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Original Research Paper

Radio diagnosis

ULTRASONOGRAPHIC EVALUATION IN ACHILLES TENDON RUPTURE

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ABSTRACT The emergency department (ED) commonly sees patients with acute Achilles tendon injuries from sports-related activities. Significant patient morbidity may arise from an Achilles tendon rupture that is missed or misdiagnosed. Nevertheless, clinically diagnosing an Achilles tendon rupture is not always straightforward. Pain and soft tissue swelling may make it difficult to do physical examination exercises to rule out a tendon injury. It has been demonstrated that ultrasound is highly sensitive in identifying Achilles tendon ruptures. This case report describes a case of a fifty-year-old male who complained of excruciating bilateral leg and ankle discomfort, hampering with a proper and thorough physical evaluation. However, a quick and precise diagnosis of acute Achilles tendon rupture was made possible by an ultrasound scan. This case illustrates the importance of ultrasound as a diagnostic technique in patients with suspected Achilles tendon rupture, especially if there is limited physical examination.

KEYWORDS : Achilles tendon rupture, ultrasound

INTRODUCTION

Sports injuries involving the Achilles tendon are among the most frequent (1). It usually results from overuse over time, which is common in athletes who perform long-term repetitive motions like running and jumping which involve repetitive tensile forces (2). Achilles tendon ruptures usually affect males in their 30s to 50s who have never had an injury to the leg in question (3). The most frequently mentioned causes of Achilles tendon rupture are violent dorsiflexion of a plantarly flexed ankle, unanticipated abrupt dorsiflexion of the ankle, and pushing off the weight-bearing foot with the knee extended. Due to the short cross-sectional area, high eccentric stresses, and hypovascularity, the majority of Achilles tendon ruptures happen 3 to 6 cm proximal to the tendon's calcaneal insertion (1). Over 20% of cases of acute Achilles tendon rupture have been documented to go undiagnosed, most likely due to pain and edema that interfere with a physical examination (4).

Case Report

A 50 year old male reported to the hospital with chief complaints of pain in bilateral ankle joint and feet since 1 year with associated difficulty in walking since 6 months. The pain had increased in intensity in the past one month. The patient was on pain medications since a year with on and off pain relief. Three doses of steroid injection (Inj. Kenacort) were taken in both the heels three months prior, one month apart which had resulted in increased pain.

Upon physical examination, it was discovered that the patient was experiencing extreme pain. An enlargement was observed at the back side. Both the legs did not show any signs of open wounds. The assessment of her legs and ankles were quite limited because she refused to have any more examinations of her leg and complained of extreme pain. The treating emergency physicians then used a 10- to 5-MHz linear array transducer to conduct a point-of-care ultrasound assessment. Posterior ankle ultrasound (bilateral) was performed

Investigations

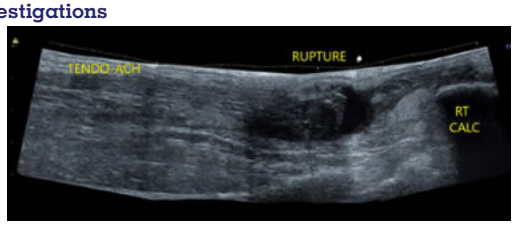

Figure 1: Ultrasonographic appearance of right calcaneum

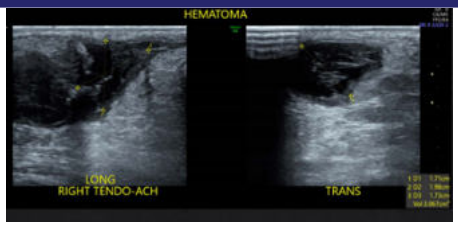

Figure 2: Ultrasound showing the presence of hematoma formed due to rupture

The right calcaneum showed evidence of a complete tear 3 cm above its insertion site. (Figure 1) There was small fluid collection/ hematoma measuring approximately 3cc in size at the site of rupture. The distance between the retracted ends of the tendon was approximately 1.3cm. (Figure 2) The proximal end was thickened and heterogenous in appearance. These findings were suggestive of a right sided complete tear of the Tendo-achilles with a small intervening fluid collection/ hematoma.

