

Case report

Chronic Achilles tendon rupture reconstructed using hamstring tendon autograft

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HIGHLIGHTS

- Large chronic defects in the Achilles tendon are challenging to treat surgically.
- Ipsilateral semi-tendinosis autograft allows for satisfactory reconstruction.
- Patient reported outcomes at one year are favourable.

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ABSTRACT

Background: Chronic rupture of the Achilles tendon (delayed diagnosis of more than 4 weeks) can result in retraction of the tendon and inadequate healing. Direct repair may not be possible and augmentation methods are challenging when the defect exceeds 5–6 cm, especially if the distal stump is grossly tendinopathic.

Methods: We describe our method of Achilles tendon reconstruction with ipsilateral semitendinosis autograft and interference screw fixation in a patient with chronic rupture, a 9 cm defect and gross distal tendinopathy.

Results: Patient reported outcome measures consistently demonstrated improved health status at 12 months post surgery: MOXFQ-Index 38–25, EQ5D-5L 18–9, EQ VAS 70–90 and VISA-A 1–64. The patient was back to full daily function, could single leg heel raise and was gradually returning to sport. No complications or adverse events were recorded.

Conclusion: Reconstruction of chronic tears of the Achilles tendon with large defects and gross tendinopathy using an ipsilateral semitendinosis autograft and interference screw fixation can achieve satisfactory improvements in patient reported outcomes up to 1 year post-surgery.

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1. Introduction

A chronic Achilles tendon injury is defined as that presenting 4 weeks after the initial event [1]. By this time healing will have occurred, with scar tissue bridging the gap between the tendon stumps [2]. If this results in an elongated tendon, the function of the gastro-soleus musculotendinous complex will be poor. A host of biomechanical studies over the last century have illustrated that active muscle units display a parabolic force-length relationship. This force is generated by the active contractile material and is greatest over a limited range of muscle lengths and decreases for lengths outside this range [3]. Thus the shortening

of the gastro-soleus muscle complex reduces its ability to contract. This can have a profound effect on the patients gait. Studies on the function of the gastro-soleus complex reveal its main function to be in controlling the forward progression of the body's centre of mass [4]. Preventing ankle movement does not influence this in dysfunctional musculotendinous units [1,4]. Thus, in patients that have a resulting lengthened Achilles tendon following a chronic rupture, surgical treatment is usually preferred to orthotic management.

Surgical treatment of chronic tendoachilles ruptures is complex. A number of techniques have been described, depending on defect size. Ruptures of less than 2 cm are amenable to direct tendon repair [5]. For defects larger than 2 cm surgeons may consider a V-Y advancement, augmentation of the repair with adjacent tendons (flexor hallucis longus or peroneus brevis), free autograft (fascia lata, plantaris, patellar and medial hamstring tendons) or indeed allograft (cadaveric and synthetic). We present our method

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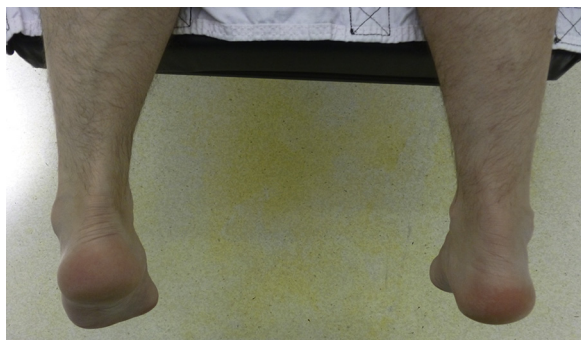


Fig. 1. Relative dorsiflexion of the right ankle due to elongation of the chronically ruptured Achilles.

of Achilles tendon reconstruction with ipsilateral semitendinosis autograft and interference screw fixation in a patient with chronic rupture, a 9 cm defect and gross distal tendinopathy.

2. Case report

A 44-year old male presented to outpatient clinic 5 months following suffering a direct blow to his right Achilles tendon whilst playing rugby. The severity of this injury forced him to cease playing immediately and despite obvious and debilitating symptoms, his presentation to hospital was significantly delayed. He had no significant past medical history, and was not taking regular medication. He worked as an academic Professor and enjoyed competing in sporting activity. On assessment, the patient's gait pattern was markedly abnormal with a failure to progress through his 3rd rocker on the right hand side (toe off). Gastrocnemius muscle atrophy and mild oedema within the lower leg were observed. Simmonds–Thompson test was positive and there was a palpable defect of normal tissue within the tendon, approximately 5 cm proximal to its insertion onto the calcaneus, extending over a significant distance. His plantarflexion power was markedly reduced in keeping with a defuncted tendoachilles complex. There was relative dorsiflexion of the affected limb on kneeling (Fig. 1). An MRI was obtained, which confirmed the chronic rupture, and also indicated no fatty infiltration within the Gastrocnemius or Soleus muscles (Fig. 2).

