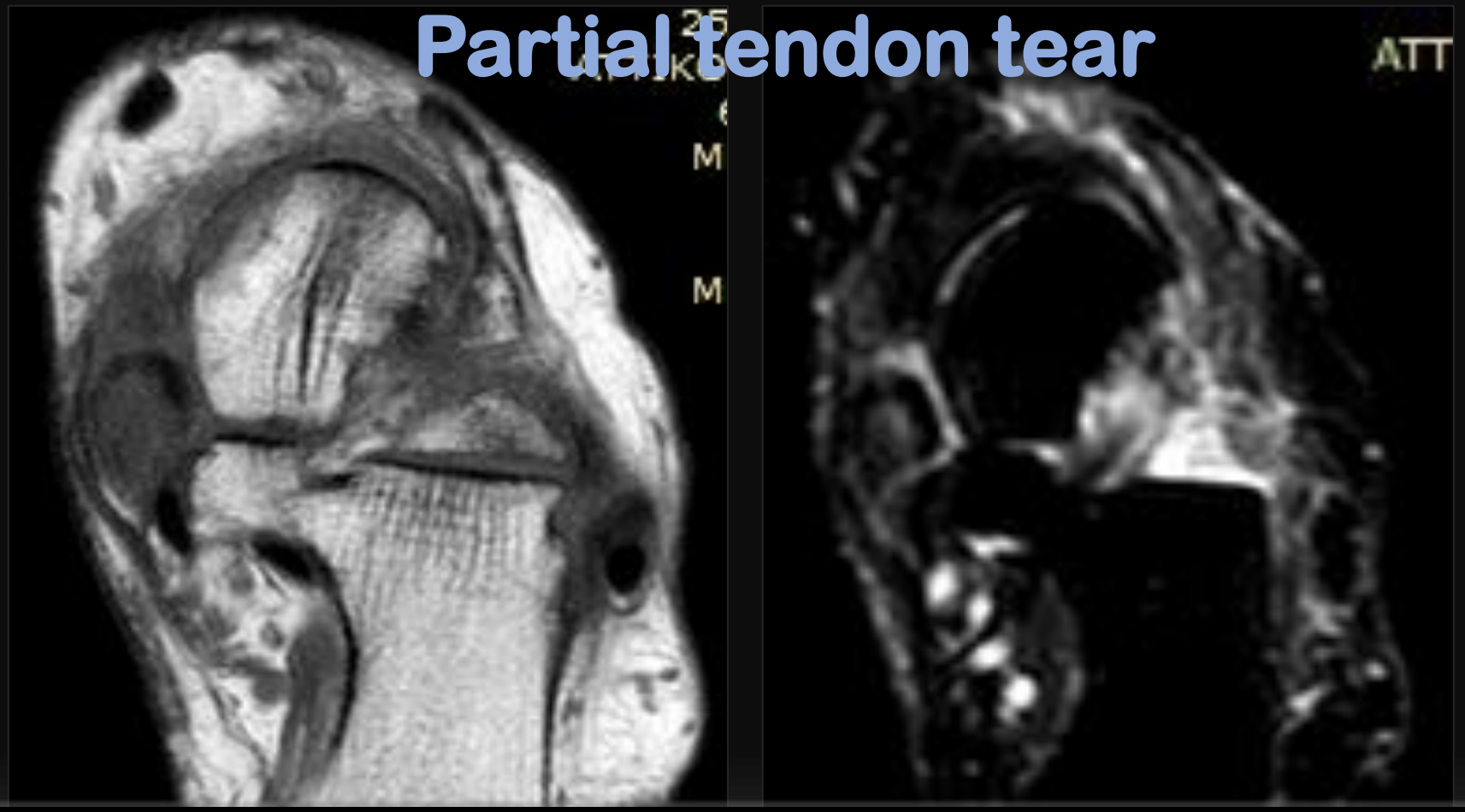
Tendon ruptures



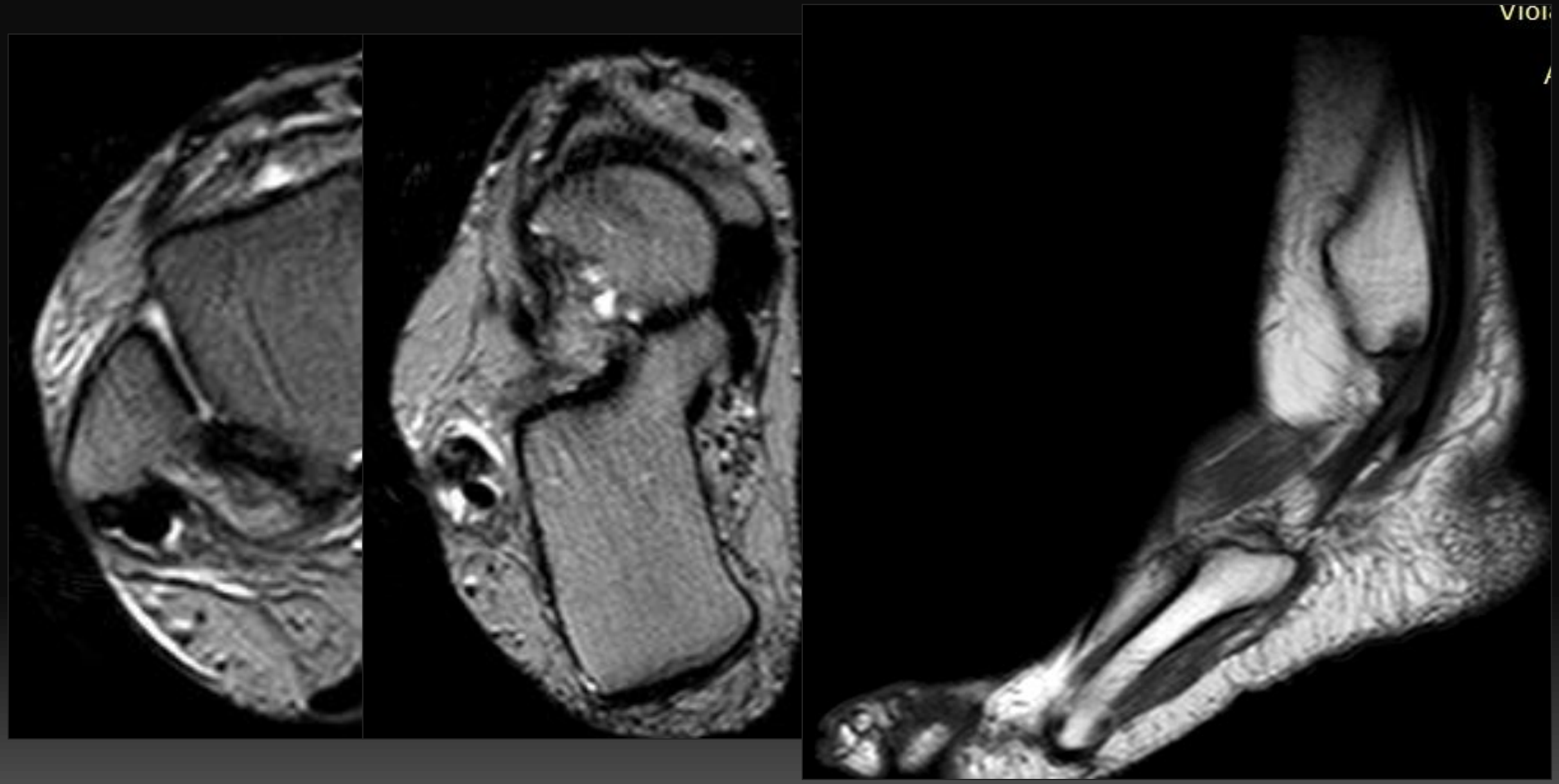


- Partial - complete disruption of tendon continuity
- Post acute traumatic episode - abnormal stretching of a degenerated/tendinopathic tendon
- MRI: partial or complete tendon discontinuity
- intermediate T1/PD and high T2 signal - edema and hemorrhage within the tendon gap

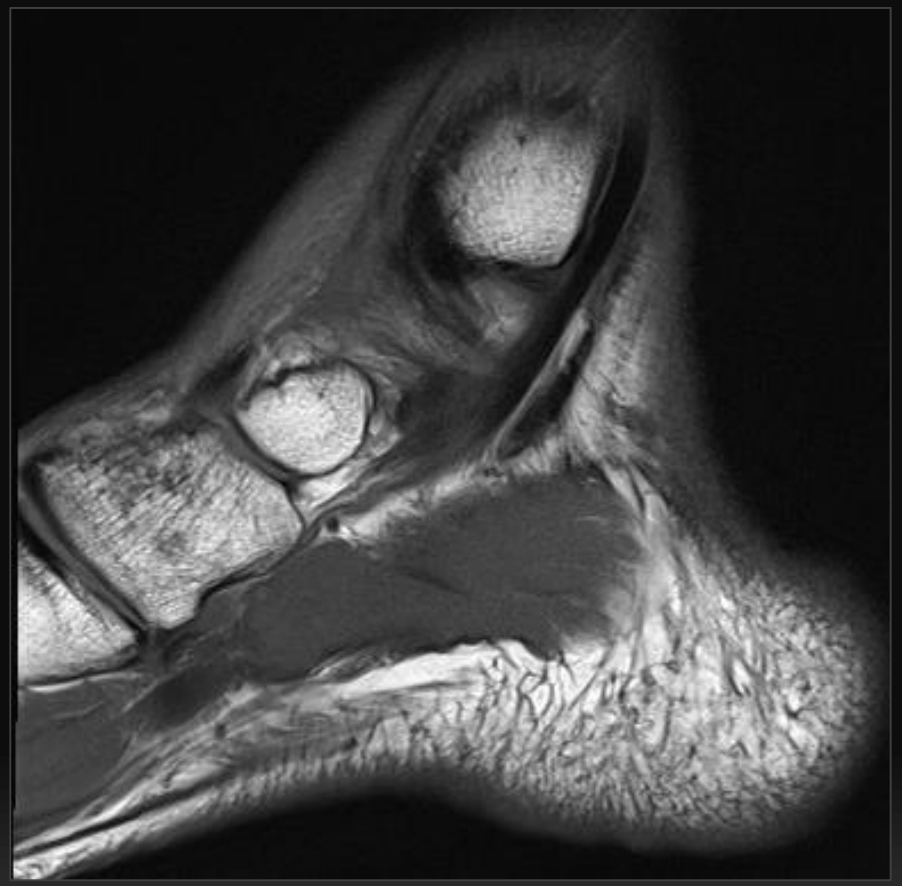
Partial tendon tear

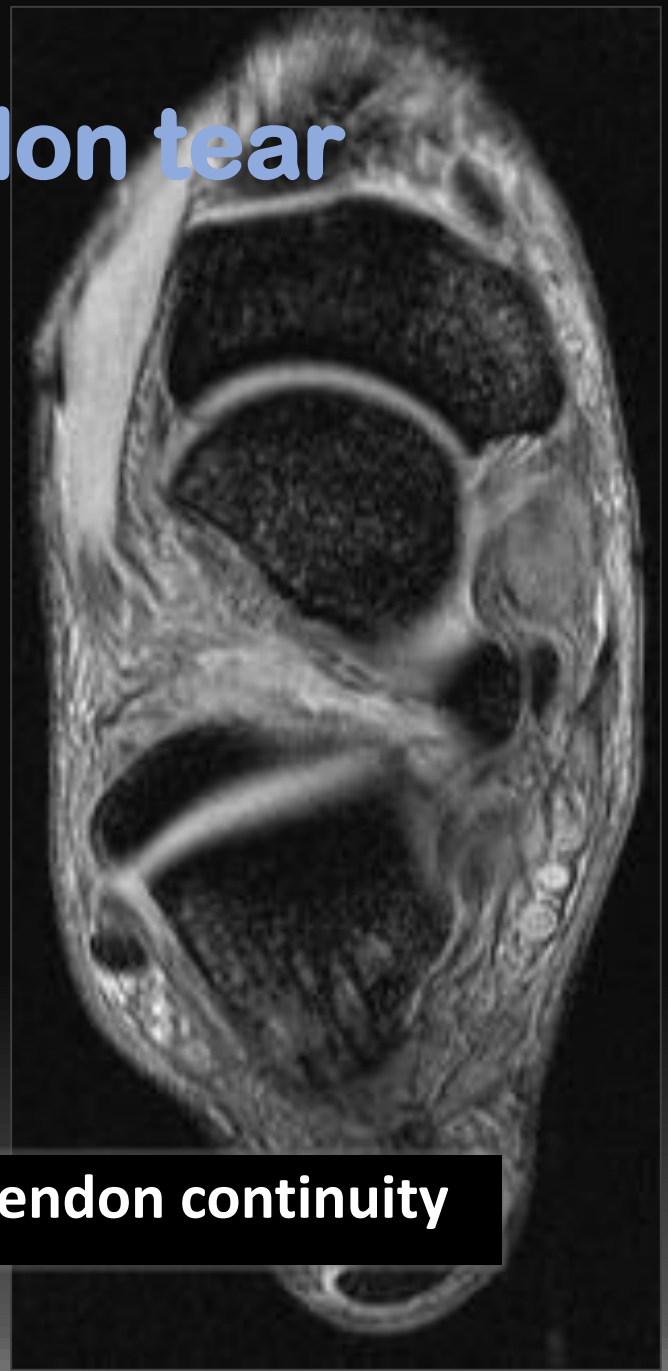


- Partial disruption of the tendon continuity
- MRI: as an area within the substance of the tendon having a signal intensity similar to that seen in advanced tendinosis on T1/PD and occasionally T2 wi

