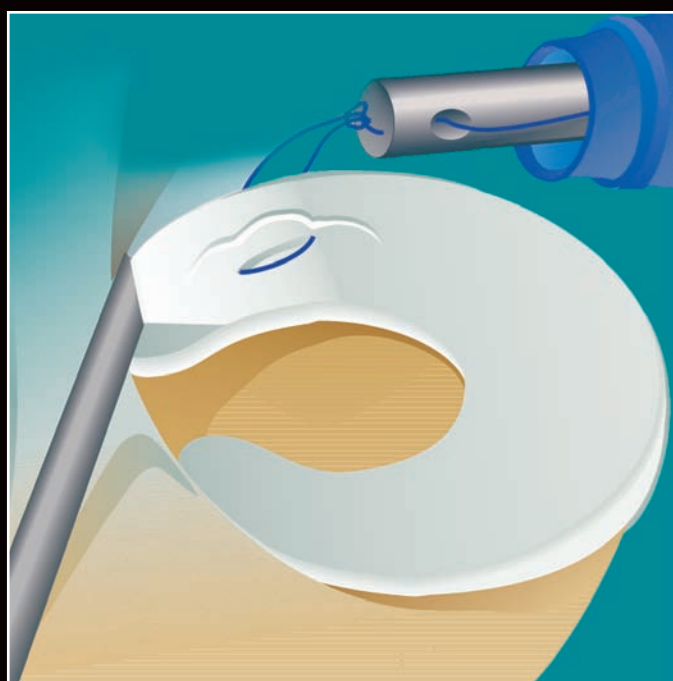




Arthroscopic Protector™ Meniscus Suturing

Surgical Techniques



Protector Meniscus Suturing

Protector Meniscus Suturing Technique I

For the relatively rare meniscus tears located sufficiently anterior, to justify unprotected placement of meniscus needles from inside/out without a deflecting retractor.

Protector Nitinol Suture Needles offer the unique safety advantage of exiting in a straight line from the end of the malleable placement cannula to facilitate accurate, controlled needle exit. Protector Nitinol suture needles pass easily through the most extreme cannula curves.



The inside/out suturing technique is indicated when tears are located in the anterior two-thirds of the meniscus.

The malleable 2 mm cannula can be shaped using the Needle Bender to accommodate variations in the contours of the tibial spine and to precisely access tear location.

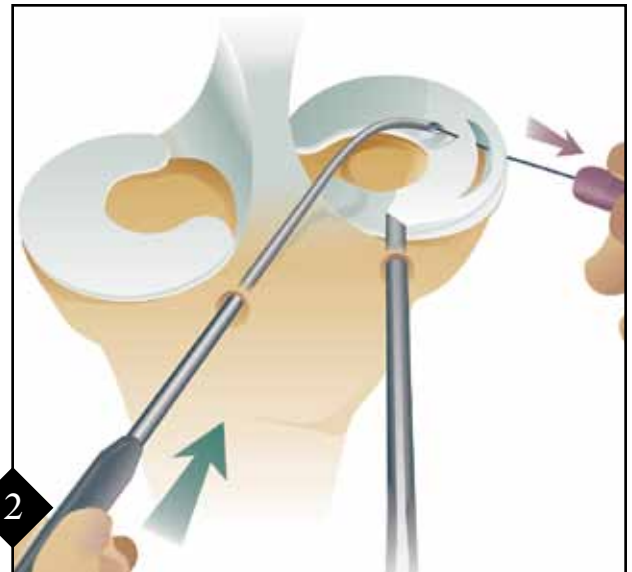
NOTE: Shape these contours gradually to prevent over-bending.

Preload the flexible Nitinol Suture Needle into the placement cannula and advance it until the needle tip is just below the cannula bevel. Lock the needle holder onto the distal end of the needle with enough distance between the needle holder and the distal end of the cannula to permit unimpeded advancement of the needle through the meniscus and meniscal tear and out through the joint capsule and overlying tissues.

