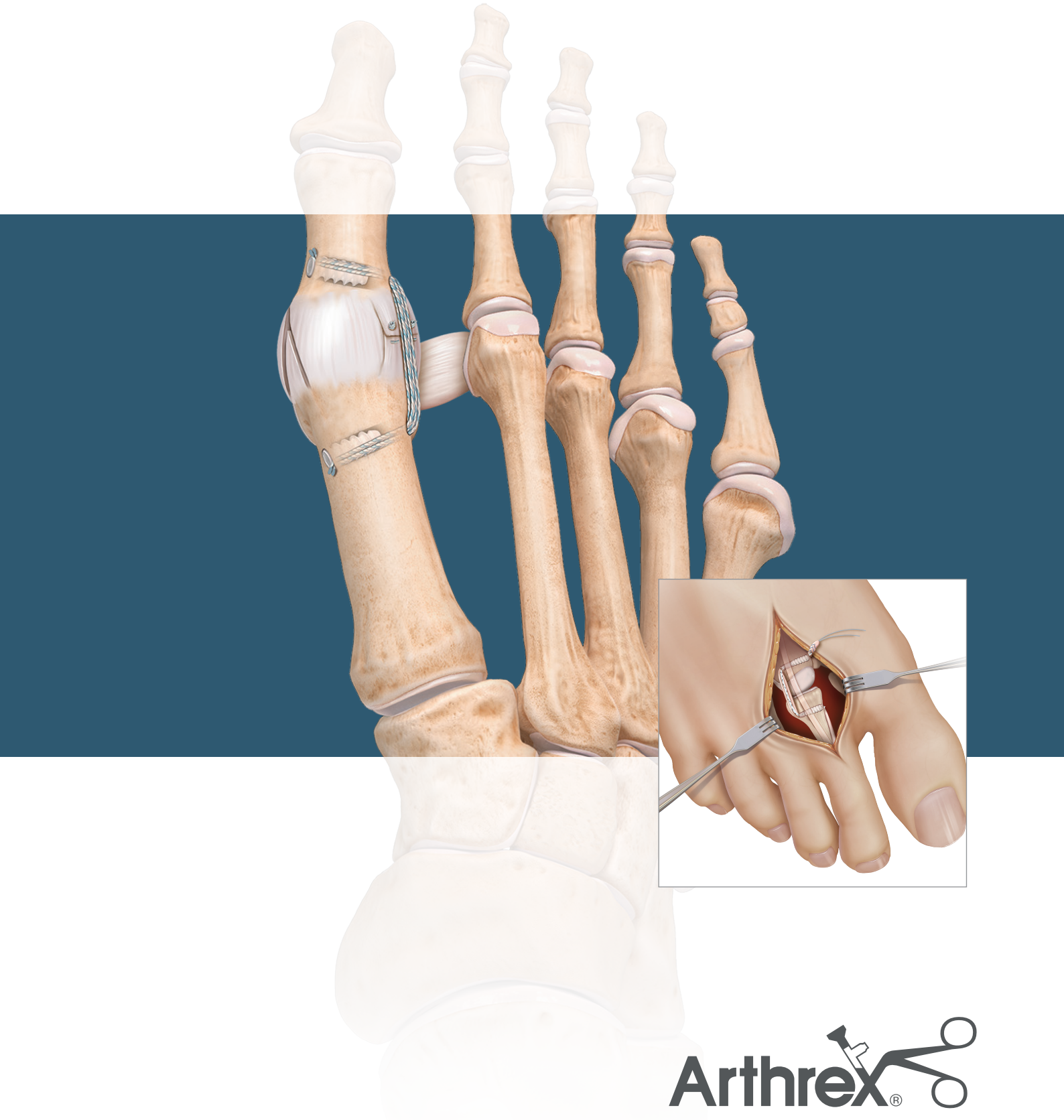
Forefoot *Internal*Brace™ Repair

Surgical Technique



Arthrex®

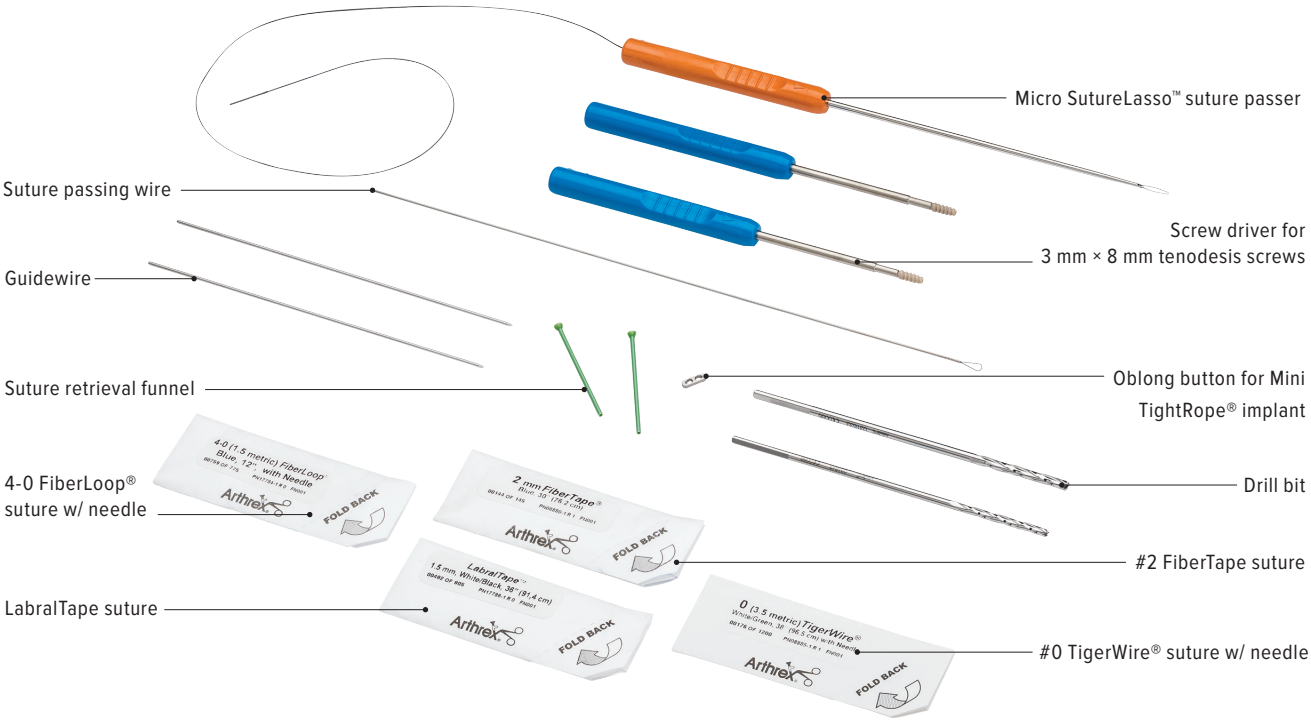
Forefoot *Internal*Brace™ Repair

Introduction

Arthrex has developed a comprehensive, completely disposable system for various augmentation procedures about the forefoot. Most commonly, this system can be used for crossover toe deformities of the lesser metatarsals or for hallux varus correction.

