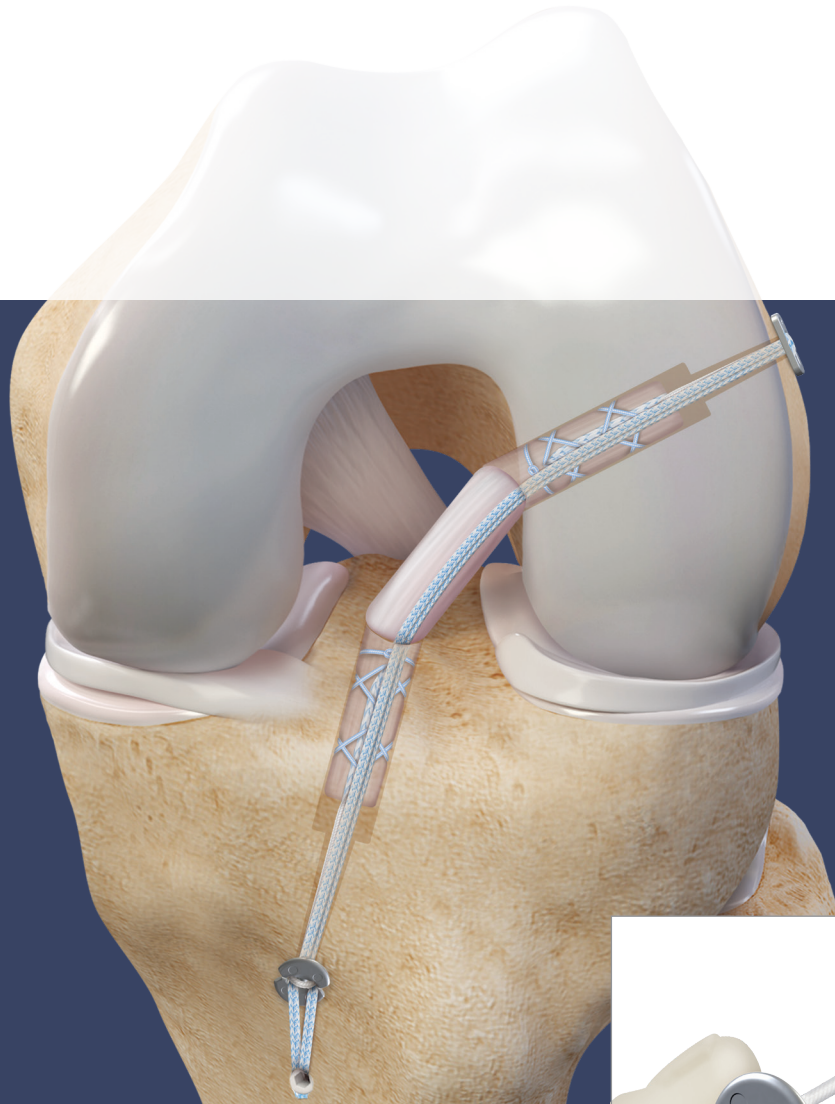


ACL TightRope® Attachable Button System (ABS)

Surgical Technique

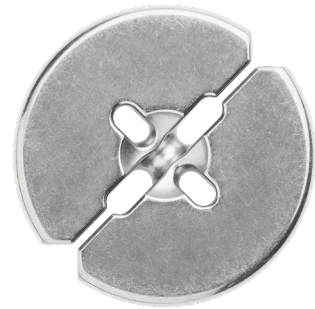


Arthrex® 

TightRope® Attachable Button System (ABS)

The TightRope attachable button system (ABS) has revolutionized tibial fixation of ACL and PCL grafts used in knee ligament surgery. TightRope ABS loops can be used on all graft types and attached to a variety of button configurations for fixation over sockets created with a FlipCutter® III drill or full tunnels with concave buttons. The new flat tape TightRope II ABS loop improves handling characteristics and is designed to reduce graft abrasion.

The two-piece TightRope II ABS implant easily passes through narrow bone tunnels and allows increased cortical fixation with the assembly of a large button over the cortical bone. Use the TightRope ABS for tibial fixation during all-inside ACL reconstruction using the QuadLink™ and GraftLink® techniques or graft fixation over tunnels created during transtibial ACL reconstruction.



