Technique Guide



Arthroscopic Meniscus Repair Inside-out Technique BIOCINCH[®]



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Technique Guide



1. Introduction

Medial and Lateral meniscus are 'wedge shaped' fibrocartilaginous structures, which act as a 'shock absorber' of the knee joint. Both are cartilaginous tissues that provide structural integrity to the knee when it undergoes tension and torsion. They are tough and rubbery to help cushion the joint and keep it stable.

Preservation of meniscal tissue has been proven to be the best approach in most cases of meniscal tears. Some meniscus tears can be repaired by suturing (stitching) the torn piece together. Whether a tear can be successfully treated with repair depends upon type of tear, as well as overall condition of the injured meniscus.

Meniscus has 3 zones:

Outer zone: Red-Red zone - Zone 1

Meddle zone: Red-White zone - Zone 2

White-White zone -Zone 3 Inner zone:

Zone 1 and Zone 2 has good chances of healing if required properly.

The inside-out and all-inside techniques have evolved for meniscal repair and are particularly useful to address posterior horn lesions. The inside-out technique allows for fine precision, a greater number of sutures, and the advantage of not having a prominent intra-articular device.

BIOCINCH Meniscal Repair Kit (Meniscal repair set with needles; Fiber USP Size 2-0/0, suture Len. 75cm, straight needles-2 units, needle Len. 25cm) allows surgeons to repair meniscal tears with inside-out arthroscopic technique.

BIOCINCH MENISCUS REPAIR (INSIDE-OUT TECHNIQUE) INSTRUMENT PRODUCT RANGE

BAK-7198 Curved Probe for Meniscus Repair BAK-7199 Meniscus Rasp BAK-7204 Meniscus Curette BAK-7200 Guide Sleeve (Double Lumen) for Meniscus Repair, Straight BAK-7201 Guide Sleeve (Double Lumen) for Meniscus Repair, Curved, Left BAK-7202 Guide Sleeve (Double Lumen) for Meniscus Repair, Curved, Right BAK-7211 Guide Sleeve (Single Lumen) for Meniscus Repair, Straight BAK-7212 Guide Sleeve (Single Lumen) for Meniscus Repair, Curved, 10° BAK-7213 Guide Sleeve (Single Lumen) for Meniscus Repair, Curved, 20° BAK-7214 Guide Sleeve (Single Lumen) for Meniscus Repair, Curved, 30° BAK-7215 Guide Sleeve (Single Lumen) for Meniscus Repair, Curved, 40° BAK-7205 Needle Pusher BAK-7206 Sleeve Bender BAK-7217 Graphic Case for Meniscus Repair Instruments





2. Preoperative Information

Recognition of the meniscus tear, location and pattern. (Radiographic views & Magnetic resonance Imaging - MRI). Various patterns of the meniscus tear can be identified preoperatively for proper surgical planning e.g. Bucket handle meniscus tear, longitudinal tear, complex tear, peripheral tear, discoid meniscus etc.

3. Anesthesia & Positioning

- General, regional, or spinal anesthesia based on patient's anesthesiologist's and surgeon's preference is discussed preoperatively.
- The patient is placed supine on a standard operating room table with the knee distal to the break in the table, which allows for easier access to the posteromedial or posterolateral knee when the foot of the table is flexed.
- A high tourniquet is applied, and a leg holder or lateral post is applied depending on surgeon preference.
- 3.1 Examination under Anesthesia
 - Examination under anesthesia; before the start of the procedure is performed to evaluate range of motion and access for ligamentous instability.
 - A standard complete diagnostic arthroscopy is performed. Injuries to the chondral surfaces or intra articular ligaments must be addressed in conjunction with the meniscus repair.
 - Results of meniscus repair is better if joint is stable.

4. Surgical Technique

- 4.1 Diagnostic Arthroscopy
 - An initial diagnostic arthroscopy is performed with traditional anterolateral and anteromedial portals.

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- The location of the portal needs to be tailored to the location of the tear. The anteromedial portal is made with the aid of a spinal needle to optimize its position and access to the medial or lateral compartments. The location of the portal can be visualized directly by insertion of a spinal needle medial to the patellar tendon. The spinal needle should enter medial compartment superior to the medial meniscus and parallel to tibial plateau.
- A Meniscal Curved Probe (BAK-7198) is then placed within the working portal and the reparability of the meniscustear is assessed.

4.2 Meniscus Tear Preparation

• The torn meniscus amenable to repair is prepared with a meniscus rasp (BAK-7199) or mechanical shaver to



stimulate vascularity within the tear. Granulation tissue debridement on both sides of the tear is performed with a mechanical rasp or alternatively, a 3.5 mm full-radius shaver.

- Rasping or shaving of the perimeniscal synovium superior and inferior the tear site is performed as vascular infiltration from this adjacent tissue often contributes to a successful healing response.
- 4.3 Planning of the Incision
 - An arthroscopic probe is pressed against the capsule at the junction of the middle and posterior portions of the meniscus to facilitate accurate placement of the posteromedial of posterolateral incision.
 - The tip of the probe is usually palpated at the posterior aspect of the joint line before an incision is made.