Features:

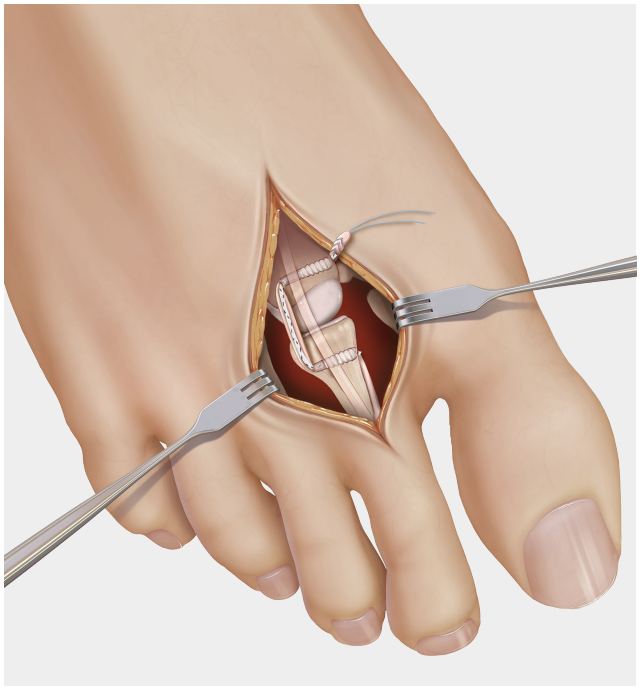
- **All-in-one system** – comes complete with 3 mm × 8 mm tenodesis screws, FiberTape® and LabralTape™ suture, drill bits, guidewires, and suture-shuttling devices in one convenient sterile package
- **Knotless repair technique** – allows surgeons to create a no-profile repair construct
- **Multiple technique options** – can be used to treat many different pathologies about the forefoot



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 InternalBrace technique is for use during soft tissue-to-bone fixation procedures and is not cleared for bone-to-bone fixation.

Extensor Digitorum Brevis *Internal*Brace™ Technique

Introduction



Second toe deformities are relatively common and represent one of the more difficult corrections a foot surgeon encounters. This guide describes a technique to correct sagittal and transverse plane deformities of the second toe at the metatarsal-phalangeal joint using an extensor digitorum brevis (EDB) tendon transfer with LabralTape™ suture augmentation and fixation with 3 mm × 8 mm PEEK tenodesis screws. This technique may be performed in isolation or in conjunction with other procedures such as hallux valgus correction or hammertoe correction.

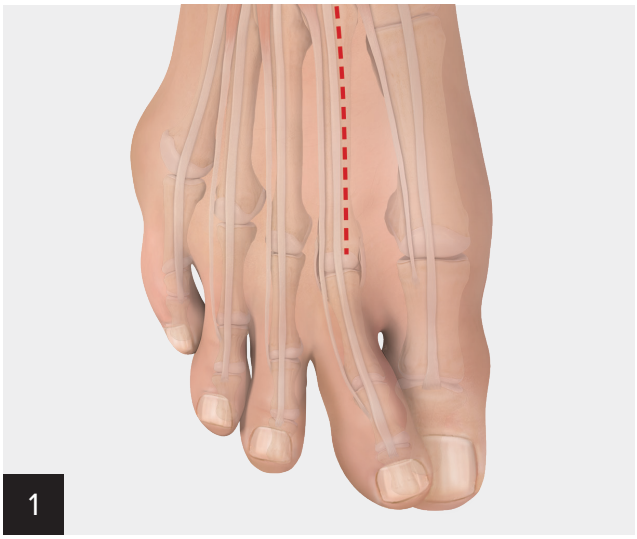
In situations where the plantar plate is irreparable or the collateral ligaments need to be restored, surgeons have the option to perform an EDB tendon transfer with *Internal*Brace ligament augmentation using LabralTape suture. This technique gives surgeons a great amount of variability for correction of any transverse and sagittal plane deformities of the lesser metatarsals by simply altering the location and direction of the bone tunnels.

Ordering Information

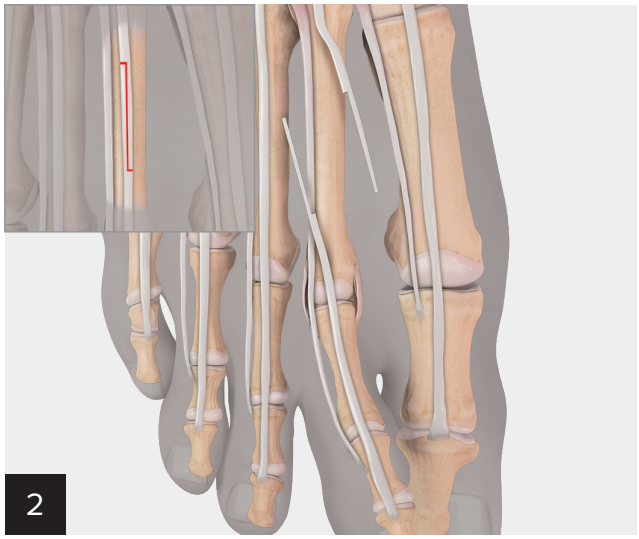
Forefoot *Internal*Brace System

Product Description	Item Number
PEEK Tenodesis Screw, 3 mm × 8 mm, qty. 2 LabralTape Suture, white/black, 36 in, 1.5 mm #2 FiberTape® Suture, blue #0 TigerWire® Suture w/ Needle, white/green 4-0 FiberLoop® Suture w/ Needle, blue, 12 in Micro SutureLasso™ Suture Passer w/ Wire, straight Oblong Button, 2.6 mm Guidewires, 43 in × 4.75 in, qty. 2 Drill Bit, cannulated, 2.5 mm Drill Bit, cannulated, 3.0 mm Suture Retrieval Funnels, qty. 2 Suture Passing Wire, 8 in	AR-**1530P-CP**

