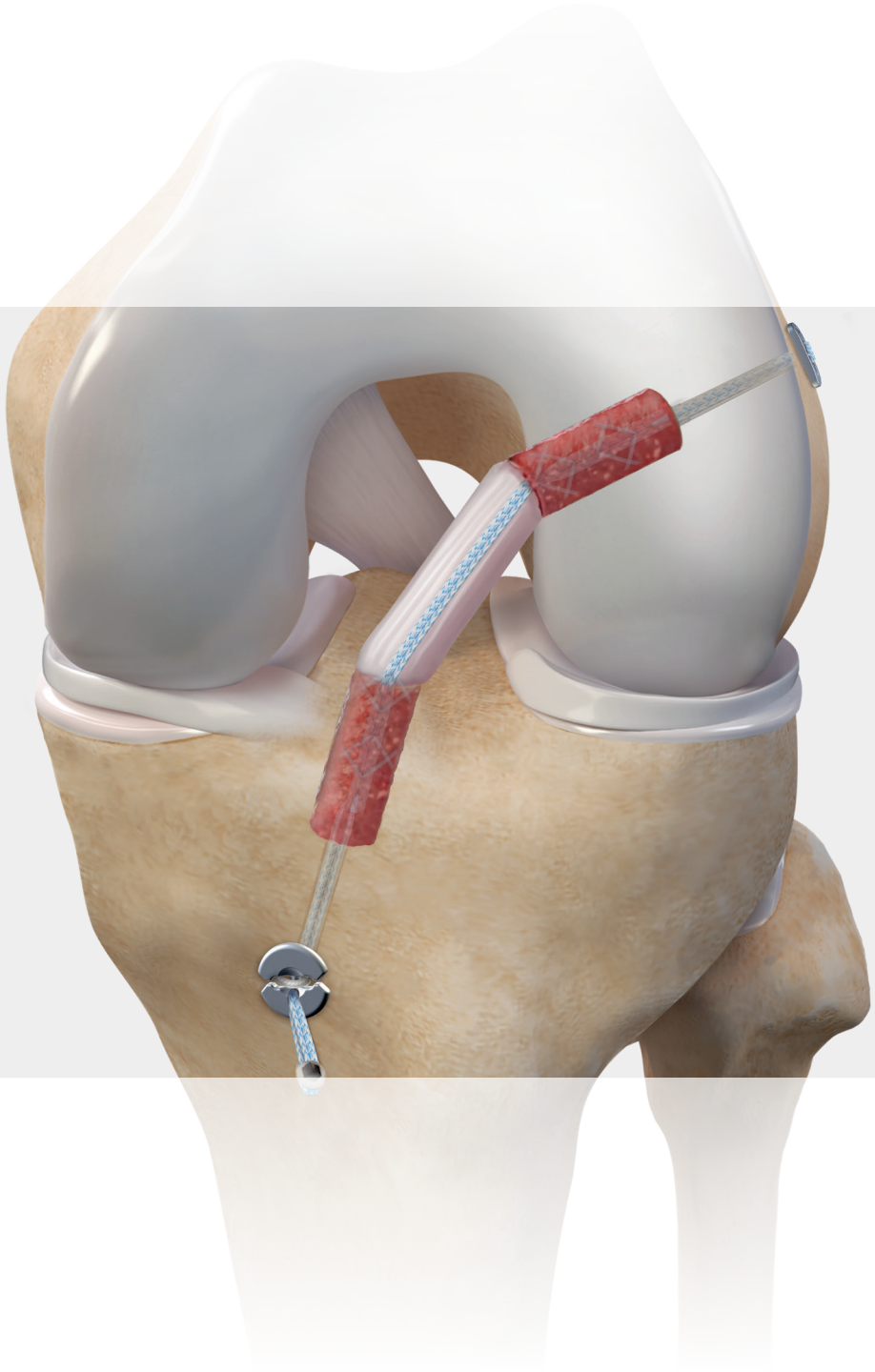
BioACL™

Surgical Technique



Arthrex®

BioACL™ Technique

Introduction

The BioACL technique harnesses the patient's own biology and combines it with the highest-quality biologic scaffolds to maximize the healing potential of anterior cruciate ligament (ACL) reconstructions. In a randomized controlled trial, the BioACL technique demonstrated significantly decreased tunnel widening at 6 months and greater early range of motion.[1]

Key Features of the BioACL Technique

Customized Platelet-Rich Plasma (PRP) Concentrate From Bone Marrow Aspirate (BMA) Processed With the Angel® System

- This technique incorporates customized concentrated PRP (cPRP) from BMA processed with the Angel system, autologous bone collected using the GraftNet™ autologous tissue collector, and bone tunnel augmentation with AlloSync™ Pure demineralized bone matrix (DBM).
- Bone marrow is a rich source of platelets and nucleated progenitor cells. The Angel device is the only system to provide cPRP from BMA with adjustable cellular levels.[2]

