BIOTEK

Surgical Technique Guide

Meniscus Root Repair using ***SHUTTLE FERRY®*** ***and MR-FIX***

EU-MDR



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Root Repair using SHUTTLE FERRY® and MR-FIX

Meniscus Root tears are classified as tears or bony avulsions occurring within 10mm of the anatomical tibial attachment of the meniscus. These tears are typicallly found posteriorly but can also occur anteriorly, often as a result of intra-medullary nailing or ACL reconstruction. Lateral posterior root tears are frequently traumatic in nature, whereas medial posterior root tears are usuallly degenerative.

Meniscal root avulsions are challenging injury causing meniscal extrusion and loss of hoop stress distribution, which can lead to the development of knee arthritis. Meniscal root tears account for about 20% of all meniscal tears, representing a significant component within the spectrum of meniscus pathologies. Posterior roots of the menisci are more commonly affected than the anterior ones, Medial MRTs are most common.

Featured Technology

SHUTTLEFERRY®:

The Biotek **SHUTTLEFERRY®** suture passer and retriever is designed to enhance suture management in tight spaces of the knee joint.

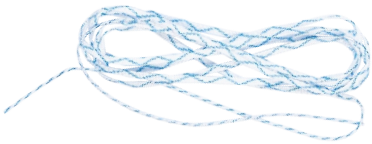
- **Low-Profile Jaw:** Allows for the seamless passage of BioFiber® sutures 2-0 , 0 and 2 & Fiber Tape size 1.1
- **Ergonomic Design:** Features a one-handed design that promotes efficiency in suturing and retrieval.
- **Single handle device:** Facilitates efficient suturing and retrieval in one step, eliminating the need for separate shuttling and retrieval processes.
- **Versatility:** Can accommodate a variety of suture configurations.



MR-FIX

- Low profile design
- Ideal for transtibial Meniscus root repair cortical suture fixation.
- Tapered button with collar easily fits on the tibia side
- Cutting edges on the both sides of the button helps easy passing and sliding of the sutures
- Dimensions 10 mm x 3.3mm





Surgical Technique

Medial Meniscus Root Repair

Step 1: Patient Positioning & Portal Placement

Create AM and AL portals adjacent to the patellar tendon. Consider an accessory medial portal based on the tear location. Position a high anterolateral portal near the patellar tendon to improve visualization of the posterior root attachments.

Step 2: Assessing Medial Meniscus Root Tear

Position the arthroscope in the intercondylar notch, medial to the PCL and lateral to the medial femoral condyle to obtain a direct view of the meniscal root attachment.

Probe the meniscal attachment to confirm the tear and assess mobility and scarring.

Notes:

- Medial meniscal root attachment is approximately 1 cm posterior to the apex of the medial tibial eminence.
- Consider performing a percutaneous pie-crusting procedure to release the MCL, either proximally or distally, for better visual access.
- Place the knee in extension and valgus with the leg holder.

Step 3: **Preparing the Tibial Bone Bed**

To prepare the tibial bone bed, use a **Meniscus Rasp (BAK-7199)** and **Meniscus Curette (BAK-7204)** to remove scar tissue and decorticate the posteromedial tibia at the site where the root will be reattached.

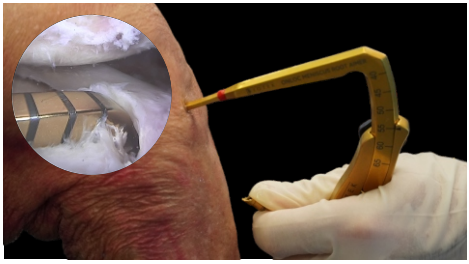
Ensure that decortication extends posteriorly to promote optimal healing.

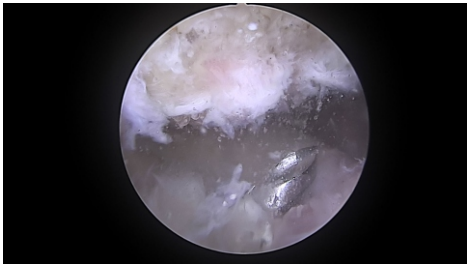
Step 4: **Preparing the Meniscal Body**

Release scar tissue on both the inferior and superior surfaces of the meniscus. Grasp the meniscus with a tissue grasper to check for mobility.

Step 5: **Tunnel Preparation**

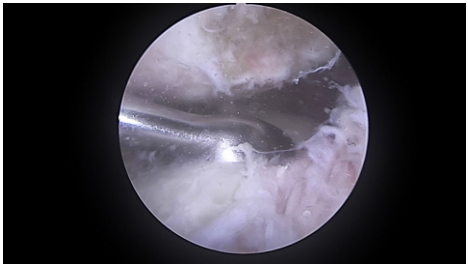
Position the meniscus in the desired anatomic location, ensuring no tension or extrusion. Place the **Biotek ONLoc® Meniscus Root Aimer (BAK-7035(e))** through the anteromedial portal.

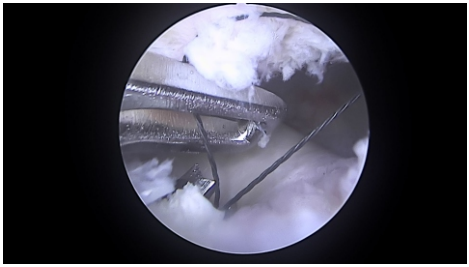




Drill a **2.4mm Beath pin (10132)** to the repair site, followed by over-drilling with a **4.7mm Endoscopic Reamer (BAK-7118).**

Utilize a curette to protect the posterior compartment during the drilling process.





