

Insertional Achilles Tendinopathy:
A Novel Approach to Diagnosis and
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Abstract

Retrocalcaneal pain is a common presenting complaint, which can lead to severe limitation of function. It is commonly due to pathology involving the Achilles tendon or inflammation of the so called retrocalcaneal bursa. Both these sites are frequent targets of medicinal injections. In some cases though, despite these measures, the problems persist. We present a series of cases whereby the symptoms were caused by fibrotic tissue in a poorly described region between the Achilles tendon and the calcaneus. We include relevant imaging to highlight the pathology.

Introduction

Retrocalcaneal pain and irritation is frequently related to the Achilles Tendon (AT) and the surrounding structures. It can be of multifactorial origin and careful clinical examination, supported by appropriate imaging is necessary in order to make the correct diagnosis and thus offer prompt and adequate treatment. In a minority of cases, conservative treatments such as orthotic devices, physiotherapy, imaged guided injections or extra corporeal shockwave treatment fail to fully eradicate the problem. In such cases, surgical intervention is often sought.

Case Presentation

A thirty two year old elite long distance runner presented to the senior author's outpatient clinic complaining of an 18 month history of posterior ankle and retrocalcaneal pain. He had no other significant medical history, a normal BMI and was a non smoker. He had no history of trauma. The pain did not resolve despite recurrent and prolonged periods of rest. He underwent a variety of other conservative treatment options such as orthotic devices, changes in footwear and training regimens, specialized physiotherapy input and anti inflammatory tablets. A plain radiograph did not reveal any abnormalities, specifically no evidence of a large Haglund's deformity. A subsequent Ultrasound Scan (USS) revealed micro tears at the insertion of the AT with evidence of retrocalcaneal bursitis. On two separate occasions, 1 month apart, the area was injected with a platelet rich plasma injection. This resulted in temporary relief of the pain but still inability of the patient to return to his desired activity and training level. Despite subsequent USS showing that the tear was healing, he proceeded to have a Magnetic Resonance Image (MRI) scan of the ankle which showed evidence of insertional Achilles tendinopathy, with intra-substance degeneration at the insertion of the of the tendon to the calcaneus and associated bone marrow oedema at the posterior calcaneal tuberosity. In view of the ongoing symptoms, the patient was carefully consented for a posterior ankle arthroscopy with a view of possible debridement of scar tissue or a bony spur/Haglund deformity that may be irritating the insertion of the tendon.

Intra-Operative Findings

Endoscopy was performed through two posterior ankle portals. There was evidence of minimal scarring and a small Haglund's deformity of the posterosuperior calcaneum, which were debrided with an arthroscopic shaver. Elevation of the AT away from the posterior calcaneal tuberosity revealed no obvious retrocalcaneal bursa, but a large 'space' between the bone and the tendon (Figure 1). Aside from scar tissue within this region, there was clear evidence of a cartilage like 'cap' covering the posterior cortex of the calcaneus and in direct contact with the most distal region of the AT. The scar and fibrotic tissue within this space was not allowing the distal aspect of the AT to glide and slide smoothly. This area was completely debrided with a shaver and the AT was then able to glide and move normally (Figure 2). The patient was referred to physiotherapy post operatively. He had an immediate resolution of his symptoms and was able, within a few weeks, to return to his training regimen and recreational activities. Specifically, plantar flexion returned to a normal range

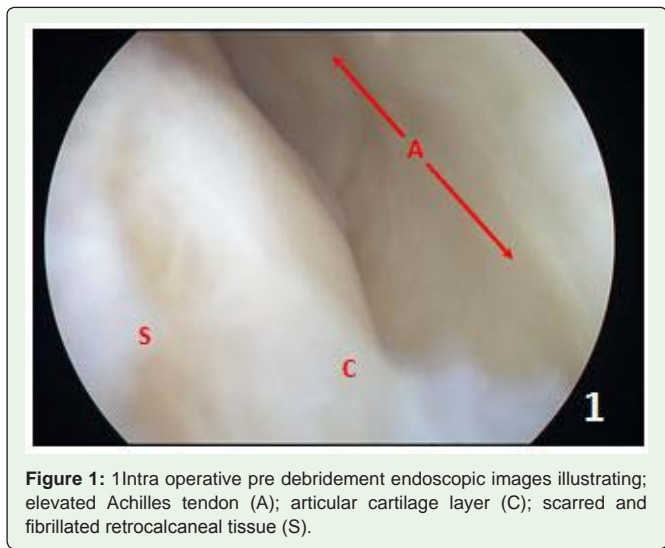


Figure 1: 1Intra operative pre debridement endoscopic images illustrating; elevated Achilles tendon (A); articular cartilage layer (C); scarred and fibrillated retrocalcaneal tissue (S).

