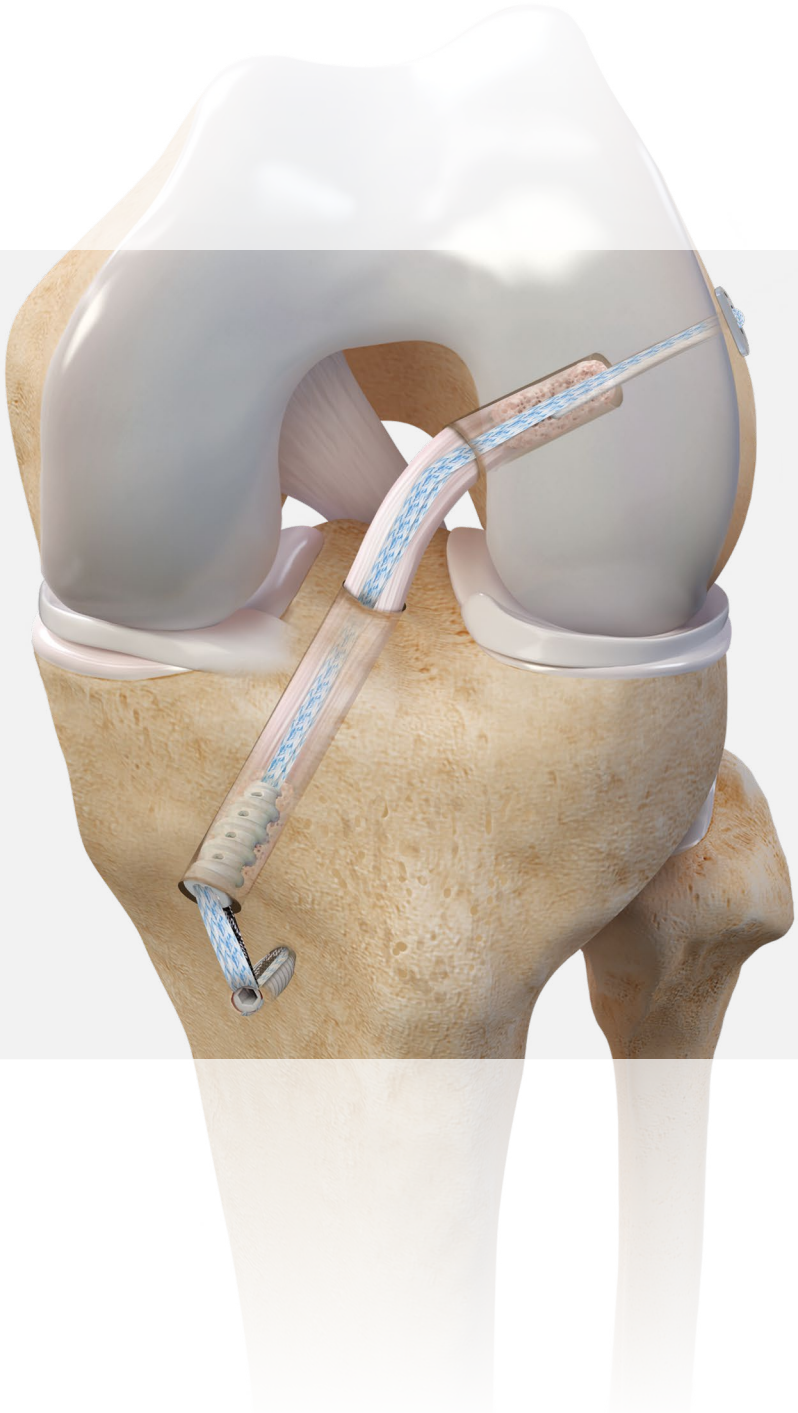
BTB ACL Reconstruction Using the *InternalBrace*™ Technique and FiberSnare® Nitinol Guidewire

