Among tendon ruptures in the foot and ankle, a spontaneous complete rupture of the tibialis anterior tendon is rare. In cases of larger defects, prior evidence indicates a tendon transfer. This study offers a method of repair for large defects with use of a tendon turnover flap and augmentation with a synthetic graft.

Literature Review

A tibialis anterior tendon rupture is a relatively rare presentation. Rupture is usually under the inferior extensor retinaculum about 1 to 3 cm proximal to the bony insertion (1). For surgical repair, prior authors have suggested a free tendon graft using the extensor tendon to the fifth digit (2), a sliding tendon lengthening (3) or a turnover with an acellular collagen membrane reinforcement after a traumatic rupture with an 8 cm gap following debridement (4). An EHL transfer has also been described following rupture as a complication of steroid injection (5). In a defect of 8 cm following a traffic accident, a split posterior tibial tendon transfer was utilized (6). Further, in rotator cuff repair in canine models, those subjects that underwent augmentation with a poly-L-lactide device demonstrated greater ultimate load and less tendon retraction (7). McCarron and colleagues demonstrate higher yield and ultimate load and decrease in failure by sutures cutting through the tibialis anterior tendon (8). In the current study, the authors elected to utilize a turnover flap with graft augmentation in order to preserve the function of the other tendons while offering a stronger repair.

Case Study

A 54 year-old male presented to the office with complaints of throbbing pain to his left anterior ankle and medial foot for one week duration and weakness in his ankle. He reported the pain began one night while sleeping, when he felt a sudden "pop" sensation to the medial aspect of his left foot. He denied any known injury or history of injury to the symptomatic extremity. He denied history of steroid or extended antibiotic use. He did have a known history of diabetes mellitus, hyperlipidemia, and right ankle surgery. His primary care physician ordered radiographs, which were negative for fracture or gross osseous abnormalities. On clinical examination, moderate tenderness and edema was localized over the course of the tibialis anterior tendon from the anteromedial to the medial aspect of the foot. A mild drop foot was noted when compared to the contralateral foot. A tibialis anterior tendon rupture was suspected and MR imaging was ordered. MRI report findings confirmed a complete rupture of the tibialis anterior tendon with a 5 cm gap at the level of the tibialeal junction. Moderate underlying tendinosis was also reported. He was placed in a CAM walker and recommended to be nonweight bearing.

The patient was taken to the operating room for surgical repair 3 weeks after presentation in office. Following sterile preparation and use of a thigh tourniquet, a 6 cm linear incision directly overlying the tibialis anterior tendon was made and carried deep through subcutaneous tissue. The extensor retinaculum was visualized and transected, exposing the tibialis anterior tendon. Following evacuation of hematoma, the foot was held in 90 degrees and manual traction was placed on the tibialis anterior tendon and a full rupture was then noted with a 5 cm gap. The proximal and distal ends of the tendon were thickened and frayed. Approximately 6 mm of the tendon was measured proximally and split in half. The distal portion of the tendon was repaired with 2-0 Fiberwire and the proximal tendon was then turned down and repaired. A woven poly-L-lactide acid synthetic device was cut and placed over the repair.

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The device was reinforced with 2-0 Fiberwire and 3-0 vicryl. A suture anchor was then placed in the medial cuneiform and the attached suture was utilized to repair the distal aspect of the tendon in a whip stitch fashion. The surgical site was copiously irrigated and the tendon sheath was reaproximated with 2-0, 3-0 vicryl. Subcutaneous tissues were reaproximated with 3-0, 4-0 vicryl. Skin was reaproximated with 4-0 nylon. DSD and a posterior splint was applied with the ankle maintained at 90 degrees. He was seen in office 10 days postoperatively at which he was placed in a cast. Sutures were removed at 21 days postop and a cast was reapplied. He remained nonweight bearing in a cast for a total of 6 weeks, then was placed in a tall CAM boot and started passive ankle ROM exercises. He remained in the CAM walker for 4 weeks with gradual progression in weight bearing and physical therapy during this time. He was then gradually transitioned out of the CAM walker and into supportive sneakers.

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Figure 1. Preparation of poly-L-lactide acid device.

Figure 2. The synthetic device is sutured onto the repair.

The patient has been followed for 12 months and continued to ambulate unassisted without pain or decrease in function to the surgically repaired limb. The patient had also subjectively reported his strength to be comparable to the nonoperative limb at final follow-up. For large defects following a rupture of the tibialis anterior tendon, previous authors have described surgical repair options including lengthening and tendon transfers. As tendon transfers are generally indicated for these large defects, there are limited studies that describe a tendon turn down with synthetic graft augmentation. This case study describes our approach for repair of a complete tendon rupture when there is significant gapping. The main goal is to offer another approach for repair while avoiding a tendon transfer and when end-to-end anastomosis does not offer adequate repair for large defects.

References