



MPFL Technique

Medial Patellofemoral Ligament
Reconstruction - utilising a
Infinity-Lock™ 5mm Tape

Surgical Technique Manual

Introduction

This technique describes a minimally invasive, anatomic MPFL reconstruction using a modern, synthetic graft, avoiding the need to harvest a medial hamstring. This avoids donor site morbidity, decreases pain and improves rehabilitation. The synthetic graft is fixed to the proximal medial border of the patella, with two 2.4mm suture anchors. This fixation technique eradicates the risk of patella fracture. Femoral fixation is achieved with a soft threaded PEEK Interference screw into a femoral socket at Schöttle's point.

Deo et al. have published a series of 85 cases using synthetic graft with a mean follow-up of 5 years, demonstrating significantly improved post-operative outcomes in knee function, no dislocations or patella fractures and no knee stiffness¹.

Xiros would like to thank Mr Hersh Deo, Consultant Trauma and Orthopaedic Surgeon, James Paget University Hospital, for his work in developing this technique.

Reducing Complications

Judicious patient selection and meticulous surgical technique is vital, in order to reduce complications following MPFL reconstruction².

Indications for the technique

This technique covers reconstruction of the medial patellofemoral ligament in adult cases of recurrent patellar dislocation (minimum of 2 dislocations).

Refer to the [IFU](#) for the full list of indications for Poly-Tape family.

Cautions

The surgeon is responsible for determining if the patient has any structural or pathological condition of the bone or soft tissue that would be expected to impair healing or prevent secure fixation. Caution is advised in patients with the following conditions:

- Patella alta
- Tibial external rotation
- Trochlear Dysplasia
- Femoral internal rotation (anteversion)
- Severe valgus / recurvatum
- Patellofemoral osteoarthritis

Refer to the [IFU](#) for the full list of contra-indications for Poly-Tape family.

Implants

Supplied by Xiros:

- Infinity-Lock 5mm Tape product number: 102-1098

Not supplied by Xiros:

- Two suture-anchors, such as Iconix* (Stryker*)
- Soft-threaded PEEK interference screw, 6x25mm (or 7x25mm if the bone quality is poor)

Instrumentation

- Arthroscopy equipment with shaver (+/- radiofrequency wand)
- Basic orthopaedic set
- Power tool
- Beath pin and 6mm reamer

Surgical Technique

PREPARATION AND INSPECTION

Position the patient supine on the operating table with a side support and foot bolster so that the knee can be fully extended or held at 90 degrees of flexion.

EUA findings should be noted.

Note: It is recommended that patients are placed on prophylactic antibiotics prior to surgery, to minimise the risk of latent infections developing at the implant site. Use aseptic technique throughout the procedure.

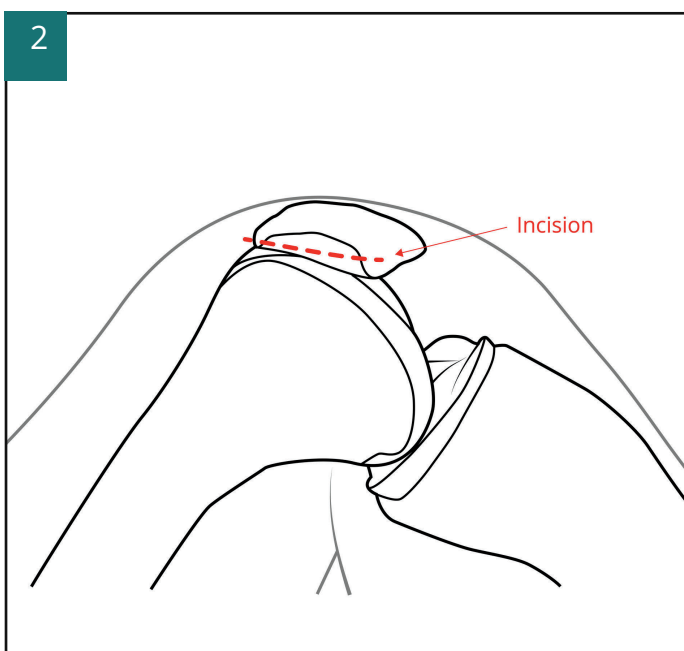
RECOMMENDED APPROACH



Preparation

Test and record the patella stability in both knees at 0 and 30 degrees of flexion. Draw the outline of the patella and the line of the medial incision.