Surgical Technique

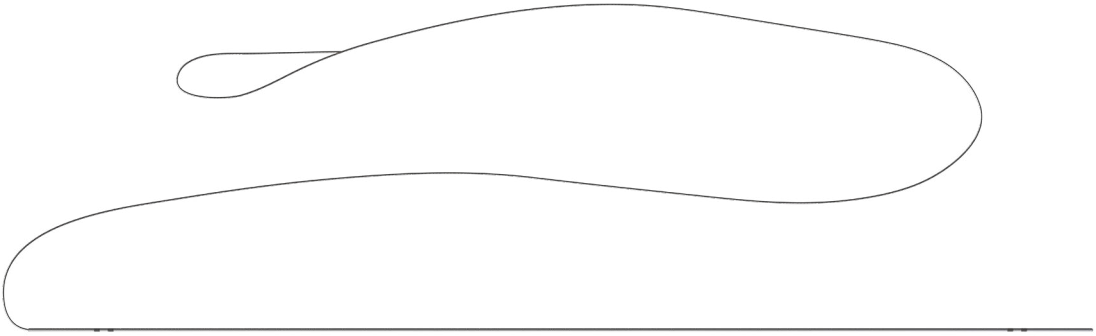


Arthrex®

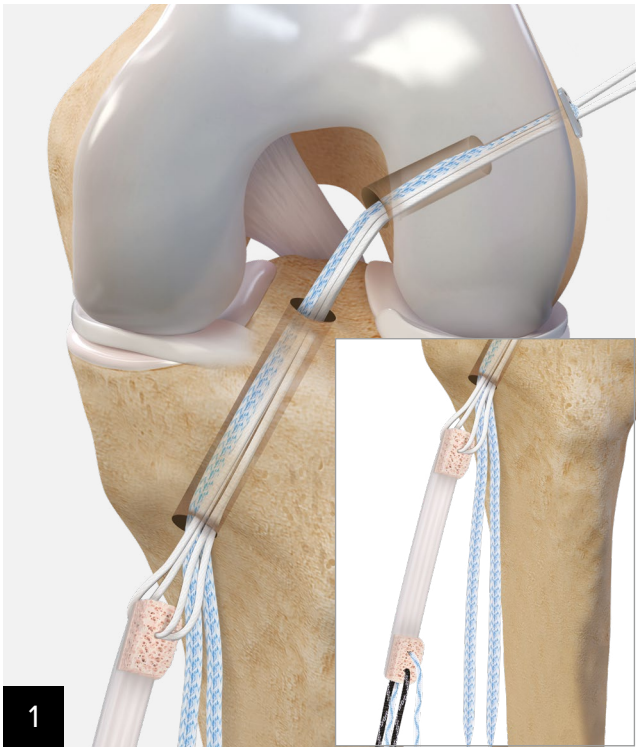
*Internal*Brace™ Technique Using the FiberSnare® Nitinol Guidewire

In peer-reviewed published literature, the *Internal*Brace technique for ACL reconstruction is associated with lower graft retear rates at 2 and 5 years,[1-4] less pain, improved patient-reported outcomes, and a faster and higher rate of return to preinjury level of activity.[5] Biomechanical research has proven that independent suture augmentation creates a load-sharing construct.

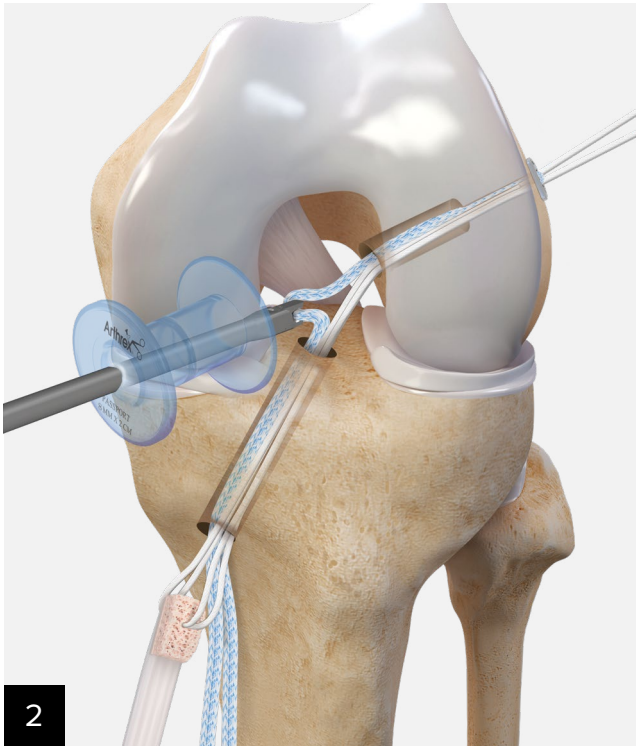
As the initial load transferred over the graft increases, the suture augmentation is engaged, resulting in load sharing and decreased peak loads on the graft that can result in creep, plastic deformation, and even structure failure in the early, vulnerable phases of graft incorporation and healing.[6,7]



