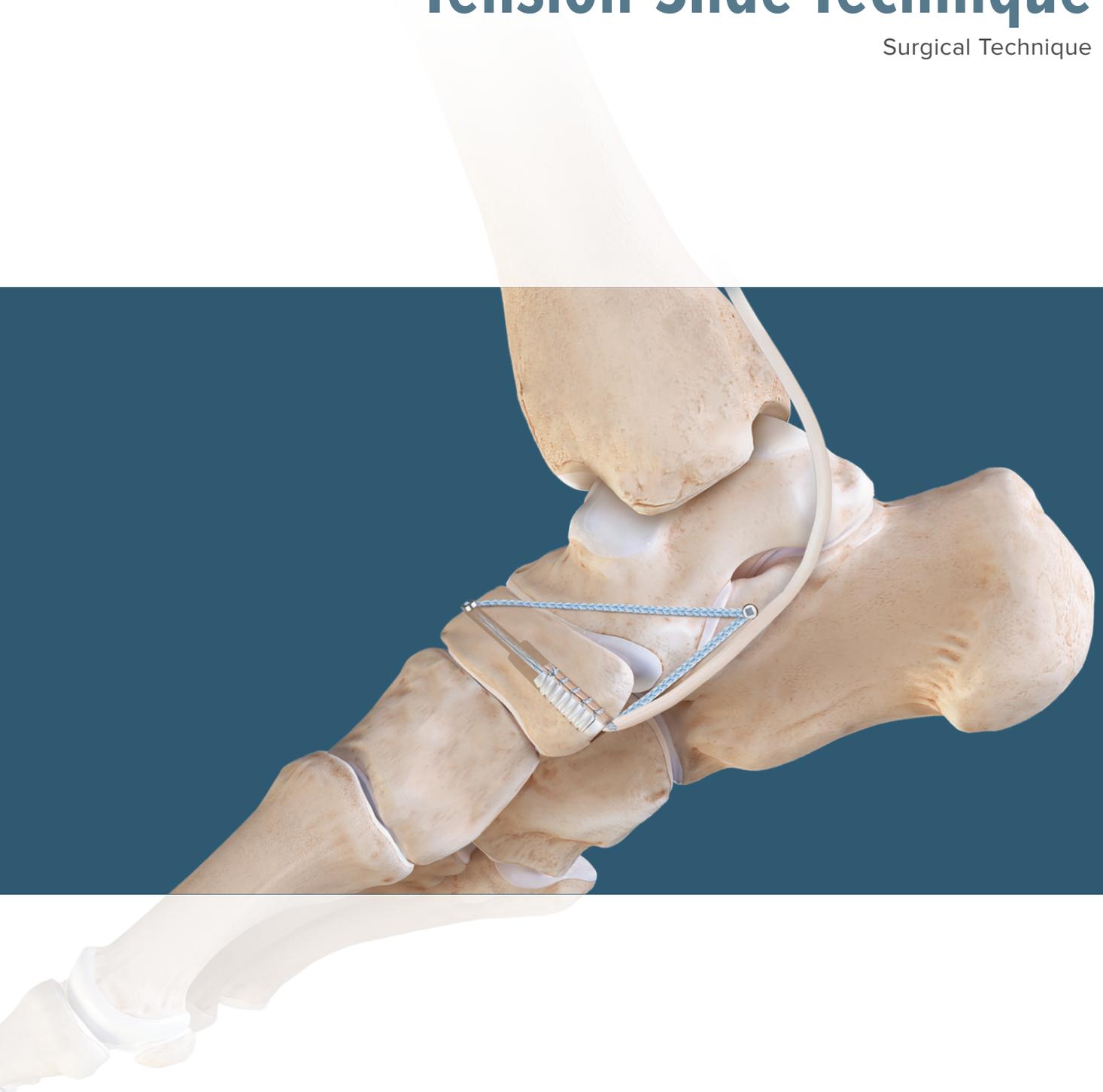


Flexor Digitorum Longus Tendon Transfer With DX Button and Tension-Slide Technique

Surgical Technique



Flexor Digitorum Longus (FDL) Tendon Transfer Using the DX Button and Tension-Slide Technique With Spring Ligament *Internal/Brace*[™] Ligament Augmentation Procedure

FDL tendon repair using the DX button and Tension-Slide Technique allows the surgeon to tension and repair the FDL through a single medial incision. The combination of cortical button fixation coupled with a BioComposite Tenodesis screw creates a strong, anatomic repair.¹

