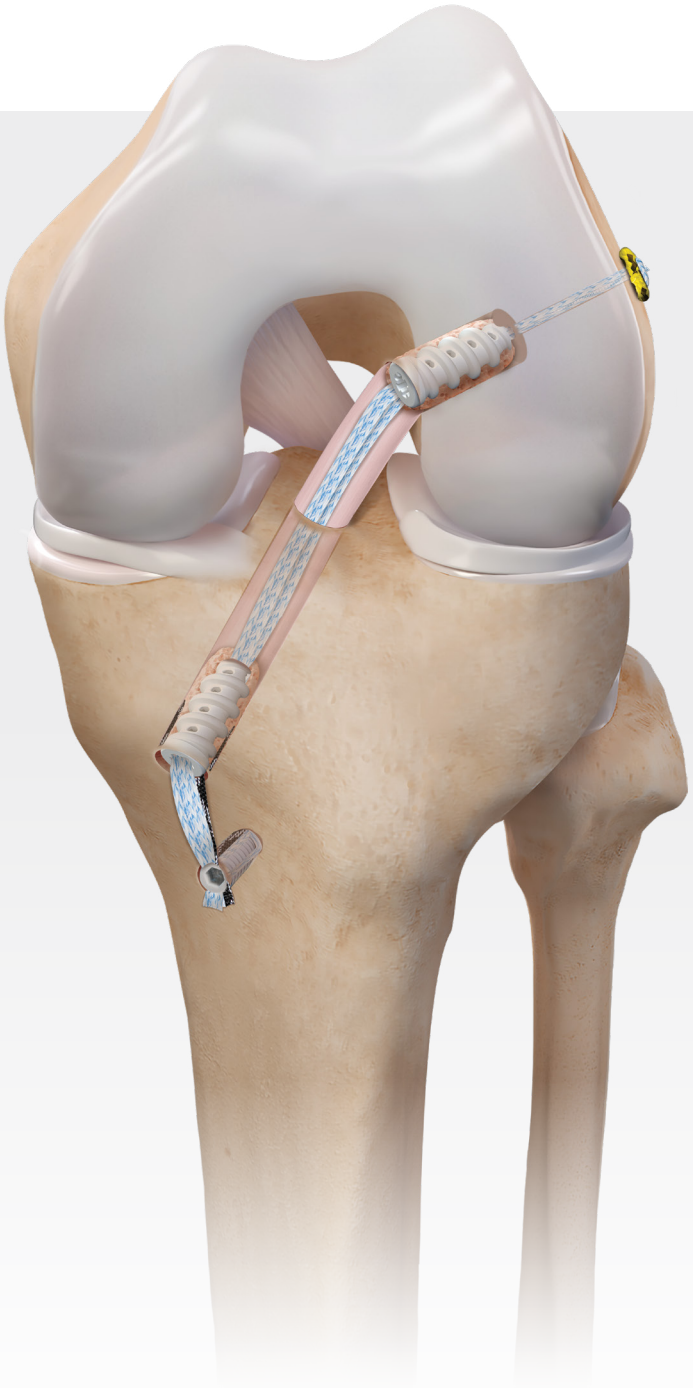
BTB ACL Reconstruction Using the FiberTape® TightRope® SB Implant for the *Internal*Brace™ Technique

Surgical Technique



Arthrex®

ACL *Internal*Brace™ Technique Using the FiberTape® Soft Button

The FiberTape soft button implant facilitates a simplified and reproducible technique for augmenting ACL reconstructions (ACLR) with cortical fixation and FiberTape suture.

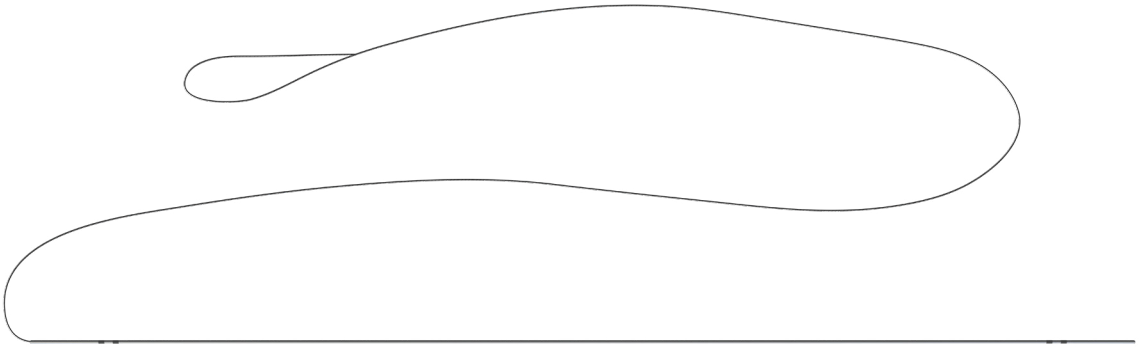
FEATURES AND BENEFITS

- **All-suture button design:** Revolutionary all-suture, soft-button technology to eliminate metal from ACLR **(a)**
- **Ability to reflip:** Implant can be reflipped as needed
- **Radiopaque design:** Allows for button-flipping confirmation
- ***Internal*Brace technique:** Proven in peer-reviewed published studies to be associated with lower ACL 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]

