



Management of Chronic Insertional Achilles Tendinopathy Using Flexor Hallucis Longus Tendon Transfer in Patients Over 50 Years of Age: A Four-Case Series Following the CARE Guidelines

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Case Report

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Abstract

Introduction: Chronic insertional Achilles tendinopathy is a debilitating condition, particularly in patients over 50 years of age, due to progressive degenerative changes. When conservative management fails, transfer of the flexor hallucis longus (FHL) tendon has emerged as a reliable surgical option. This study aimed to describe the surgical technique and present clinical outcomes in four patients, in accordance with the CARE guidelines.

Results: Four female patients (51-71 years) with chronic insertional Achilles tendinopathy unresponsive to conservative treatment underwent calcification resection, distal Achilles tendon reinsertion, and FHL transfer. At 12 months, all patients showed marked clinical improvement, with pain resolution, restored plantarflexion, and significant gains in AOFAS (American Orthopaedic Foot and Ankle Society) scores.

Conclusion: FHL tendon transfer for chronic insertional Achilles tendinopathy in patients over 50 provides excellent functional recovery, substantial pain relief, and demonstrates a favourable safety profile with no major complications.

Keywords: Substantial Pain Relief; Physical Therapy; Surgery; Mobilization

Introduction

Chronic insertional Achilles tendinopathy causes significant pain and functional impairment, associated with weakness of the posterior muscle group [1]. In patients over 50 years of age, the Achilles tendon shows increased degenerative and inflammatory changes [2]. Flexor hallucis longus (FHL) tendon transfer, combined with Achilles tendon debridement and partial calcaneal tuberosity osteotomy, improves plantarflexion strength [3], effectively fills tendon

substance loss [4], and provides well-vascularized tissue to the critical avascular zone located 2-6 cm proximal to the calcaneal insertion, promoting graft integration [5]. Some studies report significant functional improvement following FHL augmentation [2,6], while others show comparable outcomes without augmentation [3]. In this case series, we focused on the FHL augmentation technique in patients over 50 years, with a 12-month follow-up. Informed consent was obtained, and reporting adhered to SCARE guidelines [7].

Case reports

Case 1

A 71-year-old female presented with a two-year history of chronic right heel pain, associated with persistent gait impairment. Radiographs and MRI performed two years prior

revealed a calcific insertional Achilles tendinopathy of the right tendon (Figure 1). Clinical examination demonstrated tenderness at the Achilles tendon insertion, posterior swelling, and plantarflexion deficit. The preoperative AOFAS score was 45.

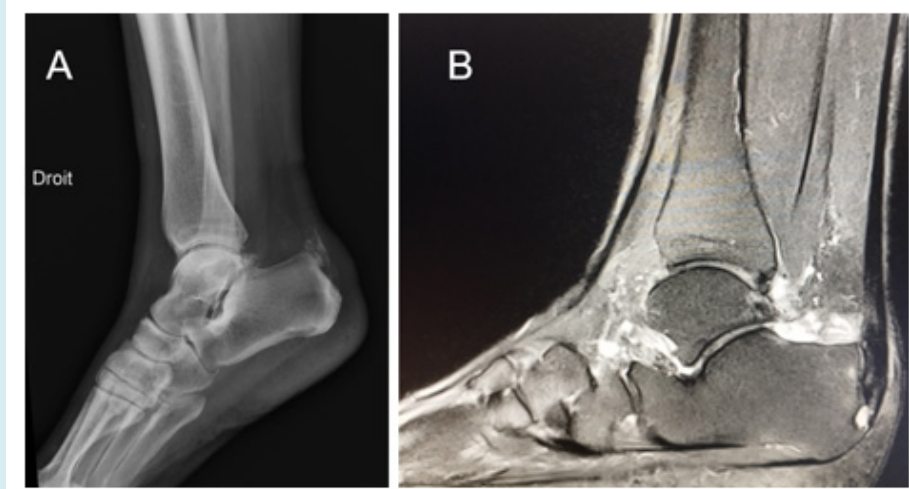


Figure 1: Lateral radiograph showing an opacity in the posterosuperior aspect of the calcaneal tuberosity (A), and right ankle sagittal DP Fat Sat MRI demonstrating hyperintensity within the tendon at its insertion site (B), suggestive of insertional Achilles tendinopathy.