Procedures

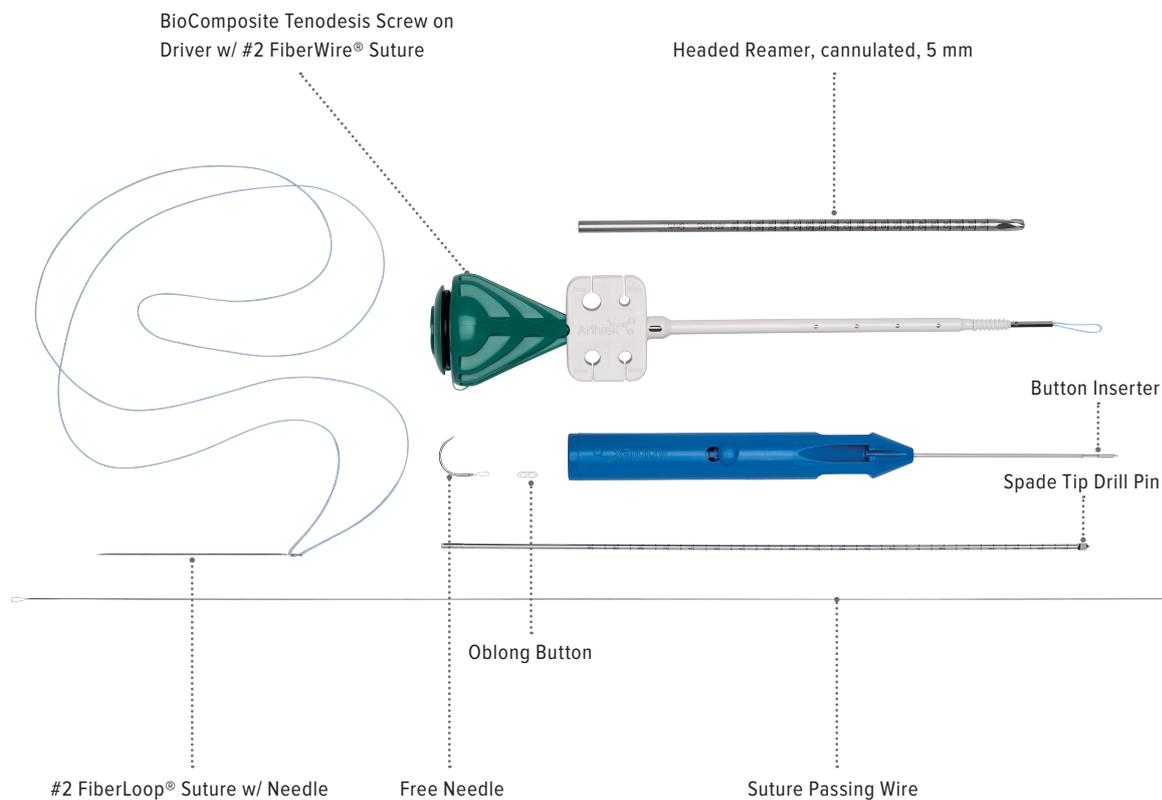
- Posterior Tibial Tendon Transfer
- Acquired Adult Flatfoot Deformity Correction

Reference

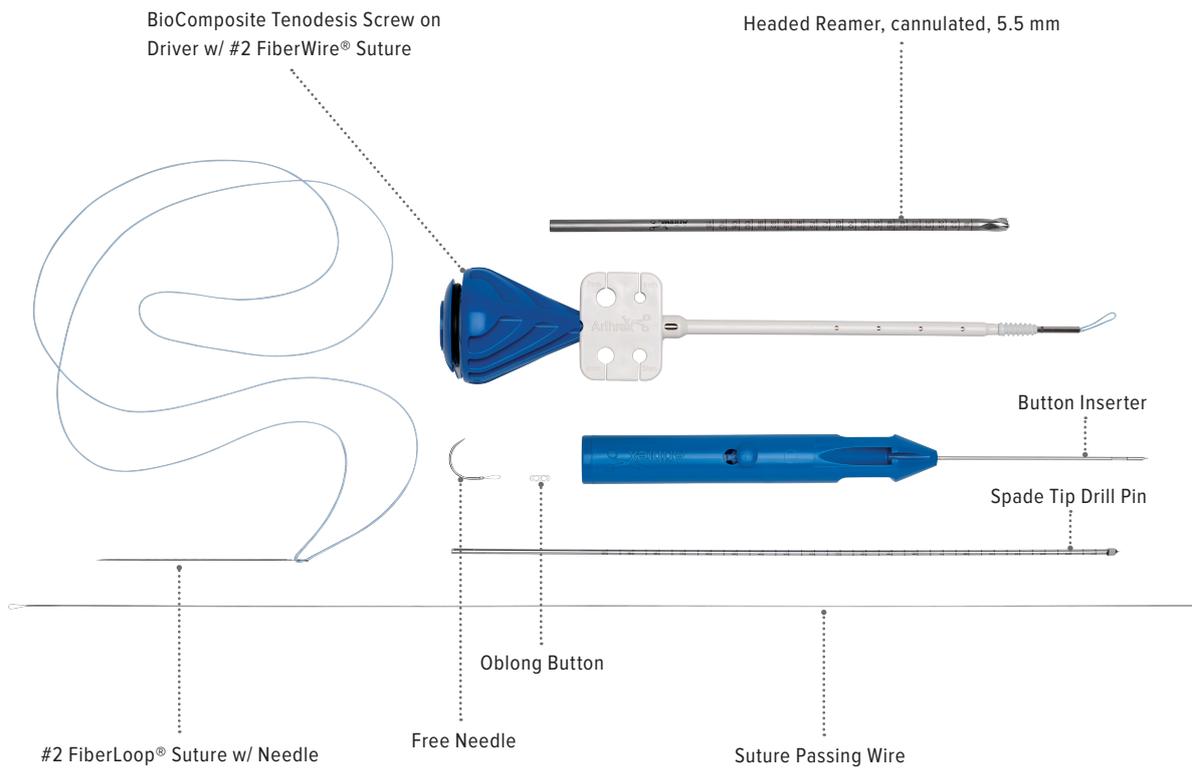
1. Arthrex, Inc. APT 04032. Naples, FL; 2018.

The *Internal/Brace* surgical technique is intended only to augment the primary repair/reconstruction by expanding the area of tissue approximation during the healing period and is not intended as a replacement for the native ligament. The *Internal/Brace* technique is for use during soft tissue-to-bone fixation procedures and is not cleared for bone-to-bone fixation.

