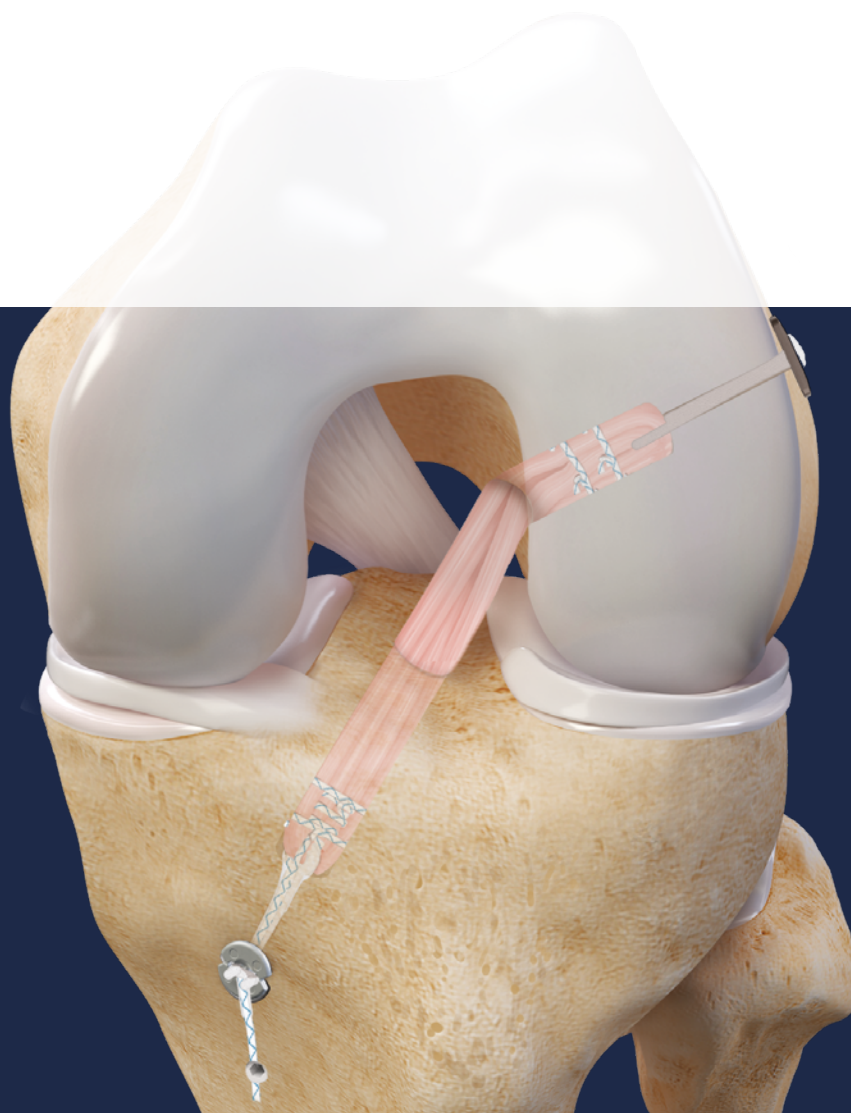


GraftLink[®] ACL Reconstruction With the ACL TightRope[®] II Fixation

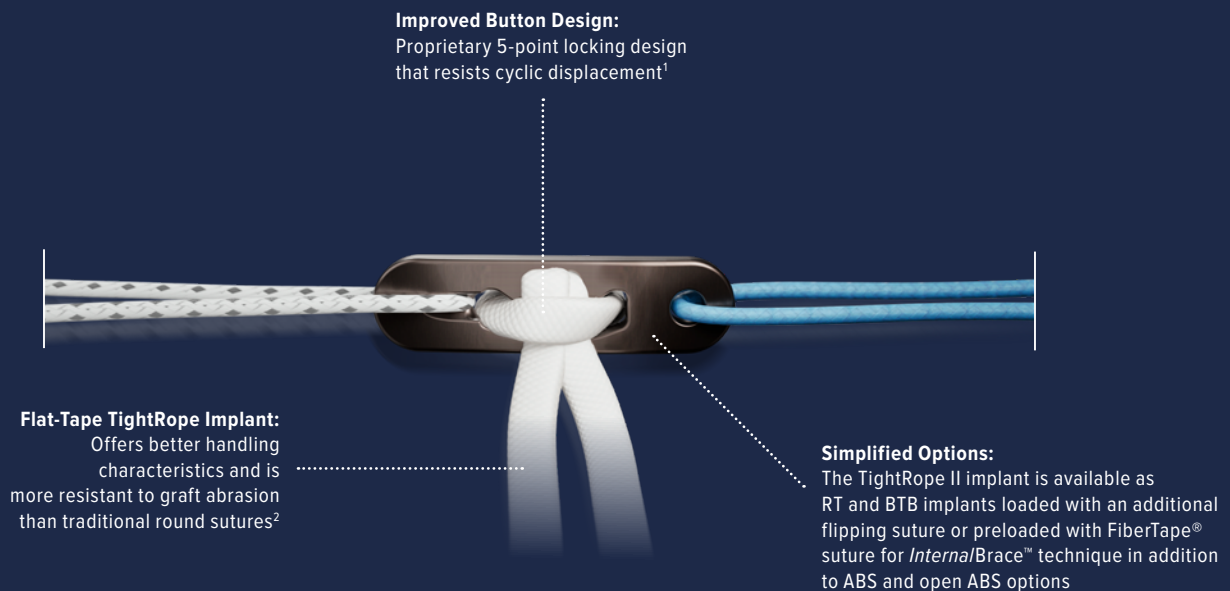
Surgical Technique



Arthrex[®] 

ACL TightRope® II Implant

Flat-Out Better Adjustable-Loop Technology



The ACL TightRope II implant is the next evolution in adjustable cortical suspensory fixation. The new flat-tape TightRope loop offers improved graft interface and handling characteristics during graft tensioning and greater resistance to graft abrasion.² The new proprietary 5-point locking design of the TightRope II button resists cyclic displacement¹ and offers excellent pull-out strength.³ The TightRope II implant was engineered to enable precise graft tensioning and allow incremental retension of the construct after cortical button fixation.

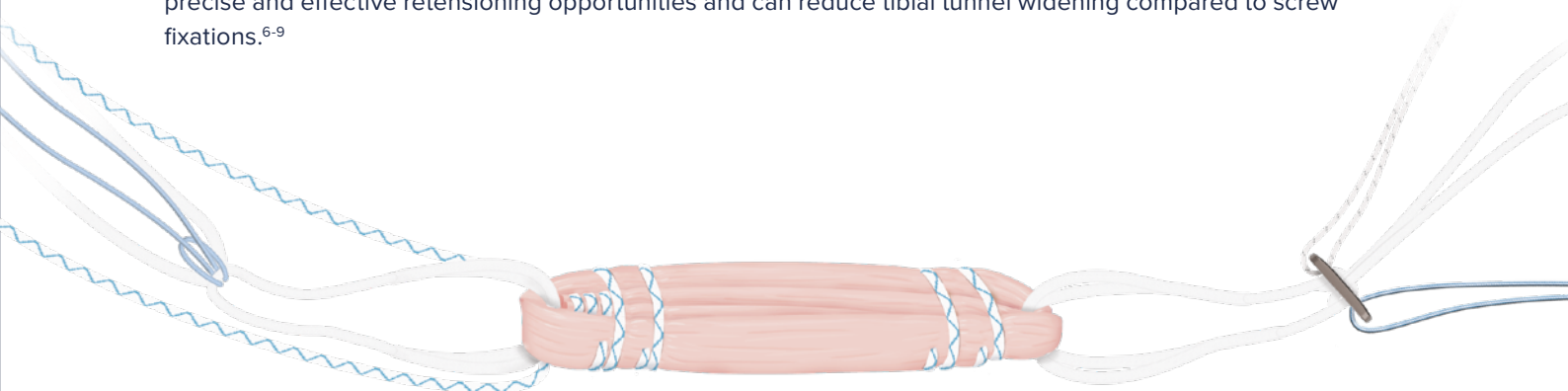
The TightRope II implant is available in a variety of configurations to accommodate various graft options and technique preferences such as:

- TightRope II RT implant
- TightRope II RT implant with FiberTape suture for *Internal/Brace* technique
- TightRope II BTB implant
- TightRope II BTB implant with FiberTape suture for *Internal/Brace* technique
- TightRope II ABS implant
- TightRope II open ABS implant
- Concave ABS buttons

GraftLink® All-Inside ACL Reconstruction

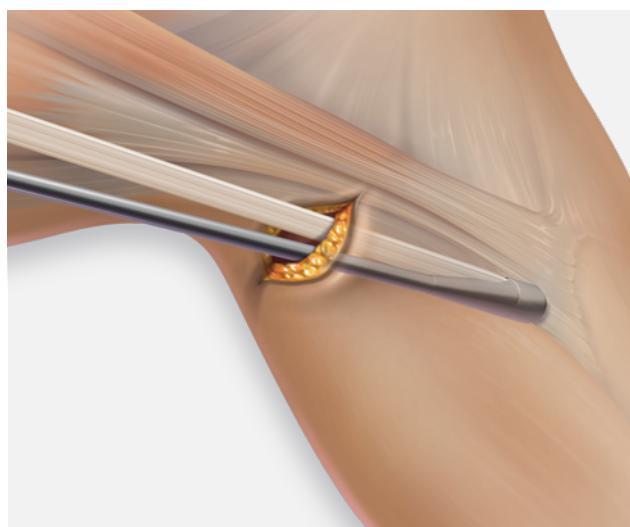
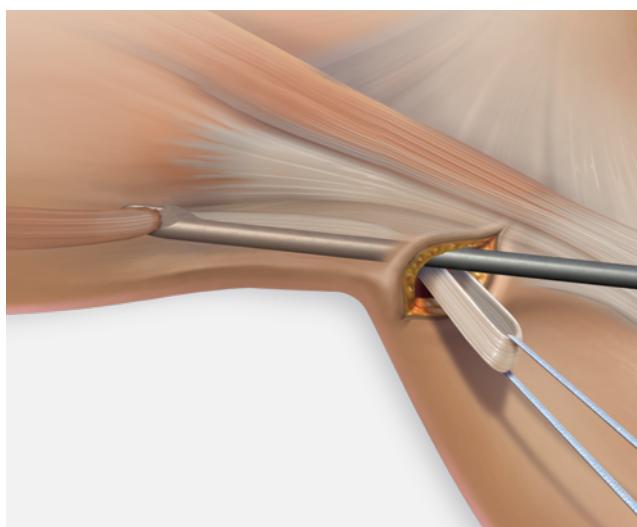
The GraftLink technique provides the ultimate in anatomic, minimally invasive, and reproducible ACL reconstruction.

- **Anatomic:** Independent tibial and femoral socket preparation with FlipCutter® III drills, flexible reamers, and/or low-profile reamers facilitate unconstrained placement of the ACL graft.
- **Minimally Invasive:** A single-hamstring harvest decreases morbidity and loss of strength. Socket preparation with the FlipCutter III drill limits soft-tissue dissection and helps preserve bone and periosteum.⁴⁻⁶
- **Reproducible:** The GraftPro® workstation simplifies graft preparation. The tapered graft and adjustable femoral and tibial ACL TightRope® II implants facilitate graft passing, fine-tuning of graft depth, and graft tensioning from the femoral and tibial sides.
- **Safe:** GraftLink ACL reconstruction offers the largest pull-to-failure forces compared to other reconstruction techniques, and similar elongation to fixed-loop devices. It is the only device and technique that allows for precise and effective retensioning opportunities and can reduce tibial tunnel widening compared to screw fixations.⁶⁻⁹



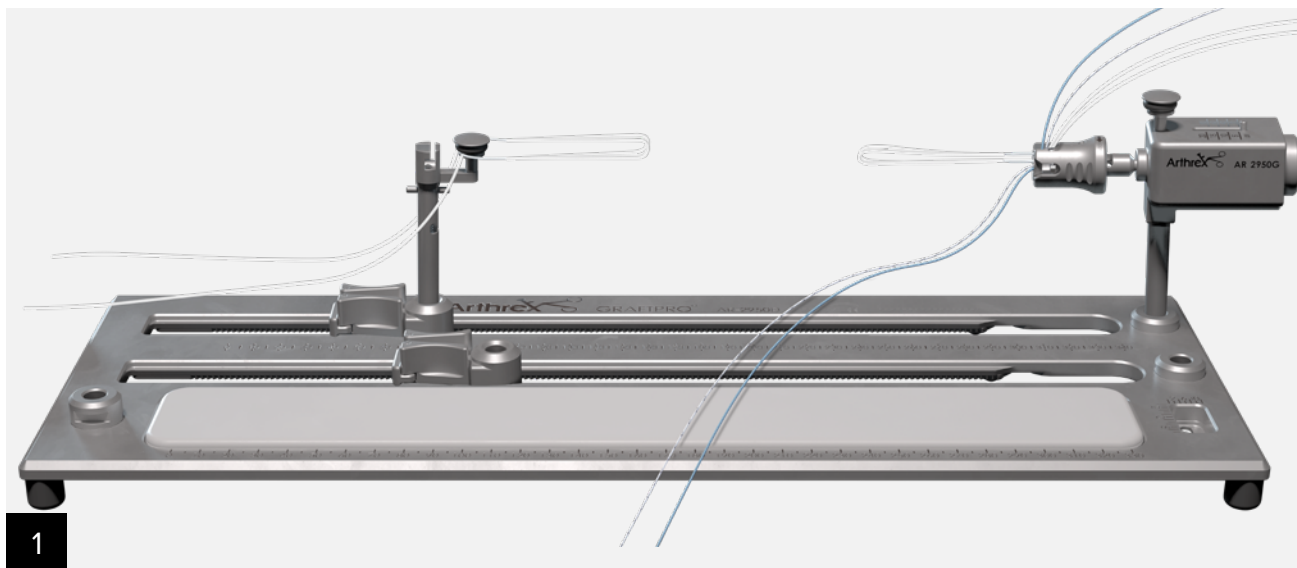
Semitendinosus Hamstring and GraftLink Implant Preparation

In most cases, only the semitendinosus is needed to create the GraftLink construct. For a less invasive option, harvest the tendon using the minimally invasive hamstring harvest technique and instruments described in Minimally Invasive Hamstring Graft Harvesting Surgical Technique (LT1-0124-EN).



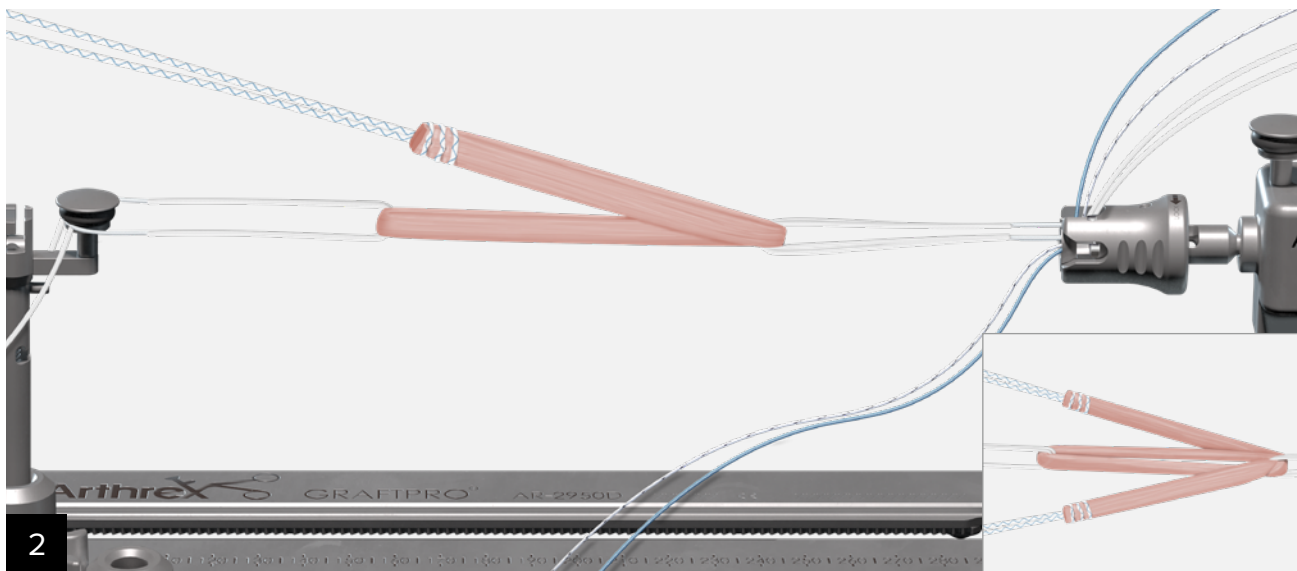
- Atraumatic hamstring harvester (AR-10300)

Graft Preparation



Place the GraftPro graft prep attachments on the GraftPro® base and load the ACL TightRope® II implants into the attachments. Measure the distance between the TightRope II loop ends. This distance should equal 10 mm less than the desired final graft length.