Surgical Technique

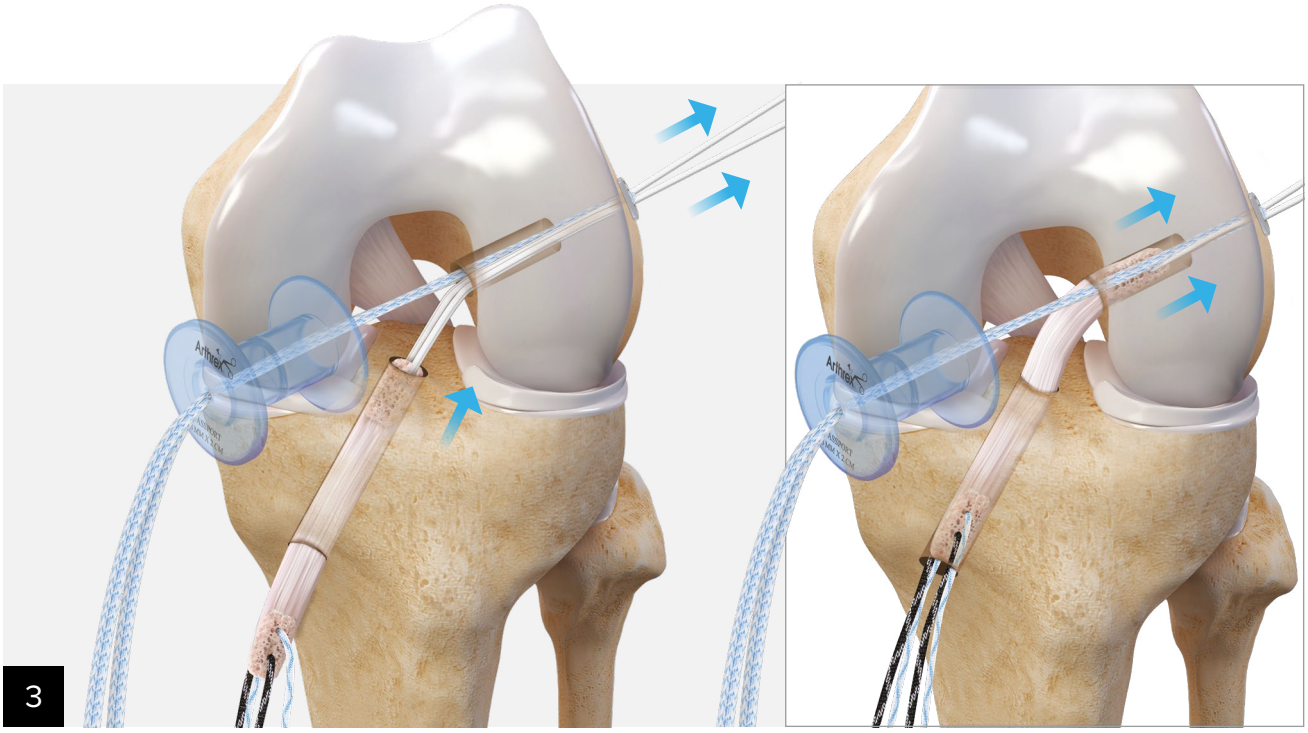


Pass the TightRope® II implant and confirm that the button is fixed on the lateral femoral cortex by pulling distally on the FiberTape® suture for the *Internal*Brace technique.



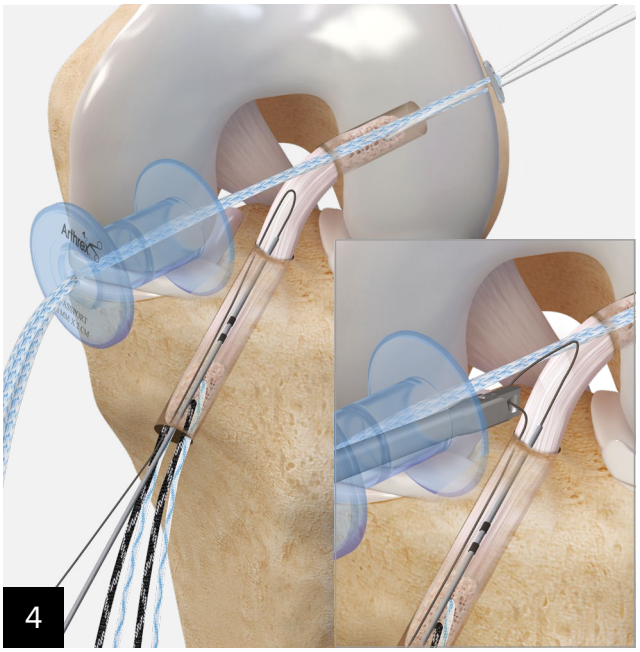
Prior to introducing the graft to the tibial tunnel, retrieve the FiberTape sutures for the *Internal*Brace technique from the joint using a FiberTape retriever. A PassPort Button™ cannula is recommended for suture management.

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.

