



Visual Diagnosis in Emergency Medicine

UNSTABLE ANKLE INJURY WITH NORMAL RADIOGRAPHS

Scott C. Sherman, MD^{*†} and Stephen W. Cooper, MD^{*}

^{*}Cook County (Stroger) Hospital, Chicago, Illinois and [†]Rush Medical School, Chicago, Illinois

Reprint Address: Scott C. Sherman, MD, Department of Emergency Medicine, Cook County (Stroger) Hospital, Rush Medical School, 1900 W Polk Avenue, 10th Floor, Chicago, IL 60612

CASE REPORT

A 21-year-old female presented to our emergency department (ED) with right ankle pain. Five days prior she reported slipping and falling on the snow, landing on her right leg, and inverting her ankle. She had difficulty walking and presented to a different ED, where she stated she had radiographs and was told she had a sprain. She was given an ankle brace and crutches. She had been bearing weight as much as her pain would allow, but stated that she decided to come to our ED because she was experiencing more pain and noted discoloration around the ankle.

On physical examination, there was no gross deformity of the right ankle and foot. Tenderness, edema, and ecchymosis, most significant on the medial surface of the ankle around the medial malleolus, was appreciated. Three-view right ankle radiographs demonstrated only soft-tissue swelling more concentrated on the medial side (Figure 1). Due to the significant pain and swelling medially, an external rotation stress radiograph of the ankle mortise was obtained, demonstrating significant widening of the medial clear space, suggesting a deltoid ligament tear and possible disruption of the distal tibiofibular syndesmosis (Figure 2). The patient was placed in a posterior splint and instructed to remain non-weight-bearing. She was given orthopedic follow-up, where she was scheduled for surgery.

DISCUSSION

Ankle injury is a commonly seen complaint in the ED. Radiographs assist in determining the presence of a fracture. Determining the stability of an ankle injury is important for the emergency clinician, as it guides treatment. Stability of an ankle injury is oftentimes straightforward, as in the setting of bimalleolar fractures or when there is a lateral malleolar fracture with an increased medial clear space (space between the articular surfaces of the talus and medial malleolus) suggesting a deltoid ligament tear. These injuries are unstable and require proper reduction, splinting, non-weight-bearing status, and referral for surgery.

In the setting of an isolated distal fibula fracture with a normal mortise view (i.e., normal medial clear space), the stability of the ankle remains unclear (1). Unfortunately, palpation of the medial surface of the ankle is not sensitive or specific enough to predict deltoid ligament rupture, and a stress view is recommended (2). The most common ED management in this scenario is immobilization with instructions for the patient to not bear weight until specialty referral, where a stress radiograph is performed. Some emergency physicians perform the stress radiograph in the ED and when it is normal, definitive management is with a walking boot.

Isolated deltoid and syndesmosis ligament tear (without fracture) is uncommon but has been reported

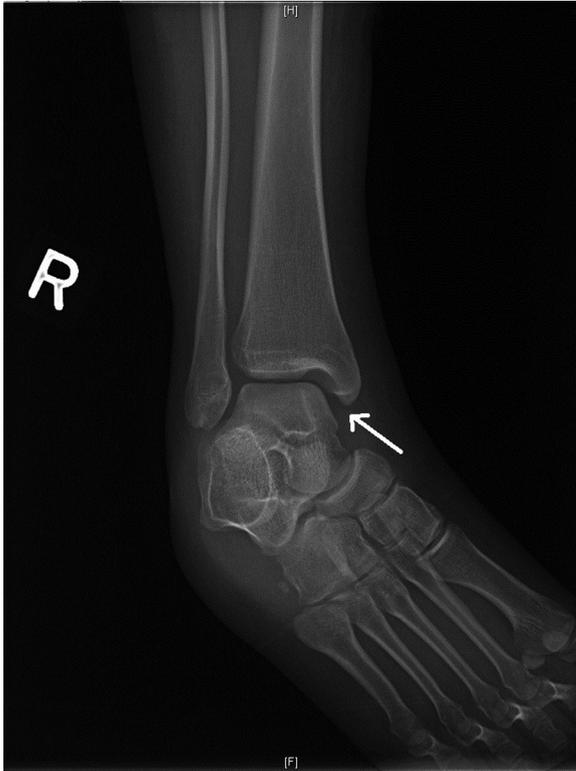


Figure 1. Mortise view demonstrating normal medial clear space (arrow).

(3). Our case is unique in that the normal initial radiographs might have convinced the clinician that they were dealing with a simple ankle sprain. The significant swelling and tenderness medially prompted the stress test on the second ED visit and prevented the patient from further bearing weight until orthopedic evaluation could be obtained. This case highlights the importance of a careful evaluation of the ankle and of not relying solely on normal initial radiographs. In the setting of an ankle injury, when significant soft-tissue injury is noted even in the absence of fracture, the prudent clinician should consider stress testing or, more commonly, simply keep the patient

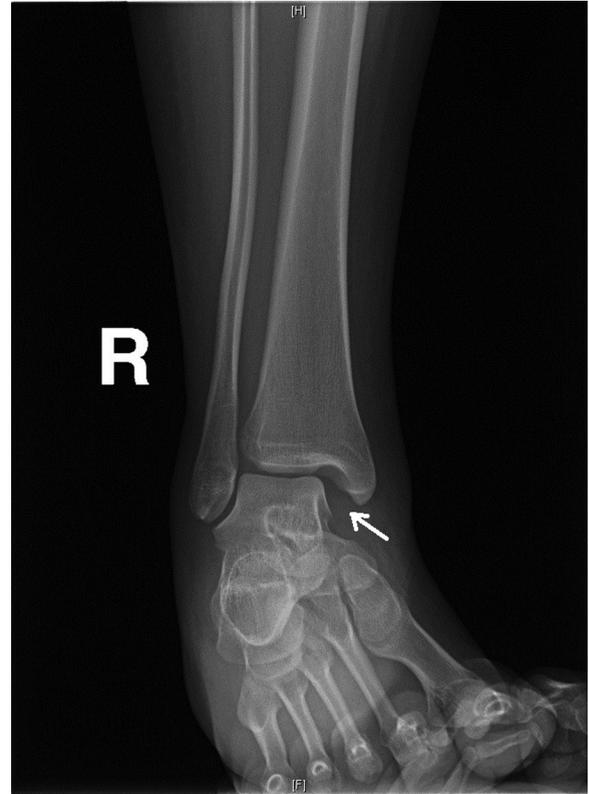


Figure 2. Mortise view of external rotation stress test demonstrating increased medial clear space (arrow).

from bearing weight until specialty evaluation can be obtained.

REFERENCES

1. Gougouslias N, Sakellariou A. When is a simple fracture of the lateral malleolus not so simple? How to assess stability, which ones to fix and the role of the deltoid ligament. *Bone Joint J* 2017; 99-B:851–5.
2. Deangelis NA, Eskander MS, French BG. Does medial tenderness predict deep deltoid ligament incompetence in supination-external rotation type ankle fractures? *J Orthop Trauma* 2007;21:244–7.
3. Miller CD, Shelton WR, Barrett GR, et al. Deltoid and syndesmosis ligament injury of the ankle without fracture. *Am J Sports Med* 1995; 23:746–50.