

TIBIALIS ANTERIOR TENDON RUPTURE

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INTRODUCTION

Rupture of the tibialis anterior tendon is a relatively rare condition. There have been reports of spontaneous ruptures that may in part be due to metabolic conditions such as diabetes mellitus, gout, systemic lupus erythematosus, and rheumatoid arthritis. Most of the spontaneous ruptures are in patients older than 50 years old. Often, spontaneous ruptures are not diagnosed in a timely fashion. To that end, many of the tibialis anterior tendon ruptures are neglected and repair can be challenging due to the large defects that need to be bridged.

The long extensor tendons of the ankle rarely rupture when compared to the Achilles, posterior tibial, and peroneal tendons. The flexor tendons of the ankle have propensity for “wear and tear” break down. Partial tears and tendinosis are commonplace with the flexor tendons, but relatively uncommon in the tibialis anterior tendon. More often than not, the long extensor tendon ruptures are caused by laceration. Traumatic closed ruptures of the tibialis anterior tendon are usually caused by a plantar flexion force. In my experience, most of the tibialis anterior tendon ruptures that I have treated occurred following a cortisone injection in the region of the insertion of the tendon. Needless to say, in most cases cortisone should be avoided in the proximity of a tendon.

DIAGNOSIS

Initial complaints by the patient might be a “soft tissue mass” on the anteromedial ankle. Some may describe weakness or foot slapping when walking. I always ask if there is a history of pain in the area of the insertion site of the tendon and whether or not there has been a cortisone injection in the area. The most important part of the physical examination is manual muscle testing and gait examination. Extensor substitution of extensor hallucis longus tendon is often seen. A drop foot or foot slap is common. Usually magnetic resonance imaging is used to confirm the diagnosis and for surgical planning.

SURGICAL REPAIR

Surgical repair of the tibialis anterior tendon rupture can be done with direct end-to-end repair in the acute scenario. Most of the time, due to delay of diagnosis, repair will need to accommodate a void. Once retracted, and the necrotic tendon is debrided, there can be up to 8 cm or more of tendon deficit.

Common techniques that are used to repair a neglected tibialis anterior tendon rupture include extensor hallucis longus tendon transfer, flap-down of the ruptured tibialis anterior tendon, autogenous grafting (i.e., split harvesting of peroneus longus tendon), allografting, xenografting, and nonanatomic repair (i.e., attaching the tibialis anterior tendon to the talus).

My personal preference is to not alter anatomy with tendon transfers or harvesting an autograft (other than a split harvest of a tendon). I will order a fresh frozen allograft of the tibialis anterior tendon to be available in case the defect is such that I cannot do a reattachment or end-to-end repair. The grafts are readily available from a tissue bank. Orthopedic surgeons use the tibialis anterior allograft for ACL repair. If your hospital has a tissue freezer, often the tendon allograft is “stocked.”

The surgical technique involves making an incision along the course of the tibialis anterior tendon proximal to the ankle joint and extended distally to the attachment site of the medial cuneiform. A tourniquet is not necessary, as it is easy to achieve hemostasis with dilute epinephrine in the local anesthesia and careful dissection. If you choose to use a tourniquet, then apply it to the thigh so it will not interfere with your surgical anatomy. I find the most challenging and critical part of the surgery is to preserve the tendon sheath as the tendon is usually scarred down to it. This is where I will take my time to carefully dissect the diseased tendon off of the sheath. Next, the tendon is inspected and debrided back to healthy tissue. Distally there may be a stump of tendon that you can reattach to or if not, then you can use a soft tissue anchor into the cuneiform.

The allograft will need to be thawed in saline for about 20 minutes. A measurement of the defect is made

with a ruler. The appropriate sized length of tendon is cut from the graft tissue. A 2-0 non-absorbable suture is used to create a whipstitch on the proximal stump of the tibialis anterior tendon. Next a whipstitch is then performed on the proximal end of the tendon graft. The proximal tendon and graft are then sutured together. The distal graft is then sutured to the distal stump if present or if not, an anchor is inserted into the medial cuneiform and the suture from the anchor is used to attach the tendon to the bone. The tendon sheath is closed as well as the retinaculum over the ankle. Anatomic tissue layer closure is done per surgeon preference. Dressings are applied and

the foot is placed in neutral position while a posterior splint is applied.

I do not think anyone really knows how much tension to put on the tendon during repair. We are taught “physiologic tension,” but in reality it comes down to your gut instincts and a “feel.” Certainly you don’t want the foot over-inverted after the repair. I will generally have the foot about half-way dorsiflexed when the tendon is tacked down. Postoperative care includes 6 weeks of nonweight bearing in a fracture boot or cast. Gradual return to weight bearing in a fracture boot at 6 weeks and physical therapy is commenced at that time. Usual return to shoes is at week 10.

ILLUSTRATED SURGICAL TECHNIQUE



Figure 1. Typical appearance of a tibialis anterior tendon rupture. Under the ribbon retractor is the tendon rupture and the sheath is “empty.”



Figure 2. The tendon is debrided back to healthy tissue. Diseased tendon will be hemorrhagic and yellow. Healthy tendon will be white and glistening.

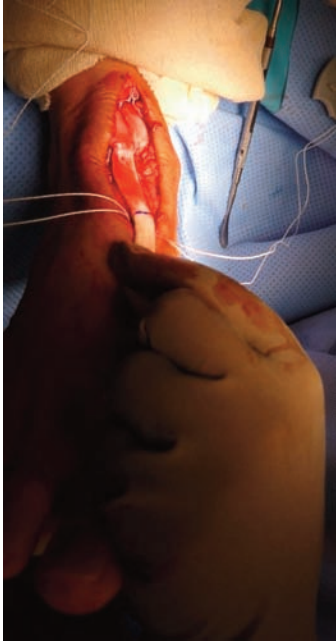


Figure 3. The allograft is laid onto the wound and measured and marked.



Figure 4. A whipstitch has been performed on the proximal tendon stump and an anchor has been inserted into the medial cuneiform.



Figure 5. A whipstitch has been performed on the proximal aspect of the allograft.

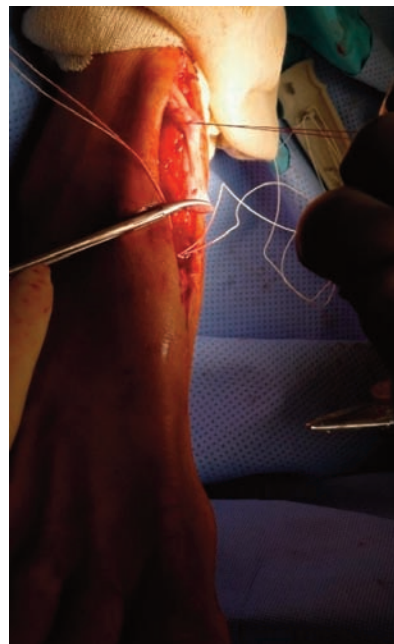


Figure 6. The proximal anastomosis has been performed. The distal end is ready to be sutured down to the cuneiform.



Figure 7. The repair is complete.



Figure 8. The retinaculum and tendon sheath are carefully repaired.



Figure 9. The tendon is completely enclosed in the sheath.



Figure 10. Subcuticular closure.