AMSER Case of the Month February 2026

18-year-old male with left ankle pain and swelling

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Patient Presentation

- HPI: 18-year-old male presents with left ankle pain and swelling that started 2 weeks ago after he was tackled awkwardly in a high school football game.
- PMH: None
- PSH: Nasal surgery
- Vitals: BP 137/75, pulse 60, height 6’2’’, weight 236 lbs
- Physical exam: Swelling of left anterior ankle. Pain to palpation of left ankle anterior to medial malleolus and anterior tibia-fibular region. No pain over the medial or lateral malleolus. No peroneal click. Anterior drawer shows good endpoint. Mild pain with active eversion and inversion.
- Labs: None ordered

What Imaging Should We Order?

ACR Appropriateness Criteria

Variant: 1 Adult or child 5 years of age or older. Acute trauma to the ankle or acute trauma to the ankle with persistent pain for more than 1 week but less than 3 weeks. No exclusionary criteria present. Initial imaging. Patient meets the requirements for evaluation by the Ottawa Ankle Rules which are positive: 1. Inability to bear weight immediately after the injury, OR 2. Point tenderness over the medial malleolus, the posterior edge or inferior tip of the lateral malleolus, talus, or calcaneus, OR 3. Inability to ambulate for 4 steps in the emergency department.

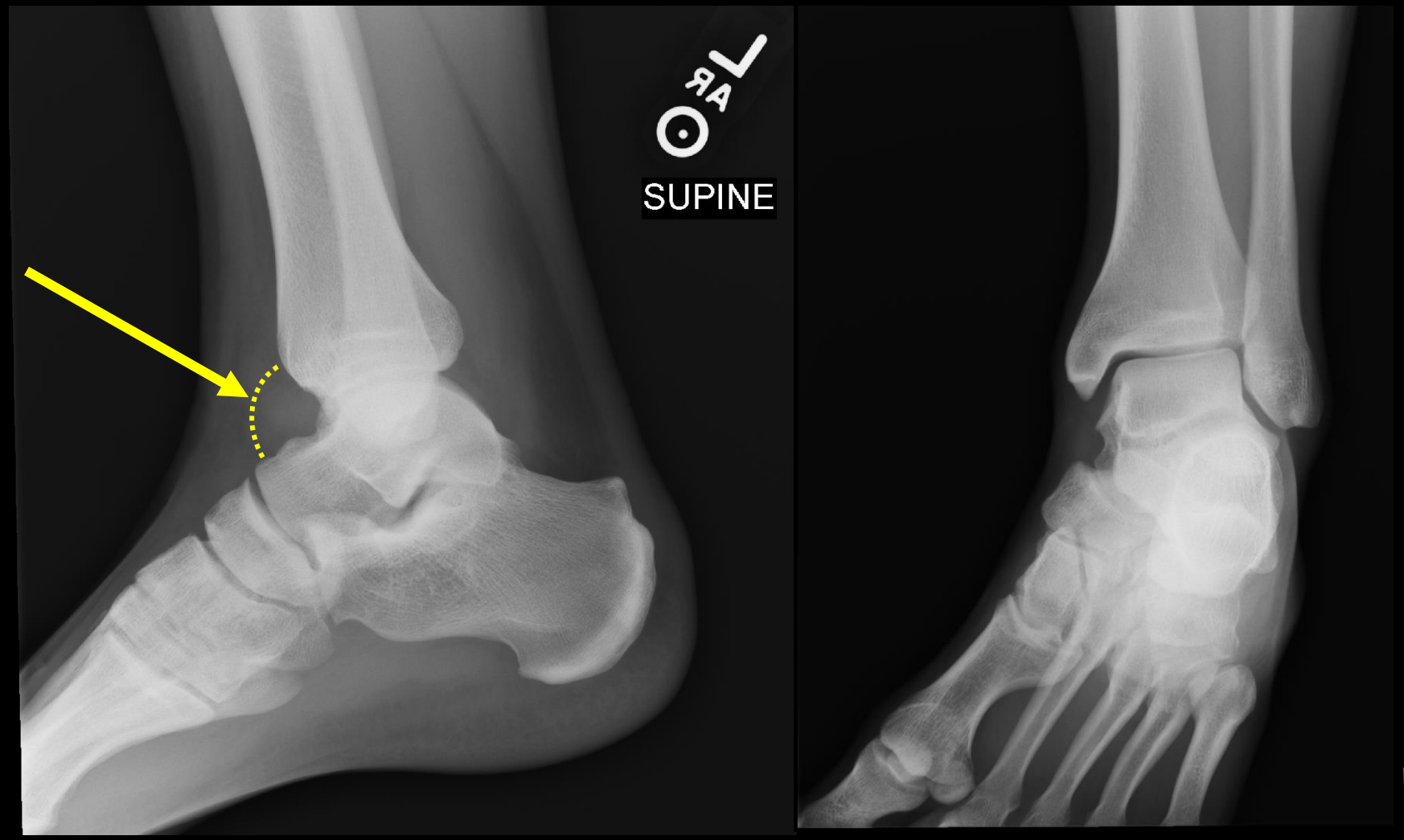
Procedure	Appropriateness Category	Relative Radiation Level
Radiography ankle	Usually Appropriate	☢
US ankle	Usually Not Appropriate	O
MRI ankle without and with IV contrast	Usually Not Appropriate	O
MRI ankle without IV contrast	Usually Not Appropriate	O
CT ankle with IV contrast	Usually Not Appropriate	☢
CT ankle without and with IV contrast	Usually Not Appropriate	☢
CT ankle without IV contrast	Usually Not Appropriate	☢
Bone scan ankle	Usually Not Appropriate	☢☢☢

