

AMSER Case of the Month

September 2026

31-year-old male presenting with acute right ankle injury

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Patient Presentation

- **HPI:** 31-year-old male presenting to urgent care one day after sustaining an acute right ankle injury while playing flag football. He reported feeling a sudden “pop” in the posterior ankle while stepping forward between plays. Immediately afterward, he had difficulty pushing off his right foot, prompting him to seek medical evaluation.
- **Vitals:** Within normal limits
- **Physical Exam:** Tenderness in the Achilles region with a palpable defect. Abnormal Thompson test. Slight residual plantar flexion. 2+ dorsalis pedis pulse. No open wound.
- **Labs:** Not obtained.

What Imaging Should We Order?

Select the applicable ACR Appropriateness Criteria

New 2020

American College of Radiology
ACR Appropriateness Criteria®
Acute Trauma to the Ankle

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	○
MRI ankle without and with IV contrast	Usually Not Appropriate	○
MRI ankle without IV contrast	Usually Not Appropriate	○
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	☢☢☢

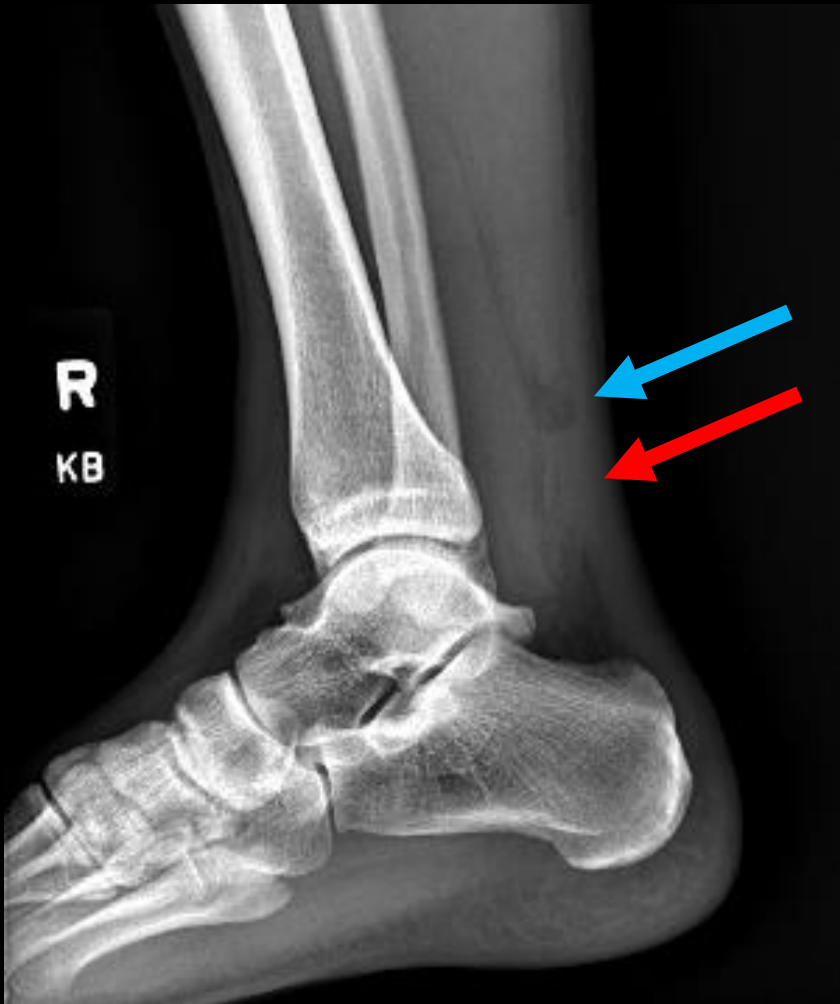
This imaging modality was ordered by the urgent care physician

Findings (unlabeled)



Lateral right ankle radiograph

Findings: (labeled)



