

# Surgical Management of Chronic Tendoachilles Tear in Elderly Patients – A Case Series

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## Learning Point of the Article:

Early diagnosis, meticulous repair, and handling of soft tissues and TA tear help in getting a better outcome in elderly patients.

## Abstract

**Introduction:** Chronic tendoachilles (TA) tears are commonly missed injuries in elderly population with associated comorbidities and they usually occur as low-energy injuries. Appropriate surgical management helps in getting a better functional outcome in elderly patients.

**Case Series:** We present a series of three cases of chronic TA tear in elderly patients managed surgically. Two patients had an insertional tear and they were managed with flexor hallucis longus (FHL) transfer and fixed with interference screw in the calcaneum. Another patient was managed with end-to-end suturing using fiber wire. All the patients are having good functional outcome without any wound complication or re-rupture.

**Conclusion:** Early diagnosis, meticulous repair, and handling of soft tissues and TA tear help in getting a better outcome in elderly patients. The final functional outcome depends on intraoperative stability of the repair, ankle physiotherapy, and wisely selection of the treatment method, which mainly depends on the location of the tear. Reconstruction with FHL tendon using interference screw in calcaneum helps to repair the insertional tears in elderly patients.

**Keywords:** Tendoachilles tear, flexor hallucis longus graft, steroid, elderly patients.

## Introduction

The Achilles tendon is the largest tendon in the body which receives fibers from the soleus and gastrocnemius muscles, the so-called triceps surae [1]. Sudden tendon contraction due to rapid acceleration can place extreme force with movement following a single step. The watershed area presents at around 2.16 cm above their insertion and is the weakest point [2]. A tear or rupture is seen most commonly at this site with the resulting loss of plantar flexion. Studies showed an incidence of about 7/100,000 in the general population [3] and approximately 10% of all Achilles tendon injuries have a pre-existing tendon disorder [4]. Other factors such as age, diabetes mellitus, steroid use, and direct trauma by a sharp object or by fall from height play a role in tendoachilles (TA) injury. The reasons for increased tear rate with age are multifactorial. The Achilles tendon has a tenuous blood supply at the mid substance of the

tendon [5], this blood supply is worsened with age, disuse, and the response to microinjury of the tendon is less robust. In addition, morphological changes with aging have shown decreased cell density [6] and a decrease in collagen fibril diameter and with increased physical training, the tendon diameter increases, and with disuse, it atrophies. Typically, tendon injuries are common in athletes who abruptly increase their training without adequate preconditioning and also the sports that involve repeated to loading cycles that cause tendinosis and eventual rupture of the tendon [7], although atypical tendon ruptures can be caused by corticosteroid or antibiotic use [8]. Management options include conservative and operative methods, the operative method selection depends on the patient factors, type of injury, level of injury from insertion of the tendon, and gap between the torn edges. The options for operative management include primary repair

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## Author's Photo Gallery



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Figure 1: Posteromedial incision showing the tendoachilles tear.

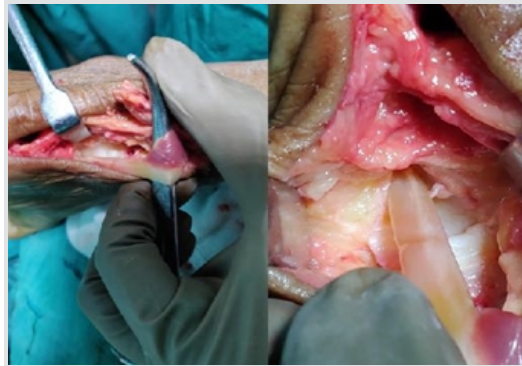


Figure 2: Identification of flexor hallucis longus tendon.



Figure 3: Preparation of the flexor hallucis longus tendon using Ethibond suture before insertion into the calcaneal tunnel.

using Krackow/Kessler/Bunnell suturing technique repair using flexor hallucis longus (FHL) tendon graft, gastrocnemius turned down the fascial flap and v-y advancements plasty. We present a series of four cases of TA tear managed surgically in elderly patients.