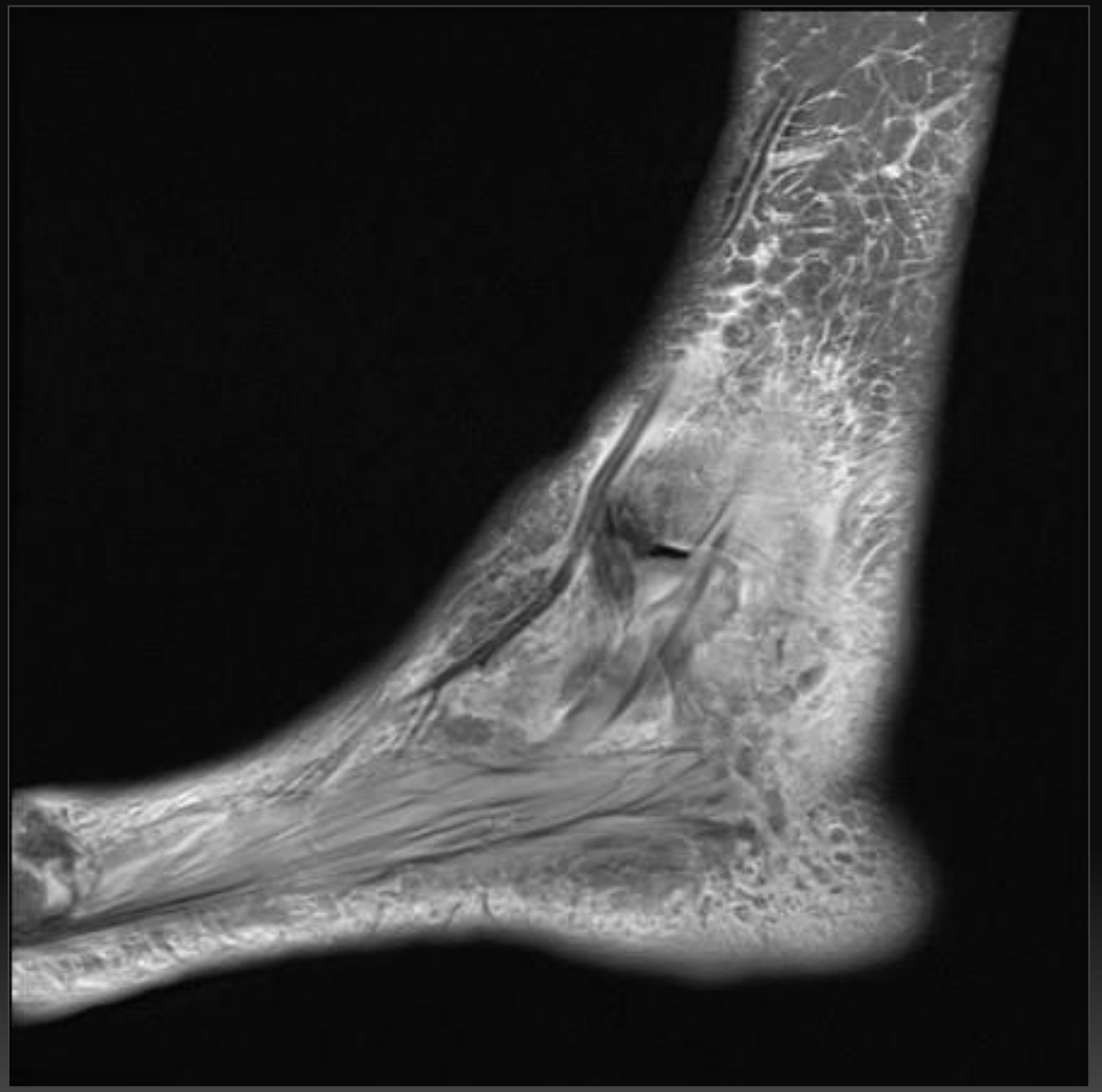


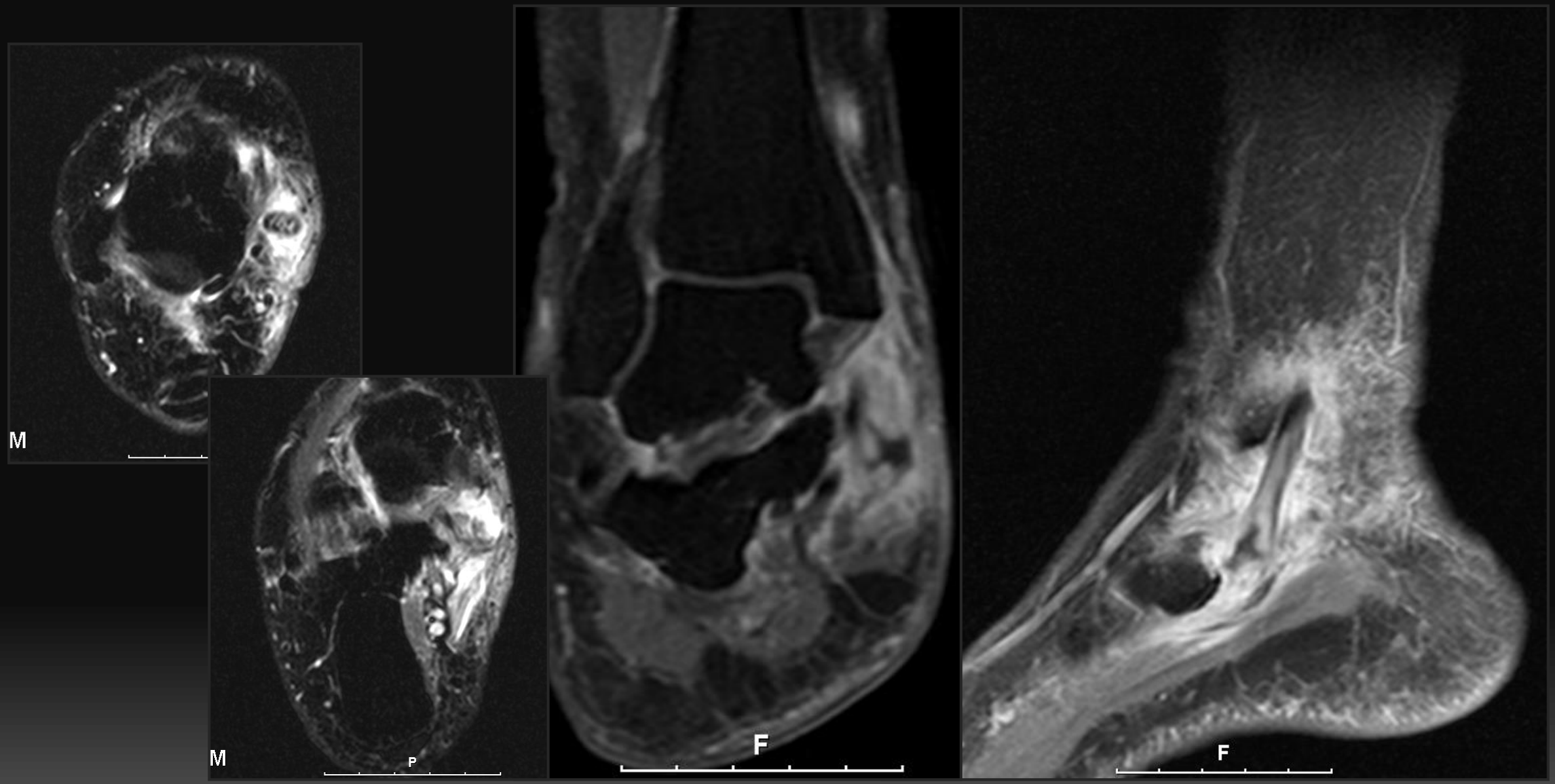
Complete tendon tear





- Complete disruption of the tendon continuity

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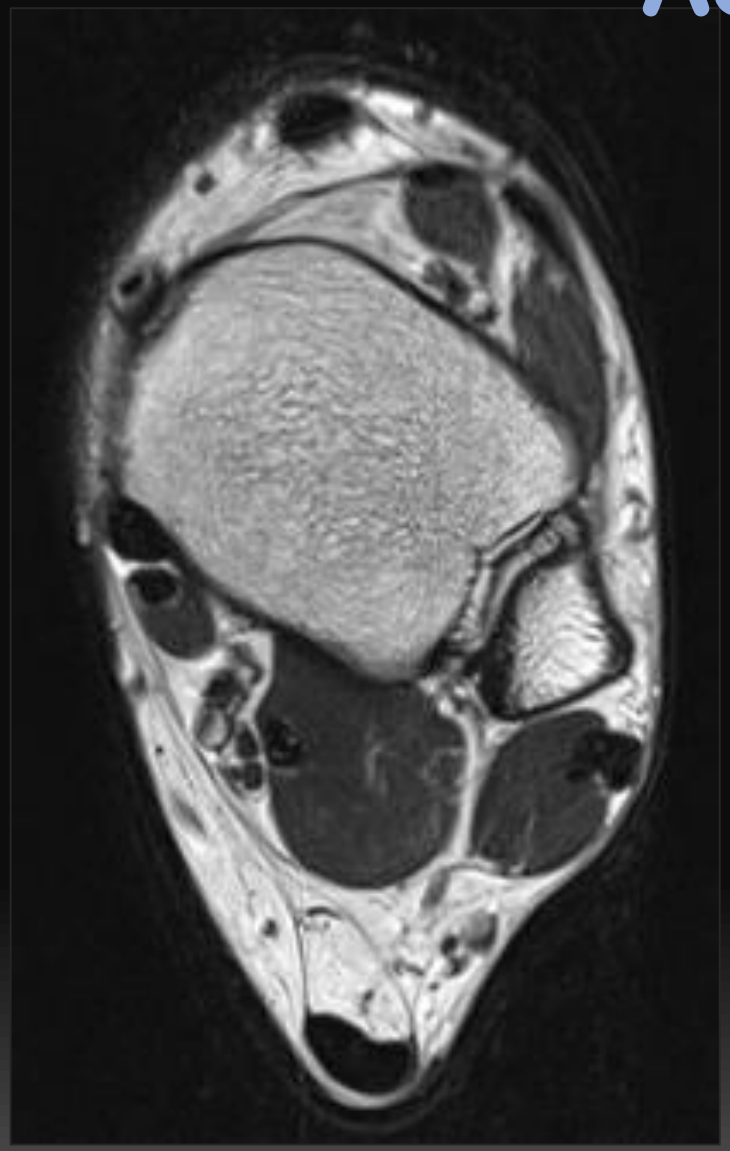
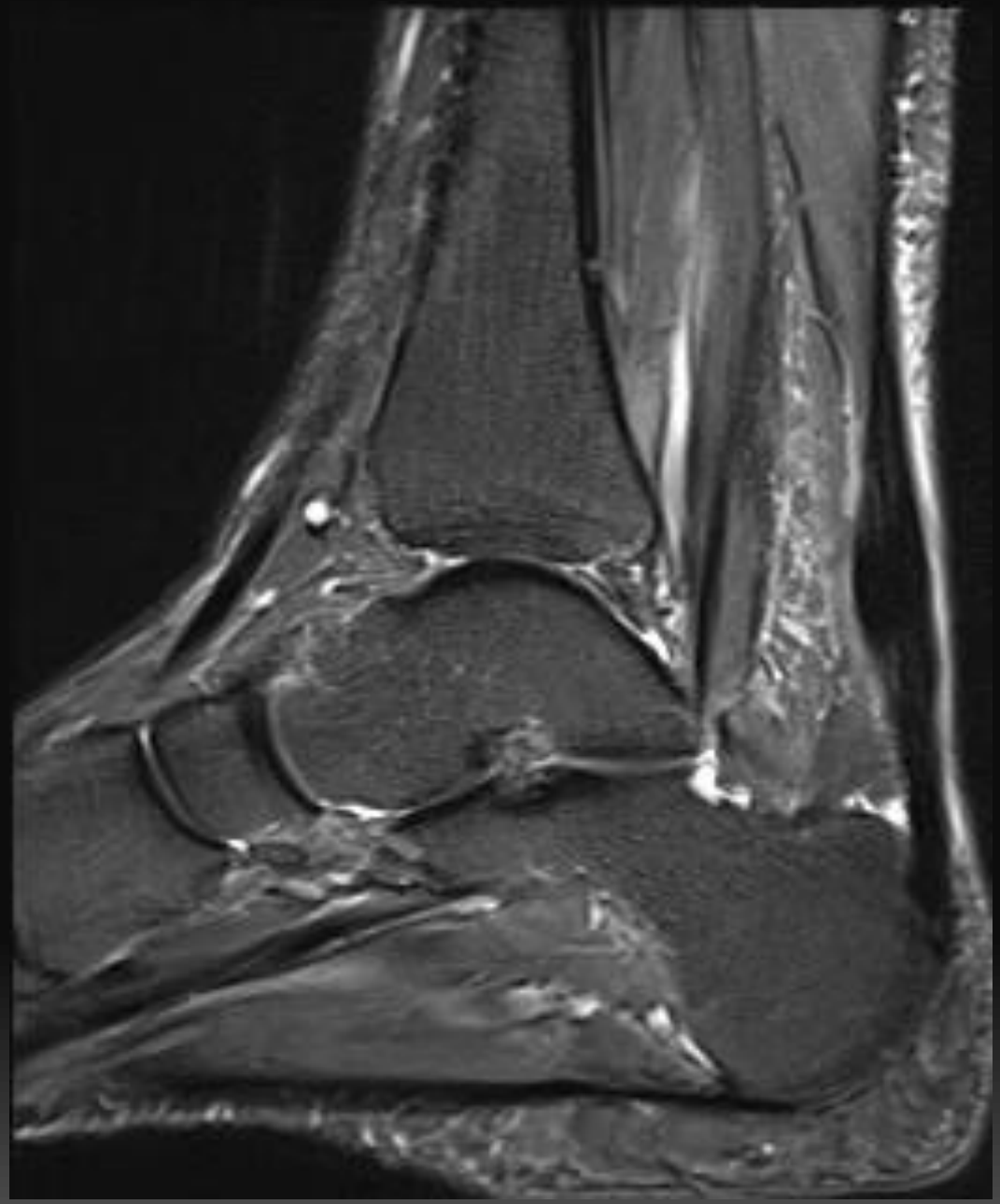
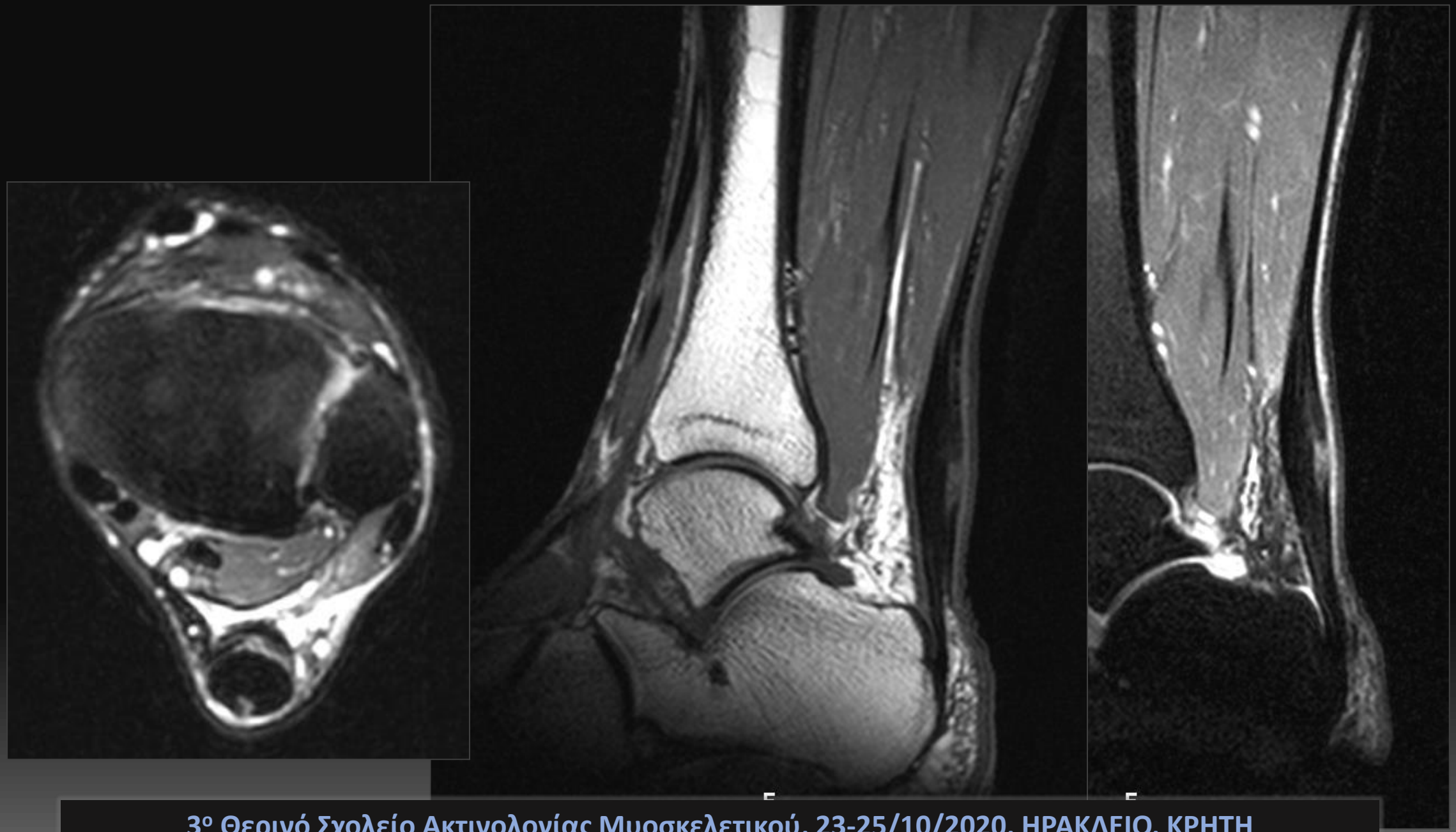
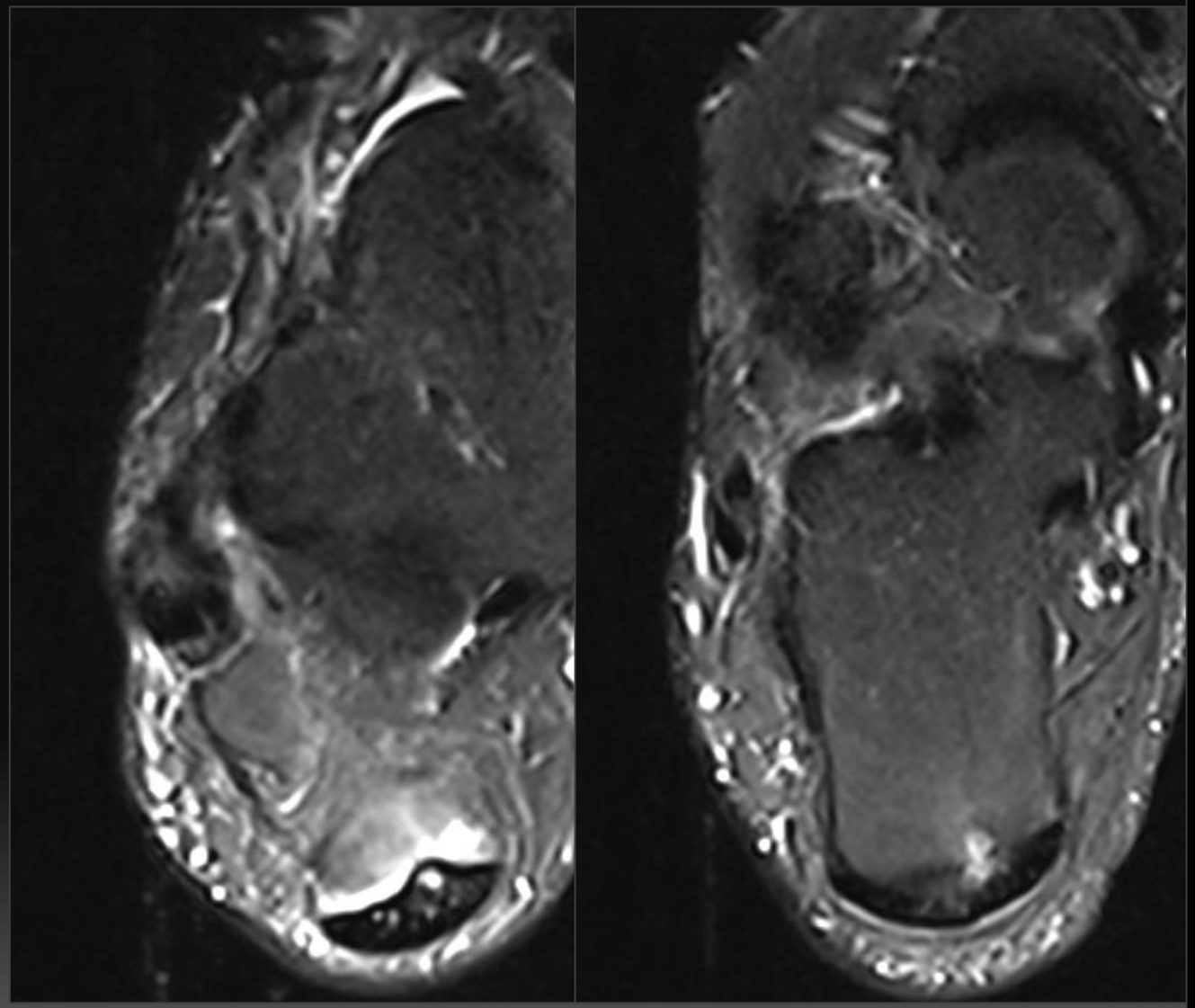
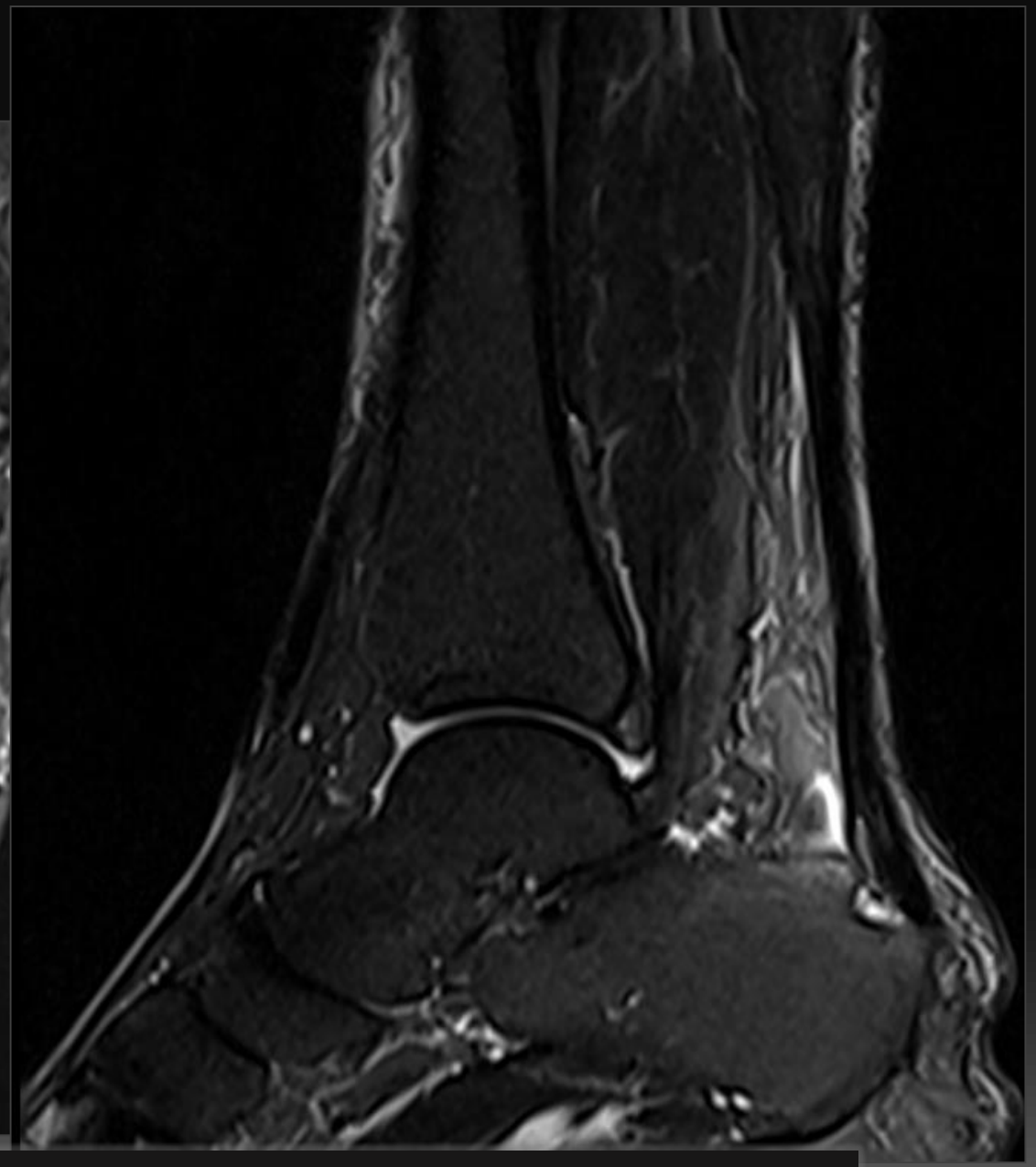
Achilles tendon