- The slotted buttons can be loaded onto the TightRope implant and locked into place



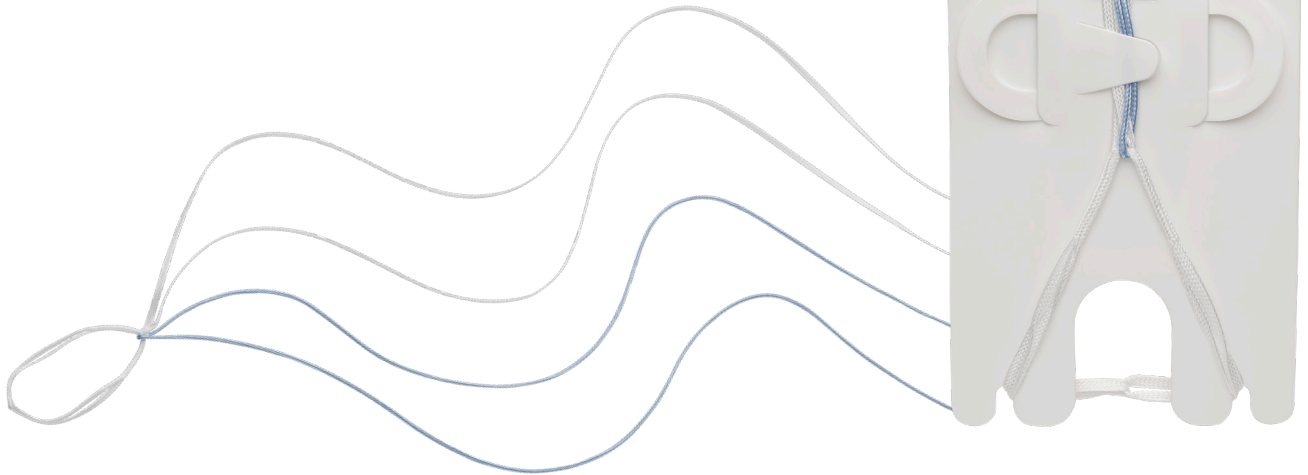
- Larger attachable button options extend the footprint, maximizing button-to-bone contact against the cortex



- Buttonless TightRope implant facilitates passing through narrow bone tunnels

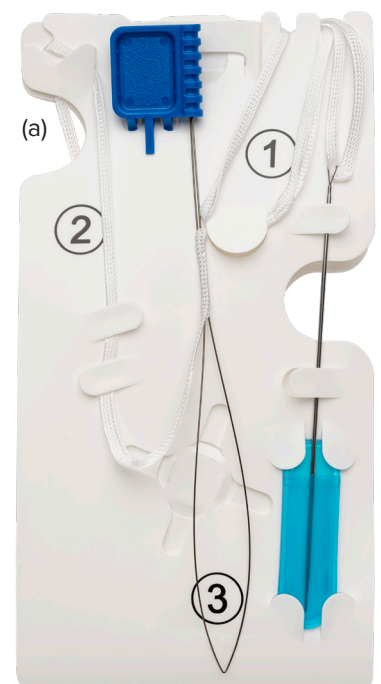
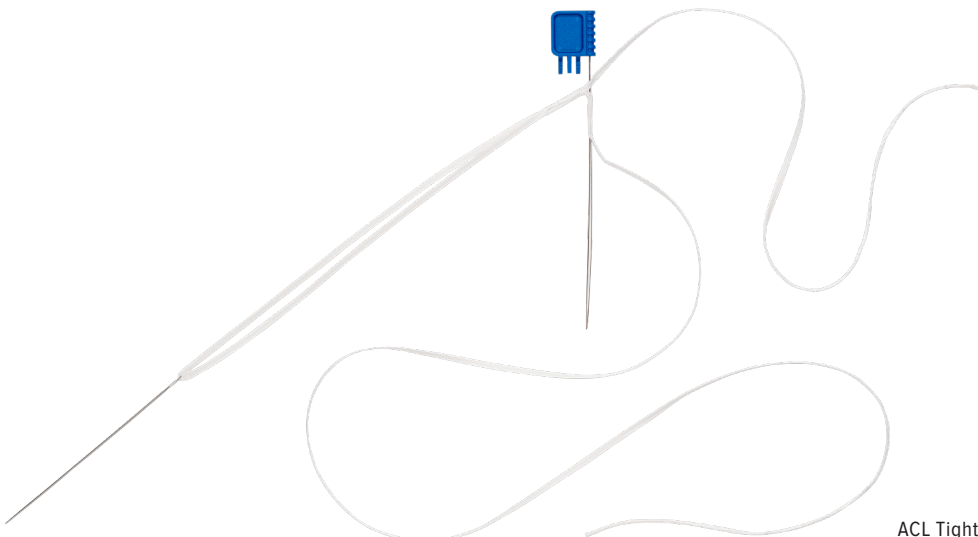
TightRope® II ABS Implant (Standard)

The standard TightRope II ABS implant was designed specifically for grafts that can be folded over the looped end of the implant. The new, improved packaging design conveniently holds the ABS implant and blue passing suture. The passing suture can be attached in between the spliced portions of the ABS implant as a luggage-tag stitch to aid in shuttling the ABS implant through the tunnel.



