
Non -Traumatic Cause of Achilles Tendon Rupture - A Case Report

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1. Introduction

The Achilles tendon rupture is a complete or partial tear that occurs due to stretching of the tendon beyond its capacity. It is the most frequently ruptured tendon in the human body [1]. It was first described by Ambroise Pare in 1575 and was first documented in medical literature in 1633 [1]. It accounts for nearly 40% of all operative tendon repairs [2]. Spontaneous non-traumatic rupture of the Achilles tendon is uncommon but can occur with long-term use of systemic corticosteroids, fluoroquinolones, or both [3]. Achilles tendon rupture or tears can be acute or chronic. These tears span from microtears to interstitial tears, to partial and then complete tears [4]. The Achilles tendon tears are frequently seen secondary to sports-related injury. However, spontaneous non-traumatic rupture of the Achilles tendon can occur in elderly patients [5].

About 24% of acute Achilles tendon ruptures are missed by clinicians particularly, in older patients or patients with a high body mass index whose causative factor is not related to sports. The use of imaging improves the diagnosis and is also important in the planning of surgical treatment as rupture of the Achilles tendon is a serious condition that can lead to significant morbidity. The pathology is reported highlighting the atypical presentation as there was no history of trauma preceding the rupture of the Achilles tendon and the importance of imaging in improving clinical practices as well as patient care.

2. Case Report

Mr. A.P., a 75-year old retired civil servant, was presented to the hospital with a 3- day history of sharp, aching pain in the right foot. The pain was persistent and not relieved by analgesics. There was associated swelling of the foot and difficulty with walking. There was no history of trauma.

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Past medical and drug history revealed that he was being managed as a case of carcinoma of the prostate and has been on hormonal drugs (goserelin acetate implant, bicalutamide tablet) for ten years. He is also on prednisolone tablets, which he has taken for waist pains for more than ten years. He had taken a course of quinolone antibiotics (ciprofloxacin) for ten days. His blood group was O Rhesus positive.

On physical examination, the patient was afebrile, anicteric, and not pale. Musculoskeletal system examination revealed mild swelling and tenderness over the posterior aspect of the right ankle, with limitation of dorsiflexion, plantar flexion, adduction, and abduction. Thompson's squeeze test was positive. Pulse rate and blood pressure were normal. Neurological examination was unremarkable. A plain radiograph and magnetic resonance imaging (MRI) of the right ankle, were ordered and the results of were reviewed.

A plain radiograph of the right ankle demonstrated a soft tissue swelling and obliteration of the pre-Achilles fat pad (Kager's triangle). Ankle mortise was maintained. No fracture was seen, however there was soft tissue fullness around the ankle joint. We made an impression of an Achilles tendinopathy.

On MRI, the sagittal T2W image showed complete disruption of the Achilles tendon fibers, with a large gap filled with high signal edema. The ends of the tendon are thickened and retracted. The gap measured about 3.96 cm, making it a type 3 tear (FIG. 1-4). A diagnosis of right Achilles tendon rupture was made. Treatment involved a conservative approach because of the patient's age and immune status as the patient was immobilized using functional bracing. The ruptured Achilles tendon has gradually healed on follow-up.

