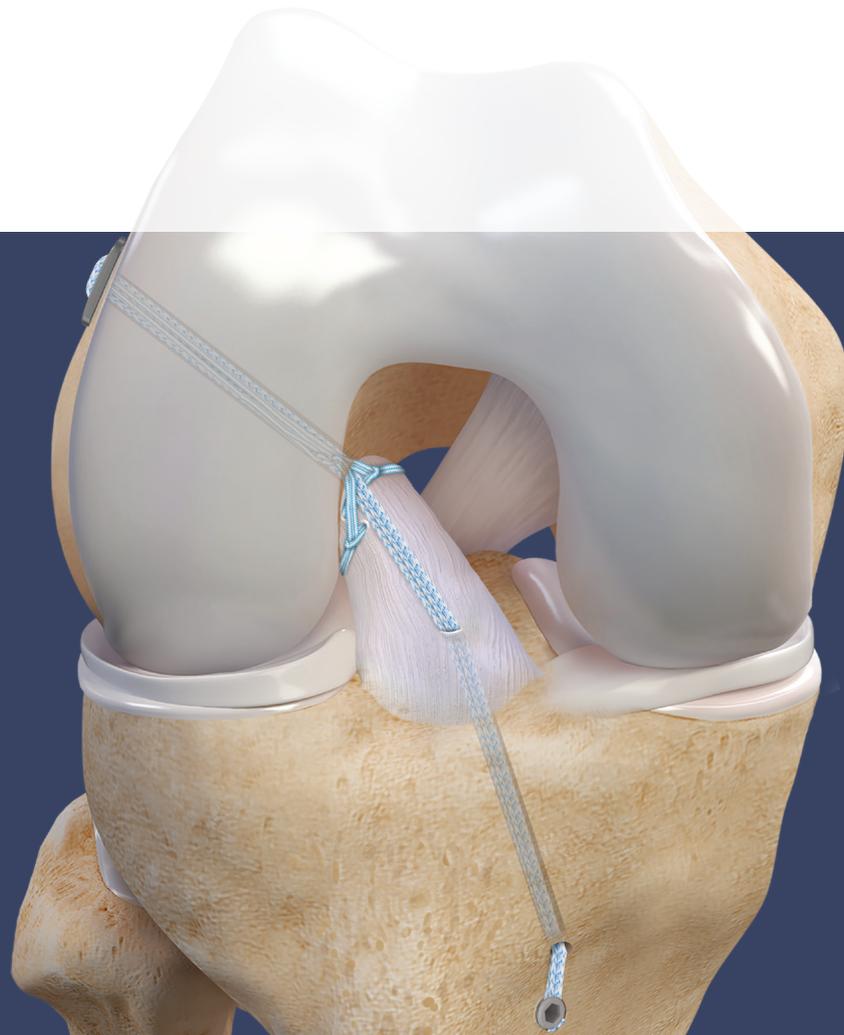


ACL Preservation With the ACL Repair TightRope[®] Implant

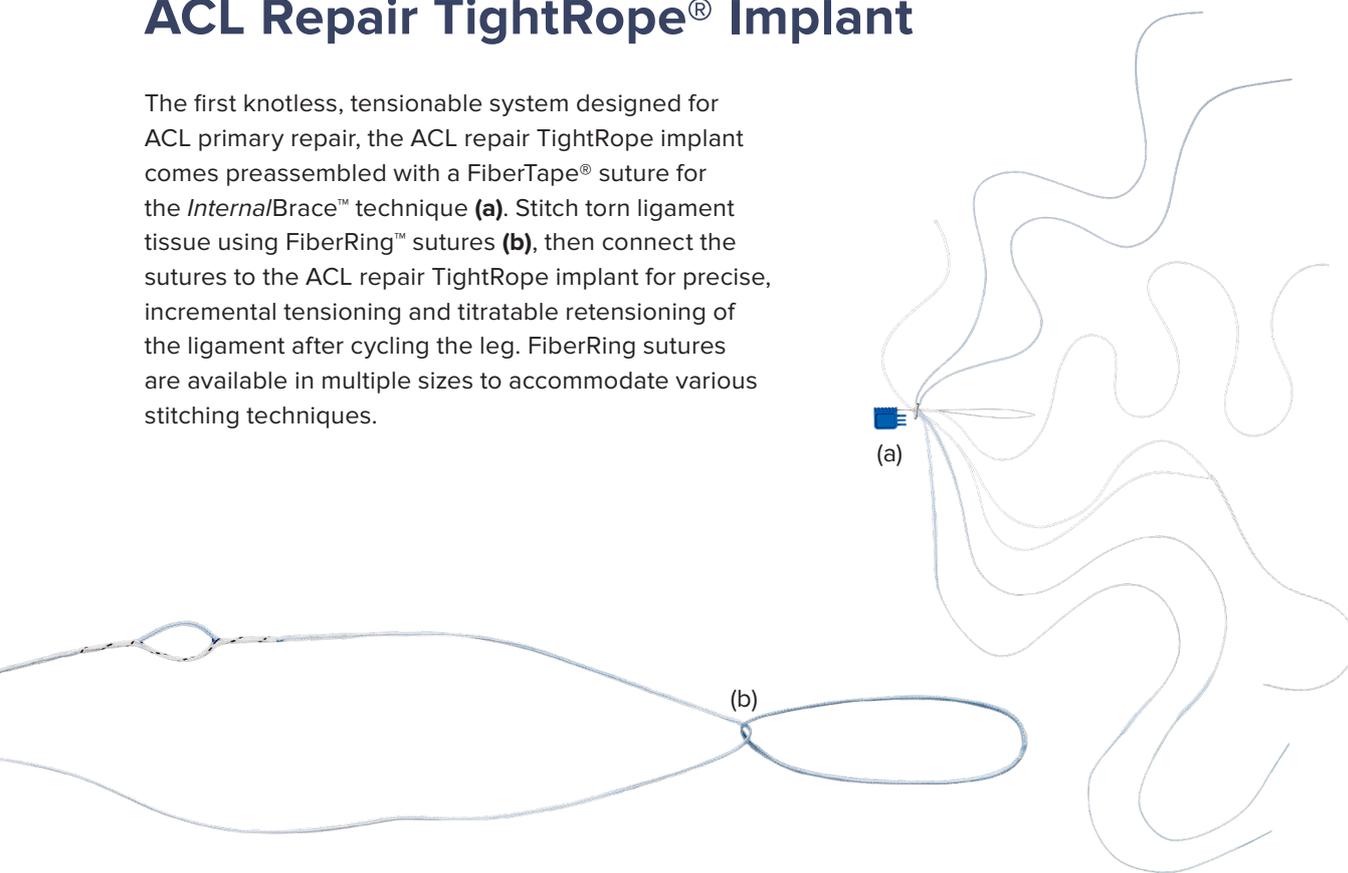
Surgical Technique



Arthrex[®] 

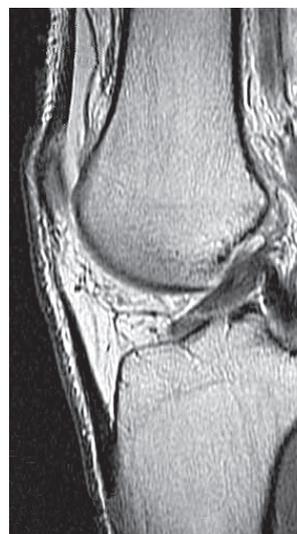
ACL Repair TightRope® Implant

The first knotless, tensionable system designed for ACL primary repair, the ACL repair TightRope implant comes preassembled with a FiberTape® suture for the *InternalBrace*™ technique (a). Stitch torn ligament tissue using FiberRing™ sutures (b), then connect the sutures to the ACL repair TightRope implant for precise, incremental tensioning and titratable retensioning of the ligament after cycling the leg. FiberRing sutures are available in multiple sizes to accommodate various stitching techniques.



Patient Selection

When selecting a patient who may benefit from primary ACL repair, it is critical to appropriately evaluate two variables: the acuteness of the injury and the tear pattern. A higher percentage of successful outcomes with primary ACL repair has historically been seen in patients with acute injuries that were addressed within the first four weeks post injury and in those with proximal tear patterns (Figures 1 and 2).^{1,2} Other variables, such as age, activity level, tissue quality, and injury mechanism, also need to be considered in the surgical decision-making process when choosing between primary ACL repair and ACL reconstruction. Based on several early outcome studies in younger patients, it appears that ACL repair should be used cautiously in this cohort.