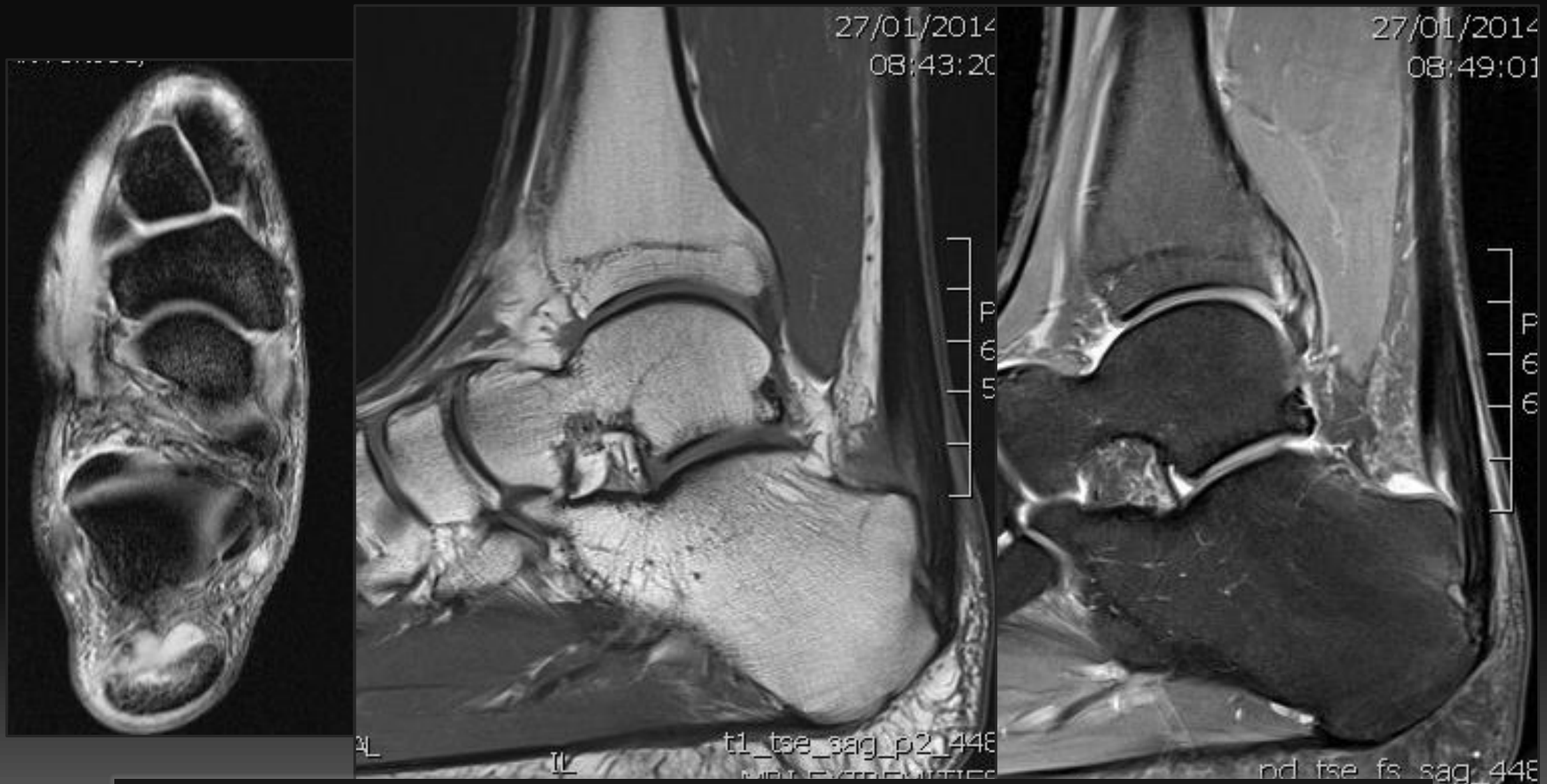








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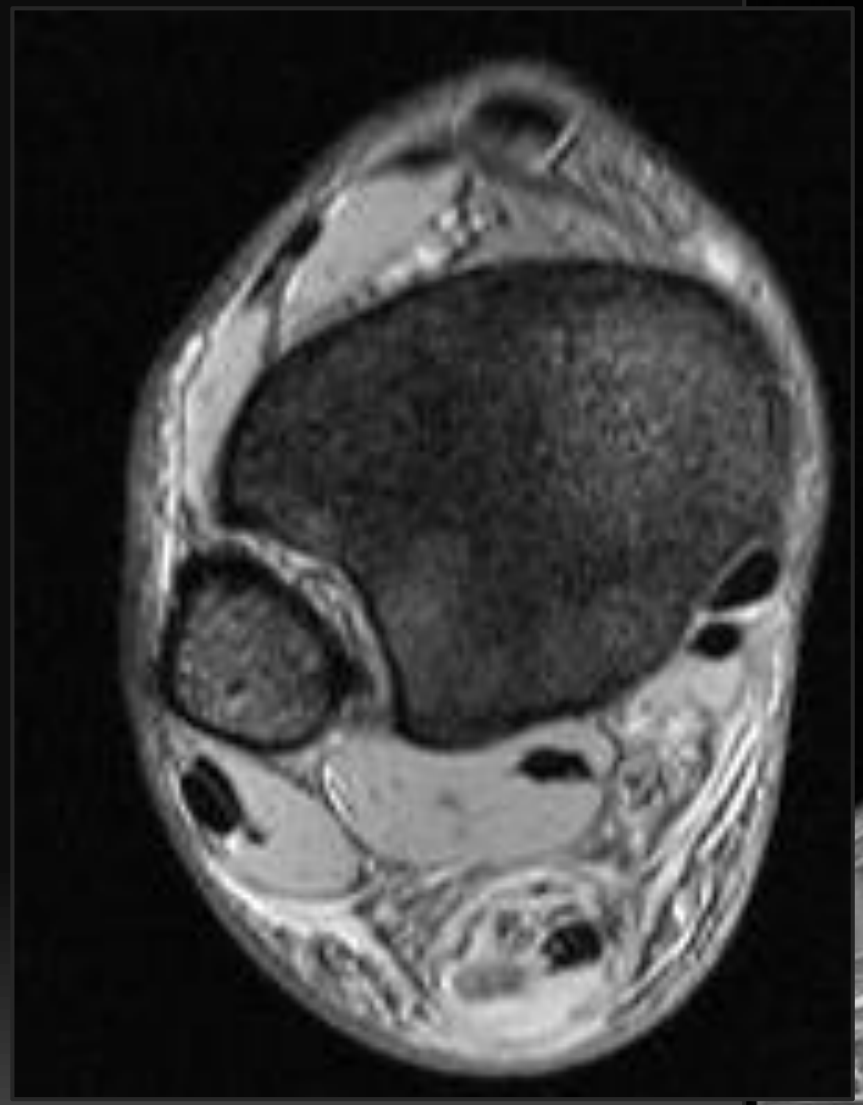
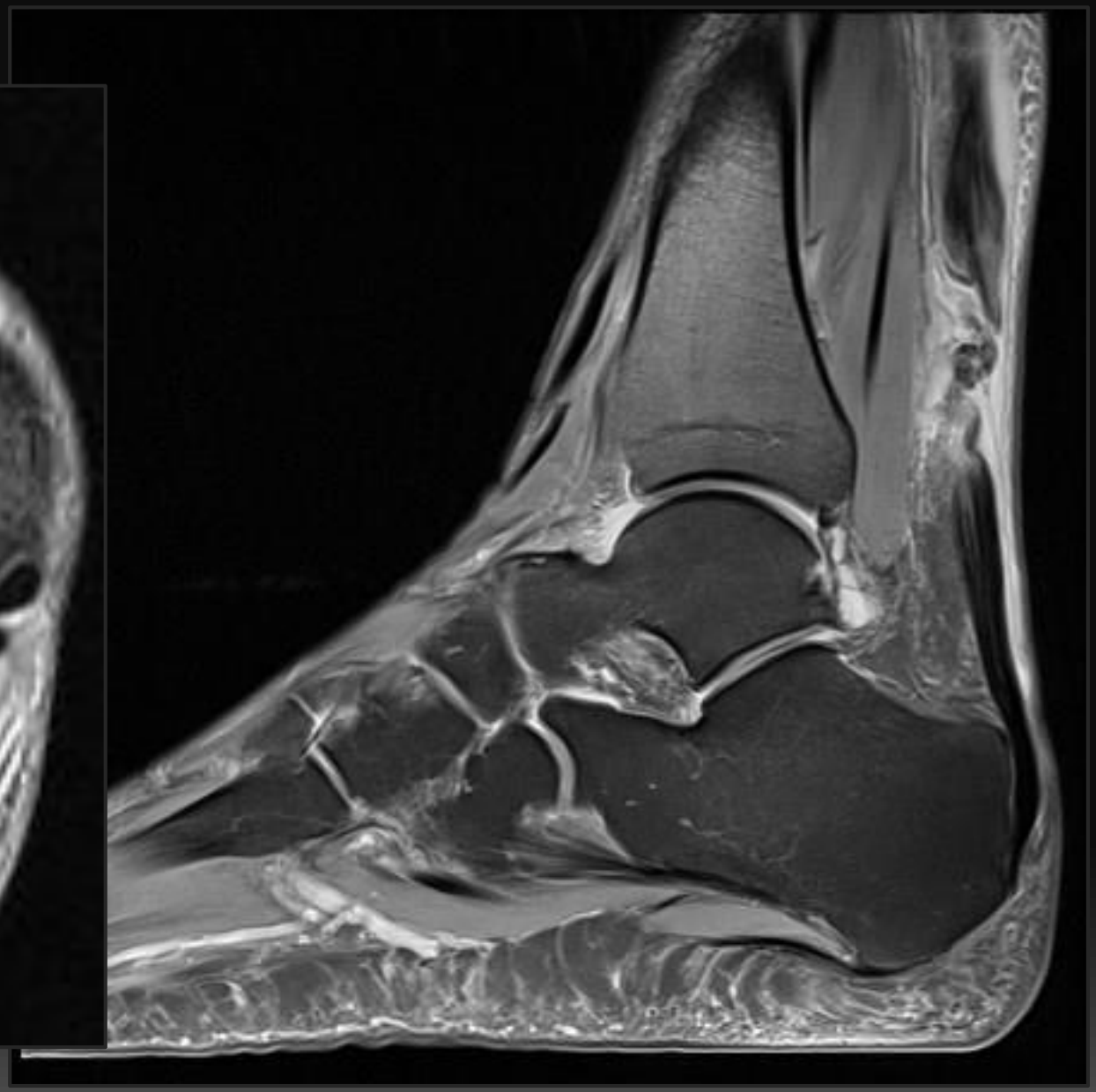
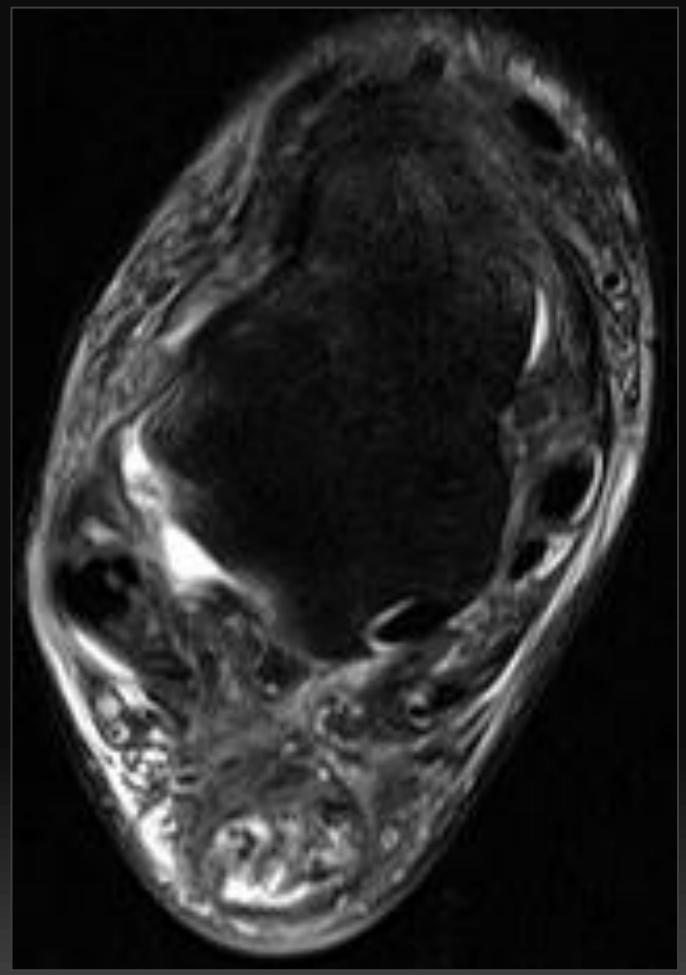
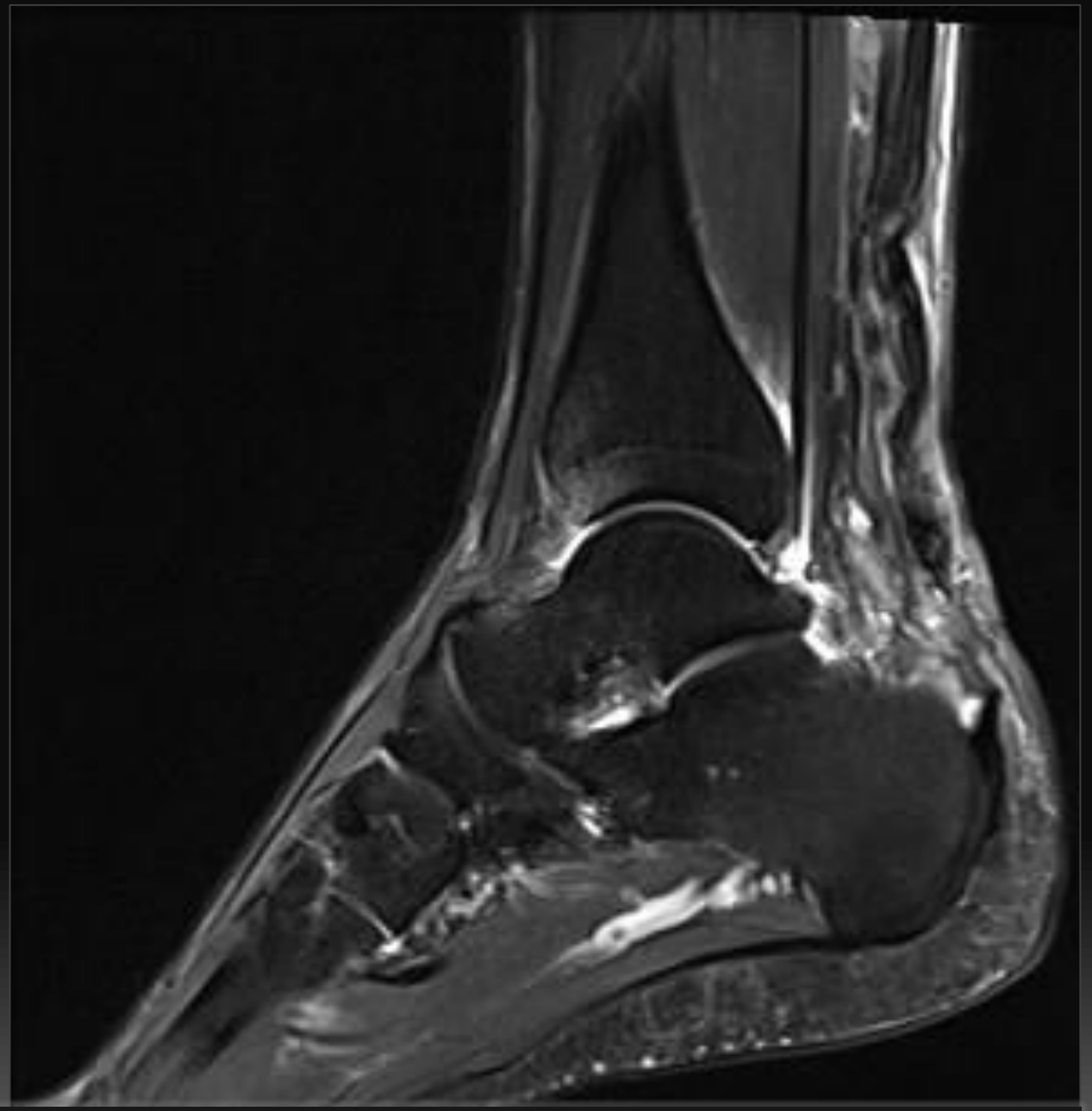
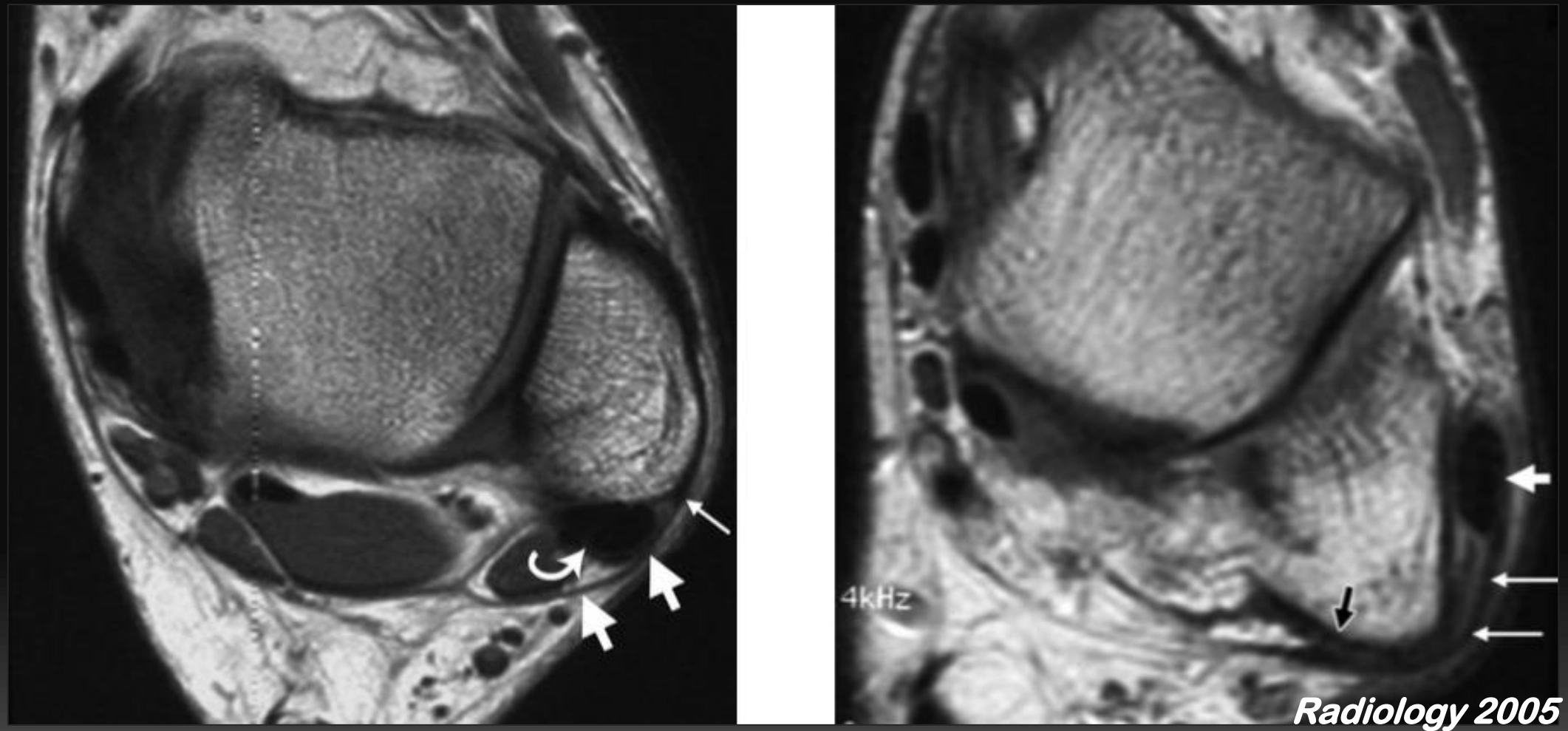




