

Traumatic Tibialis Posterior Rupture without a Fracture and Double Surgical Repair in a Paratrooper: Case Report and Surgical Technique

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Abstract

Isolated posterior tibialis tendon ruptures without a history of inflammation are rare injuries that are often missed. We present a case of a young paratrooper with an isolated PTT rupture that was managed surgically with a fiber wire enhanced graft and a flexor digitorum longus (FDL) tendon transfer. This course of therapy allowed the patient to quickly return to activity without complications.

Keywords: Flatfoot; Posterior tibial tendon; Flexor digitorum longus; Tendon grafting

Introduction

The posterior tibialis tendon plays a crucial role in foot arch support as it is the largest tendon in the medial ankle. It produces plantar flexion and supination of the ankle, stabilizes the plantar vault and it has multiple insertions on the bones of the hindfoot and midfoot [1].

Ruptures of this tendon are more usual in the presence of chronic degeneration due to inflammation [2]. Acute ruptures are usually accompanied with ankle fractures, namely medial malleolus fractures [3]. Isolated posterior tibial tendon ruptures without degeneration and without fracture are rare and are often missed because of low clinical suspicion. The diagnosis can be confirmed by MRI or U/S.

Posterior tibialis ruptures usually result in flexible acquired flat foot deformity owing to lack of medial arch support. If left untreated, traumatic rupture of the PTT and the resulting pes planus can lead to severe osteoarthritis of the ankle and foot.

Surgical management of posterior tibialis tendon rupture is usually primary end-to-end suture [4], however this is often not possible due to damaged tendon ends. In such cases the most common procedure is a flexor digitorum longus (FDL) transfer, with usually good outcomes [5]. Other tendons of the foot have also been used [6], as well as hamstring tendons [6].

The talonavicular ligament is a ligament of the foot that also plays an important role during the gait cycle. It is frequently injured in ankle sprains, thus resulting in arthritis in the long term [7].

Case Report

A 28-year-old paratrooper presented to our orthopedic outpatient clinic with persistent medial ankle tenderness and difficulty in weight bearing. The patient described an eversion ankle injury after landing on his feet from a small height accompanied by a crack sound three months ago. There was immediate pain on the medial ankle side and the patient was unable to weight bear. There were no ankle complaints or relevant medical history prior to the injury. Immediately after the injury the soldier had been referred to the local rural hospital, where ankle radiographs did not show any fracture, so a diagnosis of an ankle sprain was made, and the patient was discharged with RICE instructions.

On examination the patient was able to weight bear and had mild soft tissue swelling on the medial side of the ankle without any apparent deformity. A more detailed clinical examination revealed inability to

raise the heel of the affected foot. There was also reduced strength of inversion compared to the unaffected limb and a visible flexible pes planus deformity.

An MRI scan was arranged which demonstrated a complete posterior tibialis tendon rupture (Figures 1 and 2). There was a full-thickness tear extending from the distal portion of the tendon to the level of the medial malleolus with tendon retraction. There were no bony lesions. We decided on surgical intervention with informed consent of the patient and post-op x-rays were made to ensure that the calcaneus was in proper alignment with midfoot bony structures.

The patient underwent surgical exploration and tendon repair. We used a retromalleolar approach to explore the tendon and confirm the tear. The tendon was indeed retracted, so a direct repair was not an option. We mobilized the PTT tendon and we used the damaged end to create a free graft and reinforce the dissolved talonavicular ligament. The graft was relatively thin, so we decided to enhance it with fiber tape (wire suture) (Figures 3-5).

Two tunnels were drilled under fluoroscopic guidance, one at the sustentacular tali in 15 degrees cephalad orientation and one at the navicular tuberosity. We then proceeded to a flexor digitorum longus retrieval and tendon transfer. Both the reconstructed PTT tendon and FDL tendon were stabilized using two anchors (Arthrex 4,5 swivel lock).

Postoperatively the foot was placed in a below-the- knee plaster cast, which was removed along with the stitches at 2 weeks. Thereafter, the patient underwent a thorough physiotherapy regimen for 6 weeks. At the 3-month follow-up, the patient was pain free, with a full range of motion of the ankle, and the arch was fully restored (Figure 6). The restored tendon was fully functioning as shown by heel inversion and single leg heel rise test. At the 6-month follow up the patient had fully returned to his activities, including his running regime.

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Figure 1: Pre-operative ankle MRI, the rupture is indicated with the red arrows: Coronal view.



Figure 4: Intraoperative images: Flexor digitorum longus mobilized.



Figure 2: Pre-operative ankle MRI, the rupture is indicated with the red arrows: Sagittal view.



Figure 5: Intraoperative images: Final view before anchoring.



Figure 3: Intraoperative images: Fiberwire enhanced autograft.



Figure 6: Postoperative result, four months after the surgery.

Discussion

A high index of suspicion and a good clinical examination are necessary to recognize this rare condition. The diagnosis of posterior tibialis tendon rupture should be strongly suspected in the adult

patients presenting with twisting ankle injuries and generalized medial ankle pain.

Enhancing a tendon graft with other materials such as fiber wire is another feasible option when facing a PTT rupture for which primary

end-to-end suture is not possible and the available autologous graft is not satisfactory. Using a double repair technique in cases where single repair is deemed unreliable can ensure the best clinical outcome in young active patients with high demands.

Conclusion

Our patient was able to return to full activity in a relatively short time without difficulty. The study emphasizes the need for high clinical suspicion in ankle injuries in order to achieve early and accurate recognition along with prompt surgical referral.

Moreover, we propose an alternative method of PTT reconstruction with FDL transfer in case of an unsatisfactory autologous graft. We also want to highlight the importance of the talonavicular ligament which can be reinforced with the use of fiber tape and PPT autograft in case of insufficiency, to ensure the best surgical outcome.

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