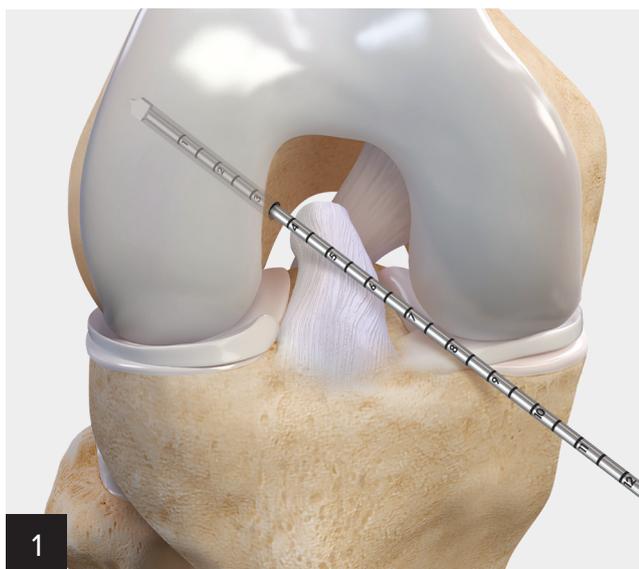
■ **Figure 1:** Sagittal T1 MRI showing proximal ACL tear



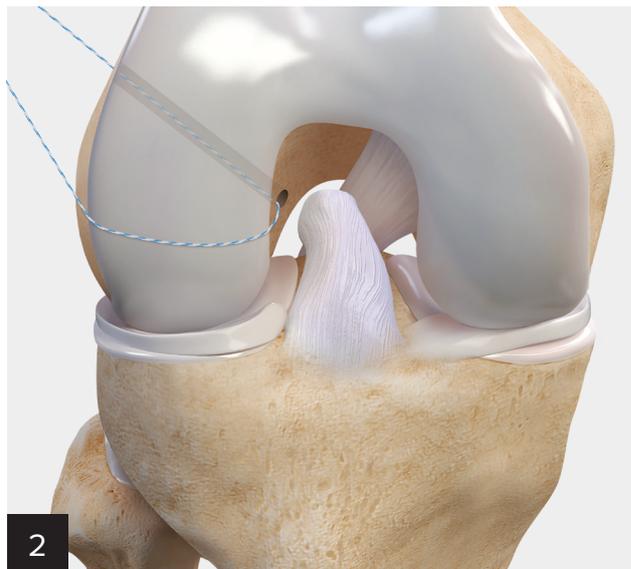
■ **Figure 2:** Coronal PD MRI showing proximal ACL tear; note fibers do not contact the femoral wall

The *InternalBrace* 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.

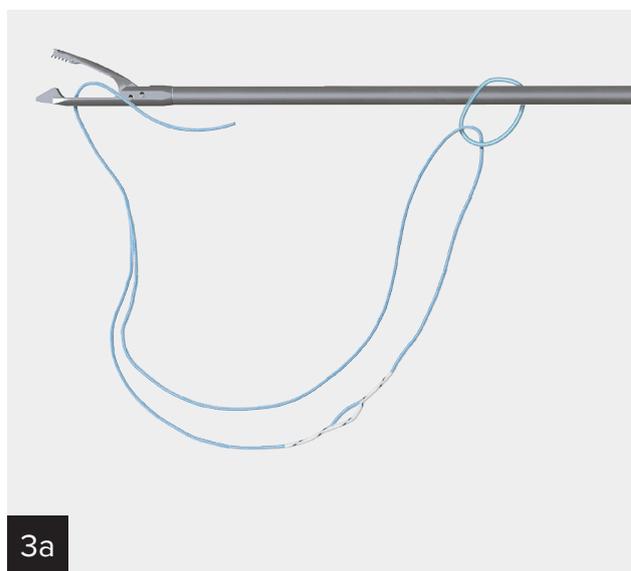
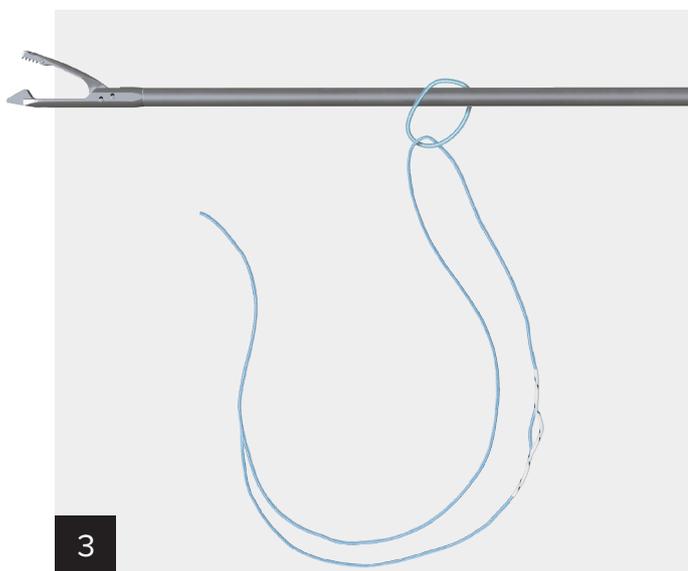
Surgical Technique



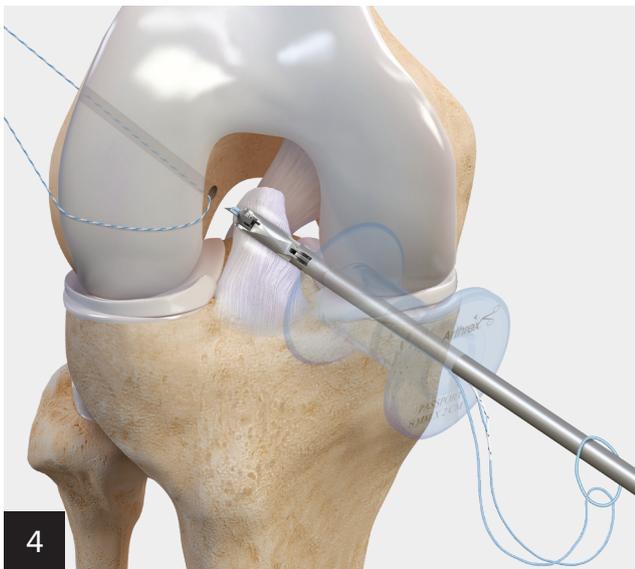
Use the spade tip drill pin for the ACL TightRope® implant to drill a tunnel through the femur. Place it anatomically in the center of the femoral ACL footprint.



Using the eyelet in the ACL TightRope drill pin, pass a SutureTape FiberLink™ suture through the femur and snap for later use.



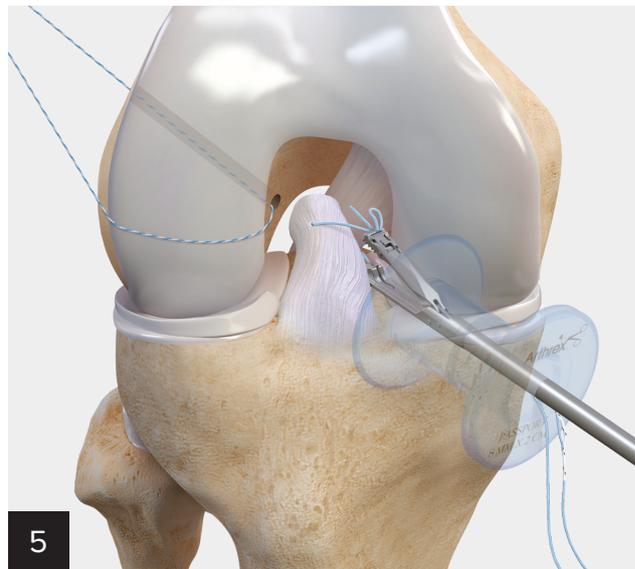
Select the appropriate size FiberRing™ suture and pass the small ring portion of the FiberRing suture over the tip of a FastPass Scorpion™ suture passer (**3**). Load the single end of the FiberRing shuttling suture into the bottom jaw of the FastPass Scorpion suture passer (**3a**).



4

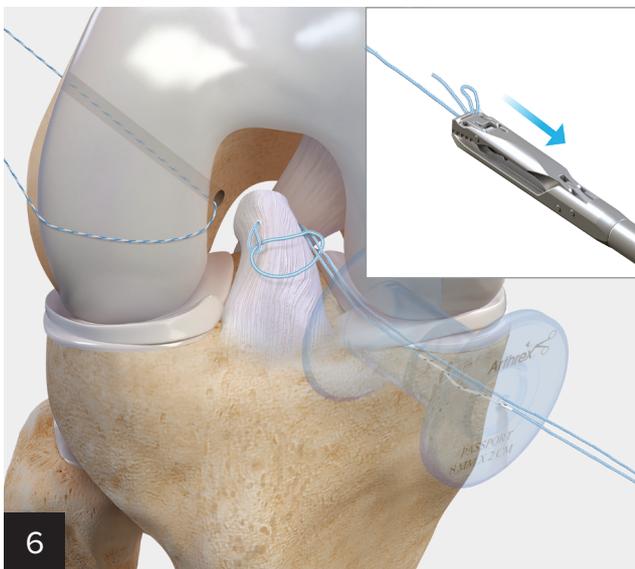
Using the FastPass Scorpion™ suture passer, pass the FiberRing™ suture through the intact portion of the ACL remnant.