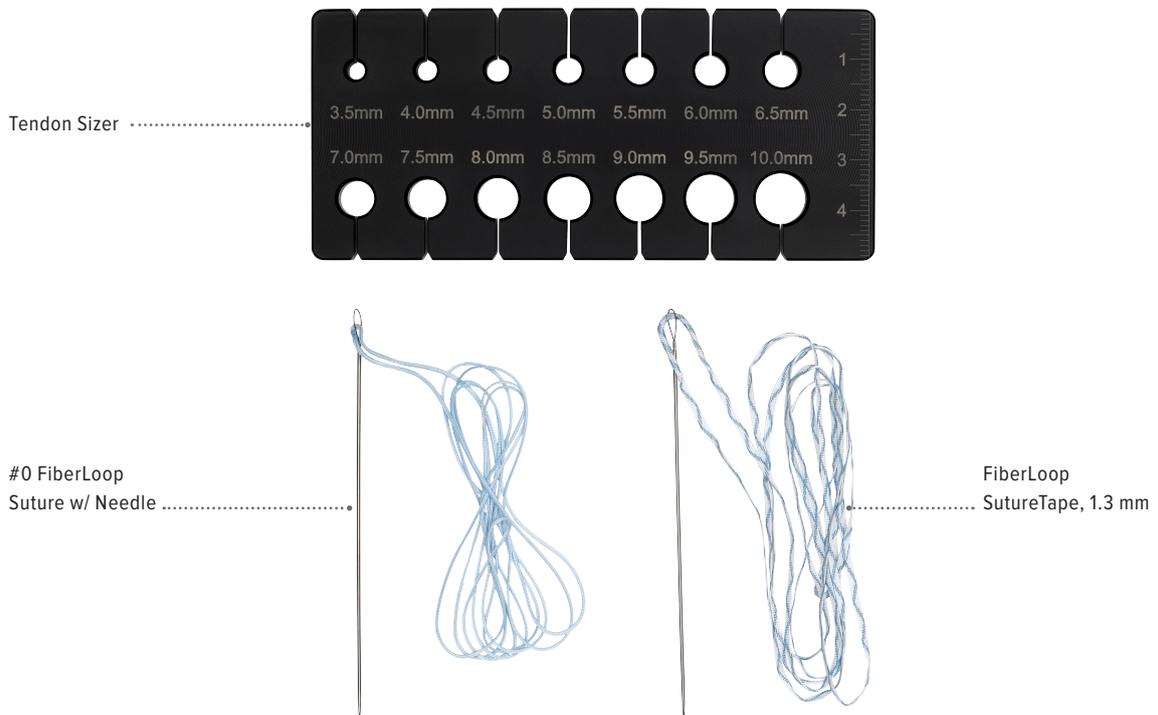
FDL Implant System, 4.75 mm



FDL Implant System, 5.5 mm



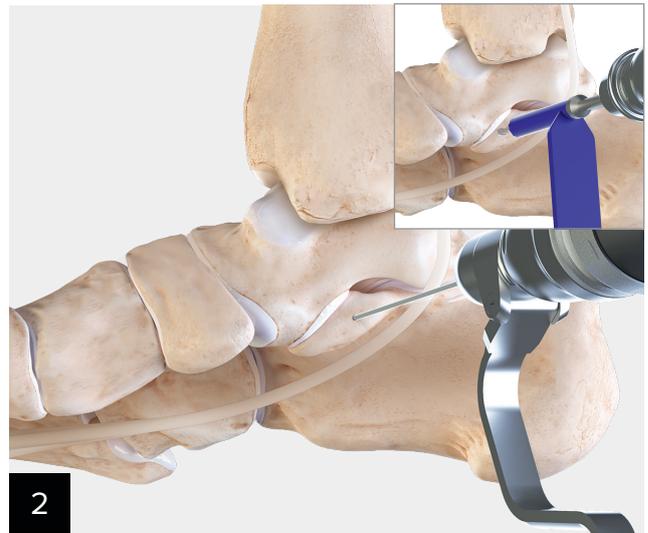
Tenodesis Graft Sizing Kit



Incision and Spring Ligament *Internal/Brace*™ Procedure Preparation



Place the patient in a prone position on the operating room table under general anesthesia with a tourniquet used per surgeon discretion. Make a 5 cm to 6 cm incision from the posterior aspect of the medial malleolus to just below the palpable navicular tuberosity. Use a combination of blunt and sharp dissection to identify the posterior tibial tendon sheath just distal to the medial malleolus; open the sheath to expose the pathology of the posterior tibial tendon.



Insert a 1.35 mm K-wire into the sustentaculum tali angled 15° plantarly and slightly posterior to avoid the subtalar joint. Verify position prior to overdrilling with a 2.7 mm cannulated drill.

