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Chronic Achilles Tendon Rupture – Repair Using Flexor Hallucis Longus (FHL) Tendon Transfer and Augmentation in a 50-Year-Old Female

[1]Rajesh K. Ambulgekar, Professor and HOD, Department of Orthopaedics, SCGMC, Nanded

[2]Raunak Ranjan, Junior Resident, Department of Orthopaedics, SCGMC, Nanded

[3]Raman Omkprakash Toshniwal, Assistant professor, Department of Orthopaedics, SCGMC, Nanded

Corresponding Author: Rajesh K. Ambulgekar, Professor and HOD, Department of Orthopaedics, SCGMC, Nanded

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Abstract

Achilles tendon ruptures are a common injury, particularly among active individuals. However, chronic Achilles tendon ruptures, defined as those occurring more than 4-6 weeks after injury, are more challenging to manage and often require specialised treatment approaches. This case report discusses the surgical management of a 50-year-old female who presented with a chronic Achilles tendon rupture, treated through repair with Flexor Hallucis Longus (FHL) tendon transfer and augmentation. The outcome was favourable with the restoration of function and resolution of pain.

Keywords: Achilles tendon rupture, chronic rupture, Flexor Hallucis Longus, tendon augmentation

Introduction

The Achilles tendon is one of the strongest and largest tendon of our body, consisting of the common shared tendon of the gastrocnemius (both medial and lateral heads) and soleus muscles, and attaches to the calcaneum in the form of a braided rope [1,2]. The twisting of the tendon provides extra biomechanical strength with its anatomic footprint comprising the superior, middle and inferior facets of the calcaneum[3].

Achilles tendon ruptures are relatively common injuries that frequently occur in sports or physical activities[4]. Acute ruptures are often treated with conservative or surgical interventions, but chronic ruptures present a unique challenge[5]. A chronic rupture, defined as a tear occurring more than 4 to 6 weeks prior, may result in a significant gap between the tendon ends, complicating repair[6].

In such cases, tendon transfer and augmentation techniques, such as using the Flexor Hallucis Longus (FHL) tendon, can offer excellent functional outcomes[7,8]. The FHL tendon is commonly used as an adjunct in Achilles tendon repair when there is insufficient tendon

tissue[9] or when repair alone may not provide enough strength for a successful healing process.

Case Presentation

A 50-year-old female presented to the hospital with a history of a non-traumatic injury, which occurred approximately 8 weeks prior during a routine walking activity. Initially, she had sought conservative management, including rest and physiotherapy, but her symptoms persisted, with noticeable weakness, pain, and inability to perform normal daily activities such as walking or standing for long periods.

Upon inspection, a gait abnormality was observed, characterised by a limp and weakness during the "push-off" phase of walking. Calf muscle atrophy on the affected side with a visible step-like deformity was seen, especially when the patient's foot was in a dorsiflexed position.

The patient demonstrated significant weakness in plantar flexion, a positive Thompson test (no calf muscle contraction with squeezing the calf), and a palpable gap in the Achilles tendon at the level of the rupture. Matles test came out to be positive, as while lying prone and knees bent at 90 degrees, the injured foot fell into a neutral / dorsiflexed position in comparison to the uninjured foot, which remained in a relaxed plantar flexed position. The Stand and Maintain Plantarflexion (STAMP) and Tendo-Achilles Rise (TAR) tests were also positive. In the STAMP test, the patient stood with support against a wall and a double-leg heel raise was attempted, where once the uninjured leg was taken off the ground, there was an inability to maintain the position. In a positive TAR test, patient attempted a single heel rise with wall support with an inability to maintain the position for 5 seconds.

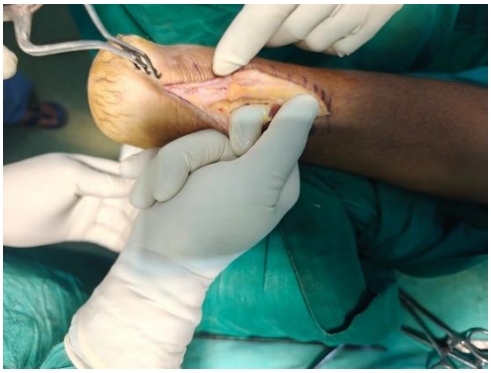
There was no significant evidence of inflammation or infection. Radiographs were taken to assess the calcaneal alignment, and MRI imaging revealed a complete rupture of the Achilles tendon with a gap of approximately 3 cm.