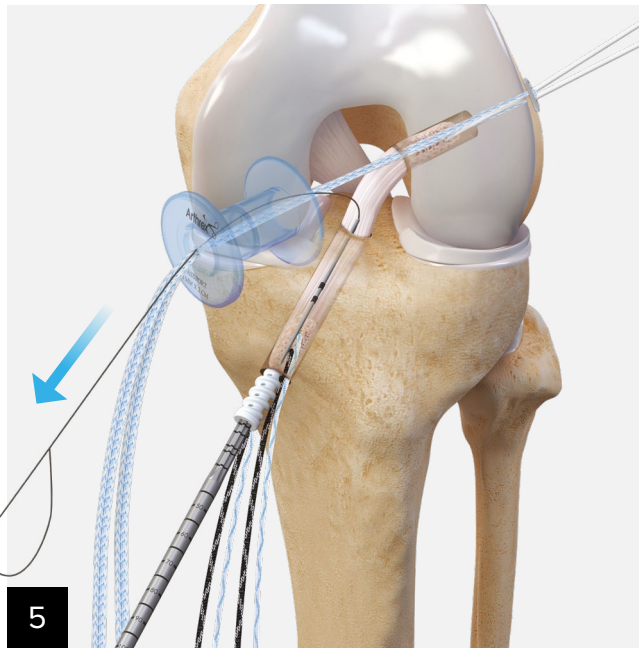


To advance the graft, pull on the tensioning strands one at a time, alternating approximately 2 cm on each side. When the femoral bone block is visible in the joint, stop advancing the graft and align the bone block with the femoral tunnel using a grasper or probe. Once femoral bone block is flush with the lateral wall of the notch, pull firmly back on the graft to check fixation.

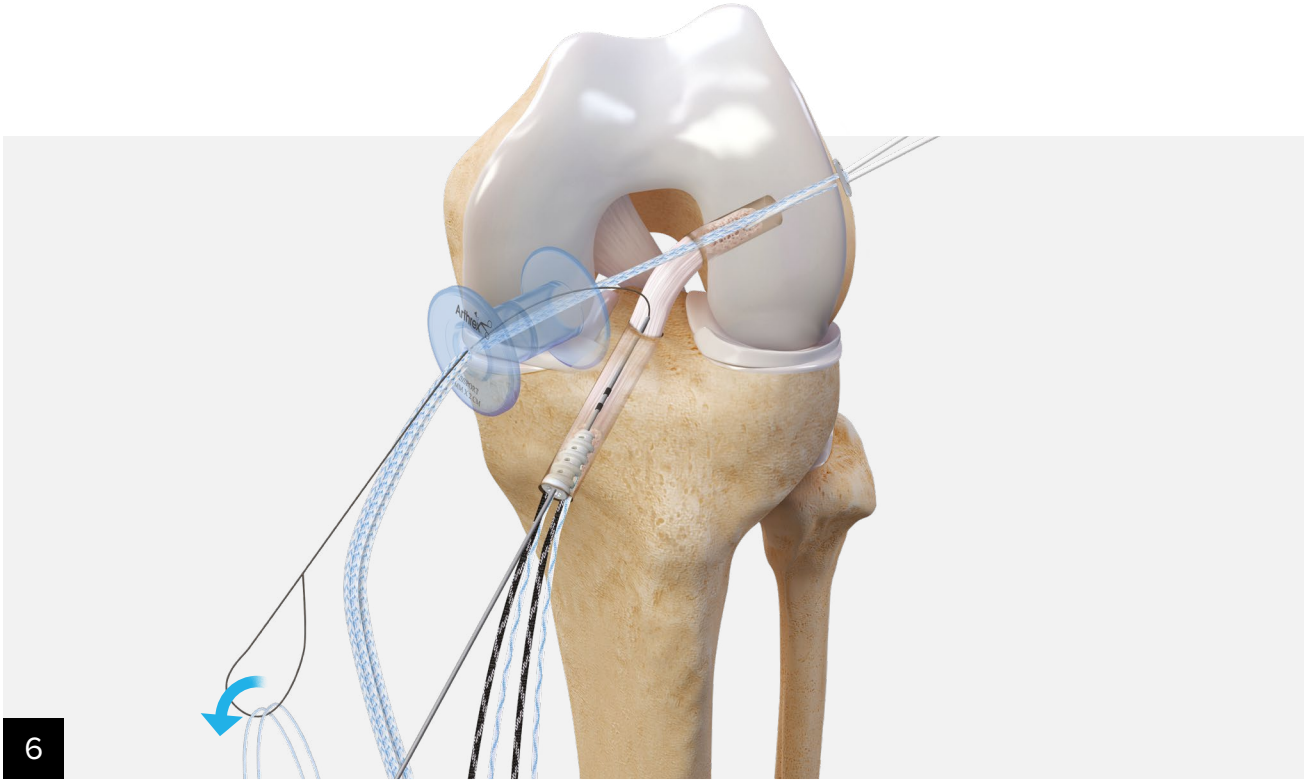
Note: Once the graft is seated, do not continue pulling the tensioning strands. If tunnels are divergent, it may be helpful to use a probe through the lateral portal to facilitate implant and graft passage out of the tibia and into the femoral socket.