Following failure of conservative management, the patient underwent calcification excision with distal Achilles tendon reinsertion combined with the FHL tendon transfer under general anesthesia, in the prone position with a thigh tourniquet. Via a medial para-Achilles approach, the tendon sheath was opened, the Achilles tendon detached, and the calcific lesion excised. The FHL tendon was identified, looped, and sectioned distally with the ankle in equinus (Figure 2). A 6-mm blind tunnel was drilled anterior to the native Achilles insertion, and the graft was fixed using an interference

screw. The Achilles tendon was reinserted posterior to the graft on four anchors using a double-row speed-bridge construct. Postoperatively, the limb was immobilized in a non-weight-bearing equinus cast for three weeks, followed by a removable boot with weight-bearing. Physical therapy focusing on ankle mobilization was initiated at six weeks. At six months, plantarflexion was restored, gait was pain-free, and AOFAS scores were 82 and 99 at six and twelve months, respectively (Figure 3).

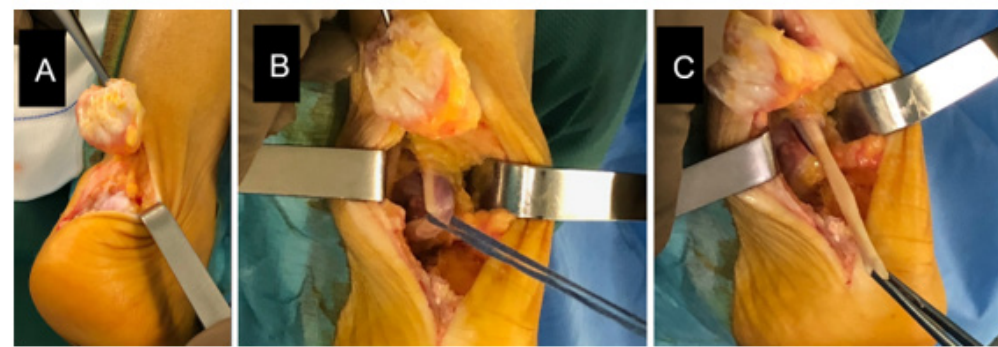


Figure 2: Detachment and elevation of the Achilles tendon followed by resection of the calcification (A), whipstitching of the FHL tendon (B), and distal transection with the foot in equinus (C).



Figure 3: Passage of the graft through the blind tunnel and fixation with an interference screw (A), Achilles tendon reinsertion on anchors using a double-row suture technique (B), and restored plantar flexion at 6-month follow-up (C).

Case 2

A 56-year-old female presented with chronic right hindfoot pain. The preoperative AOFAS score was 35. Initial imaging revealed a large calcification of the distal Achilles tendon, including its insertion. Surgical management consisted of calcification excision with distal Achilles tendon reinsertion combined with the FHL tendon transfer, performed by the same surgical team. Through a medial para-Achilles approach, the tendon sheath was opened, the Achilles tendon detached, and the calcification excised (4 cm longitudinal \times 2.5 cm transverse; (Figure 4). The deep aponeurosis was opened, the FHL tendon identified, looped,

and sectioned distally with the ankle in equinus. The distal portion was prepared with whipstitching, and a 6-mm blind tunnel was drilled. The graft was passed and fixed with an interference screw (Figure 5). Due to substantial tendon loss following excision, a quadriceps tendon graft was harvested. A second tunnel was drilled at the calcaneal tuberosity, and the quadriceps graft was sutured proximally to the remaining Achilles tendon stump and reinserted distally on four anchors using a double-row speed-bridge construct (Figure 6). Postoperative management was identical to case 1. At three weeks, the surgical wound was fully healed. At twelve months, the patient was pain-free, and AOFAS scores were 84 and 95 at six and twelve months, respectively.



Figure 4: Lateral radiograph of the right ankle showing features of chronic insertional Achilles tendinopathy with distal tendon calcification (A), and appearance of tendon substance loss (B) after calcification resection (C).

