

Lateral ankle injuries are a common occurring pathology that often can lead to chronic lateral ankle pain or instability. Addressing these through anatomic reconstruction has been shown to provide superior outcomes, and with new technology, augmented lateral ligament reconstructions have become standard of care.

Significant to this technique is the utilization of a novel Dynamic Matrix™. Artelon's FlexBand matrix immediately aids in the restoration of joint kinematics, resists degradation of mechanical properties, and supports efficient tissue regeneration. The technique described here offers an advanced surgical method for lateral ankle reconstruction.

Notes: Artelon's FlexBand is approved to augment, but not replace the ligamentous structures.

CLINICAL HISTORY AND SURGICAL PLAN

A 55 year-old healthy male presents with a long standing forefoot driven hindfoot cavovarus foot type with associated lateral ankle instability. The patient experiences recurrent ankle sprains and has failed bracing, physical therapy, and other conservative treatments. MRI confirms tearing of the lateral ankle ligaments as well as peroneal tendon pathology. The patient wishes to undergo surgical intervention. The surgical plan is a cavus reconstruction with multiplane correctional Z-cut calcaneal osteotomy, dorsiflexory 1st metatarsal osteotomy, peroneal tendon repair, and lateral ankle ligament reconstruction utilizing Artelon's FlexBand matrix.

REQUIRED IMPLANTS AND INSTRUMENTATION:

- Artelon FlexBand (0.5 x 16cm)
- #0 Vicryl suture
- Guide wire (x3)
- Cannulated drill bit for 4.0 interference screw
- Cannulated drill bit for 5.0 interference screw
- 5mm PEEK interference screw
- 4mm PEEK interference screw (x2)



INTRAOPERATIVE FINDINGS

The hindfoot Z-cut valgus osteotomy was used to set the hindfoot at neutral, while the forefoot plantar flexed ray was addressed with a 5 mm dorsal closing wedge of the 1st metatarsal. Following realignment, the peroneus brevis tendon was repaired.

A positive anterior drawer and talar tilt test confirmed lateral ankle ligament insufficiency. Examination of the ligaments revealed clear laxity in both the anterior talofibular ligament (ATFL) and calcaneal fibular ligaments (CFL) with poor quality tissue because of the chronic nature of the injury.

SURGICAL TECHNIQUE

STEP 1: A Standard lateral ankle incision is made over the distal fibula and curved anteriorly toward the talus (Figure 1). Dissection is carried down to the inferior extensor retinaculum, which is preserved for a Gould modification later.

STEP 2: The ATFL is identified, incised, and elevated at its origin/insertion on the fibula and talus (Figure 2). Dissection is carried to the CFL and its origin/insertion are identified on the fibula and lateral calcaneus. The CFL is preserved.

STEP 3: The 0.5 x 16cm FlexBand is prepared on the back table. It is sewn in a Y fashion with #0 Vicryl suture for separation into each ligament repair (Figure 3). A whip stitch is placed at each end of the graft.

STEP 4: Three guide wires are then placed for interference screws (Figure 4). One wire is first placed in the anterior distal fibula 50% between the origin of the ATFL and CFL. One guide wire is then placed at the insertion of the ATFL and one at the CFL. Fluoroscopy can confirm accurate placement of the wires for matrix fixation.



Figure 1: Standard lateral ankle incision over the distal fibula and ATFL.



Figure 2: Exposure of the ATFL. The ATFL has been incised off the fibula to expose the lateral talus. Note the additional incision for a calcaneal osteotomy.



Figure 3: FlexBand matrix sutured into a Y-configuration with a whip stitch on each arm.



Figure 4: Placement of guide wires for interference screws. One 50% between the origin of ATFL and CFL. One at the insertion of the ATFL on the lateral talus and one at the insertion of the CFL on the lateral calcaneus.

SURGICAL TECHNIQUE

DYNAMIC CHRISMAN SNOOK LATERAL ANKLE STABILIZATION TECHNIQUE UTILIZING ARTELON® FLEXBAND™ TECHNOLOGY

Described by Greg Berlet, MD & Travis Langan, DPM (Columbus, OH)



Figure 5: The over-sewn portion of the FlexBand matrix is fed into the distal fibula.

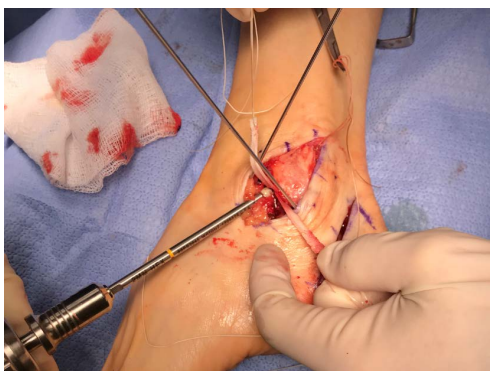


Figure 6: Interference screw affixing the FlexBand into the fibula.



Figure 7: FlexBand tensioned and secured into the talus and calcaneus recreating the ATFL and CFL.



Figure 8: Post-operative radiographs showing cavus foot reconstruction with visible drill holes where the FlexBand is secured with interference screws in the talus and calcaneus.

STEP 5: The wires are then over drilled and the base of the Y portion of the graft is fed into the distal fibula (Figure 5). A 5mm PEEK interference screw is used to affix the graft into the fibula (Figure 6).

STEP 6. The graft is then fed into the drilled holes in the talus and calcaneus. The foot is everted and the graft is tensioned appropriately. The graft is then affixed into the talus and calcaneus with a 4mm PEEK interference screw in each hole (Figure 7). Tension is set so the the patient's hindfoot is able to invert a maximum of 10 degrees with a solid endpoint.

STEP 7. A standard anatomic Broström repair then takes place over the graft. The ATFL is repaired in a pants-over-vest fashion and the inferior extensor retinaculum is oversewn into the repair for added strength and stability with the Gould modification.

Standard layered closure then follows.

Finally, post-op radiographs are taken to confirm overall construct (Figure 8).

POST-OPERATIVE CARE

The patient is placed into a non-weightbearing splint postoperatively. At 1-week post-op, the patient is placed into a non-weightbearing cast. At 4-weeks post-op, the patient is placed into a weightbearing boot. Ankle rehabilitation begins at 6-weeks following the 3 phase OFAC rehabilitation protocol. The patient is transitioned into normal shoe gear with an ankle brace at an average of 8 weeks postop. The patient transitions out of the brace and continues regular activities at 10-weeks post-op. Return to full activity is estimated at 4-months post operatively.

CONCLUSION

A 55 year-old male with chronic lateral ankle instability underwent a cavus reconstruction with lateral ligament reconstruction utilizing Artelon's FlexBand matrix. The procedure provided a strong and reliable ligament repair. The procedure allowed for normal return to activity at 16 weeks. Reconstruction of the ATFL and CFL ligament using Artelon's technology is safe and effective, with the capacity of supporting a difficult foot structure.