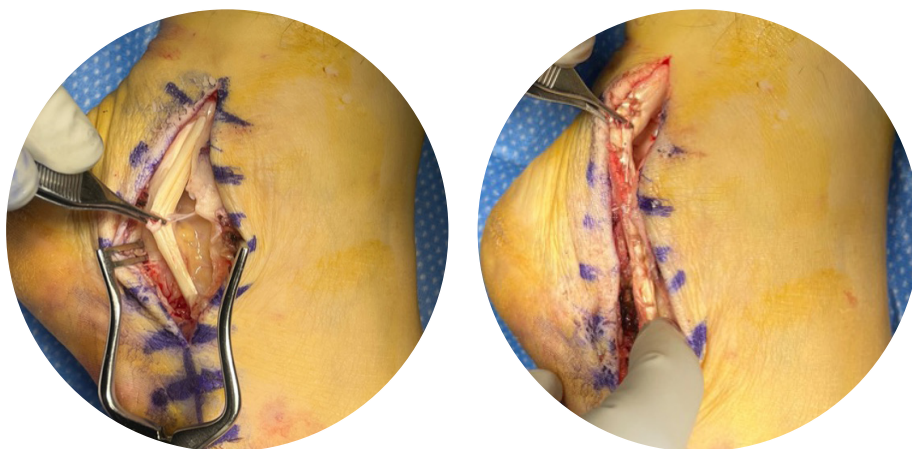


CASE STUDY

Peroneal Tendon Repair with the BioBrace® FA Reinforced Implant

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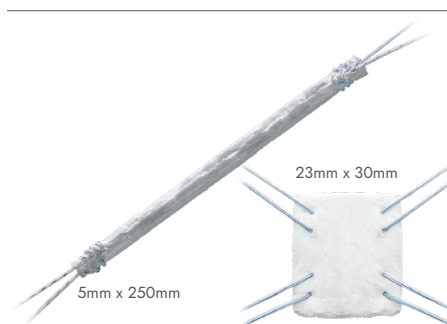
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PRESENTATION

A 61-year-old male presented with a complaint of right ankle pain, without inciting injury. A history of chronic left knee pain failing previous surgeries had resulted in compensation to his right lower extremity. Protected weightbearing, narcotic/over-the-counter pain medications, lidocaine patches, ice, rest, and elevation had all failed for approximately 4 months prior to referral. The patient's body mass index was 39.5kg/m²; other medical comorbidities included cardiovascular disease, hypertension, diabetes with neuropathy, gastroesophageal reflux disease, hypothyroidism, and osteoarthritis. His surgical history included placement and subsequent removal of a spinal cord stimulator.

EXAMINATION

Physical examination revealed an antalgic gait and diffuse swelling to the right ankle, without ecchymosis. Pain was subjectively reported as an 8 out of 10 on a verbal analogue scale, and tenderness with palpation along the course of the peroneal tendons from the retromalleolar sulcus of the fibula proximally, extending to the cuboidal groove distally was reported. A prominent peroneal tubercle and reduced eversion strength against resistance were appreciated; Sobel's stress test of the superior peroneal retinaculum (SPR) was negative.



BioBrace® FA Reinforced Implant

There was no tenderness with palpation of the lateral malleolus, anterior syndesmosis, or anterior talofibular ligaments, and stress examination failed to reveal any discernable ankle instability. The patient was diagnosed with neuropathy using a 5.07g SW monofilament; the neurovascular status was otherwise intact.

Conventional weightbearing failed to reveal any osseous pathology (**Figure 1**). Given the presence of a metal coil from previous removal of a spinal cord stimulator, computed tomography (versus MRI) and non-invasive arterial ultrasounds were obtained; a metallic artifact in the foot unrelated to the primary complaint was identified.

Non-operative treatment was started which included subtalar joint, and peroneal tendon sheath injections. The subtalar injection failed to improve symptomatology, while the peroneal injection provided almost complete

relief. An edema reduction protocol and protected weightbearing in a boot was initiated, along with medications, rest, ice, and elevation. After approximately 6 months of failed non-operative treatment, surgery for peroneal tendon repair with synthetic graft augmentation, resection of the hypertrophied peroneal, and possible tendon transfer was scheduled.

SURGICAL TECHNIQUE

The patient was placed in the a "lazy" lateral decubitus position and was pre-scrubbed with chlorhexidine prior to formal preparation and draping. A lateral approach through a curvilinear incision along the course of the peroneal tendons was made from proximal to distal. Care was taken to avoid iatrogenic injury to branches of the sural nerve. A hemostat was placed between the peroneal tendons and SPR, and the retinaculum was transected revealing complete rupture of the peroneus longus, and longitudinal tearing to the peroneal brevis tendons (**Figure 2**).



Figure 1. Conventional weightbearing radiographs

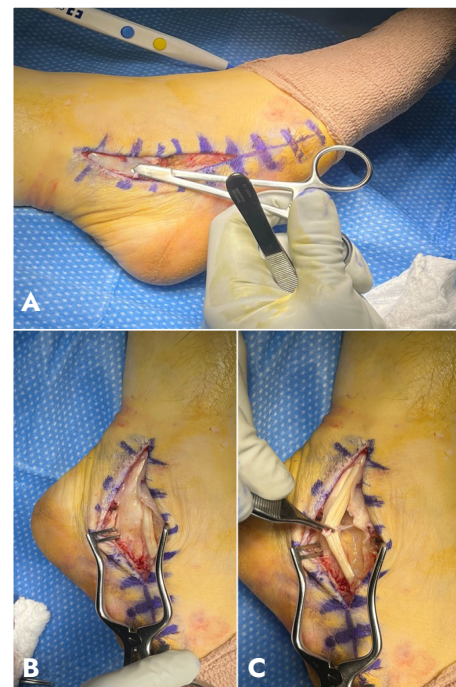


Figure 2.