TightRope II ABS Implant (Open)

The open TightRope II ABS implant was designed specifically for closed-end grafts such as BTB, Achilles tendon bone blocks, or presutured QuadLink™ and GraftLink® allografts. The new, improved packaging design conveniently holds the open ABS implant. This new implant uses the same sequence to assemble the implant to the graft. The implant packaging has been reduced for ease of use and a new wire snare has been added to aid in shuttling of the open TightRope strand through the splice of the implant. **Note: Retrieve the “step two” (2) suture from the cutout at the top left of the assembly card (a). The suture will dispense smoothly from the wheel inside the card. Do not unravel or try to pass the suture clipped to the back of the assembly card.**



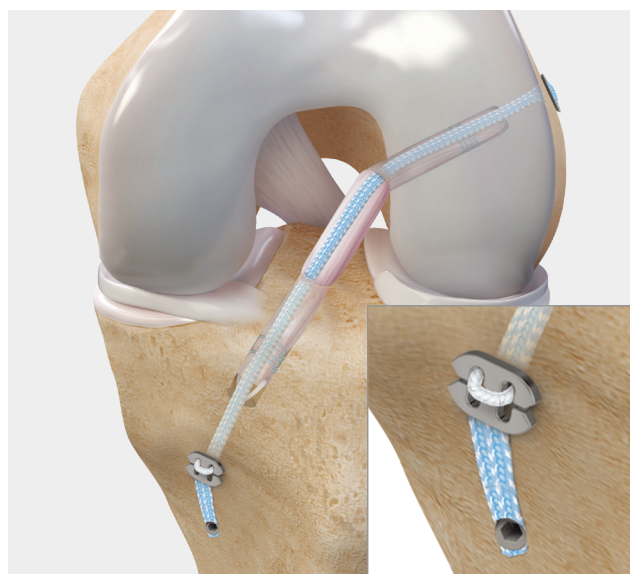
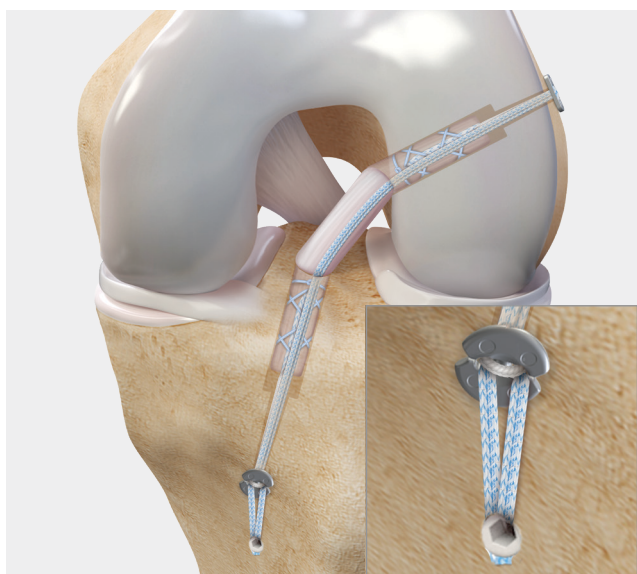
ABS Button Overview

The TightRope® ABS implant has revolutionized tibial fixation of ACL and PCL grafts. TightRope ABS loops can be used on all graft types and attached to a variety of button configurations for fixation over flipcut sockets or full tunnels with concave buttons.

The advantages of the TightRope ABS implant include:

- Strong, reliable cortical fixation superior to interference screws¹
- Maximum graft-to-bone contact improves incorporation and healing²

- The ability to retension grafts after fixation and knee cycling
- Several different button options for sockets and full tunnels
- Ability to seal off tibial tunnel to preserve blood and growth factors in tibial tunnel



Concave ABS Buttons

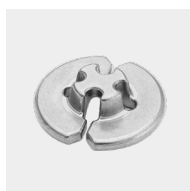
Ideal for both sockets (11 mm button) and full tunnel applications (14 mm and 20 mm buttons). The centering feature of these buttons maintains position over the tunnel and provides a better seal at the cortex than standard flat buttons. The concave surface countersinks sutures and knots. The 14 mm and 20 mm buttons have slots for the TightRope implant loop along with two holes for additional sutures.

Flat ABS Buttons

Can be used over tibial sockets created with a FlipCutter® III drill, the ABS loops pass easily through small-diameter tunnels and allow attachment of ABS buttons against the tibial cortex. ABS buttons are available in multiple sizes and shapes and provide strong, reliable cortical fixation.



Concave ABS Button, 11 mm w/ 4 mm collar (AR-1588TB-3)



Concave ABS Button, 14 mm w/ 7 mm collar (AR-1588TB-4)



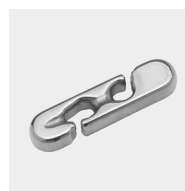
Concave ABS Button, 20 mm w/ 9 mm collar (AR-1588TB-5)



TightRope ABS Button, 8 mm × 12 mm (AR-1588TB)



Round TightRope ABS Button, 14 mm (AR-1588TB-1)



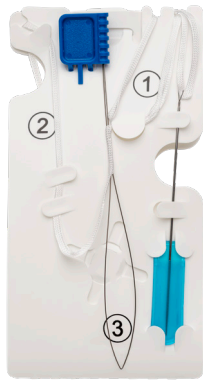
Oblong TightRope ABS Button, 3.4 mm × 13 mm (AR-1588TB-2)

Graft Options

TightRope® ABS implant fixation can be used in conjunction with any graft type. The TightRope II ABS loop allows fixation of grafts that can be passed around a closed loop (hamstrings). The open TightRope II ABS loop can be assembled around closed-end grafts such as BTB and Achilles bone blocks or allograft QuadLink™ and GraftLink® constructs.