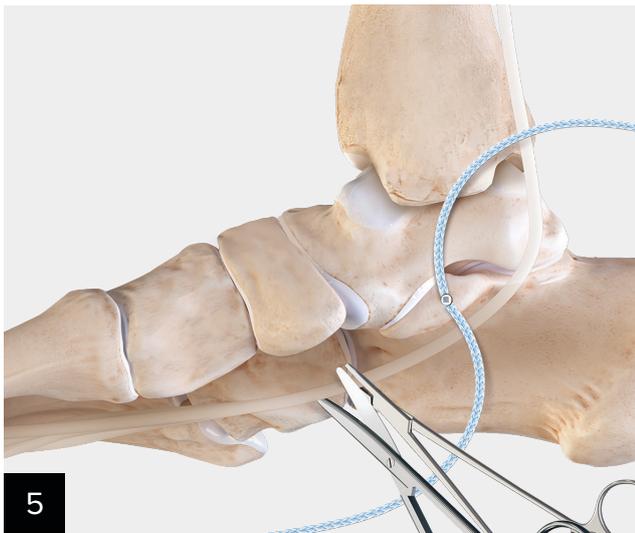


Use the 3.5 mm tap (black handle) and tap to laser line.



Insert a 3.5 mm SwiveLock® anchor (black handle) loaded with FiberTape® suture. Hold the paddle and turn the handle clockwise until the black line is slightly countersunk.

Tendon Preparation

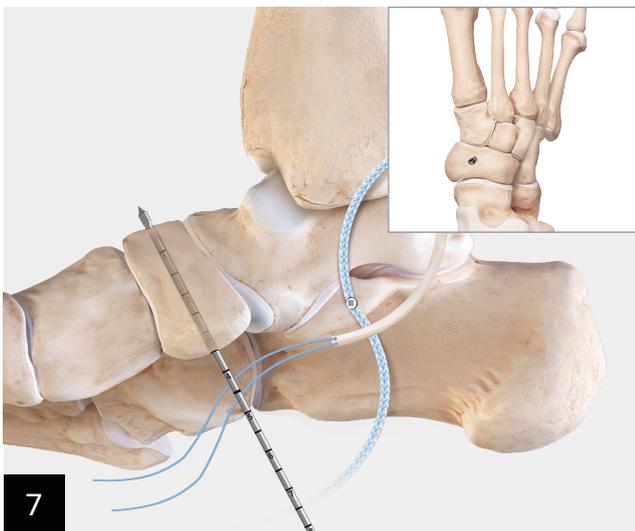


Identify the FDL tendon lying just below the medial malleolus and in a separate sheath next to the posterior tibial tendon. Open the sheath and dissect into the plantar medial foot, making sure there is enough length for insertion into the navicular, and cut the FDL tendon at that point.



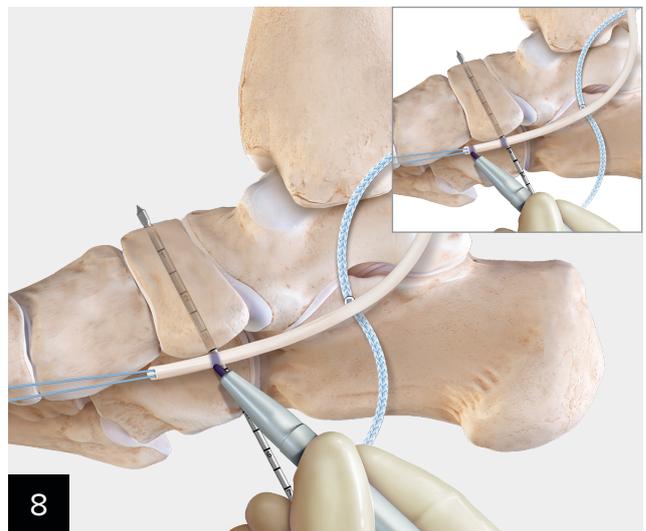
Place a traction stitch through the tendon using a #2 FiberWire® suture or #2 FiberLoop® suture. Use the traction stitch to size the tendon through one of the holes on the tendon sizer. Based on the tendon diameter choose and open either the 4.75 mm × 15 mm or 5.5 mm × 15 mm FDL implant system.

Navicular Tuberosity Prep



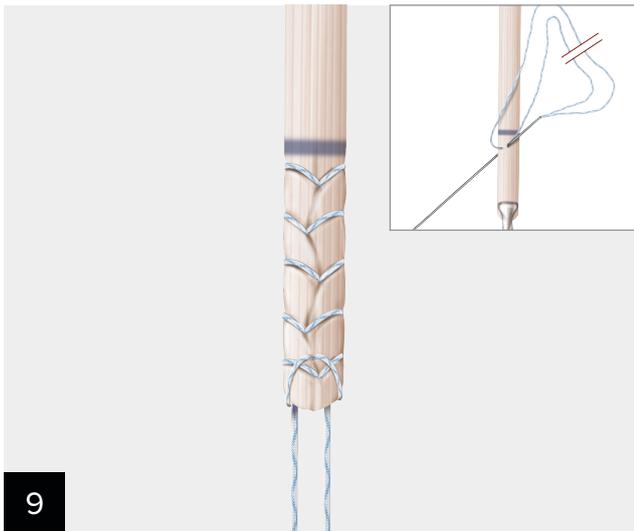
At the center point of insertion of the posterior tibial tendon on the plantar medial navicular tuberosity, drill the 3.2 mm spade tip pin bicortically across the body of the navicular from plantar medial to dorsal lateral.

Note: Fluoroscopy is recommended. The 3.2 mm spade tip pin should be centered in bone and just breach the dorsal cortex.