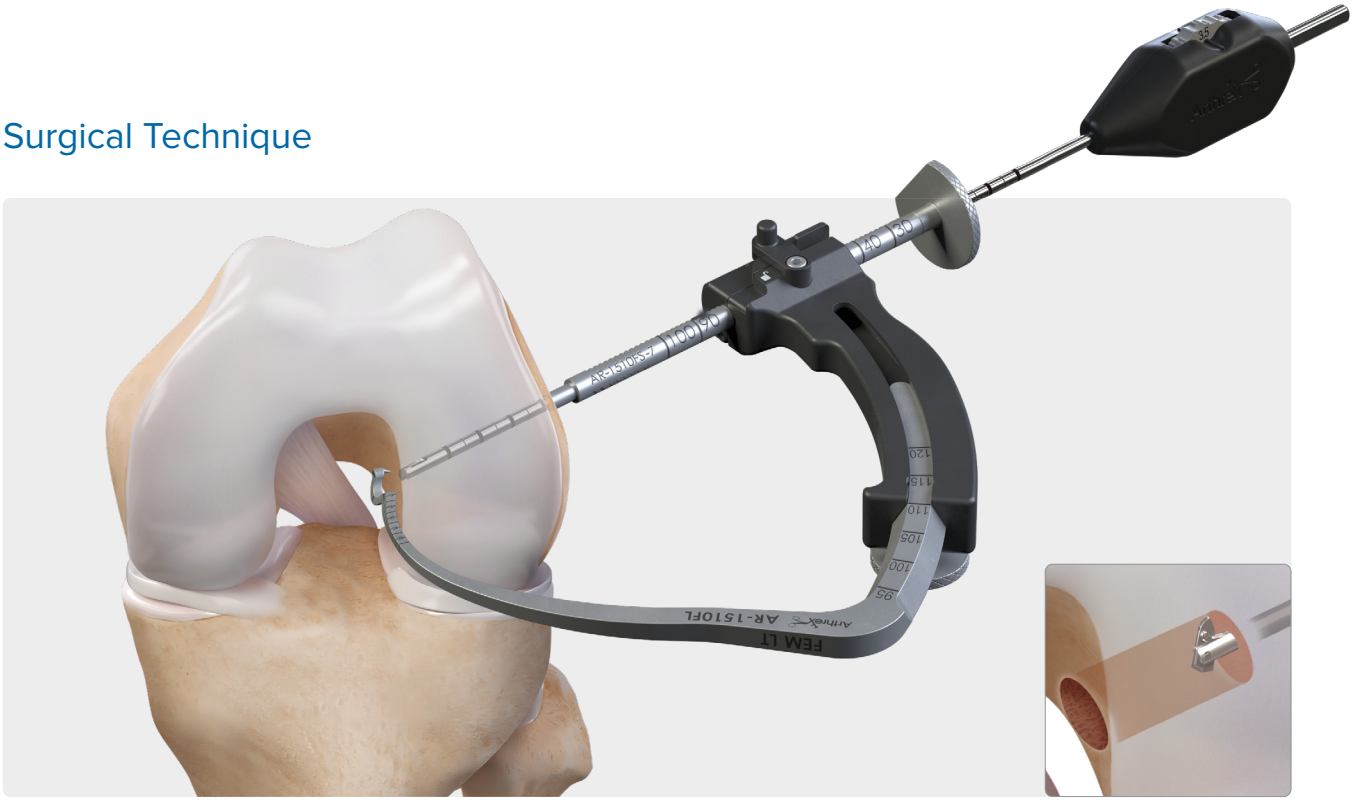
The *Internal*Brace surgical technique is intended only to augment the primary repair/reconstruction by expanding the area of tissue approximation during the healing period and is not intended as a replacement for the native ligament. The *Internal*Brace technique is for use during soft tissue-to-bone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

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

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 structural failure in the early, vulnerable phases of graft incorporation and healing.[6,7]

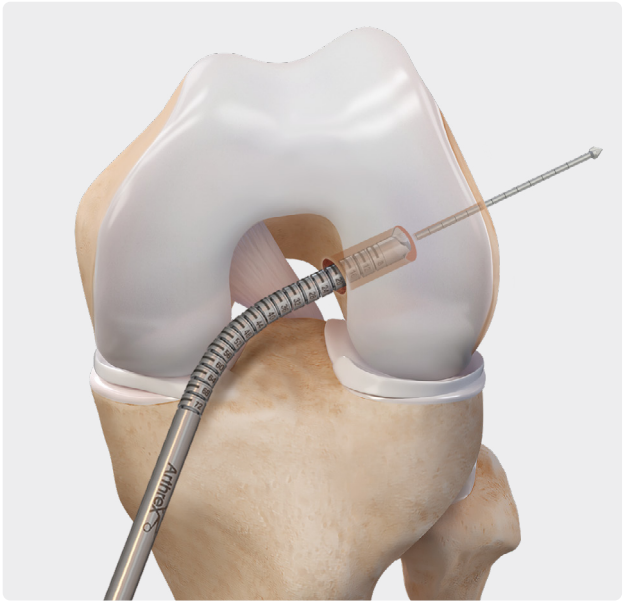


Surgical Technique



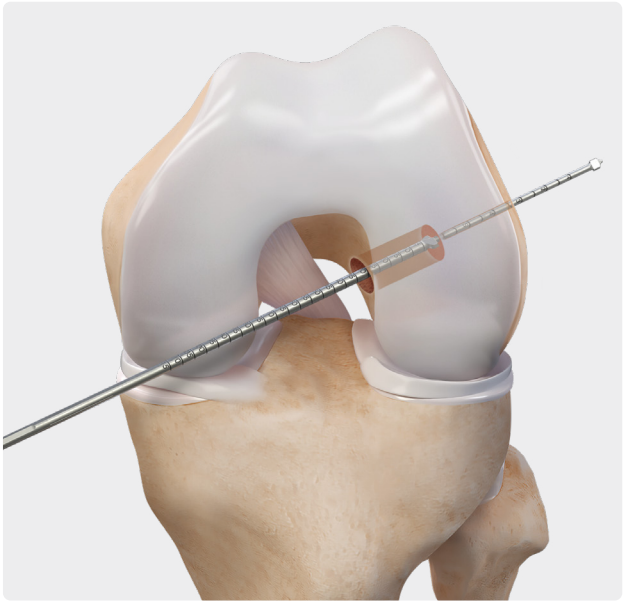
1a

FlipCutter® III drill option: The femoral socket can be prepared in a retrograde fashion using the FlipCutter III drill and RetroConstruction™ guide system.