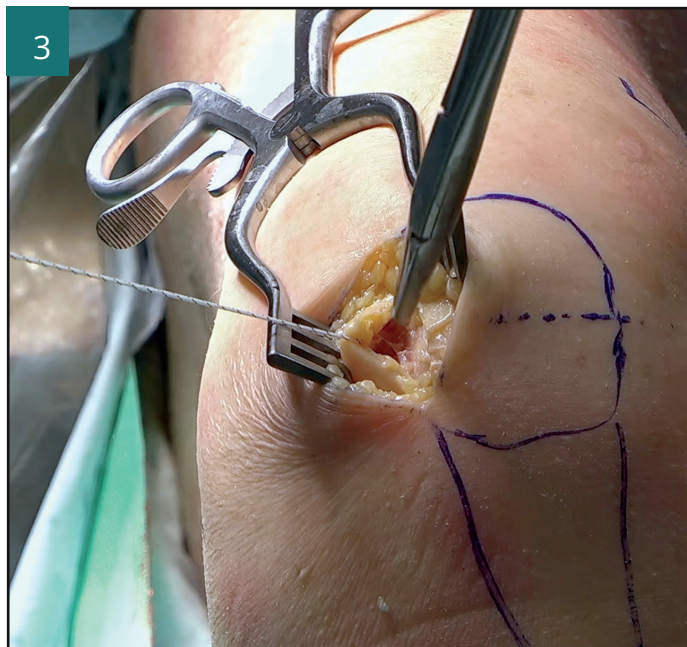
Fig. 1 Leg in position with patella, proximal tibia and line of first incision marked. The transverse dotted line is the half way line of the patella. Incision should be proximal to this.



Incision

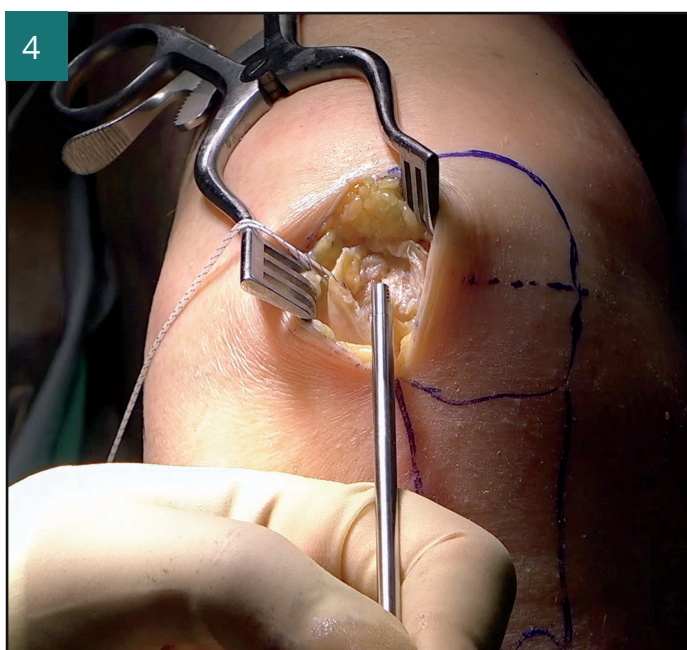
Make a longitudinal incision, exposing the medial border of the patella, the graft will be fixed to the proximal half of the medial patella.

Fig. 2 Longitudinal incision exposing medial border of the patella.



Gently incise layer 2 using a scalpel, being careful not to penetrate the capsule. Use a long dissecting scissor to develop a passage between layers 2 and 3 (the capsule) from the medial patella down to the level of the medial epicondyle. Place a stay suture through the edge of layer 2 to mark the entrance, allowing the tunnel to be opened when it is needed.