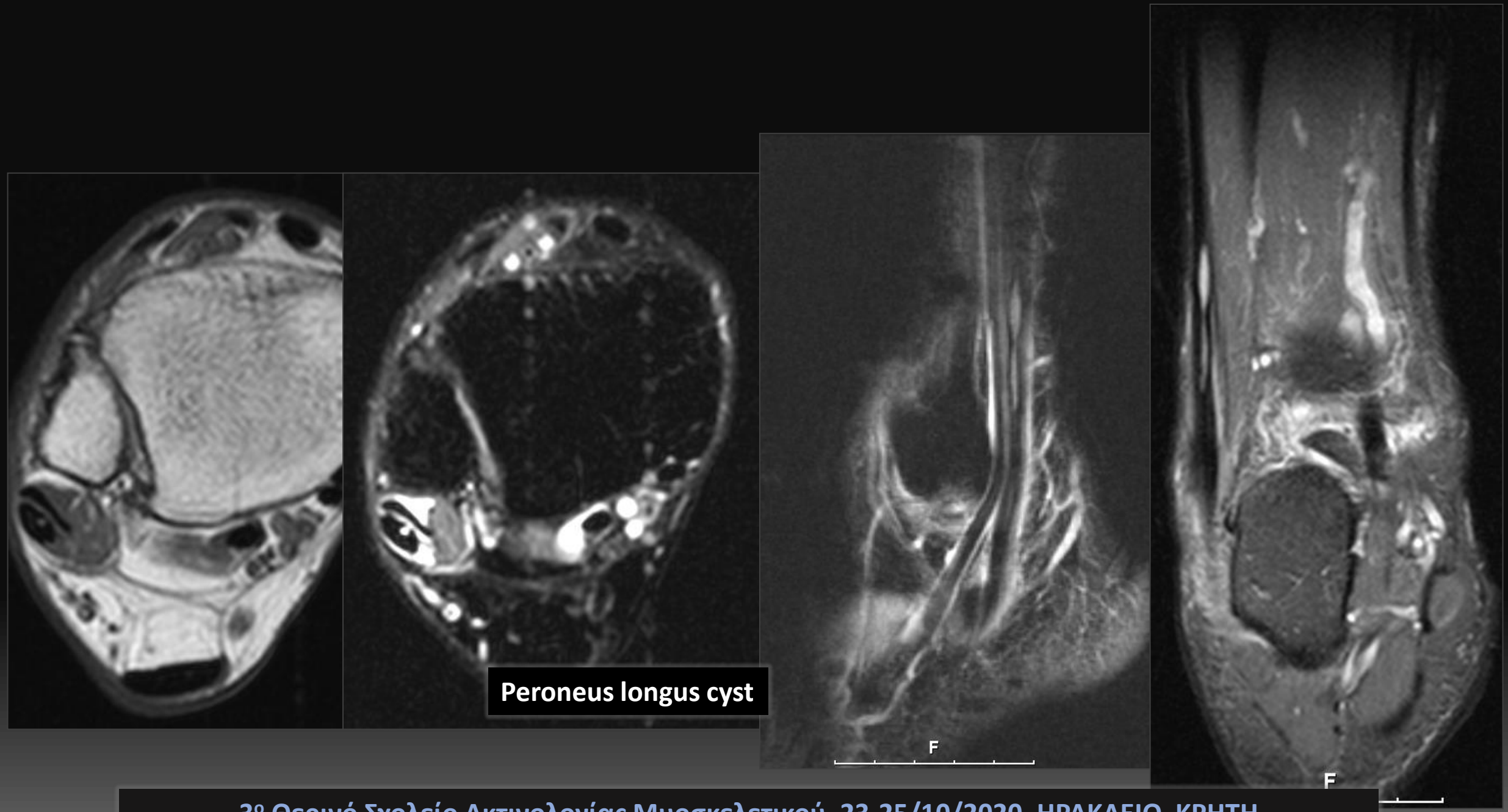




Tendon dislocation & Other



- EDL cyst


Peroneus longus cyst
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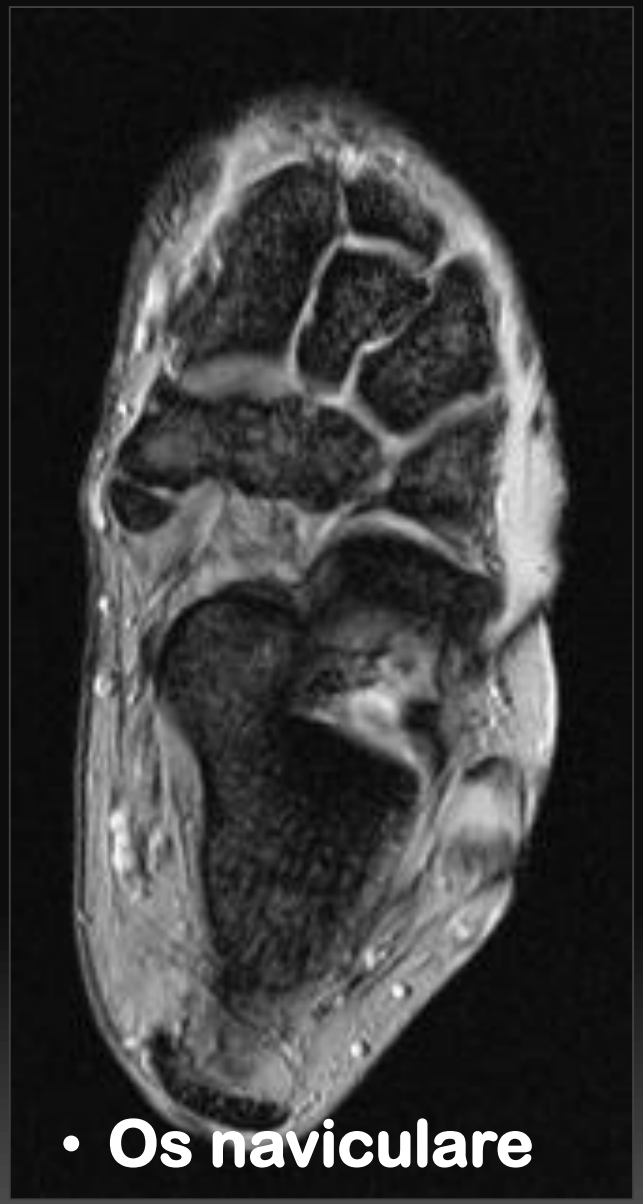


• Os naviculare

• Os peroneum

Impingement

- Degenerative alteration in a joint in which there is excessive friction between joint tissues typically causing limitations in the range of motion and the perception of joint pain.
- Unwanted compression of soft tissues between two or more harder underlying structures.

Medical Dictionary 2009 Farlex and Partners

Ankle Impingement

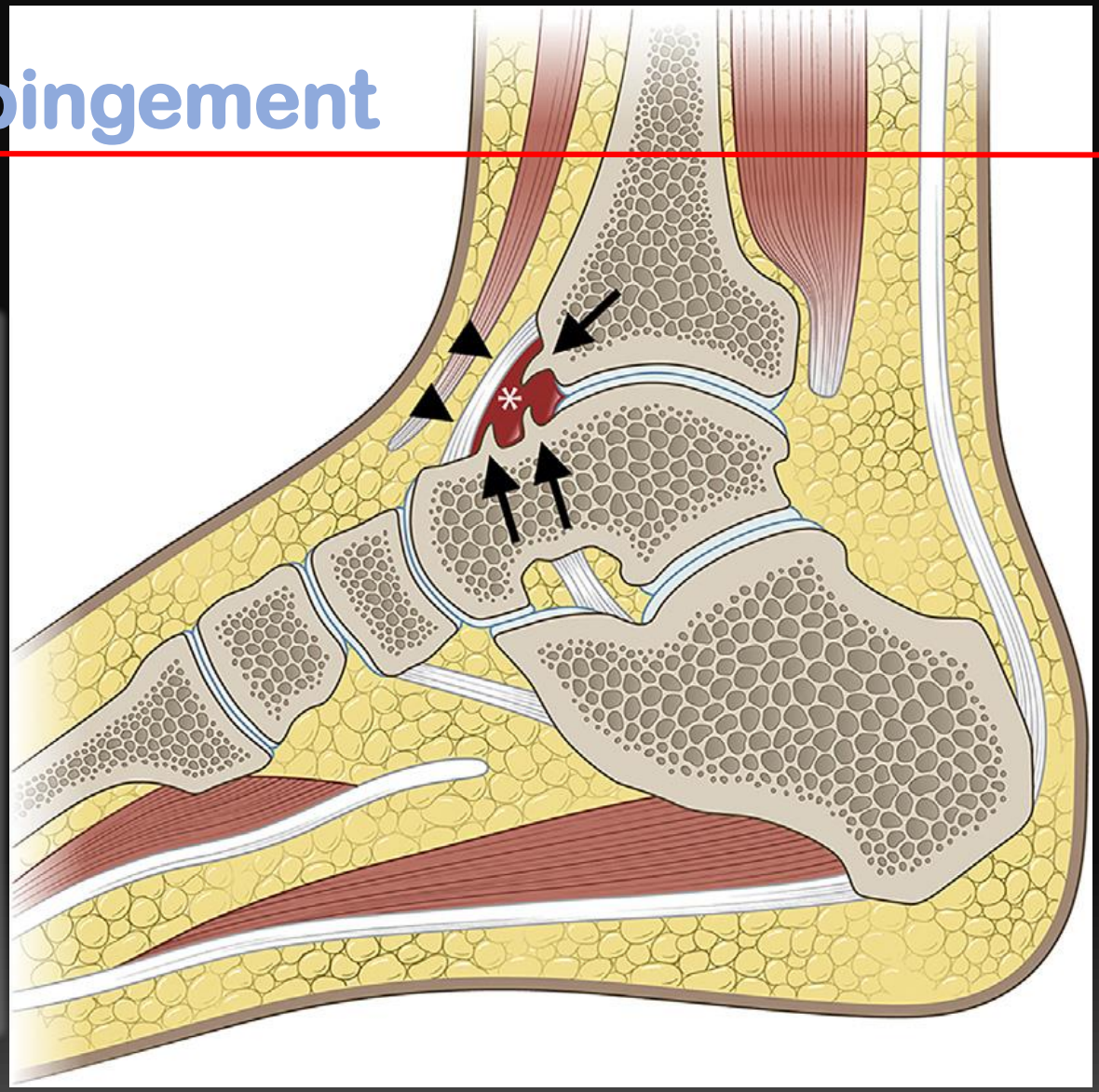
- Limited range of motion and pain when performing specific movements about the joint, often in a load-bearing position
- Variable etiology & pathogenesis
- Clinical diagnosis,
  supporting information provided by XRs and particularly by more advanced imaging (US,CT, MRI)

Ankle Impingement Syndromes

- Anterior impingement syndromes:
  - anterior impingement syndrome,
  - anteromedial impingement syndrome &
  - anterolateral impingement syndrome
- Posterior impingement syndromes:
  - posterior impingement syndrome &
  - posteromedial impingement syndrome
- Extra-articular lateral hindfoot impingement syndromes:
  - talocalcaneal & subfibular impingement