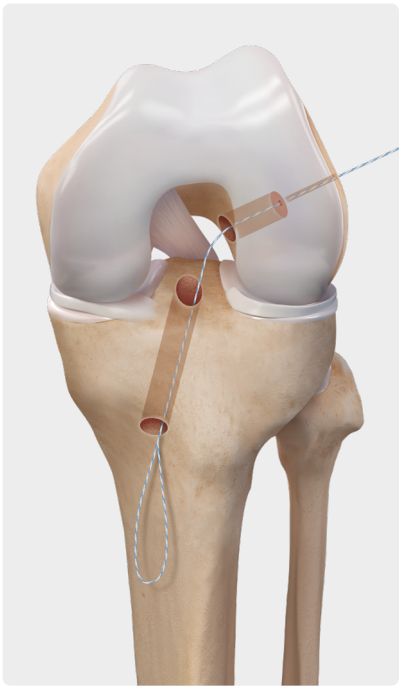
1b

Flexible reamer option: The socket can be prepared in an antegrade fashion with the ACL TightRope® drill pin and flexible reamers.



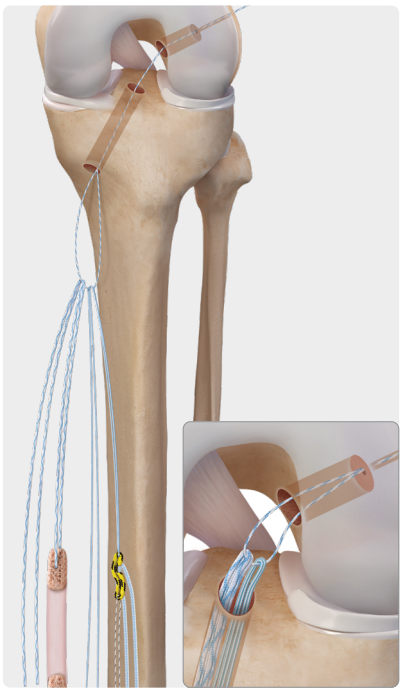
1c

Low-profile reamer option: The socket can be prepared in an antegrade fashion with the ACL TightRope drill pin and low-profile reamers.



2

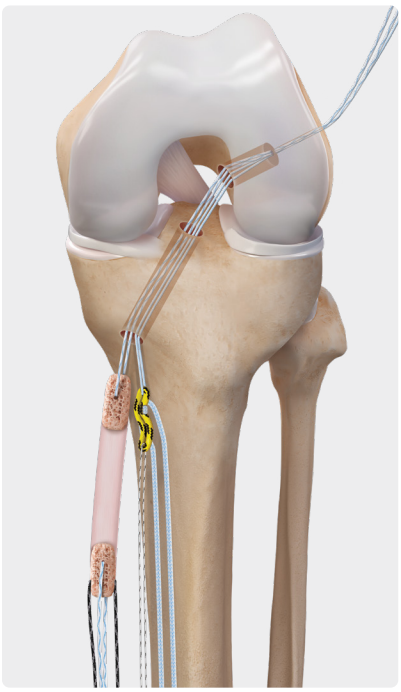
Pass FiberSnare® suture to facilitate graft and FiberTape® soft button passage.



3

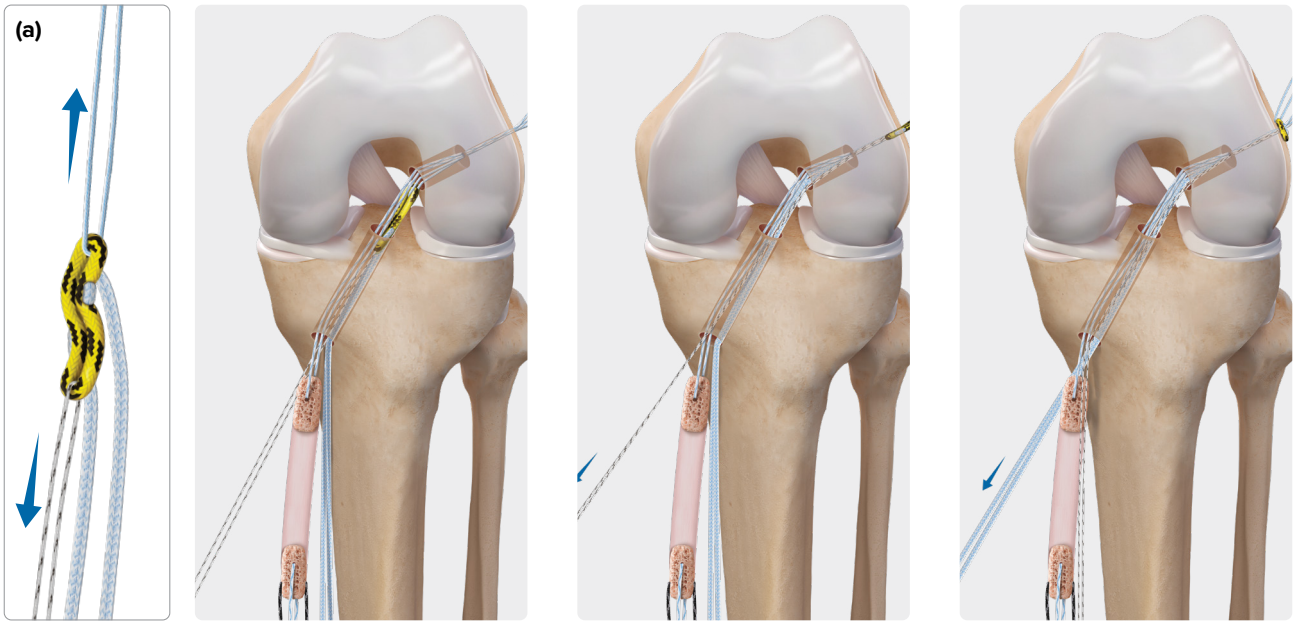
Load the blue soft button passing suture and graft passing sutures through the loop of the FiberSnare suture.