Use the PassPort Button™ cannula for suture management in the working portal to optimize visibility and maneuverability inside and outside the joint while aiding in suture management.



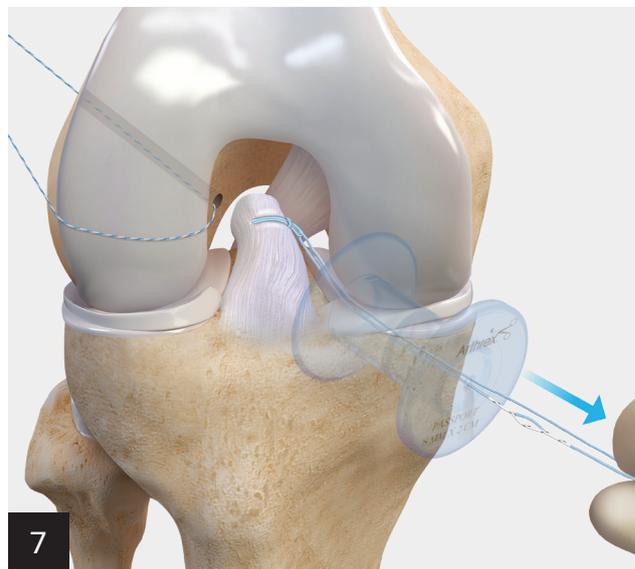
5

Visually confirm the FiberRing suture has been captured in the top jaw of the FastPass Scorpion suture passer and gently remove the instrument.



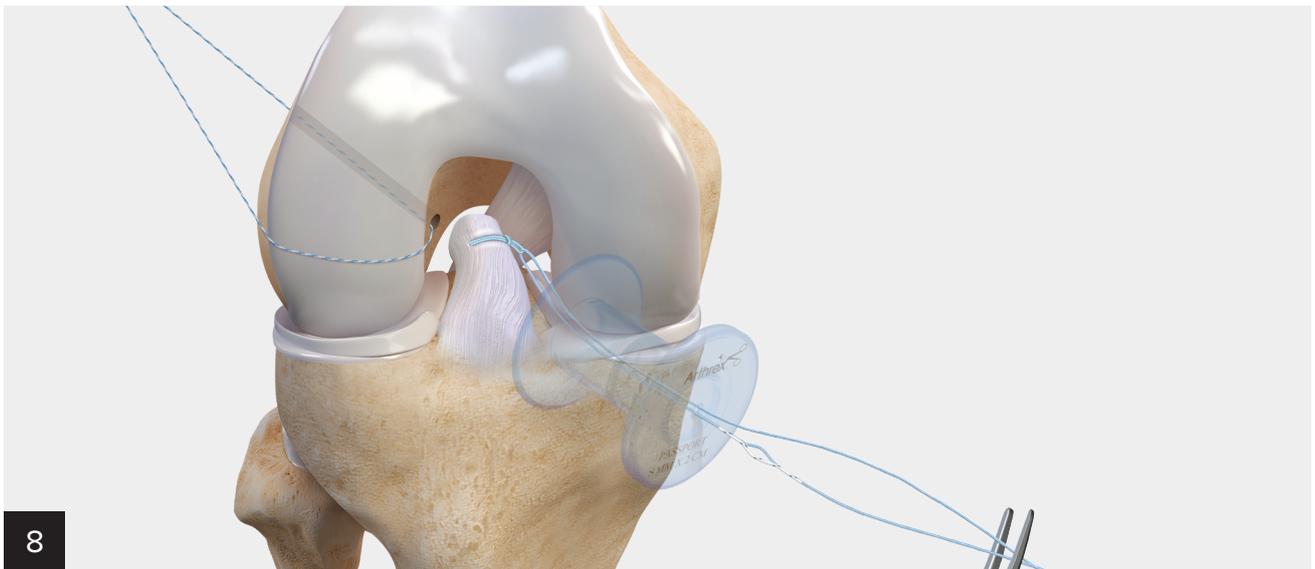
6

As the FastPass Scorpion suture passer is removed from the knee, the FiberRing luggage tag will begin to reduce down into the joint and onto the ligament.

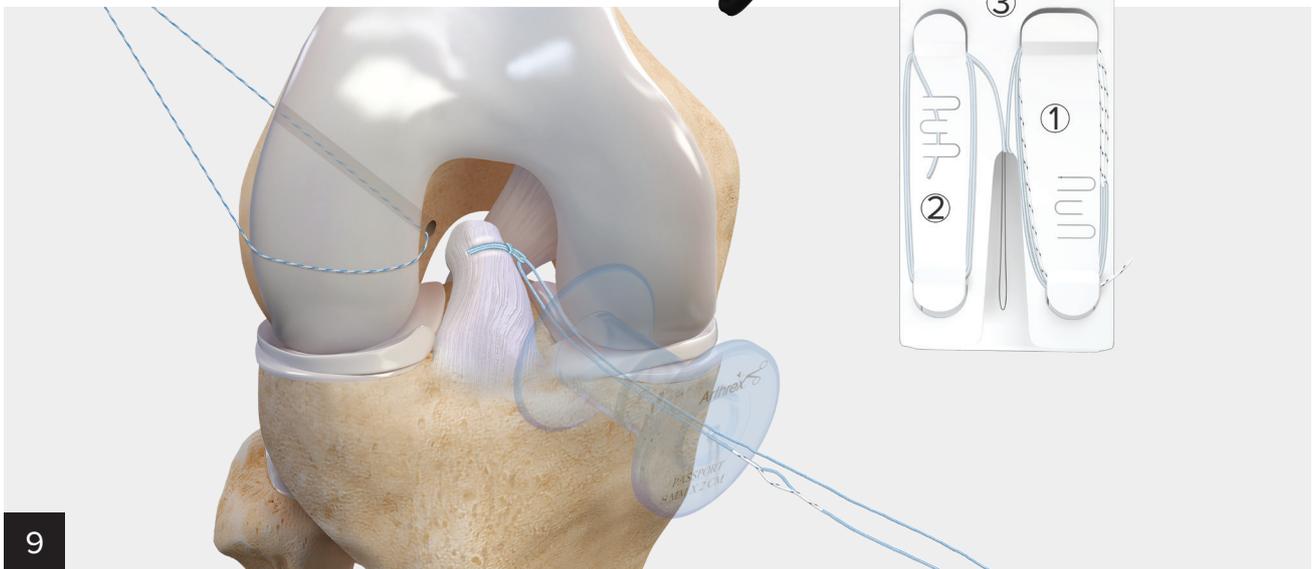
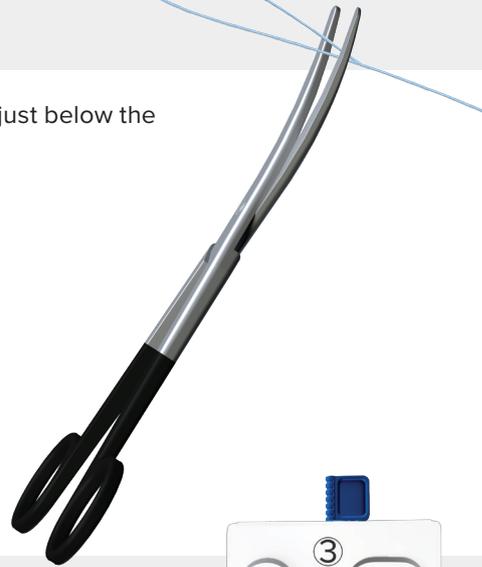


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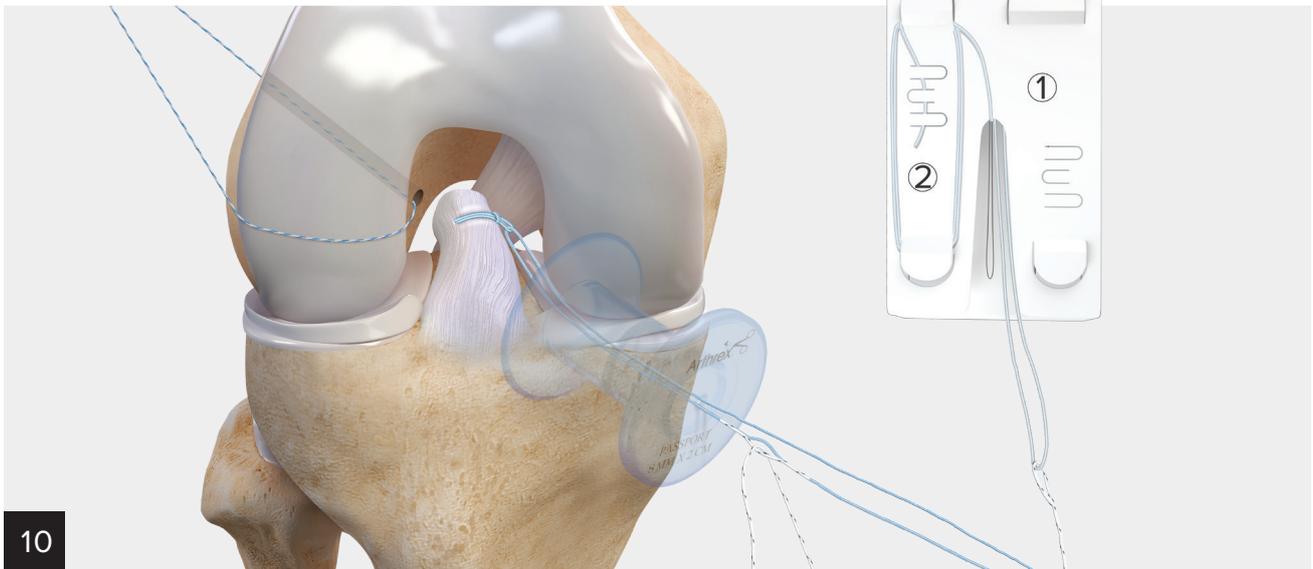
Remove the FiberRing suture from the FastPass Scorpion suture passer and gently pull the end of the FiberRing shuttle loop to fully cinch down the FiberRing suture at the ACL to form the luggage tag stitch.