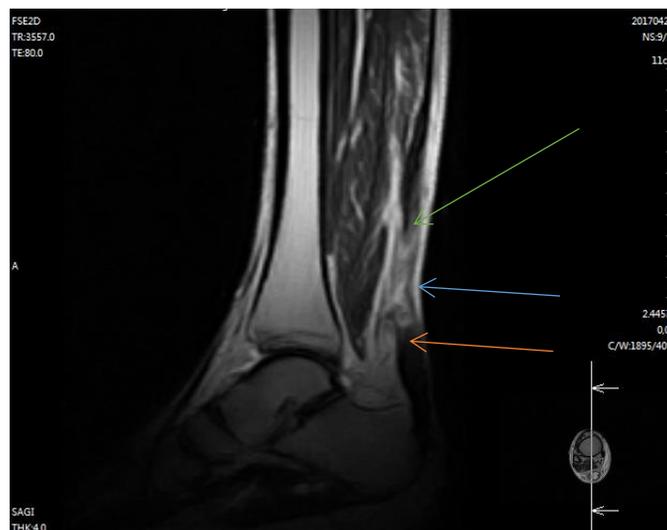


FIG. 1. Sagittal T2W MRI of the right lower extremity image showing complete disruption of the Achilles tendon fibres, with a large gap filled with high signal oedema. Blue arrow showing the defect, red arrow showing the distal stump and orange arrow (proximal stump).

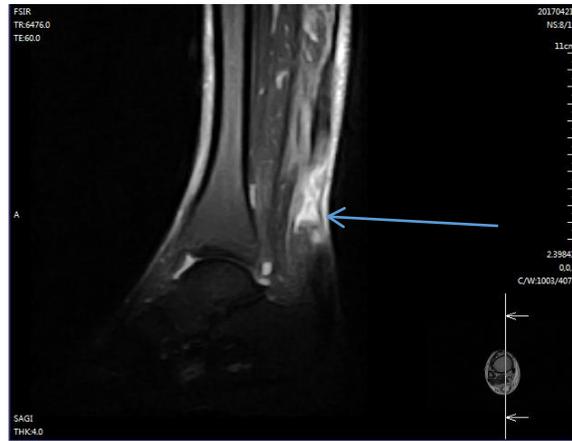


FIG. 2. Short tau inversion recovery image of the right lower extremity showing high signal intensity due to oedema. (Blue arrow).



FIG. 3. Coronal T2W MRI image of the right lower extremity showing complete disruption of the Achilles tendon fibers, with a large gap filled with high signal oedema.

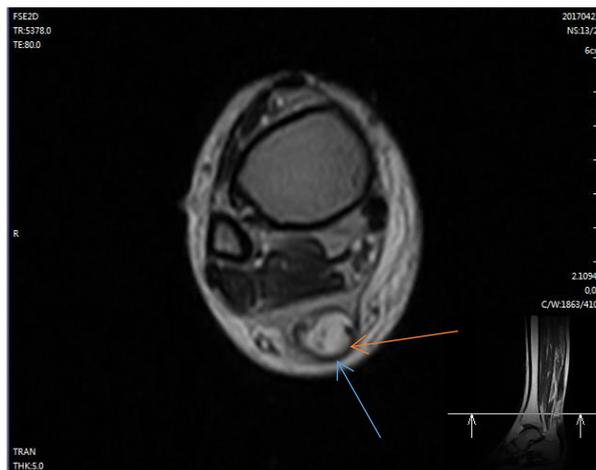


FIG. 4. Axial T2W MRI image of the right lower extremity through the defect showing increased signal intensity due to edema. The plantaris tendon is however intact. (Red arrow).

3. Discussion

Achilles tendon rupture has an incidence of 2.66 ruptures per 1000 persons-years or about 18(8.3-24) per 100,000 populations in the United States. In Nigeria, its incidence is unknown due to poor documentation. Achilles tendon rupture is mostly seen in men with a male- to -female ratio of 5:1 [6]. The index patient was however a male. Its occurrence has been seen more in the middle- aged group, however our patient was elderly.

The etiology of Achilles tendon rupture is multifactorial. However, the risk factors associated with Achilles tendon tears include diabetes mellitus, intratendinous steroid injection, systemic inflammatory diseases such as rheumatoid arthritis, systemic lupus erythematosus, etc., repeated microtrauma, gout, hyperparathyroidism, ochronosis, antihypertensives, and fluoroquinolone antibiotics. The Achilles tendon rupture may occur on one or both sides. Our patient had a unilateral rupture of the right Achilles tendon and had the following risk factors; male gender, diabetes, long-term corticosteroid use, and age over 70(elderly).

