INTERESTING CLINICAL IMAGE:
Diagnosis of Achilles Tendon Rupture with Ultrasound in the Emergency Department Setting

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ABSTRACT
The authors describe a case of a middle-aged male with ruptured Achilles tendon sustained while jumping.


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CASE PRESENTATION
A 59-year-old male patient presented to the emergency department (ED). He complained of feeling a “snap” in his left ankle the day before presenting to the ED. He had been playing with his grandchildren and was jumping on one leg when he heard the snap and felt immediate pain in the left Achilles area. The pain was followed by swelling of his left ankle.

An ankle x-ray was read as: (a) No acute fracture or dislocation; (b) Thickened and ill-defined Achilles’ tendon likely related to Achilles’ tendon rupture; (c) Post-traumatic changes to deltoid and tibiotalar ligaments (d) Diffuse soft tissue swelling…” (Fig 1).

Posterior ankle ultrasound was performed at the bedside, which demonstrated the rupture of the left Achilles tendon (Figs 2-4). Contralateral Achilles tendon ultrasound was performed to obtain a view of a normal Achilles tendon (Fig 5).

To evaluate the Achilles tendon, the patient should lie prone to allow complete examination of the calf and ankle. The tendon is first evaluated longitudinally, in a sagittal plane. The transducer is then rotated 90 degrees and the tendon is evaluated in the transverse plane.1

Figure 1. Left ankle x-ray.

Figure 2. Left Achilles longitudinal view with disruption of the tendon fibers.

The Achilles tendon is apt to injury in the region 2-6 cm proximal to the calcaneus insertion due to a relative decrease in vascularity to that area. Partial thickness tears can appear as an area of hypo- or anechogenicity within the tendon disrupting the fibers. Full thickness tears have completely disrupted tendon fibers and can have tendon retraction. The tendon stumps are often tapered. It is important to keep in mind that an intact plantaris tendon can simulate the fibers of an intact Achilles tendon. Additionally, dynamic imaging is an important key to the full examination of the tendon. With palpation of the calf muscles or passive movement of the foot, tendon retraction can make identification of the Achilles tendon stumps easier.1

Figure 3. Left Achilles longitudinal view with rupture of the tendon fibers. Edema can be visualized between the proximal and distal stumps of the tendon.
Achilles tendon rupture evaluated with lateral radiographs show soft tissue swelling and an Achilles tendon tear is suggested when the Kager’s triangle is disrupted.\(^2\) While evaluating partial Achilles tendon ruptures, in 1990 Kalebo found that soft tissue radiography only showed localized swelling and that ultrasound was a better method for detection of ruptures.\(^7\) In the same study, Kalebo found that ultrasound was more accurate than CT in identification of partial Achilles tendon ruptures.\(^3\) MRI accurately images Achilles tendon pathology.\(^4,5\)

**Figure 4.** Left Achilles proximal to rupture. Measurement of Achilles tendon width in blue with values in the lower right corner of the image.

Advantages to ultrasound imaging include direct correlation of image findings with patient symptoms, dynamic imaging, wide availability of ultrasound equipment, lower cost than MRI, and speed of examination. Disadvantages of ultrasound imaging include operator dependence, unfamiliarity with scanning technique, and limitation to imaging only structures superficial to the bony cortex.\(^6\) An additional asset of ultrasound is that it can visualize the entire Achilles tendon, from the muscle body to the calcaneal insertion.

**Figure 5.** Right Achilles tendon, which is intact. Measurement of achilles tendon is shown in blue.

X-ray evaluation of tendons is limited, and Magnetic Resonance Imaging (MRI) is costly and time-consuming. For many patients with suspected tendon injury, ultrasound may be a fast and cost-effective method of evaluation.

In this case, the patient was referred to an orthopaedic surgeon. The decision was made for operative repair of the Achilles tendon. Approximately 7 months after the surgical repair, the Achilles tendon was reported to be doing well.

**REFERENCES**