> **Note:** Do not load the TigerWire® countertension suture or FiberTape suture limbs in the FiberSnare shuttle.



4

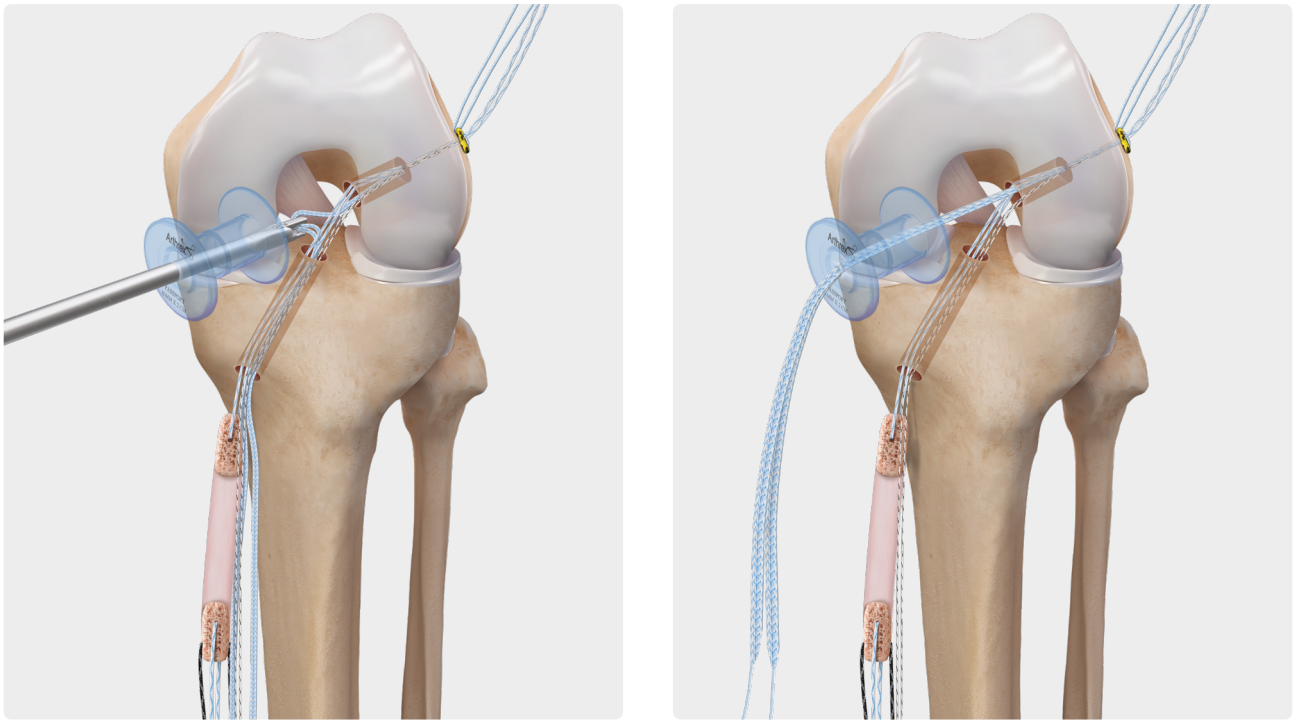
Using the FiberSnare suture, shuttle the blue FiberWire® tails of the soft button and the graft sutures together through the tibia and femur.