### Case Series

#### Case 1

A 61-year-old male presented with complaints of pain in the left ankle and difficulty in walking for 1 month. There was no significant history of trauma and the patient had a history of taking injections in the heel region for heel pain 6 months back. About a month back, he suddenly experienced pain and popping sound in the left heel region while walking on the road and is unable to walk properly since then. There was no history of diabetes or hypertension. On examination, there was mild tenderness present at the ankle, no swelling or deformity was seen, a palpable gap of around 2 cm was present in the region of Achilles tendon insertion and there was no any wound. Thompsons test and Matles test was positive. X-ray of the left ankle anteroposterior and lateral view showed no bony injury, the local ultrasound showed TA tear near the tendon insertion (1 cm of the stump was present at insertion) with a defect of 3.5 cm between the two torn edges of the tendon.

The patient was operated in prone position under tourniquet, the Achilles tendon was exposed using posteromedial incision

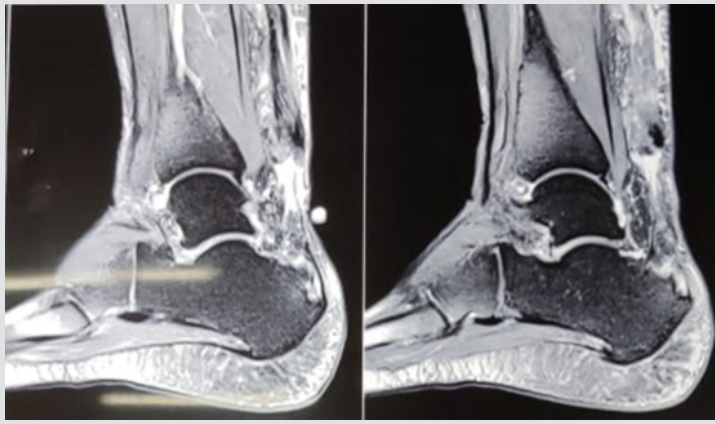
extending up to 1 cm below the calcaneal insertion (Fig. 1). Paratenon was carefully incised and the sural nerve was identified and retracted. Tendon ends were debrided to remove calcifications. The prominent posterosuperior calcaneal tuberosity was excised using the small osteotome. FHL was dissected by protecting the neurovascular bundle (Fig. 2). The FHL tendon was pulled up as far as possible with simultaneous plantar flexion of the ankle and first toe and was transected at the level of the calcaneum. A bone tunnel was made in the calcaneum using the drill starting at the superior calcaneal tuberosity and going in an anteroinferior direction and exiting at the plantar aspect of the heel. A Krackow stitch was taken at the end of the FHL tendon (Fig. 3). The tendon is pulled into the calcaneal tunnel and securely fixed with the help of an interference screw of the same size as the tunnel diameter. The proximal part of the Achilles tendon part was sutured to FHL tendon, the paratenon was sutured back and the wound was closed in layers. Below-knee slab was given in plantar flexion. Post-operative ankle X-ray showed the proper placement of interference screw (Fig. 4). Limb elevation was given in the post-operative period. Suture removal was done on day 14 and below-knee cast in plantar flexion was given for 2 more weeks. After 4 weeks post-operative, below-knee cast in neutral position was given for 3 weeks and later cast was removed and the supportive walking boot was given for 6 weeks, and the patient was advised to walk with weight-bearing as tolerated. At present 2 years follow-up, the patient is comfortable with no



Figure 4: Post-operative X-ray showing interference screw placement in calcaneum.



Figure 5: Functional outcome.



**Figure 6:** Magnetic resonance imaging ankle showing the tendoachilles tear.

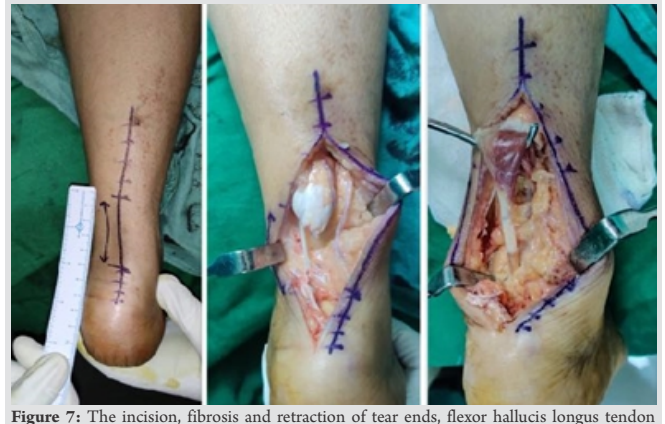
pain and difficulty in walking with ankle dorsiflexion of 10 degrees and full plantar flexion (Fig. 5).