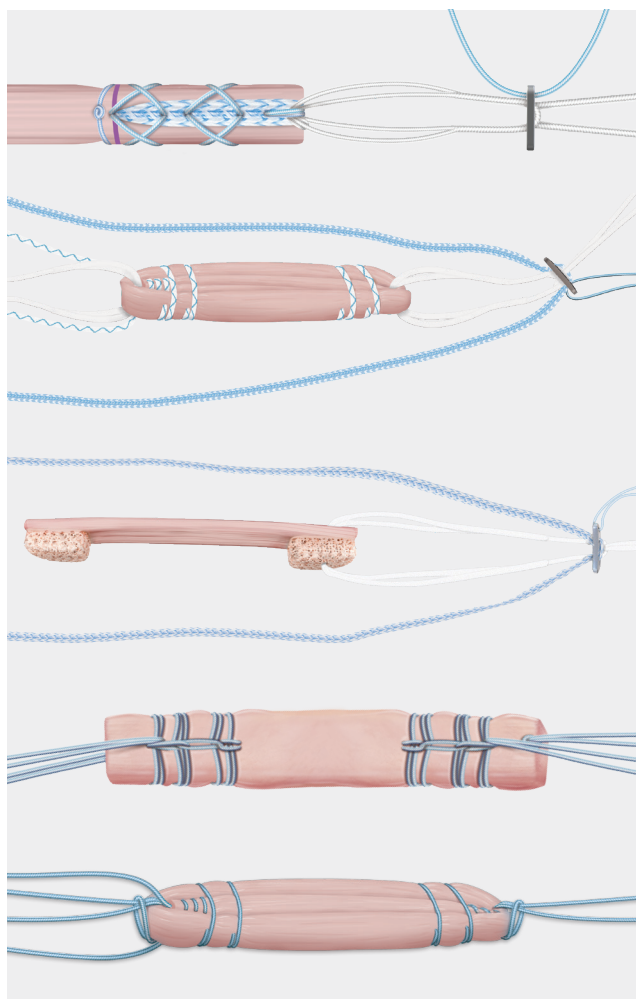
■ TightRope II ABS Implant



■ Open TightRope II ABS Implant

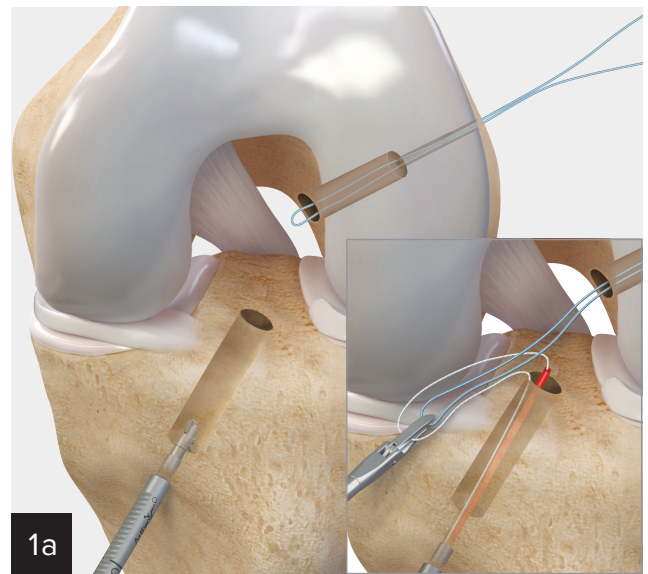
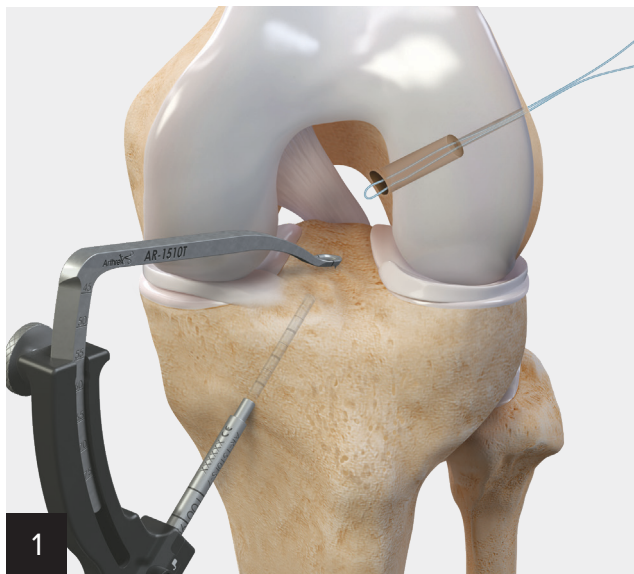


