

TECHNOLOGY OVERVIEW

Artelon manufactures Dynamic Matrix™ solutions for tendon and ligament reconstruction. Our technology can be utilized to enhance the strength of repair constructs without adding kinematic constraint.¹ Clinically, this technology is novel in its ability to:

- **Restore** kinematics
- **Resist** failure from necrosis
- **Regenerate** native tissue through load sharing^{2,3,4}

Artelon's FLEXBAND Technology is extremely inert, and less reactive than common biomaterials such as titanium, polystyrene and suture.⁵ It integrates into the repair site and scaffolds new tissue growth. Its high compliance also permits load sharing, which stimulates rapid tissue remodeling through mechanotransduction.⁶ FLEXBAND maintains its properties for five years, then dissolves in water and is eliminated from the body.

INTRODUCTION

The peroneal tendon complex is the active stabilizer of the lateral ankle. These structures are the primary resistors of foot inversion, and have been shown to be critical for foot stability proprioception and preemptive correction⁷. They are also common sources of hindfoot pain following ankle injuries, which can lead to chronic ankle instability and several hindfoot abnormalities when left untreated. Therefore, reconstruction of these structures requires strength, creep resistance, and an environment supportive of host tissue regeneration.

The surgical methods here describe utilizing Artelon's FLEXBAND technology to augment a peroneus longus repair.

PRE-OPERATIVE FINDINGS

The patient presented with continued left posterolateral ankle pain and swelling after undergoing a left peroneal tendon repair with peroneus longus to brevis tendon transfer by an outside surgeon 6 months prior. Her ambulation was poor secondary to pain despite physical therapy and CAM boot immobilization.

Clinically, the patient had tenderness and edema over the peroneal tendons, pain and weakness with resisted eversion of the foot, and evidence of peroneal dislocation on exam. MRI of the left ankle showed evidence of peroneal tendon subluxation (Figure 1), partial split tear of the peroneus brevis tendon, peroneal tenosynovitis, and peroneus longus tendinosis (Figure 2).

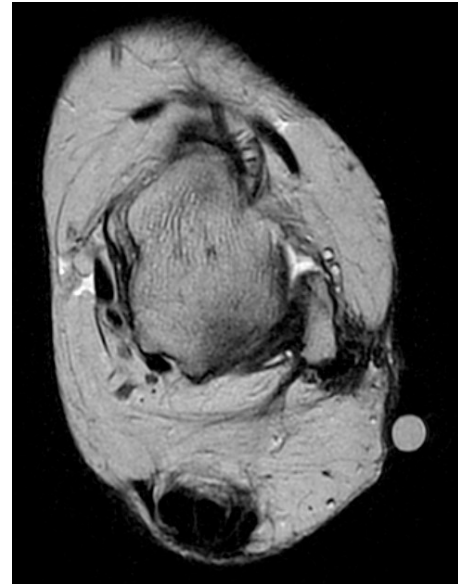


FIGURE 1: Preoperative T1 axial image showing subluxation of the peroneal tendons and peroneus brevis tendon tear.

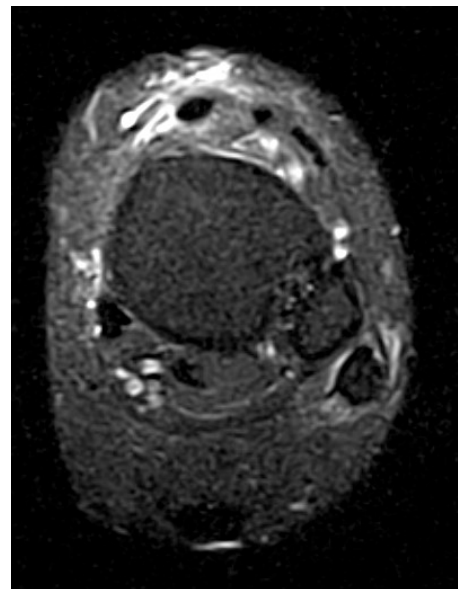


Figure 2: Preoperative T2 axial image showing tendinosis of the peroneus longus tendon and tenosynovitis around the peroneal tendons.

References:

1. Gisseffalt et al, *Biomacromolecules* 2002, 3, 951-958.
2. Lijjsten et al, *J. Biomater. Sci: Materials in Medicine* 13 (2002) 351-359
3. Peterson et al, *Knee Surg Sports Traumatol Arthrosc* (2014) 22:2109-2120.
4. Peterson et al., *The Anterior Cruciate Ligament: Reconstruction and Basic Science*. 2nd ed., Elsevier 2018.
5. Gretzer et al, *J. Biomater. Sci. Polymer Edn*, Vol. 17, No. 6, pp. 669-687 (2006)
6. Gersoff et al, *J Knee Surg*, 2018 Apr 27.
7. Cho et al, *FAJ*. Vol 40(8): 961-968 (2019)

SURGICAL INTERVENTION



Figures 1-3: Longitudinal partial split tear of peroneus brevis tendon.



Figure 4: Peroneus brevis after excision of tendinosis segment of peroneus longus with proximal transfer of peroneus longus to peroneus brevis.



Figure 5: Sizing Artelon's FLEXBAND to augment secondary repair of peroneus brevis tendon tear.



Figure 6: FLEXBAND is sutured to peroneus brevis tendon using 2-0 suture.

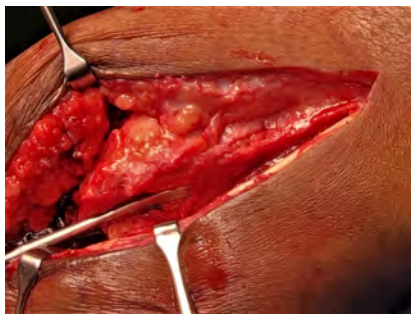


Figure 7: Peroneus brevis tendon is retracted posteriorly to show fibular groove deepening.

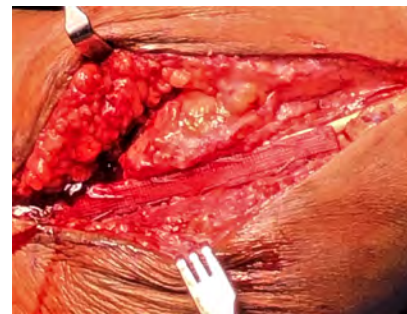


Figure 8: Peroneus brevis tendons after augmentation with Artelon's FLEXBAND and fibular groove deepening with no evidence of subluxation out of groove.

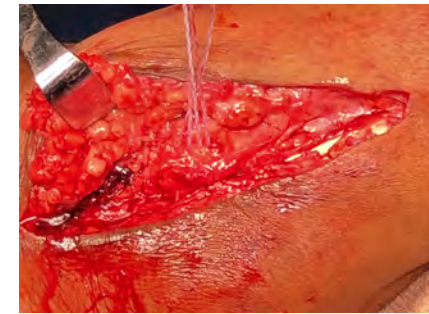


Figure 9: Superior peroneal retinaculum secondary repair.

FOLLOW UP

The patient was splinted for two weeks and then transitioned to a CAM walker boot, which was worn for 3-weeks. They were non-weightbearing for the initial 3-weeks and then began to weight bear as tolerated in the CAM boot. Patient began home ankle range of motion at 2-weeks postoperatively and started formal physical therapy at 4-weeks postoperatively. At 5-weeks post-op, they were weaned from the CAM boot and pain was noted to be improved from pre-op. By 3 months, the patient had begun to return to regular activity with significantly improved pain and swelling.

CONCLUSION

Use of Artelon's FLEXBAND technology allows patients to mobilize faster with less pain and quicker return to regular activity.