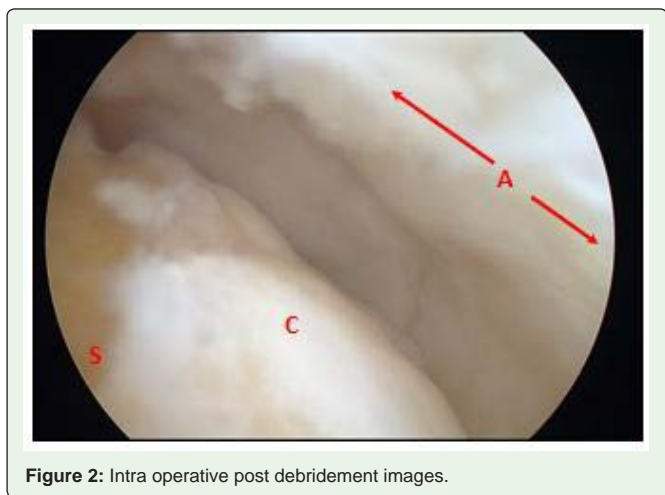


Figure 2: Intra operative post debridement images.

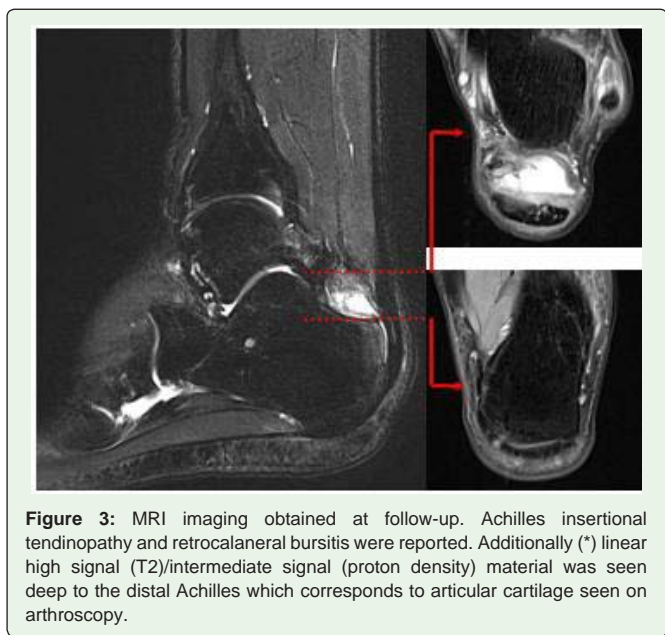


Figure 3: MRI imaging obtained at follow-up. Achilles insertional tendinopathy and retrocalaneral bursitis were reported. Additionally (*) linear high signal (T2)/intermediate signal (proton density) material was seen deep to the distal Achilles which corresponds to articular cartilage seen on arthroscopy.

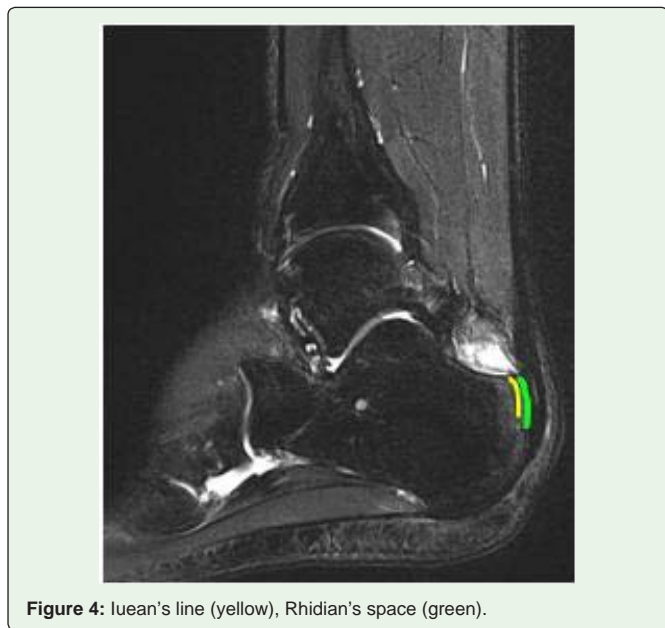


Figure 4: Iuean's line (yellow), Rhidian's space (green).

of movement within two weeks. The patient returned to training at 6 weeks.