■ FiberTag® TightRope ABS Implant

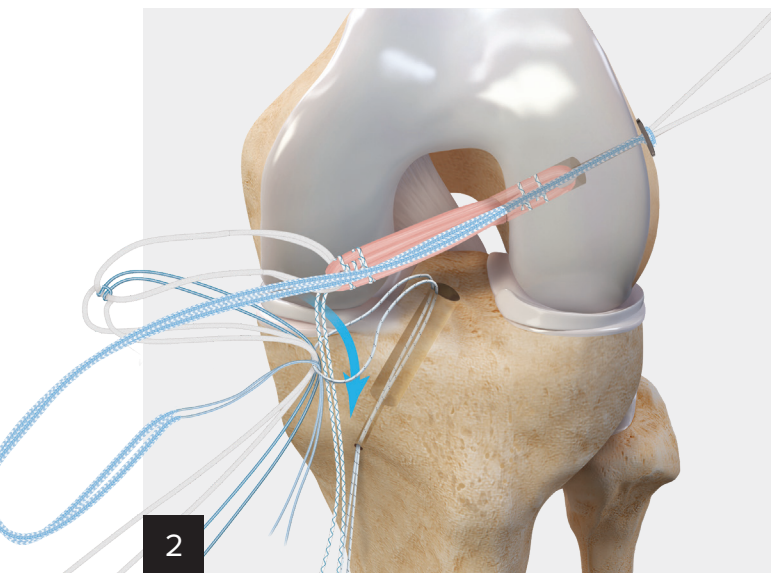


- QuadLink quadriceps tendon autograft with FiberTag TightRope implants
- GraftLink hamstring tendon autograft with TightRope II RT implant and FiberTape® suture for the *InternalBrace*™ technique and ABS implant
- Patellar tendon autograft with TightRope II BTB implant and FiberTape suture for the *InternalBrace* technique
- TightRope II BTB and open ABS implants can be assembled onto presutured QuadLink allografts
- TightRope II BTB and open ABS implants can be assembled onto presutured GraftLink allografts

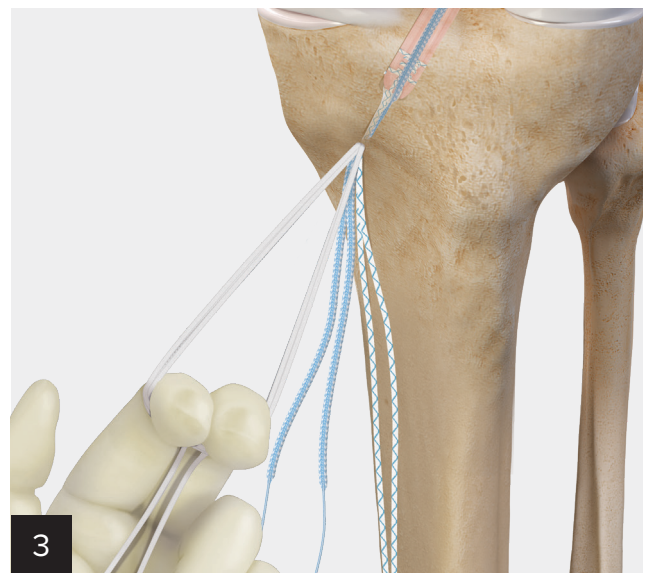
Technique: Fixation Over Tibial Sockets Using the *Internal/Brace*™ Technique



A tibial socket can be prepared with the FlipCutter® III drill and the side-release RetroConstruction™ guide. FlipCutter III drills create socket diameters from 6 mm to 12 mm while only leaving a small 3.5 mm perforation through the cortex. Use a FiberStick™ or FiberSnare® suture to shuttle the graft retrograde into the socket (**1a**).

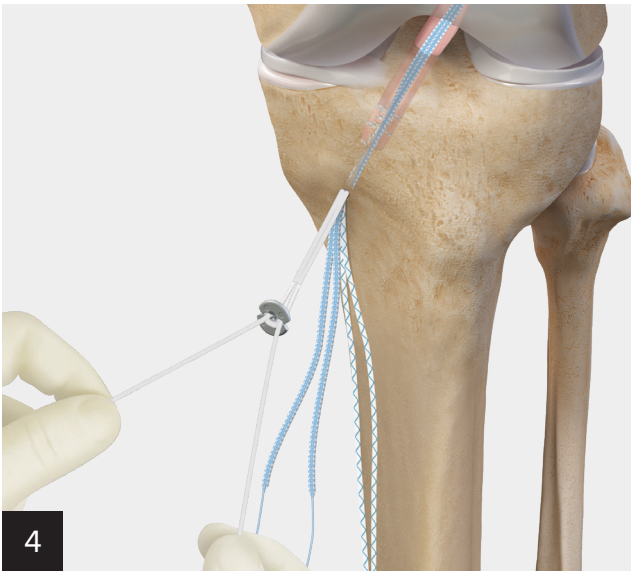


Pass the TightRope® II ABS loop through the tibial socket by attaching a passing suture to the spliced area.
Note: Pass any backup sutures attached to the graft.