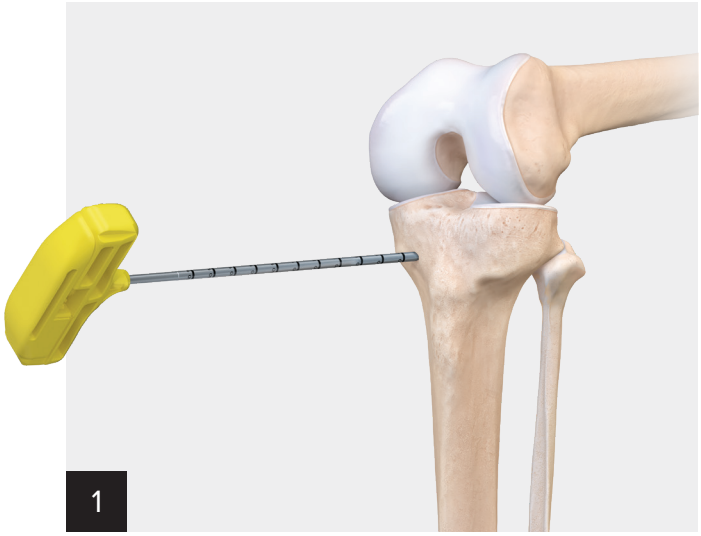
AlloSync™ Pure DBM

- AlloSync Pure DBM resists irrigation and can be used in a fluid environment when hydrated. It maximizes osteoinduction for bone remodeling and is histologically proven to contain all five elements of bone formation.[3-5]

GraftNet™ Autologous Tissue Collector

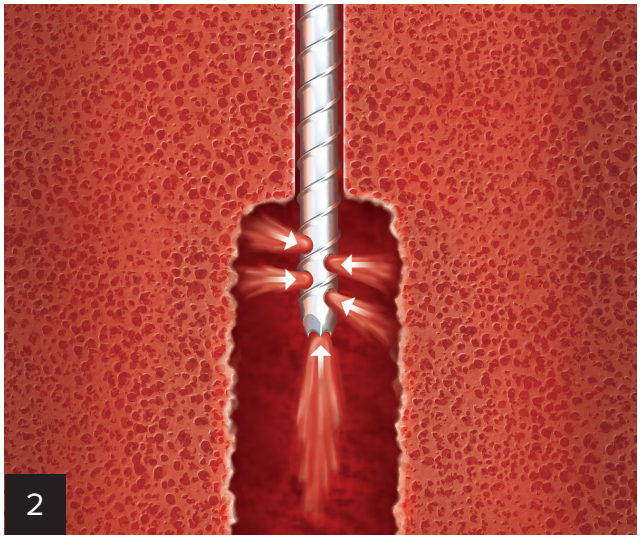
- The suction-activated GraftNet device is designed to collect autologous tissue for a multitude of applications. When connected to an arthroscopic shaver, the GraftNet device can easily collect resected bone during ACL tunnel drilling. This autologous bone can then be combined with a mixture of DBM and cPRP from BMA to accelerate femoral and tibial tunnel remodeling.[1,6-8]

BMA Harvest: Proximal Tibia Harvest Technique



Perform bone marrow aspiration at the beginning of the case, prior to applying a tourniquet.

Under direct visualization, insert the Vortex™ BMA harvesting needle into the diametaphyseal region of the proximal tibia. Position the trochar low enough to avoid subchondral bone and close to the insertion of the pes anserinus. Aim approximately 30° distally, and insert the trochar to a depth of 3 cm.

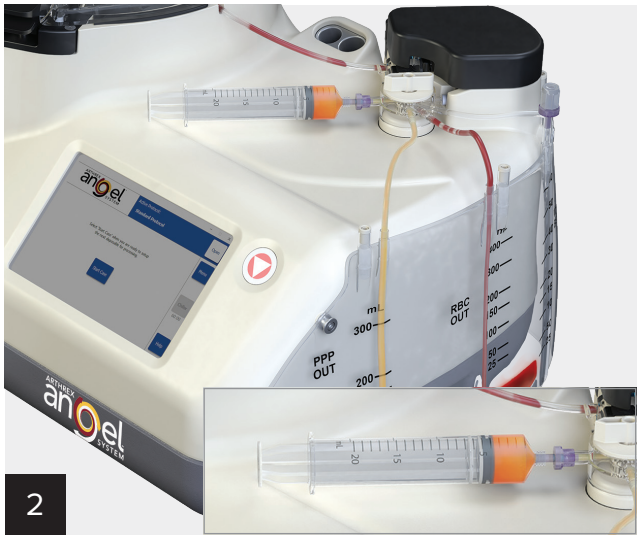


Slowly aspirate the bone marrow. The Vortex needle's unique threaded tip and vent holes allow for easy and accurate repositioning of the needle tip within the bone for optimal aspiration volume.

