Arthroscopic all – Inside repair of meniscal ramp lesions

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Abstract

Meniscal ramp lesions are disruptions of the posterior menisco-tibial attachment of the medial meniscus and are commonly associated with anterior cruciate ligament injuries. However, they can be frequently missed when reviewing standard magnetic resonance imaging and difficult to treat. In this presentation, we describe our approach to repair a meniscal ramp lesion using a minimally invasive all-inside technique. We use this technique for the following surgical indications: meniscal tears involving the peripheral and meniscocapsular attachment of the posterior horn resulting in increased meniscal translation. The procedure is performed using standard arthroscopic portals along with a posteromedial portal placed using spinal needle localisation to ensure access around the lesion. Advantages of this technique include a minimally invasive repair that avoids the typical medial knee incision and dissection needed for traditional inside-out repairs, as well as direct visualisation of the repair site to ensure an appropriately tensioned anatomic repair. Technical pearls including adequate arthroscopic visualisation of the posteromedial compartment allowing the creation of a posteromedial working portal, direct passage of sutures through the edges of the ramp lesion facilitating an anatomic repair, and tensioning of the repair with arthroscopic knots to ensure restoration of the posterior horn stability are all critical to a good outcome. Furthermore, the use of two different curve directions for more displaced tears may be necessary to achieve an anatomic repair. In this case and in our experience, we use a Corkscrew SutureLasso 45°/C14 curve left for the meniscus bite and right for the capsular bite, as well as a long 8.25 mm by 70 mm twist-in cannula to accommodate the passing of insertion instrumentation in larger patients.

Keywords:
Knee
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Technique structure

Outline of the problem

Meniscal ramp lesions are tears extending less than 2.5 cm in length, resulting from disruptions to the peripheral attachments, including the meniscosynovial or meniscocapsular attachments (red-red zone), of the posterior horn of the medial meniscus [1]. Given the low sensitivity of standard magnetic resonance imaging in detecting ramp lesions, which appear as vertical tears or posterior plateau oedema, they often go undiagnosed and cause clinically detectable laxity as well as potential long-term sequelae [2].

Surgical indications and contraindications

Indications for this technique include “ramp lesions” or meniscocapsular disruptions of the peripheral attachments of the posterior horn of the medial meniscus, either in isolation or in the presence of a concomitant anterior cruciate ligament or lateral meniscal tear [1]. Contraindications include grade III or higher osteoarthritis in the ipsilateral compartment, degenerative tears with poor healing potential, or meniscocapsular separations in which the meniscal rim is not intact [1].

Treatment options

Ramp lesions can be managed both conservatively and surgically. Given the theoretical healing potential of the meniscal red-red zone, nonoperative management may serve as an appropriate treatment modality aimed at decreasing inflammation and pain with rest, activity modification, anti-inflammatory medications, and physical therapy. If this fails, though more technically challenging, repairing the lesion using either an all-inside or inside-out technique may be advantageous in providing adequate outcomes to patients [3].

1 This is a video-based article. The related video(s) can be viewed here: https://doi.org/10.1016/j.jisako.2022.04.004
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Technique

All – inside repair of meniscal ramp lesion

- Supine or in thigh holder with knee flexed to 90°.
- Arthroscopic probe used to evaluate increased translation of the posterior horn of the medial meniscus.
- Visualisation of posteromedial meniscus using Gilquist technique to enter posterior knee medial to the posterior cruciate ligament.
- Creation of posteromedial portal proximal to the ramp lesion under arthroscopic visualisation with spinal needle localisation to ensure adequate working space and trajectory for lesion repair.
- Debridement of posteromedial meniscocapsular junction using an arthroscopic shaver to improve biological healing at the repair site.
- A curved #0 polydioxanone (PDS) suture passing device is introduced into the posteromedial portal and through the most medial edges of the meniscocapsular disruption.
- Sutures are passed in vertical fashion first through the posterior horn of the meniscus and then through the capsule in two separate bites, placed approximately 5 mm apart to ensure adequate fixation.
- PDS suture is used to shuttle a high-tensile, braided suture through both edges of the torn meniscocapsular junction.
- Arthroscopic cannula (7 mm) placed through posteromedial portal, and suture limbs are delivered through the cannula.
- Sutures are tensioned and tied.
- Passage of PDS suture is repeated working from medial to lateral, shuttling the high-tensile braided suture as the true repair suture, until ramp lesion is completely repaired, and meniscocapsular junction has been anatomical restored.
- Arthroscopic probe confirms restoration of stability of posterior horn of medial meniscus.

Advantages of current technique

- Arthroscopic visualisation of posteromedial knee allowing safe creation and usage of posteromedial working portal.
- Tear is directly visualised and can be tensioned to ensure anatomic reduction and repair of meniscocapsular junction.
- Surgical technique allows for safe, efficient, and anatomic repair created from insertion of the all-inside implants, chondral damage, and neurovascular damage of the saphenous neurovascular bundle [3,9]. In addition, patients may experience persistent pain, swelling, infection, and erythema as well as symptoms of nerve irritation [9].

Conclusions and future perspective

In this technique video, we describe an approach to repair a meniscal ramp lesion using a minimally invasive all-inside technique using a posteromedial working portal. Although repair is a technically demanding treatment modality, the advantages of this technique include a minimally invasive repair that avoids the typical medial knee incision and dissection needed for traditional inside-out repair of these lesions that may lead to neurovascular risks, as well as direct visualisation of the repair site to ensure and appropriately tensioned and anatomic repair. As such, clinicians should familiarise themselves with the surgical repair of this subtle yet increasingly prevalent meniscus injury. Future studies will expand on the outcomes of the multiple treatment modalities to guide patients and identify factors promoting optimal results.

Declaration of competing interest

The authors have no competing interest to declare.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jisask.2020.04.004.

References