Utilization of a Next Generation Decellularized Dermal Allograft to Augment the Complex Repair of Ruptured Peroneus Brevis and Torn Peroneus Longus Tendons

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Surgical Summary

Clinical Presentation:

- 43-year-old female presented with one year history of swelling and pain in her left foot that began after she was jumping in place. Previously treated, by another podiatrist, with a controlled ankle motion (CAM) boot for eight weeks, along with NSAIDs, and home physical therapy (PT) resulting in significant improvement. The pain resurfaced in the prior three weeks.
- Examination: 2+ deep tendon reflexes, no focal deficits. Pain along peroneal and cuboid calcaneus region with no pain at base 5th metatarsal.
- Patient started on Medrol by mouth and instructed to return to CAM boot. MRI without contrast ordered.
- MRI without contrast revealed:
    - Severe tendinopathy and longitudinal split tearing retromalleolar and inframalleolar peroneus brevis and peroneus longus tendons. Minor peroneal tenosynovitis. Superior peroneal retinaculum (SPR) and inferior peroneal retinaculum (IPR) intact. Shallow retromalleolar groove. Diminutive peroneal tubercle and retrocrural trochlear eminence.
- Surgical plan to repair peroneal tendons, utilizing a decellularized dermal allograft (DermaPure®), for soft tissue reinforcement.

Intraoperative Findings:

- The peroneus brevis tendon was completely ruptured. The peroneus longus tendon was noted to be diseased, hypertrophied, with muscle longitudinal tears, and with less than 50% of the tendon intact. The intact tendon was also diseased with surrounding synovitis and scar tissue.

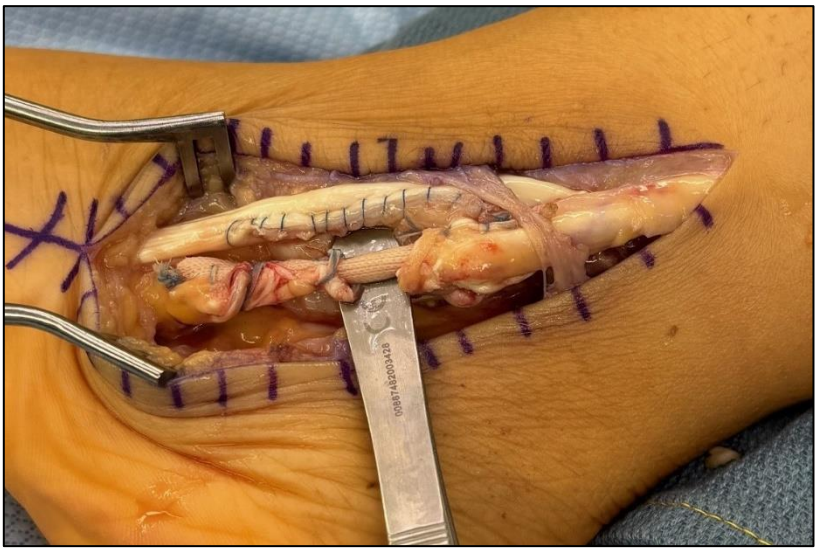

Figure 1. Repair of peroneus brevis and longus tendons.

Surgeon Perspective:

"This patient had a complex injury to the peroneus tendon. DermaPure provided reinforcement of the repair. This patient demonstrated reduced swelling and scar tissue formation, and experienced an earlier time for range of motion exercises and weight-bearing."

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Surgical Procedure:

- The surgical site was prepped and draped in the usual sterile fashion. Using an Esmarch, the left lower extremity was manually exsanguinated, and the pneumatic thigh tourniquet was inflated to 250 mmHg. The Esmarch was removed, and attention was directed to the left lateral ankle.
- Using a 15-blade scalpel, an 8 cm curvilinear skin incision was made along the course of the peroneal tendons down to the 5th metatarsal base. The incision was deepened, and the underlying subcutaneous soft tissues were dissected using sharp and blunt dissection until the peroneal tendon sheaths were revealed. The tendon sheath was incised longitudinally parallel to the course of the tendons. The peroneus brevis tendon was completely ruptured. The peroneus longus tendon was diseased, hypertrophied, with muscle longitudinal tears, and less than 50% intact. The intact tendon was surrounded with synovitis and scar tissue, which was removed using a 15-blade scalpel and curette. The surface of the peroneus longus tendon was roughened with a curette. An Artelon® graft was placed within the peroneus longus tendon, and the tendon was tubularized down to the level of the calcaneocuboid joint (Figure 1). An Artelon® graft was sutured to the peroneus brevis tendon and tubularized (Figure 1). A 7 cm x 10 cm DermaPure® (a decellularized dermal allograft) was sutured around the peroneus brevis and longus tendon repairs using Prolene® 4-0 for soft tissue support (Figure 2). The tendons were inspected to ensure they were appropriately tubularized. The site was irrigated with sterile normal saline. The extensor retinaculum was reapproximated using 2-0 Vicryl® sutures. The subcutaneous tissue was reapproximated with 4-0 Vicryl® sutures. The skin was sutured with minimal tension using 3-0 nylon. The site was dressed with Xeroform®, dry gauze, Kerlix, and a loose ACE® wrap.
- The patient tolerated the procedure well and was transferred to the post anesthesia care unit. Neurovascular status intact to the operative limb.

Post-Operative Notes:

- Discharged home non-weight-bearing (NWB). Return to the clinic in one week.
- Week one post-op: Surgical site healing well. Remain NWB in CAM boot, start passive range-of-motion (ROM) exercises while boot is off.
- Week two post-op: Sutures removed. Remain NWB. Instructed to bring crutches next visit for partial-weight-bearing (PWB) instructions.
- Week four post-op: PWB to full-weight-bearing (FWB) in CAM boot to tolerance.
- Week seven post-op: Gabapentin 300 mg one capsule orally at bedtime ordered. Instructed to slowly transition out of CAM boot into running/supportive shoes to tolerance.

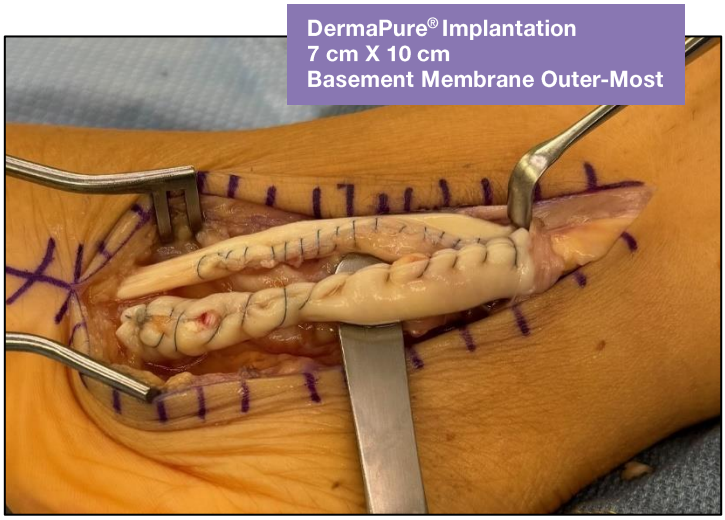

Figure 2. Placement of DermaPure® for soft tissue reinforcement.

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