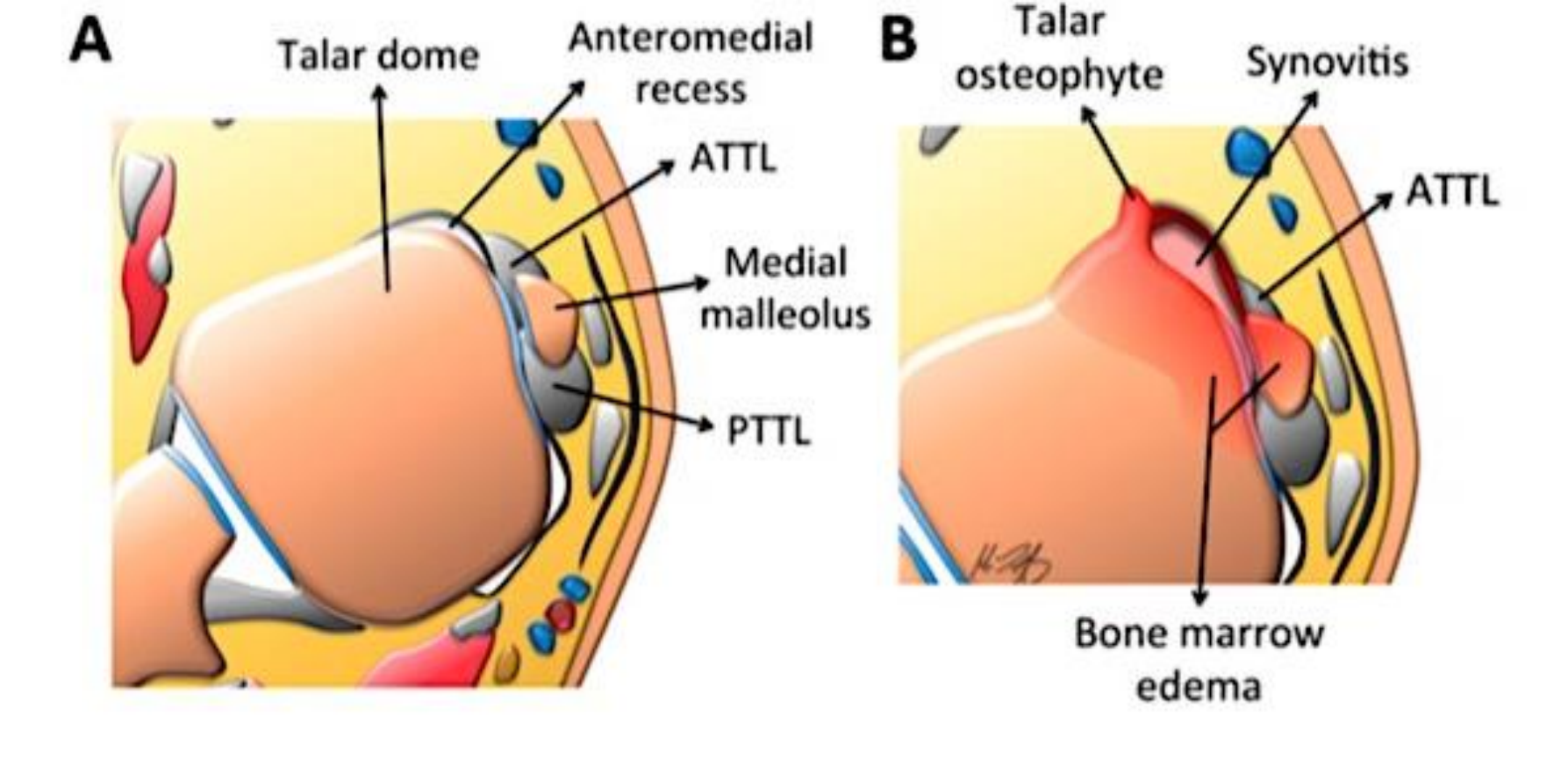
Anterior impingement

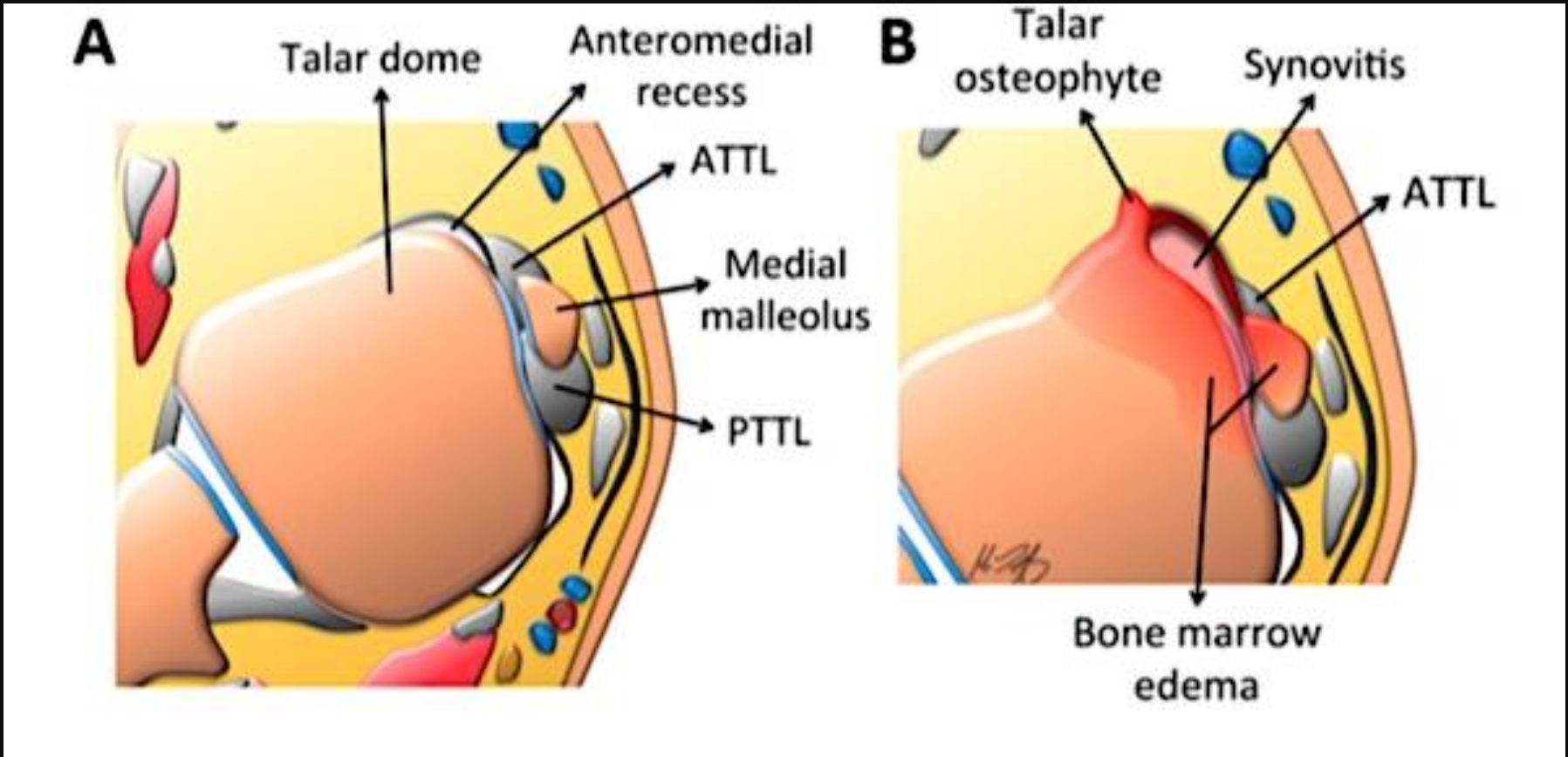
- anterior aspect of the ankle:
  (central portion of ankle recess
  between anterior tibial plafond - talar dome)
- direct microtrauma to talus - tibia
- osseous spurs
- athlete's/footballers' ankle
- common in
  ballet dancers and soccer players



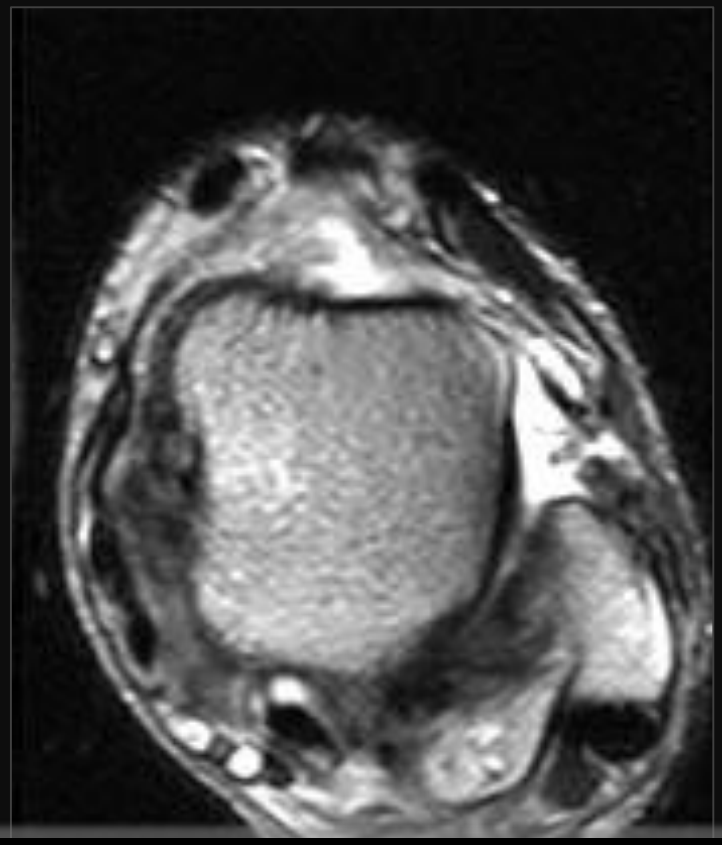
- Clinical diagnosis
- XRs - CT: bony spurs
- MRI: localization of bone spurs, characterize synovial thickening & visualize intra-articular fibrous bands and other soft-tissue pathology

Anteromedial impingement

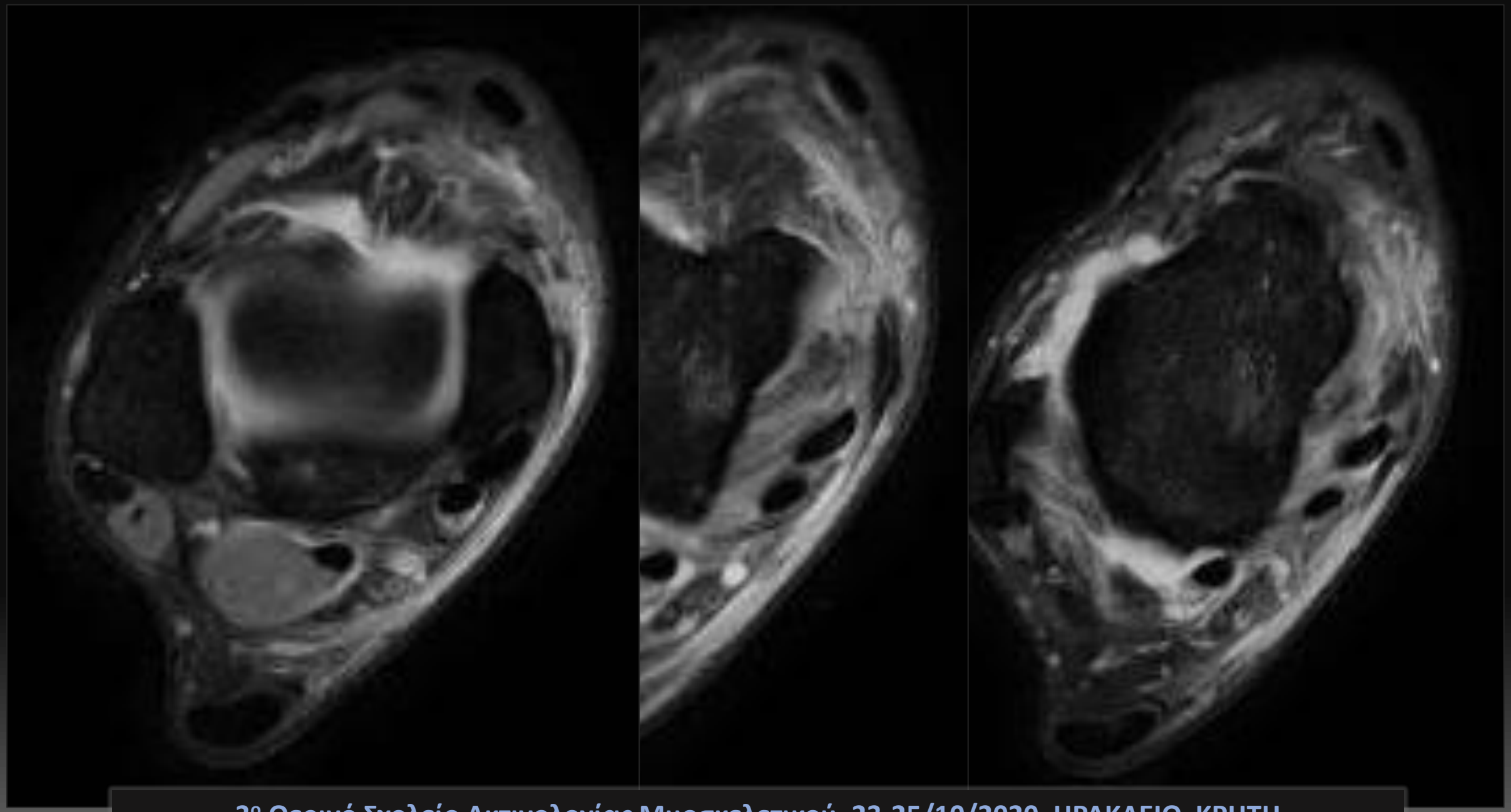




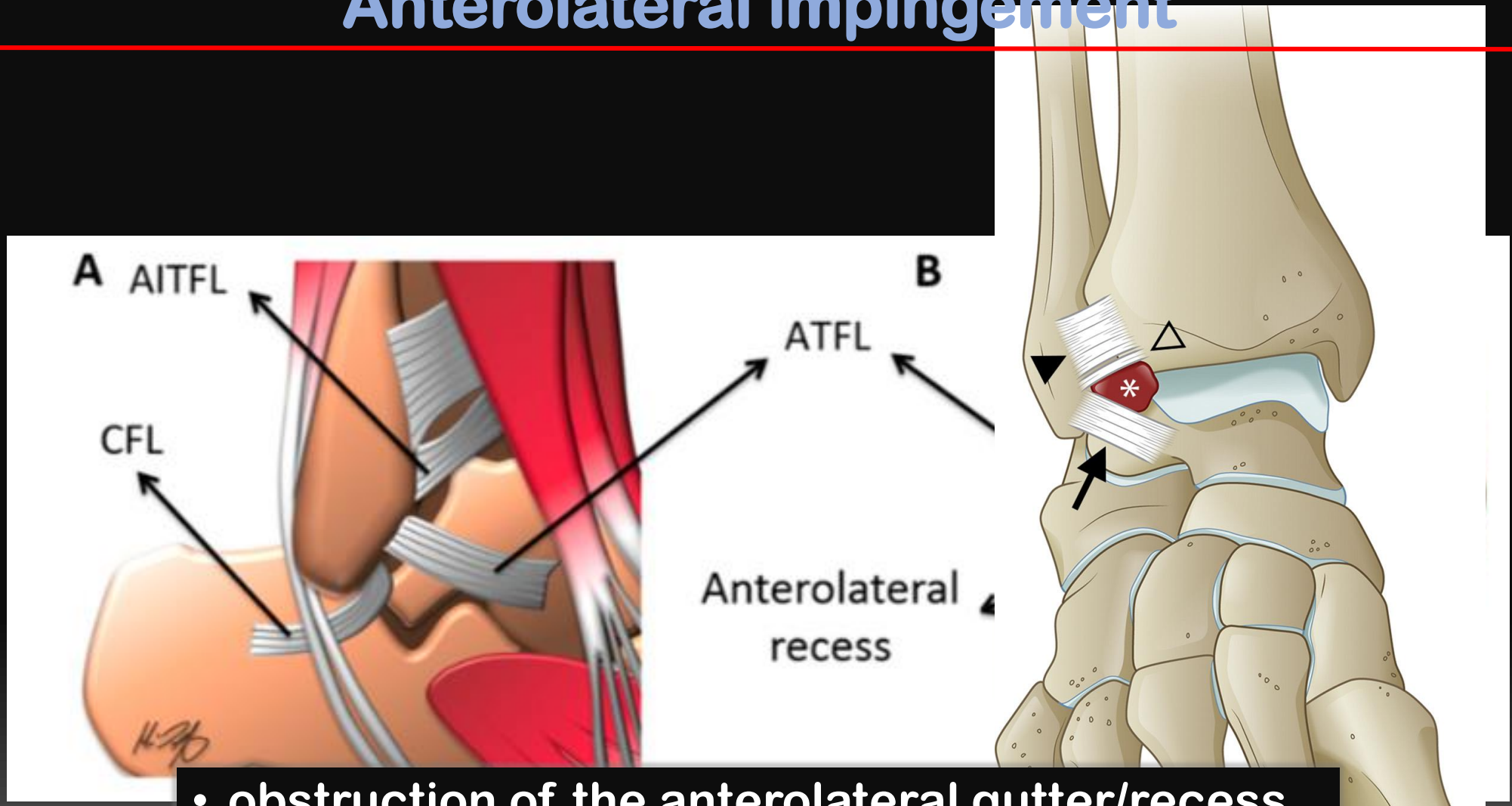
- prior plantar flexion/inversion injury, pain
- seen in soccer players, dancers and cross-country runners
- damage to ATTL, which thickens,
  bony spurs along the talar neck, anterior margin of the medial malleolus, and anteromedial tibial plafond



- XRs: frontal & exaggerated oblique projections -
  medial talar, tibial plafond and medial malleolar osteophytes/enthesophytes
- CT: better localizing bone spurs and osteochondral lesions
- MRI: medial ligaments, articular cartilage and associated soft tissues