Note: Aspiration can also be done from the iliac crest or distal femur.

Angel® cPRP System Processing

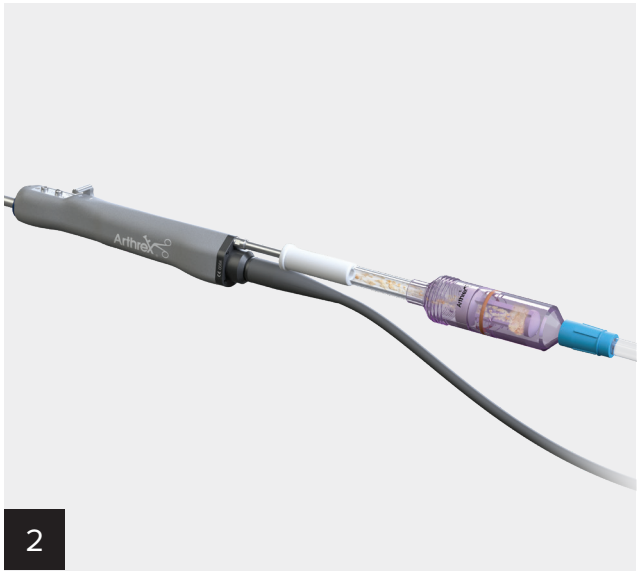
After the Angel cPRP system has been assembled and the operator has connected the heparin-flushed bone marrow filter to the "whole blood in" compartment, the citrated BMA can be introduced. The Angel system can process 40 to 180 mL of whole blood, BMA, or a mixture of both in a single cycle.



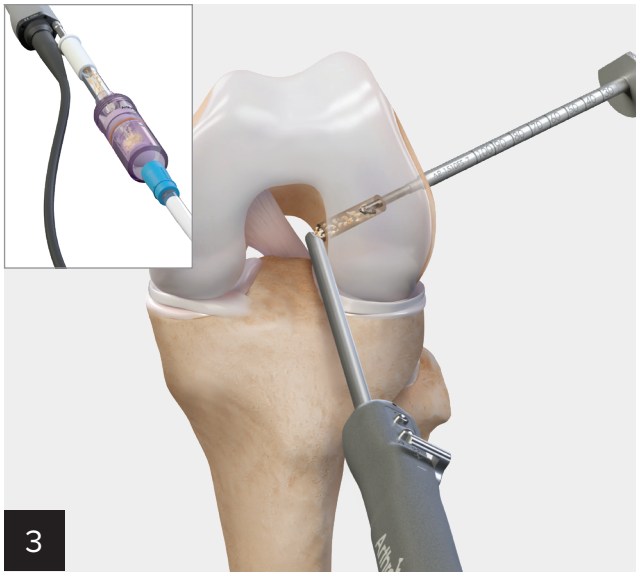
After processing, the cPRP from BMA will be dispensed into the PRP collection syringe, ready for use.

Tunnel Drilling and Autograft Bone Collection With the GraftNet™ Device

The femoral and tibial sockets can be prepared with the FlipCutter® III drill and the side-release RetroConstruction™ guide.

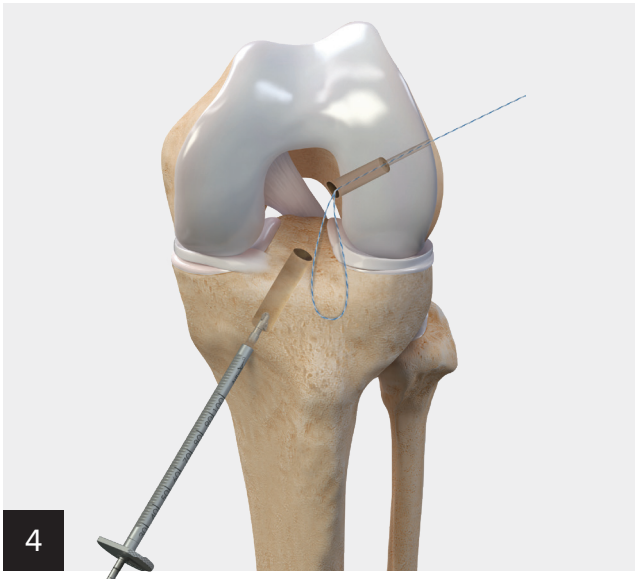


Attach the GraftNet device to the shaver, in line with suction, to harvest bone debris from the tunnels.



Place the shaver in the lateral portal on oscillate mode at 6200 rpm in forward direction. It is recommended to use the 5.5 mm bone cutter blade.