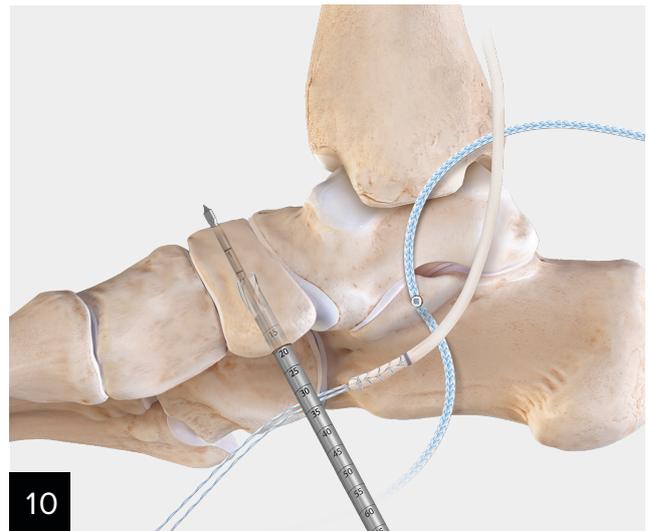


Place the foot in maximum plantar flexion and inversion and pull the traction stitch so that the FDL tendon is at appropriate tension at the interface of the bone and the 3.2 mm pin. Use a pen to mark the desired level of tension the surgeon wants in the hole and then make another mark 15 mm distal to the entry hole.

Navicular Tuberosity Prep

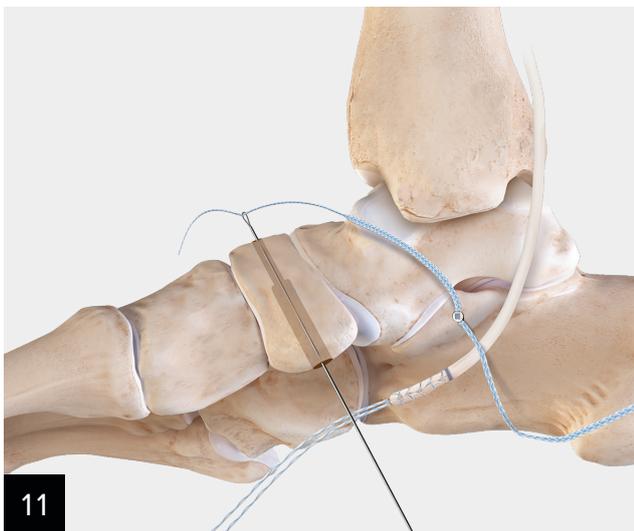


An Allis clamp can be used to speed whipstitch with FiberLoop® SutureTape and lock the sutures by making the final pass proximal to the previous pass and having the needle exit through the distal tip of the tendon. Cut the FiberLoop SutureTape near the needle, leaving suture limbs that are long enough to pass through the 8 mm DX button. Cut at the distal mark and bulletize the tip of the tendon.



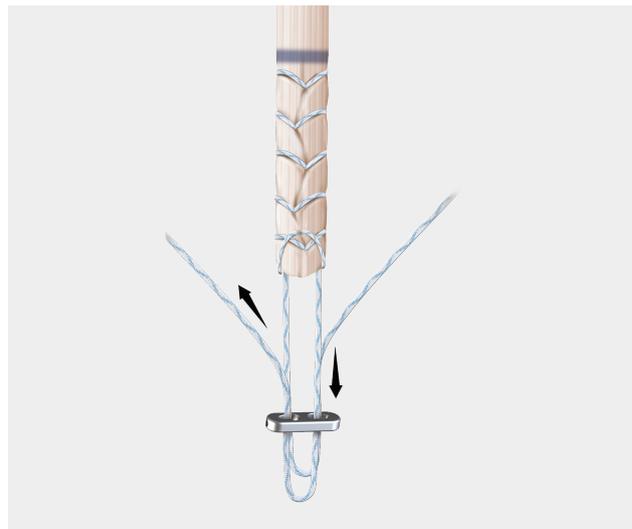
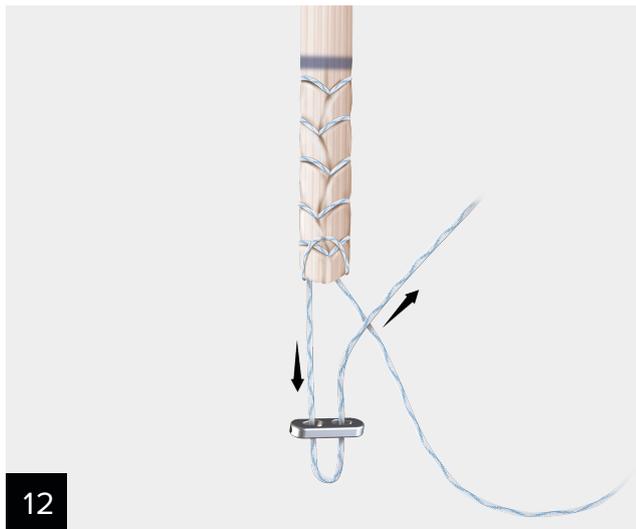
Drill over 3.2 mm spade tip pin 20 mm using the 5 mm or 5.5 mm cannulated headed reamer included in the FDL implant system. Remove the spade tip drill pin. Irrigate to remove bone debris.