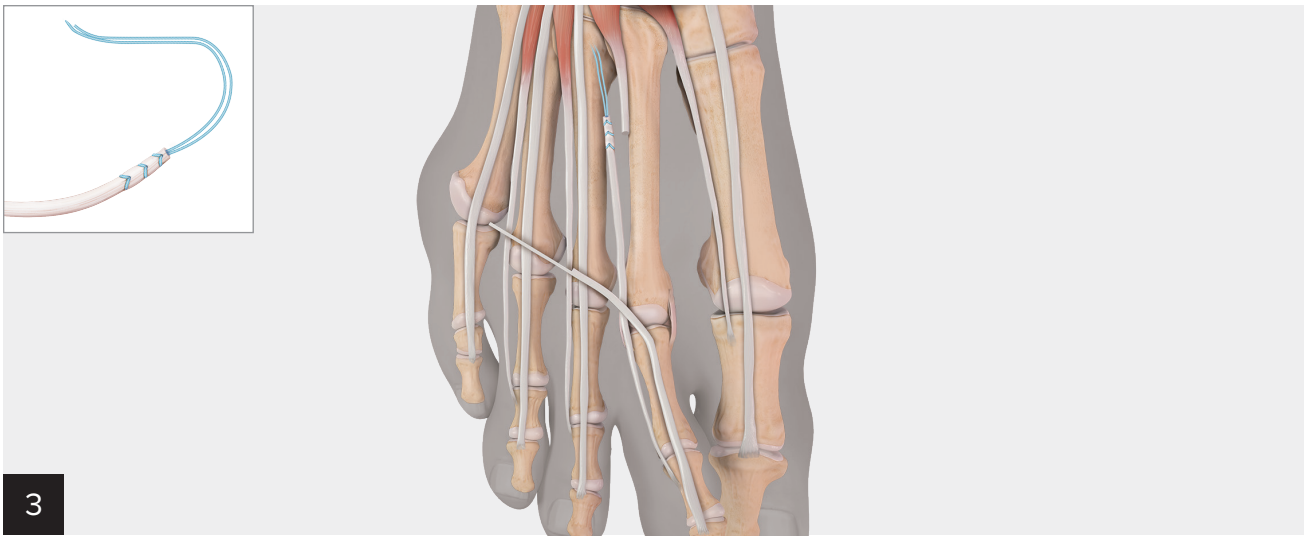
Extensor Digitorum Brevis *Interna*lBrace™ Technique



Make a dorsal longitudinal incision starting proximal to the second toe MTP joint and extend it proximally just medial to the extensor digitorum longus (EDL) tendon.

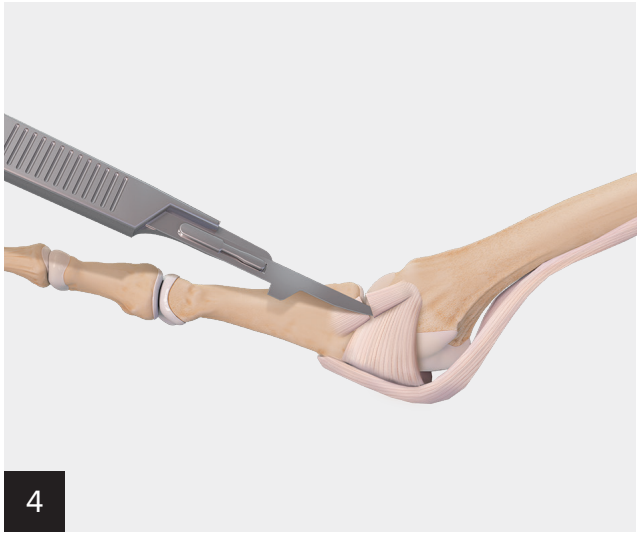


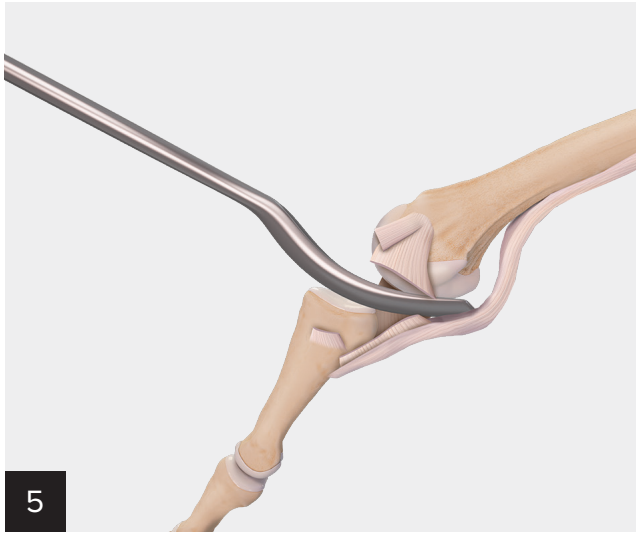
Identify the EDL and EDB tendons. In cases of sagittal plane deformity, an EDL Z-lengthening is typically carried out.



Carefully dissect the EDB free of its surrounding soft tissue from distal to proximal and then transect it at the musculotendinous junction. It is important to transect the EDB as far proximal as possible so that adequate tendon length can be obtained.

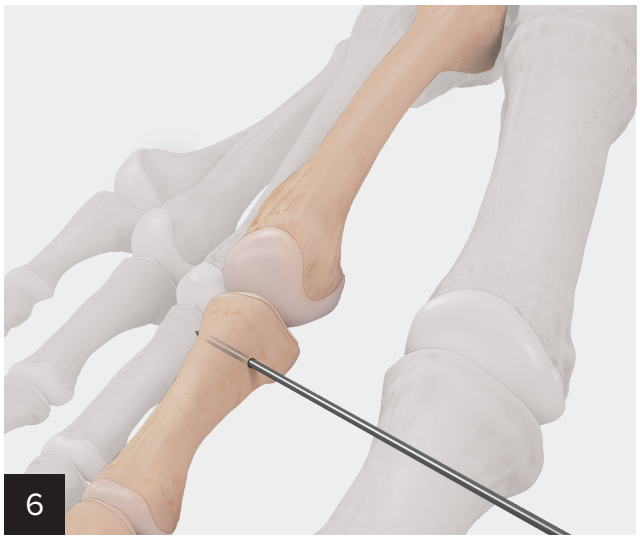
Distally, take down the raphe between the EDL and EDB to provide more length and allow for easier mobilization of the EDB. It is important that the insertion of the EDB tendon be left intact. Use a 4-0 FiberLoop® whipstitch at the free proximal end of the EDB.



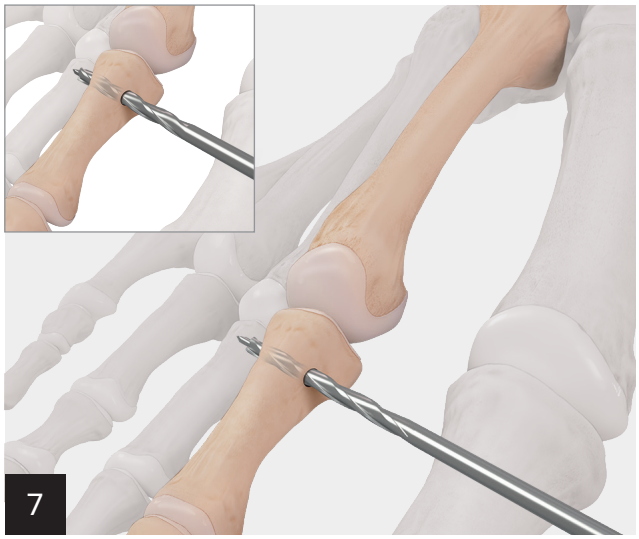


Perform a dorsal longitudinal capsulotomy followed by soft-tissue dissection to expose the metatarsal head and base of the proximal phalanx. The surgeon may choose to release the medial collateral ligament if it is deemed to be contracted.