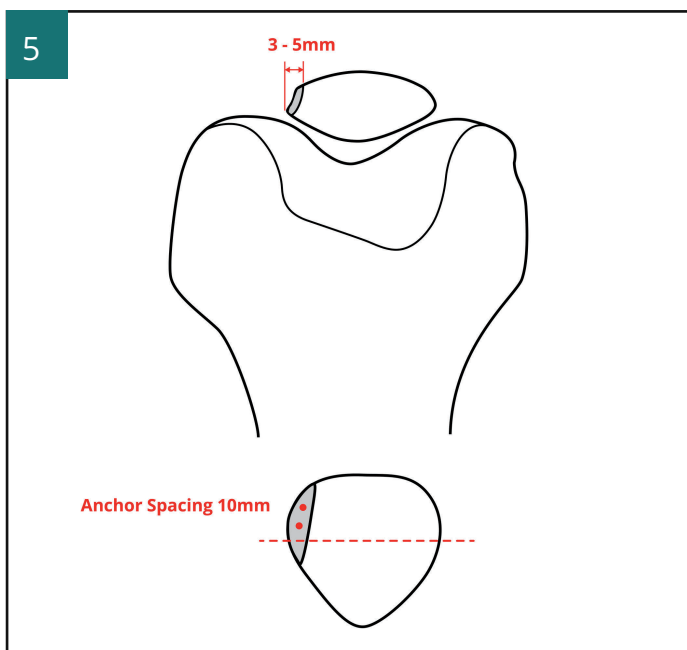
Fig. 3 Soft tissue tunnel between layers 2 and 3 with stay suture through the edge of layer two.



Patella Preparation

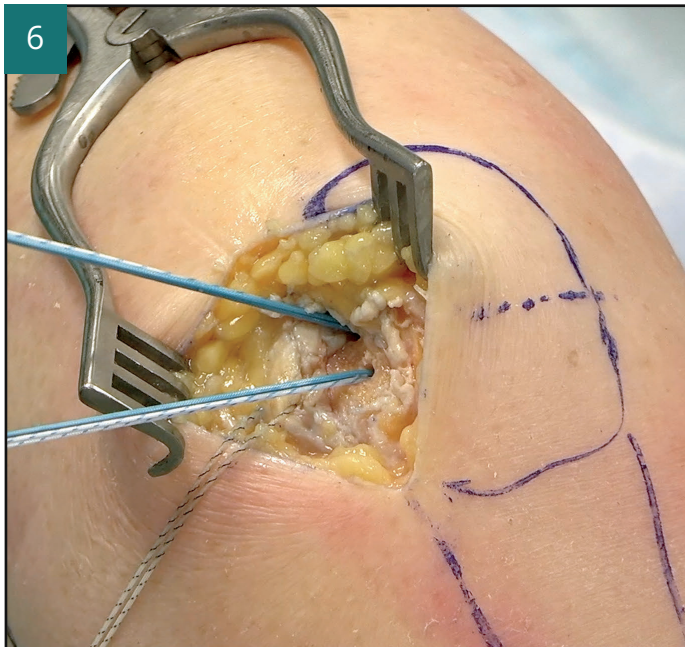
Dissect the periosteum off the medial border of the proximal half of the patella using sharp dissection to expose cortical bone. Create a shallow trough into the sub-cortical bone, using a burr or arthroscopic shaver handpiece.

Fig. 4 Creating a shallow trough using an arthroscopic shaver blade.



The trough should be positioned to allow placement of 2 suture anchors, in the proximal half of the patella, 10mm apart.

Fig. 5 Trough on the medial border of the proximal half of the patella.

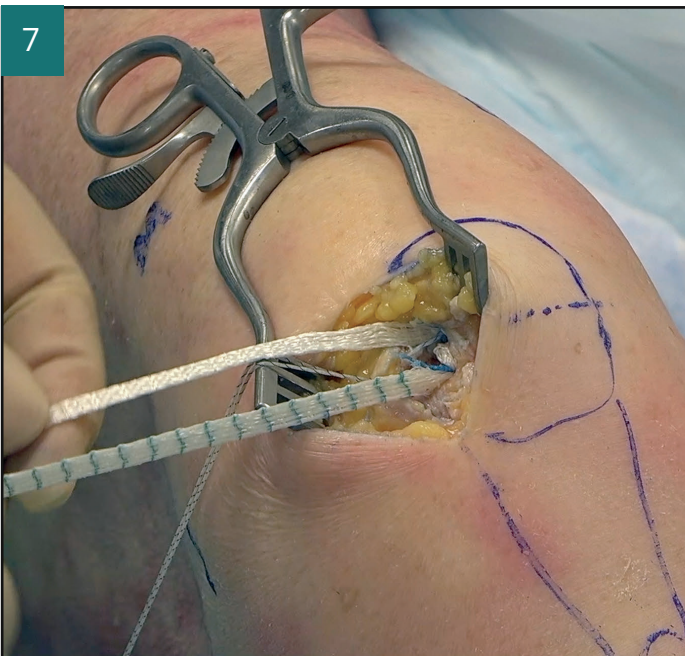


Patella Fixation

Prepare the Infinity-Lock 5mm Tape by removing it from its packaging, and reducing the cinch loop by pulling the 2 ends apart to turn it into a straight tape.