5

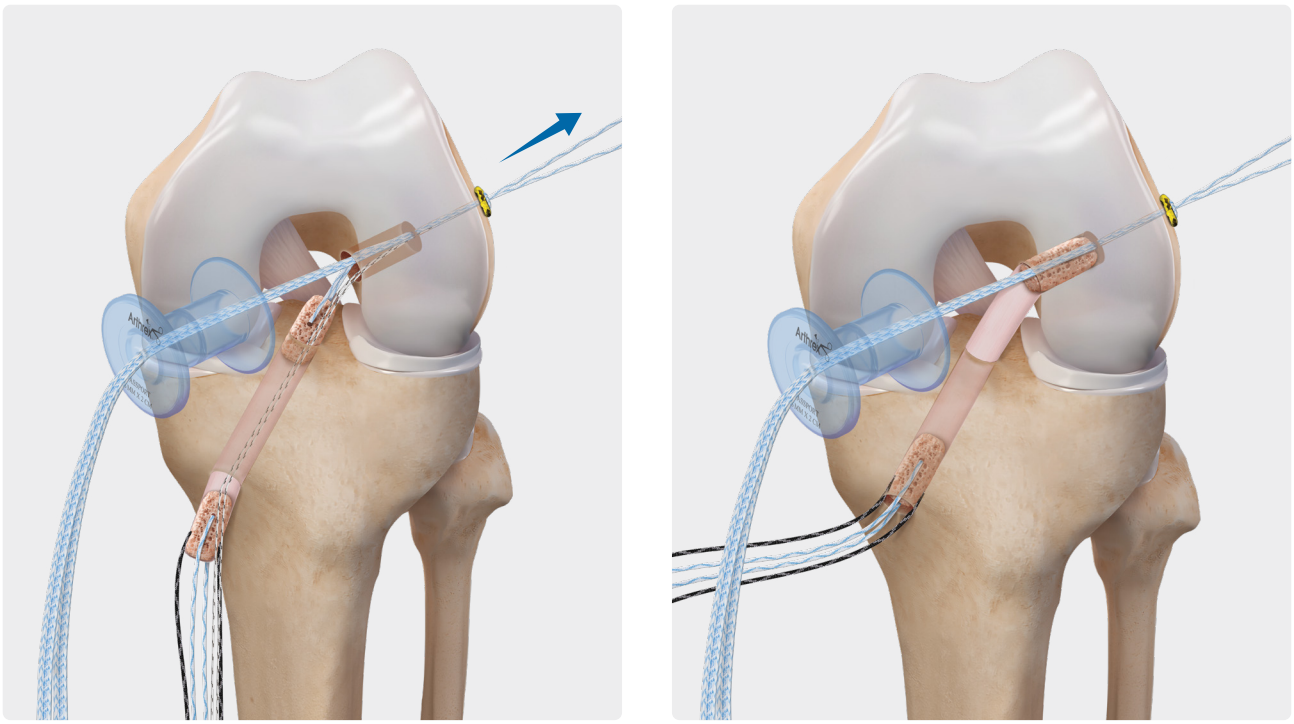
While holding countertension on the TigerWire® suture, pull the blue FiberTape® soft button passing suture to bring the button through the femur. Pull the distal ends of the FiberTape suture to confirm fixation on the cortex **(a)**.

> **Note:** A line on the implant marked at the intraosseous length may be helpful to signal that the button has exited the femur. The button can also be viewed through the medial portal as it exits the femoral cortex.