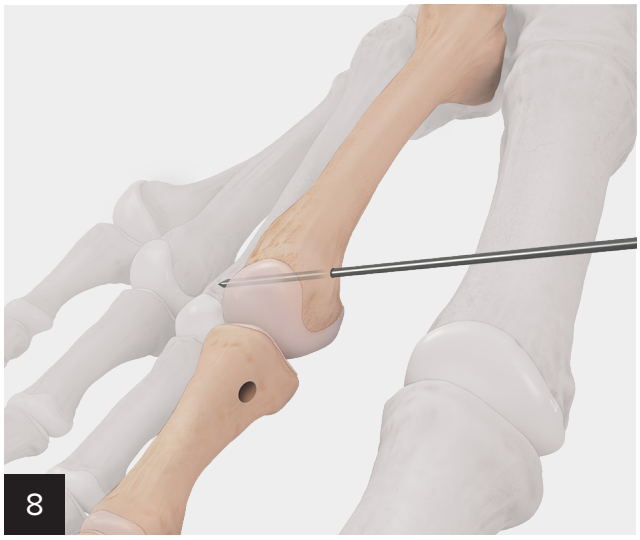
Carefully insert a McGlamry elevator under the metatarsal head to release the plantar plate.



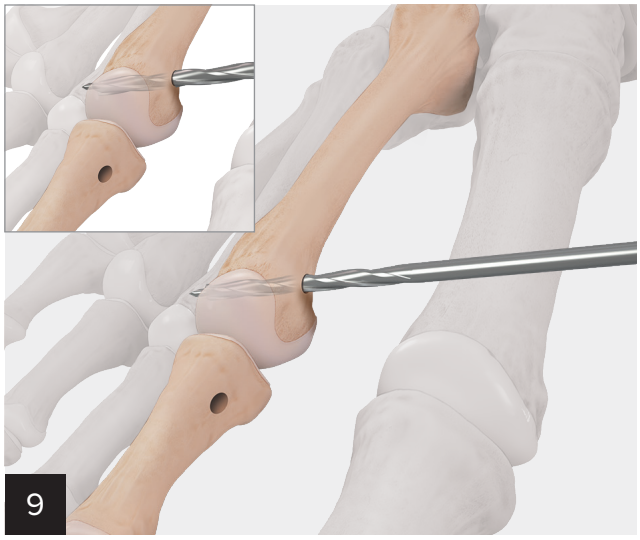
Pass a smooth guidewire from dorsal medial to plantar lateral through the base of the proximal phalanx approximately 4 mm from the joint. Viewing the base of the proximal phalanx as a clock face, direct the guidewire from 10 o'clock to 4 o'clock in the right foot and 2 o'clock to 7 o'clock in the left foot.



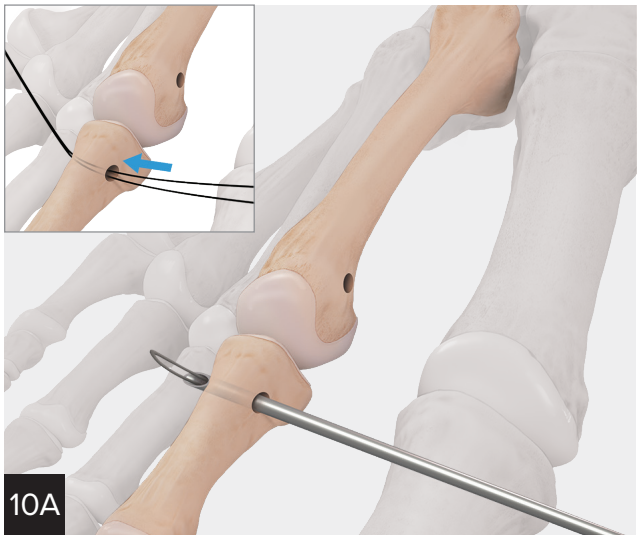
Use a 2.5 mm cannulated drill bit to create a bicortical tunnel over the guidewire. The tunnel can be overdrilled with a 3.0 mm drill if a wider tunnel is needed.



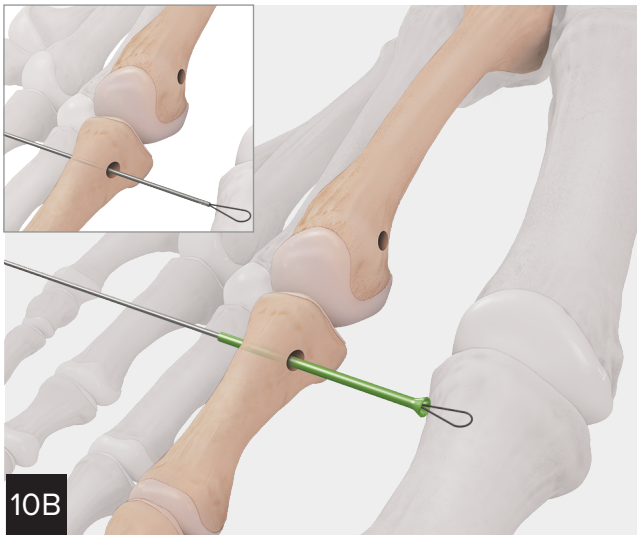
Starting approximately 1 cm proximal to the distal-most aspect of the 2nd metatarsal head, insert a smooth guidewire through the metatarsal from dorsal medial to plantar lateral with similar orientation to the phalangeal tunnel.



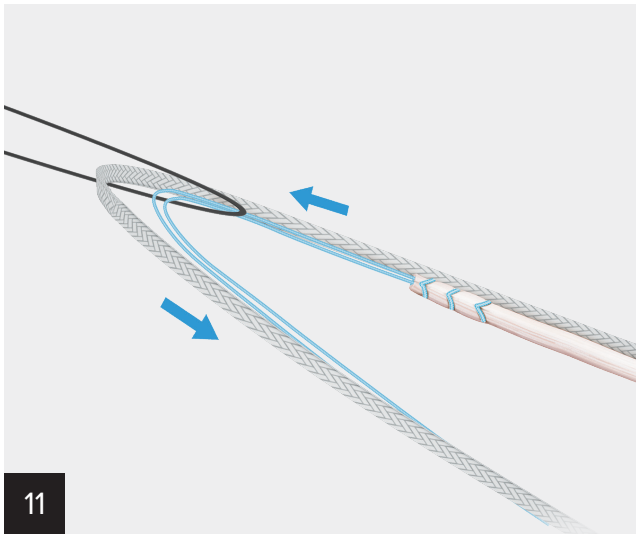
Drill a bicortical metatarsal tunnel using a 2.5 mm cannulated drill. Again, the tunnel can be overdrilled with a 3.0 mm cannulated drill if necessary.