Complete tunnel drilling and pass the FiberSnare® suture for graft shuttling.



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Prepare the tibial tunnel and collect the autograft bone in a similar fashion.

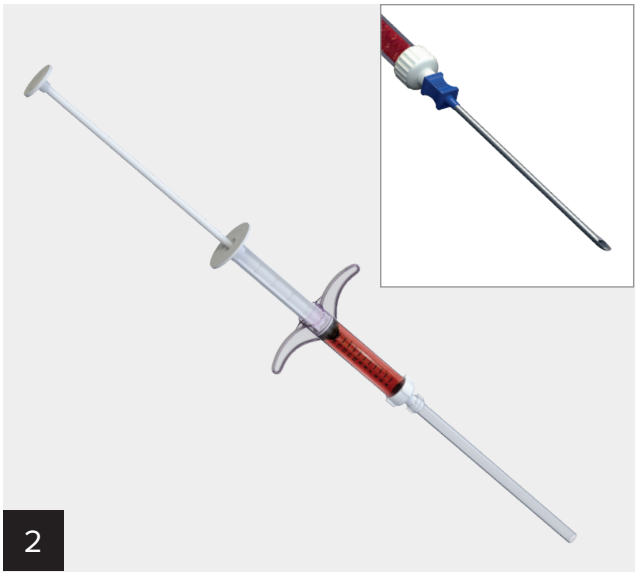
5

Following collection of autologous bone from the ACL tunnels, disconnect the tissue collector from the shaver and suction. Disassemble the GraftNet™ device and withdraw the plunger to access the autologous tissue.

Composite Graft Preparation With AlloSync™ Pure DBM and Angel® cPRP From BMA

1

Prepare the composite graft for bone tunnel augmentation by mixing the autograft bone collected from the GraftNet device with 5 cc of AlloSync Pure DBM and 3 cc of Angel cPRP from BMA.



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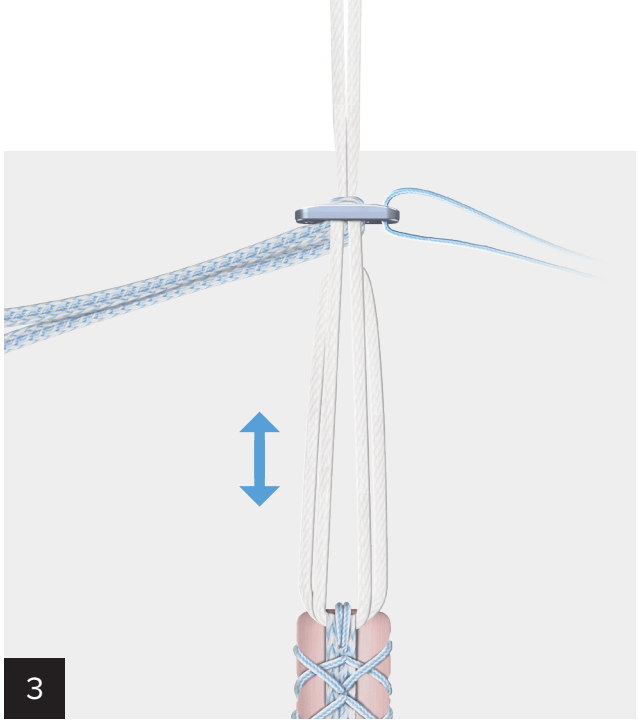
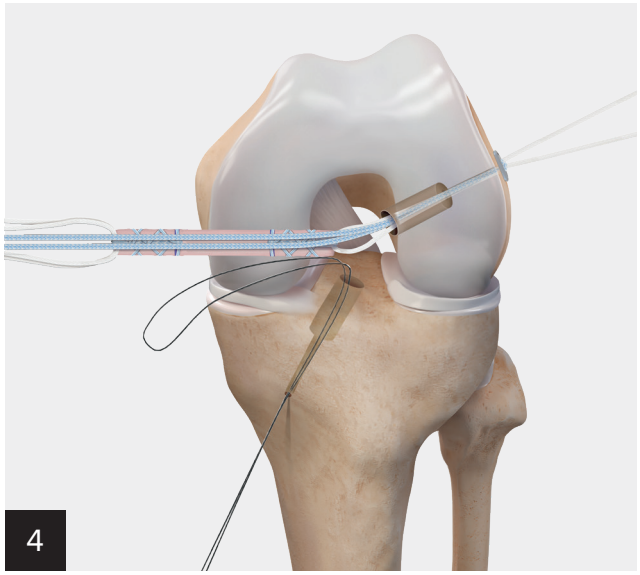
Load the composite graft mixture into the BioXpress™ graft delivery device.

Note: Alternatively, a Tuohy needle and syringe can be used.