This imaging modality was ordered by the orthopedic physician

Findings (unlabeled)

Findings (labeled)

Anterior tibiotalar joint effusion



What Imaging Should We Order Next?

ACR Appropriateness Criteria

Variant: 4 **Adult or child 5 years of age or older. Acute trauma to the ankle with persistent pain for more than 1 week but less than 3 weeks. No exclusionary criteria present. Initial radiographs negative. Next study.**

Procedure	Appropriateness Category	Relative Radiation Level
MRI ankle without IV contrast	Usually Appropriate	O
CT ankle without IV contrast	Usually Appropriate	☢
Radiography ankle	May Be Appropriate	☢
Radiography ankle stress views	May Be Appropriate	☢
US ankle	Usually Not Appropriate	O
MRI ankle without and with IV contrast	Usually Not Appropriate	O
CT ankle with IV contrast	Usually Not Appropriate	☢
CT ankle without and with IV contrast	Usually Not Appropriate	☢
Bone scan ankle	Usually Not Appropriate	☢☢☢

This imaging modality was ordered by the orthopedic physician

ACR Appropriateness Criteria

Variant: 6 Adult or child 5 years of age or older. Acute trauma to the ankle. Radiographs negative for osseous injury and physical examination or radiographs demonstrate alignment abnormality suggesting syndesmotic/ligamentous injury or dislocation. Next study.

Procedure	Appropriateness Category	Relative Radiation Level
Radiography ankle stress views	Usually Appropriate	☢
Radiography leg	Usually Appropriate	☢
MRI ankle without IV contrast	Usually Appropriate	O
CT ankle without IV contrast	Usually Appropriate	☢
US ankle	Usually Not Appropriate	O
MRI ankle without and with IV contrast	Usually Not Appropriate	O
CT ankle with IV contrast	Usually Not Appropriate	☢
CT ankle without and with IV contrast	Usually Not Appropriate	☢
Bone scan ankle	Usually Not Appropriate	☢☢☢