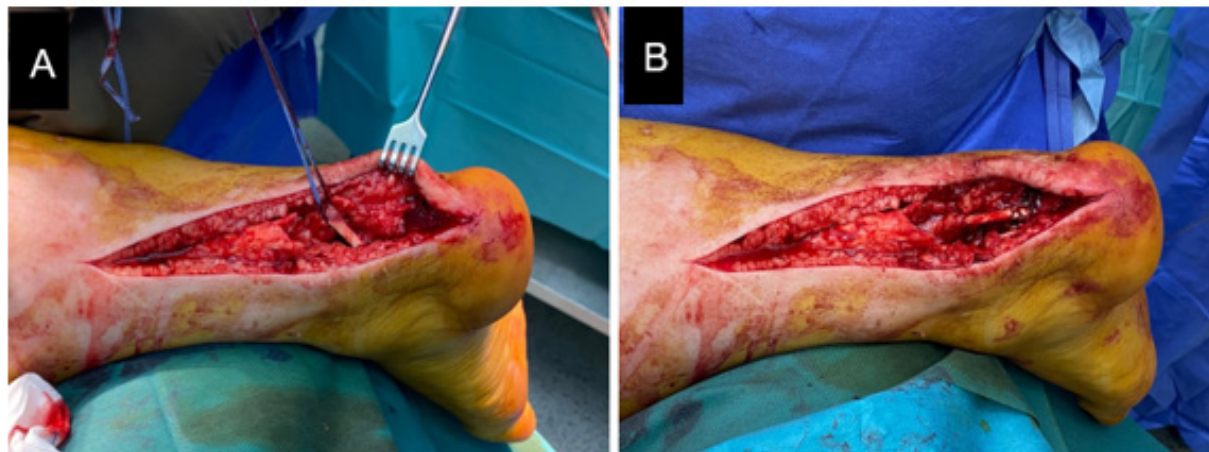


Figure 5: Tendon transection with the foot in equinus (A) and reinsertion using an interference screw (B).

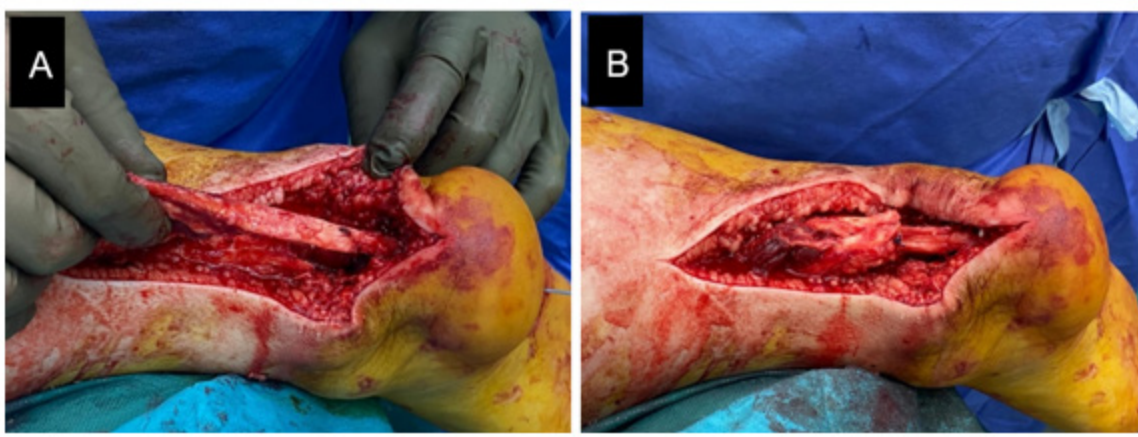


Figure 6: Quadriceps tendon graft harvested to fill the substance loss of the distal Achilles tendon (A) and final appearance after FHL augmentation and defect filling (B).

Case 3

A 51-year-old female presented with chronic left hindfoot pain, localized to the Achilles tendon insertion. The preoperative AOFAS score was 61. Initial imaging revealed a posterior calcaneal tuberosity exostosis consistent with Haglund's deformity, along with calcifications at the Achilles tendon insertion. Surgical management consisted of excision of the calcaneal tuberosity and calcifications, distal Achilles tendon reinsertion, and FHL tendon transfer. The procedure was performed using the standardized technique described for previous cases, including Achilles tendon brushing. Postoperative recovery was uneventful, with no complications. AOFAS scores at six and twelve months were 95 and 97, respectively.

Case 4

A 57-year-old female presented with chronic left hindfoot pain. She had previously undergone surgery 11 months earlier for Haglund's deformity, including resection of the calcaneal tuberosity and Achilles tendon brushing. Clinical evolution was marked by persistent pain (preoperative AOFAS score 65), and imaging revealed distal tendon calcifications associated with a large calcaneal spur. Revision surgery was performed, consisting of excision of the calcaneal spur and tendon calcifications, distal Achilles tendon reinsertion, and FHL tendon transfer, using the standardized technique applied in the other cases. Postoperative recovery was uneventful. AOFAS scores at six and twelve months were 97 and 99, respectively. The chronological sequence of events is summarized in Table 1.