Use a FiberWire® scissor to cut the FiberRing™ shuttle loop just below the splice, leaving two tails.

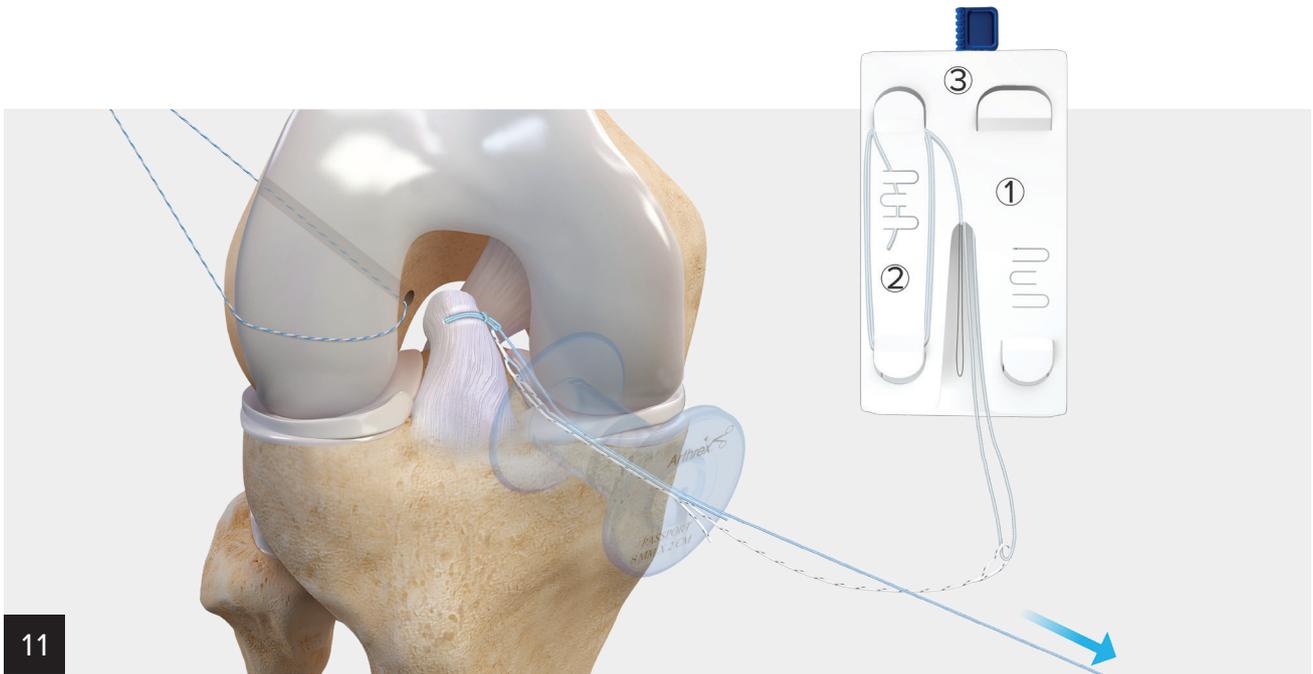


Identify and unravel the black and white TigerWire® leader suture located at the (1) on the ACL repair TightRope® assembly card.



10

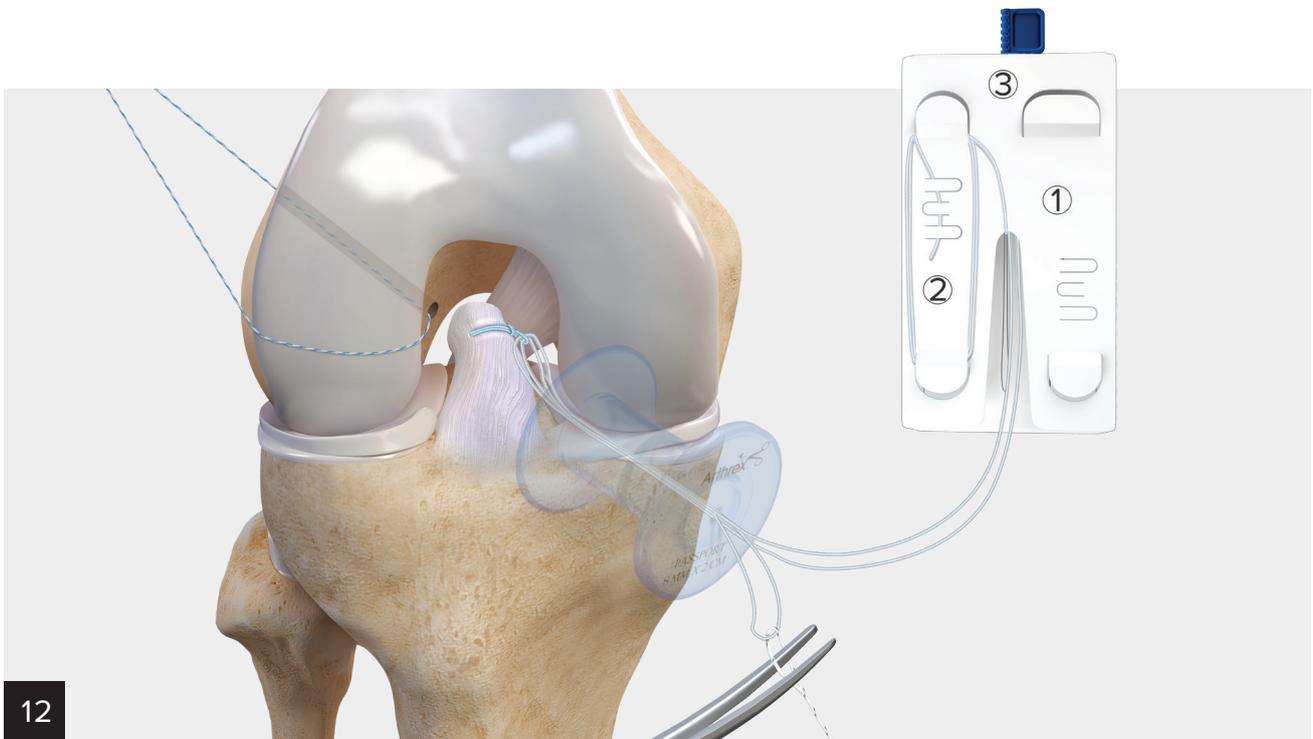
Load approximately two in of the black and white leader suture from the **(1)** section of the card into the suture eyelet of the FiberRing™ shuttle loop.