Place the two suture anchors 10mm apart at the base of the trough, according to the manufacturer's instructions. This gives enough strength (approx. 500N pullout) in securing the graft and avoids the need to drill through the patella (the leading cause of patella fractures)

Fig. 6 Suture anchors attached into the base of the medial trough, before removing excess sutures.



Attach the midpoint of the graft into the trough by tying the anchor sutures over the graft.

The graft can be wrapped in a vancomycin-soaked gauze whilst preparing the femoral socket

Fig. 7 Infinity-Lock 5mm Tape attached to suture anchors.



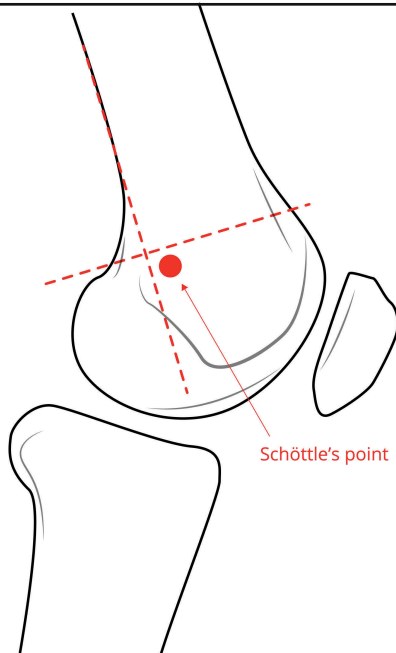
Identifying the Femoral Attachment Point

Femoral attachment site is the main determinant of a successful postoperative outcome. The graft needs to be attached close to Schöttle's point. Use of an image intensifier is recommended to find Schöttle's point.

If using, manoeuvre the image intensifier for an over-the-top lateral view of the distal femur as shown, with the operator on the medial side of the knee. It is important to get a true lateral view, with the femoral condyles overlapping, adjusting the image intensifier position and angle until this is achieved.

Fig. 8 Schöttle's Point identified with image intensifier.

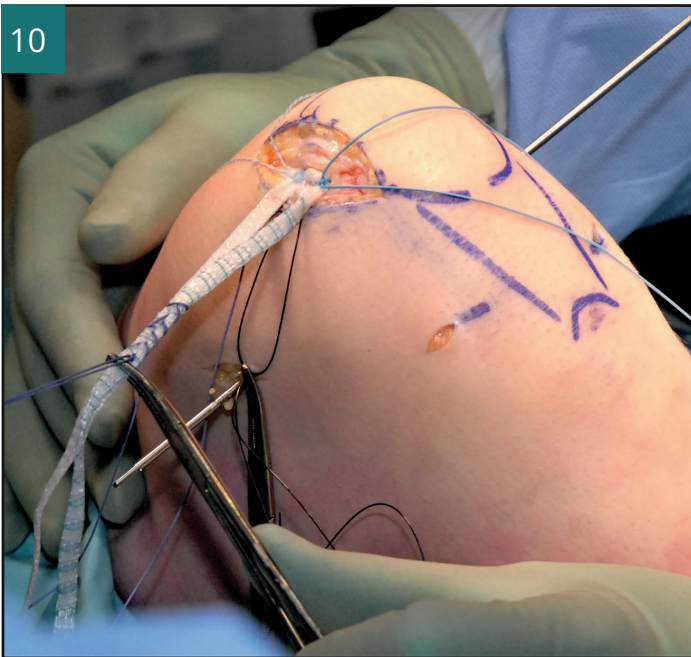
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Hold a passing pin (Beath Pin) with a clamp and use the image to position the tip of the pin at Schöttle's point³. Make a 10-20 mm longitudinal incision at this point and dissect soft tissue down to the periosteum. Drive the pin through the femur, in a slightly anterior and slightly proximal direction, using a wire driver. The pin should penetrate through the lateral cortex until about 20 mm is left protruding medially.

Fig. 9 Schöttle's point is situated 1.3 mm anterior to a tangent line along the posterior femoral cortical line and 2.5 mm distal to a perpendicular line, intersecting the most proximal part of the medial epicondyle. The overlapping condyles indicate true lateral view.