The retracted stump of peroneus longus was freed from underlying adhesions, and longitudinal tearing the peroneus brevis was sharply resected. Direct repair of the peroneus brevis, augmented with BioBrace® FA 5mm by 250mm, was then performed using absorbable suture. BioBrace® FA is a highly porous bovine collagen sponge, reinforced with PLLA microfilaments. It was chosen as it gives soft tissue repairs additional mechanical strength at times zero, affording earlier time to WB, faster rehab, and a reduced convalesce period, in general. BioBrace® FA does this while simultaneously improving the native biology, encouraging the body's repair process.

The authors preferred method involves saline application to the bio-inductive scaffold first, to improve the materials pliability, ease suture passage, and reduces bulk. A single suture is then used to tag the reinforced scaffold proximally, facilitating tubularization inside-out, out-side in. The hypertrophied peroneal tubercle was resected using a rongeur, and exposed cancellous bone was cauterized (**Figure 3**).

The residual peroneus longus tendon was then resected to a level just proximal to the retromalleolar sulcus of the fibula and SPR footprint; end to end repair of the longus to brevis was performed in standard fashion. It is important to be cognizant of the ruptured tendons resection level to mitigate the risk for adhesions and the potential for "mass effect" in the retro-malleolar sulcus following repair of the SPR repair.

The technique affords additional supplemental augmentation of the peroneus brevis distal the retromalleolar sulcus using BioBrace® FA along its posterior/plantar surface, given the absence of the resected peroneus longus; as was performed in the present case. Finally, repair of the SPR was performed, stability and tendon excursion

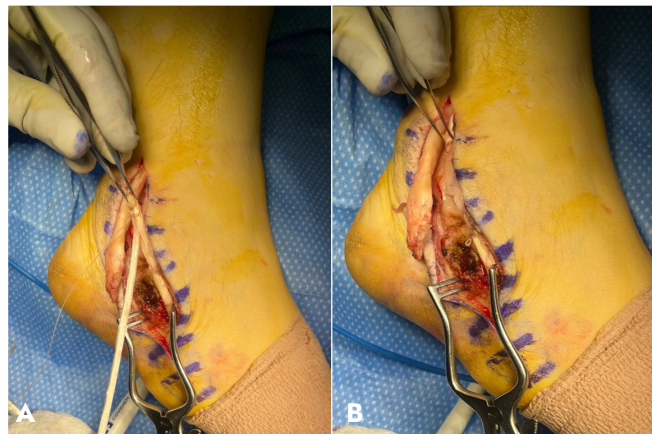


Figure 3.

was assessed, and layered closure was performed (**Figure 4**).

With consideration to the patients age, body habitus, and medical comorbidities; the patient was non-weightbearing (NWB) in a posterior splint for 2 weeks, followed by continued NWB in a short leg fiber glass cast for 4 additional weeks thereafter. At 6 weeks postoperative, he was transitioned to protected weightbearing (PWB) in a boot for 4 weeks. During that time, active ankle range of motion began and at 10th week postoperative, a lace up ankle brace was dispensed and formal physical therapy commenced.

The above protocol varies from the authors preferred method of 2 weeks NWB posterior splint, 4 weeks PWB boot, and 6 weeks weightbearing as tolerated in a brace with formal physical therapy. At 12 weeks postoperative, patients are allowed to discontinue brace use, continue self-directed physical therapy from home, and gradually begin increasing activities back to baseline for the subsequent 3 months. Patients are cleared to full activity upon return for assessment.

DISCUSSION

BioBrace® FA offered Dr. Rushing's patient additional mechanical strength. In the setting of a PB tendon with almost

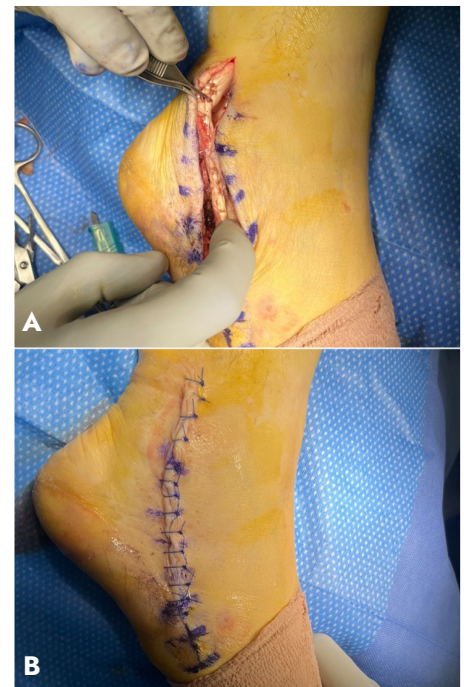


Figure 4.

50% cross sectional tearing and an absent PL (ruptured and retracted >5cm); Dr. Rushing was concerned with coronal stability of the ankle, as well as eversion strength. BioBrace® FA helped to improve the biology of the ankle repair; with the comorbidities listed, this patient would not heal and remodel as one typically would, so BioBrace® FA acts as an equaliser for the patients poorer protoplasm.



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