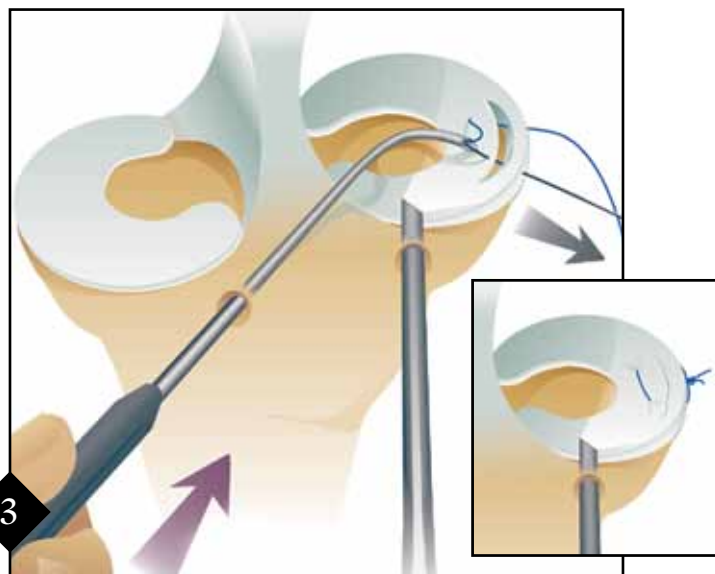
Insert the placement cannula through the contralateral portal and use the beveled tip to carefully approximate the most posterior segment of the tear first.

Load the desired suture into the wire loop on the distal end of the Nitinol needle. The surgeon may use either absorbable or permanent sutures depending on personal preference. However, suture diameter larger than #1 is not recommended for use with this system.

Once the desired positioning has been obtained, advance the needle through the meniscus across the tear and out through the capsule.



Remove the needle holder and place it over the tip of the needle and pull the needle and one arm of the suture out of the joint.



Reposition the needle holder on the needle and slide the needle back into the cannula.

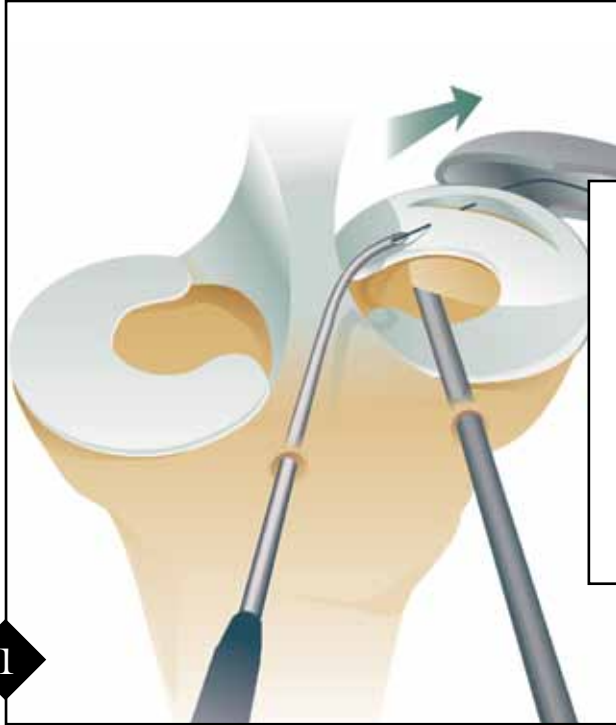
Reposition the tip of the cannula on the meniscus approximately 5 mm anterior to the first suture pass and advance the needle through the tear. Load the anterior end of the suture into the wire loop on the needle and once again pull the needle through the meniscus and out of the joint. This will create a horizontal mattress stitch across the tear. The suture ends are then tied on top of the knee extracapsule. If the tear is large, it is advisable to place multiple sutures to close the tear versus trying to approximate the tear with one wide mattress stitch.

A vertical mattress repair can also be accomplished by orienting the suture passes one above the other.

Protector Meniscus Suturing Technique II

For the most common meniscus tears located further posterior, where risk from needle injury to posterior neurovascular structures is present.

A small posterior extracapsular incision is made and the handle of the Needle Catcher is inserted anterior to the medial or lateral gastrocnemius tendon as a popliteal retractor and needle deflector during inside/out placement of Nitinol needles.



the needle through the meniscus across the tear and out through the capsule. The concave handle on the Needle Catcher, acting as a popliteal retractor, is positioned anterior to the gastrocnemius tendon and posterior to the posterior capsule to protect the posterior neurovascular structures. Once the needle tip is safely inside the Needle Catcher, remove the needle

holder and place it over the tip of the needle and pull the needle and one arm of the suture out of the joint.