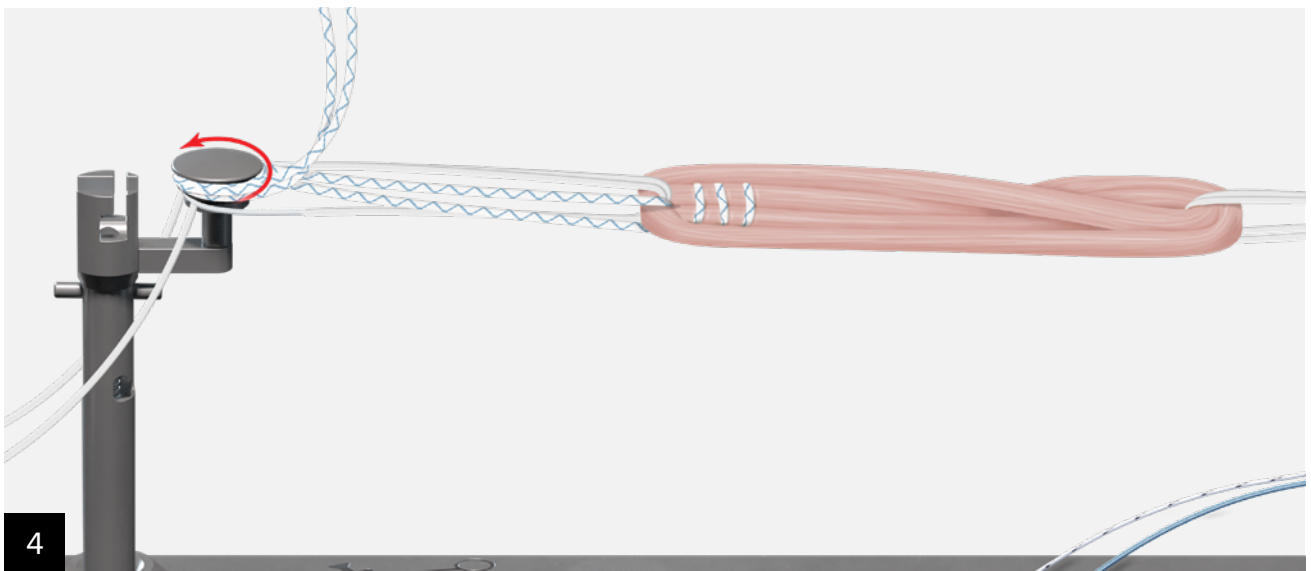
Note: A TightRope II implant is used for femoral fixation and a TightRope II ABS implant is used for tibial fixation.



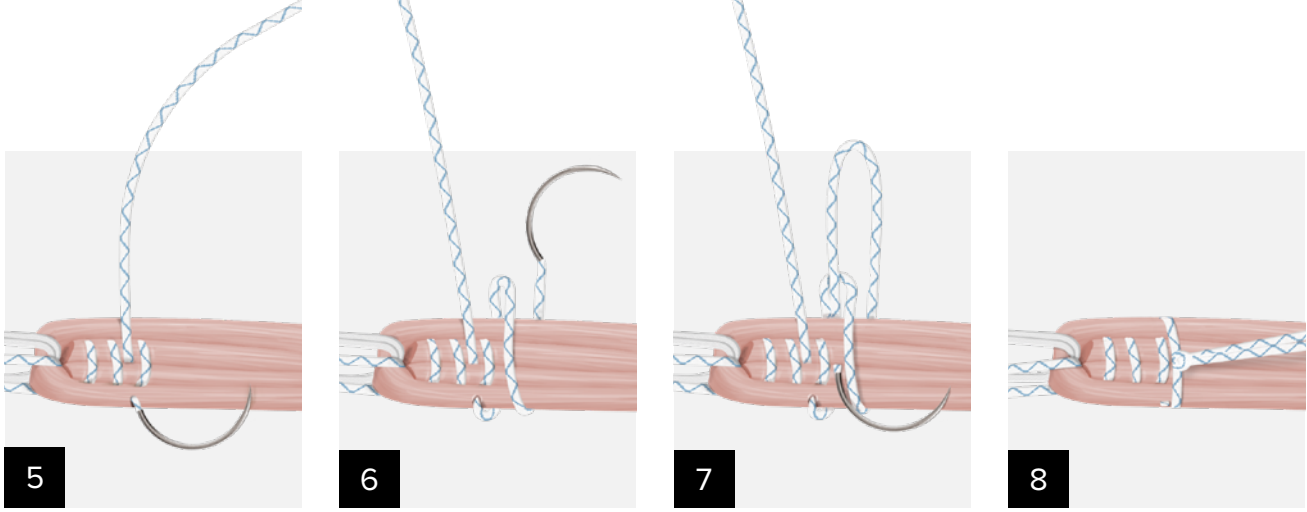
Measure the overall graft length. **Note: A length of 26 cm will yield a 4-stranded GraftLink® construct of at least 6.5 cm, which will provide at least 2 cm of graft in the femoral and tibial sockets.** Load the graft through the implants by folding it symmetrically over the loops. Stitch both graft ends together with a single 1.3 mm FiberLoop® SutureTape after passing the graft through the ACL TightRope II implants.



For each whipstitch, pass one tail over the graft loop and the other under the graft loop. This will ensure that the tails of the graft are tucked inside the loop during tensioning, which will facilitate tapering of ends and uniform thickness of the graft.



Once the graft is folded appropriately and the desired length is obtained, wrap the whipstitch sutures around the post to hold the construct in place.



5
The first stitch may now be placed. Using a “buried-knot” technique, start from the inside of the graft and place the needle through the first two graft limbs.

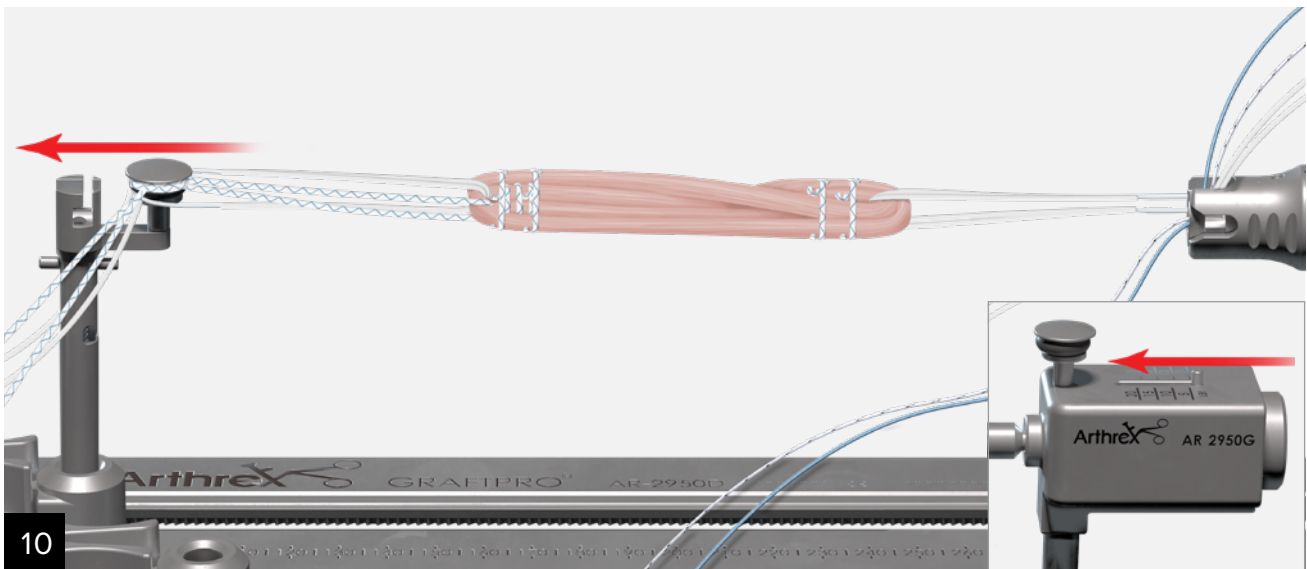
6
Wrap the SutureTape around the graft, then place the needle through the second set of graft limbs from outside-in.