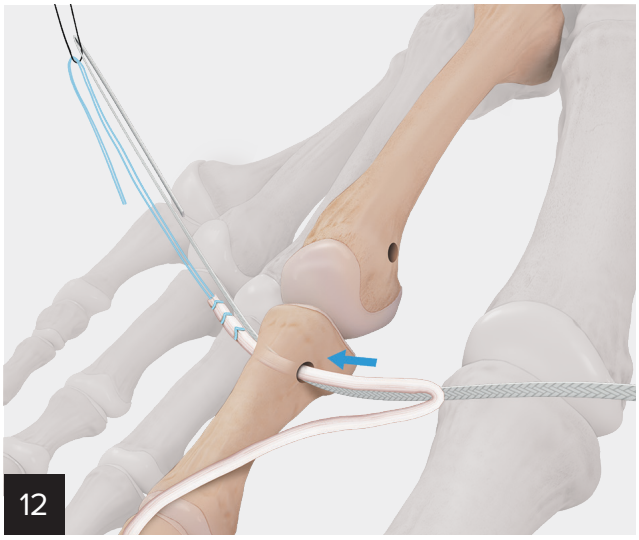


Option A: Using the straight Micro SutureLasso™ suture passer, pass the nitinol suture-passing wire into the proximal phalanx bone tunnel.

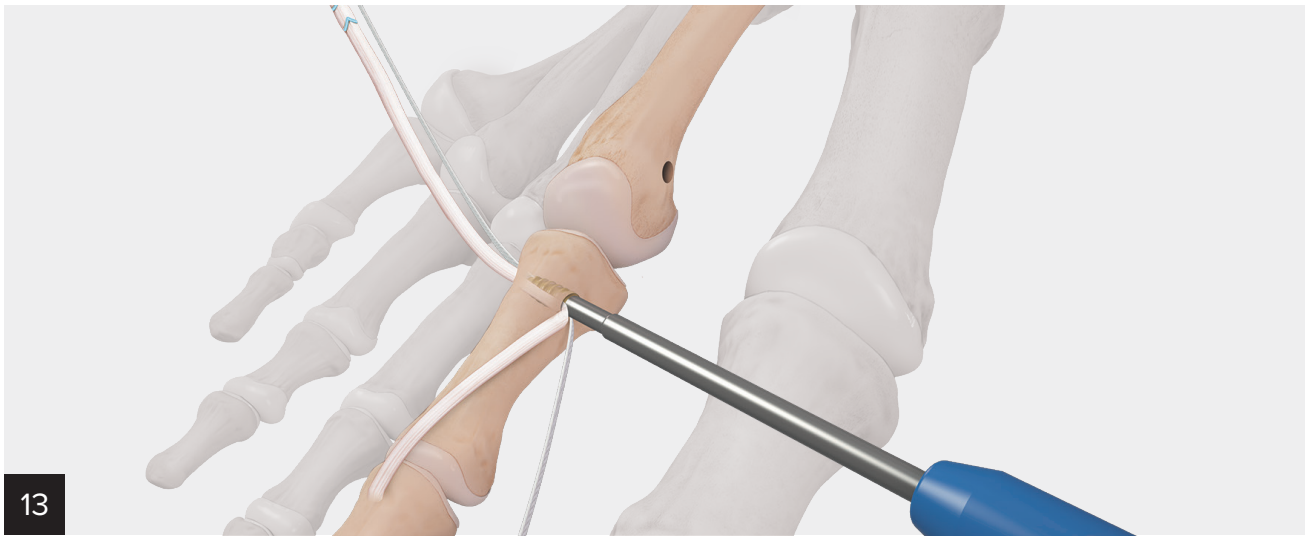


Option B: Use the PEEK suture-retrieval funnel to shuttle the suture-passing wire into the proximal phalanx bone tunnel.

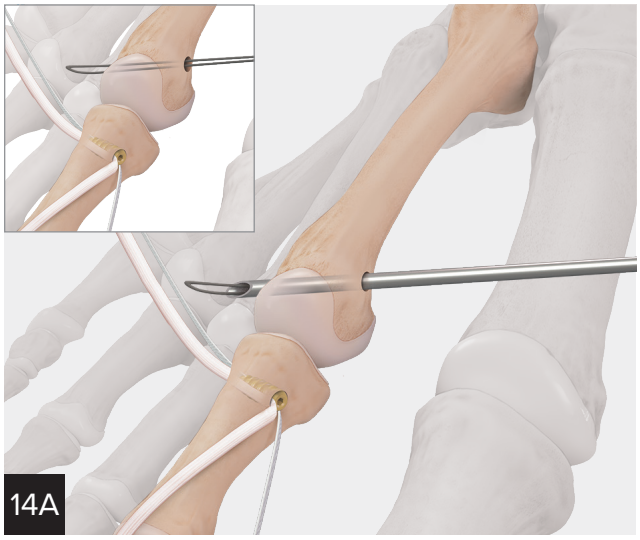




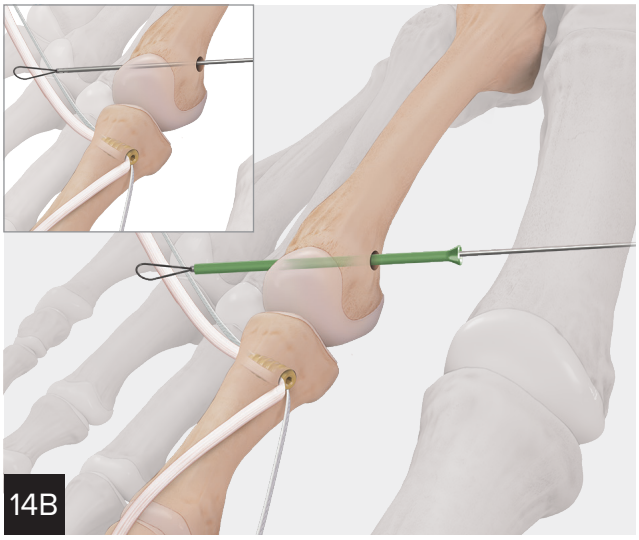
Shuttle the LabralTape™ suture and whipstitched EDB through the tunnel from medial to lateral.



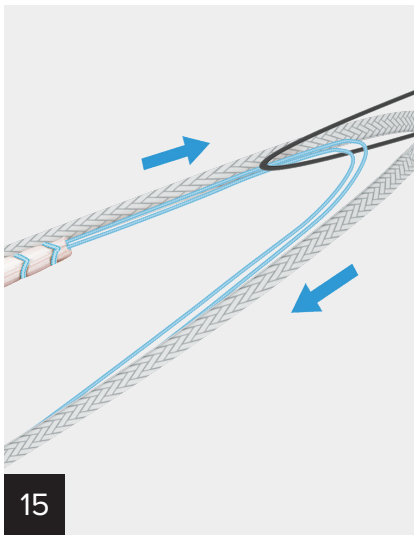
With tension applied to the EDB tendon and LabralTape suture, insert a 3 mm × 8 mm PEEK tenodesis screw from medial to lateral until flush with the medial cortex.