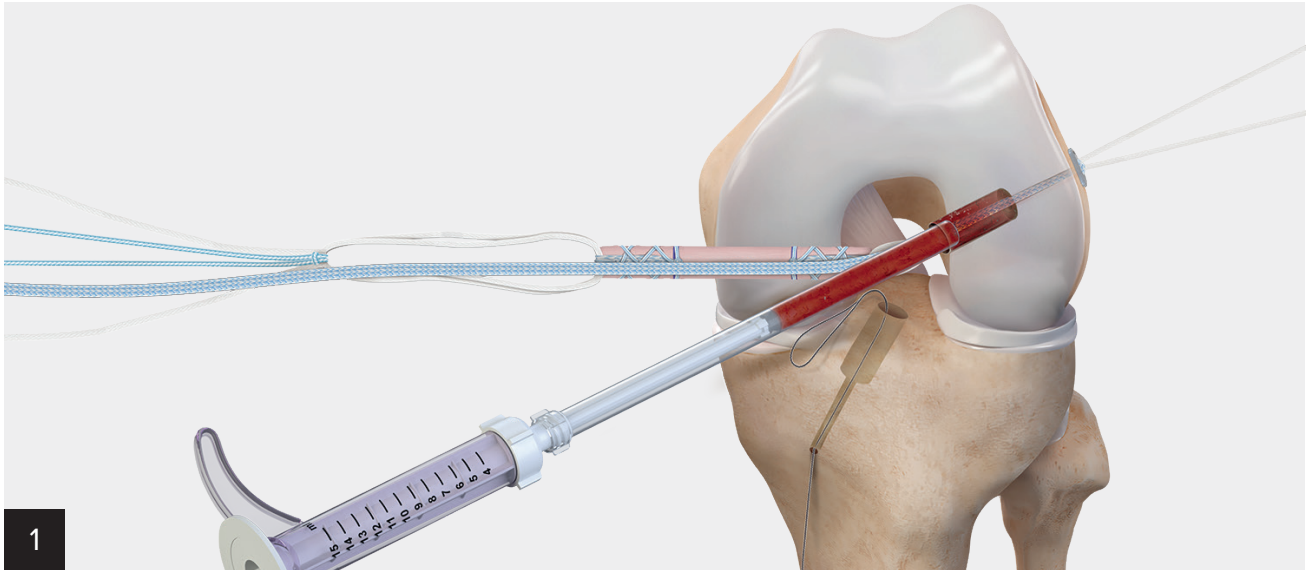
Prepare the QuadLink™ ACL graft with the FiberTag® TightRope® II implant on the femoral side. Prep the tibial side with the FiberTag TightRope II attachable button system.

Prior to passing the FiberTag TightRope II implant through the femur, lengthen the femoral FiberTag TightRope II implant to allow room for composite graft delivery into the tunnel.