### Case 2

A 56-year-old female presented with pain in the right ankle and difficulty to walk or weight bear on the right foot for 1½ months. The patient had a history of fall 1½ months back. The patient was taken four injections to the left heel 15 days apart for the right heel pain 6 months back. The patient was a known case of diabetes and on treatment.

On examination, there was mild tenderness present at the ankle with no obvious swelling or deformity. There was a palpable gap of around 3 cm at the ankle and Thompsons and Matles tests were positive. X-ray of the right ankle showed no abnormalities. Magnetic resonance imaging right ankle showed TA tear with retraction at the inferior portion with a gap of 3.2 cm between the torn ends (Fig. 6).

The patient was operated in prone position under tourniquet, the Achilles tendon was exposed using posteromedial incision extending up to 1 cm below the calcaneal insertion. Paratenon was carefully incised and the sural nerve was identified and retracted. Tendon ends were debrided to remove calcifications. The prominent posterosuperior calcaneal tuberosity was excised using the small osteotome. FHL was dissected by protecting the neurovascular bundle (Fig. 7). The FHL tendon



**Figure 7:** The incision, fibrosis and retraction of tear ends, flexor hallucis longus tendon identification.

was pulled up as far as possible with simultaneous plantar flexion of the ankle and first toe and was transected at the level of the calcaneum. A bone tunnel was made in the calcaneum using the drill starting at the superior calcaneal tuberosity and going in an anteroinferior direction and exiting at the plantar aspect of the heel. A Krackow stitch was taken at the end of FHL tendon. The tendon is pulled into the calcaneal tunnel and securely fixed with the help of an interference screw of the same size as the tunnel diameter. The proximal part of the Achilles tendon part was sutured to FHL tendon, the paratenon was sutured back, and the wound was closed in layers. Below-knee slab was given in plantar flexion. Post-operative ankle X-ray showed the proper placement of an interference screw (Fig. 8). Limb elevation was given in the post-operative period. Suture removal was done on day 14 and below-knee cast in plantar flexion was given for 2 more weeks. After 4 weeks post-operative, below-knee cast in neutral position was given for 4 weeks. The later cast was removed and the supportive walking boot was given for 6 weeks and the patient was advised to walk with weight-bearing as tolerated. At present 1-year follow-up, the patient is comfortable with no pain and difficulty in walking with ankle dorsiflexion of 15 degrees and full plantar flexion (Fig. 9).

### Case 3

A 63-year-old female presented with weakness in the left ankle



**Figure 8:** Both pre-operative and post-operative X-ray (post-operative X-ray showing interference screw in the calcaneum).



**Figure 9:** Functional outcome.



Figure 10: The incision and the tendoachilles tear.



Figure 11: The end-to-end repair of the tendoachilles tear using fiber wire.

and difficulty in walking for 25 days. The patient was apparently alright and had a history of fall 25 days back. The patient was a known case of diabetes mellitus for 20 years and on medications.

On examination, tenderness and mild swelling were present over the area of TA. Thompsons and Matles tests were positive with a palpable gap at the TA of around 1 cm.

X-ray of the right ankle showed no abnormalities, the local ultrasound showed TA tear with a gap of 1 cm between the torn ends. The tear was at a distance of 3 cm from the insertion of the tendon on the calcaneum.

