

EM CASE OF THE WEEK

BROWARD HEALTH MEDICAL CENTER DEPARTMENT OF EMERGENCY MEDICINE

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I was running and now my ankle is killing me!



Ankle pain is a frequent cause for presentation to the emergency department. The general population is staying more active today, and not all that is ankle pain is a sprain or fracture. The clinical evaluation and physical exam is very important in the diagnosis of ankle pathology and can lead to more effective use of imaging studies and better outcomes for the patient.

EM CASE OF THE WEEK

EM Case of the Week is a weekly “pop quiz” for ED staff. The goal is to educate all ED personnel by sharing common pearls and pitfalls involving the care of ED patients. We intend on providing better patient care through better education for our nurses and staff.



Achilles Last Stand: Rupture of the Achilles Tendon

A 52 year old African American male with no significant past medical history presents to the ED with a chief complaint of right ankle pain. The patient states that he was on an obstacle course training for an upcoming test for law enforcement when he felt a “pop” when trying to jump over a wall. The patient states he was able to complete the course, but at a slower pace. He tried taking naproxen and applying ice to his ankle, but neither was able to alleviate his pain. His vital signs were: T 98.8, HR 76, RR 20, BP 142/80, and O2 sat 99% on room air. On physical exam, the patient was found to be an overweight male in no acute distress. He was able to bear weight but had an antalgic gait. The patient’s right ankle was swollen with bruising on the posterior aspect of his ankle approximately 3 inches proximal to the insertion of the Achilles tendon to the calcaneus. Active dorsiflexion, plantar flexion, eversion and inversion were present in bilateral ankles. The patient was found not have passive plantar flexion of the right ankle when the gastrocnemius was squeezed. What is a risk factor associated with Achilles tendon rupture?

- A. Fluoroquinolone use
- B. Glucocorticoid use
- C. Obesity
- D. Age >50 years
- E. Male gender
- F. All of the above



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Take Home Points

- The Achilles tendon is the second most frequently ruptured tendon and is prone to complete rupture.
- Up to 25% of Achilles tendon ruptures are misdiagnosed.
- Remember to rely on a thorough history and physical exam—Achilles tendon rupture is a clinical diagnosis.
- Imaging studies help in cases where the history and physical exam do not lead to a clear diagnosis. Point of care ultrasound of the Achilles tendon is highly sensitive in diagnosing a rupture. MRI is also very helpful in the diagnosis but is more expensive and timely.
- Treatment can be non-surgical or surgical, and there is no general consensus on what is best. What is most important is a timely diagnosis and initiation of treatment.

Achilles Tendon Rupture

The correct answer is F, all of the above. The risk factors are numerous, and one of the more famous ones is the use of fluoroquinolone antibiotics. However, it is exceedingly rare to see – one study showed that out of 46,776 patients treated with fluoroquinolones, 3.2 cases of tendon problems were found for every 1000 years of exposure. Also, be mindful of a middle-aged patient presenting with ankle pain after having hearing a “pop” while trying to run or jump. Other risk factors as listed above are obesity, age >50 years, male gender, and glucocorticoids (especially if a tendon was accidentally injected while attempting to treat a bursitis). Other risk factors involve athletes—from decathletes to hockey players and military recruits.

Discussion:

History

Imaging studies can be used to diagnose the severity of Achilles tendon injury as well as confirm what may be an unclear clinical picture. Nonetheless, it is the clinical picture that makes the diagnosis of this injury. History will often closely follow what was presented in the above case: **a middle aged, overweight male doing a physical activity and hearing a “pop” with immediate subsequent pain.** The patient will describe the incident as feeling like being hit or kicked in the back of the leg. However, some studies have shown that up to 1/3 of patients with an Achilles tendon rupture may actually not report pain. What activities can lead to this injury? As opposed to ankle sprains, **Achilles tendon rupture is typically during the “push off” phase of an activity as opposed to the landing phase.** Also associated with Achilles tendon rupture are an abrupt increase in training, chronic injury to the Achilles tendon, and shear stress from an abrupt change in direction (picture a wide receiver planting their foot to make a cut towards the sidelines).

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and click on the “Conference” link. All are welcome to attend !

Physical Exam

As healthcare providers, it is important to begin any physical exam with observation from the time you see the patient through the end of the encounter. Although the gastrocnemius-soleus complex is the primary plantar flexor of the foot, there are also other muscles that contribute to this movement and the patient may be able to walk into the emergency department on their own. Before palpating the ankle, visual inspection can show **loss of the surface anatomy compared to the contralateral side, as shown in the picture on the previous page.**

Palpation may show a **palpable gap** approximately 2-3 inches proximal to the insertion of the Achilles tendon to the calcaneus.

The Thompson test (squeeze test) is a sensitive special test that can help in the diagnosis of Achilles tendon rupture. Place the patient in the prone position with the feet hanging off the edge of the exam table. Squeeze the calf, and observe the foot for plantar flexion; compare the movement to the uninjured side with the same maneuver. If there is a lack of plantar flexion or a decrease in plantar flexion on the injured side, this is indicative of an Achilles tendon rupture.

Imaging

Point of care ultrasound is useful in rapid diagnosis/confirmation of an Achilles tendon rupture. Ultrasound will show disruption of the fibrillar appearance of the tendon, and may also show a gap between the proximal and ruptured tendon ends. However, swelling and hematoma may make the image difficult to analyze. Passive dorsiflexion and plantar flexion of the foot may show movement of the ruptured tendon ends, making it easier to make the diagnosis.

Plain X-ray should be used as a means to rule out pathology other than Achilles tendon rupture. This could help to rule out fractures as well as changes to the calcaneus seen in tendonopathy and calcaneal bursitis.

One sign to be on the lookout for is a decrease in the total area of **Kager's triangle**, which is an apex-cephalad, scalene triangle filled with adipose tissue bordered anteriorly by the deep flexor tendons, posteriorly by the Achilles tendon, and inferiorly by the calcaneus.

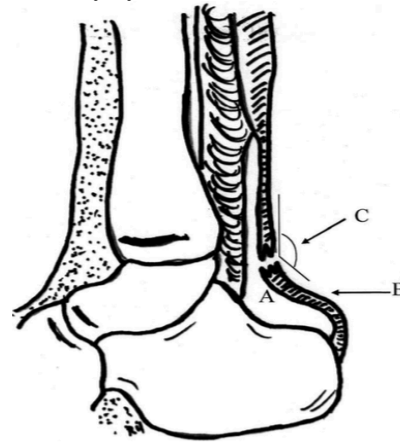


FIGURE 3. Depiction of a lateral view of the ankle with achilles tendon rupture. Labeled are the loss of Kager's triangle (A), a positive Arner's sign (B), and a decrease in Toygar's angle (C).

MRI is useful when ultrasound does not provide enough information. It shows soft tissue in much greater detail, and can be useful in the diagnosis of a partial Achilles tendon rupture. MRI may be both time and cost prohibitive in the emergency setting.

Treatment

- Once the diagnosis of an Achilles tendon rupture is made, if it is acute, then emergent orthopedic referral is warranted (**within 2 days of injury**).
- Pain control
- The main goal in treatment of Achilles tendon rupture is restoring the tendon length and tension, and can be achieved conservatively or with surgery.
- In the ED the patient should be **placed in a splint with their foot in the equinus position** (foot plantar flexed, but not forcibly) until further evaluation by orthopedics.

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