Introduce the FiberSnare® nitinol guidewire up the tibial tunnel between the tibial bone block and tunnel wall until it is visible in the joint. Retrieve the FiberSnare shuttle suture out of the PassPort Button™ cannula.

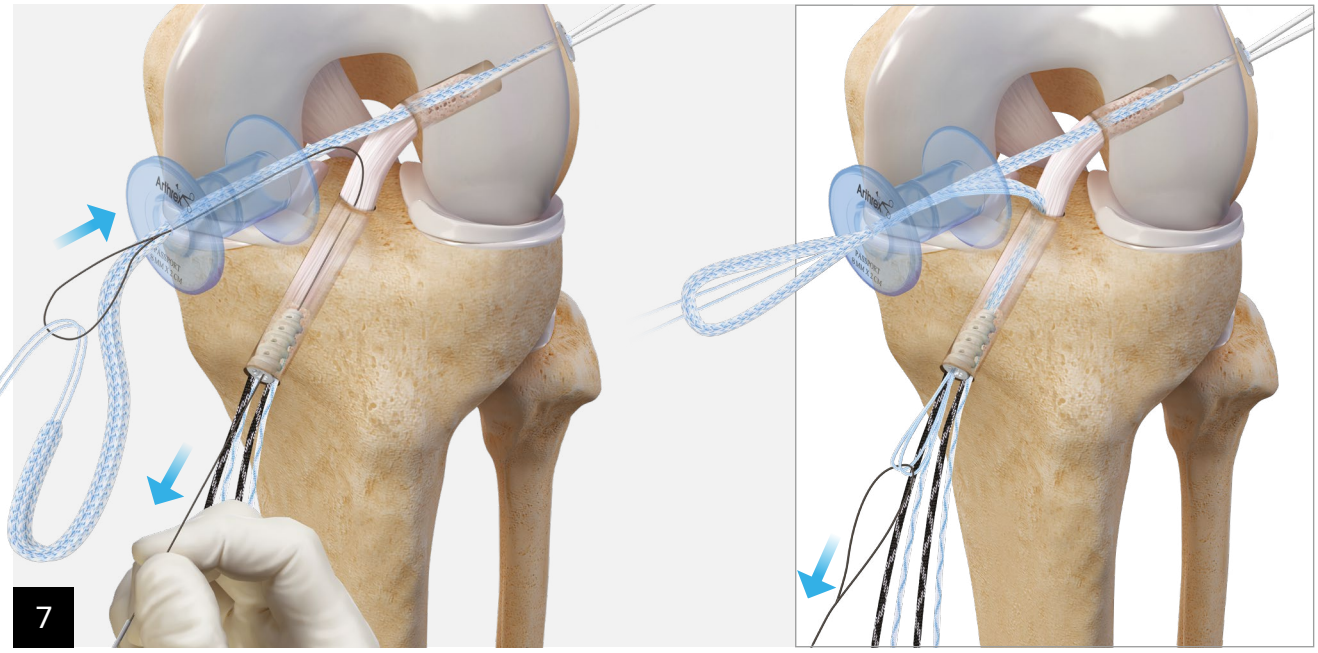


Prepare the tibial tunnel using the appropriate size FastThread™ interference screw tap. Advance the appropriate size FastThread interference screw until the back of the screw is flush with the end of the graft.

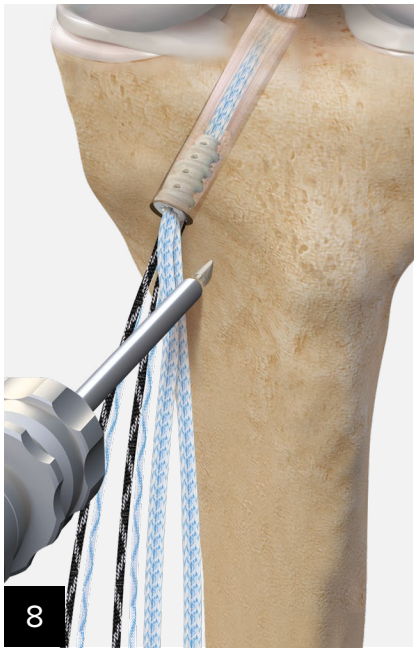


Outside the PassPort Button™ cannula, place the round ends of the FiberTape® suture for the *Internal*Brace™ technique into the loop of the FiberSnare® shuttle suture.