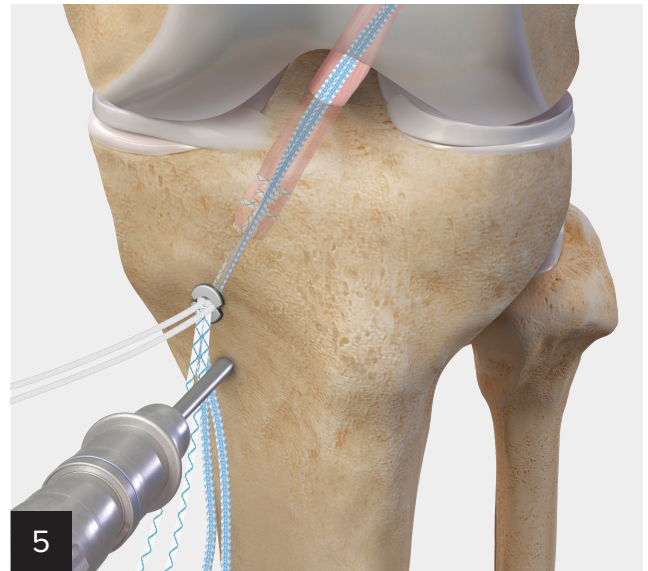


Once the ABS loop is passed, remove the passing suture and pull on the inside of the loop and backup sutures to fully insert the graft into the tibial socket.

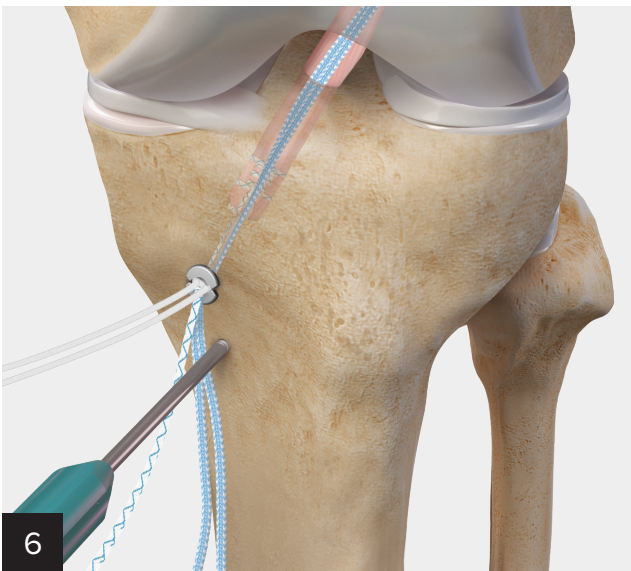
The *Internal/Brace* surgical technique is intended only to augment the primary repair/reconstruction by expanding the area of tissue approximation during the healing period and is not intended as a replacement for the native ligament. The *Internal/Brace* technique is for use during soft tissue-to-bone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



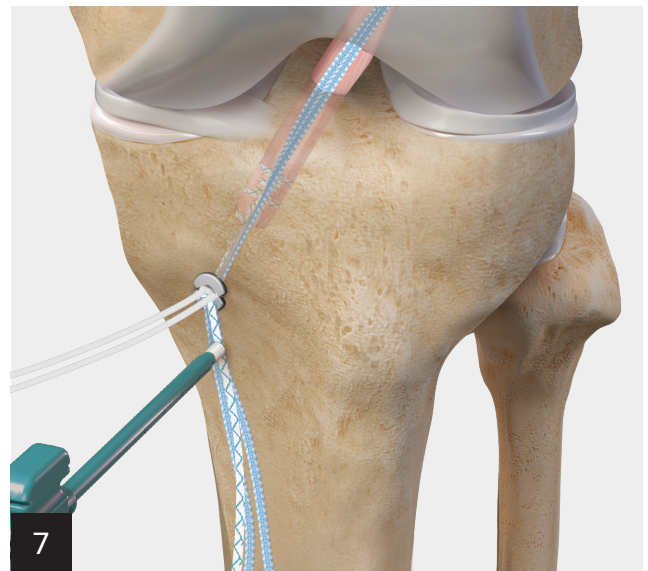
4 Load the 11 mm concave ABS button onto the proximal portion of the loop by passing each side through its respective slot on the button. Pull on the tensioning strands to advance the button toward the bone. Load the FiberTape® and backup sutures into the slots before the button enters the skin.