This imaging modality was ordered by the orthopedic physician

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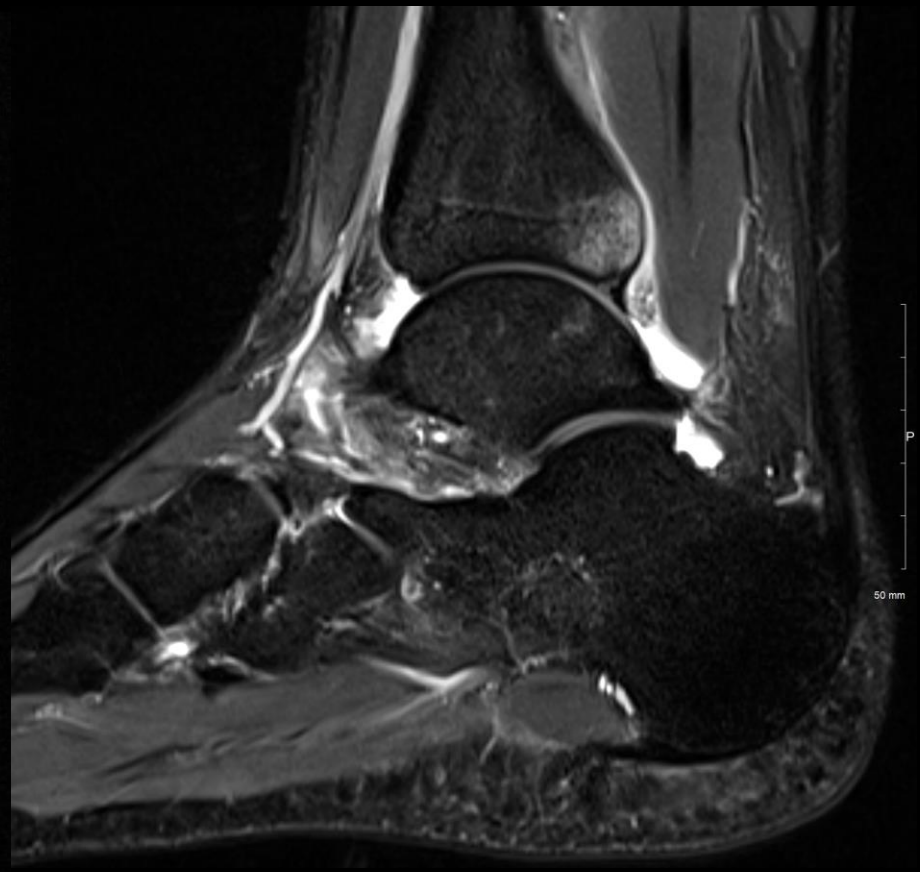
Findings (unlabeled)