7
Tension the suture and tie a knot to secure the stitch.



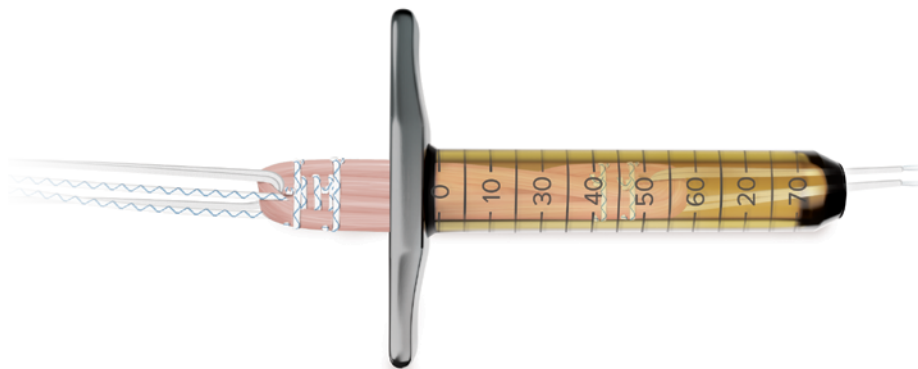
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This may be repeated on either end of the graft for a total of two stitches on each end.

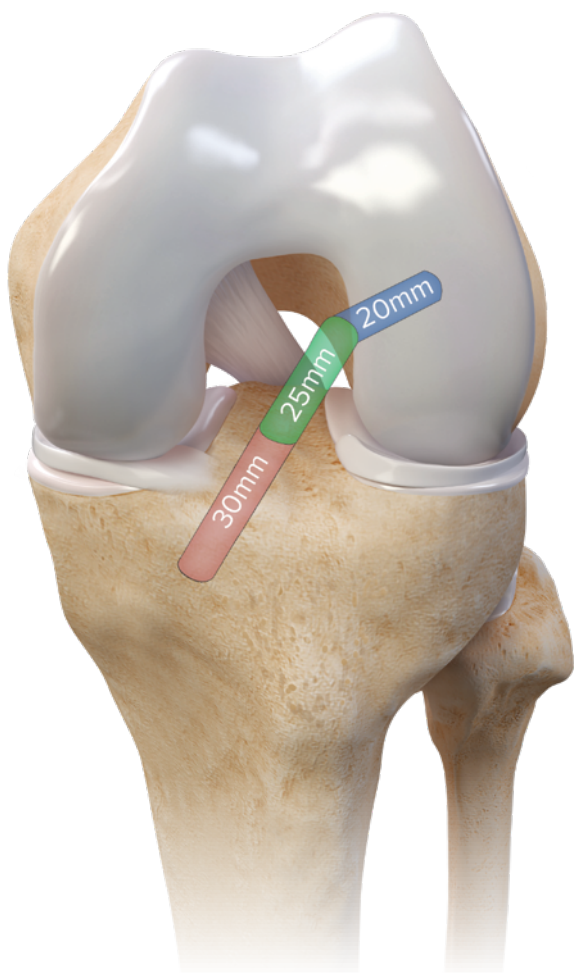


10
The GraftPro® graft prep attachments may now be used for tensioning by simply pulling on the sliding attachment until the desired tension is obtained as read on the tensiometer. The whipstitched FiberLoop® SutureTape may be retained and used as supplemental fixation.

Graft Sizing and Socket Creation



The graft tube set is ideal for approximate sizing and compressing the GraftLink® construct. These full-length translucent tubes facilitate graft compression, approximate sizing, and preparation. The unique transparent tube with an etched ruler provided with approximate measurements allows visualization of the graft while sizing the approximate diameter and length. A funneled entrance and attachable handle ease the entry of grafts into the sizer, allowing compression of up to 2 mm and the reduction of bone loss.¹⁰ Small holes in the graft tube allow hydration of the graft or injection of biologics along the entire length.



Assuming a maximum intra-articular length of 25 mm, there will be approximately 20 mm of graft in the femoral and tibial socket. Drill the femur 20 mm deep and the tibia approximately 30 mm deep to allow an extra 10 mm for tensioning.

Measure the graft length and diameter. Pass both the femoral and tibial ends of the graft into the sizing block to measure the diameter for socket drilling. Graft compression tubes may also be used for sizing and compression of the graft.

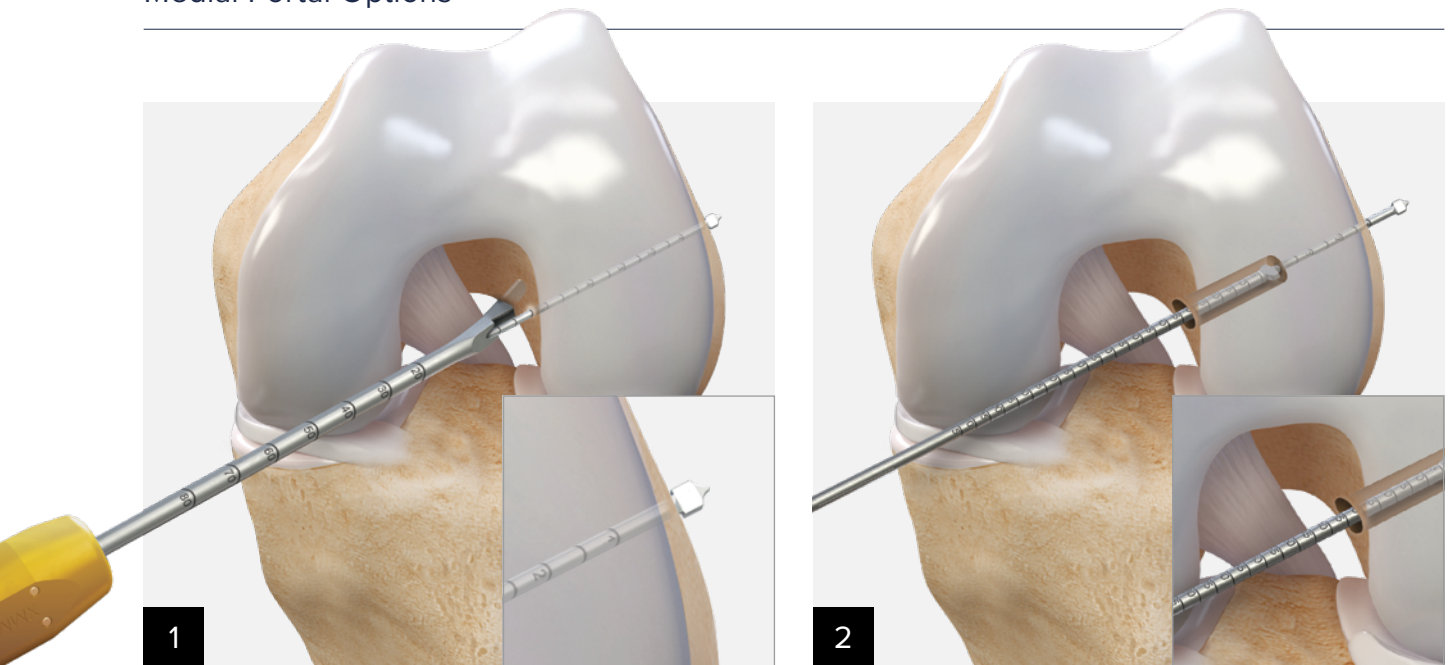
- **Socket Creation:** The length from the end of the femoral socket to the end of the tibial socket should be at least 10 mm longer than the graft to ensure that the graft can be tensioned fully (65 mm graft length).