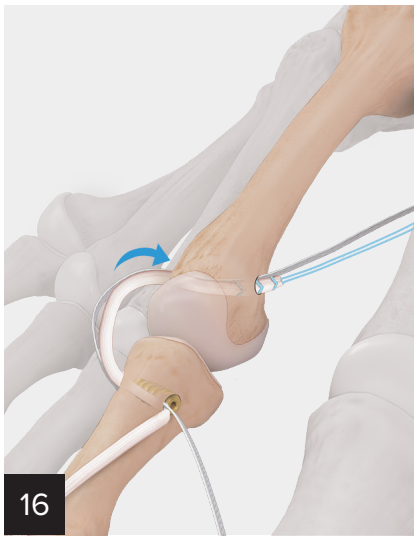
Option A: Using the straight Micro SutureLasso™ suture passer, shuttle the suture-passing wire through the metatarsal tunnel.

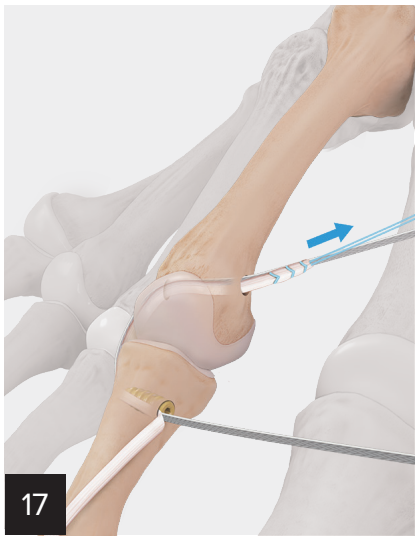


Option B: Use the PEEK suture-passing funnel to shuttle the suture-passing wire into the proximal phalanx bone tunnel. Care should be taken to ensure the loop is exiting laterally in this instance.

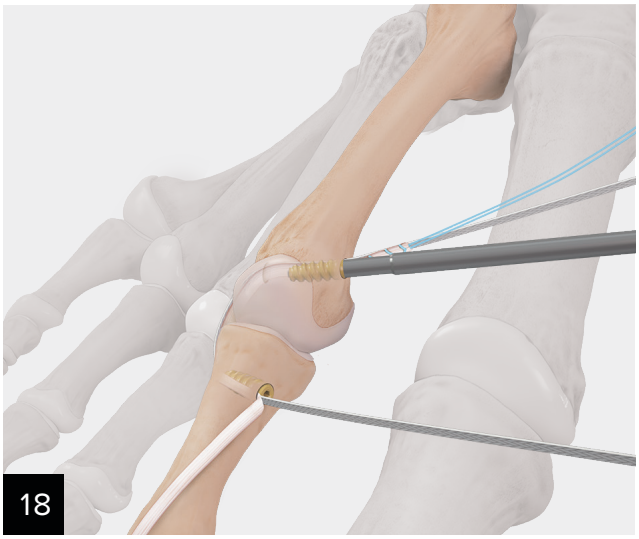


Shuttle the whipstitched EDB tendon and proximal end of the LabralTape™ suture from lateral to medial through the bone tunnel.





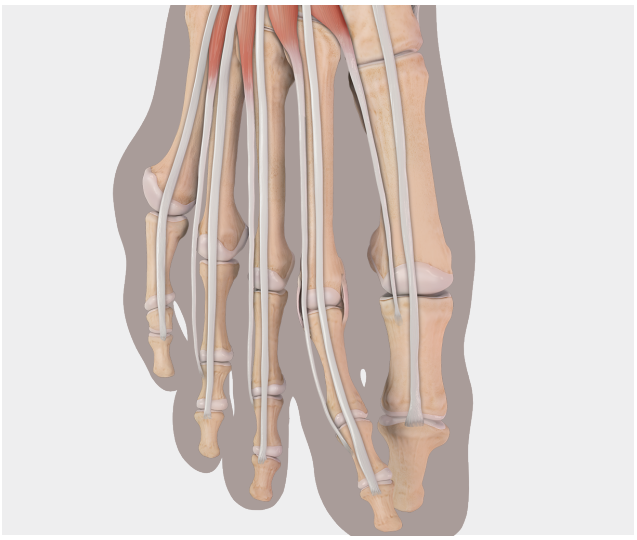
Pull equal tension on both the EDB and LabralTape suture until the desired correction is achieved.



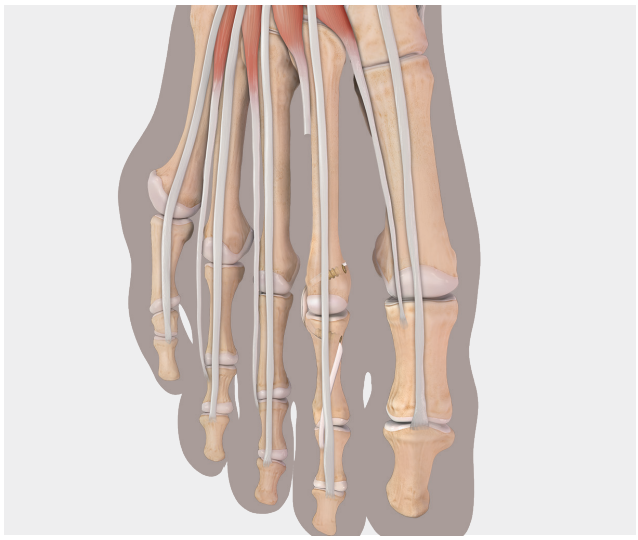
Insert a 3 mm × 8 mm PEEK tenodesis screw from medial to lateral until flush with the medial cortex to achieve final fixation of the construct. The joint capsule may be closed per surgeon preference.

At this point, the excess tendon and LabralTape™ sutures can be cut flush medially.

Pre-op



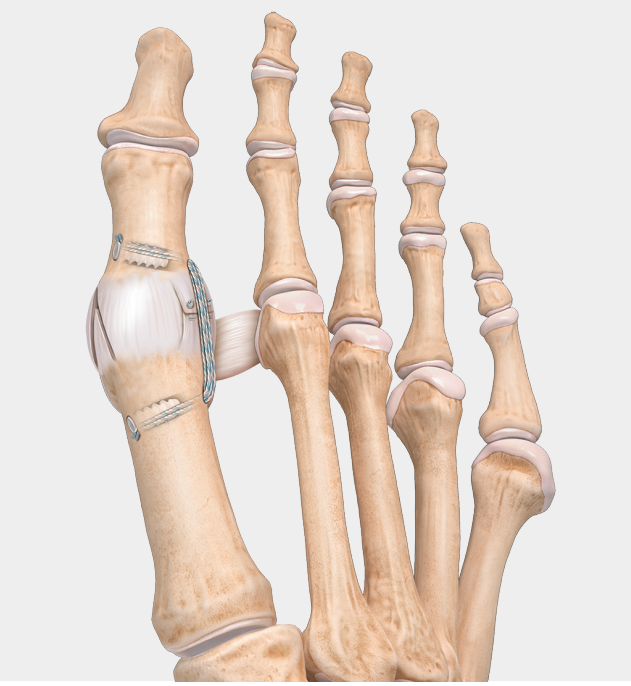
Post-op



Post-op Protocol:
When the procedure is performed in isolation, patients are instructed to bear weight in the heel in a post-op shoe for 6 weeks before transitioning to normal shoewear. If the procedure is performed in conjunction with another procedure, then the postoperative protocol may be dictated by the more major procedure. However, post-op protocol is surgeon- and patient-dependent.

