



Tips & Tricks: Tips and Tricks: Use of a Spinal Needle for Partial Meniscectomy of a Bucket Handle Meniscus Tear

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Background

Meniscal tears are common intraarticular injuries resulting from forceful twisting or hyperflexion of the knee. Bucket handle tears, in particular, account for 10-19% of these injuries and frequently occur with a concomitant ACL injury. Most bucket handle meniscus tears involve the medial meniscus.⁸

In addition to the pain and mechanical symptoms associated with other, more common meniscal injuries, bucket handle tears can cause intermittent episodes of locking of the knee joint secondary to displacement of the torn fragment into the intercondylar notch. This fragment can also flip back into its anatomic position, which provides transient unlocking of the joint.

MRI is both a sensitive and specific modality for detecting bucket handle meniscus tears. These injuries typically consist of a vertical or oblique tear involving the posterior horn of the meniscus that extends longitudinally through the body and anterior horn. As a result, the inner meniscal fragment can be seen displaced into the intercondylar notch. Several signs on MRI are useful in detecting bucket handle meniscus tears including the “absent bow tie sign” in the coronal plane and the “double PCL sign” in the sagittal plane.⁴

Whenever possible, meniscal repair is the operative treatment of choice for meniscus tears. This is especially true for bucket handle tears which typically involve a large portion of the meniscus.³ However, certain characteristics make some of these bucket handle tears more suitable to partial meniscectomy rather than repair. These include a tear occurring in the avascular zone, a tear associated with underlying degenerative changes, inability to anatomically reduce the displaced fragment during attempted repair, and significant deformation of the torn fragment.^{1,9}

Arthroscopic partial meniscectomy and resection of the bucket handle tear is a commonly performed, yet often challenging, procedure. Various techniques have been described for the resection and removal of the bucket handle tear which occasionally require an accessory, posteromedial portal

to optimize visualization.¹ Other described techniques require additional equipment not typically utilized during a standard partial meniscectomy such as a beaver blade or suture punch.^{2,6,7}

The use of a spinal needle—an inexpensive, readily available instrument used in standard diagnostic arthroscopy - was first described in 2002.⁵ This technique guide seeks to expand on the originally described technique with use of intra-operative images for guided understanding.

Surgical Technique

The patient is positioned supine on a regular OR table with a lateral post located 2-3 finger breadths proximal to the knee flexion crease. The extremity is prepped and draped in usual sterile fashion. The knee is injected with local anesthetic. Portal sites are marked using the lateral tibial plateau, lateral edge of the patellar tendon, and inferior border of patella as landmarks for the lateral portal. The medial portal is marked directly across from the lateral portal. Local anesthetic is injected at the portal sites. The lateral portal is incised, dilated with a hemostat, and the arthroscope is placed into the knee joint. A spinal needle is used to localize the height and trajectory of the medial portal just superior to the medial meniscus. The medial portal is incised, dilated with a hemostat, and the probe is inserted. A diagnostic arthroscopy of the knee is first performed to identify and characterize the tear (Figure 1A-B) as well as any additional intra-articular pathology.

Once the decision has been made to proceed with partial meniscectomy rather than repair, the first step is to detach the “handle” from its attachment site on the anterior horn using a “predator” (Figure 1C). This creates a flap which allows the tear to be better grasped. The arthroscope is then switched from the lateral portal to the medial portal to improve visualization of the posterior horn. A “wolf” grabber is then inserted in the ipsilateral portal with the tooth near the end of the anterior horn to control the flap. Maintaining a firm grasp on the flap, the grabber is twisted