Graft tubes (AR-1886-S)
Sizing block (AR-1886)

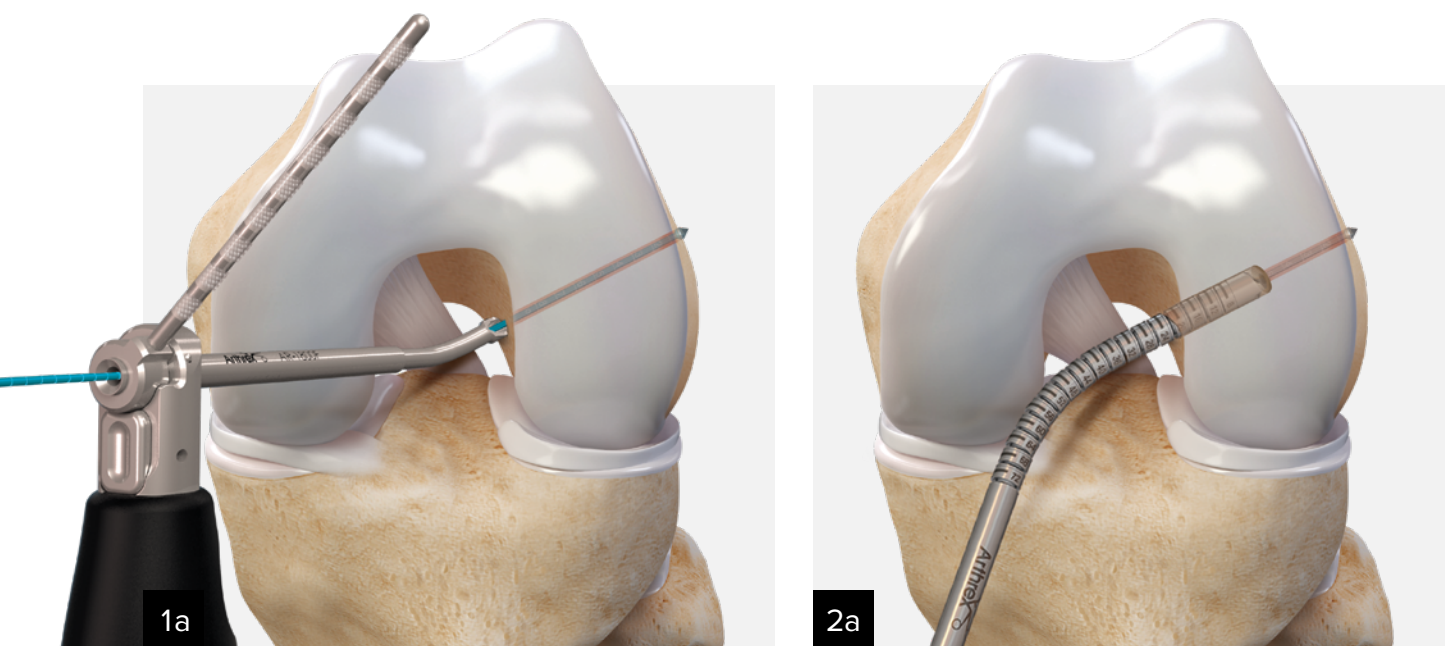
Femoral Socket Preparation

The femoral socket should be created using either a FlipCutter® III drill or through the medial portal with flexible or low-profile reamers.

Medial Portal Options

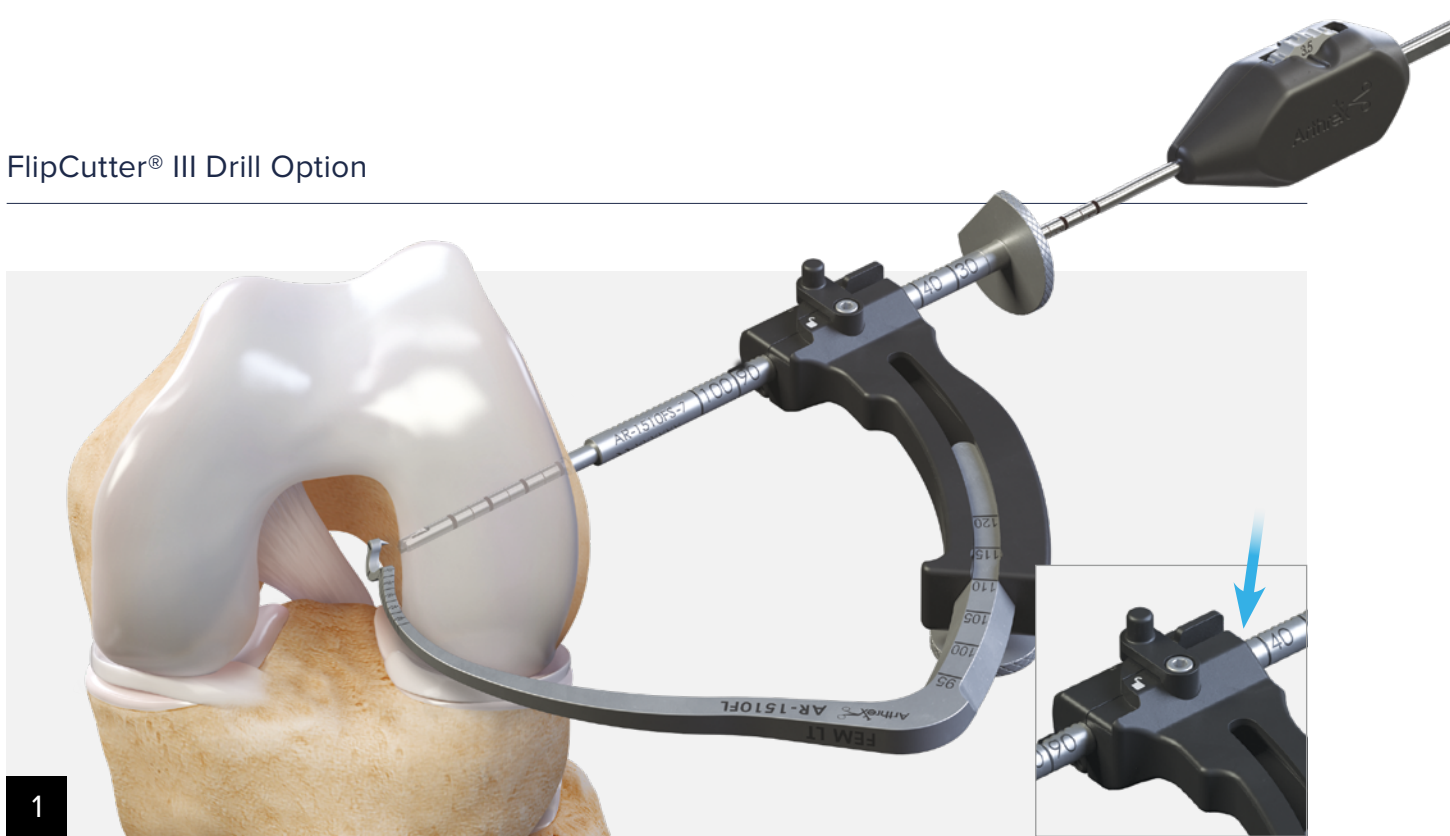


For medial portal drilling, use the TightRope® drill pin, transportal ACL guides, and low-profile drills. Note the intraosseous length from the TightRope drill pin. After socket drilling, pass a suture with the TightRope drill pin for later graft passing.