4.4 Exposure

- 4.4.1 Posteromedial
 - A vertical 3 to 4 cm incision is made posterior to the medial collateral ligament, extending one third above and two thirds below the joint line, with the knee flexed 60 to 90 degrees.
 - The incision is carried through the skin, and dissecting scissors are used for subcutaneous dissection.
 - Dissection continues to the level of the sartorial fascia. The fascia is incised sharply with a scalpel at the superior and the anterior margin of the sartorius, and the pes tendons are identified and retracted posteriorly.



• A popliteal retractor is then placed within the interval for protection of the popliteal neurovascular structures.

4.4.2 Posterolateral

- A vertical 3 to 4 cm incision is made over the posterolateral joint line, just posterior to the lateral collateral ligament (LCL), with one third of the incision above and two thirds below the joint line with the knee flexed 90 degrees. Flexion of the knee to 90 degrees allows the posterior nerve, popliteus artery and inferior geniculate artery to fall posteriorly.
- Dissection is carried through the skin, and dissecting scissors are used to dissect the

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subcutaneous tissues. The interval between the iliotibial band and the biceps femoris tendon is identified and sharply incised with a scalpel. (Care must be taken to avoid injury to the inferior lateral genicular artery, which runs in this area. The biceps tendon is retracted posteriorly and serves to protect the peroneal nerve.) Blunt dissection with the surgeon's finger allows direct palpation of the posterolateral capsule and the lateral head of the gastrocnemius.

- A popliteal retractor is placed at the posterior margin of the capsule and separates the posterolateral capsule medially from the lateral head of the gastrocnemius laterally.
- 4.5 Suture Placement
 - Before the repair is attempted, a complete evaluation of the lesion is performed including size, stability, and state of the meniscus, as well as type and zone of the lesion. Typically, lesions that measure between 1 and 4 cm and are in the red-red zone or red-white zone can be repaired. The tear should be anatomically reduced, and the sutures should be placed perpendicularly to the lesion to restore its anatomic position.
 - The meniscal body fragment is reduced with a probe in preparation for suture repair. Guide sleeves (BAK-7200/ BAK-7201/BAK-7202/BAK-7211/BAK-7212/BAK-7213/ BAK-7214/BAK-7215) are used to place suture into the medial meniscus or lateral meniscus from the anterolateral portal or anteromedial portal respectively.
 - The arthroscope remains in the ipsilateral portal for viewing; the contralateral portal is used for suture placement in the anterior and central horns of the meniscus during repair. Viewing and working portals may need to be switched for placement of posterior horn sutures.
 - Suture placement begins at the posterior extent of the identified tear and gradually extends to the anterior margin
 - BIOCINCH[®] (Meniscal repair set with needles, Fiber USP Size 2-0/0, suture Len. 75cm, straight needles-2 units, needle Len. 25cm) is used for the repair. Double arm meniscal repair needles are delivered into the joint and guided into position with the curve cannula system. The curve of the cannula should be directed medially for a medial meniscus tear and laterally for a lateral meniscus tear to facilitate exit into the popliteal retractor.





• A single limb of the suture is initially passed through the meniscus above the tear, push the needle with needle pusher (BAK-7205) and retrieved as it

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exits within the popliteal retractor.

- The remaining limb of the suture is placed in a similar manner, below the tear, to form a vertical mattress stitch. The suture pair is held with a clamp to facilitate suture management.
- Suture are placed sequentially from posterior to anterior until the full extent of the tear has been addressed. Suture are placed at 3 to 5 mm intervals.
- Make an incision on the skin up to the joint capsule where the sutures come out through skin. Cut the needles from sutures.
- Suture limbs are tied one by one through the posteromedial/posterolateral safety incision. While tying the knot the surgeon has to make sure that the knot is pushed down till the joint capsule, and it is not stuck in subcutaneous tissue.
- Re-look arthroscopy should be done in the end to see tension of the stitches and meniscus reduction.
- 4.6 Suture Tying
 - The sutures are serially tied from posterior to anterior against the capsule, with care taken not to overtighten or to deform the meniscal body. sutures can be tied immediately, or several sutures can be clamped and tied as a group at one time.
 - A fibrin clot may be placed within the meniscal tear, particularly for tears that extend to the avascular zone before the suture are tied.
 - The knee is taken through a full range of motion and visualized for gap formation or suture breakage.
- 4.7 Closure

The arthroscopic portals are closed in the standard fashion, and the accessory wound is closed in layers with suture material according to surgeon's preference. Closure of the subcutaneous tissue and skin occurs in 2 separate layers. After the wound is dressed, a brace locked in full extension is placed in the operating room.



- 5. Important points
 - Tear location and the knee ligamentous stability are the most important factors that determine successful meniscus outcome.
 - The anteromedial working portal should be made based on meniscus repair location.

6. Ordering Information

Catalog No.	Product Description
BAK-7196	BIOCINCH [®] Meniscal repair set with needles Fiber USP Size 2-0, suture Len. 75cm straight needles-2 units, needle Len. 25cm
BAK-7216	BIOCINCH [®] Meniscal repair set with needles Fiber USP Size 0, suture Len. 75cm straight needles-2 units, needle Len. 25cm

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