Lateral right ankle radiograph

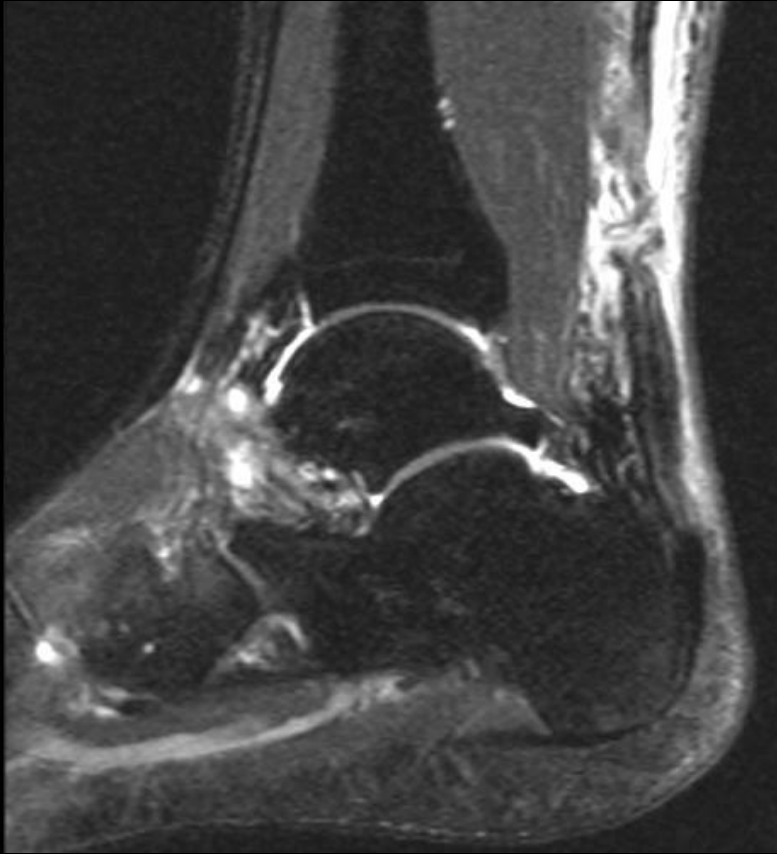
Edema within the pre-Achilles (Kager's) fat pad with **focal herniation of fat** through the Achilles tendon, highly suspicious for Achilles tendon rupture.

Normal lateral ankle radiograph for comparison



Findings (unlabeled)

MRI was obtained to confirm rupture and assess rupture location, tendon gap, and retraction for management planning.

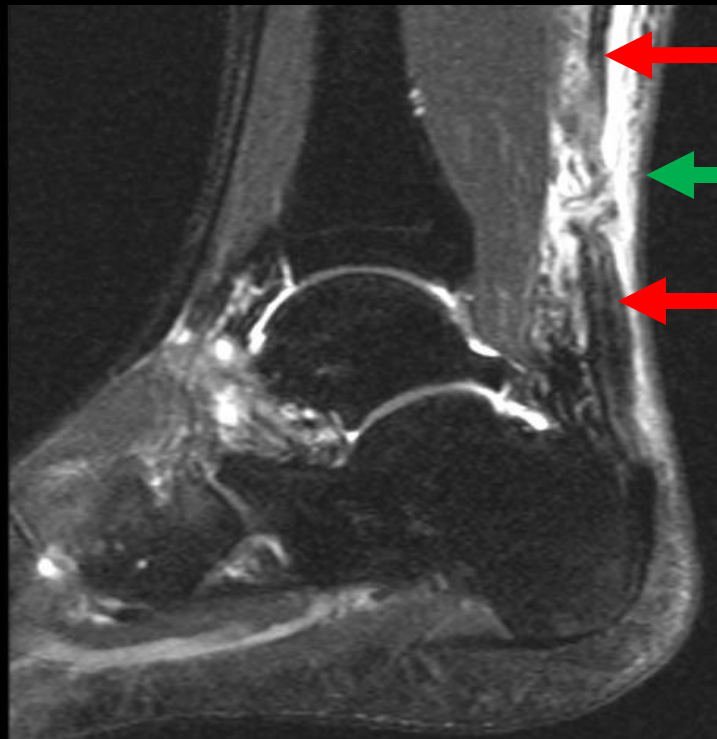


**Sagittal fat-suppressed
T2-weighted image**



**Sagittal
T1-weighted image**

Findings (labeled)

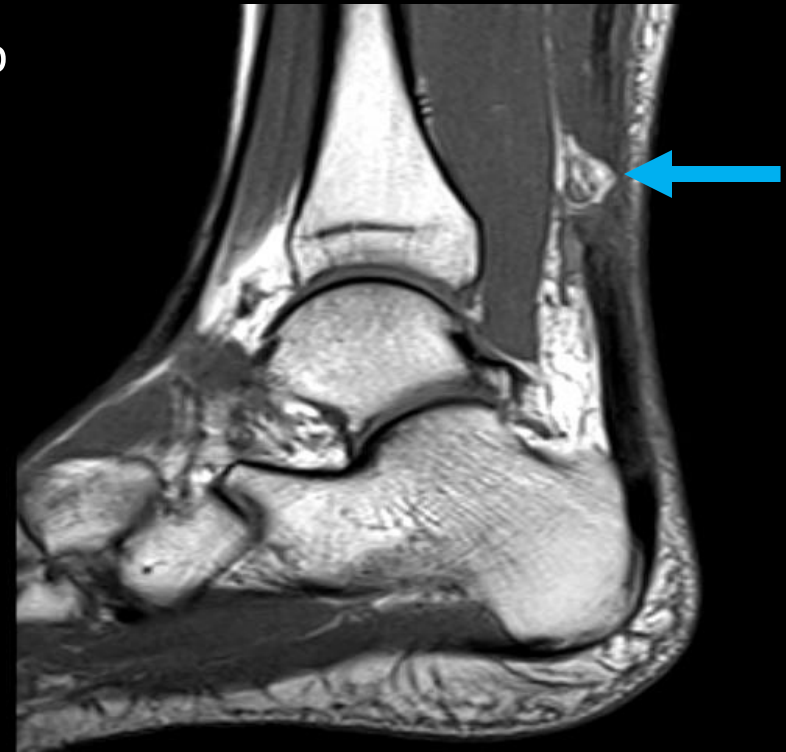


← Proximal stump



← Distal stump

Sagittal T2 FS



Sagittal T1

Complete Achilles tendon rupture at the lower margin of the musculotendinous junction and accompanying herniation of the pre-Achilles fat pad through the tendon defect with regional soft tissue edema.