Hallux Varus *Internal*Brace™ Technique

Introduction



Arthrex has developed a technique that allows for a knotless, low-profile fixation option for patients presenting with hallux varus using FiberTape® suture and the Tenodesis Screw System for interference fixation. A cortical button is included for situations with soft bone at the proximal phalanx. Using a #1 FiberWire® suture laterally, the capsule can be sutured into the FiberTape suture and tied off to create a direct biologic repair.

Ordering Information

Forefoot *Internal*Brace System

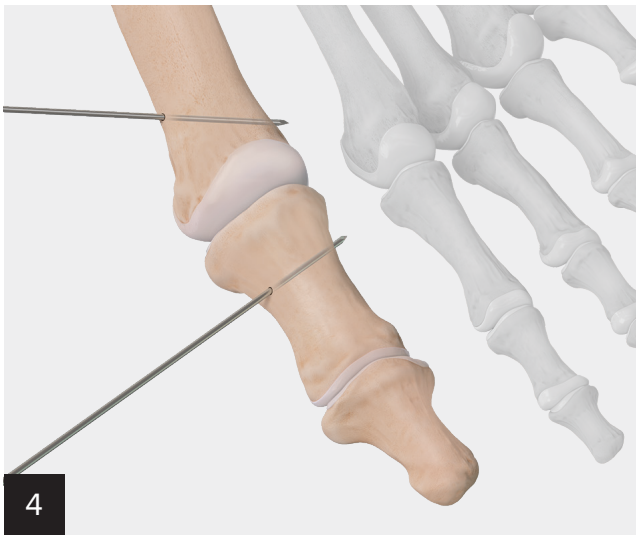
Product Description	Item Number
PEEK Tenodesis Screw, 3 mm × 8 mm, qty. 2 LabralTape Suture, white/black, 36 in, 1.5 mm #2 FiberTape® Suture, blue #0 TigerWire® Suture w/ Needle, white/green 4-0 FiberLoop® Suture w/ Needle, blue, 12 in Micro SutureLasso™ Suture Passer w/ Wire, straight Oblong Button, 2.6 mm Guidewires, 43 in × 4.75 in, qty. 2 Drill Bit, cannulated, 2.5 mm Drill Bit, cannulated, 3.0 mm Suture Retrieval Funnels, qty. 2 Suture Passing Wire, 8 in	AR-**1530P-CP**

Hallux Varus *Interna*lBrace™ Technique

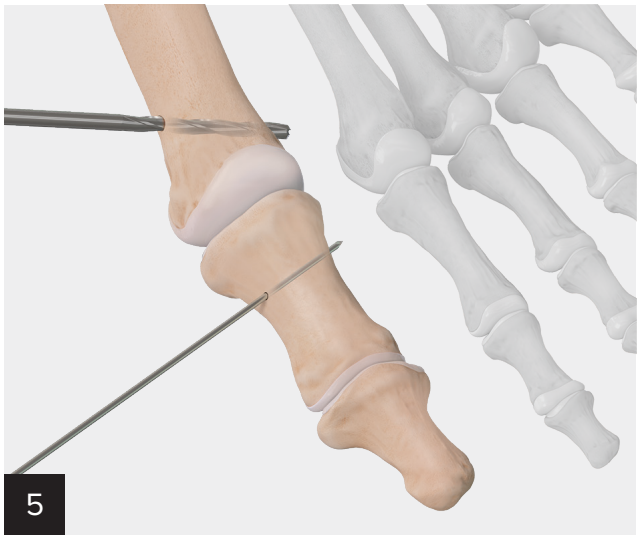
Make an incision over the medial aspect of the 1st metatarsophalangeal joint. The incision should be long enough to visualize the metadiaphyseal junction of the 1st metatarsal and the proximal phalanx. The joint capsule is exposed.

Make a vertical incision over the 1st MTP joint to release the contracted medial capsule. The tissue between the medial sesamoid and the metatarsal head may also need to be removed or released to mobilize the medial sesamoid.

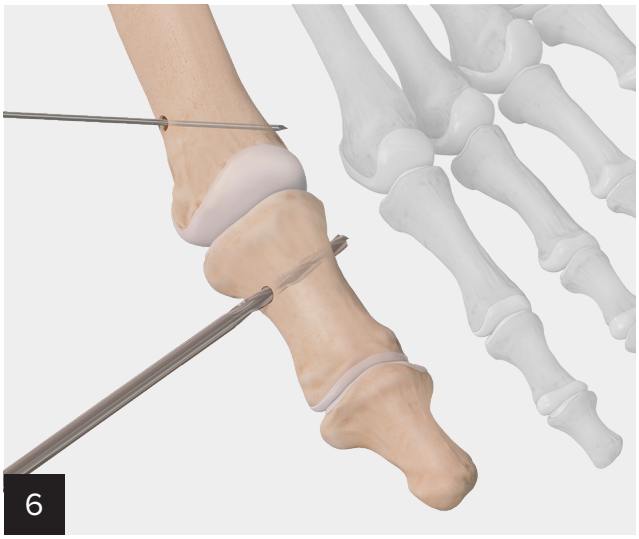
Make a second incision in the 1st web space. Incise the loose lateral 1st MTP joint capsule in a vertical fashion (dorsal to plantar) in preparation for plicaton.



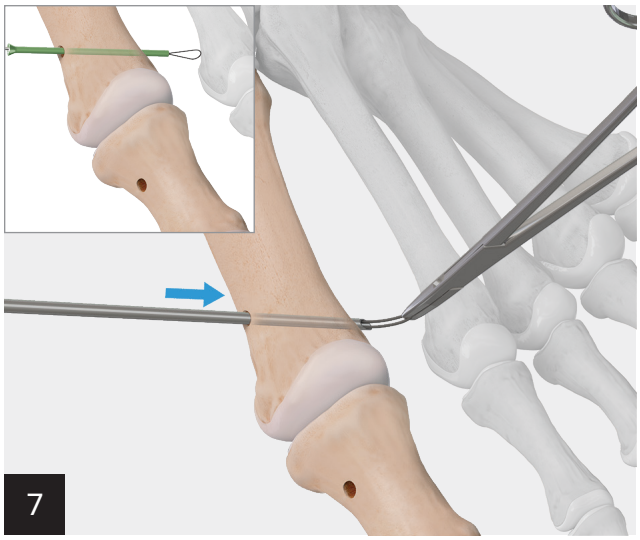
Place a guidewire into the medial metatarsal in the metadiaphyseal junction at midline and advance it laterally, exiting just proximal to the articular cartilage. Place a second guidewire into the proximal phalanx, exiting just distal to the articular cartilage.