The patient was operated on under general anaesthesia and also had a popliteal local anaesthetic nerve block. The patient was positioned prone with his heel over the edge of the table so that the correct tension of the Achilles could be correctly ascertained. A thigh tourniquet was used.

A posterior approach, just medial to the midline, was made from proximal to the musculotendinous junction to the insertion. The paratenon was dissected free of the Achilles and the plane fully developed. The tendon was grossly fibrotic in the area of rupture with fulminant distal tendinopathy (Fig. 3). The entire distal tendon was therefore excised up to healthy margins proximally.

Hamstring autograft was harvested from the ipsilateral knee. A vertical incision was made opposite the tibial tubercle, midway between the tibial tubercle and the posterior border of the tibia over the pes anserinus. A vertical incision was made in the fascia. The semitendinosus tendon was identified. It was divided distally and whip stitch inserted. All adhesions were freed. An open stripper was used to harvest the tendon. The tendon was pre-tensioned to 10 pounds for 20 min.

A wire was passed from the superior calcaneum, as close to the insertion of the Achilles as possible, exiting through the heel. This was over drilled to 7 mm. The hamstring graft was passed through the proximal stump 3 cm from its end. The double-strand of semitendinosus was passed through the drill hole and pulled to

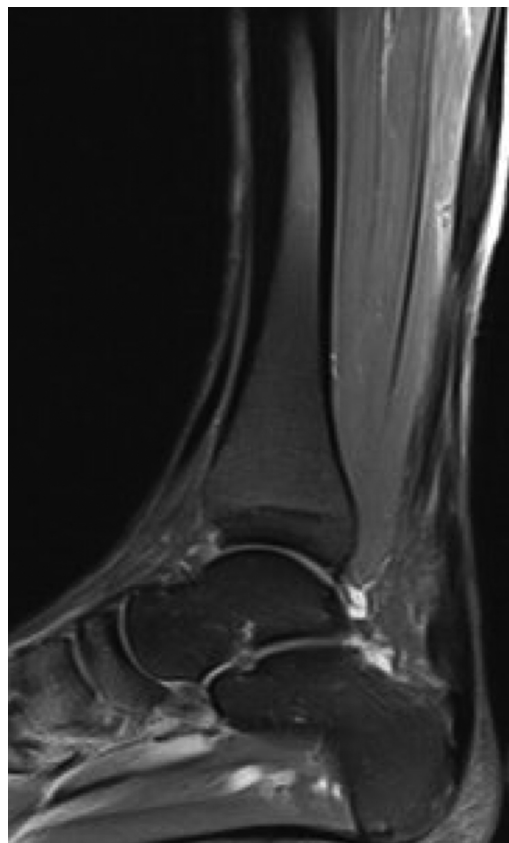


Fig. 2. MRI showing chronic rupture and the absence of fatty intramuscular infiltration.

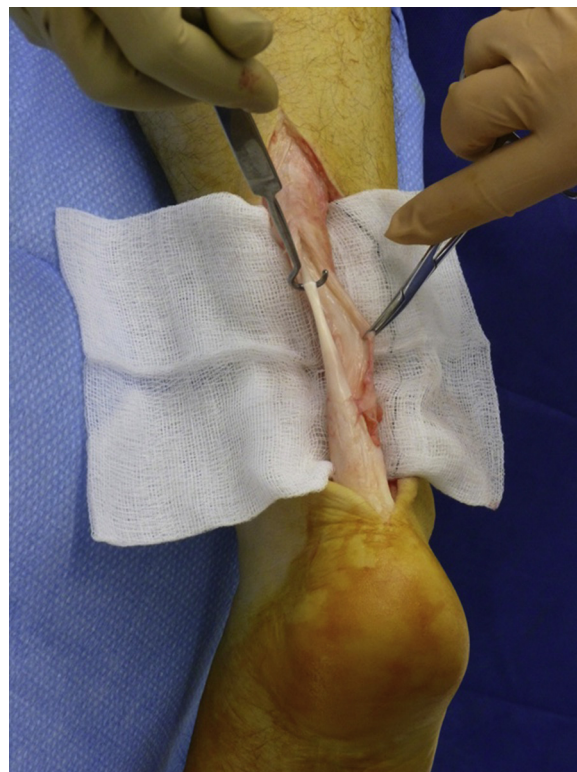


Fig. 3. Grossly tendinopathic elongated tendon with multiple tears and an intact plantaris.

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