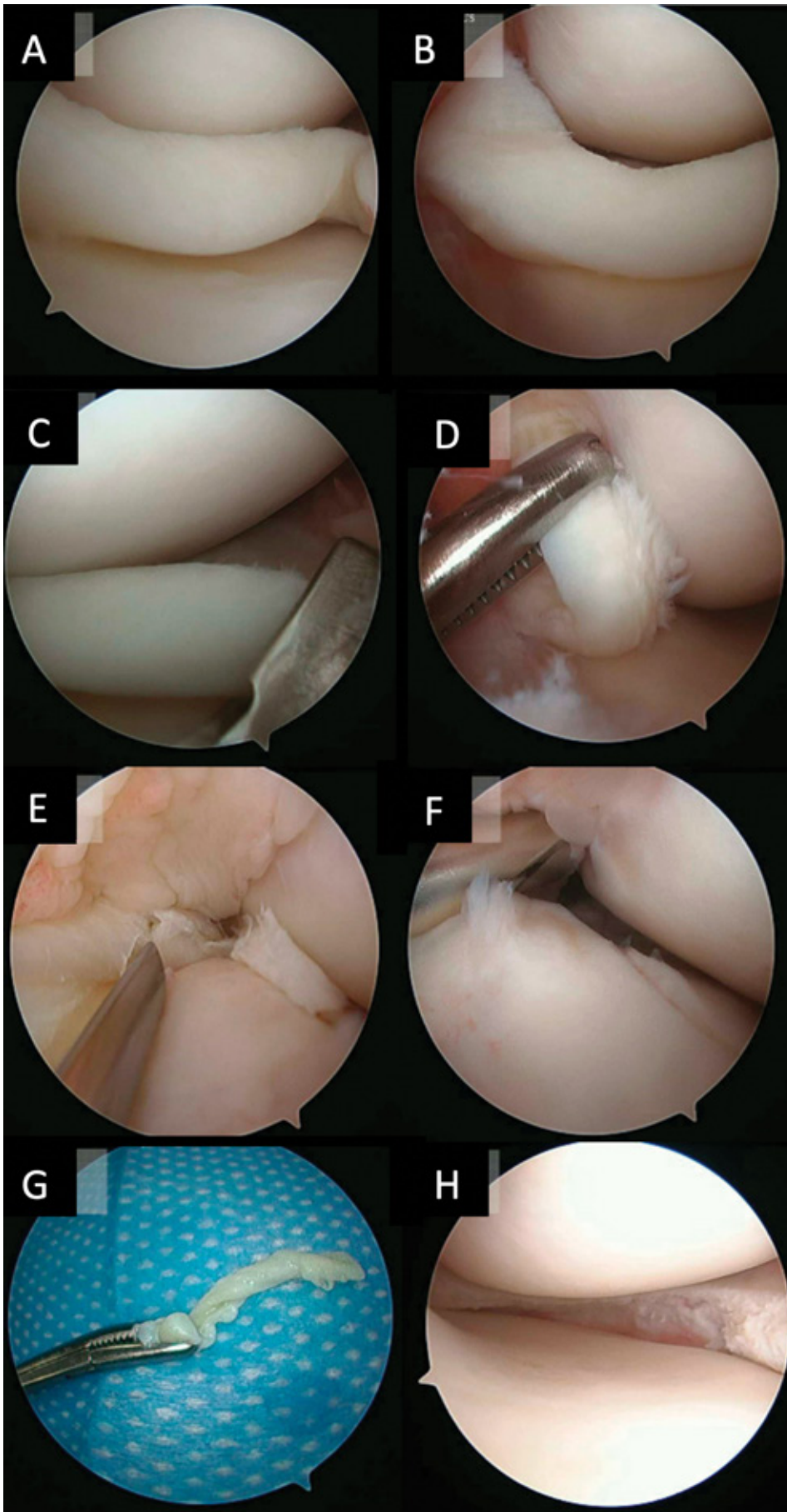


Figure 1. Arthroscopic partial meniscectomy of bucket handle meniscus tear. **(A-B)** Bucket handle meniscus tear on diagnostic arthroscopy; **(C)** Using “preactor” to detach the “handle” from its attachment site on the anterior horn; **(D)** Using the “wolf” grabber to twist the flap away from the posterior horn; **(E-F)** Repeatedly passing spinal needle into flap of meniscus at its posterior attachment site until fully release; **(G)** Removal of the torn meniscus through the medial portal; **(H)** Using curved shaver to contour the remaining meniscus.

either clockwise or counterclockwise in order to twist the flap of meniscus away from the posterior horn (Figure 1D). This is continued until a condensed shape of meniscal tissue is formed at the base of the posterior horn that can be easily removed.

Under arthroscopic visualization, the same 18-gauge spinal needle is inserted on the ipsilateral side, one-third of the way from the medial border of the patella to the medial portal, and one centimeter higher than the medial portal. The beveled tip of the spinal needle is repeatedly passed into the condensed flap of meniscus at its posterior attachment site while continuing to twist the flap with the wolf grabber until it is released (Figure 1E-F). The flap of tissue can be removed from the joint through the medial portal with the “wolf” grabber (Figure 1G). To complete the partial meniscectomy, a curved shaver is used to contour and smooth the remaining meniscus (Figure 1H).

Conclusion

This technique uses portals that have already been established, and instruments that have been opened for the diagnostic arthroscopy. The meniscal flap is twisted into a tight, condensed shape, allowing for controlled detachment with the spinal needle. Removing the tear in one piece

rather than dividing it not only improves efficiency as there are no small fragments to retrieve, but also minimizes the formation of postoperative loose bodies. This technique is an inexpensive, effective, and reliable method for resection of a bucket handle meniscus tear.

References

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