

## Case report

## An atraumatic case of extensive Achilles tendon ossification



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## ABSTRACT

**Background:** Ossification of the Achilles tendon is rare with most cases of ossification or calcification consisting of small, focal lesions. This pathology is usually predisposed by surgery, trauma, or other factors.

**Case description:** A case of extensive Achilles ossification and calcification, without prior surgery or trauma, is reported. Following removal of one of the largest ossific masses reported in the literature, measuring 11.0 cm × 2.5 cm × 2.0 cm with additional 6.5 cm calcifications, surgical reconstruction was required.

**Purpose and clinical relevance:** The objective of this report was to describe an unusual case of Achilles tendon ossification and calcification that occurred without the presence of predisposing factors. When a large gap is present after removal of the ossification, direct repair may be impossible and V-Y lengthening plus flexor hallucis longus (FHL) transfer is a viable option for pain relief and return to function.

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## 1. Introduction

Ossification of the Achilles tendon is rare with most cases consisting of small focal lesions that occur following surgery or trauma. The first Achilles tendon ossification was documented by Ghormley in 1938 in a single case report with review of 21 cases [1]. In a review published in 2008 by Richards et al. [2], most reports of surgical treatment did not require reconstruction, due to the small size of ossific lesions. The largest ossification reported to date, to the author's knowledge, measured 10 cm in length [3,4].

The case presented demonstrates a lesion of 11 cm in length plus two smaller lesions of an aggregate 6.5 cm in length. This manuscript presents clinical features and imaging of an atraumatic case of heterotopic ossification with dystrophic calcification in the Achilles tendon and discusses possible etiology and the various surgical options used to treat this phenomenon.

## 2. Case report

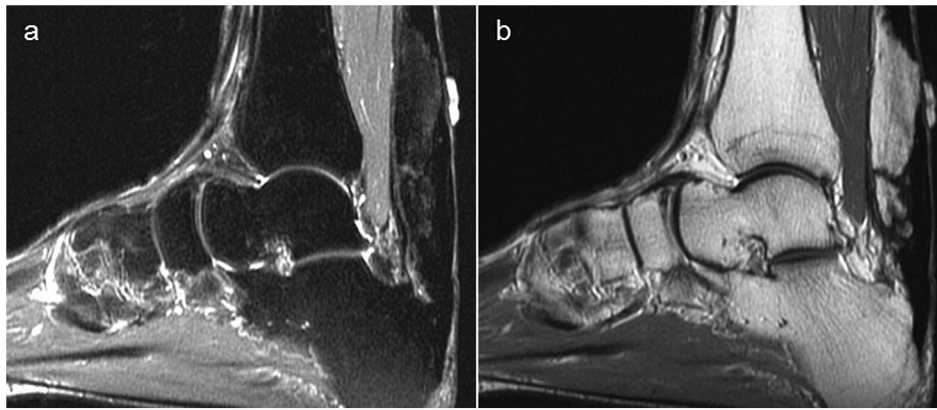
A 57-year-old female presented to our clinic with complaints of pain and swelling of the right Achilles tendon. The patient's pain

was exacerbated by any activity and was hindering her athletic pursuits as a recreational runner. In association with the pain the patient described a peculiar sensation of “popping” along the back of her calf. Rest most often, but not always, alleviated the pain. The patient had been symptomatic for 10 years but had declined any treatment at an outside facility. Since this time she had undergone physical therapy but her condition had become progressively worse to the point that she had become debilitated. There was no incidence of trauma nor was there any relevant medical or surgical history. Her athletic activities were limited to recreational exercise including running and yoga.

Upon examination, a longitudinal fusiform swelling was noted 3 inches proximal to the Achilles tendon insertion and extending roughly 6 inches proximally. The patient had a tight gastrocnemius–soleus complex with a sagittal range of motion of 10 degrees, and walked with a mild antalgic gait. A magnetic resonance imaging investigation was ordered utilizing a combination of T1, high-resolution proton density, fat suppressed T2 weighted, and fast spin echo inversion recovery sequences. Imaging revealed a fusiform thickening of the Achilles tendon and a large lobular focus of ossification within the tendon. Measurement of the ossification on MRI was 9.5 cm cranial caudally by 1.7 cm anterior posteriorly × 2.2 cm transversely with no evidence of retrocalcaneal bursitis (Figs. 1–3). Following discussion with the patient, surgery was in the form of removal of the heterotopic ossification followed by evaluation of the tendon to determine whether or not the

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**Fig. 1.** Sagittal T2 weighted (a) and proton density (b) magnetic resonance images of the right ankle. Extensive heterotopic ossification measured 9.5 cm (craniocaudal) by 1.7 cm (anteroposterior).