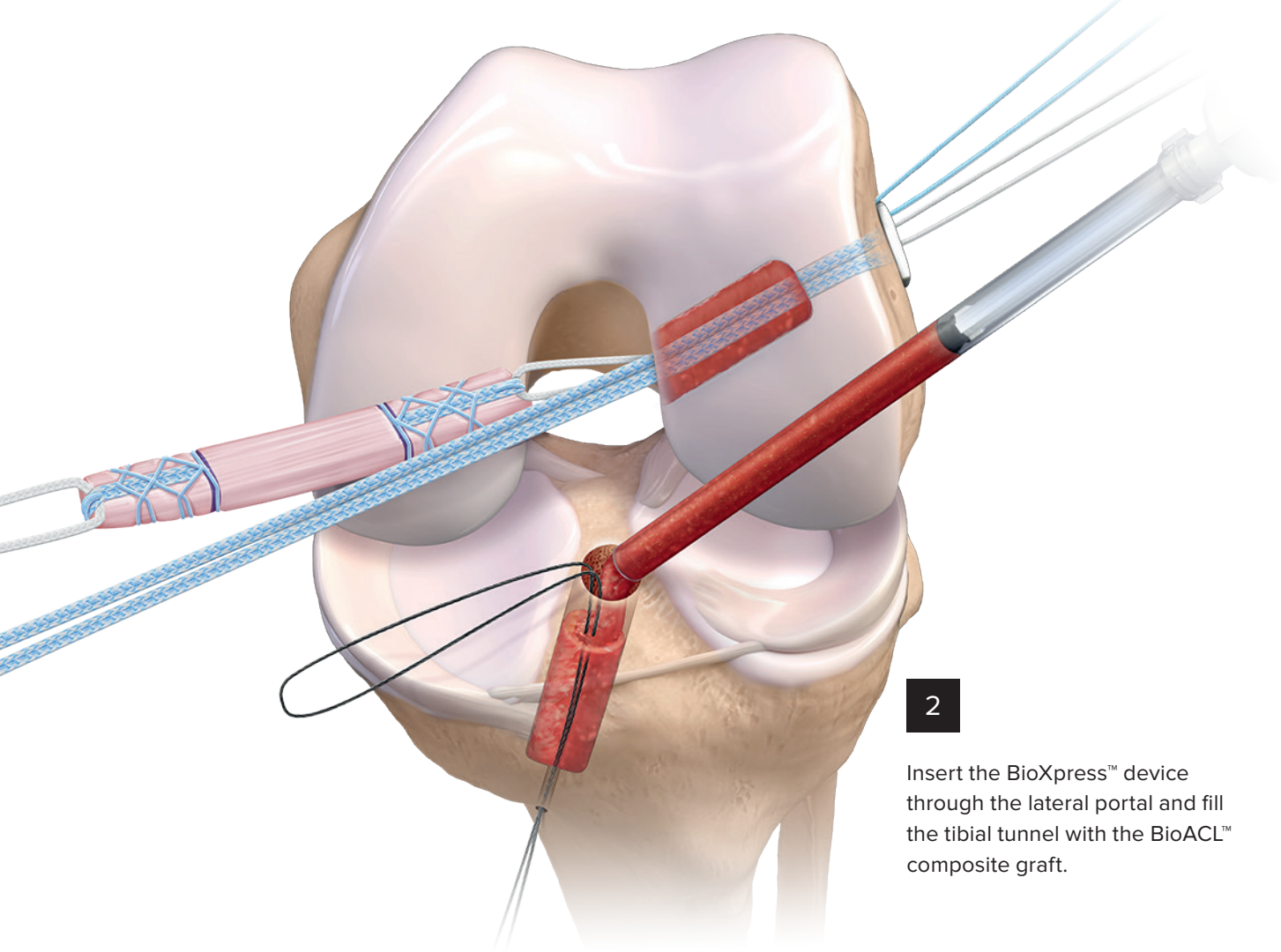


Advance the FiberTag TightRope II implant's shortening strands and FiberWire® passing suture through the femoral socket, advancing the button out of the femur. Ensure the button seats firmly on the femoral cortex.

Composite Graft Delivery With AlloSync™ Pure DBM and Angel® cPRP From BMA



Using the BioXpress™ device, deliver the BioACL™ composite graft into the femoral tunnel through the medial portal. To ensure proper graft impaction, fully fill the tunnel with the composite graft.



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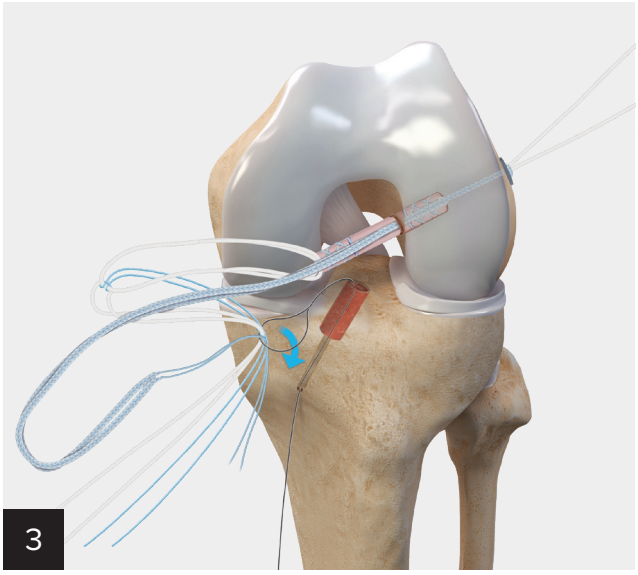
Insert the BioXpress™ device through the lateral portal and fill the tibial tunnel with the BioACL™ composite graft.



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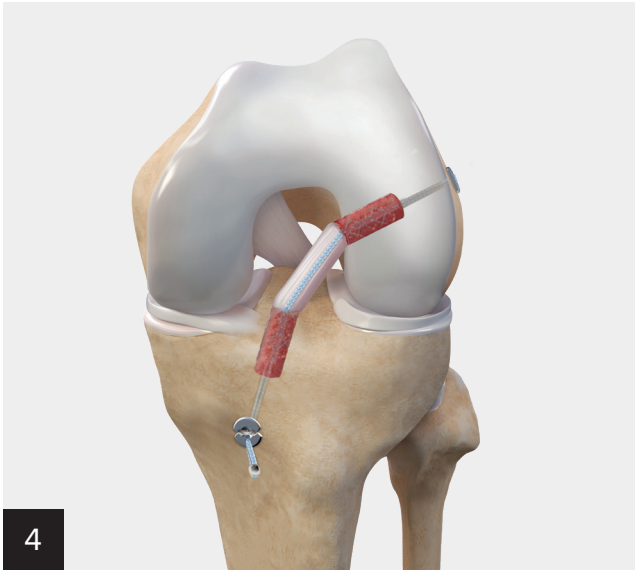
Use the FiberTag® TightRope® II implant's shortening strands to finish advancing the femoral end of the graft into the femoral tunnel. Pass the FiberTag TightRope II attachable button system (ABS) loop through the tibial socket.