Passing FiberTape® for Spring Ligament *Internal/Brace*™ Procedure



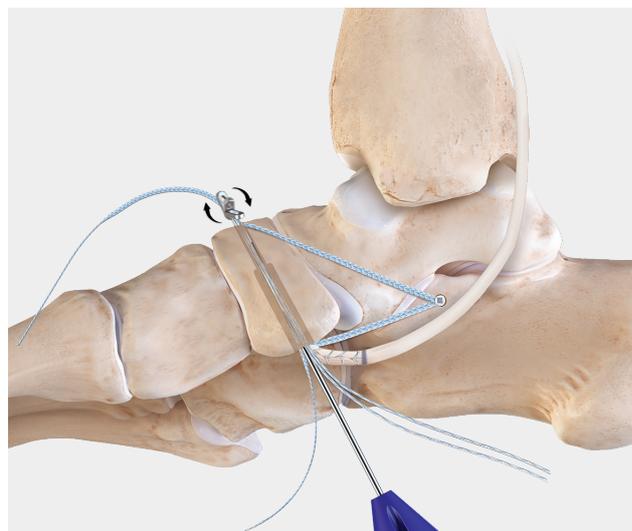
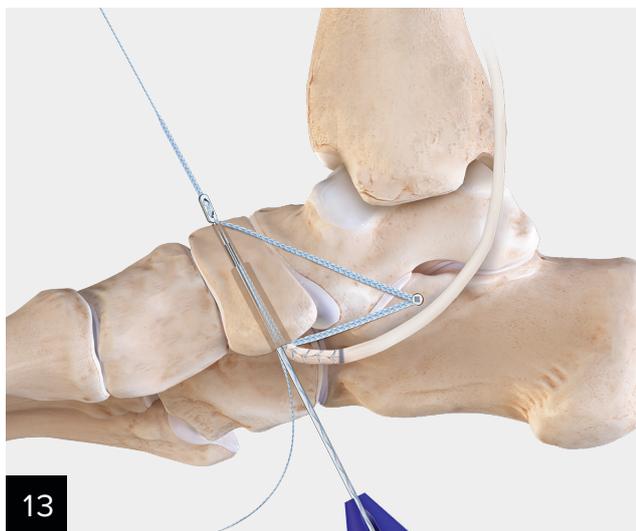
Take one limb of the FiberTape suture and pass it dorsal to plantar using the Nitinol wire passer and repeat with the other limb plantar to dorsal. Confirm concentric reduction of the talonavicular joint on coronal and sagittal imaging.

Button Loading



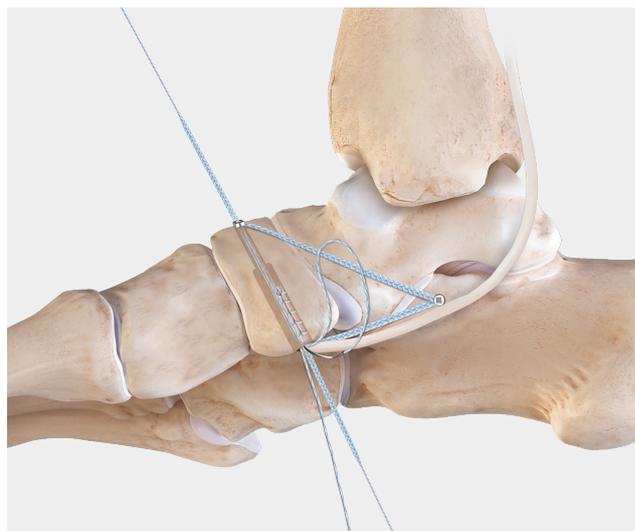
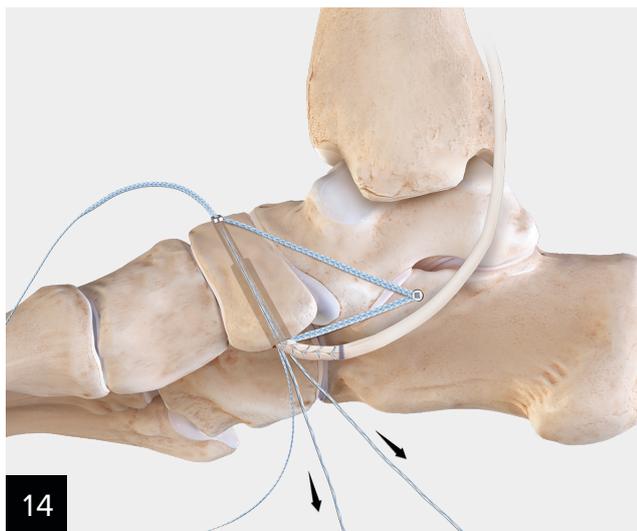
Use a straight needle to thread one limb of suture from the tendon whipstitch through one side of the 8 mm DX button and back through the opposite side. Thread the other suture limb through the button in the same manner, starting on the opposite side from the first limb. Make sure the suture limbs are not tangled by pulling each limb and ensuring the button slides freely.

Button Passing



Hold tension on the suture limbs and insert the tip of button inserter into the button. With tension on the sutures, insert the button through the navicular under fluoroscopy, ensuring it is deployed through both cortices. Pull back the lever on the inserter handle to release the button. **Note: Leave the button inserter in the hole when pulling tension back on the button.**

Tensioning and Securing the Tendon



Pull on the free ends to seat the button against the dorsal cortex of the navicular. Confirm with fluoroscopy that the button is properly positioned resting against cortex. Grasp each suture limb and slowly apply tension to dock the tendon into the bone tunnel. Once the tendon is fully seated, use the free needle to pass one limb through the tendon and then tie 3 or 4 knots.



Hold one limb of the FiberTape® suture under tension from dorsal to plantar and the second limb of the FiberTape suture (in conjunction with FDL if you are transferring) under tension from plantar to dorsal while inserting the 4.75 mm or 5.5 mm Tenodesis screw into the bone tunnel next to the tendon, securing it so that the screw sits flush with the cortex. Cut excess suture.