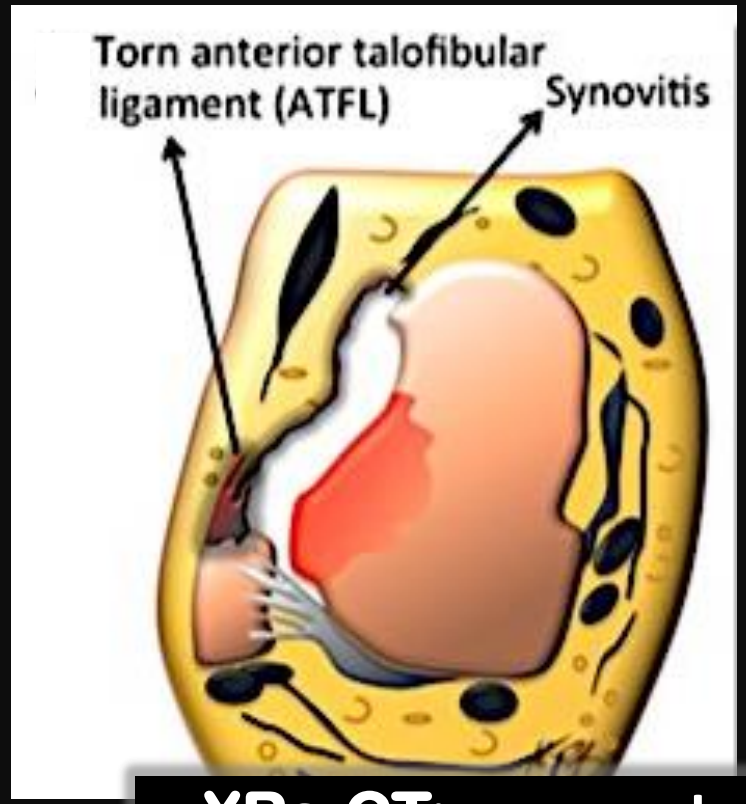


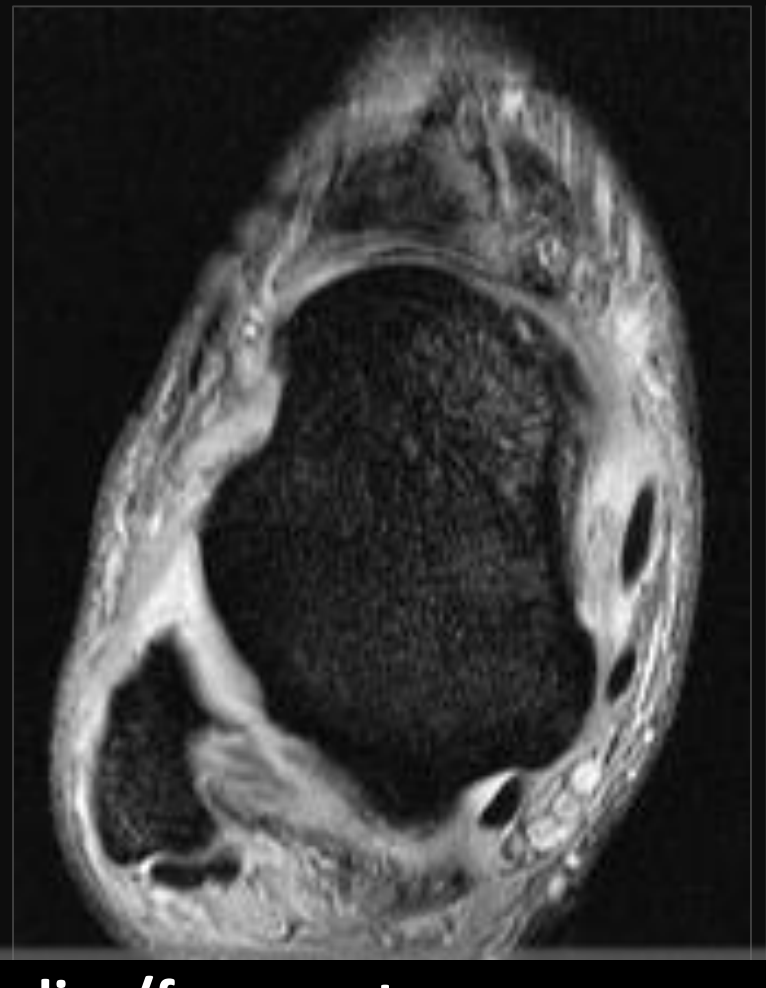
Anterolateral impingement

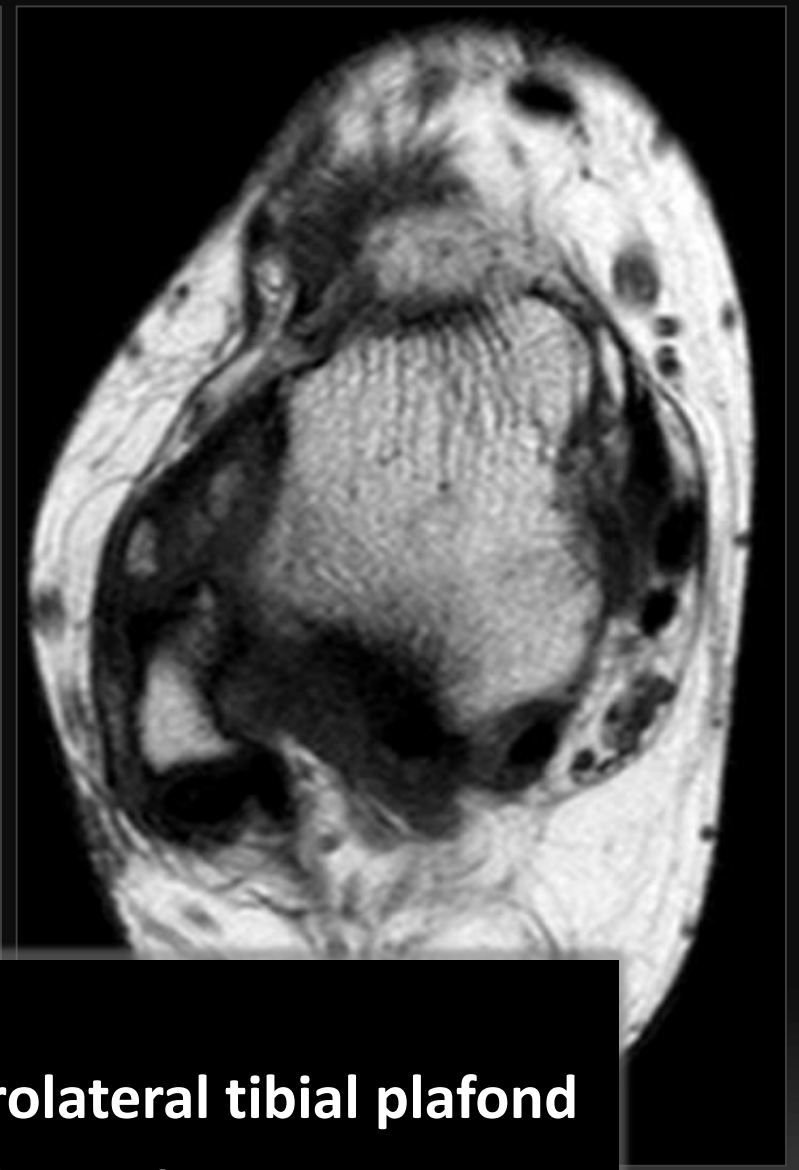


- obstruction of the anterolateral gutter/recess

- **Localized pain during internal/external rotation with limited dorsiflexion**
- **most common ankle injury: ATFL sprain**
- less common cause: thickening of part of the inferior aspect of the AITFL
- **Other causes: ganglia, anterolateral tibial plafond spurs/ossicles, avulsed osseous fragments and syndesmotic ligament complex injury**
- **D/D: sinus tarsi syndrome, peroneal tendon subluxation or injury, tarsal coalition and osteoarthrosis**



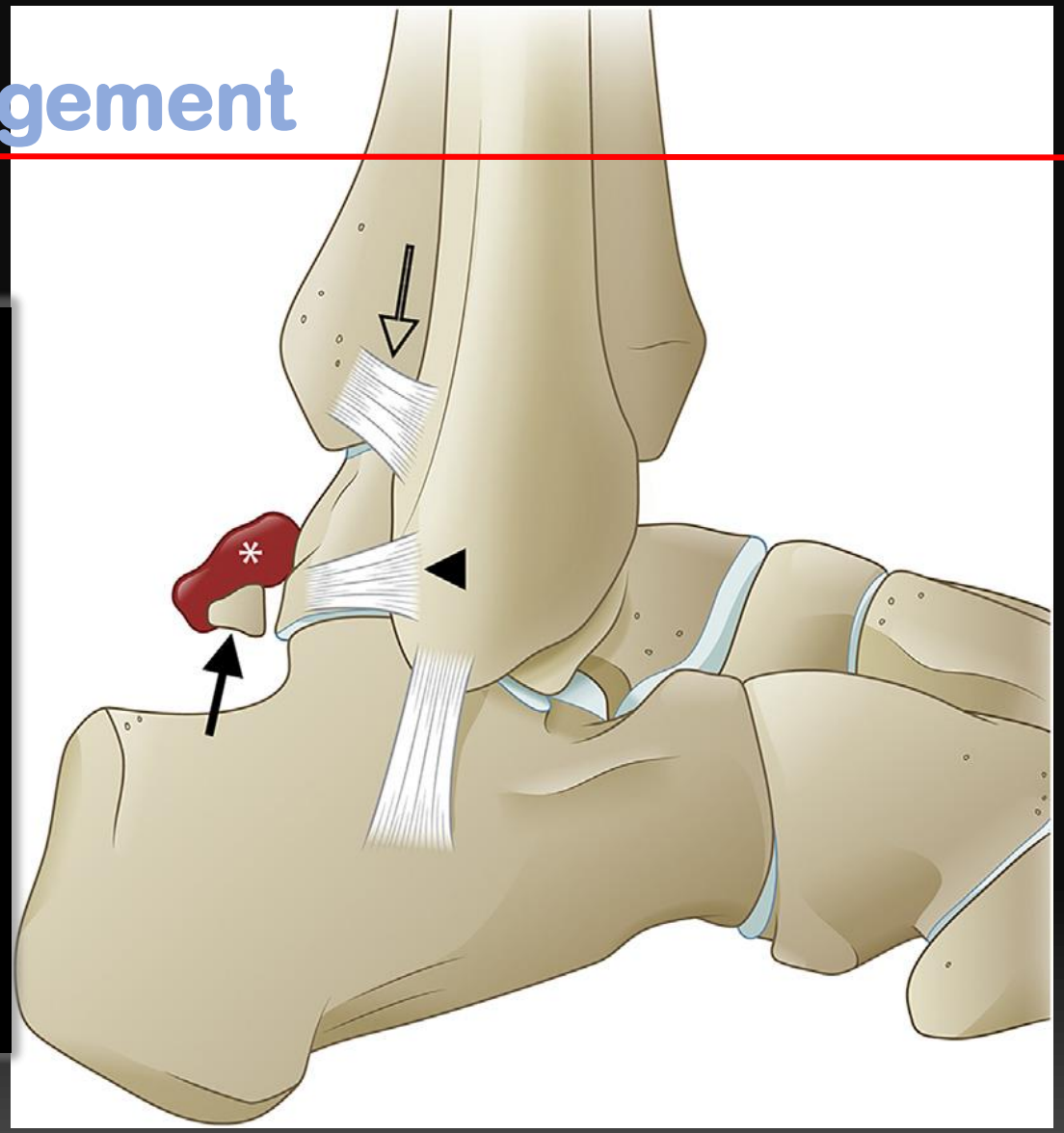




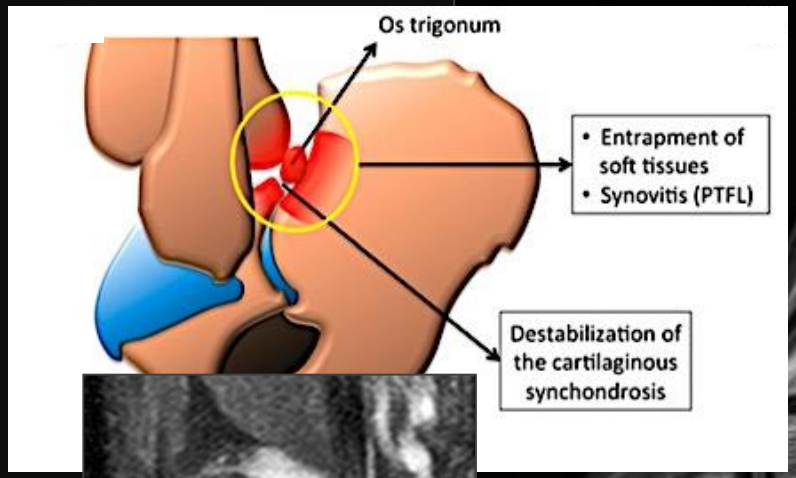
- **XRs-CT**: osseous bodies/fragments,
- osteophytes projecting over the ALG or the anterolateral tibial plafond
- US: dynamic techniques, soft tissue injuries, guidance for injections
- MRI: bony & soft tissue pathology

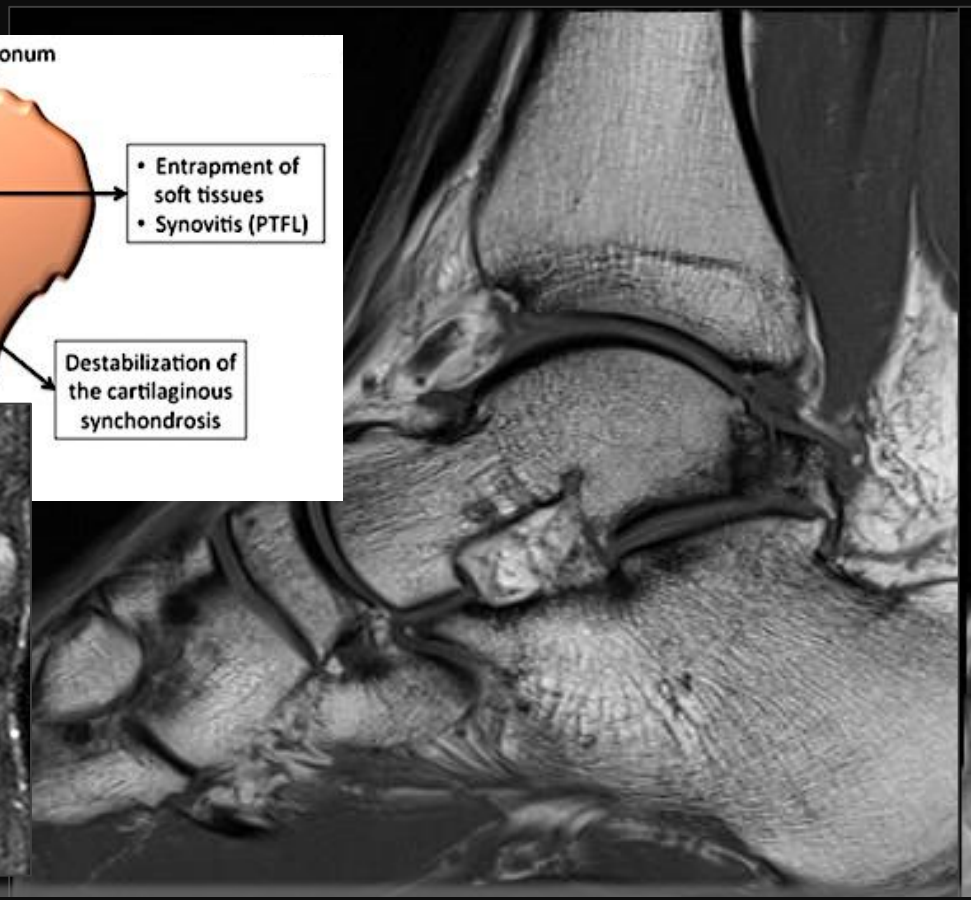
Posterior impingement

- majority of p. imp. syndromes: related to posterior talus
- causes: acute plantar hyperflexion injury and chronic repetitive microtrauma
- chronic pain and swelling in posterior ankle
- seen with activities that cause
- extreme plantar flexion (ballet, soccer, football and downhill running)

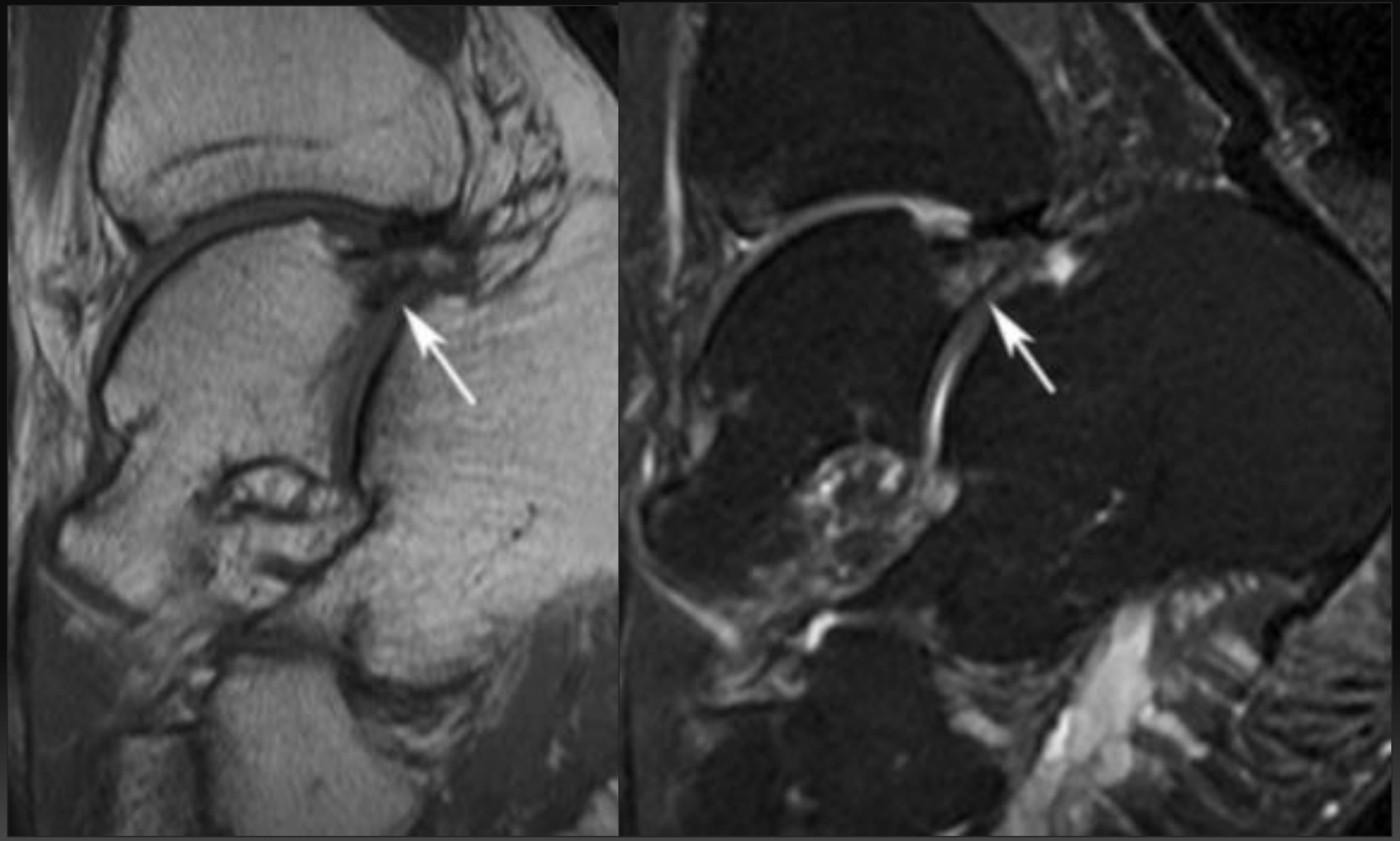


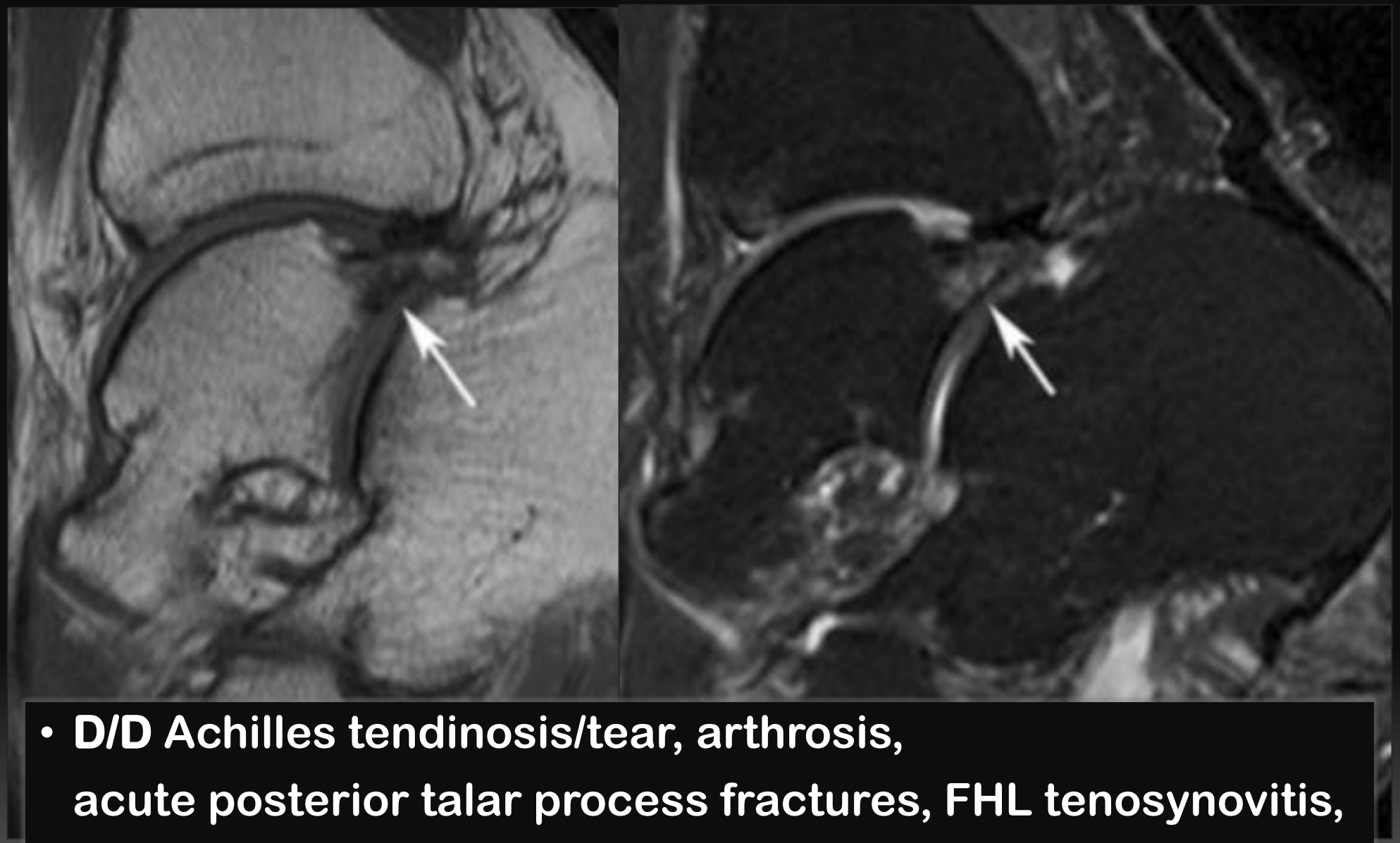
- XR (lateral view): presence of Stieda's process or os trigonum
- CT: osseous variants, additional osseous bodies, OCLs