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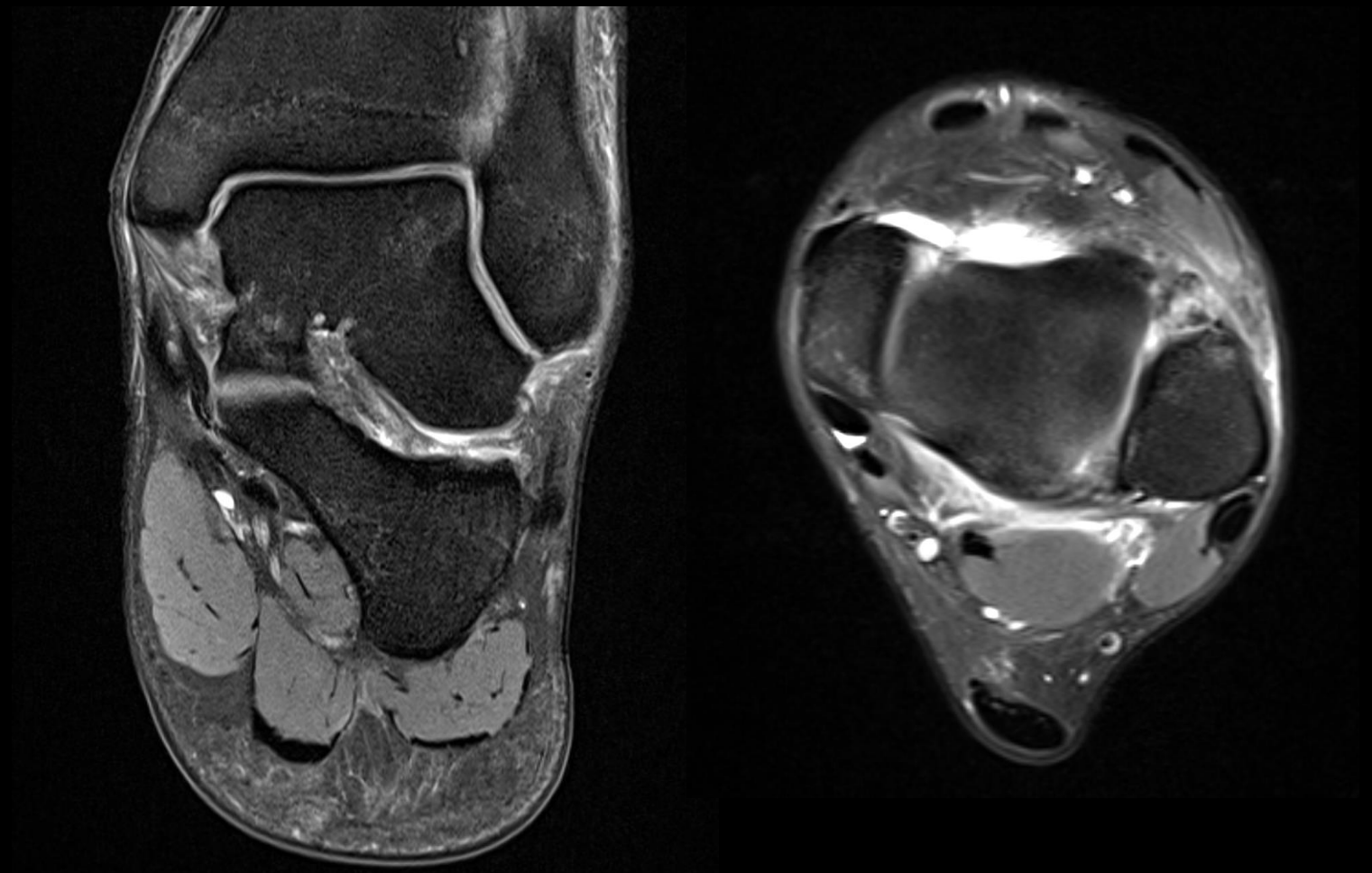
