

Tools of the Trade features reviews of the hottest new products, with surgical pearls written by surgeons who know these products best.

All-Inside Meniscal Repair Devices

Arthrex, Inc. (<http://www.arthrex.com>) Knee Scorpion



The Arthrex Knee Scorpion allows for simple passage of suture at the root to repair the tissue. The mechanism of the Knee Scorpion self-retrieving the suture after passage eliminates the need for another step in the procedure, which saves time. There are various types of suture configurations that can be incorporated into meniscus repairs with the Knee Scorpion. Depending on tissue quality and location, I will either pass the center of the suture to create a cinch or luggage tag type of stitch, or sometimes a simple stitch.

A challenging meniscal tear pattern that repair is particularly made easier by use of the Knee Scorpion is the radial tear of the lateral meniscus. Here it is easy to place a side-to-side "spanning" circumferential suture pattern, which is the strongest suture configuration, and it reduces the tissue very well. This approach also is ideal for variant root type tears, those that are 3 to 4 mm from the root commonly seen with the lateral meniscus associated with anterior cruciate ligament tears.

Benefits: The Knee Scorpion has a very low profile to facilitate placement in the joint with a 5° upcurve to avoid injury to the femoral condyle. The needle captures the suture after passage, which saves time and an additional surgical step. It can be used with both 0 Fiber-

Wire and 2-0 FiberWire.

Surgical pearl: Using a cannula through the working portal prevents any tissue bridge when passing and tying sutures. I prefer a Passport button cannula since its flexibility allows more access in different planes compared to a rigid type cannula.



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Arthrex, Inc. (<http://www.arthrex.com>) SpeedCinch



The SpeedCinch's pistol grip design permits ergonomic, one-handed all-inside meniscal repair. It is best suited for meniscal tears of the posterior horn and body. The posterior horn of the meniscus can be repaired with the SpeedCinch inserted through either the ipsilateral or contralateral portal. Meniscal body tears, however, are best approached via a contralateral portal. The end of the device contains a 15g needle that should be advanced across the meniscus. After passage of the needle, the first implant is pushed through the needle when the trigger is fully deployed.

Next, the SpeedCinch needle should be moved at least 1 cm for placement of the second implant in either a horizontal or vertical mattress fashion. After the needle is brought to the second insertion site, the implant selector button is moved to 2 and the trigger

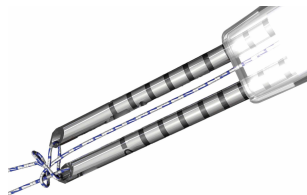
is depressed until the first click is felt and heard. Next, the trigger is held in place after the first click and the needle is advanced across the meniscus before fully depressing the trigger, which will advance the second implant. The device is then removed and the pre-tied knot is secured with a knot



pusher and then cut.

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Cayenne Medical, Inc. (www.cayennemedical.com) The CrossFix II System



The CrossFix II System offers a unique, all-arthroscopic, suture-only meniscal repair that reduces the risk of chondral injury. Its "all-inside" technique uses 2 parallel suture delivery needles, available in both curved and straight designs, inserted through a single incision to provide an all-inside meniscus repair. This simple procedure can be performed in minutes via the device's pre-tied, sliding knot, creating a "suture only" mattress stitch that replicates the repair of standard open suturing techniques. The speed and reproducibility of the repair dramatically improves operating room efficiency. Even complex girth tears requiring multiple sutures can be repaired in minutes.

Benefits: All-suture, no implants; single insertion; pre-tied, sliding knot. Parallel

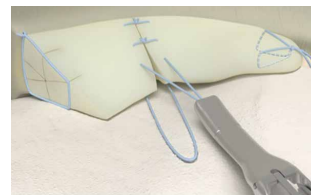
needles may be difficult to use in very tight knees.

Surgical pearl: Avoid torquing the needles upon insertion into the meniscus.



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Ceterix Orthopaedics, Inc. (www.ceterix.com) NovoStitch Plus



The Ceterix NovoStitch Plus enables surgeons to place circumferential compression stitches around meniscus tears. These stitch patterns are designed to provide anatomical reduction and uniform compression of the tear edges, and repair the femoral surface (top) and tibial surface (bottom) of the tear with each stitch. It is also designed to eliminate neurovascular risk and avoid excessive entrapment or extrusion of the meniscus to capsule. The NovoStitch Plus passes circumferential stitches via an all-inside arthroscopic technique. In addition to anatomically repairing vertical tears, circumferential stitches also enable repair of tear types that were previously considered difficult to adequately sew.