Figure 3: Ultrasonographic appearance of left calcaneum

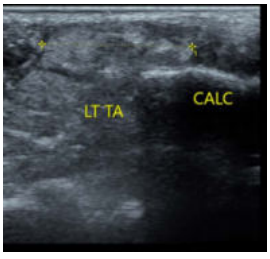

Figure 4: Ultrasound showing a thinned out left Achilles tendon

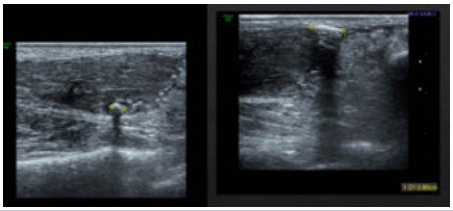

Figure 5: Ultrasound showing a calcification in the left Achilles tendon

The left tendo-Achilles showed severe thinning in its distal portion in the retrocalcaneal region (approximately 3.3 cm in length) with abnormal thickening and heterogenous echotexture of the proximal end. There was no evidence of any fluid collection evident in the retrocalcaneal region. However, few calcific foci were noted within the proximal portion of the tendon, the largest measuring 0.8 cm. These findings were suggestive of chronic partial thickness tear of the distal portion. (Figure 3-5)

Figure 6: X-ray showing calcific foci in the left tendon as seen on ultrasound and few tiny calcific foci on the right side

DISCUSSION

Despite being the strongest tendon in the human body, the Achilles tendon is the most commonly injured ankle tendon (5). It originates from the soleus and gastrocnemius muscles and inserts into the calcaneus' posterior portion. It is important to distinguish between partial tears and the hypoechoic appearance of the muscle fibers at the musculotendinous junction and the tendon insertion at the calcaneus. Achilles tendon rupture is becoming more common as high-velocity sports have become more popular, the aging population continues to be physically active, and the usage of fluoroquinolones and steroid injections continues (6) .For Achilles tendon rupture, ultrasonography has a 96% to 100% sensitivity and an 83% to 100% specificity (4,7).

The patient should lie prone to enable a thorough examination of the calf and ankle in order to assess the Achilles tendon. In a sagittal plane, the tendon is first assessed longitudinally. Next, the tendon is assessed in the transverse plane after the transducer has been turned 90 degrees.

Due to a relative decrease in vascularity, the region 2–6 cm proximal to the calcaneus insertion is particularly vulnerable to Achilles tendon injury. A region of hypo- or anecho-genecity within the tendon that disrupts the fibers might manifest as partial thickness tears. Totally broken tendon fibers might result in tendon retraction in full thickness tears. Often, the tendon stumps taper off. The fibers of an undamaged Achilles tendon can be mimicked by an intact plantaris tendon. Furthermore, dynamic imaging is a crucial component of a thorough tendon assessment. Identifying the Achilles tendon stumps might be facilitated by tendon retraction when the calf muscles are palpated or the foot is not moved. (8)

It is advisable to compare with the contralateral (normal) side using dynamic imaging. The typical pattern of parallel fibers in the long axis is completely disrupted in an acute total rupture of the Achilles tendon, and the tendon ends are frequently retracted. Hematoma development at the rupture site, posterior acoustic shadowing at the rupture edges, adjacent hypoechoic tendinosis, herniation of Kager's fat into the tendon gap, and visibility of the plantaris tendon are additional sonographic findings (4).

When the Kager's triangle is disturbed, an Achilles tendon rupture is suspected based on soft tissue edema seen on lateral radiographs. In 1990, Kalebo evaluated partial Achilles tendon ruptures and discovered that ultrasound was a more effective way to detect ruptures than soft tissue radiography, which only showed localized swelling. In the same study, it was discovered that when it came to identifying partial Achilles tendon ruptures, ultrasound was more accurate than computed tomography. (9) Achilles tendon pathologies can be accurately seen by magnetic resonance imaging (MRI).(10,11)

Ultrasound is helpful in differentiation of an Achilles tendon rupture that is partial or full thickness. Separation of one tendon end from the other suggests full-thickness rupture at the ankle with mild dorsiflexion and plantar flexion. On the other hand, a partial rupture of the tendon with some intact fibers is indicated by the tendon moving continuously across the rupture site. (12) The advantages of ultrasound imaging include speed of examination, reduced cost compared to MRI, dynamic imaging, wide availability of ultrasound equipment, and a direct correlation between image results and patient symptoms. Ultrasound imaging has limitations, such as the inability to image objects below the surface of the bone cortex and operator dependence and unfamiliarity with scanning technique. (13) The ability to see the whole Achilles tendon, from the muscle body to the calcaneal insertion, is another benefit of ultrasound technology. There are limitations to X-ray examination of tendons, and MRI is expensive and time-consuming. Ultrasonography can be a quick and affordable way to evaluate many people who have a suspected tendon damage. (10)

This case demonstrates the application of ultrasonography, particularly in cases when the physical examination is incomplete or unclear, in the assessment of patients with suspected tendon rupture. Point-of-care ultrasonography may help these patients receive the right care and prevent misdiagnosis.

CONCLUSION

It has been demonstrated that ultrasound imaging plays a supporting role in the diagnosis and follow-up of Achilles tendon rupture cases. Therefore, it is advised to rely on the clinical examination and assessment along with the use of imaging to rule out additional injuries and provide further clinical information.

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