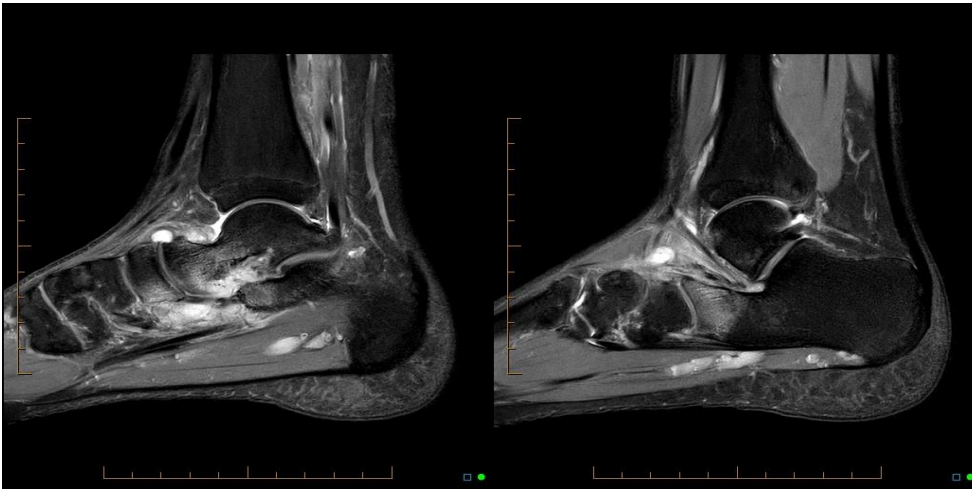


30 yr old male inversion injury some months ago with ongoing pain and progressive pes planus

MRI Ankle/Foot (Triplanar PD and PD fat-sat sequences):

- Bone bruising med/plantar aspects talar head-neck; sustentaculum and anterior process calcaneus and lateral navicular (consistent with midfoot inversion injury).
- High grade tear superomedial portion spring ligament and tibiospring component superficial deltoid ligament. MPO and IPL bands of the spring ligament thickened / scarred but intact.
- Partial tearing of the cervical and interosseous talocalcaneal ligaments in the sinus tarsi.



PD SPAIR Sagittal – Talus, navicular and anterior calcaneal marrow oedema / bone bruising



(i) PD Coronal –Ruptured superomedial component Spring Lig

(ii) PD SPAIR Coronal –Ruptured superomedial component Spring Lig (arrows at defect)

(iii) PD SPAIR Sagittal – SM portion Spring ligament tear cleft/rupture

Discussion

- Calcaneonavicular ligament (**Spring Ligament**) complex is a key static stabilizer of the medial longitudinal arch and is frequently injured (often in association with posterior tibial tendon insufficiency).
- Disruption of SL destabilizes longitudinal arch -> allowing plantar and medial rotation of talar head and valgus alignment of the calcaneus (pes planovalgus) - clinical result is an acquired flatfoot deformity.
- Acute injuries of the spring ligament are rare (often athletes / trauma). Isolated tears of the spring ligament without associated PTT tear are very rare and can present as an acquired flatfoot deformity.
- Surgical repair is now an important management component of adult-acquired flatfoot.
- Toye et al (2005) correlated surgically proven SL tears with MRI findings: abnormal spring ligament calibre, signal intensity, waviness, full-thickness gap, and posterior tibial tendonopathy. The finding *unique* to cases with surgically proven tears is a **full-thickness gap** in the ligament, (79% of the 14 cases).

Anatomy

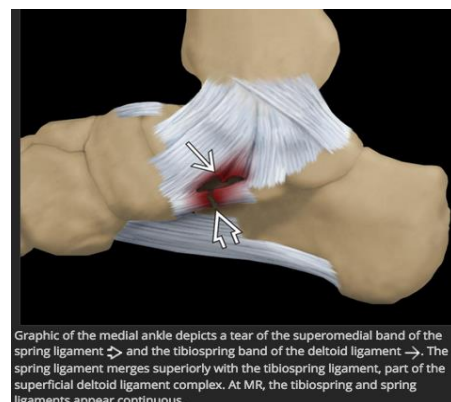
- 3 bands of Spring:
 - *Superomedial*: medial surface of sustentaculum tali to navicular (most important for stability and most commonly injured component)
 - *Medioplantar oblique*: anterior margin of sustentaculum to navicular
 - *Inferoplantar longitudinal*: body of calcaneus to navicular

Imaging

- **MRI** - PD and PD SPAIR imaging (tri-planar with thin sections)
- **CT** – Torn ligament poorly defined (soft tissue windows)
- **XR** – Flatfoot deformity may be evident

Differential Diagnoses

- PTT tear / tendinopathy
- Deltoid ligament sprain
- Spring ligament recess
- Navicular stress fracture (vague midfoot pain)



Further Reading:

- Stadnick, ME. Spring Ligament Tear. MRI Web Clinic – January 2008
- Toye LR, et al. MRI of Spring Ligament Tears. AJR 2005;184:1475-1480
- Orr JD et al. Isolated spring ligament failure as a cause of adult-acquired flatfoot deformity. Foot Ankle Int. 2013; 34(6) 818-23
- Stat Dx online (including graphic on current page)