11

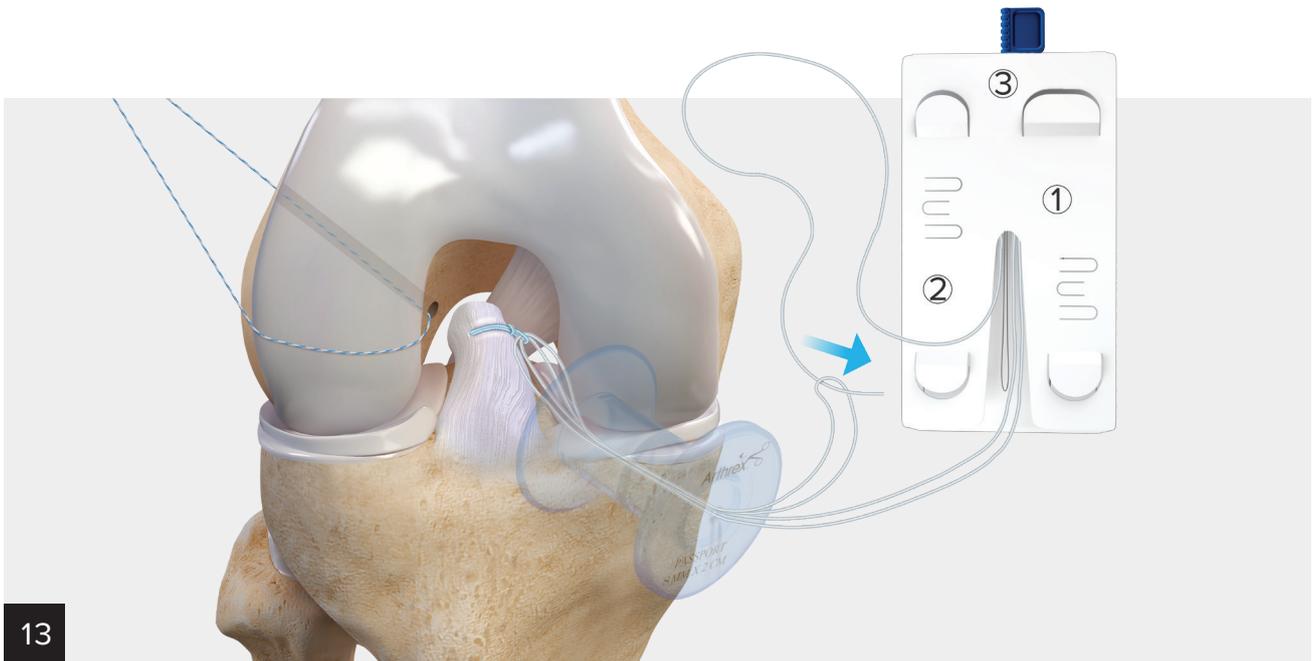
Pull the free blue tail of the FiberRing™ shuttle loop to shuttle the black and white TightRope® leader suture through the luggage tagged FiberRing suture and back out of the Passport Button™ cannula. Once the leader suture is passed, the blue FiberRing shuttle loop may be discarded.

Note: Repeat this passing step to load the ACL repair TightRope suture onto subsequent FiberRing sutures if more than one luggage tag stitch is performed.



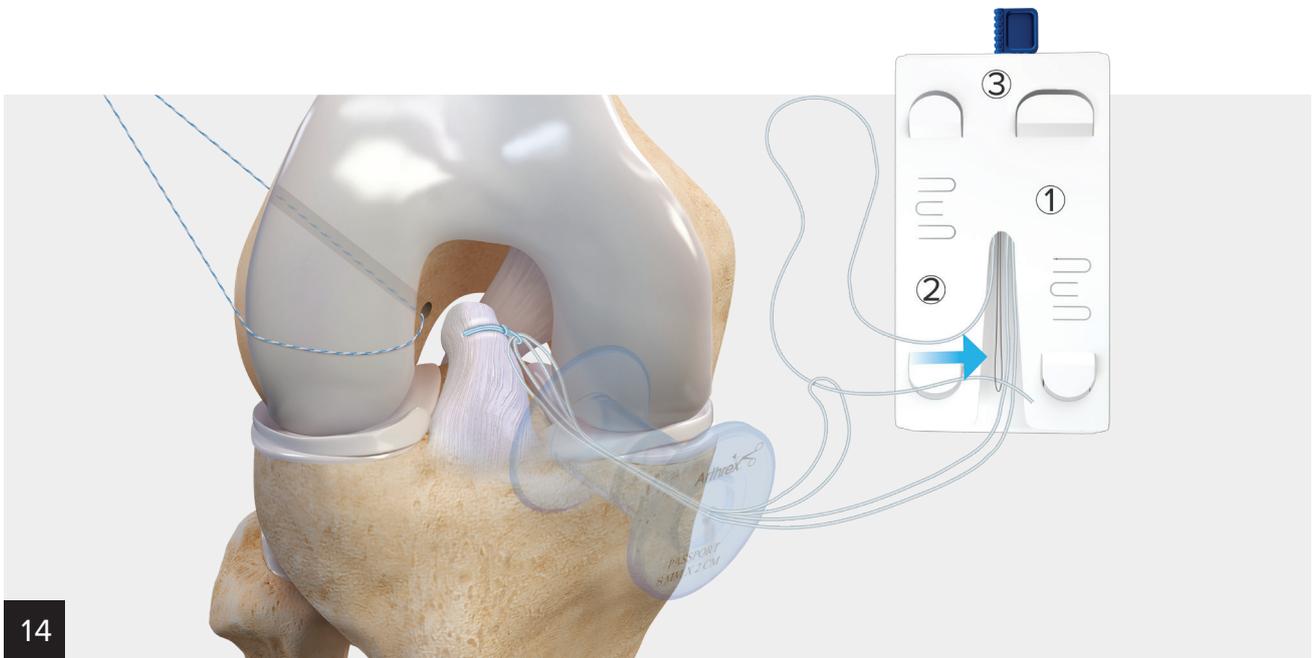
12

The black and white leader suture can now be removed using a FiberWire® scissor and discarded.



13

Identify and unravel the open suture limb of the TightRope® suture labeled **(2)** on the assembly card and pass through the previously shuttled ACL repair TightRope® loop.



14

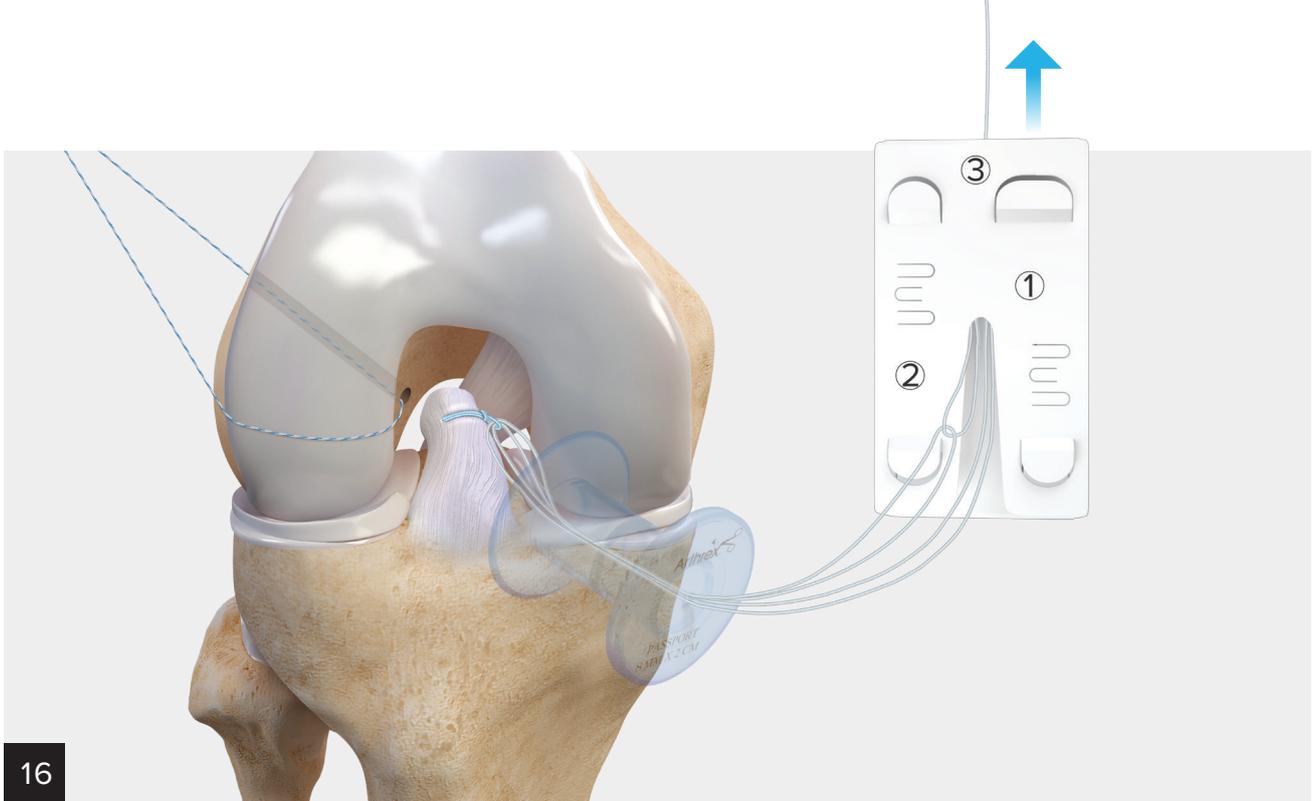
Load one cm of the single white suture tail labeled **(2)** through the nitinol passing loop.

Note: Fold the suture over the wire to form a crease so as to prevent the suture from sliding during passage.



15

Hold two fingers over the top of the card as pictured, and pull the blue threader to complete the pass.