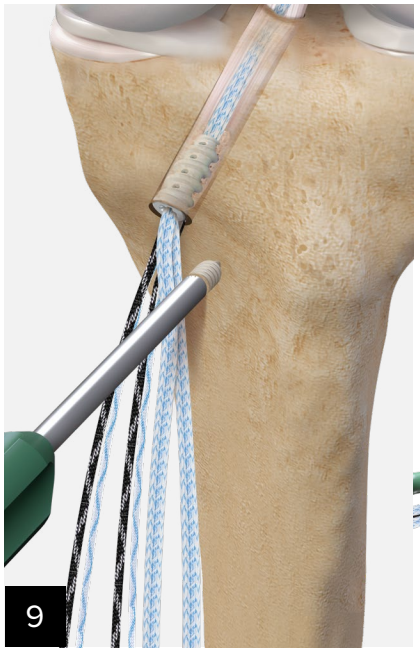
Note: Place the round ends of the FiberTape limbs in the FiberSnare shuttle loop to facilitate passage through the cannulation of the screw, not the flat tape portion of the FiberTape suture.



Remove the nitinol guidewire from the tibial tunnel and gently pull the attached FiberSnare suture distally in line with the tunnel by hand to shuttle the round ends of the FiberTape suture for the *Internal*Brace technique through the cannulation of the FastThread™ interference screw.

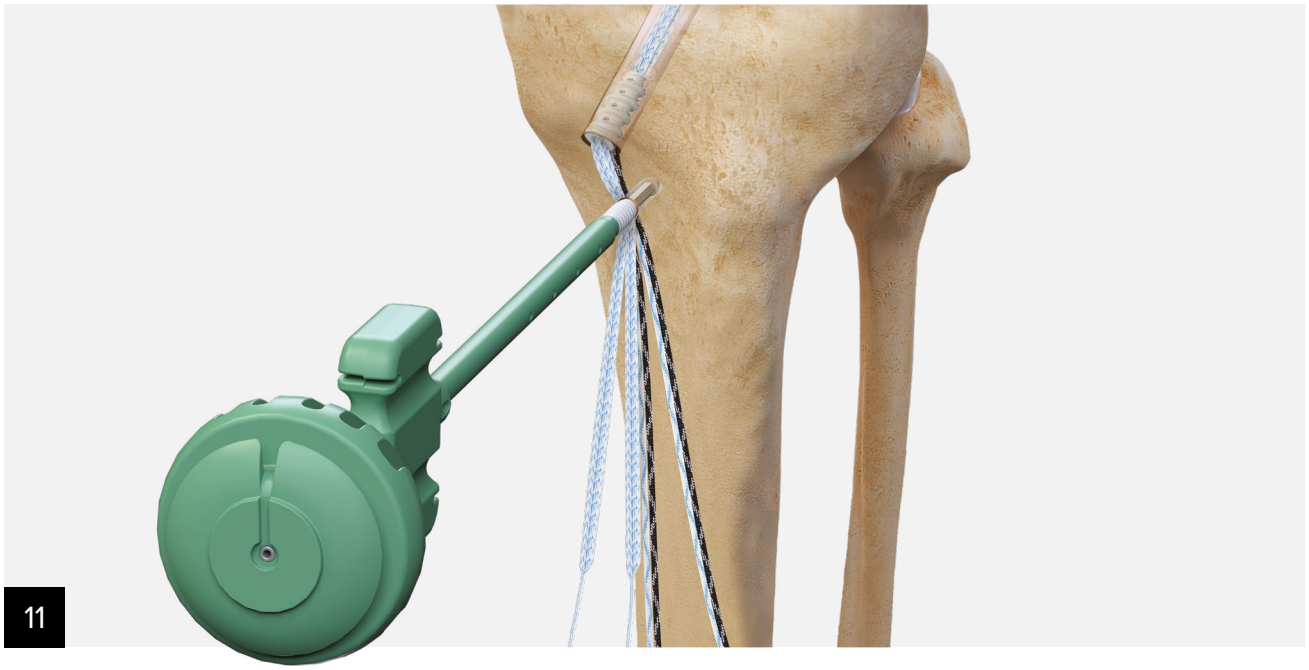


Advance the spade-tip drill into the tibia to the depth of the drill collar, which represents a 20 mm depth.

