

Missed tendo achilles avulsion: the diagnostic pitfalls and challenges of late surgical fixation

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Citation

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Abstract

We report a case of calcaneal avulsion fracture in a 61-year old woman with history of ipsilateral lower limb weakness following tuberculosis meningitis at 19-years of age. Her fracture was missed at accident and emergency presentation despite pathognomonic plain radiographic features. Presenting via fracture clinic at four weeks she was treated by tendo-achilles re-attachment using bone anchor sutures to a more proximal site on the calcaneum. The authors review the literature, highlight indicators for clinical suspicion of this injury, and describe a technique for late surgical fixation.

INTRODUCTION

Ruptures of the Achilles tendon are more common than avulsion fractures of the os calcis. Bohler in 1958 first divided avulsion fractures of the os calcis into two subgroups [3]. The first, producing a triangular fragment tilted up at an angle, and the second, comprising a vertically displaced oval fragment. Avulsion fractures of the os calcis have been attributed to direct trauma [48] and neuropathy [2], with diabetes commonly being the underlying pathology.

We present a case of calcaneal avulsion fracture in a 61 year old lady with a history of ipsilateral lower limb weakness following tuberculosis (TB) meningitis at 19 years of age. We highlight the indications for clinical suspicion of this injury and describe a technique for late surgical fixation.

CASE REPORT

A 61 year old woman sustained injury to her right foot when she slipped down a couple of steps at home. She experienced immediate pain and swelling in the posterior aspect of her heel. She presented to accident and emergency (A&E) department 14-days later with persistent symptoms and difficulty walking. A radiograph (Fig. 1) was performed in A&E and a diagnosis of ankle sprain was made. The patient was advised rest, ice, elevation and compression.

Figure 1

Figure 1: Lateral plane radiograph of the hind foot at 14 days.



Demonstrates avulsion of the tendo-achilles with significant retraction of the bone fragment.

At fracture clinic assessment a further 2 weeks later, history revealed pre-existing ipsilateral lower-limb weakness following TB meningitis at age 19-years, and pre-injury independent mobility without aids though with some restriction. Examination demonstrated significant tenderness and swelling over posterior aspect of the calcaneum and

ankle with a positive Simmond's test. Avulsion injury of the tendo achilles was diagnosed and patient admitted for surgery.

Surgery was performed under general anaesthesia and thigh tourniquet control in the right lateral position via dorsomedial skin incision. Significant retraction of the tendo achilles was noted and a more proximal re-insertion site was prepared (Fig. 2) with osteotome, recessing the os calcis to accommodate the debrided tendo achilles insertion.

Figure 2

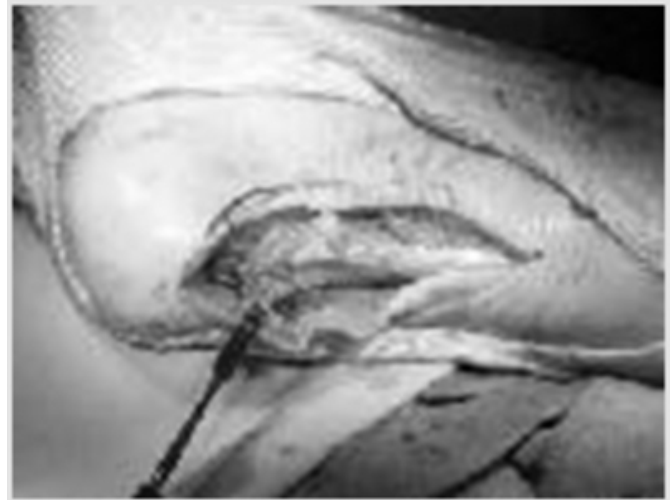
Figure 2: Operative photograph. Avulsion site of the os calcis is marked with arrow-1; the prepared proximal insertion site (arrow-2); and the debrided avulsion fragment (arrow-3).



Fixation was achieved using two distal 5.0 mm corkscrew suture anchors (Arthrex, Naples, FL 34108-1945, Unites States) and a single more proximal 5.0 mm corkscrew parachute II tissue anchor (Arthrex, Naples, FL 34108-1945, Unites States) (Fig 3.).

Figure 3

Figure 3: Operative photograph. Depicts the re-attached tendo achilles.



Wound was closed with continuous 2/0 vicryl suture to paratenon and continuous running 2/0 nylon suture to skin. Plaster of Paris back slab was applied in the equinus position and patient mobilized with crutches non-weight bearing on operated side.

Skin sutures were removed at two weeks from surgery and continued non-weight bearing for four weeks in full equinus below knee lightweight cast, followed by four weeks mid equinus, and two week neutral position fully weight bearing. Following plaster removal and continued physiotherapy the patient made excellent progress and at final clinic review at six months from surgery had regained full level of pre-injury activity and had no problems with the wound or fixation.

DISCUSSION

Bohler divided avulsion fractures of the os calcis into two subgroups [3]. The first, producing a triangular fragment tilted up at an angle, and the second, comprising a vertically displaced oval fragment, as seen in the case we describe.

In our case despite clinical signs and pathognomonic plain radiographic features the diagnosis was initially missed, possibly due to a combination of poor anatomical knowledge and a lack of clinical suspicion. At fracture clinic assessment Simmond's test was positive, and though uncertain if prompt diagnosis in A&E could have affected management or outcome, time to definitive treatment was delayed. Other authors have alluded to the diagnostic benefit of radiographs in suspected achilles tendon injuries in the older and at risk patient [510]. Lateral plain radiograph of the foot is a useful

investigation to identify significant osteopaenia of the calcaneum [1], which may predispose to this injury, and to establish the level of injury and degree of displacement which may affect management. Clinicians should be vigilant of this injury particularly in older patients, and those at risk of osteoporosis.

In our case anatomic re-attachment to the original calcaneal avulsion site was deemed inappropriate due to tension on such a repair and risk of wound problems. The proximal re-attachment site in our case was at a comparable level to the anomolus proximal calcaneal insertion observed in 20% of cadaveric heels [7].

Achilles tendon re-attachement using anchor sutures has been shown to be safe and effective [9]. In a cadaveric study assessing cantilever load and mode to failure use of two bone anchors had significantly better load resistance than one anchor alone, and no significant improvement using two or three anchors [6]. As our patient demonstrated osteopaenia of the calcaneum we used three anchor sutures in an isosceles triangle configuration with apex proximal.

This case highlights the need for early clinical suspicion, appropriate clinical examination, and a lateral radiograph of the ankle in order to avoid undue delay in diagnosis and to provide the best possible outcome. Authors believe the described technique of achilles tendon re-attachment to a more proximal site offers a safe and effective treatment in those patients who may present late following this injury.

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