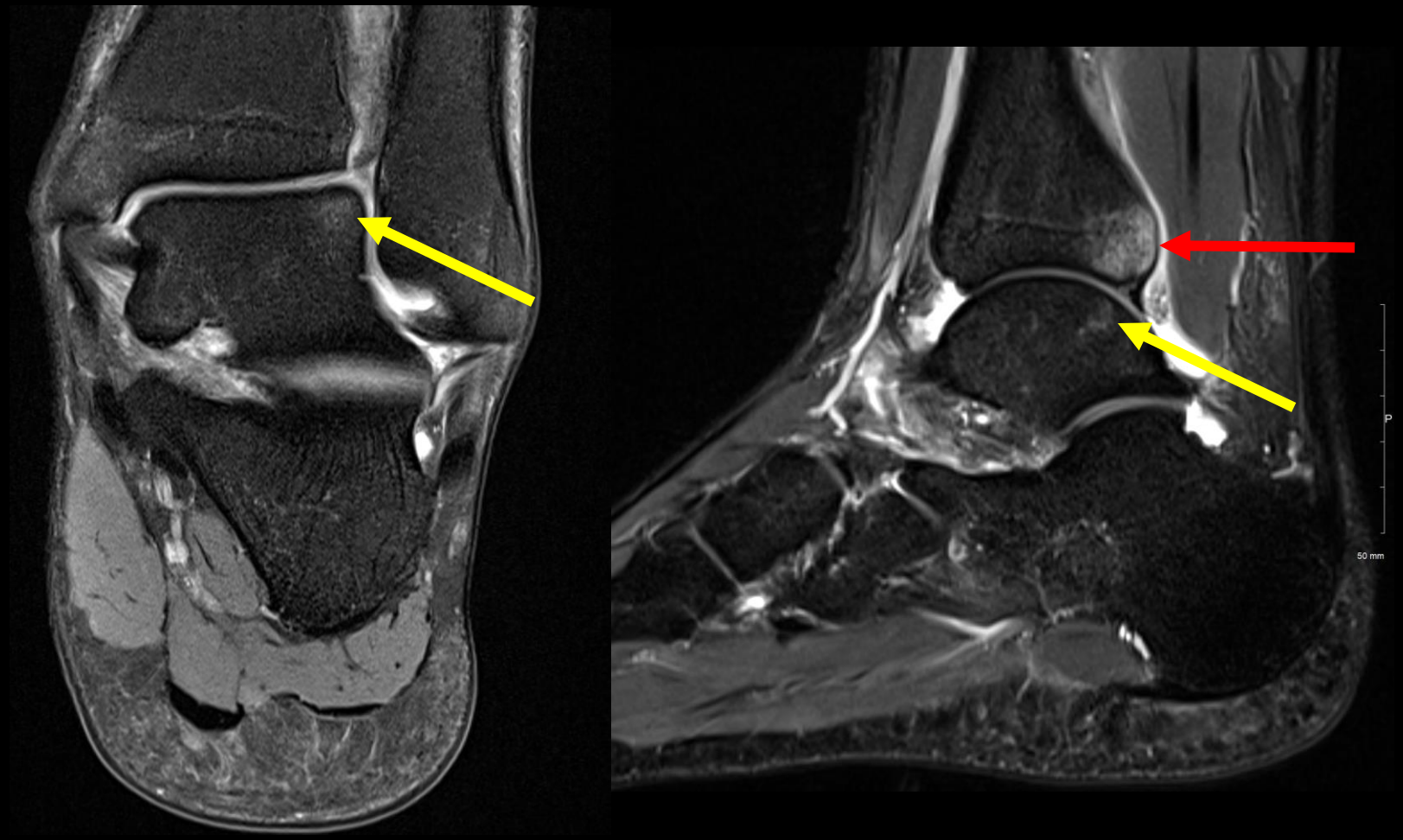
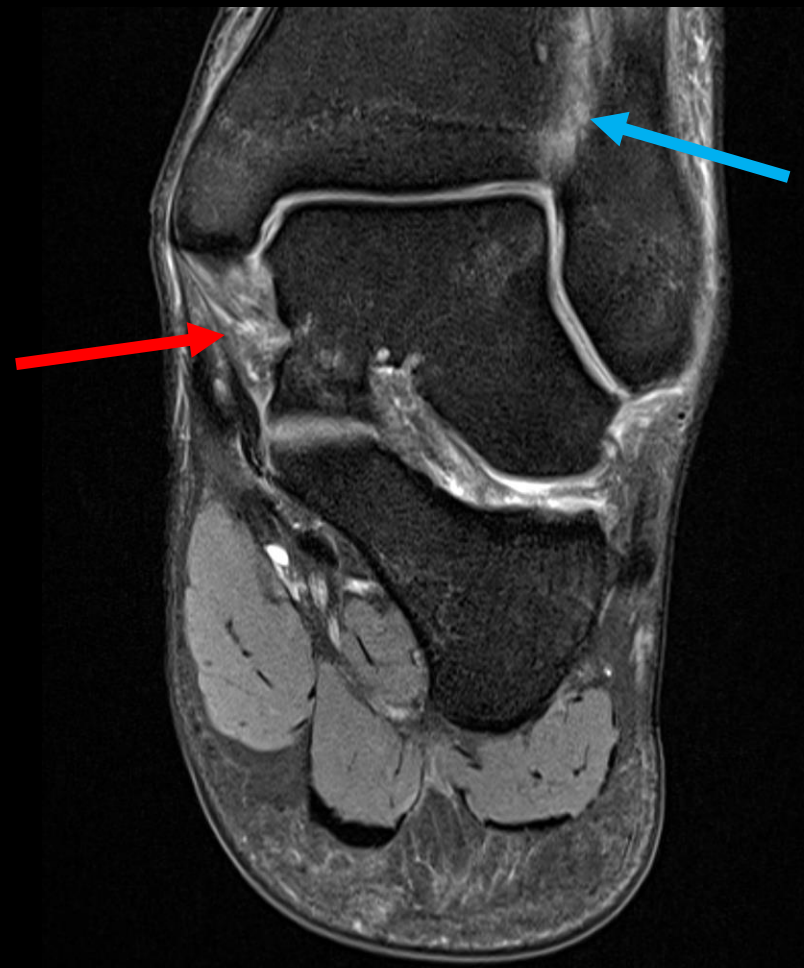