Retrospective Review of the MRI

Following this procedure, the patient was presented at our local radiology multidisciplinary meeting. A retrospective review of the pre-operative MRI scan revealed an intermediate signal layer over the posterosuperior calcaneum at the site of the cartilage cap found intra-operatively. Pre-operatively, this was thought to have been a sliver of fluid tracking down the cortex of the calcaneum. However, closer review showed that the signal projected from this area was high on T2 weighted series and intermediate on proton density weighted, consistent with articular cartilage (Figure 3).

Discussion

The tendinous portion of the gastrocnemius and soleus muscles merges to form the Achilles tendon, which is the largest and strongest tendon in the human body. Nomenclature has led to several terms that, although meaning separate and distinct entities, are often all used interchangeably and almost in a 'thesaurus type manner' to describe pain around the Achilles tendon. The term Tendinosis implies tendon degeneration without clinical or histological signs of intratendinous inflammation [1]. Tendinosis tends to affect all the component of the tendon, including the collagen, tenocytes, and extracellular matrix [2]. Tendinitis refers to involvement of the tendon itself, which should show inflammatory features [3]. It describes a clinical syndrome rather than a specific histopathological entity.

Since the case described in this article, the same patient has undergone an endoscopy on his contra-lateral limb for the same problem. Once again this 'space' between the bone and tendon was noted, in association with a cartilage cap. Arthroscopic debridement has led to a complete resolution of his symptoms. A pre-operative MRI scan revealed the presence of a cartilage layer in the retrocalcaneal space. To date, the senior author has performed such procedures, with similar findings, in eight patients who all describe immediate

post operative improvement and subsequent resolution of symptoms. An area that is frequently targeted for treatment of retrocalcaneal pain is the so-called retrocalcaneal bursa. This is an area that is frequently targeted radiologically in order to treat non-insertional Achilles tendon pain and irritation. Kachlik et al. [4] performed a cadaveric anatomical study of the retrocalcaneal bursa in 10 fresh and 30 embalmed lower limb specimens. The bursa was clearly identifiable in all specimens and covered by the adipose tissue of the distal part of Kager's triangle. Another constant finding was that of a synovial fold, 1-2 cm in length, filling a narrow wedged-shaped space between the upper posterior surface of the calcaneal tuberosity and the lower anterior surface of the Achilles tendon. The bursa volume was found to be around 1.0-1.5 ml. They also found that the entire surface of the retrocalcaneal bursa on the side facing the cortical bone was covered by a layer of fibrous cartilage, thicker on the bottom of the bursa, where it continued dorsally to the cartilaginous segment of the Achilles tendon attachment and the calcaneal tuberosity.

The authors have noted that in a significant minority of cases, during ultrasound guided injection of the retrocalcaneal bursal space, the injected steroid and local anaesthetic seem to dissipate into a 'space' rather than be contained within a bursal sac. MRI scans performed on these patients does tend to show a line tracking along the retrocalcaneal region which can be easily interpreted as fluid, but in fact represents the already described cartilage cap.

The senior author has performed endoscopic procedures on eight cases for this problem and has noticed this retrocalcaneal space and cartilage cap in all cases. We advocate that in cases of resistant

posterior ankle or AT pain, the MRI scans are scrutinized carefully to look for this characteristic line of cartilage that we refer to as 'Iuean's line'. If present, the aetiology of the pain may be due to the induced fibrosis between the cartilage and tendon, filling the retrocalcaneal space that we refer to as 'Rhidian's space' (Figure 4).

The authors are now undertaking a number of prospective studies to assess less invasive treatment methods in such cases. We hypothesize that if during an USS guided retrocalcaneal bursal injection there is evidence of the steroid/local anaesthetic cocktail dissipating down Rhidian's space, rather than being contained within the bursa, hydro dilation of this space is performed at the same setting. Furthermore, in cases when patients are referred from other parties for MRI scans of the ankle, the incidence of Iuean's line is noted and USS hydro dilation of that area is offered to the patient via the treating clinician. Should hydro dilation of Rhidian's space fail to resolve the symptoms, then an endoscopic assessment should be considered.

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