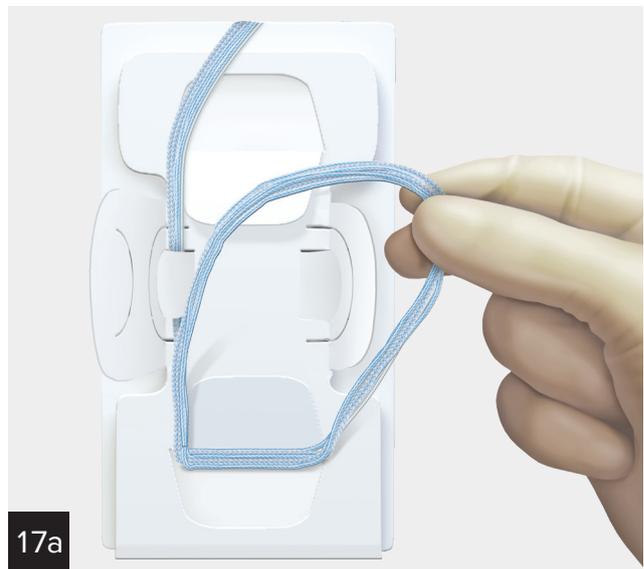


16

Pull the newly created white shortening strand to remove slack from the loops.

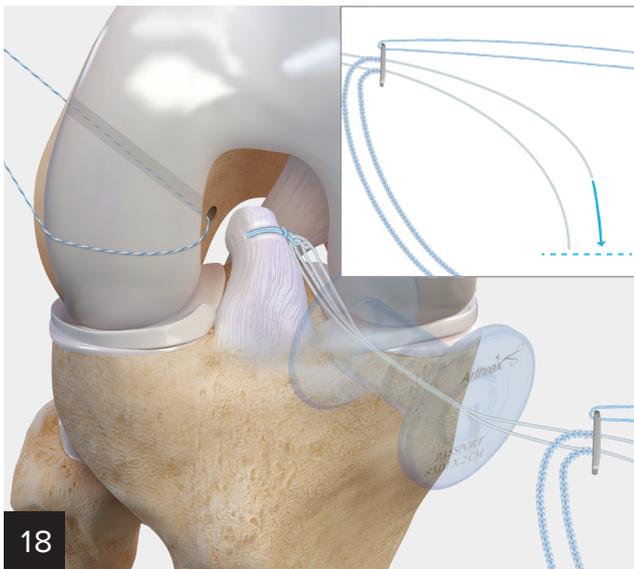


17



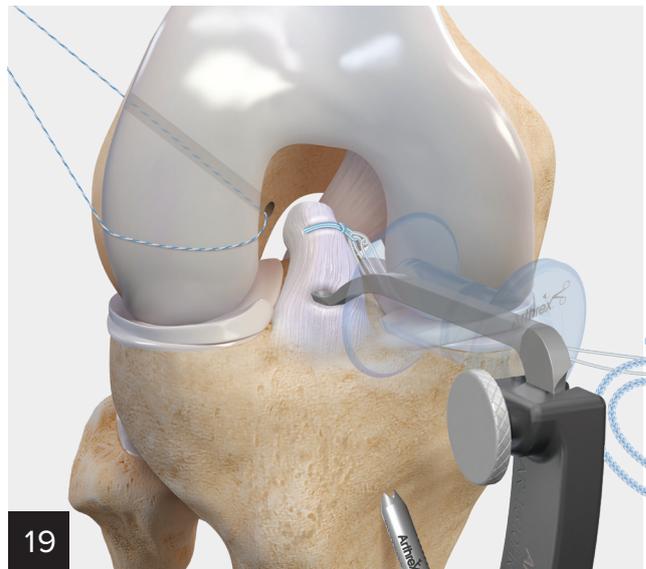
17a

Unsnap the packaging on the back of the card and pinch down the suture cleat to retrieve the sutures. The assembly card can now be opened, the construct removed (**17a**), and the assembly card discarded.



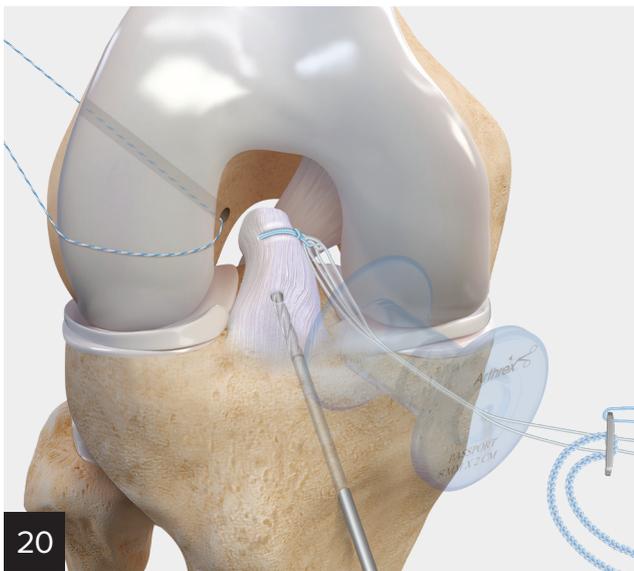
18

Identify and even out the lengths of the white TightRope® suture shortening tails.



19

Use the RetroConstruction™ tibial ACL marking hook and the 2.4 mm drill sleeve to localize centrally into the anterior third of the ACL tibial insertion.

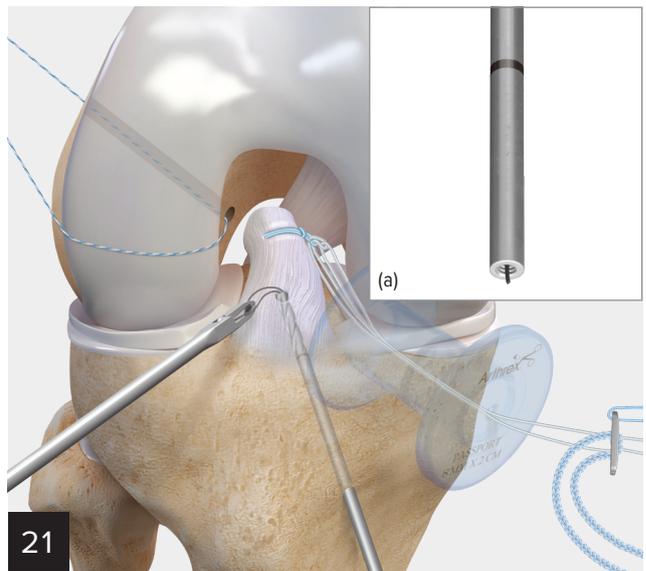


20

Drill the 2.4 mm cannulated drill into the joint. Once in position, remove the ACL drill guide, leaving the 2.4 mm cannulated drill pin in the proximal tibia.

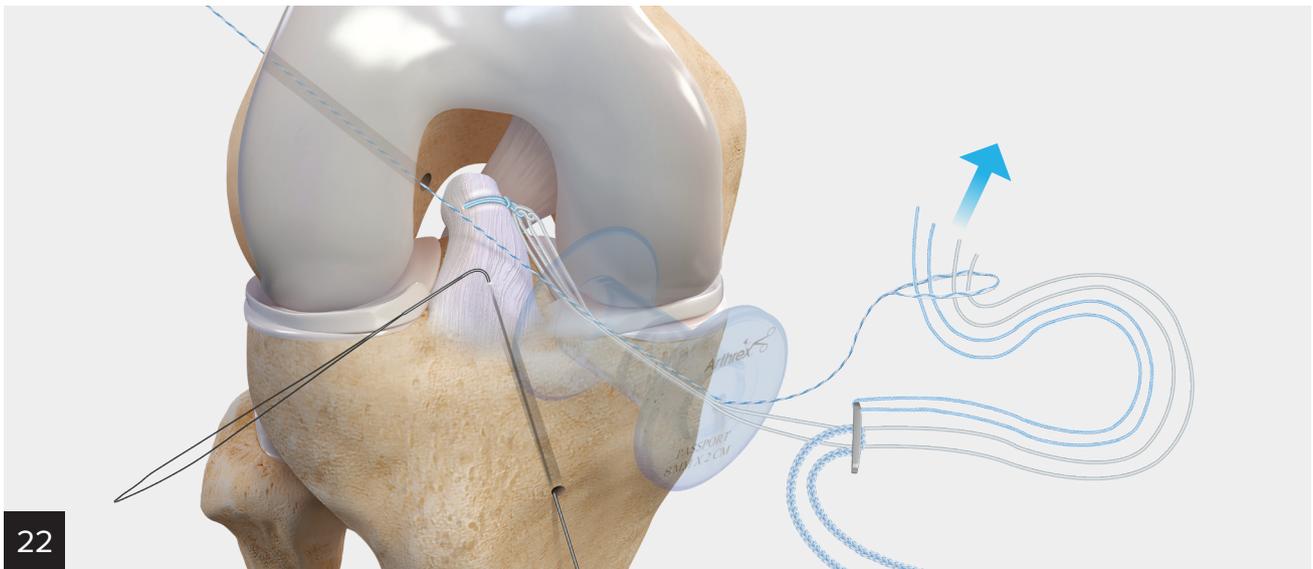
If the trocar has backed out or if bone is trapped in the cannulation of the drill, carefully reinsert the trocar and turn clockwise to thread the trocar back into the drill. Screwing in the trocar will dislodge any bony debris stuck in the cannulation.