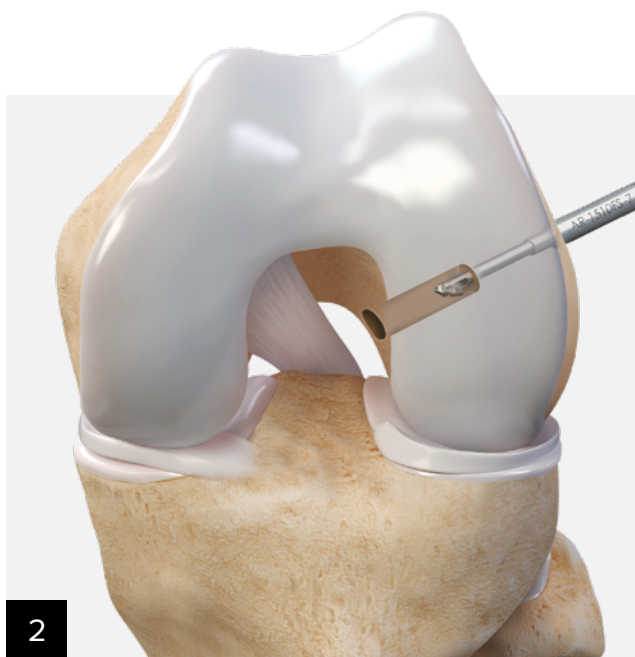


The flexible reamer system may be used for medial portal drilling. Use the flexible TightRope drill pin, flexible reamer guide, and flexible low-profile drills. Note the intraosseous length from the flexible TightRope drill pin. After socket drilling, pass a suture with the TightRope drill pin.

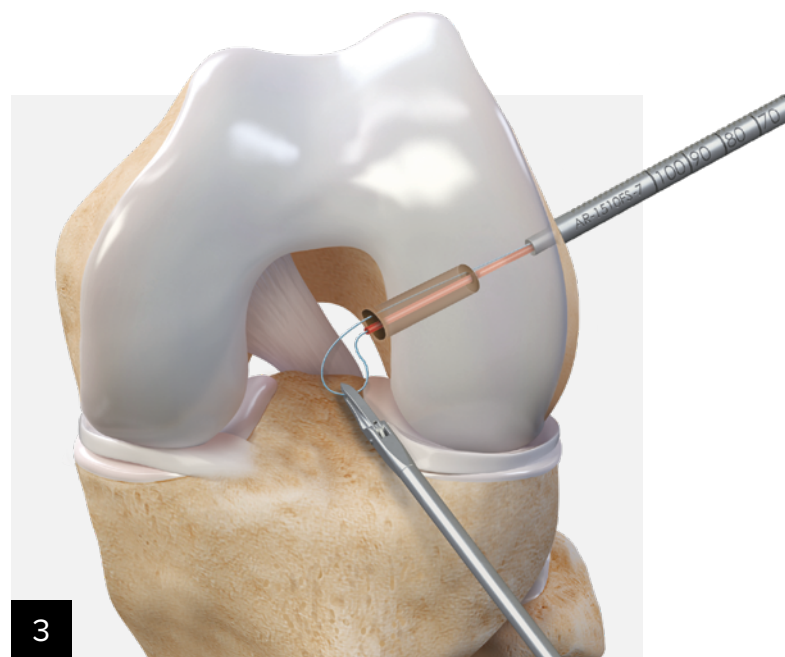
FlipCutter® III Drill Option



1 The FlipCutter III drill may also be used to create the femoral socket. Place the guide into the joint and push the drill sleeve down to the bone. Note the femoral measurement where the drill sleeve meets the guide. Drill the FlipCutter drill into the joint, remove the guide, and tap the stepped drill sleeve into the bone.

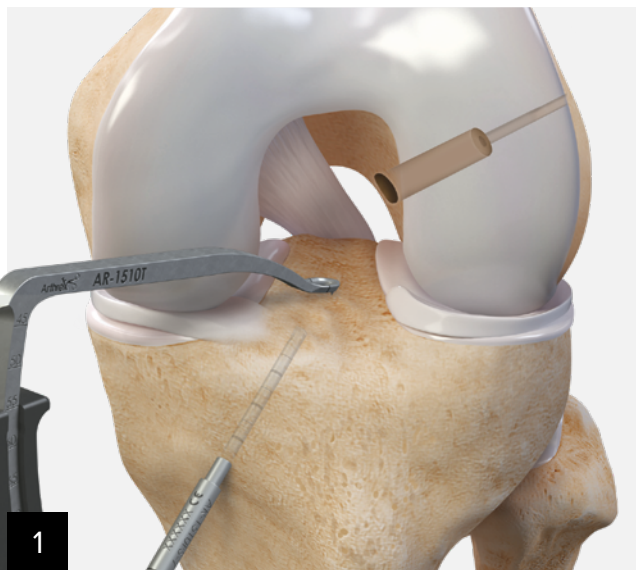


2 Flip the blade on the FlipCutter drill and ream until the desired approximate socket depth is reached as measured on the FlipCutter drill markings.

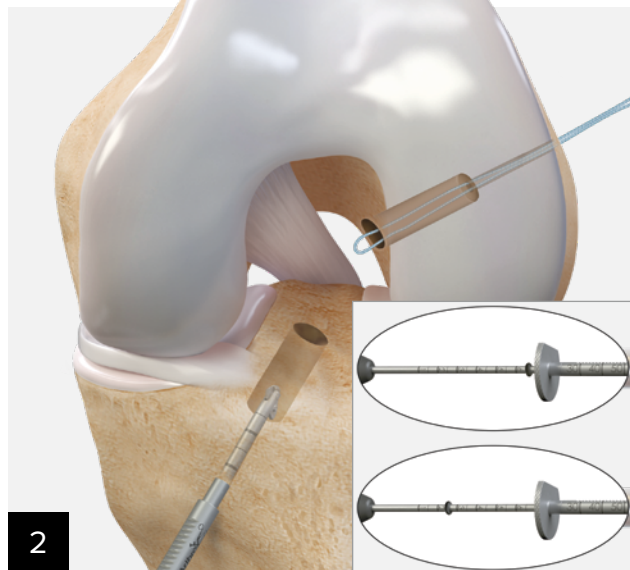


3 After “flipcutting,” flip the blade straight and remove it from the joint while keeping the drill sleeve in place. Pass a FiberStick™ suture passer through the stepped drill sleeve and dock for later graft passing.

Tibial Socket Preparation

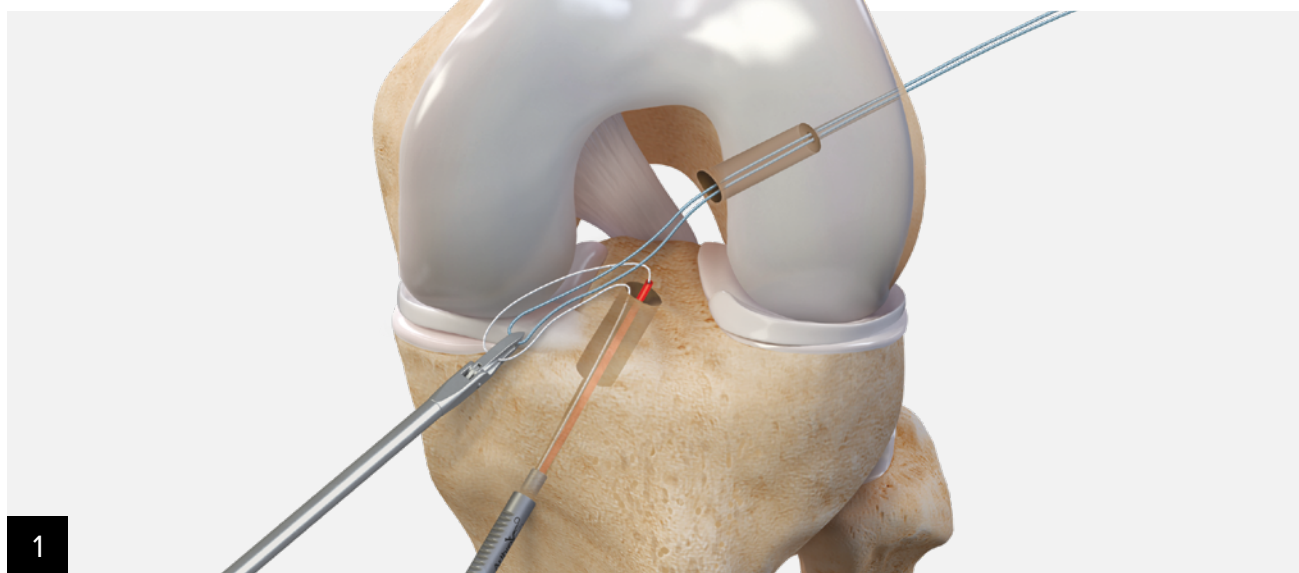


Drill the FlipCutter® III drill into the joint. Remove the marking hook and tap the stepped drill sleeve into the bone.



