

# A New Surgical Technique of Arthroscopic Partial Meniscectomy for Unstable Inferior Leaf of the Anterior Horn in a Horizontal Tear of Lateral Meniscus

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We introduce a new arthroscopic partial meniscectomy technique using a three portals and a small skin hook retractor to remove unstable inferior leaf in horizontal meniscal tear that involved the anterior portion of the lateral meniscus. The patient is positioned for a standard knee arthroscopy. After careful estimation of the depth and extent of the cleft and stability of the superior and inferior leaves is done through the standard anteromedial portal, a small skin hook retractor is inserted through the standard anterolateral portal to raise the dominant superior leaf of anterior horn, then the unstable inferior leaf is excised with a 90° rotary punch and a motorized shaver through the extreme far anteromedial portal. This technique is useful method to remove unstable inferior leaf of anterior horn of lateral meniscus which is difficult to remove with a standard technique.

**Keywords:** Lateral meniscus, Horizontal tear, Partial meniscectomy

Typically, symptomatic irreparable meniscal tears are treated by surgery. Arthroscopic partial meniscectomy is recommended for the treatment of irreparable meniscal tears. Horizontal tears of the meniscus are the most common degenerative tears of the meniscus. They usually begin at the inner aspect of the meniscus and extend toward the periphery producing a superior and an inferior leaf. When horizontal tears that extend to the anterior horn of the meniscus and the inferior leaf are to be removed, it is difficult to visualize and resect the inferior leaf of the anterior half of the meniscus through standard anterior portals. Here, we describe a new surgical technique of arthroscopic excision using three portals and a small skin hook retractor for the unstable inferior leaf of the anterior horn in the horizontal tear of the lateral

meniscus.

## Surgical Technique

The patient is positioned for standard knee arthroscopy. Three portals are used in this technique: a standard anteromedial portal, a standard anterolateral portal, and an extreme far anteromedial portal (Fig. 1). The first portal is a standard anterolateral portal. This portal is located 1 cm above the lateral joint line and 1 cm lateral to the margin of the patellar tendon. This portal provides easy access for a special instrument to the anterior horn of the lateral meniscus.

An arthroscope is inserted and maintained in this portal throughout the procedures. The second portal is the standard anteromedial portal. This portal is located approximately 1 cm above the medial joint line and just medial to the margin of the patellar tendon and provides viewing of the anterior horn of the lateral meniscus. To avoid collision of arthroscopic instruments, this portal is more closer to the patella tendon than the normal standard anteromedial portal. The extreme far anteromedial portal is created as another working portal 3 cm medial to the margin of the patella tendon. This portal is located 1 cm above the medial joint line and nearly anterior to the medial edge of the medial femoral condyle. This portal is used for the removal of the

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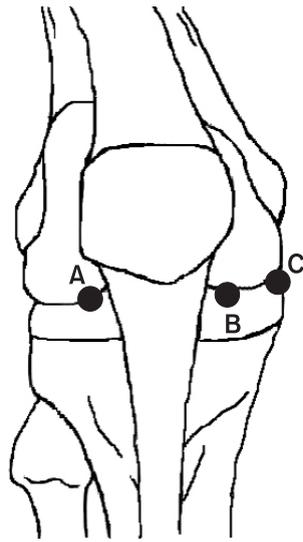


Fig. 1. This illustration shows the locations of a standard anterolateral portal (A), a standard anteromedial portal (B), and an extreme far anteromedial portal (C).

unstable inferior leaf in the anterior horn of the lateral meniscus.

After diagnostic arthroscopy, a careful estimation of the depth and extent of the cleft and stability of the superior and inferior leaves is made with the use of a probe under the position of Figure "4". Through the low anterolateral portal, a small skin hook retractor is inserted to reach the superior leaf of the anterior horn. This portal allows optimal and stable handling of the dominant superior leaf and viewing of the unstable inferior leaf (Fig. 2). The unstable inferior leaf of the lateral meniscus is then excised with a 90° rotary punch through the extreme far anteromedial portal (Fig. 3). A motorized shaver (Linvatec, Largo, FL, USA) is used to smooth the remnant rim of the meniscus (Fig. 4).

A small skin hook retractor is used to provide firm and stable meniscal retraction during postural or instrumental changes. The operator should always maintain appropriate retraction during arthroscopic meniscectomy. The dominant superior leaf can be damaged and detached with excessive or sudden retraction force.