The trocar is removed from the cannulated drill, allowing a lasso wire to be delivered through the cannulation of the drill until it is visualized in the joint.



21

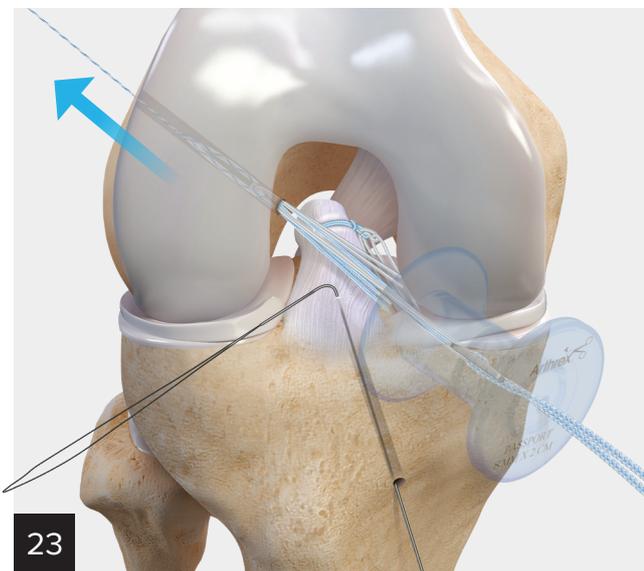
Retrieve the lasso wire with a KingFisher® grasper and advance the lasso wire until the opposite end of the wire is no longer visible at the back end of the cannulated drill **(a)**. Chuck the cannulated drill and carefully remove it from the tibia. Pay attention to the lasso wire to ensure it remains visible in the distal aperture of the tibial tunnel. Snap the ends of the wire together with a hemostat for later use.



22

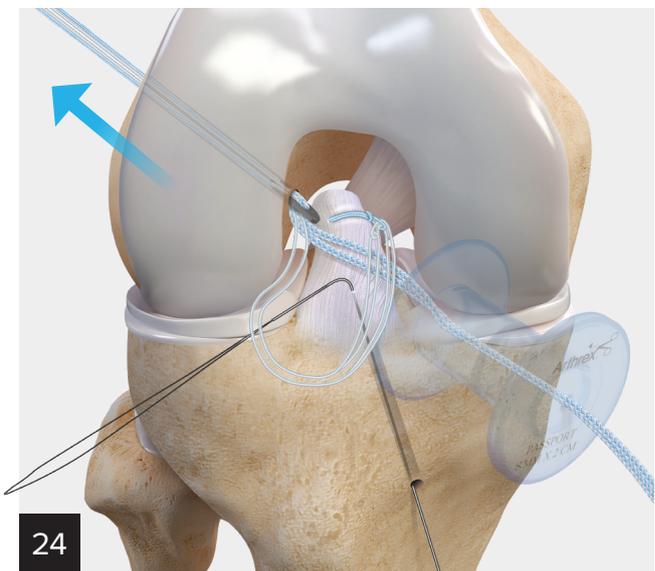
Retrieve the SutureTape FiberLink™ suture through the PassPort Button™ cannula. Identify the white TightRope® tensioning sutures and the blue TightRope passing suture. Load all four ends into the loop of the SutureTape FiberLink suture, which was previously passed through the femur.

Note: Do not load the FiberTape® sutures for the *Internal/Brace™* technique in the SutureTape FiberLink suture loop.



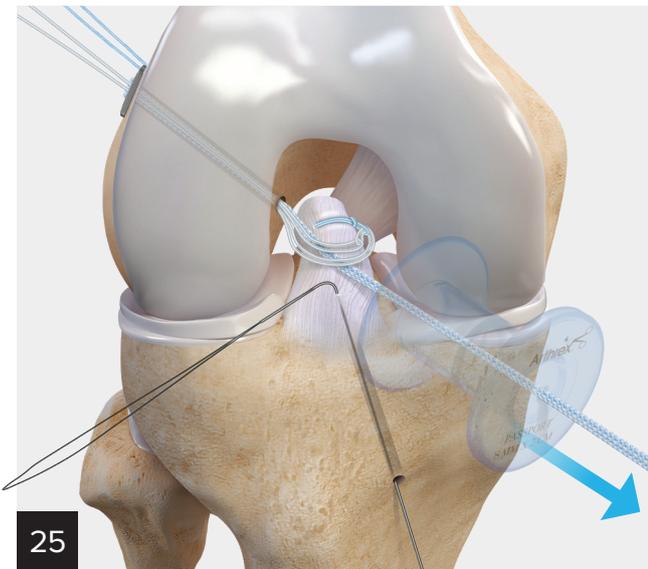
23

Using the SutureTape FiberLink suture, shuttle the ACL repair TightRope suture tails through from the medial portal through the joint and out the lateral femur.

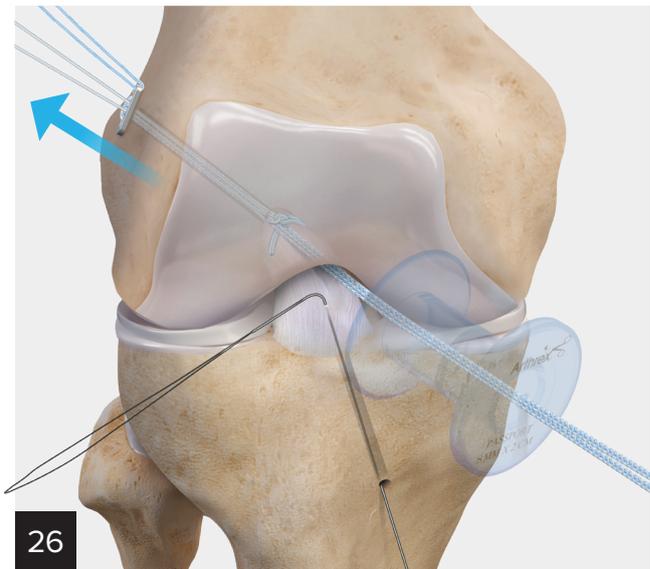


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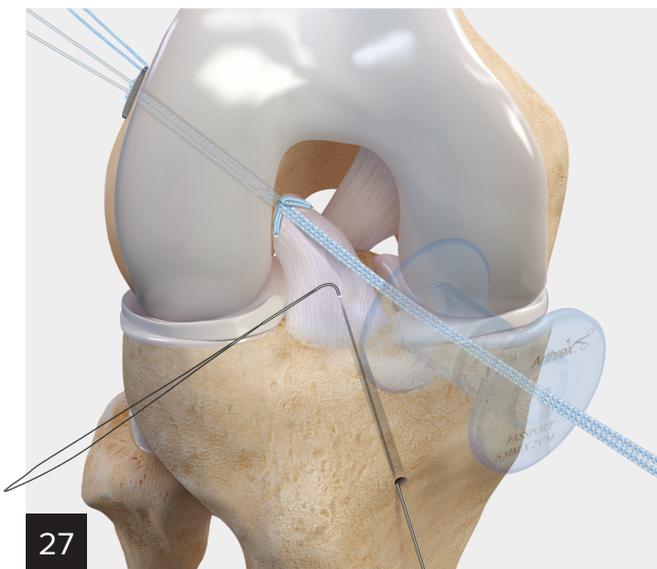
Use the blue TightRope passing suture to pass the TightRope button through the lateral femur, using the FiberTape *Internal/Brace* sutures still in the medial PassPort Button™ cannula for counter-tension.



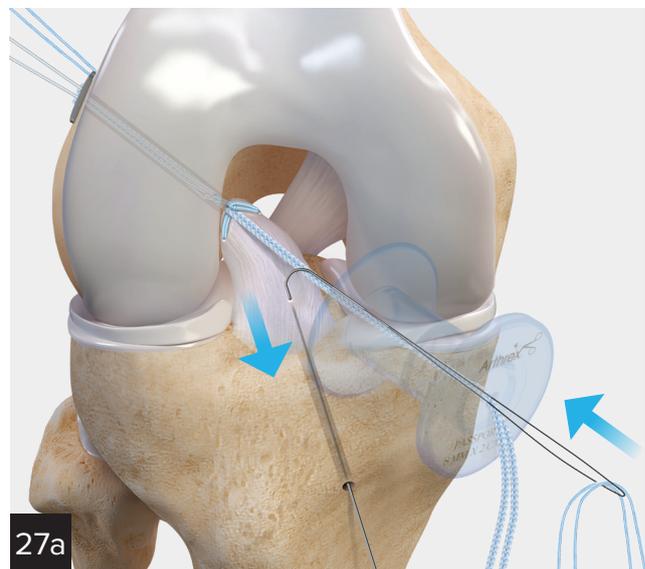
25 Pull the blue FiberTape® sutures to confirm the button has been flipped.