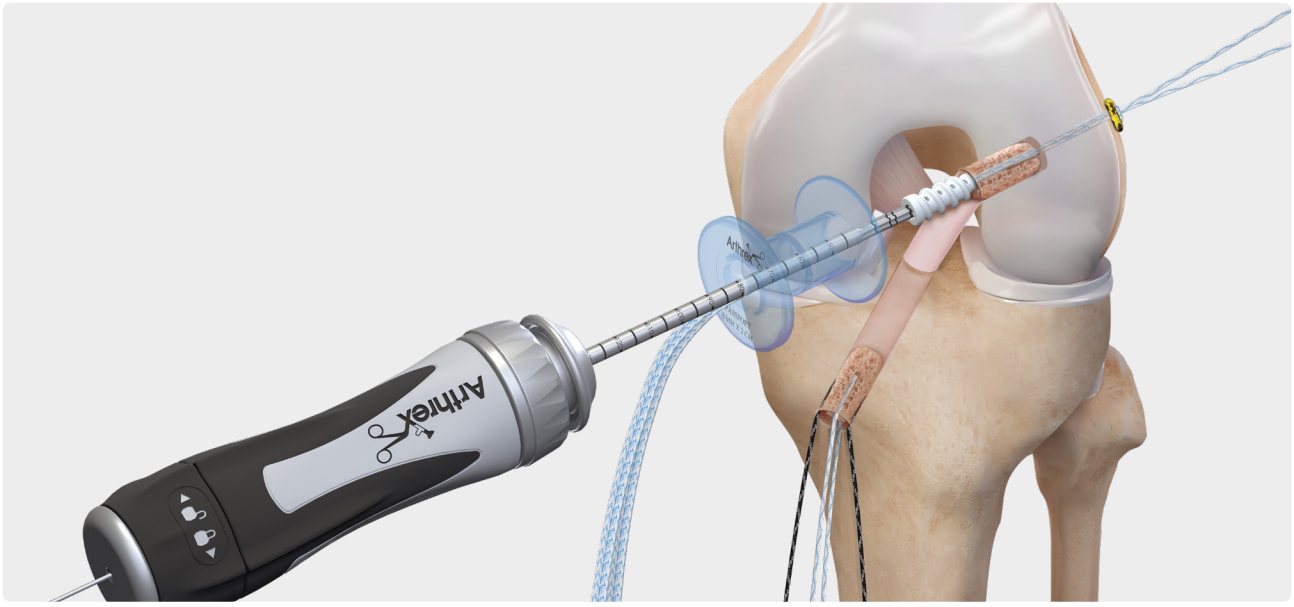
6

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



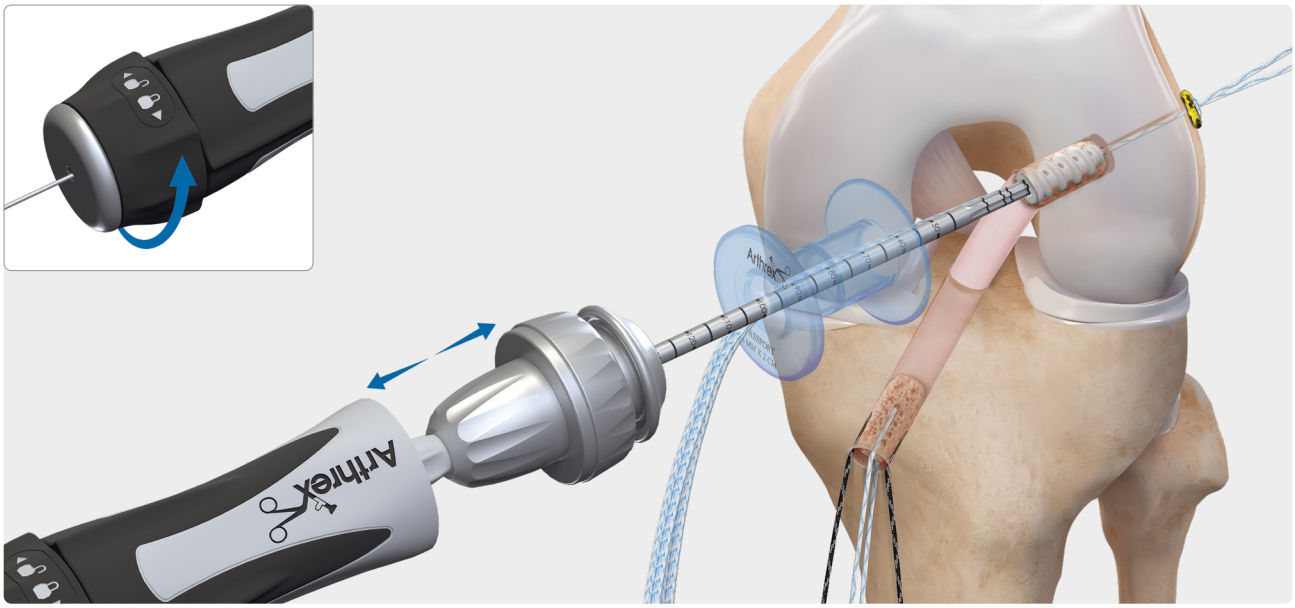
7

With the FiberTape® soft button in place, pull the graft sutures and advance the graft into the femoral socket.



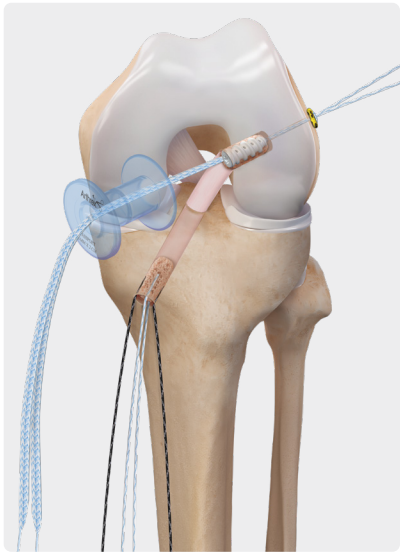
8

Place a 1.1 mm nitinol guidewire into the femoral socket. Tap the socket with a FastThread™ interference screw tap of a compatible size and advance the screw to the appropriate depth.



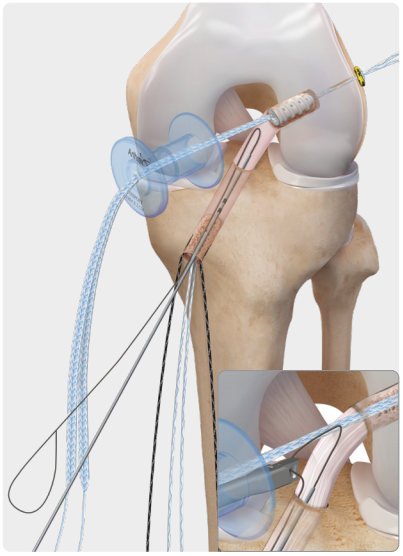
9

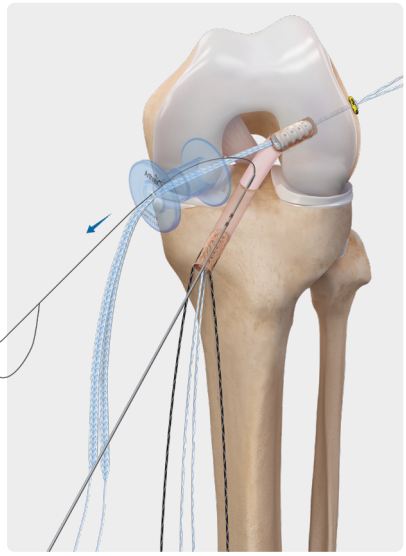
If resistance is encountered when removing the screwdriver, unlock the slap hammer mechanism by twisting the knob on the back of the SlapDriver handle counterclockwise. Forcefully slide the handle away from driver tip in a slap-hammer fashion. Repeat as needed until the SlapDriver screwdriver is removed.



10

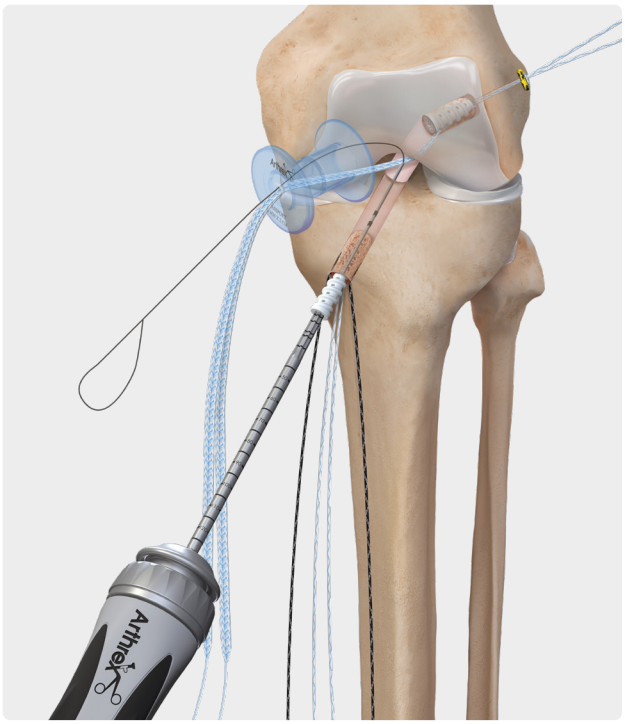
Introduce the FiberSnare® nitinol guidewire up the tibial tunnel between the tibial bone block and tunnel wall until it is visible in the joint.