10



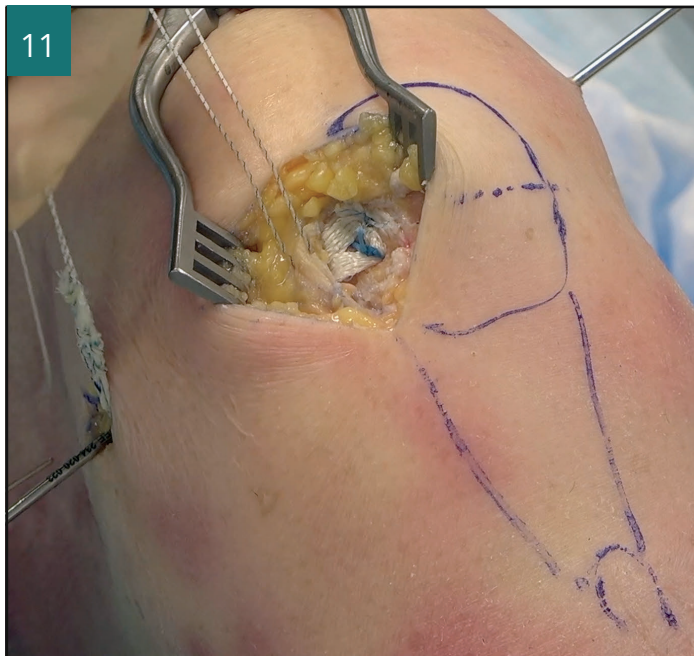
Femoral Preparation

Make a socket in the medial femur with a 6mm cannulated reamer to a depth of 25mm or 30mm, depending on the selected screw length. Clear the periosteum around the tunnel entrance to aid graft insertion.

Hold the two tails of the Infinity-Lock 5mm Tape down to the Beath pin. With a marker pen, mark where it crosses the pin and mark 20mm past the pin. Overlap the 2 limbs and whipstitch starting from the outer mark to the inner mark and back again (1 Vicryl*, for example). The tape should now form an anatomic triangular graft, with the base at the medial patella and the point at the passing pin entry point. The whipped end should extend 20mm beyond the protruding medial passing pin.

Tie off the whip stitch suture, remove the needle and keep it long. Trim the excess length of the Infinity-Lock 5mm Tape at the outer mark and discard the cut pieces.

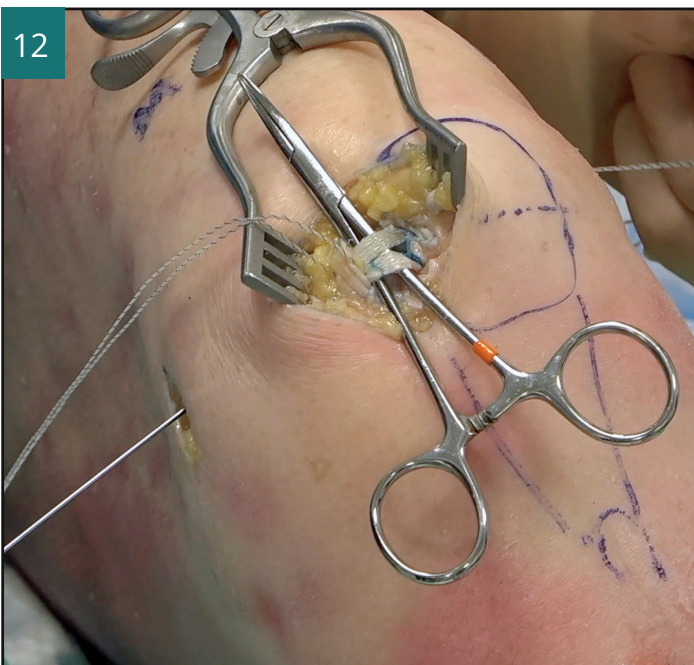
Fig. 10 Infinity-Lock 5mm Tape whip-stitched beyond Schöttle's point.



Placing the Graft

The passage between layer 2 and 3 needs to be developed and fully opened. Do this by placing a clip in the passage from the patella incision to the medial incision and opening the clip. Pull a looped passing suture (1 Ethilon*, for example) from the medial incision and out of the patella incision using the clip. Pass the ends of the whip sutures into the passing loop and pull to deliver the whip suture, then the graft, through the passage. The Infinity-Lock 5mm Tape should now be emerging from the medial incision.