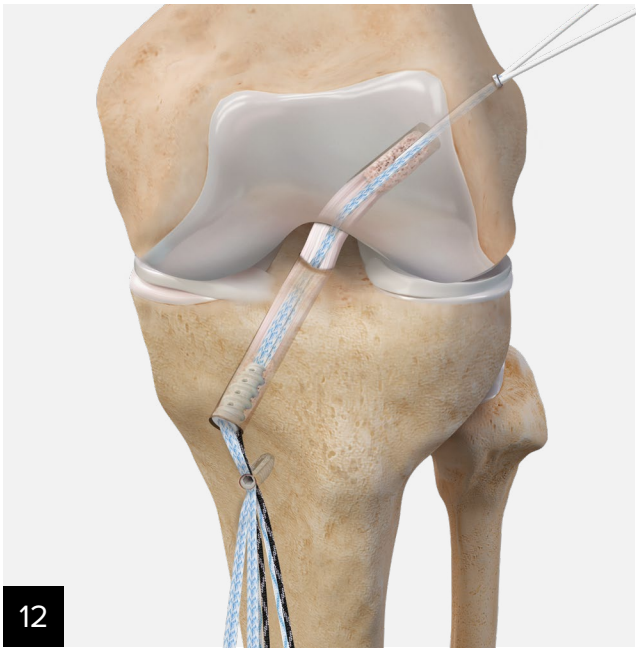


Use the 5.2 mm tap in the drilled hole and tap the socket.

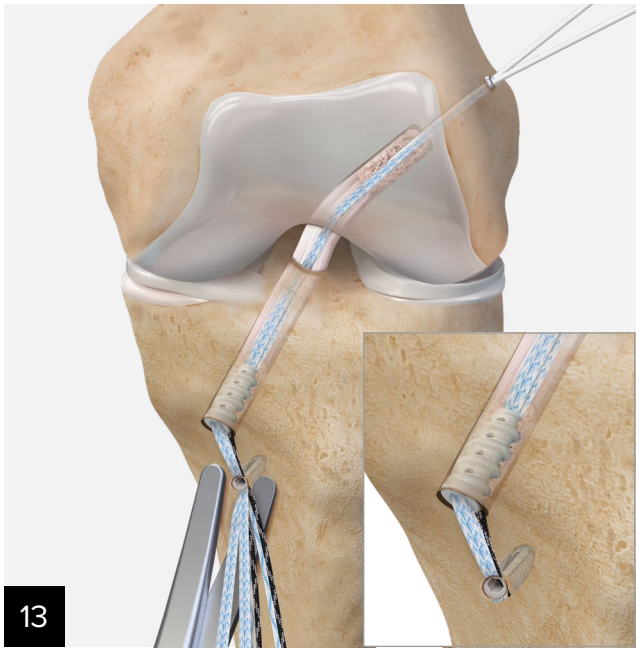
With the leg in full extension, pass the FiberTape® suture and graft whipstitch sutures through the eyelet of the 4.75 mm BioComposite SwiveLock® anchor.



Push the anchor into the drill hole until the eyelet is fully seated. Maintain tension on the suture limbs and screw the biocomposite anchor into the tibia. After removing the driver, keep the knee in extension and remove the retention suture from the anchor.



Cycle several times and then retension the femoral TightRope® sutures with the knee in extension.



Final fixation: Cut the excess suture flush.

Ordering Information

FiberSnare® Nitinol Guidewire

Product Description	Item number
FiberSnare nitinol guidewire, 1.1	AR-**1249IB**
FiberSnare nitinol guidewire, 2.0	AR-**1254IB**

Implants

Product Description	Item number
TightRope® II BTB implant with FiberTape® suture for the *Internal*Brace™ technique	AR-**1588BTB-IB**
ACL FiberTape® button	AR-**1588TB-IB**
TightRope button extender, 5 mm × 20 mm	AR-**1589RT**
Backup Kits	
Secondary Fixation Implant System w/ BioComposite SwiveLock® anchor 4.75 mm × 19.1 mm	AR-**1593-BC**
Secondary Fixation Implant System w/ PEEK SwiveLock anchor 4.75 mm × 19.1 mm	AR-**1593-P**