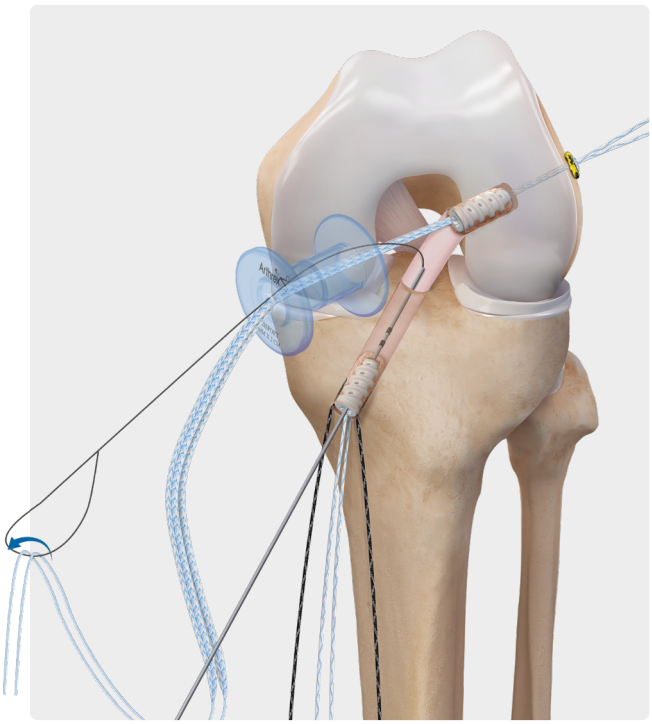
11

Retrieve the FiberSnare shuttle suture out of the PassPort Button™ cannula.



12

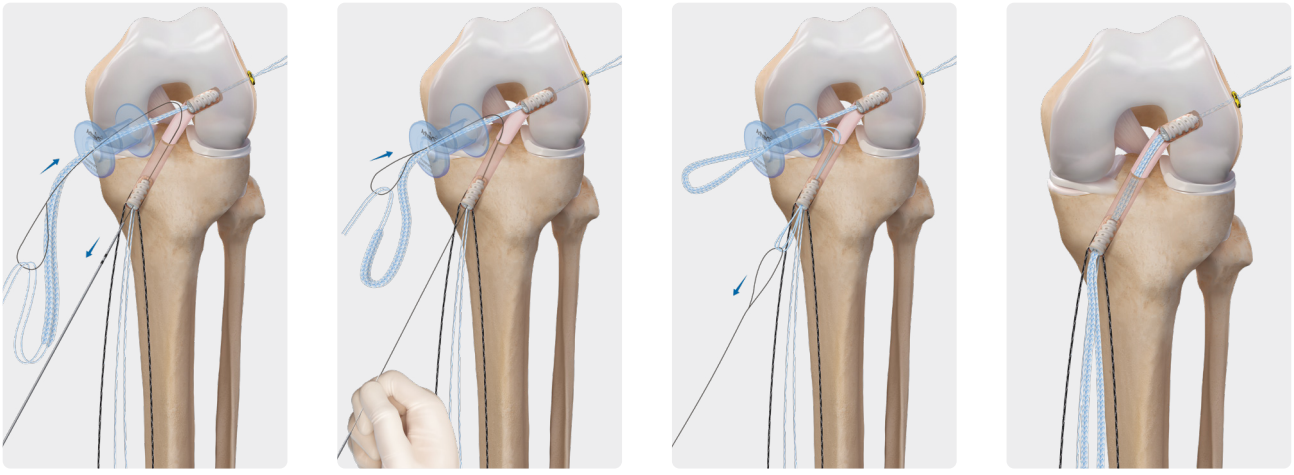
Prepare the tibial tunnel using the appropriate size FastThread™ interference screw tap. Advance the appropriate size FastThread interference screw until the back of the screw is flush with the end of the graft.



13

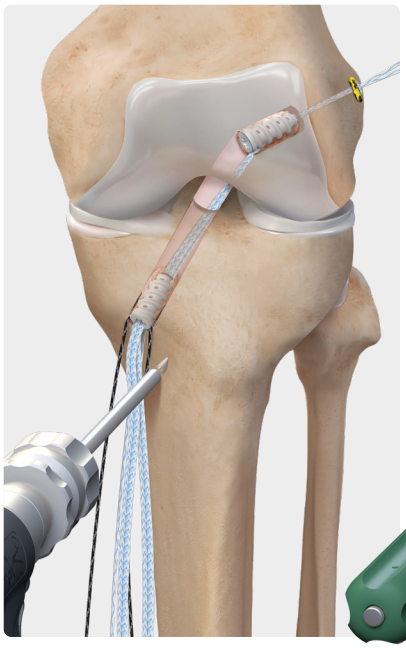
Outside the PassPort Button™ cannula, place the round ends of the FiberTape® suture for the *Internal*Brace™ technique into the loop of the FiberSnare® shuttle suture.

> **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.