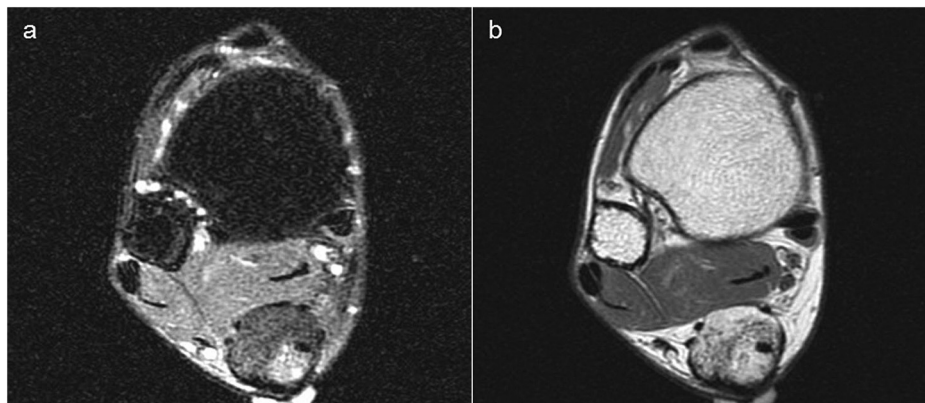
tendon would be viable in of itself or whether a flexor hallucis longus (FHL) tendon transfer would be required.

The surgical procedure consisted of a longitudinal incision extending proximally from the calcaneus made in the posterior aspect of the heel approximately 10 cm in length. The Achilles tendon was revealed to have extensive ossification, degenerative fraying, and loss of normal architecture throughout nearly the entire length of the tendon (Fig. 4). At this point the two ends of the tendon were trimmed of scar tissue and the ossified section of the tendon was removed. After the ossified portion of the tendon was resected, a gap extending 10 cm remained between the proximal and distal ends of the Achilles tendon. In order to bridge the gap a V-Y lengthening and a transfer of the FHL tendon was required. Additionally, a large Haglund's exostosis and retrocalcaneal bursa were excised. The FHL was released from the position distal to the knot of Henry then brought out posteromedially, passed through a transverse drill hole in the posterior aspect of the calcaneus, and tenodesed to the V-Y lengthening from the original Achilles tendon. The distal stump of the FHL was tenodesed to the flexor digitorum longus (FDL). The more proximal aspect of the FHL tendon was also tenodesed to the proximal Achilles (Fig. 5). The tenodesis of the FHL to the remaining Achilles tendon was performed using Pulvertaft weave with 2-0 Fiberwire (Arthrex, Inc, Naples, FL, USA) [5]. The procedure was concluded with injection of concentrated bone marrow aspirate (CBMA) harvested from the iliac crest and platelet-rich plasma (PRP) into the repaired tendon, with the paratendon then closed over the repaired tendon.

Three portions of the tendon were sent to pathology for analysis. Two of these specimens were glistening white tissue

measuring an aggregate  $6.5 \text{ cm} \times 2.0 \text{ cm} \times 1.5 \text{ cm}$  in the greatest dimensions. The other specimen was tan and yellow bony tissue with dense soft tissue measuring  $11.0 \text{ cm} \times 2.5 \text{ cm} \times 2.0 \text{ cm}$  in its greatest dimensions. Radiographic and photographic images of the larger specimen are provided in Fig. 6. Microscopically the specimens appeared to be fragments of tendinous tissue demonstrating extensive necrosis with a slight degree of vascular infiltration and extensive ossification that occurred within previously calcified tendinous tissue (Figs. 7 and 8).

The patient first returned two weeks postoperatively with no significant pain but some throbbing and aching when in a dependent position. The wound was clean and intact and healed without complication. A below knee tri-laminar plaster cast was applied with the ankle in 20 degrees of plantar flexion and weight bearing was not allowed for the initial 4-week post-operative period. At four weeks the cast was reapplied to place the ankle in 10 degrees of plantar flexion and patient remained non weight bearing. At the six-week postoperative time point, the cast was removed and the patient was put in a controlled ankle movement (CAM) boot and allowed to place 10% of their weight on the affected leg. At 10 weeks the patient was pain free and reported continual improvements since time of operation with slight discomfort likely caused by the compression of the boot. Some slight tenderness remained around the heel and dorsiflexion was limited, however, no pain was experienced within this limited range. A single heel-rise test was performed ten weeks postoperatively. The patient was able to achieve heel-rise without pain until at maximum plantarflexion. Once the patient was at highest achievable heel rise there was tenderness through the posterior



**Fig. 2.** Axial T2 weighted (a) and proton density (b) magnetic resonance images of the right ankle. Heterotopic ossification measured 2.2 cm (transverse) by 1.7 cm (anteroposterior).

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