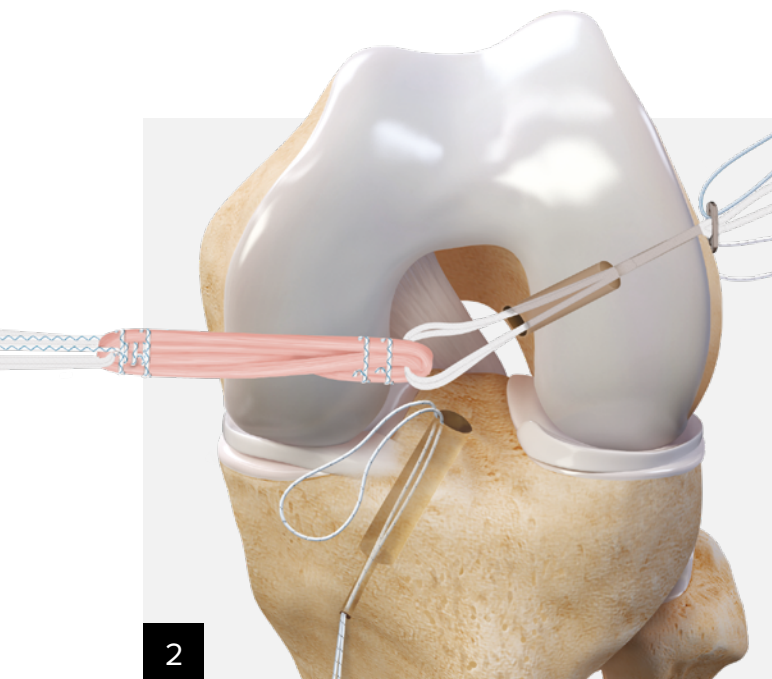
Flip the blade to the appropriate diameter for the tibial socket. Note the measurement where the drill sleeve meets the guide. Drill on forward, with traction, to cut the socket. Use the rubber grommet and 5 mm markings on the drill to measure the approximate socket depth.

Graft Passing



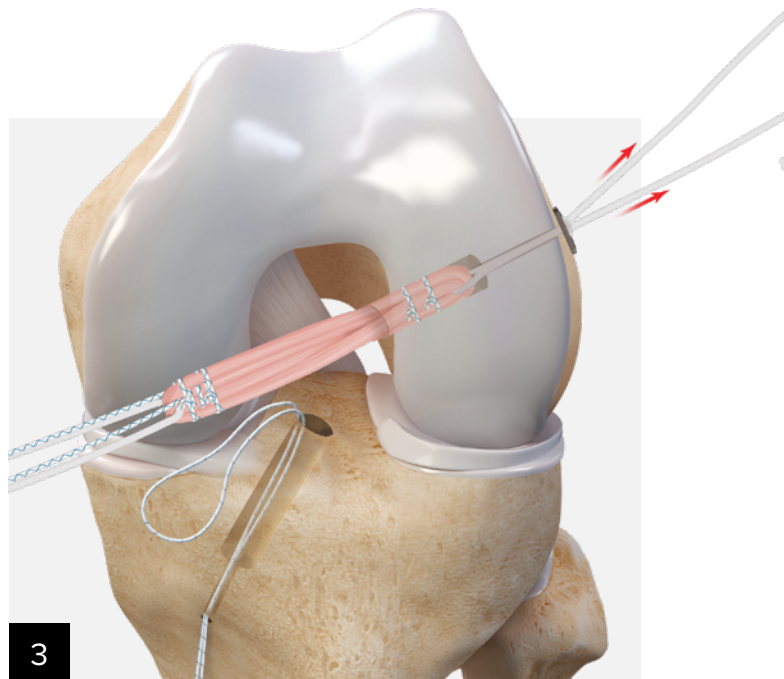
Adjust the FlipCutter tip back into the straight position by rotating the sizing wheel back to the starting position (3.5 mm) and remove from the joint. Pass a TigerStick® suture passer into the joint and retrieve the tibial TigerStick and femoral FiberStick sutures together from the medial portal with a suture retriever. Retrieving both sutures at the same time will help avoid a tissue bridge that can complicate graft passing.

Note: A PassPort Button™ cannula may also be used in the medial portal to prevent tangling.



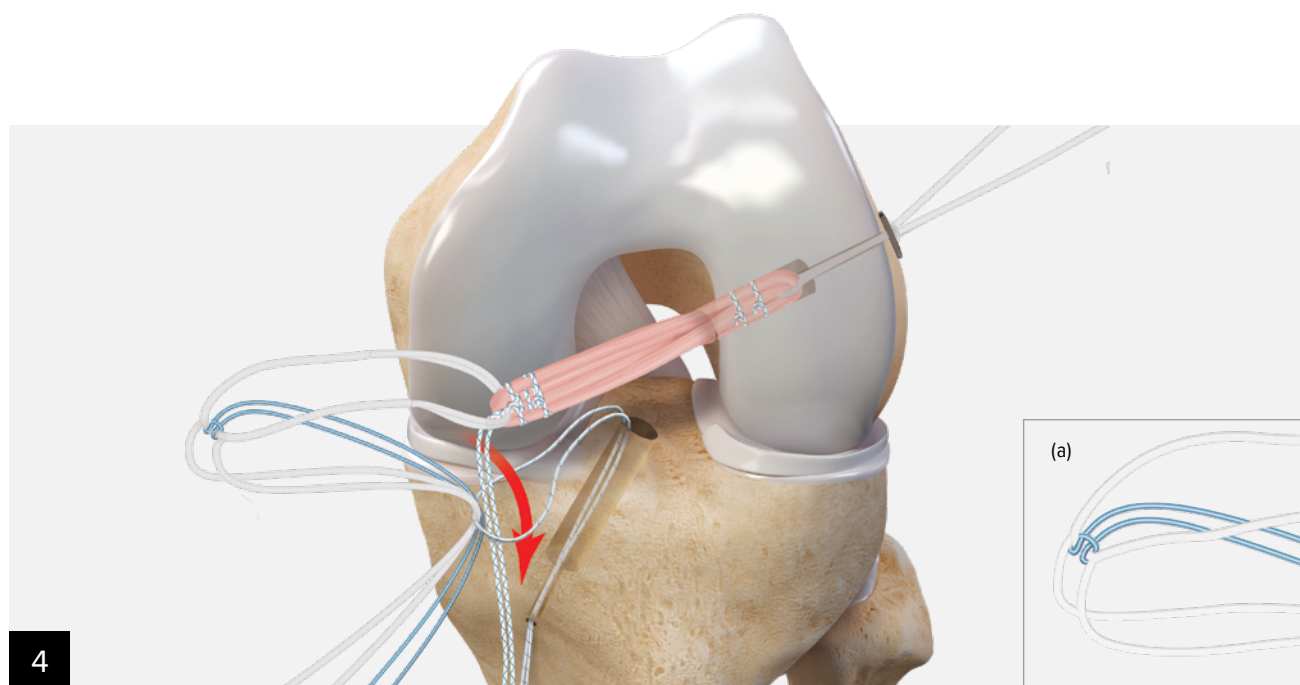
Pass the blue FiberWire® passing suture, the TigerWire® flipping suture, and the TightRope® II implant shortening strands through the femur. Remove slack from the sutures and ensure equal tension. Clamp or hold both blue and white sutures and pull them together to advance the button out of the femur. Pull back on the graft to confirm the button is seated.

Note: The femoral length may be marked on the TightRope II loop to signal when the button has exited the femur.