Findings (labeled)

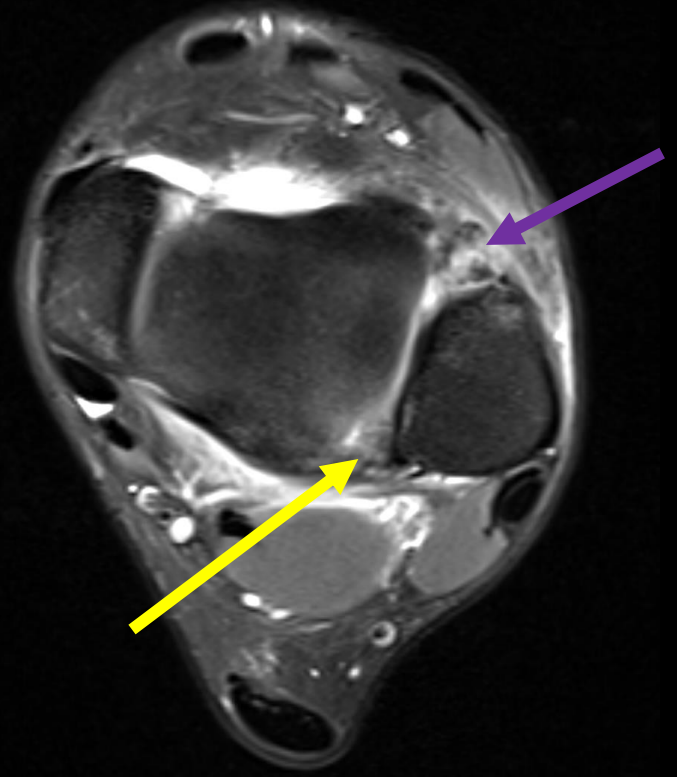


Posterior tibial edema (red), most likely reactive
Talar dome edema (yellow), possible osteochondral

Findings (labeled)



Partial thickness tear of deltoid ligament (red)
Edema within interosseous membrane (blue)



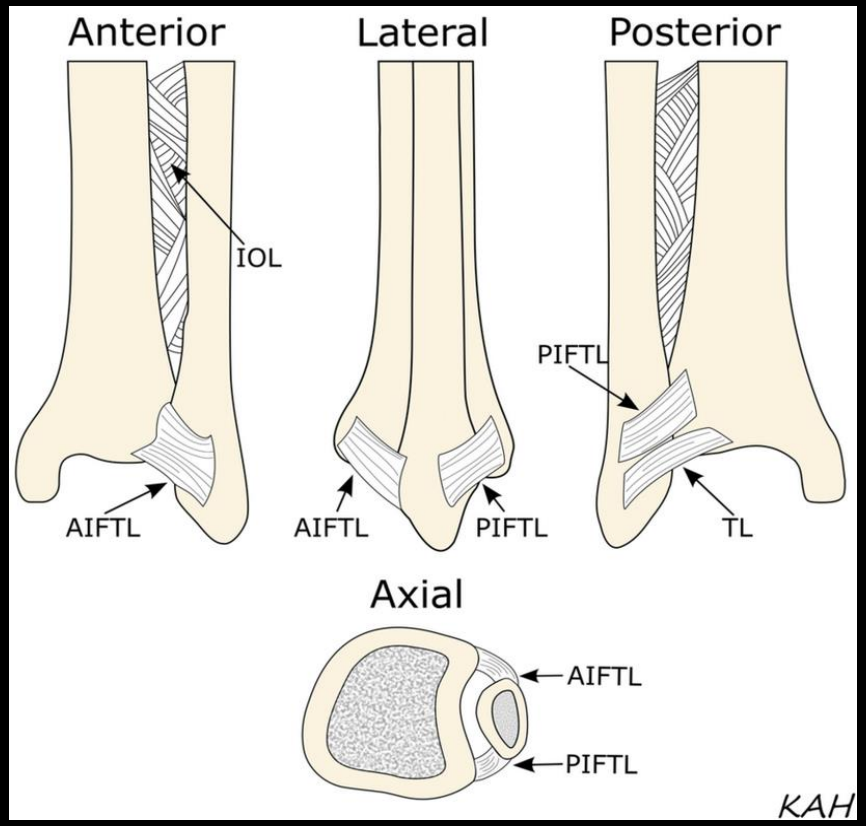
Rupture of anterior tibiofibular ligament (purple)
Posterior tibiofibular ligament strain with edema (yellow)