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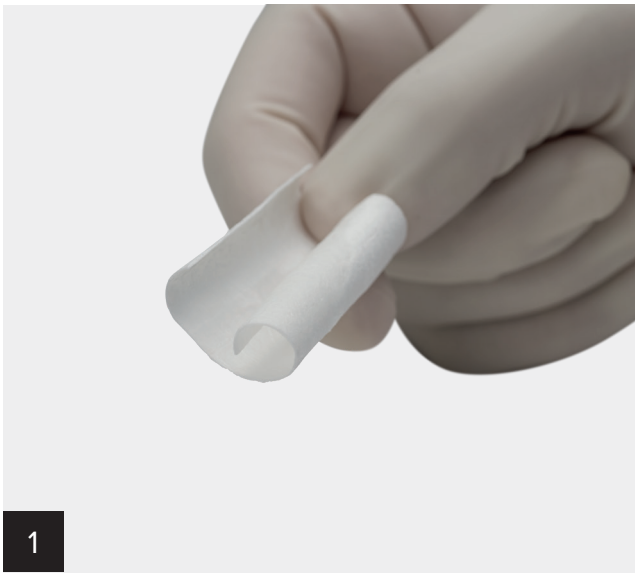
Fully seat the QuadLink™ graft into both the femoral and tibial tunnels. Complete fixation of the FiberTape® sutures for the *Internal*Brace™ technique in full extension. After cycling the knee several times, complete femoral and tibial TightRope final tensioning.

Optional: QuadLink™ Augmentation With Collagen Scaffold

- A collagen scaffold can contain regenerative qualities and act as a barrier or wrap. In ACL reconstruction, a collagen scaffold can provide additional biological support to soft tissues.
- TenoWrap™ collagen tendon wrap is a resorbable type I collagen matrix that provides a nonconstricting encasement for a protected environment and gliding surface for the tendon sheath. Designed to be an interface between the tendon and surrounding tissue, TenoWrap grafts are conformable, nonfriable, and self-curling for easy placement.



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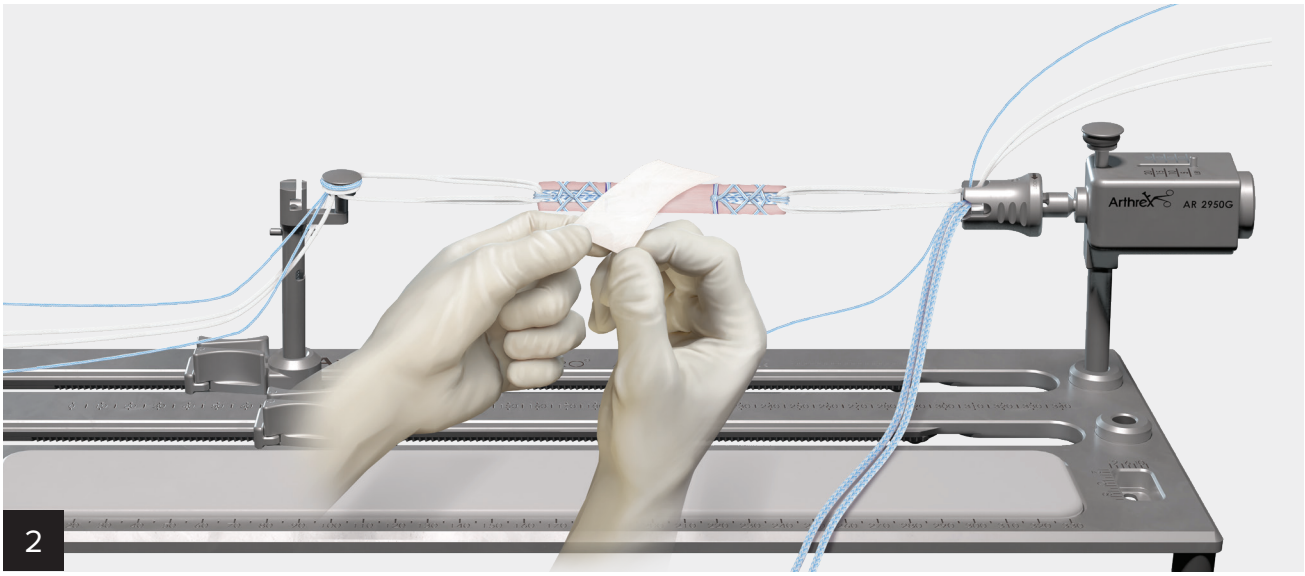
Optionally, a collagen scaffold, such as the TenoWrap graft, can be used to augment the QuadLink ACL graft during a BioACL™ procedure.