The patient was operated in prone position under tourniquet using posteromedial incision, tear ends reached, edges were freshened (Fig. 10). As we were able to approximate the two edges, the ends of the tendon were sutured by Krackow suturing technique using fiber wire (Fig. 11). Wound was closed in layers. Below-knee slab is given in plantar flexion. Limb elevation was given in post-operative period. The diabetes mellitus was monitored in post-operative. The patient was discharged on day 3 and sutures removed on day 14 post-operative and below-knee cast in plantar flexion was given for 1 more week. After 3 weeks post-operative, below-knee cast in

neutral position was given for 3 weeks. Later cast was removed and supportive walking boot what is given for 6 weeks, and the patient was advised to walk with weight-bearing as tolerated.

At present 1½ years follow-up, the patient is having good ankle range of motion with no pain and difficulty in walking (Fig. 12).

### Discussion

Surgical management of TA tear in elderly patients is difficult as compared to young patients, because most of the elderly patients have associated comorbidities such as diabetes, hypertension, cardiovascular diseases, and use of a steroid for general or local pathologies. Associated diabetes causes impaired surgical wound healing if proper wound care and diabetic control are not done properly. Use of local or generalized steroid predisposes to TA tear and also causes rerupture after the surgical management. Furthermore, the associated other comorbidities weaken the general health of the patient and lead to poor outcome after surgery.

TA injuries are common in clinical practice, most of them occur as a result of direct trauma or excessive athletic activity and in patients with associated comorbidities such as diabetes mellitus and peripheral vascular disease in which it is more difficult to treat. Wounds are notorious when it comes to healing. Furthermore, the tendon has a watershed area which makes it difficult to heal and regenerate even after the tear is adequately repaired and needs keen post-operative care and it takes usually 12 weeks to heal completely. If unrecognized, this common injury can be debilitating due to the associated loss of function; however, if promptly treated, functional outcomes are very positive. The incidence of Achilles tendon injuries is quoted at between 5 and 10/100,000 of the general population and appears to be increasing [3,9].

Usually, local ultrasonographic evaluation is sufficient to diagnose the tear and plan the surgery or conservative line of management. Conservative treatment options are either cast



Figure 12: The functional outcome.

immobilization or functional bracing with early rehabilitation. Functional bracing, achieved through the use of a boot with gradual reduction of plantar flexion over an 8 week period, is now preferred as it has been shown to produce better outcomes due to early mobilization and more rapid return to daily activities [10]. Recent systematic reviews suggest that surgery has a lower rerupture rate but does carry an increased risk of complications, such as wound breakdown and infection [11].

When the stump is present near, the insertion of the tendon primary repair can be tried using the suturing technique such as Krackow sutures, Bunnell sutures, or modified Kessler sutures. When there is no much of the stump left, FHL tendon graft and interference screw can be used for repair as it provides adequate strength to the tendon. Furthermore, when the gap between the torn edges is more and approximation is not possible one needs to opt for gastrocnemius fascial turndown flap or v-y plasty as suited. Minimal invasive percutaneous repair is also an option these days. Mobilization in post-operative is very important and contractures are prevented by early rehabilitation which helps the patient to recover faster.

In a review of 25 papers reporting a total of 2647 ruptures treated surgically, Nistor found the incidence of major complications – deep infections 1%, fistula 3%, necrosis of skin 2%, and an unqualified percentage of minor complications [12]. In our series, we did not find any wound-related complications. The closure of the peritenon is very critical as

the main blood supply is from the peritenon only. The peritenon provides a vascular supply for Achilles tendon along with the vessels from musculotendinous junction proximally and the periosteum distally. There is a relatively avascular zone located 2–6 cm proximal to its insertion that is named watershed area of the TA.

### Conclusion

Early diagnosis, meticulous repair, and handling of soft tissues and TA tear help in getting a better outcome in elderly patients. The final functional outcome depends on intraoperative stability of the repair, ankle physiotherapy, and wisely selection of the treatment method, which mainly depends on the location of the tear. Reconstruction with FHL tendon using interference screw in calcaneum helps to repair the insertional tears in elderly patients. Even elderly patients with diabetes can be managed well with the good functional outcome without any complication using the above-mentioned methods.

### Clinical Message

It is possible to get good outcome even in elderly patients with proper clinical, radiological assessment of the tear and appropriate selection of surgical methods.

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