FastThread™ Screw Instrumentation

Product Description	Item number
FastThread interference screw instrument set	AR-**1996S**
Biocomposite Interference Screws	
6 mm × 20 mm (used with 6 mm driver)	AR-**4020C-06**
7 mm-10 mm × 20 mm screws	AR-**4020C-07 – 10**
7 mm-12 mm × 30 mm screws	AR-**4030C-07 – 12**
PEEK Interference Screws	
6 mm × 20 mm (used with 6 mm driver)	AR-**4020P-06**
7-10 mm × 20 mm screws	AR-**4020P-07 – 10**
7-12 mm × 30 mm screws	AR-**4030P-07 – 12**
Taps	
Fixed-handle taps, 6-10 mm	AR-**4020HT-06 – 10**
Quick-connect tap shafts, 6-10 mm	AR-**4020T-06 – 10**
Flexible Quick-connect tap shafts, 6-10 mm	AR-**4020TF-06 – 10**
Quick-Connect Drivers	
Quick-connect Driver, for 20 and 30 mm screws (hexalobe)	AR-**1996CD-1**
Quick-connect Driver, for 20 mm-length screws only (hexalobe)	AR-**4020D-1**
Quick-connect Driver, extended-length shaft (hexalobe)	AR-**1996CDL-1**
Quick-connect Driver, for 20 mm-length screws only (hexalobe)	AR-**4020DF**
Quick-connect Driver, for 6 mm-diameter screws (trilobe)	AR-**4019D-1**

Ratcheting SlapDriver	
SlapDriver, ratcheting, quick-connect handle	AR-**1999SD**
Fixed SlapDrivers	
SlapDriver, fixed, for 20 mm- and 30 mm-length screws only (hexalobe)	AR-**1996SD**
SlapDriver, fixed, for 20 mm screws only (hexalobe)	AR-**4020SD**
SlapDriver, fixed, for 6 mm-diameter screws only (trilobe)	AR-**4019SD**

FlipCutter® Drilling Options

Product Description	Item number
FlipCutter III drill, 6-12 mm	AR-**1204FF**
RetroConstruction™ drill guide set	AR-**1510S**

Reamer Options

Product Description	Item number
Flexible Reamers	
Curved guide for flexible pins	AR-**1800F**
TightRope® drill pin, flexible	AR-**1298FLX**
Reamer, flexible, 7-11 mm, w/ flexible guide pin	AR-**1400F-70** – AR-**1400F-110**
Reamer, flexible, w/ flexible TightRope drill pin, 7-11 mm	AR-**1401F-70** – AR-**1401F-110**
Low-Profile Reamer Option	
Reamer, low profile, 5-11 mm	AR-**1405LP** – AR-**1411LP**
ACL TightRope drill pin, open eyelet, 4 mm	AR-**1595T**
ACL TightRope drill pin, closed eyelet, 4 mm	AR-**1595TC**

Accessories

Product Description	Item number
#2 FiberSnare with #2 FiberWire® braided polyblend suture, white/blue with closed loop, 26 in, one end stiffened, 12 in	AR-**7209SNL**
#2 FiberSnare with #2 FiberWire braided polyblend suture, black/white with closed loop, 26 in, one end stiffened, 12 in	AR-**7209SNT**
Suture retriever	AR-**12540**
FiberWire® cutter	AR-**12250**
TightRope suture cutter	AR-**4520**

Products advertised in this brochure / surgical technique guide may not be available in all countries. For information on availability, please contact Arthrex Customer Service or your local Arthrex representative.

References

1. Daniel AV, Wijdicks CA, Smith PA. Reduced incidence of revision anterior cruciate ligament reconstruction with internal brace augmentation. *Orthop J Sports Med.* 2023;11(7):23259671231178026. doi:10.1177/23259671231178026
2. Daniel AV, Smith PA. Primary all-soft tissue quadriceps tendon autograft anterior cruciate ligament reconstruction with suture tape augmentation resulted in satisfactory patient outcomes and a low graft failure rate in high school and collegiate athletes [published online March 20, 2024]. *Arthroscopy*. doi:10.1016/j.arthro.2024.02.047
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4. Smith, PA. Primary bone patellar tendon bone anterior cruciate ligament reconstruction with and without suture tape augmentation. Abstract presented at: ACL Study Group Meeting 2024; January 29–February 1, 2024; Niseko, Japan. Accessed May 21, 2024.
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6. Bachmaier S, Smith PA, Argintar EH, Chahla J, Higgins LD, Wijdicks CA. Independent suture augmentation with all-inside anterior cruciate ligament reconstruction reduces peak loads on soft-tissue graft. a biomechanical full-construct study. *Arthroscopy.* 2022;38(1):88-98. doi:10.1016/j.arthro.2021.09.032
7. Bachmaier S, Smith PA, Bley J, Wijdicks CA. Independent suture tape reinforcement of small and standard diameter grafts for anterior cruciate ligament reconstruction: a biomechanical full construct model. *Arthroscopy.* 2018;34(2):490-499. doi:10.1016/j.arthro.2017.10.037

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