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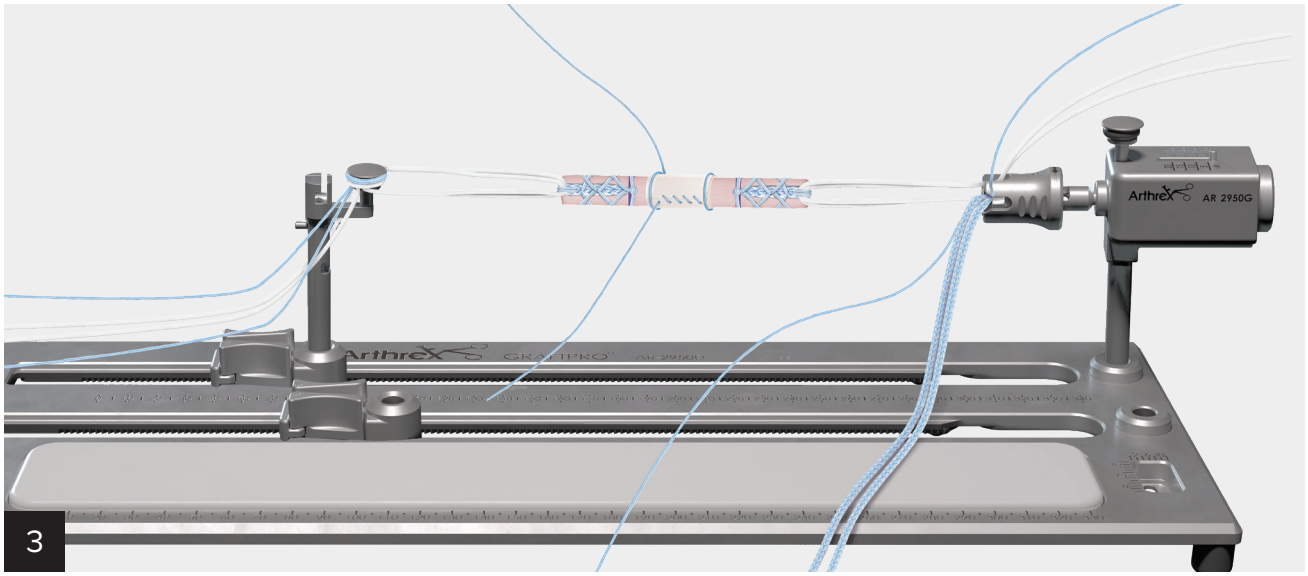
To secure the collagen scaffold to the QuadLink construct, an absorbable monofilament suture can be used. Place the scaffold in the center of the QuadLink graft and carefully wrap the TenoWrap scaffold circumferentially.



Place circumferential sutures around both ends of the TenoWrap™ scaffold using absorbable monofilament sutures to promote a watertight environment around the QuadLink™ construct. Finally, suture a running stitch along the free edge of the TenoWrap scaffold.

The *Interna*lBrace 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 *Interna*lBrace technique is for use during soft tissue-to-bone fixation procedures and is not cleared for bone-to-bone fixation.

Ordering Information

Product description	Item number
Angel® BMA processing kit w/ Vortex™ threaded recovery needle, closed-tip, 13 ga, w/ ACD-A	ABS-**10062K-TH13CTA**
Angel BMA processing kit w/ Vortex threaded recovery needle, open-tip, 13 ga, w/ ACD-A	ABS-**10062K-TH13OTA**
Angel cPRP and BMA tray	ABS-**10062T**
GraftNet™ autologous tissue collector	ABS-**1050**
GraftNet XL bone collection device	ABS-**1052**
AlloSync™ Pure DBM, 5 cc	ABS-**2010-05**
BioSurge™ II cell and bone graft processing system	ABS-**2016-02**
BioXpress™ graft delivery device, angled-tip cannula	ABS-**10053-15-45**
ACL FiberTag® TightRope® II implant, for *Internal*Brace™ technique	AR-**1588RTT2-IB**
ACL FiberTag TightRope II ABS implant	AR-**1588TNT2**
TightRope ABS button, round, concave, 11 mm, for *Internal*Brace technique	AR-**1588TB-3IB**
ACL backup fixation system, secondary fixation w/ BioComposite SwiveLock® anchor, 4.75 mm × 19.1 mm	AR-**1593-BC**
ACL backup fixation system, secondary fixation w/ PEEK SwiveLock anchor, 4.75 mm × 19.1 mm	AR-**1593-P**

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

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Arthrex manufacturer, authorized representative, and importer information (Arthrex eIFUs)

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