Final Dx:

High ankle sprain with syndesmotic ligament tears and high-grade partial deltoid ligament tear

Case Discussion

- Definition[1]
  - High ankle sprains involve the tibiofibular syndesmosis, including the anterior-inferior tibiofibular ligament (AITFL), posterior-inferior tibiofibular ligament (PITFL), interosseous membrane, interosseous ligament (IOL), and inferior transverse ligament (ITL)
- Etiology[1-2]
  - Usually occurs due to ankle external rotation with concomitant dorsiflexion or leg internal rotation, leading to the talus rotating laterally and the fibula being separated from the tibia



Hao KA, Vander RA, Nichols JA, Reb CW. Intraoperative Assessment of Reduction of the Ankle Syndesmosis. Current Reviews in Musculoskeletal Medicine. 2022;15(5):344-352. doi:10.1007/s12178-022-09769-0

Case Discussion (cont.)

- Clinical presentation[3]
  - Anterolateral and/or posterolateral ankle pain
  - Medial ankle swelling/tenderness
  - Pain above the ankle
  - Difficulty bearing weight
- Imaging appearance[1,2,5-6]
  - X-rays may show soft tissue swelling, and stress radiographs may demonstrate increased medial clear space (>4 mm), increased tibiofibular clear space (>6 mm), or decreased tibiofibular overlap (<6 mm on AP view or <2.8 mm on mortise view)
  - MRI may show signal changes within/around the ligaments, edema, or a lambda sign (continuous signal from the ankle mortise into the tibiofibular recess)

Lambda sign

Ryan LP, Hills MC, Chang J, Wilson CD. The lambda sign: a new radiographic indicator of latent syndesmosis instability. *Foot Ankle Int*. 2014;35(9):903-908. doi:10.1177/1071100714543646

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Case Discussion (cont.)

- Treatment[5]
  - Non-operative: (1) immobilization in a cast or CAM walking boot (non-weight bearing) for up to 10 days, (2) early range-of-motion exercises, (3) ankle brace/support, (4) physical therapy, and (5) NSAIDs
  - Operative: (1) fixation with screws across distal tibiofibular joint or (2) with suture-button implants
    - For chronic or persistent instability
- Prognosis[5]
  - Most patients experience good recovery and return to sport within 6-12 weeks of rehabilitation/surgery
  - Up to 40% of patients experience residual symptoms, such as chronic ankle instability, persistent pain and swelling, or posttraumatic osteoarthritis

References:

1. Molinari A, Stolley M, Amendola A. High ankle sprains (syndesmotic) in athletes: diagnostic challenges and review of the literature. Iowa Orthop J. 2009;29:130-138.
2. Hunt KJ, Phisitkul P, Pirolo J, Amendola A. High Ankle Sprains and Syndesmotic Injuries in Athletes. J Am Acad Orthop Surg. 2015;23(11):661-673. doi:10.5435/JAAOS-D-13-00135
3. Dubin JC, Comeau D, McClelland RI, Dubin RA, Ferrel E. Lateral and syndesmotic ankle sprain injuries: a narrative literature review. J Chiropr Med. 2011;10(3):204-219. doi:10.1016/j.jcm.2011.02.001
4. Hao KA, Vander RA, Nichols JA, Reb CW. Intraoperative Assessment of Reduction of the Ankle Syndesmosis. Current Reviews in Musculoskeletal Medicine. 2022;15(5):344-352. doi:10.1007/s12178-022-09769-0
5. Melanson SW, Shuman VL. Acute ankle sprain. PubMed. Published 2023. https://www.ncbi.nlm.nih.gov/books/NBK459212/
6. Ryan LP, Hills MC, Chang J, Wilson CD. The lambda sign: a new radiographic indicator of latent syndesmosis instability. *Foot Ankle Int*. 2014;35(9):903-908. doi:10.1177/1071100714543646

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