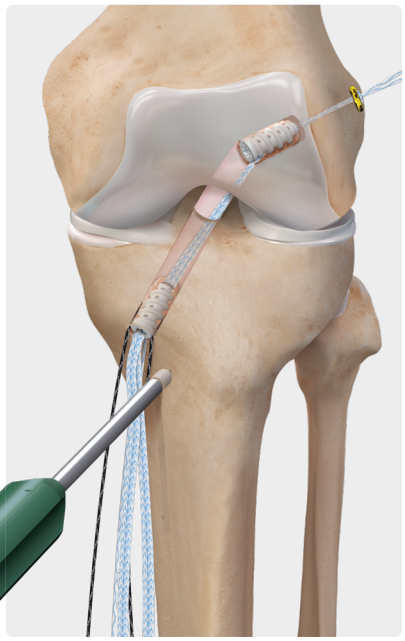
14

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.



15

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

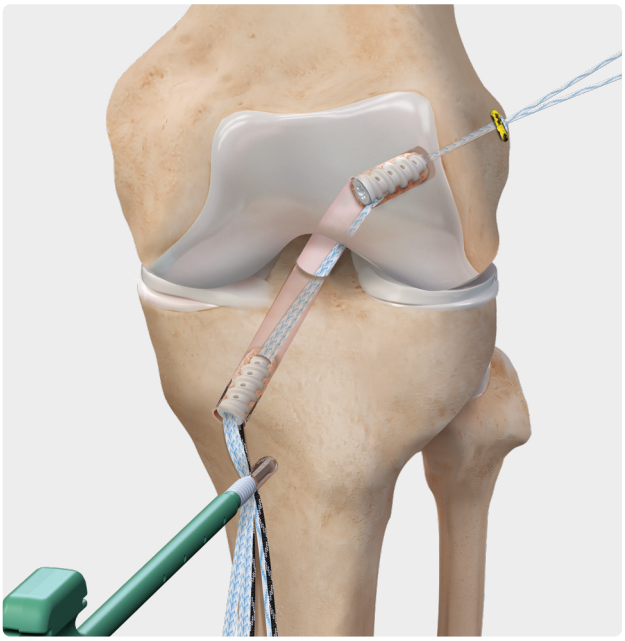


16

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

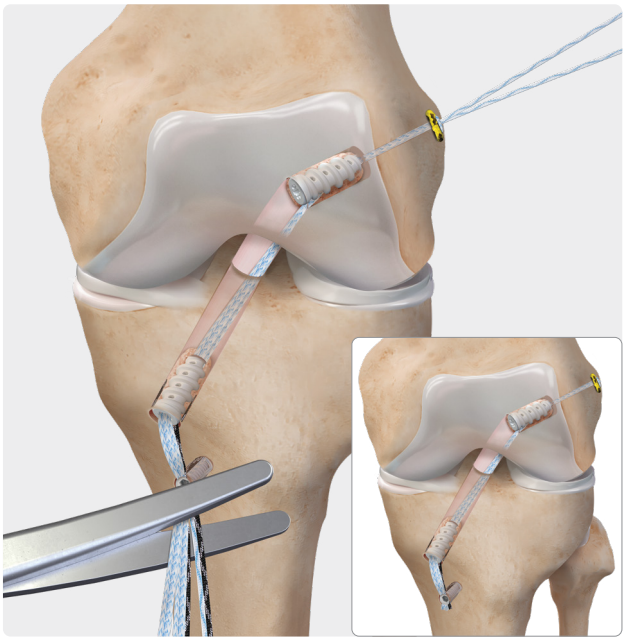
17

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.



18

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.



19

Final fixation: Cut the excess suture flush.

Ordering Information

Implants

FiberTape® soft button implant	AR-1588SBR-IB
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

FiberSnare® Nitinol Guidewire

FiberSnare nitinol guidewire, 1.1	AR-1249IB
FiberSnare nitinol guidewire, 2.0	AR-1254IB

FastThread™ Screw Instrumentation

FastThread Interference Screw Instrument Set	AR-1996S
Biocomposite Interference Screws	
6 mm × 20 mm (used with 6 mm driver)	AR-4020C-06
7-10 mm × 20 mm screws	AR-4020C-07–10
7-12 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 length screws only (hexalobe)	AR-4020SD
SlapDriver, fixed, for 6 mm-diameter screws only (trilobe)	AR-4019SD

FlipCutter® Drilling Options

FlipCutter III drill, 6-12 mm	AR-1204FF
RetroConstruction™ drill guide set	AR-1510S

Reamer Options

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
4.5 mm spade-tip TightRope drill pin	AR-1595TC-45

Accessories

#2 FiberSnare guidewire w/ #2 FiberWire® braided polyblend suture, white/blue w/ closed loop, 26 in, one end stiffened, 12 in	AR-7209SNL
#2 FiberSnare guidewire w/ #2 FiberWire braided polyblend suture, black/white w/ 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. *Arthroscopy.* 2025;41(1):95-105. doi:10.1016/j.arthro.2024.02.047
3. Wilson WT, Kennedy MJ, MacLeod D, Hopper GP, MacKay GM. Outcomes of anterior cruciate ligament reconstruction with independently tensioned suture tape augmentation at 5-year follow-up. *Am J Sports Med.* 2023;51(14):3658-3664. doi:10.1177/03635465231207623
4. Daniel AV, Smith PA. Less subsequent revision anterior cruciate ligament (ACL) reconstruction following primary bone-patellar tendon-bone ACL reconstruction with suture tape augmentation—a retrospective comparative therapeutic trial with 5-year follow-up. *Arthroscopy.* 2024;40(9):2455-2464. doi:10.1016/j.arthro.2024.01.019
5. Bodendorfer BM, Michaelson EM, Shu HT, et al. Suture augmented versus standard anterior cruciate ligament reconstruction: a matched comparative analysis. *Arthroscopy.* 2019;35(7):2114-2122. doi:10.1016/j.arthro.2019.01.054
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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Arthrex manufacturer, authorized representative, and importer information (Arthrex eIFUs)

US patent information

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