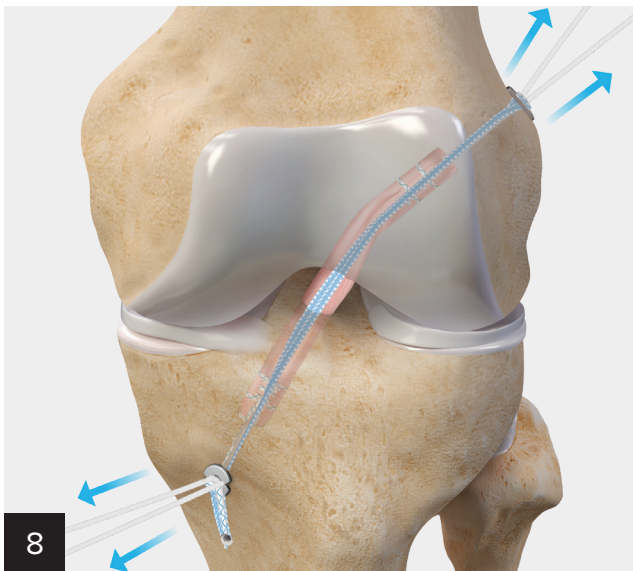
5 Using the spade-tip drill from the ACL backup kit, drill into the tibia to the depth of the drill collar. This represents 20 mm.



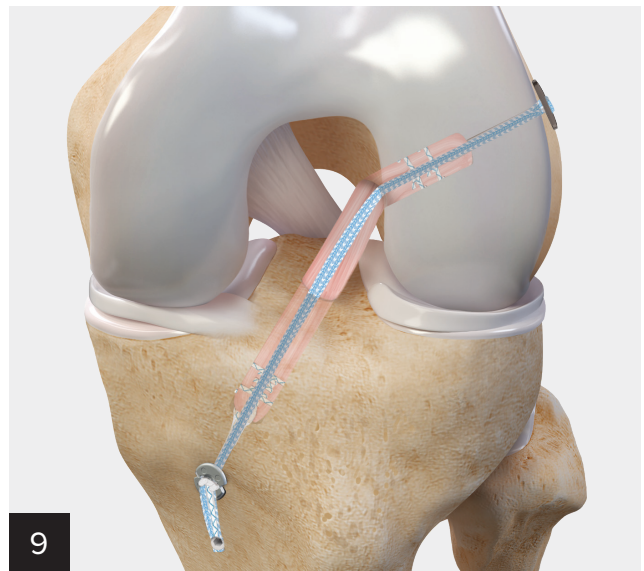
6 Use the 5.2 mm tap in the drilled hole and tap the socket.



7 In full extension, pass the FiberTape and backup sutures through the SwiveLock® anchor. Insert the anchor into the drill hole until the eyelet is fully seated. Hold the thumb pad steady and rotate the driver handle clockwise until the anchor body is flush with the bone.

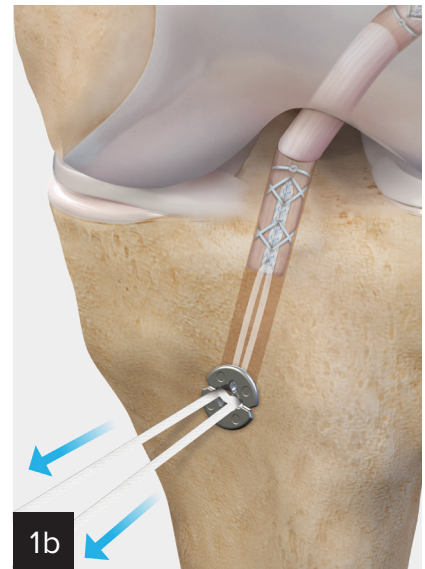
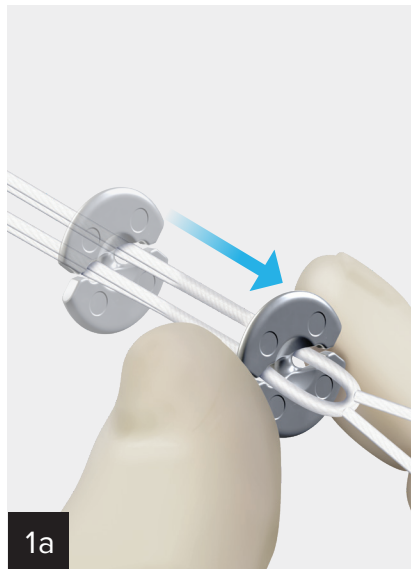


8
Cut the FiberTape® suture flush. The knee can be cycled several times and the TightRope® II RT and ABS implants can be retensioned.