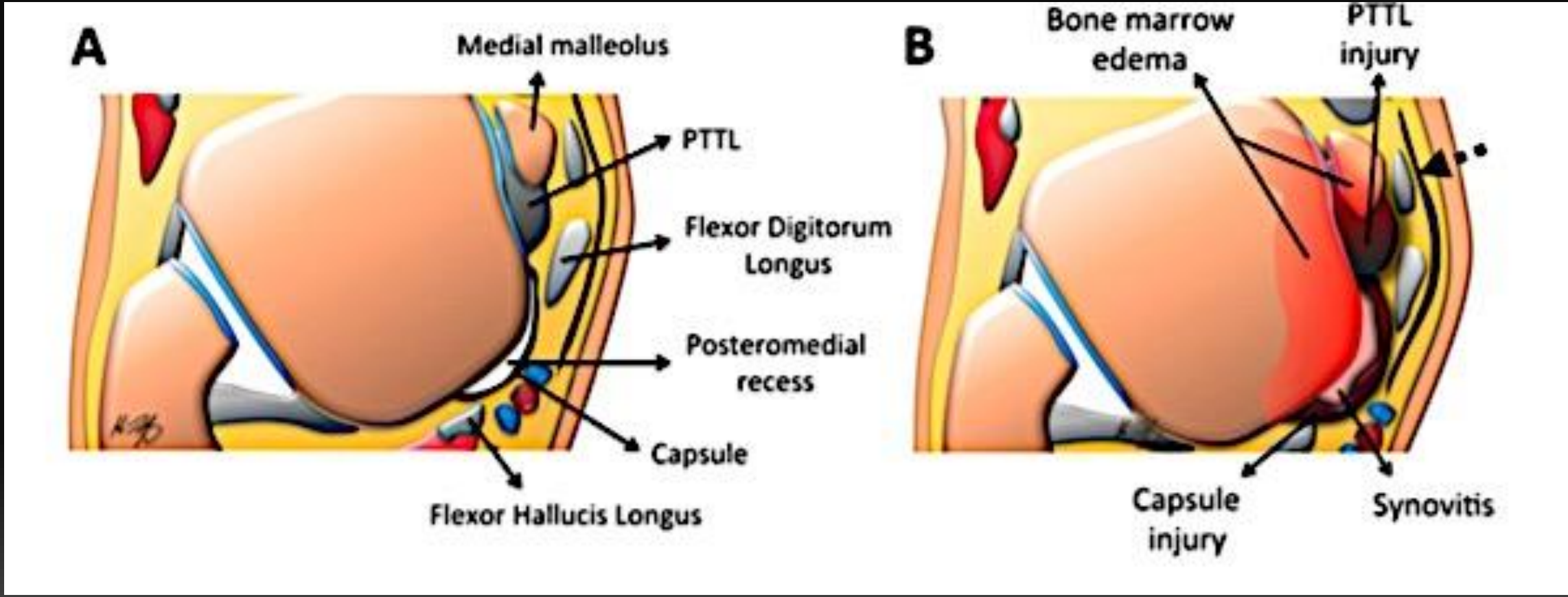
- **US: used for injections of local anaesthetic or corticosteroids,**
- **MRI: bone marrow oedema (low T1/high T2 signal) in talus, calcaneus or os trigonum, increased signal at the synchondrosis, synovitis and thickening of the posteriorcapsule - ligaments, possible posterior subtalar/tibiotalar ganglia**

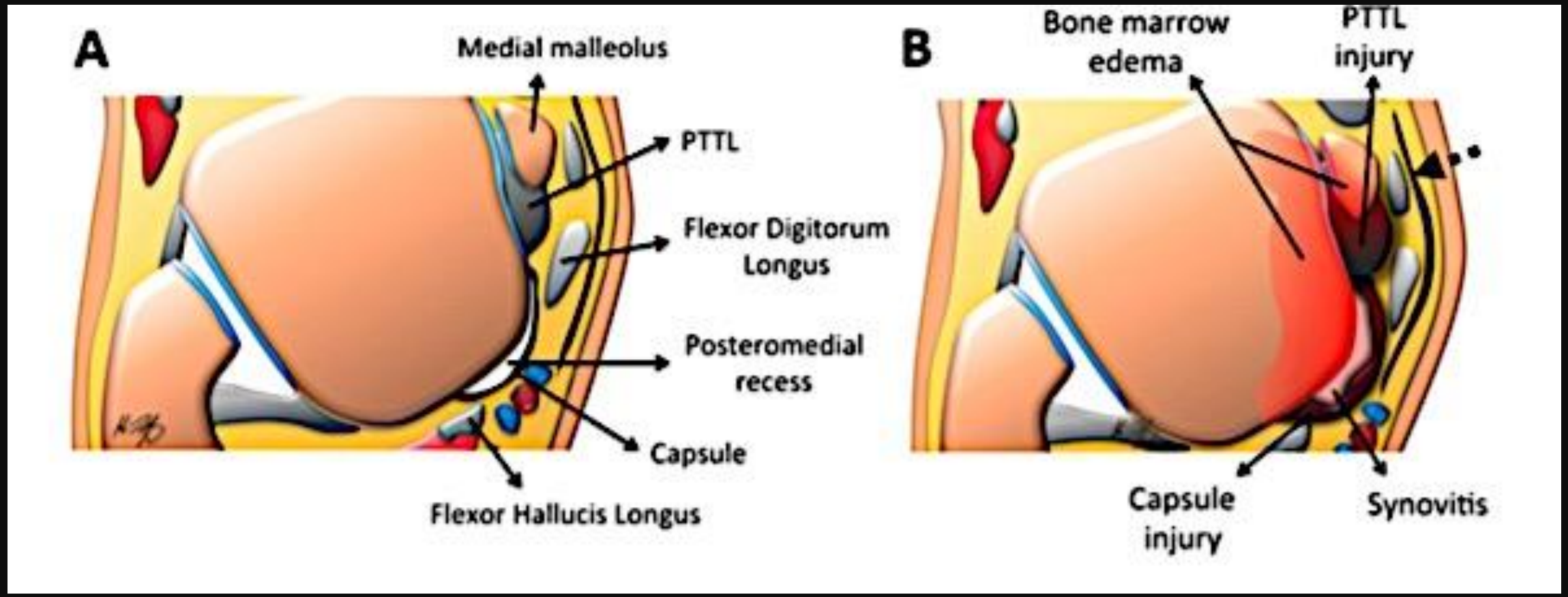




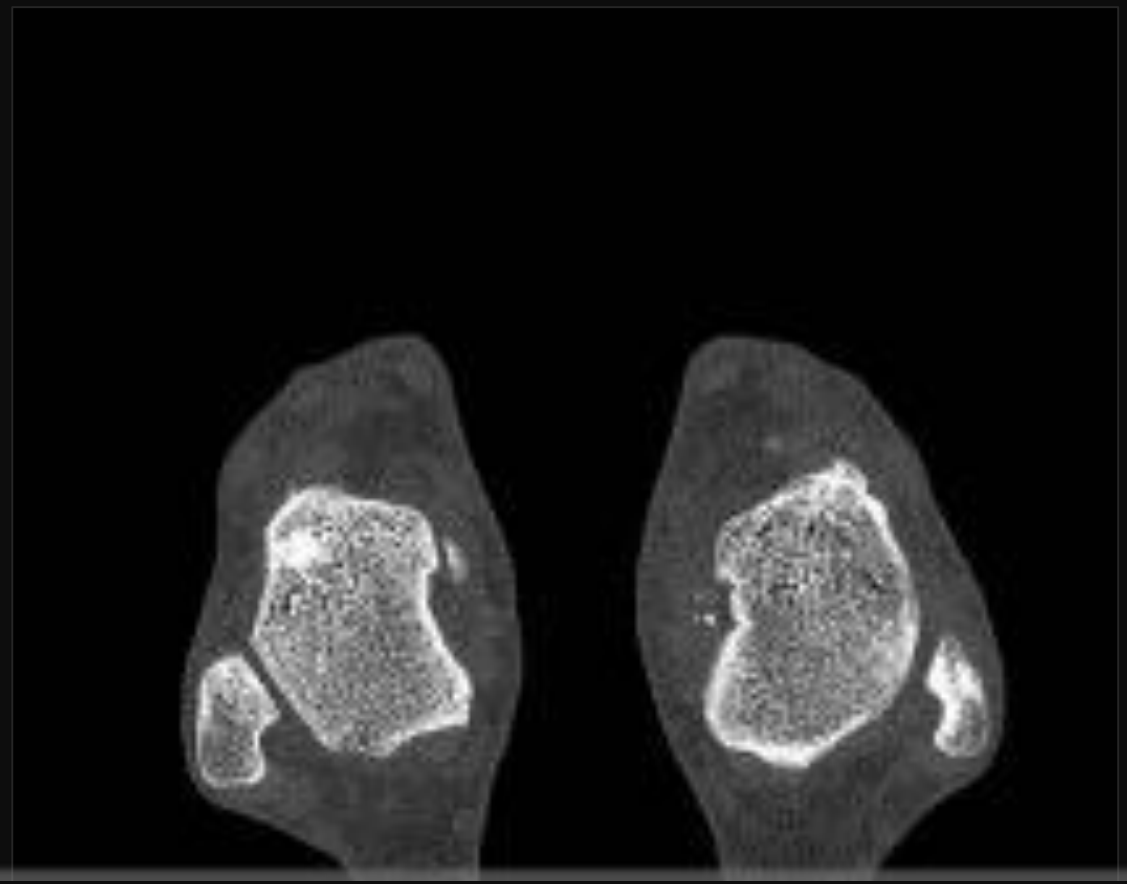
- **D/D Achilles tendinosis/tear, arthrosis,**
  acute posterior talar process fractures, FHL tenosynovitis,
  Haglund's syndrome, OCLs and retrocalcaneal bursitis

Posteromedial impingement





- plantar flexion, inversion and internal rotation trauma
- damage to PTTL and associated synovitis, which can partially encase PT, FHL or FDL
- deltoid ligament pathology
- pain over posteromedial aspect of the ankle in both passive - active movements



- US: hypoechoic PTTL
- **MRI: intermediate intensity on fluid-sensitive sequences, thickening and loss of the normal fibrillar pattern of deltoid ligament and particularly PTTL, fluid collections or synovitis posteriorly,**
  irregular soft tissues within the posteromedial recess

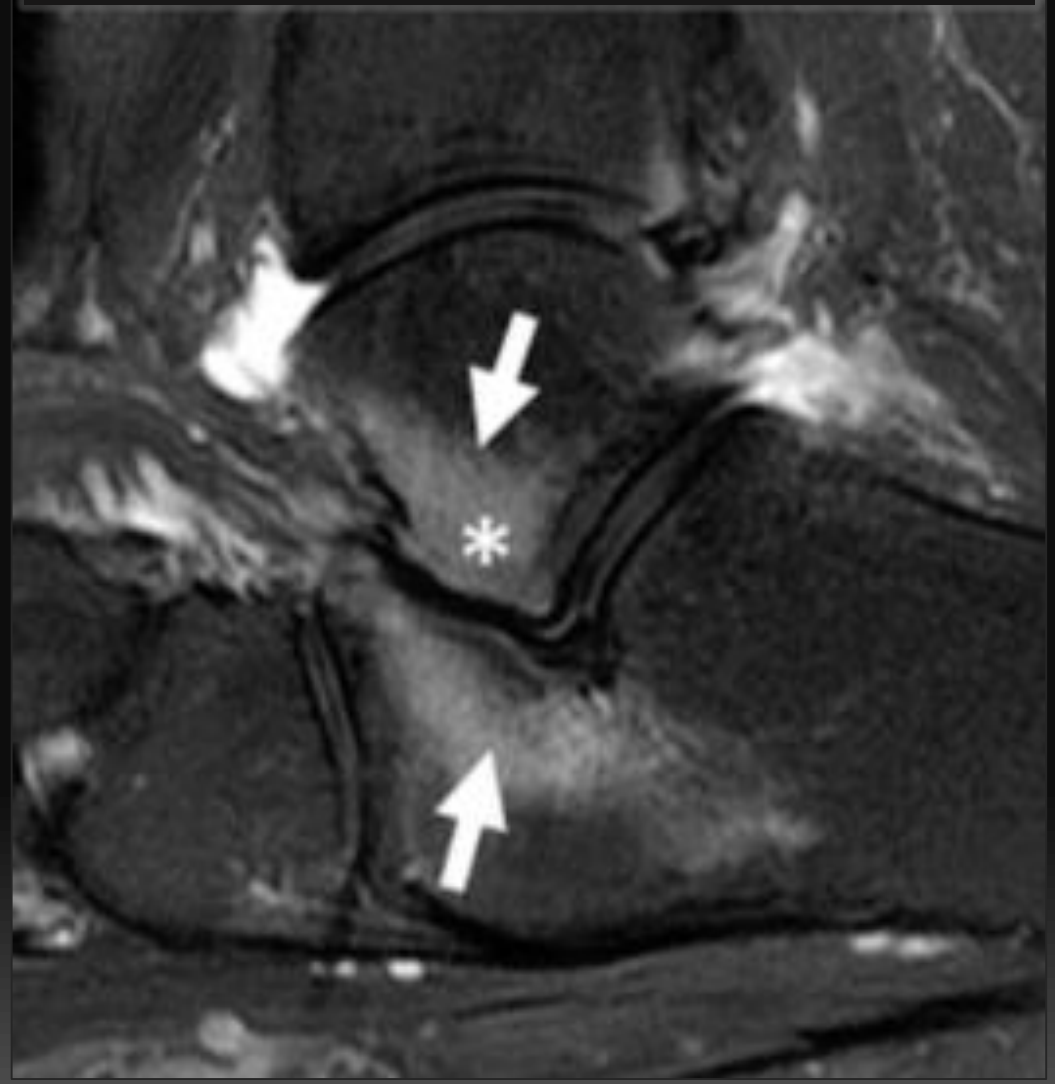

A
B
C
Can As of Rad Jour 2017

Extra-articular lateral hindfoot impingement syndrome

- Non-traumatic cause of impingement
- Sequela of pathologic PT tendon,
  which causes flatfoot and hindfoot valgus deformity.
- Common sites for impingement:
  between the lateral talus and calcaneus (talocalcaneal impingement) and
  between the calcaneus and fibula (subfibular impingement)
- Other sites involved in PTT pathology: sinus tarsi and distal fibula