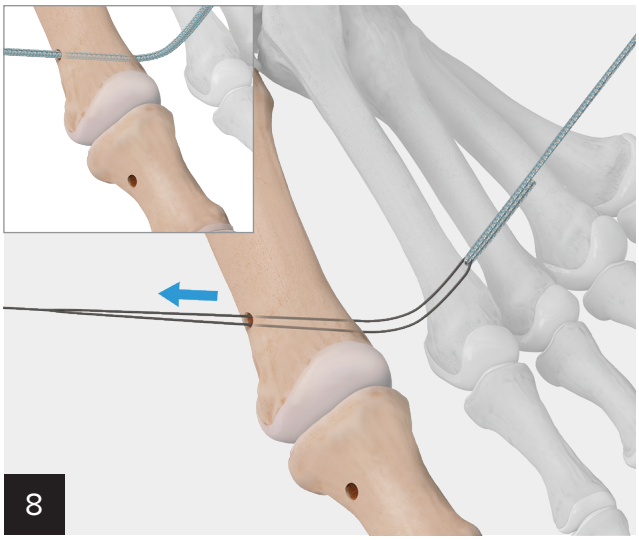
Overdrill the 1st metatarsal guidewire using the 2.5 mm cannulated drill bit.



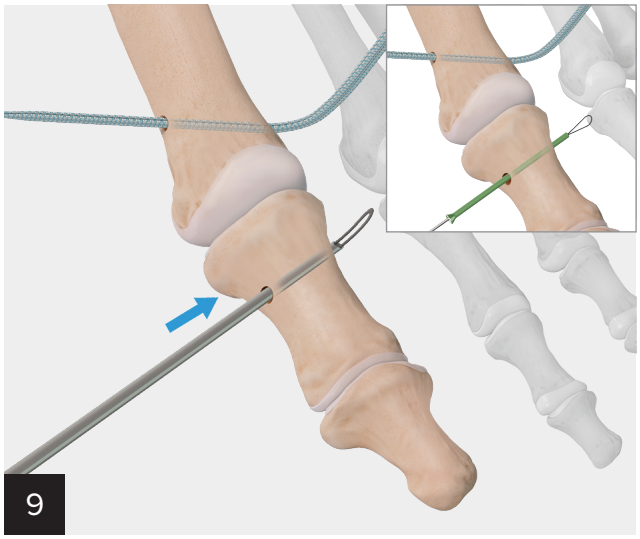
Next, overdrill the proximal phalanx guidewire using the 2.5 mm drill.



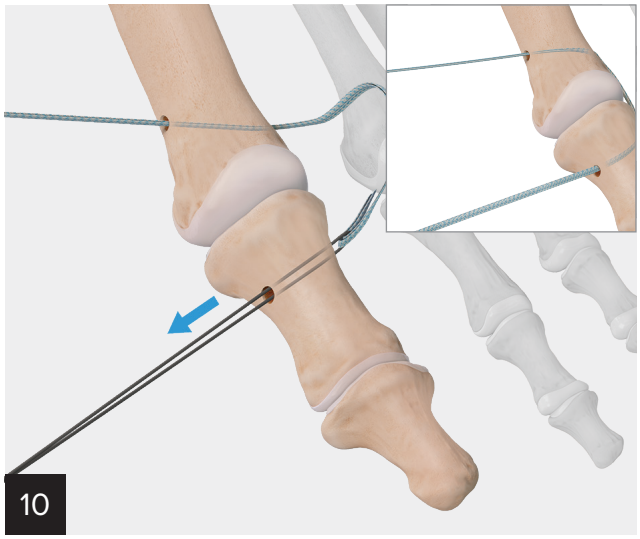
Advance a straight Micro SutureLasso™ suture passer with a nitinol suture-passing wire into the 1st metatarsal drill hole. Use a needle driver to pull the wire out of the lasso. Alternatively, the PEEK suture retrieval funnel may be used to shuttle the suture-passing wire from lateral to medial.



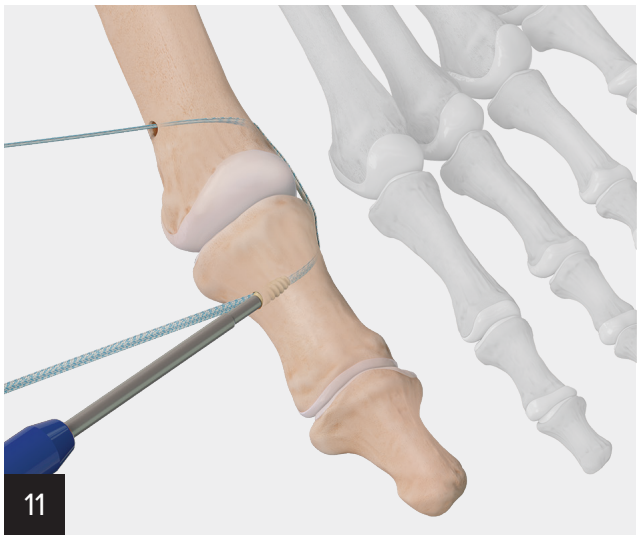
Insert a doubled-over FiberTape® suture laterally into the nitinol suture-passing wire and pull it medially through the 1st metatarsal drill hole.



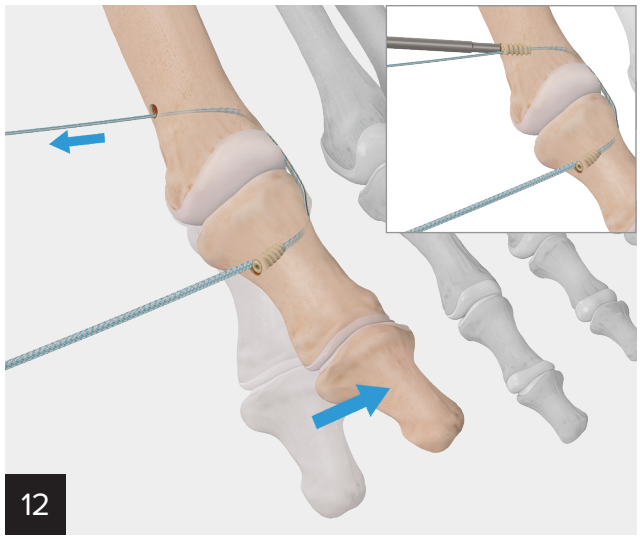
Insert the Micro SutureLasso™ suture passer with the nitinol passing wire into the proximal phalanx drill hole. The PEEK suture retrieval funnel may be used in a similar fashion as described earlier.



Pull the distal end of the doubled FiberTape® suture through the proximal phalanx drill hole from lateral to medial using the suture-passing wire.



While holding tension on the FiberTape suture, insert a 3 mm × 8 mm PEEK tenodesis screw into the bone tunnel at the proximal phalanx.



Place the toe into the corrected position. Tension the FiberTape suture and place the second 3 mm × 8 mm PEEK tenodesis screw into the metatarsal head bone tunnel.

Optional: Cut the excess FiberTape® suture flush with the bone. In a situation where the bone in the proximal phalanx is deemed to be too soft, a cortical button may be used with a looped FiberTape suture. In this case, screw fixation is performed in the 1st metatarsal only.

If desired, the lateral capsule may be sutured into the FiberTape suture using the FiberWire® suture provided to augment the repair.

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