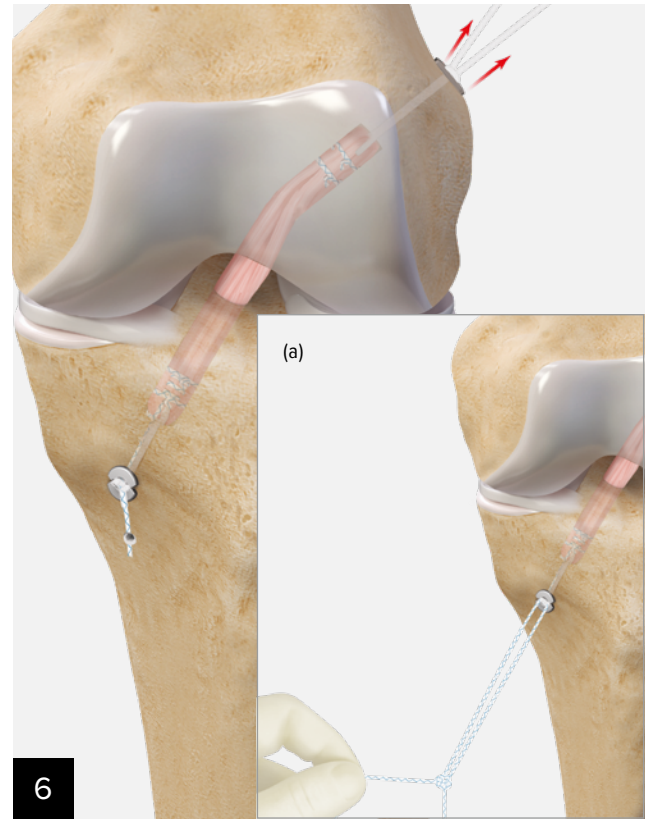
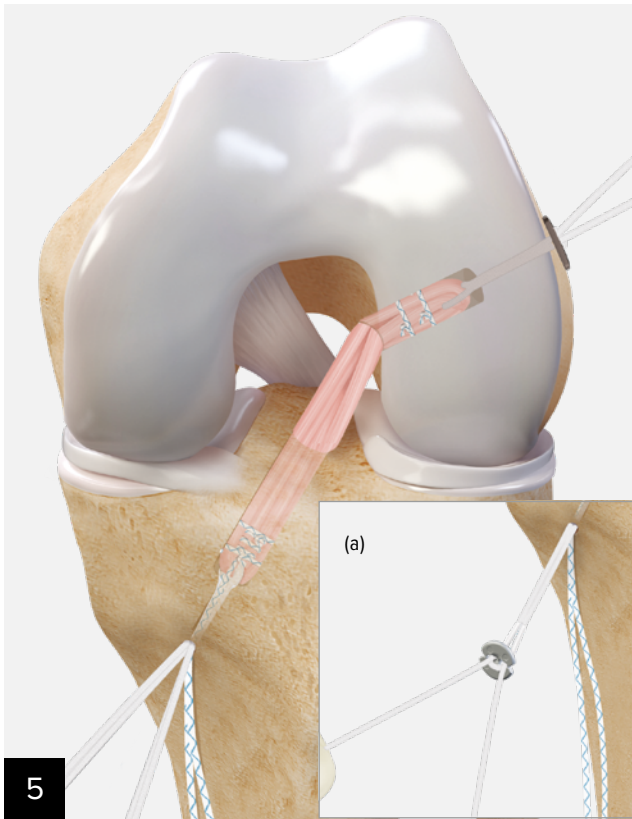


While maintaining slight tension on the graft, pull the shortening strands proximally one at a time to advance the graft. Pull on each strand in 2 cm increments.

Note: The graft can be fully seated into the femur or left partially inserted until tibial passing is complete. The latter option allows fine-tuning of graft depth in each socket.



Load the cinch suture, the integrated passing suture of the ABS implant (a), and whipstitch tails from the graft into the tibial passing suture. Pull distally on the integrated ABS passing suture to deliver both the TightRope II ABS loop and the whipstitch sutures out of the tibia distally.



Advance the graft into the tibia by pulling on the inside of the ABS loop and whipstitch sutures. Load the concave ABS button onto the loop. Pull on the white shortening strands to advance the button to bone and tension the graft (a) with the leg in extension.

Note: Ensure the button has a clear path to bone, so as to not entrap soft tissue under the button. The shortening strands are tied over the ABS button to protect the tibial TightRope® loop.

After the knee is cycled several times, the TightRope II sutures can be tensioned again with the knee in extension. The whipstitch sutures may be backed up using the ACL backup kit. Alternatively, the whipstitch sutures may be tied over the tibial TightRope II ABS button (a).

Ordering Information

Implants

Product Description	Item Number
ACL TightRope® II RT Implant, double loaded passing sutures	AR-1588RT-2J
TightRope II ABS Implant	AR-1588TN-20
TightRope II ABS Implant, open	AR-1588TN-21
ABS Button, concave, 11 mm	AR-1588TB-3
ABS Button, concave, 14 mm	AR-1588TB-4
ABS Button, concave, 20 mm	AR-1588TB-5
ACL Backup Fixation System, BioComposite	AR-1593-BC
ACL Backup Fixation System, PEEK	AR-1593-P

Instruments (FlipCutter® III Technique)

Product Description	Item Number
FlipCutter III Drill, 6 mm-12 mm	AR-1204FF
RetroConstruction™ Drill Guide Set	AR-1510S
RetroConstruction Handle, side release	AR-1510HR
Drill Guide Sleeve, stepped, 7 mm	AR-1510FS-7
Drill Guide Sleeve, stepped, 10 mm	AR-1204FDS-10
Drill Tip Guide Pin, 3.5 mm (predrill for FlipCutter drill)	AR-1250F
Footprint Femoral ACL Guide, left	AR-1510FL
Footprint Femoral ACL Guide, right	AR-1510FR
Femoral ACL, tip to tip	AR-1510F-01
Footprint Femoral ACL Guide, left, small angle	AR-1510FLS
Footprint Femoral ACL Guide, right, small angle	AR-1510FRS
Tibial ACL Marking Hook, for RetroConstruction drill guide	AR-1510T
Tibial ACL Drill Guide, pin tip	AR-1510GT
Tibial Marking Hook ACL Guide, pin tip, small angle	AR-1510GTS

Instruments (Medial Portal Technique)

Product Description	Item Number
TightRope® Drill Pin, open	AR-1595T
TightRope Drill Pin, closed	AR-1595TC

GraftPro® Graft Preparation System (AR-2950DS)

Product Description	Item Number
GraftPro Board	AR-2950D
GraftPro Posts	AR-2950AP
GraftPro Case	AR-2950DC
GraftPro GraftLink® Implant Tensioner	AR-2950GT
GraftPro GraftLink Holder	AR-2950GH
GraftPro Button Holder	AR-2950BH
GraftPro Soft-Tissue Clamp	AR-2950SC
Optional	
Cutting Board Clamp	AR-2950CBC

Accessories

Product Description	Item Number
Suture Retriever	AR-12540
Graft Sizing Block	AR-1886
Suture Cutter, for ACL TightRope® II implant	AR-4520
Graft Tube Set	AR-1886-S
Atraumatic Hamstring Harvester	AR-10300
Minimally Invasive Hamstring Harvester	AR-1297L

Suture Options

Product Description	Item Number
FiberStick™ Suture, #2 FiberWire® suture, blue, one end stiffened, 1270 mm	AR-7209
TigerStick® Suture, #2 TigerWire® suture, white / black, one end stiffened, 1270 mm	AR-7209T
SutureTape Loop, white / blue, 1.3 mm, 508 mm loop, with straight needle, 76 mm, 12 per box	AR-7534
SutureTape Loop, white / black, 1.3 mm, 508 mm loop, with straight needle, 76 mm, 12 per box	AR-7534T
SutureTape Suture, white / blue, 1.3 mm, with needle	AR-7500
#2 TigerLoop™ Suture, white / green, 508 mm, with straight needle, 76 mm needle with 7 mm loop, with TigerWire suture	AR-7234T
#0 FiberWire Suture, blue, 965 mm, 22.2 mm ½ circle, with tapered needle	AR-7250
#2 FiberWire Suture, with straight needle	AR-7246
#2 FiberWire Suture, with 2 straight needles	AR-7246-02

Products may not be available in all markets because product availability is subject to the regulatory approvals and medical practices in individual markets. Please contact your Arthrex representative if you have questions about the availability of products in your area.

References

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InternalBrace™ surgical technique is intended only to support the primary ligament reconstruction and is not intended as a replacement for the standard of care using biologic augmentation in a primary reconstruction. *InternalBrace* surgical technique is intended only for soft-tissue-to-bone fixation and is not cleared for bone-to-bone fixation.



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 and/or outcomes.

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