Period or context	Event	Details
<ul style="list-style-type: none"> Chronic pain in the right hindfoot Failure of conservative treatment 	Clinical examination	<ul style="list-style-type: none"> Severe right heel pain with persistent gait impairment Tenderness at the Achilles tendon insertion + posterior swelling + plantarflexion deficit AOFAS score: 45(P1), 35(P2), 61(P3), 65(P4)
	Lateral radiograph + ankle sagittal DP Fat Sat MRI	<ul style="list-style-type: none"> Opacity in the posterosuperior aspect of the calcaneal tuberosity (P1, P2, P3, P4) and within the tendon (P2) Hyperintensity within the tendon at its insertion site
	Diagnosis	Insertional Achilles tendinopathy
Surgery	Calcification excision with distal Achilles tendon reinsertion combined with the FHL tendon transfer	<ul style="list-style-type: none"> General anesthesia, prone position, thigh tourniquet Medial para-Achilles approach. Opening of the tendon sheath, detachment of the Achilles tendon and excision of the calcification. Distal section of the FHL tendon with the ankle in equinus position Fixation of the graft with an interference screw, placed anterior to the tendon, into a 6-mm blind tunnel located anterior to the Achilles tendon. Reinsertion of the Achilles tendon using four anchors with a double-row SpeedBridge-type construct Specificity of P2: given the loss of tendon substance after resection of the large calcification, the quadriceps tendon was harvested, sutured proximally to the remaining Achilles tendon stump, and distally reinserted using four anchors mounted with sutures in a double-row SpeedBridge-type configuration Specificity of P3 and P4: Achilles tendon combing (longitudinal tenotomy), in addition to the standard procedure, due to Haglund's disease
Postoperative period	Rehabilitation	<ul style="list-style-type: none"> Below-knee cast in equinus position without weight-bearing (3 weeks) Then a removable boot with weight-bearing (3 weeks). Physiotherapy starting from the 6th week
At six months	Follow-up	<ul style="list-style-type: none"> Normal plantar flexion Painless gait
At six and twelve months	Scores AOFAS at 6-12 months	82-99(P1), 84-95 (P2), 95-97(P3), 97-99(P4)

P1: first patient P2 : second patient P3 : third patient P4: fourth patient FHL : Flexor hallucis longus

Table 1: Timeline of clinical events.

Discussion

The Achilles tendon is composed of fibers from the gastrocnemius and soleus muscles and serves as the primary ankle plantar flexor [8]. Its vascularization relies on the paratenon, but in cases of overuse, blood flow to the critical zone located 2–6 cm proximal to its insertion may be compromised, leading to tendon injury and fibrosis [2,9]. Chronic insertional Achilles tendinopathy is associated with irreversible fibrous degeneration [10,11]. FHL tendon transfer is frequently performed to reinforce tendon structure,

enhance mechanical strength, and improve vascular supply [12]. Its neuromuscular activation is synchronized with the triceps surae, providing optimal support for normal gait mechanics [13,14]. This procedure is indicated in cases of tendon substance loss greater than 50% and in patients over 50 years of age [15-17]. The FHL tendon is preferred over other grafts due to its length, durability, relative motor unit strength compared with other tendons (e.g., flexor digitorum longus), and anatomical proximity to the Achilles tendon [15]. The FHL has greater muscle mass and strength than the flexor digitorum longus and peroneal tendons, which are

also used in the treatment of chronic Achilles tendinopathy [18]. Some authors perform a secondary medial approach at the forefoot, at the dorsal-plantar skin junction near the first metatarsal, to control the distal section of the tendon [2]. Proper graft tension is achieved with the ankle in dorsiflexion to place the Achilles tendon under maximal stretch. Once correctly tensioned, any excess length of the FHL is trimmed to ensure optimal pull of the transferred tendon.

The transfer of the FHL tendon is a minimally invasive procedure that generally yields favorable outcomes [19]. The comparison between FHL transfer combined with Achilles tendon debridement and debridement alone remains controversial: while some authors report no significant difference [5], others note improved functional outcomes and reduced pain in patients over 50 years of age [2]. Den Hartog et al. [20] observed a higher healing rate and marked improvement in AOFAS scores in 18 of 26 patients over 50 years old.

Conclusion

FHL tendon transfer combined with Achilles tendon debridement provides significant functional improvement and substantial pain relief in patients over 50 years with chronic insertional Achilles tendinopathy.

Authors contributions

Bizolé Balepna DY wrote the first draft and updated the article in accordance with the CARE guidelines.

Nanema H and Baleng PN critically reviewed. Baroan C and Nieto H critically reviewed and contributed to the edition of the final version.

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