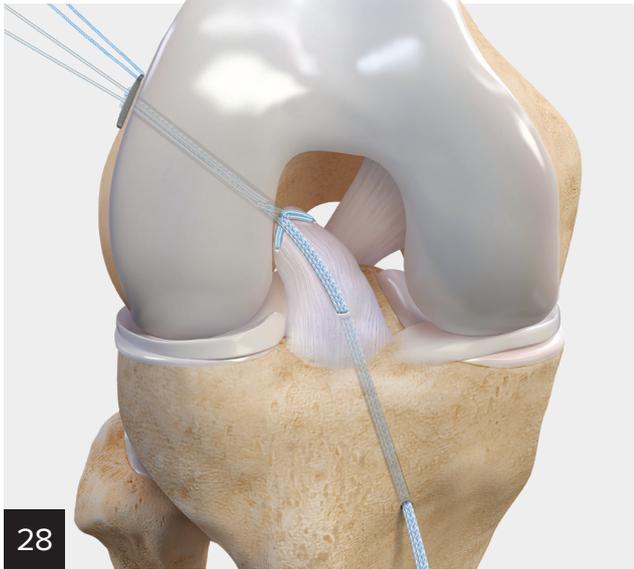


26 With countertension on the blue FiberTape sutures and the knee in extension, gently remove the slack in the TightRope® suture by alternately pulling the white TightRope tensioning sutures 2 cm to 3 cm at a time.

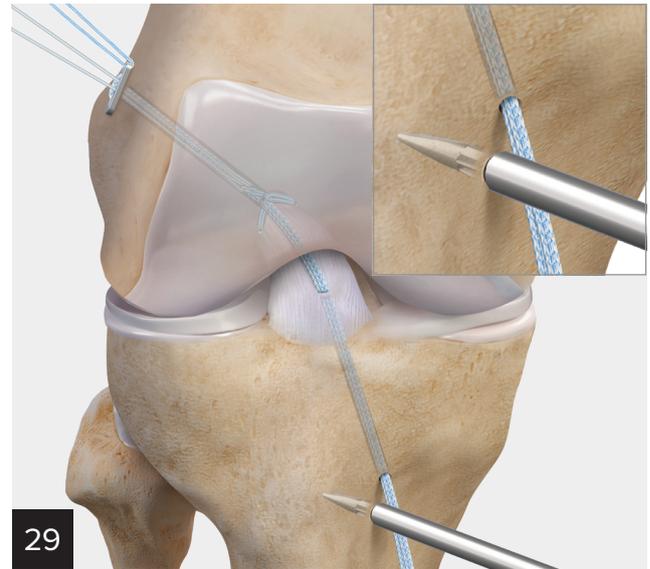


27 Retrieve the loop of the lasso wire out of the PassPort Button™ cannula in the medial portal and load the blue FiberTape sutures into the loop.

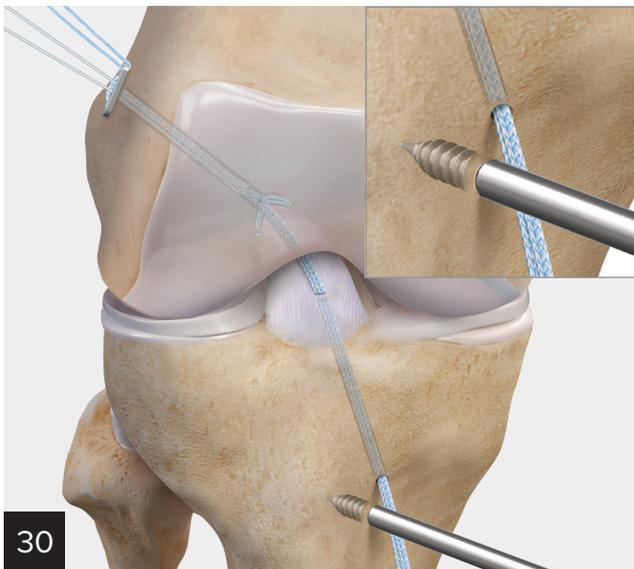




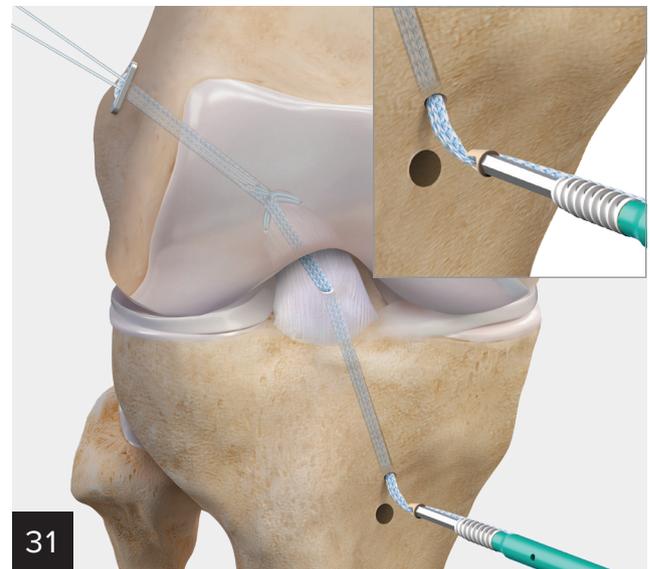
Pull distally on the lasso wire to shuttle the blue FiberTape® sutures out of the tibial tunnel.



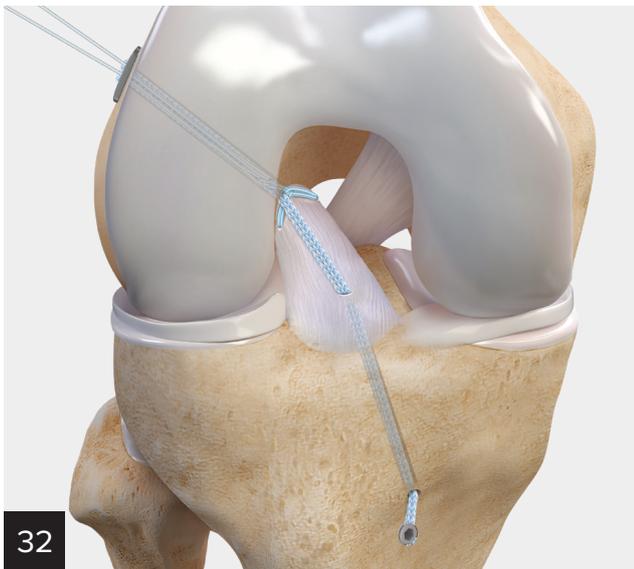
Use the 4.75 mm SwiveLock® drill from the ACL Backup Fixation Kit to drill a pilot hole 1 cm distal to the tibial bone tunnel. The drill is calibrated with a hard stop at 20 mm.



Use the 5.2 mm bone tap included in the ACL Backup Fixation Kit to tap the pilot hole.



Place the knee in full extension and fix the FiberTape sutures using a 4.75 mm SwiveLock® anchor.



Put the knee through a range of motion, then with the knee in full extension, retension the ACL repair TightRope® tensioning sutures.



Final fixation.

Ordering Information

Product Description	Item Number
ACL Repair TightRope® w/ FiberTape® Suture for <i>InternalBrace</i> ™ Technique	AR-1588R-IB
TightRope Button w/ FiberTape Suture for <i>InternalBrace</i> Technique (no TightRope loop)	AR-1588TB-IB
FiberRing™ w/ Shuttle Loop, 25 mm	AR-7282-25
FiberRing w/ Shuttle Loop, 35 mm	AR-7282-35
FiberRing w/ Shuttle Loop, 45 mm	AR-7282-45
FiberRing w/ Shuttle Loop, 55 mm	AR-7282-55

Additional Products

Product Description	Item Number
PassPort Button Cannula™, 8 mm × 2 cm	AR-6592-08-20
FiberLink™ 1.3 mm SutureTape, looped w/ closed loop (white/blue)	AR-7535
ACL TightRope Drill Pin, closed eyelet, 4 mm	AR-1595TC
ACL ToolBox Instrument Set	AR-1900S
RetroConstruction™ Drill Guide System Instrument	AR-1510S
Ratcheting Drill Sleeve, 2.4 mm	AR-1510FD-24
2.4 mm Cannulated Drill and Passing Wire	AR-1594D-24
Implant System, secondary fixation w/ BioComposite SwiveLock® anchor, 4.75 mm × 19.1 mm	AR-1593-BC
Implant System, secondary fixation w/ PEEK SwiveLock anchor, 4.75 mm × 19.1 mm	AR-1593-P
FlipCutter® III Drill	AR-1204FF

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. van der List JP, DiFelice GS. Preoperative magnetic resonance imaging predicts eligibility for arthroscopic primary anterior cruciate ligament repair. *Knee Surg Sports Traumatol Arthrosc.* 2018;26(2):660-671. doi:10.1007/s00167-017-4646-z
2. van der List JP, Jonkergouw A, van Noort A, Kerkhoffs GMMJ, DiFelice GS. Identifying candidates for arthroscopic primary repair of the anterior cruciate ligament: a case-control study. *Knee.* 2019;26(3):619-627. doi:10.1016/j.knee.2019.02.004



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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