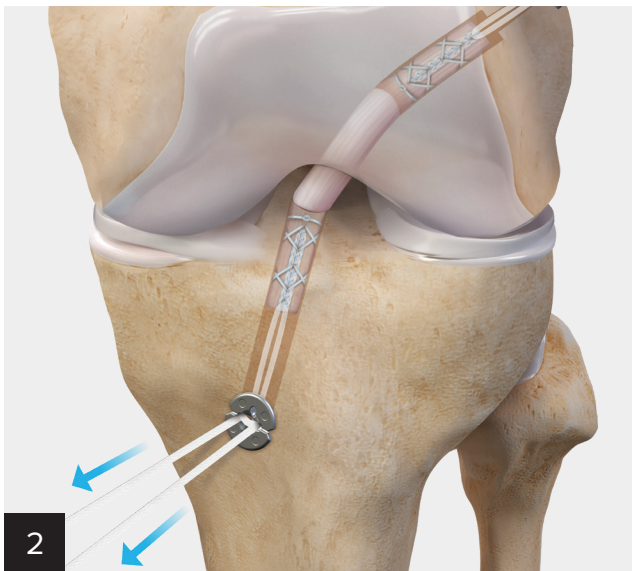
9
Final fixation: The tensioning sutures of the tibial TightRope II ABS implant can be tied over the ABS button for additional fixation.

Technique: Fixation Over Full Tunnels

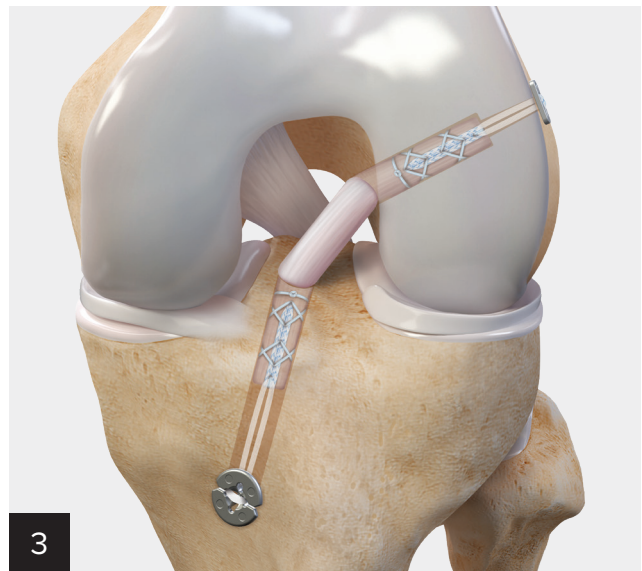


After passing the graft transtibially, attach the TightRope ABS button to the proximal ABS loop by inserting each side into its respective slot and pulling the button down to the spliced area where it will be locked onto the loop **(1a)**. If backup sutures will be used, place them through the additional holes in the button.

Pull the TightRope ABS implant tensioning strands to advance the button to bone. Ensure the collar of the button enters the tunnel and the button is lying on the cortex **(1b)**.



Final graft tension may now be set by pulling on the tensioning strands of the TightRope® implant. Cycle the knee and retension the implant as desired. Cut the tensioning strands flush. Alternatively, the tensioning sutures of the tibial TightRope II ABS implant can be tied over the ABS button for additional fixation.



Final fixation.

Ordering Information

TightRope II ABS Loops

Product Description	Item Number
TightRope II ABS Implant, standard	AR-1588TN-20
TightRope II ABS Implant, open	AR-1588TN-21
ACL FiberTag® TightRope ABS Implant	AR-1588TNT

Concave ABS Buttons

Product Description	Item Number
Concave ABS Button, 11 mm w/ 4 mm collar	AR-1588TB-3
Concave ABS Button, 14 mm w/ 7 mm collar	AR-1588TB-4
Concave ABS Button, 20 mm w/ 9 mm collar	AR-1588TB-5

Additional ABS Buttons

Product Description	Item Number
TightRope ABS Button, 8 mm × 12 mm	AR-1588TB
TightRope ABS Button, round, 14 mm	AR-1588TB-1
TightRope ABS Button, oblong, 3.4 mm × 13 mm	AR-1588TB-2

QuadLink™ Implant Kits With Concave ABS Button

Product Description	Item Number
Each QuadLink Kit includes: QuadPro® Tendon Harvester, FiberTag® TightRope implant, FiberTag TightRope ABS implant, 11 mm round concave ABS button, FlipCutter® III drill, PassPort Button™ Cannula, FiberStick™ and TigerStick® sutures, and FiberWire® and TigerWire® sutures	
QuadLink Implant System, 8 mm	AR-1288QIS-80
QuadLink Implant System, 9 mm	AR-1288QIS-90
QuadLink Implant System, 10 mm	AR-1288QIS-100
QuadLink Implant System, 11 mm	AR-1288QIS-110

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

1. Smith PA, DeBerardino TM. Tibial fixation properties of a continuous-loop ACL hamstring graft construct with suspensory fixation in porcine bone. *J Knee Surg.* 2015;28(6):506-512. doi:10.1055/s-0034-1394167
2. Uchida R, Nakamura N, Suzuki T, et al. Excellent bone plug–socket integration at 8 weeks after anterior cruciate ligament reconstruction using an adjustable-length loop cortical fixation device. *JISAKOS.* 2019;4(1):9-14.



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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