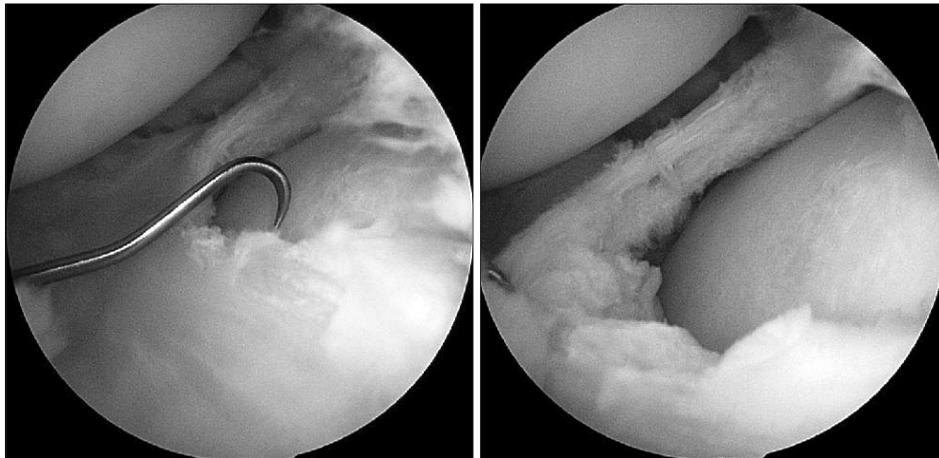


Fig. 2. A small skin hook retractor is inserted through the standard anterolateral portal and pulls out the dominant superior leaf.

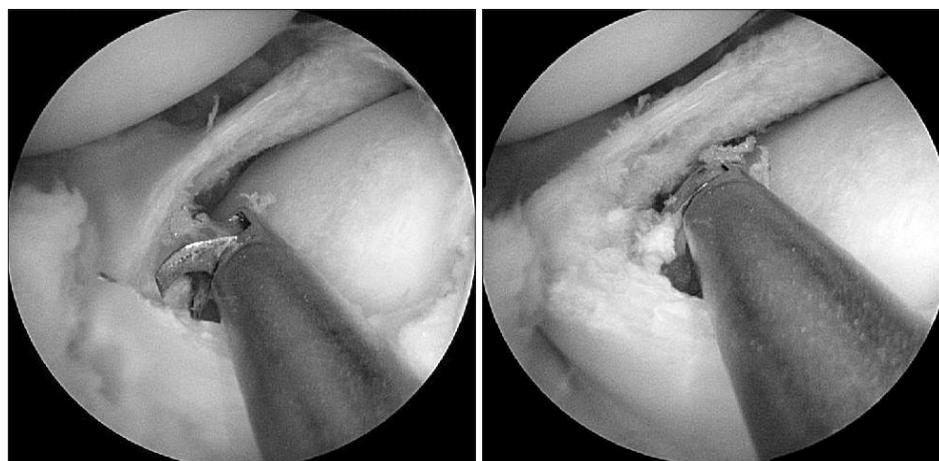


Fig. 3. The unstable inferior leaf of the anterior horn is resected with a 90° rotary punch through the farthest anteromedial portal.



Fig. 4. The unstable inferior leaf of the anterior horn is almost excised.

## Discussion

Horizontal tears of the meniscus are associated with degenerative changes in the meniscal tissue<sup>1)</sup>. Until recently, the preferred treatment for meniscal injury has been partial meniscectomy or subtotal meniscectomy. For degenerative tears, partial meniscectomy is preferred over subtotal meniscectomy<sup>2)</sup>. The goal of careful partial meniscectomy of the horizontal tear is to preserve meniscal functions<sup>3)</sup>.

It is difficult to reach the inferior leaf of the anterior half of the meniscus to perform proper resection of the meniscus in tears extending to the anterior portion of the meniscus. And it is difficult to decide how much of the meniscus should be resected in the case of deep-seated horizontal tears because it often extends into the capsular junction in multiple directions. Various methods for the treatment of a horizontal tear in the anterior horn of the meniscus have been proposed and described. Kim et al.<sup>4)</sup> described the inframeniscal portal technique for horizontal tears of the meniscus. It proved to be an effective method for treating horizontal tears of the meniscus; however, the disadvantage of this technique is the complication of impending synovial fistula.

Kim and Park<sup>5)</sup> described an arthroscopic technique of partial meniscectomy for horizontal tears of the meniscus using 3 portals. This technique is safe and simple, and does not cause injury to the soft tissues. However, it does not allow optimal handling

of the dominant superior leaf for excision of the unstable inferior leaf of the anterior horn in horizontal tears of the meniscus. Meniscal retraction using a probe does not provide enough stability because of probe slippage during the arthroscopic procedure.

We have described a technique of arthroscopic partial meniscectomy using 3 portals and a small skin hook retractor for horizontal meniscal tears that involve the anterior portion of the lateral meniscus. Our technique is a useful method because it allows optimal and stable handling of the dominant superior leaf and viewing of the unstable inferior leaf. And surgeons can attempt resection of the margins of the meniscus more easily because the stable retraction is helpful in identifying the shape and extent of deep-seated horizontal tears.

## Conflict of Interest

No potential conflict of interest relevant to this article was reported.

## Acknowledgments

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