Benefits: Passes both sides of the stitch with 1 insertion (avoids tissue bridges and girth hitches). Retractable lower jaw (allows access to tight knees, and allows removal from knees with mobile menisci). Needle extends into

the posterior gutter through the tip of the lower jaw (does not touch chondral surfaces). Smaller lower jaw tooth (easier insertion of the lower jaw under the meniscus). Upper jaw curved to follow the shape contour of the femoral side of the meniscus and femoral condyle. Compared to hybrid all-inside devices, inside-out and outside-in repairs. Enables anatomical reduction and uniform compression. Each stitch repairs the top and bottom of the tear. Designed to eliminate neurovascular risk. Avoids excessive capsular entrapment. Repairs effectively in front of the popliteal hiatus. Enables side-to-side radial tear repair, and top-to-bottom horizontal tear repair. Significantly smaller needle than used by hybrid all-inside devices.

Surgical pearl: A spinal needle should be used to establish the skin incision location of the working portal. The optimal skin incision location is one where a spinal needle can be inserted such that the distal end of the needle is parallel to the region of the tibial plateau under the meniscus.



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Mitek Sports Medicine (www.depuysynthes.com)

Mitek Omnispan



The Mitek Omnispan Meniscal Repair System is an all-inside arthroscopic meniscal repair device. It consists of a low profile needle, pre-loaded with 2 PEEK backstops and No. 2/0 Orthoc-

ord High Strength Orthopaedic Suture, which is delivered using the Omnispan System Applier. The needles come in 3 angles (0°, 12°, and 27°) and the Applier is a single-patient, multi-use design, meaning the same Applier can be used for multiple implants with a single patient. The needles also have a safety sleeve over each set of implants to prevent delivery failure. Once the needle is attached to the Applier, the device is inserted into the knee. Using the gray trigger, the first implant is delivered into the meniscocapsular region. The red trigger is then pulled, advancing the second implant. Once appropriate positioning of the second implant is determined, the gray trigger is fired again. The surgeon pulls on the sliding knot advancing the suture through the implants creating a suture bridge over the tear. The final repair consists of Orthocord Suture spanning the meniscus, while the PEEK backstops are embedded in the meniscocapsular area only.

Surgical pearls:
An adequate portal opening is paramount for successful implementation. I widen my portal with an instrument clamp to allow easy passage of the Applier. It is usually necessary to switch the camera back and forth between both portals to gain access to the angles needed to create the repair. I also always use a skid when inserting the Applier to prevent soft tissue impingement.

The surgeon should always check to make sure the implant is properly loaded on the back table, ensuring it is fully inserted into the locking

mechanism and loaded in the correct direction.

The surgeon should hold the Applier firmly when firing the gray trigger, as some kick-back does occur.

The Applier should remain in the joint throughout the advancing and deployment of implants, so the surgeon can maintain visualization with the scope. Once the implants are in position, I then remove the Applier from the joint space.

Use a probe to place counter-pressure on the meniscus when tightening the suture. The sliding suture system is a double-loop design. In order to smoothly advance the suture, I recommend that a probe be placed on the smaller loop closest to the meniscus, so that when the suture is tightened, the probe is under the smaller loop. A gentle back-and-forth pulling maneuver between the free suture and the probe creates a smooth transition during tightening.



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Smith & Nephew Inc. (www.smith-nephew.com) FAST-FIX 360



The FAST-FIX360 design enables you to deploy implants in any hand position—vertically, horizontally on either side of the meniscus—with a fast, smooth advancing motion. This spring-action design facilitates

the advancement of each implant into the capsule. Smaller implants and pre-tied, self-sliding knots made of ULTRA-BRAID 2-0 Suture create smaller needle insertions, reducing disruption to the meniscus. Low-profile, stiffer needle shaft improves control while enabling access and visibility to hard-to-reach areas of the meniscus. Set needle depth penetration from 10 mm to 18 mm with the push of a button. The FAST-FIX 360 System has biomechanical properties that best reproduce the vertical mattress suture technique.

Surgical pearl: Assess tear pattern and reparability, then reduce and template repair construct and suture points. Precisely select portal insertion sites, ensuring perpendicular vector needle delivery at the repair site. Measure the meniscal fragment size and rim width, setting the depth penetration limiter (usually set to 15 to 18 mm). Insert first anchor posteriorly and superiorly or away from the insertion portal and then after deployment, insert the second anchor anteriorly and inferiorly or into the “near” tear fragment. Tension the suture using the knot pusher/cutter as a “suture stent” to manually “pull and push” the suture, compressing the repair construct and coapting the tear. Avoid “over-repairing” the tear by spacing out sutures at 3 mm to 5 mm and alternating femoral and tibial undersurface placement.



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