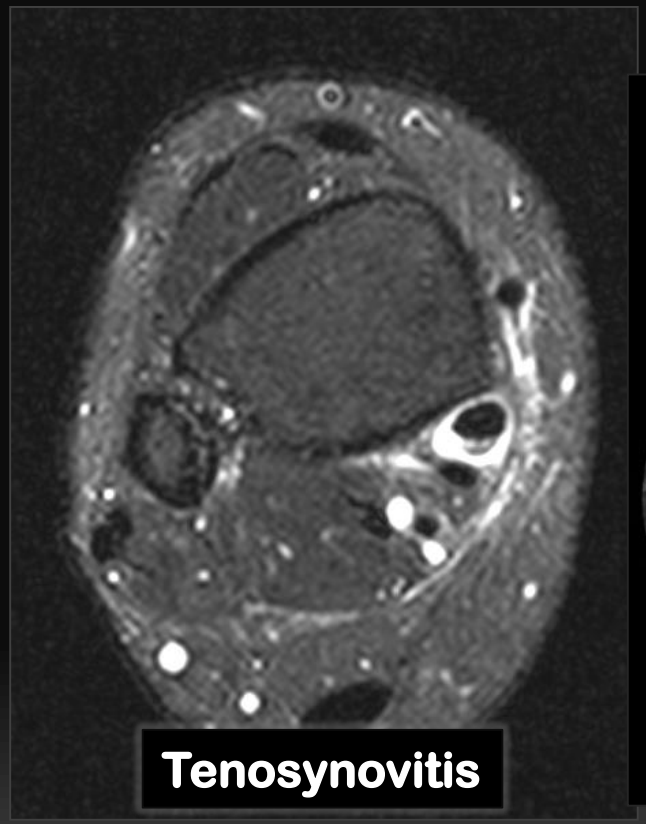
Fibulocalcaneal impingement

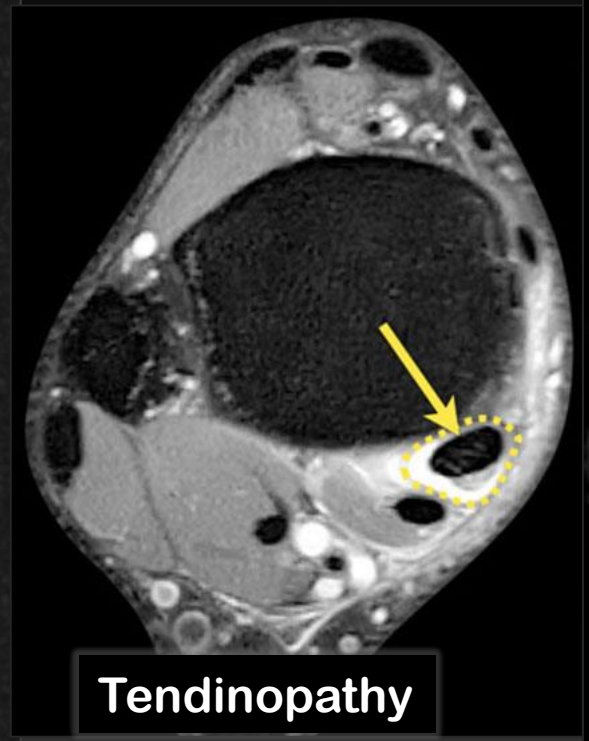
Talocalcaneal impingement

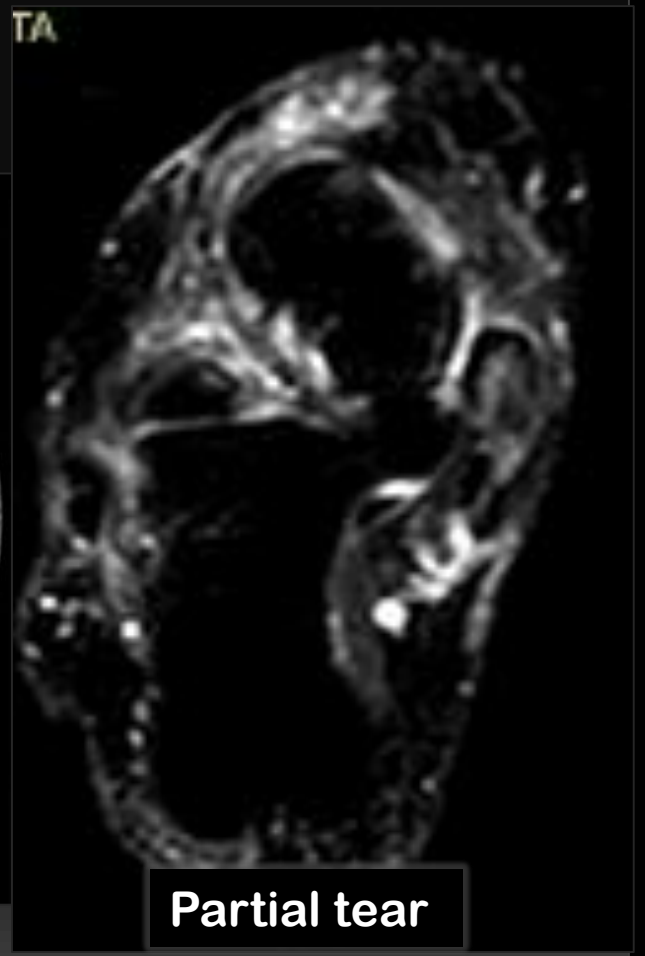


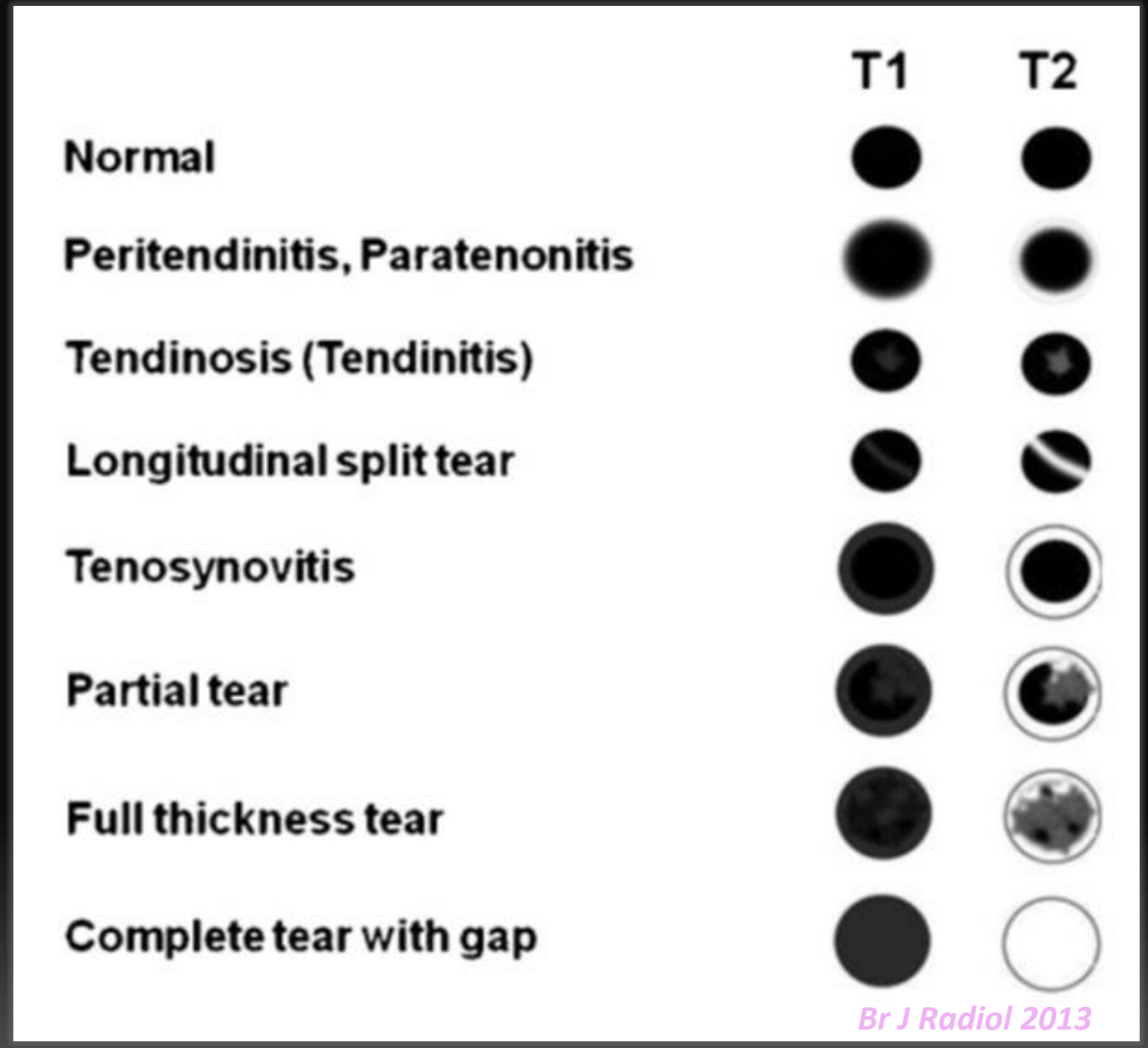
- XRs: may be difficult to see the osseous contact, secondary signs: cystic degeneration, subchondral sclerosis & dorsal talar “beaking”
- CT: diagnosis - assist to surgical planning, degenerative subtalar - subfibular changes, tarsal coalitions
- MRI: calculate the hindfoot valgus angle and evaluate for accessory anterolateral talar facet , degree of PT pathology, cystic changes and bone marrow oedema within the lateral talus, soft-tissue thickening between fibula - calcaneus, entrapment of fat/calcaneofibular ligament, fibular tip oedema and calcaneofibular neofacet

Ankle & Foot Tendon Pathology



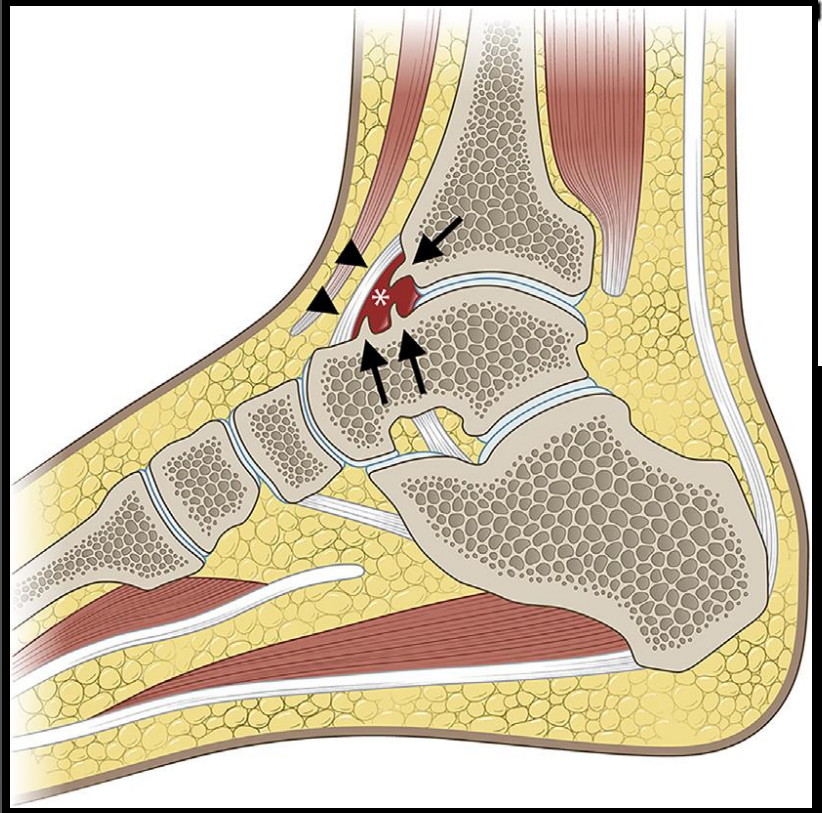


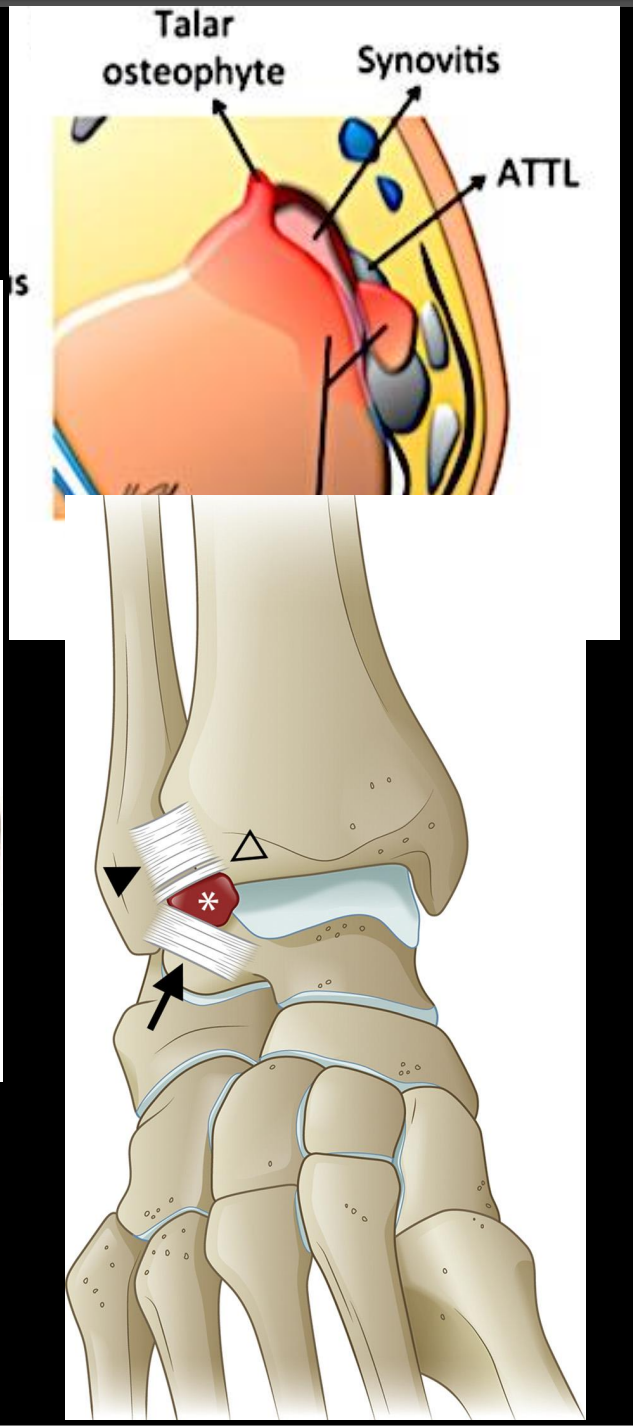


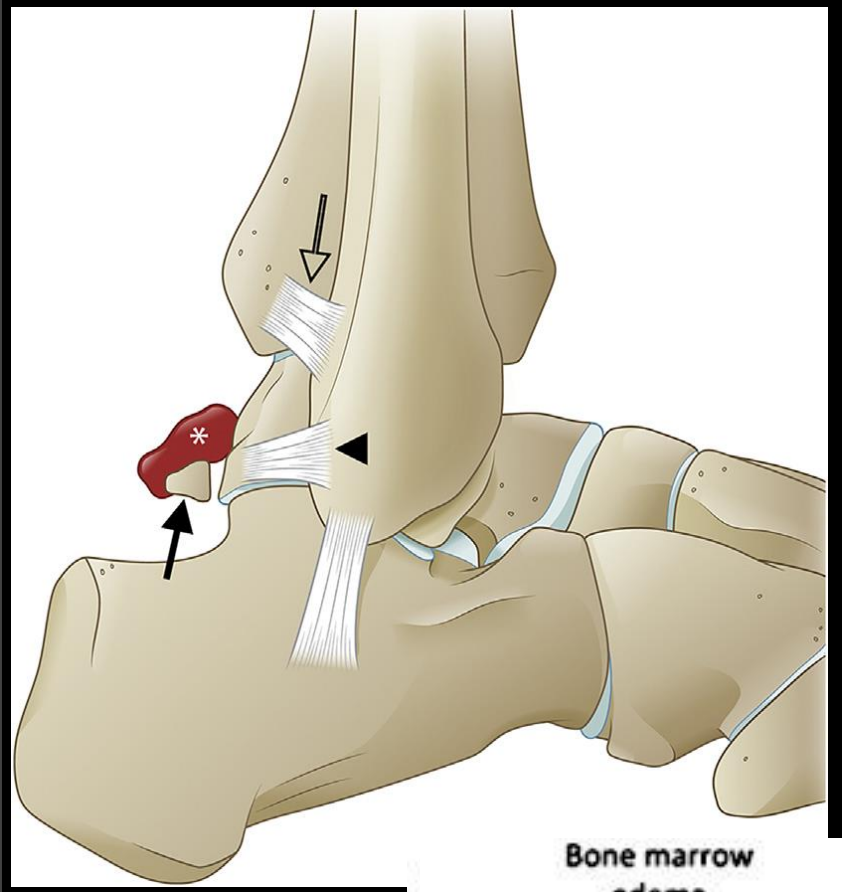

T1
T2
Normal
Peritendinitis, Paratenonitis
Tendinosis (Tendinitis)
Longitudinal split tear
Tenosynovitis
Partial tear
Full thickness tear
Complete tear with gap
Br J Radiol 2013

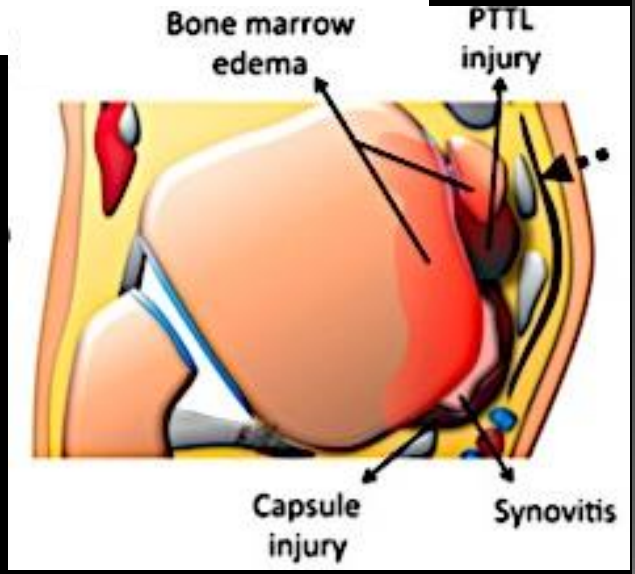
Ankle Impingement Syndromes

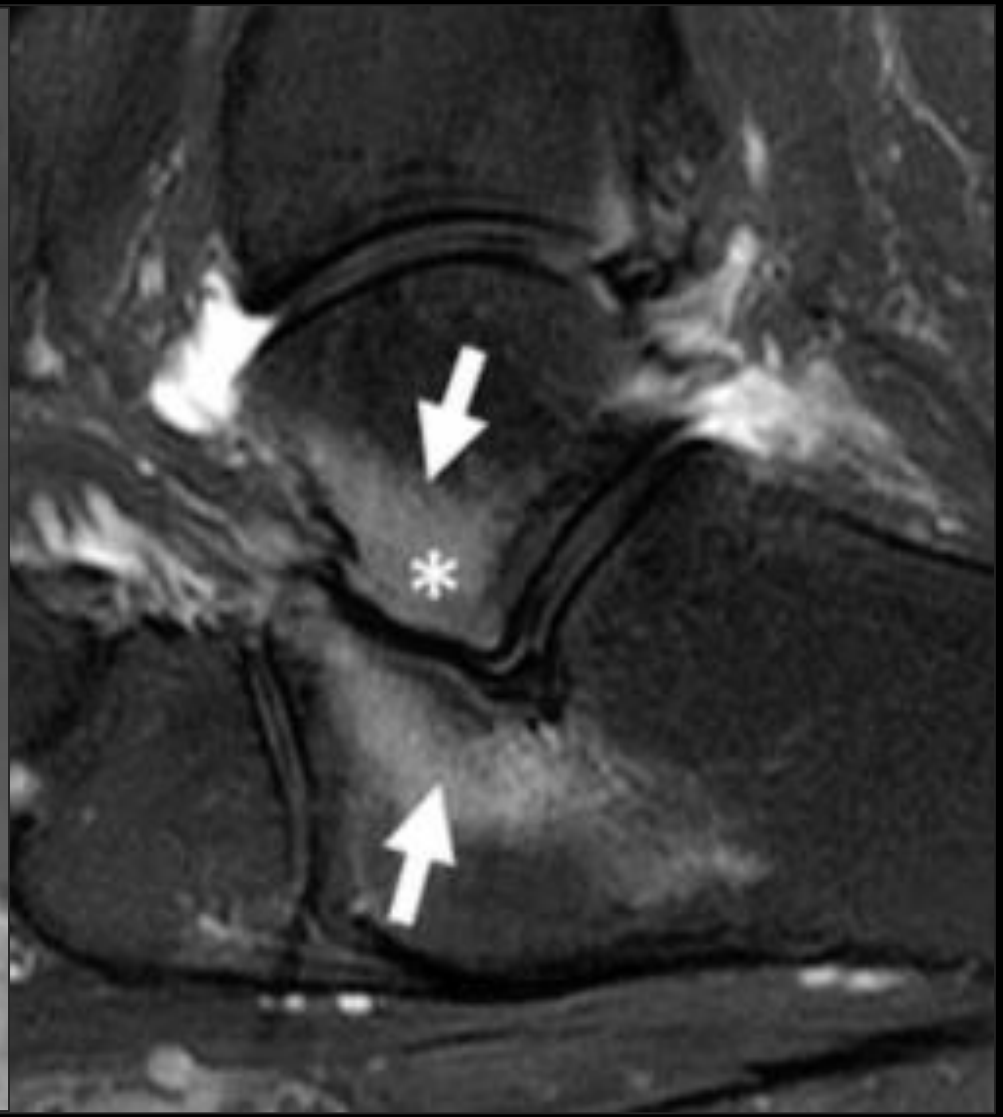
- Anterior impingement syndromes:
  - anterior impingement syndrome,
  - anteromedial impingement syndrome &
  - anterolateral impingement syndrome
- Posterior impingement syndromes:
  - posterior impingement syndrome &
  - posteromedial impingement syndrome
- Extra-articular lateral hindfoot impingement syndromes:
  - talocalcaneal & subfibular impingement




Talar
osteophyte
Synovitis
ATTL




Bone marrow
edema
PTTL
injury
Capsule
injury
Synovitis



Sunset in Lavrida in Rethymno, North Crete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"Η ΡΕΥΜΑΤΟΛΟΓΙΑ
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