Surgical Intervention

After detailed discussion with the patient regarding the treatment options, the decision was made to proceed with surgical repair using FHL tendon transfer and augmentation. The patient was placed under general anesthesia, and the procedure was carried out as follows:

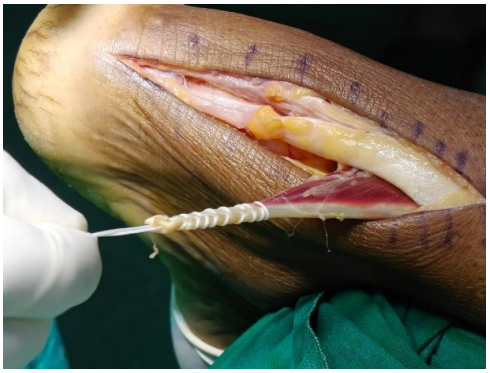
Incision and Exposure

A posterior midline incision was made to expose the Achilles tendon. The ruptured ends of the tendon were identified, and the gap was measured. The Achilles tendon was found to be deficient distally near its site of insertion. The proximal end of the Achilles tendon was debrided to freshen the tissue.



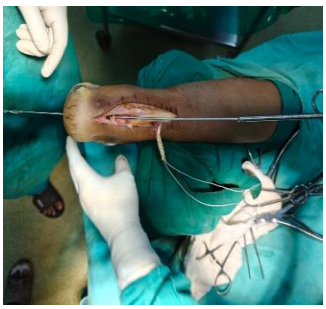
The soft tissue dissection was continued over medial and inferior aspect of tendo Achilles and FHL tendon was identified.

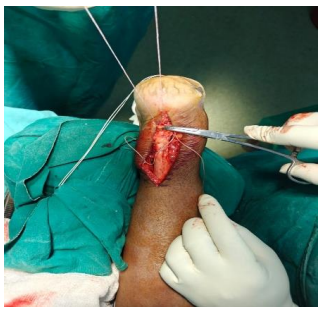
FHL Tendon Harvesting: The Flexor Hallucis Longus tendon was harvested from the foot, just above the ankle joint. The tendon was carefully detached from its insertion, as distally as possible near the tarsal tunnel and mobilized to the Achilles tendon. FHL tendon graft was then prepared using fibre wire and the size of the graft was measured which came out around 6mm.



FHL tendon transfer: The tendo Achilles insertion was identified on the calcaneum, and a big pin was passed 1 cm anterior to its insertion while drilling a canal of 6 mm using a reamer. The FHL graft was then passed through the canal and tightened while keeping the foot dorsiflexed. A 7mm interference screw was then passed through this canal to fix the graft in place.

The remaining fibres of the tendo Achilles were sutured using fibre wire and an anchor was passed through the calcaneum at the old tendo Achilles site.



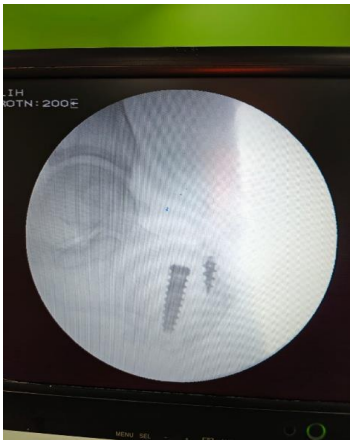


Closure: The wound was irrigated, and the layers were closed in a standard fashion using absorbable sutures for the deeper layers and a running subcuticular suture for the skin, followed by mattress sutures for skin approximation.

The patient was placed in a below-knee splint to immobilize the ankle in plantar flexion.

Postoperative Course

The patient was initially kept non-weight-bearing for the first six weeks post-surgery, with gradual introduction to partial weight-bearing. Physical therapy was started immediately after the splint was removed to facilitate ankle mobility and strength recovery.



At the 6-month follow-up, the patient reported a significant improvement in pain, with near-complete resolution of the gap in the tendon. The patient had regained nearly full plantar flexion strength and was able to resume daily activities, including walking and light exercise, with minimal discomfort. The patient expressed satisfaction with the outcome.

Discussion

Chronic Achilles tendon ruptures present a significant challenge in both diagnosis and management. Surgical repair of a chronic rupture involves overcoming challenges such as tendon retraction, scarring, and inadequate soft tissue for repair[5,6]. In this case, the use of FHL tendon transfer and augmentation provided an effective solution by augmenting the strength of the repaired Achilles tendon and facilitating functional recovery.

The FHL tendon is a strong and reliable tendon that is frequently used in tendon augmentation procedures due to its size, length, and role in ankle plantar flexion[7,9]. In cases of chronic ruptures where there is a gap between the tendon ends, FHL tendon transfer and augmentation allows for adequate reconstruction and functional restoration of the Achilles tendon.

Several studies support the use of FHL tendon transfer and augmentation for chronic Achilles tendon ruptures, reporting high rates of functional recovery and low re-rupture rates[8,10]. The patient in this case achieved excellent results, with complete restoration of function and resolution of symptoms.

Conclusion

Chronic Achilles tendon rupture is a challenging injury, particularly in middle-aged individuals. Surgical repair with FHL tendon transfer and augmentation is a safe and effective technique to address these challenging cases. The procedure in this case resulted in a favorable outcome with complete functional recovery and no complications. This approach should be considered in the management of chronic Achilles tendon ruptures, particularly when tendon gaps are present or when primary tendon repair alone may not suffice.

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