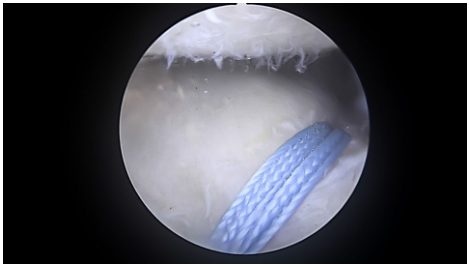
Remove the 2.4mm wire, leaving the 4.7mm Endoscopic Reamer loaded with a Nitinol loop.

Step 6: **Passing the First Tape**

Use the Biotek **SHUTTLE FERRY®** Suture Passer to pass a USP 0 BioFiber Suture through the posterior horn of the meniscus,

Retrieve a Nitinol loop through the cannula using a suture retriever.





Pass the ends of the **1.1 mm BioFiber Tape** which passed through the root tissue, through the loop to shuttling down the tibial tunnel.

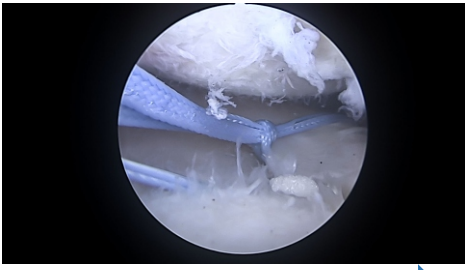
Verify suture placement with a probe.

Note: If needed, use a cannula into the anteromedial portal to avoid suture entanglement.

Step 7: **Passing the Second Tape**

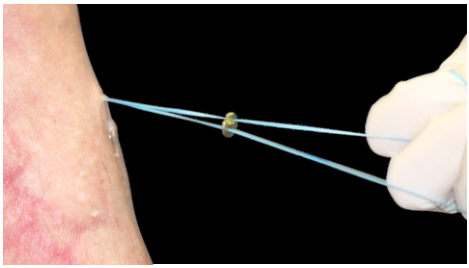
Repeat the tape passing process using the **SHUTTLE FERRY®** I Suture Passer Mini. Apply gentle traction on the first tape to aid in positioning the second tape.

Shuttle the second tape down the tunnel and probe the meniscus while flexing and extending the knee to verify release and mobility. Consider passing a third tape if necessary.



Step 8: **Suture Fixation**

Using MR-FIX Tapered Round Fixation Button



Tie the root repair sutures over a **MR-FIX** tapered round fixation button on the anterior tibial cortex and pass two limbs of the first suturetape through the open slots and the other two limbs of the other Fiber Tape through the remaining two holes of the MR-FIX.

Using VIM-FIX®- LRP anchor

Achieve suture fixation by creating pilot holes using a **T-Handle Tap (10038)** little inferior on tibia.

Load the distal ends of the repair tapes into the eyelet of the anchors and insert the anchors into the pilot holes. Gently tap the anchors and secure the retention sutures well by tightening the anchor.

Note - Lateral Meniscal Root Tears

Note that lateral meniscal root tears are often associated with ACL tears. Visualize from the anterolateral portal, with most of the work performed from the anteromedial portal.

Repair lateral root tears before placing the ACL graft. Remember that access is generally easier for lateral root repairs due to their proximity to the lateral tibial eminence. Consider an accessory lateral portal if needed.

Ordering information

Cat Code	Description
10119	MR-FIX Tapered Round Fixation Button
10291	BioFiber® Fiber Tape, Size 1.1 Blue–Black, Len. 38"
10290	BioFiber® Fiber Tape, Size 1.1 White–Black, Len. 38"
BF-2WC	BioFiber® Fiber USP Size 2 with MO-6 needle, White–Blue, Len. 36"
BF-2W	BioFiber® Fiber USP Size 2 with MO-6 needle, White, Len. 36"
BAS-9142.475F	VIMFIX®-LRP Ligament Anchor, PEEK knotless, Dia. 4.75mm
10160	BIO-VIM®-LRP Bioabsorbable Ligament Anchor, Knotless, PEEK Tip, Dia. 4.75mm
BAS-9025	Suture Retriever
BAK-7204	Meniscus Curette
BAK-7199	Meniscus Rasp
BAK-7118	Endoscopic Reamer
BAK-7065	Arthroscopic Probe
BAK-7035(e)	ONLoc® Meniscus Root Aimer
10511	SHUTTLE FERRY® I Suture Passer Mini for Knee
10513	Needle for SHUTTLE FERRY® I – Suture Passer Mini for Knee (Nitinol)
10132	Suture Passing Pin, Trocar- Tip
10038	Tap for VIMFIX-PK® Dia 4.5mm & 5.5mm and VIMFIX-LR Dia 4.75mm & 5.5mm

Disclaimer:

The information in this document is for educational purposes only. It is not intended to serve as comprehensive medical advice or a full description of the procedure. It is the responsibility of the operating surgeon to determine and utilise the appropriate products and techniques in accordance with their clinical experience and evaluation of each patient. Review and understand all product and safety information including indications for use, contraindications, effects, precautions and warnings.



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