Final fixation.

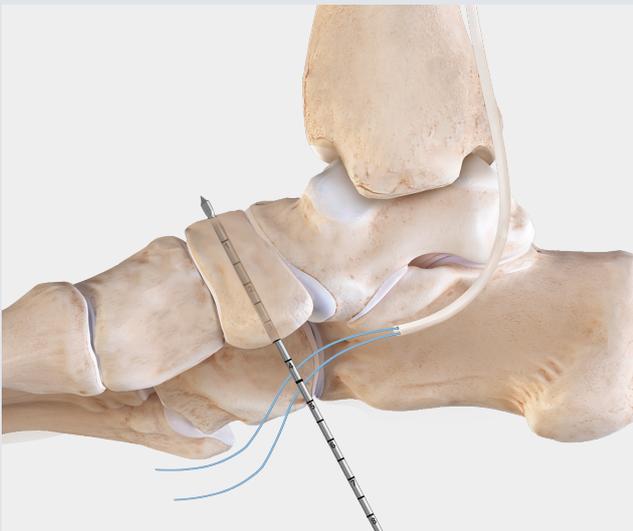
Alternate Technique Without Using Spring Ligament *InternalBrace*™ Augmentation Procedure



Identify the FDL tendon lying just below the medial malleolus and in a separate sheath next to the posterior tibial tendon. Open the sheath and dissect into the plantar medial foot, making sure there is enough length for insertion into the navicular, and cut the FDL tendon at that point.

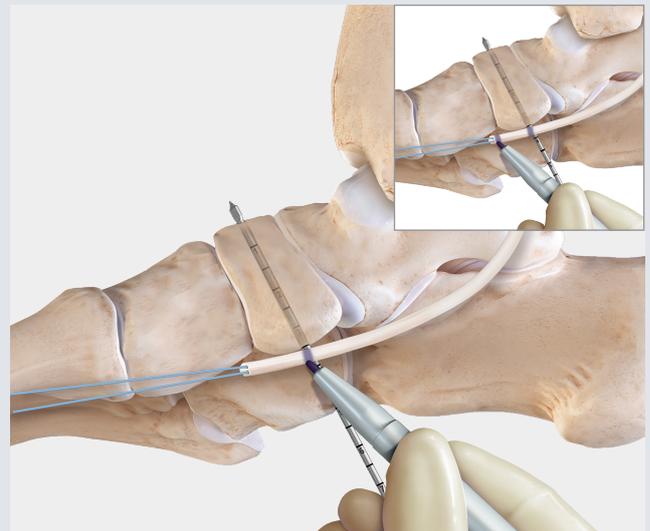


Place a traction stitch through the tendon using a #2 FiberWire® suture or #2 FiberLoop® suture. Use the traction stitch to size the tendon through one of the holes on the tendon sizer. Based on the tendon diameter choose and open either the 4.75 mm × 15 mm or 5.5 mm × 15 mm FDL implant system.



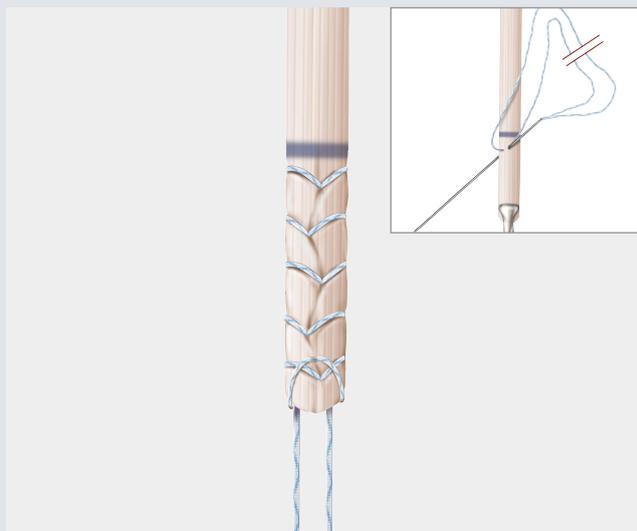
At the center point of insertion of the posterior tibial tendon on the plantar medial navicular tuberosity, drill the 3.2 mm spade tip pin bicortically across the body of the navicular from plantar medial to dorsal lateral.

Note: Fluoroscopy is recommended. The 3.2 mm spade tip pin should be centered in bone and just breach the dorsal cortex.



Place the foot in maximum plantar flexion and inversion and pull the traction stitch so that the FDL tendon is at appropriate tension at the interface of the bone and the 3.2 mm pin. Use a pen to mark the desired level of tension in the hole and then make another mark 15 mm distal to the entry hole.

Alternate Technique Without Using Spring Ligament *InternalBrace*™ Augmentation Procedure



An Allis clamp can be used to speed whipstitch with FiberLoop® SutureTape and lock the sutures by making the final pass proximal to the previous pass and having the needle exit through the distal tip of the tendon. Cut the Fiberloop SutureTape near the needle, leaving suture limbs that are long enough to pass through the 8 mm DX button. Cut at the distal mark and bulletize the tip of the tendon.