Non-traumatic rupture of the Achilles tendon has been documented with rheumatoid arthritis, chronic kidney disease on dialysis, gout, and renal transplantation. Drugs such as quinolones and long-term systemic corticosteroids have also been implicated as contributing factors to Achilles tendon rupture. A study by Newnham and his colleagues documented that Achilles tendon rupture was seen in patients on long-term oral corticosteroids for chronic airway obstruction and none was reported among patients with chronic airway obstruction not receiving oral corticosteroids [3].

The mechanism of steroid-induced Achilles tendinopathy is not fully understood however there may be a suppressed repair mechanism of partially injured tendons after movement leading to a complete rupture [7]. Another proposed theory of steroid-induced Achilles tendinopathy is a reduction in the tensile strength of the tendon due to collagen fibril dysplasia [8]. Disruption of the normal healing process by steroids may eventually lead to the rupture of a diseased tendon [7].

Patients present with sudden onset of pain, swelling at the back of the heel, and difficulty with walking as seen in the index patient.

Commonly, most ruptures occur in the avascular zone of the tendon which is usually 2 cm - 6 cm from its insertion point [9]. This was demonstrated in our patient. Atypical locations can occur, and it could be proximal or distal insertional tears. Proximal tears are more common than distal insertional tears [7]. Partial tears are tears that not involve all of the tendon fibers but may extend to the surface whereas complete tear or rupture involves the entire cross-section of the tendon with a gap between the retracted torn ends of the tendon. Our patient had a complete tendon tear. Achilles tendon rupture was classified into 4 groups by Kuwada in 1990 [10]. This classification was based on the severity of the tear and the degree of retraction. Type 1: Partial rupture $\leq 50\%$. Type 2: Complete rupture with tendinous gap ≤ 3 cm. Type 3: Complete rupture with a tendinous gap of 3 cm - 6 cm. Type 4: Complete rupture with a defect of >6 cm (neglected ruptures). Our patient had a type 3 complete rupture with a tendinous gap of 3.96 cm.

Diagnosis of Achilles tendon rupture is clinical however imaging modalities such as an ultrasound and magnetic resonance imaging (MRI) may aid diagnosis and also in preoperative planning when surgical intervention is indicated [1]. Plain radiographs may show soft tissue swelling and obliteration of the pre-Achilles fat pad (Kager's triangle) which are indirect signs of pathology involving the Achilles tendon. These findings were noted in our patient. Plain radiographs may also show calcaneal spurs or tendon calcification.

Magnetic resonance imaging with its high soft tissue contrast resolution is useful in the assessment of the preoperative and postoperative conditions of the Achilles tendon [1]. Complete rupture is usually seen as a tendinous gap occupied with blood or oedema which appears as high signal intensities on T2W images. This was noted in our patient. The retracted ends of the tendon are usually demonstrated in complete tears. Ultrasound scan will show a separation of the torn tendon ends with an associated change in the contour of the tendon in full-thickness tear [11]. The margins of the tear may have acoustic shadowing due to sound beam refraction and associated hypoechoic areas indicative of tendinosis. A partial-thickness tear will still show intact fibers; however, the tendon may be enlarged greater than 1 cm and contain abnormal hypoechoic or anechoic areas indicative of the tear. They may be associated with adjacent tendinosis which is seen as a loss of the regular linear pattern of the tendon architecture with heterogeneous areas [7]. Color and power Doppler sonography may be useful in defining the margins of an acute tendon tear.

Treatment includes a surgical and a non-surgical or conservative approach [12]. The selection of treatment options however depends on the patient's age, level of activity, and other risk factors such as diabetes mellitus. The conservative treatment involves immobilisation with rigid casting or functional bracing, and this was done for the index patient.

4. Conclusion

Early recognition of the imaging findings is important as a delay in diagnosis has a detrimental effect on the prognosis.

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