Final Dx:

Complete Achilles tendon rupture

Case Discussion

- Achilles tendon rupture is a common injury, classically occurring in active adults during sports that involve sudden acceleration, deceleration, jumping, or rapid changes in direction.
- Patients often describe a sudden popping sensation or the feeling of being struck in the back of the ankle, even when no contact injury occurred.
- Clinical findings may include posterior ankle pain, difficulty with push-off, weakness with plantar flexion, a palpable tendon gap, and an abnormal Thompson test.

Case Discussion

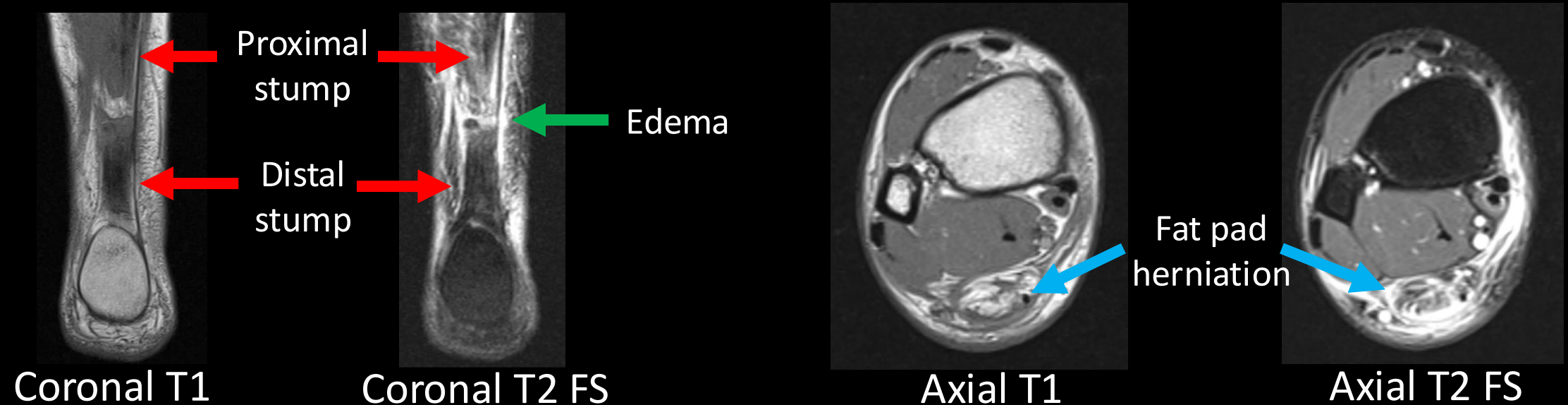
Imaging Pearls:

- In the setting of trauma, radiographs are initially obtained to rule out fracture or avulsion injury.
- Radiographs may show indirect signs of Achilles tendon rupture, including edema in the pre-Achilles (Kager's) fat pad, loss of the normal Achilles tendon silhouette, and focal herniation of the pre-Achilles fat pad through the tendon defect.
- Ultrasound is often the first-line confirmatory test for suspected Achilles tendon tear (sensitivity >97%, specificity >94%).
- MRI confirms the diagnosis and allows for evaluation of extent (complete vs partial tear), location, tendon gap/retraction, and proximal and distal tendon stumps for treatment planning.

Case Discussion

MRI Findings:

- T1-weighted sequences define anatomy and tendon morphology. The Achilles tendon normally appears uniformly dark/low in signal.
- Fluid-sensitive (T2/PD) fat-suppressed or STIR sequences highlight edema/hemorrhage within the tendon gap in the setting of acute ruptures.



Case Discussion

Management

- Initially, Achilles tendon ruptures are managed with immobilization in plantar flexion, heel lift/boot, and protected weight-bearing.
- Treatment options include functional nonoperative rehabilitation vs operative repair.
- Modern functional bracing has reduced the historical re-rupture gap between operative and nonoperative treatment, while surgery carries higher wound/infection/nerve complication risk.
- Operative repair may be favored in young active patients/athletes, significant tendon gap/retraction, or high functional demand.

References:

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2. Amendola F, Barbasse L, Carbonaro R, Alessandri-Bonetti M, Cottone G, Riccio M, De Francesco F, Vaienti L, Serror K. The Acute Achilles Tendon Rupture: An Evidence-Based Approach from the Diagnosis to the Treatment. *Medicina*. 2022; 58(9):1195. <https://doi.org/10.3390/medicina58091195>
3. Schweitzer ME, Karasick D. MR imaging of disorders of the Achilles tendon. *AJR Am J Roentgenol*. 2000;175(3):613-625. doi:10.2214/ajr.175.3.1750613
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