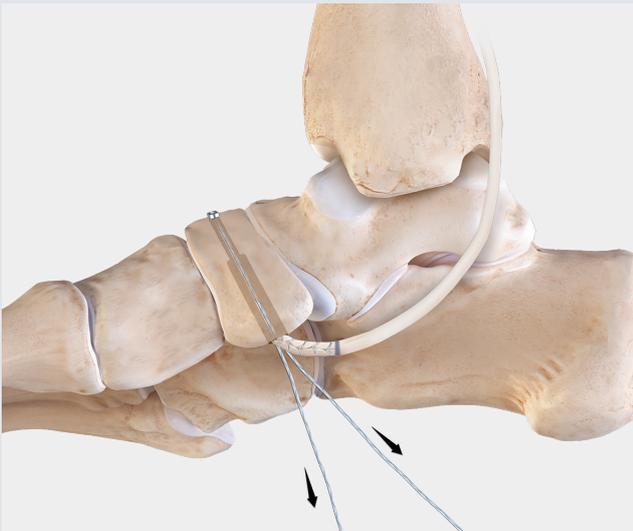


Drill over 3.2 mm spade tip pin 20 mm using the 5 mm or 5.5 mm cannulated headed reamer included in the FDL implant system. Remove the spade tip drill pin. Irrigate to remove bone debris.

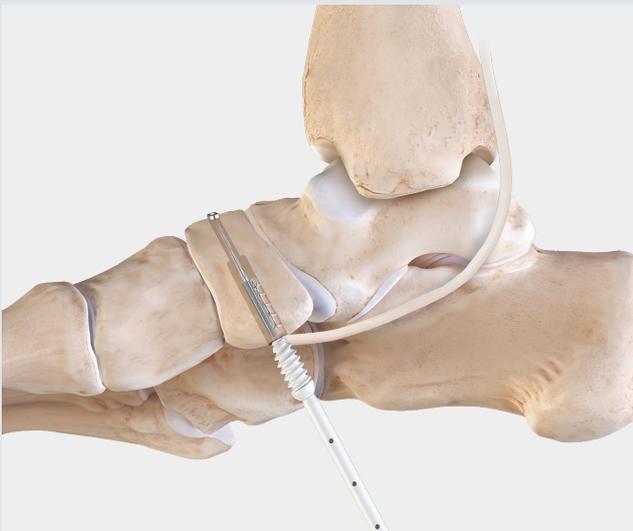


Hold tension on the suture limbs and insert the tip of the button inserter into the button. With tension on the sutures, insert the button through the navicular under fluoroscopy, ensuring it is deployed through both cortices. Pull back the lever on the inserter handle to release the button. **Note: Leave the button inserter in the hole when pulling tension back on the button.**

Alternate Technique Without Using Spring Ligament *InternalBrace*™ Augmentation Procedure



Pull on the free ends to seat the button against the dorsal cortex of the navicular. Confirm with fluoroscopy that the button is properly positioned resting against cortex. Grasp each suture limb and slowly apply tension to dock the tendon into the bone tunnel. Once the tendon is fully seated, use the free needle to pass one limb through the tendon and then tie 3 or 4 knots.



Hold one limb of the FiberTape® suture under tension from dorsal to plantar and the second limb of the FiberTape suture (in conjunction with FDL if you are transferring) under tension from plantar to dorsal while inserting the 4.75 mm or 5.5 mm tenodesis screw into the bone tunnel next to the tendon securing it so that the screw sits flush with the cortex. Cut excess suture.

Final fixation.

Post-Op Protocol

Postoperatively, place the patient in a posterior and stirrup splint with the foot in plantar flexion and inversion. After wound healing, remove the splint and apply a cast in less plantar flexion and inversion. Weightbearing should be delayed for 4 to 6 weeks post-op until healing is confirmed. The patient is then placed into a walking boot with an arch supportive insole and to begin progressive weightbearing up to full weight as tolerated.

Ordering Information

FDL Implant System, 4.75 mm

Product Description	Item Number
Oblong Button, 2.6 mm × 8 mm BioComposite Tenodesis Screw on Driver w/ #2 FiberWire® Suture, 4.75 mm × 15 mm Spade Tip Drill Pin, 3.2 mm Headed Reamer, cannulated, 5 mm #2 FiberLoop Suture w/ Needle, blue Free Needle Suture Passing Wire Button Inserter	AR-1547BC-CP

FDL Implant System, 5.5 mm

Product Description	Item Number
Oblong Button, 2.6 mm × 8 mm BioComposite Tenodesis Screw on Driver w/ #2 FiberWire Suture, 5.5 mm × 15 mm Spade Tip Drill Pin, 3.2 mm Headed Reamer, cannulated, 5.5 mm #2 FiberLoop Suture w/ Needle, blue Free Needle Suture Passing Wire Button Inserter	AR-1555BC-CP

Disposables Kit

Product Description	Item Number
Tenodesis Graft Sizing Kit w/ FiberLoop® SutureTape Tendon Sizer #0 FiberLoop w/ Needle, blue FiberLoop SutureTape, 1.3 mm	AR-1676ST



This description of technique is provided as an educational tool and clinical aid to assist properly licensed medical professionals in the usage of specific Arthrex products. As part of this professional usage, the medical professional must use their professional judgment in making any final determinations in product usage and technique. In doing so, the medical professional should rely on their own training and experience and should conduct a thorough review of pertinent medical literature and the product's directions for use. Postoperative management is patient-specific and dependent on the treating professional's assessment. Individual results will vary and not all patients will experience the same postoperative activity level or outcomes.

View U.S. patent information at www.arthrex.com/corporate/virtual-patent-marking

arthrex.com