Reposition the needle holder on the needle and slide the needle back into the cannula. Reposition the tip of the cannula on the meniscus approximately 5 mm anterior to the first suture pass and advance the needle through the tear. Load the anterior end of the suture into the wire loop on the needle and, once again, pull the needle through the meniscus and out of the joint. This will create a horizontal mattress stitch across the tear. The suture ends are then tied extracapsular. If the tear is large, it is advisable to place multiple sutures to close the tear versus trying to approximate the tear with one wide mattress stitch.

A vertical mattress repair can also be accomplished by orienting the suture passes one above the other. Current literature indicates that vertical suture placement results in repairs which are stronger than those incorporating horizontal mattress techniques.

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Tears located in the middle or posterior third of the meniscus can also be repaired from inside/out using the Arthrex system. With posterior tears, however, it is necessary to protect the saphenous or peroneal nerve from damage during posterior needle exit. To accomplish this goal, the concave handle on the Needle Catcher is positioned as a popliteal retractor to deflect the Nitinol suture needle away from the nerve as the needle exits the posterior capsule.

The malleable 2 mm placement cannula is shaped using the bending tool to accommodate variations in the contours of the tibial spine to precisely access the tear.

NOTE: Shape these contours gradually to prevent over-bending.

Preload the flexible Nitinol Suture Needle into the formed placement cannula and advance it until the needle tip is just below the cannula bevel. Lock the needle holder onto the proximal end of the needle with enough distance between the needle holder and the distal end of the cannula to permit unimpeded advancement of the needle through the meniscal tear and out through the joint capsule and into the Needle Catcher.

Insert the placement cannula through the contralateral portal and use the beveled tip to carefully approximate the most posterior segment of the tear first.

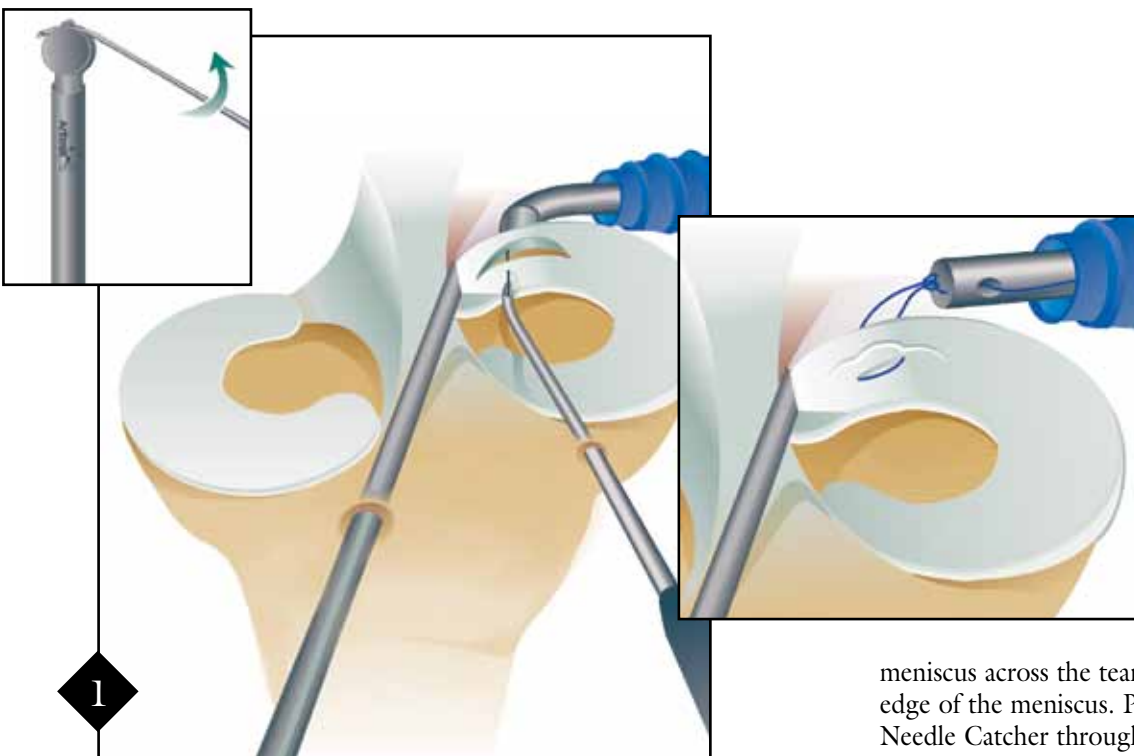
Load the desired suture into the wire loop on the distal end of the Nitinol Suture Needle. The surgeon may use either absorbable or permanent sutures depending on personal preference. However, suture diameter larger than #1 is not recommended for use with this system.

