

Anterior Talofibular Ligament Rupture/Repair and Reinforcement Using DermaSpan™ Acellular Dermal Matrix

A Single Patient Case Study

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Introduction

The anterior talofibular ligament (ATFL) is the most commonly injured ligament in the ankle.¹ The mechanism of injury is most frequently an inversion ankle sprain with the ankle in a plantarflexed position. Although it is sometimes the only structure injured, often other ankle ligaments such as the calcaneofibular, posterior talofibular, deltoid, and anterior inferior tibiofibular ligaments are injured concomitantly.

If treated properly, the ATFL ligament will usually heal uneventfully. At times, in spite of proper treatment, or with improper treatment, the ligament may not heal, or may heal attenuated. Should this be the case, instability of the ankle and/or pain may persist. After conservative measures have been exhausted, surgical intervention is warranted.

There is a wide variety of surgical techniques for lateral ankle ligament repair including end-to-end anastomosis, use of anchors, and use of pliable biologic grafts for reinforcement or tendon covering, which may increase tensile strength at the time of initial repair.² The latter have grown in popularity because of ease of application, conformability to the injured site, ability to incorporate and remodel with the host tissue,³ minimal profile when applied to the repair site, and increase in tensile strength.²

Case Study

A 49-year-old male suffered a work related injury in which he had an inversion ankle sprain of the left ankle. The patient was treated conservatively for six weeks and released to full duty with a 0% impairment rating. The patient returned to a workers compensation clinic a year later stating that his pain had continued after discharge, and that he had been wearing a figure eight brace since. At this time, physical therapy was prescribed for two weeks with instructions for home exercises. Because of ongoing symptoms, the patient was referred to my clinic for evaluation and treatment.

Physical Exam

Initial exam revealed edema over the lateral left ankle, mild ecchymosis, pain with plantarflexion and inversion of the foot on the leg, and pain on palpation of the lateral ligamentous complex.

Preoperative Work-Up

An MRI was ordered revealing attenuation and associated tearing of the ATFL (Figure 1, 2). The surrounding ligaments and tendons were intact with no identifiable abnormalities of the surrounding joints. The patient was scheduled for surgical repair of the ATFL with the use of Biomet's DermaSpan™ Acellular Dermal Matrix for augmentation. Due to attempted conservative care, surgery was performed three and a half months after the initial visit.



Fig. 1
MRI Sagittal view torn ATFL

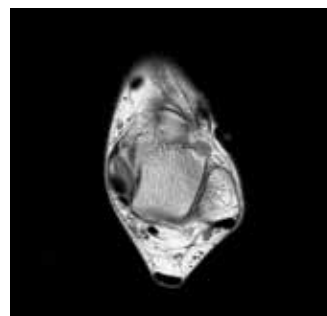


Fig. 2
MRI Transverse view torn ATFL

Surgical Procedure

An ankle arthroscopy was performed for examination and debridement of the ankle joint. Once completed and the instrumentation removed, attention was given to the lateral ankle. A semicircular incision was created just beyond the lateral malleolus and ligaments. The incision was deepened beyond the skin and subcutaneous tissue and a flap was created and elevated while taking care to identify and retract the superficial peroneal nerve. The ATFL was identified and found to be ruptured. A modified Brostrom procedure was performed with anastomosis of the ends using 2-0 non-absorbable suture with a Modified Kessler suture technique. A coma shaped piece of the DermaSpan™ matrix was fashioned from a 4x4 cm graft and used to cover the lateral ligaments extending from the malleolus beyond the ligaments. A 2-0 absorbable suture was used to anchor the DermaSpan™ graft to the fibular periosteum, ligamentous tissue, and periligamentous tissue using simple and horizontal mattress suture techniques (Figure 3).



Fig. 3
Anchored DermaSpan™ matrix

The wound was closed in layers and dressed according to preference. A posterior splint was applied with the ankle in neutral position, ensuring that the position was maintained while the patient emerged from anesthesia.

Rehabilitation

One week postoperatively the wound was examined and found to have no signs of infection. The posterior splint was reapplied and daily dressing changes with an alcohol wipe and triple antibiotic dressing were ordered.

Skin staples were removed at three weeks postoperatively. At this time a short-leg cast was applied and left on for two weeks. The patient returned to the clinic early and had the cast removed at four weeks post-op. The patient was then placed in a CAM walker and allowed to begin partial weight bearing. He was then allowed to progress to full weight over the next two weeks. At that time, the patient was placed in an ankle brace and a running sneaker and allowed to increase activity.

Postoperative Follow-up

The patient was seen several times over the next several months before being discharged, having reached maximum medical improvement with a 0% impairment rating. The patient returned to full activity without pain or loss of strength.

Conclusion

In this case, the use of the DermaSpan™ matrix for the reinforcement of the tendon repair strengthened the repair with minimal bulk, and allowed for restoration of normal strength and motion.

References

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3. L DiDomenico, G Blask, L Cane, D Cross. Repair of Lacerated Anterior Tibial Tendon with Acellular Tissue Graft Augmentation. *Journal of Foot & Ankle Surgery.* 2012 May; (51): 642-44.

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