Fig. 11 Infinity-Lock 5mm Tape in place in passage and emerging from medial incision.



Adjusting Graft Tension

Before docking the graft into the femoral socket, place a clip under the limbs of the tape at the patella border to create some slack, this ensures that the graft is not under any tension in normal movement.

Place a guide wire for the interference screw into the femoral socket (nitinol wire) next to the Beath pin.

Tip: Ensure that the nitinol wire is placed into the femoral socket before removing the Beath pin. The knee should not be ranged until the Beath pin is removed.

Fig. 12 Clip placed under the patellar end of the Infinity-Lock 5mm Tape completely de-tensions the graft in flexion and prevents over-tightening. The femoral end of the tape has been inserted in the screw hole, the guide wire can be seen entering the hole; the surgeon's hand is holding the whip-stitch suture on the lateral side, to keep the graft docked in place.

Thread the whip stitch suture limbs through the eyelet of the passing pin and firmly pull the pin out of the lateral femur with pliers, delivering the whip stitch to the lateral side. By pulling on the whip stitch, the end of the graft can then be docked into the femoral socket under direct vision. The clip at the patella prevents overtightening as the graft is docked.

Tip: Ensure the graft is fully docked in the femoral socket, the tape can be levered slightly back out with a clip, then the lateral sutures pulled firmly to re-engage the graft with a definite "clunk" as the graft docks.

Take the knee through the full range of movement. Test the tension of the graft in full extension with the clip still attached before committing to fixing the graft to the femur. If the other knee is normal, the lateral glide can be compared to that knee for the extent of lateral movement with a firm end point.

Fixing the Graft

Advance a 6x25mm (or 7x25mm in soft bone) PEEK interference screw over the guide wire until it is flush with the medial femoral cortex. Make a final confirmatory test of patella stability and ROM. Once satisfied, cut all suture tails, infiltrate with high volume local anaesthetic (eg: 100ml of 0.2% ropivacaine) and close the incisions.



Fig. 13 Fixing the graft into the femoral socket with a 6mm soft threaded PEEK screw.

Post-operative Management

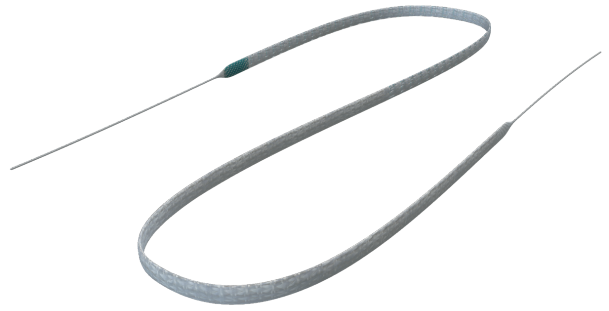
Standard rehabilitation protocols should be applied. A typical example is as follows.

- Early range of motion is encouraged to prevent stiffness.
- The patient can fully weight bear without a knee brace.
- Ice therapy will reduce pain and swelling.
- Inner quadriceps (VMO) strengthening is important to preserve good extensor function and to aid patella tracking and proprioception.

Typically, many patients return to light, daily activities at 4-6 weeks with heavier, physical, or sporting activities at 3 months

Ordering Information

102-1098 Infinity-Lock 5mm Tape



References

1. Deo H, Mohamed R, Ahmed G. Medium-term outcome of medial patellofemoral ligament reconstruction using synthetic graft. *The Knee* 2023; 44:220-226
2. Tscholl, PM. et al The Relationship of Femoral Tunnel Positioning in Medial Patellofemoral Ligament Reconstruction on Clinical Outcome and Postoperative Complications. *Arthroscopy*, Volume 34, Issue 8, 2410 – 2416
3. Schöttle PB, Schmeling A, Rosenstiel N, Weiler A. Radiographic landmarks for femoral tunnel placement in medial patellofemoral ligament reconstruction. *Am J Sports Med*. 2007 May;35(5):801-4. doi: 10.1177/0363546506296415. Epub 2007 Jan 31. PMID: 17267773.

Please refer to the Instructions for Use leaflet for essential information, including Use, Sterility, Indications, Contraindications, Warnings and Precautions, Potential Adverse Effects.

Video of the technique is available on YouTube

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