Once desired positioning has been obtained, advance

Protector Meniscus Suturing Technique III

For meniscus tears located near the posterior root of the posterior horn of the meniscus.

A posterior portal is created and the tubular end of the Needle Catcher is positioned through a cannula into the posterior recess behind the meniscus to catch the Nitinol Suture Needle as it exits the posterior aspect of the meniscus.



This technique, also known as the all-inside repair, is used specifically for peripheral posterior horn tears which are bordered posteriorly by a recess with the knee in flexion. It has several unique advantages over other methods.

1. This technique uses a posterior endoscopic portal, eliminating the need for a posterior incision. With the knee flexed to 90°, the saphenous and peroneal nerves are positioned well below the hamstring or biceps femoris tendon away from a properly positioned posterior portal. The posterior portal can be maintained using a Twist-In Cannula loaded on a Reusable Obturator.
2. All knots are positioned intracapsular against the posterior rim of the meniscus, eliminating any possible capsular shortening with resultant flexion contracture.

This repair places the cannula in the ipsilateral portal, and the malleable placement cannula is formed as necessary to easily access the tear. A 70° arthroscope is useful in these cases.

Pre-load the flexible Nitinol Suture Needle into the formed cannula and advance it until the needle tip is just below the cannula bevel. Lock the needle holder onto the distal end of the needle with enough distance between the needle holder and the distal end of the cannula to permit unimpeded advancement of the needle completely through the meniscal tear.

Load the desired suture into the wire loop on the distal end of the Nitinol needle. The surgeon may use either absorbable or permanent sutures depending on his or her personal preference. However, suture diameter larger than #1 is not recommended for use with this system.

Once desired positioning has been obtained, advance the needle through the

meniscus across the tear and out through the posterior edge of the meniscus. Place the tubular end of the Needle Catcher through the posterior portal cannula and push the needle into the lumen of the Needle Catcher. Continue to advance the needle into the Needle Catcher until the tip can be grasped and pulled through the joint. Take care to only extract one arm of the suture out of the cannula.

Reposition the needle holder on the needle and slide the needle back into the cannula. Reposition the tip of the cannula on the meniscus approximately 5 mm anterior to the first suture pass and advance the needle through the tear. Load the anterior end of the suture into the wire loop on the needle and pull the needle through the meniscus and out of the joint as before. This will create a horizontal mattress stitch across the tear. If the tear is large, it is advisable to place multiple sutures to close the tear versus trying to approximate the tear with one wide mattress stitch.

For a vertical mattress repair, remove the Needle Catcher after passing the first suture arm and insert a Suture Retriever through the posterior portal. Retrieve the other arm of the suture so that both arms exit through the posterior portal. Current literature indicates that vertical suture placement results in repairs which are stronger than those incorporating horizontal mattress techniques.

To close the defect, use a Two-Hole Knot Pusher to advance a slip knot through the posterior cannula until it is secure against the posterior meniscal margin below the weight-bearing area. Make sure that the suture is not twisted during knot advancement. Lock this slip knot in place with two or three overhand throws, and cut the suture using the Suture Cutter.

Protector Meniscus Suturing Set (AR-4060S)

(comes sterile and includes):

Malleable Curved Cannula w/Handle, qty. 1
Nitinol Suture Needle w/Wire Loop End, qty. 1
Adjustable Needle Holder, qty. 1

Accessories:

Needle Catcher	AR-6660
Cannula Bending Tool	AR-6650
Two-Hole Knot Pusher, 5 mm diameter for size #1 suture and larger	AR-1315
Meniscal Repair Rasp	AR-4130
Twist-In Cannula, 8.25 mm I.D. x 7 cm, sterile, qty. 5	AR-6530
Reusable Obturator for AR-6530, gold	AR-6531
Suture Retriever	AR-4030
Suture Cutter	AR-12250
2-0 FiberWire, 38 inches, sterile, qty. 12	AR-7221

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.



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