

## Technical Note With Video Illustration

# Arthroscopic Partial Meniscectomy of a Medial Meniscus Bucket-Handle Tear Using the Posteromedial Portal

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**Abstract:** Arthroscopic resection of irreparable bucket-handle tears of the medial meniscus is a commonly performed procedure. Adequate visualization of the posterior horn of the medial meniscus can be a challenging task with the conventional use of the anterior portal. An attempt to resect the posterior horn in a blind fashion may result in iatrogenic damage of the articular cartilage in the posterior compartment, over-resection of a remnant meniscus, or an insufficient resection of the torn fragment. We describe the use of the posteromedial portal for an accurate visualization and resection of the posterior attachment of a bucket-handle tear for arthroscopic partial meniscectomy, as well as detection of other injuries that may be involved in the posteromedial compartment, while avoiding injury to other intra-articular structures during the arthroscopic procedure. We found that the use of the posteromedial portal is a safe and efficient method in removing a bucket-handle tear of the medial meniscus in one piece. **Key Words:** Arthroscopy—Bucket-handle tear—Partial meniscectomy—Posteromedial portal.

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Arthroscopic resection of irreparable bucket-handle tears of the medial meniscus is a commonly performed procedure. It frequently accompanies anterior cruciate ligament injury and may also cause locking of the knee joint due to displacement of a torn fragment into the intercondylar notch. Although repair is attempted whenever possible, a bucket-handle tear in the avascular zone, a tear already accompanied by degenerative change, the inability to obtain anatomic reduction of the displaced fragment, and deformation of a torn fragment may be indications for partial meniscectomy.<sup>1</sup> Although various techniques have been introduced for resection of bucket-handle tears, none has described thorough visualization and accu-

rate resection of the posterior attachment of the tear by using the posteromedial portal.<sup>2-6</sup> In this report, we describe use of the posteromedial portal for an accurate visualization and resection of the posterior attachment of a bucket-handle tear during arthroscopic partial excision of a medial meniscus in one piece. This technique allows detection of other injuries that may be involved in the posteromedial compartment, such as a double longitudinal tear of the medial meniscus posterior horn, displacement of meniscal fragment into the posterior compartment, and cartilage damage of the posterior femoral condyle, while avoiding iatrogenic injuries to the remnant meniscus and articular cartilage during instrumentation.

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## SURGICAL TECHNIQUE

### Diagnostic Arthroscopic Examination

Diagnostic arthroscopic examination of the knee is performed using the standard anterolateral and anteromedial portals. For easy access to the posteromedial compartment, the anterolateral portal should be placed

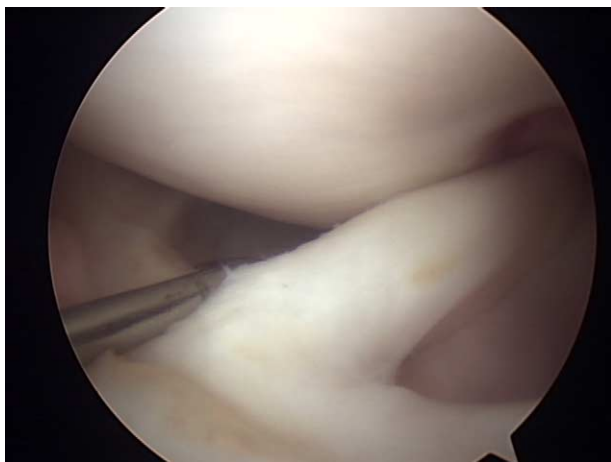
just lateral to the patellar tendon and right above the lateral meniscus. The posteromedial compartment can be approached by passing an arthroscope through the intercondylar notch.

### Reduction of a Torn Meniscus

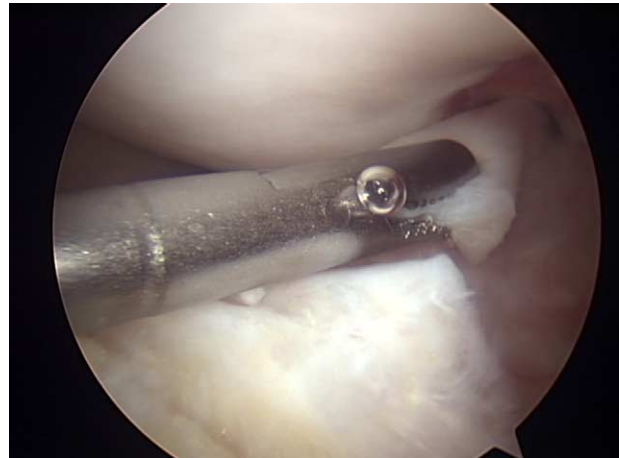
When a medial meniscus bucket-handle tear is locked into the intercondylar notch, one may try to reduce the torn meniscus using a probe. Reduction of the torn fragment may be attempted while widening the medial compartment by applying a valgus force in a 20° flexed and externally rotated knee. This procedure is a crucial step for determining whether to repair or to excise an irreducible bucket-handle fragment or a severely deformed meniscus. In addition, it allows the surgeon to clear the intercondylar notch space, which allows an arthroscopic passage for approaching the posteromedial compartment.

### Examination of the Posteromedial Compartment

Various anatomic structures in the posteromedial compartment, such as the medial meniscus posterior horn, the posteromedial capsules, and the medial femoral condyle, are examined using an arthroscope inserted at the anterolateral portal and passed through the intercondylar notch. While keeping the knee flexed at 90°, a spinal needle is inserted at the posteromedial corner under transillumination to avoid injury to neurovascular structures, such as the saphenous nerve. After a stab skin incision followed by widening with hemostat, a probe is inserted to examine the extent, degree, and shape of the peripheral tear. A switching stick is inserted to keep the posteromedial



**FIGURE 1.** Medial meniscus bucket-handle tear viewed from the anterolateral portal. Arthroscopic scissors are inserted at the anteromedial portal to excise the anterior base of the tear.



**FIGURE 2.** A grasper is introduced through the anteromedial portal to hold the released anterior portion of the bucket-handle tear.

portal open. Then, the arthroscope is switched to the posterior medial portal to examine the posteromedial compartment and posteriorly attached fragment of the torn medial meniscus<sup>7</sup> (Video 1).

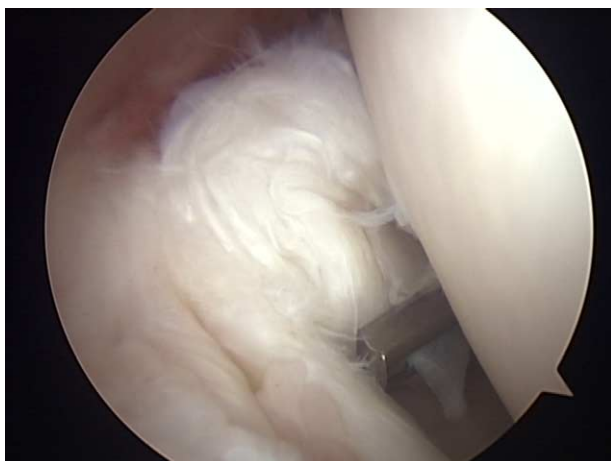
### Removal of Medial Meniscus Bucket-Handle Tear

The arthroscope is reinserted into the anterolateral portal and arthroscopic scissors are inserted at the anteromedial portal to excise the anterior attachment of the bucket-handle tear, while taking caution not to damage the articular cartilage (Fig 1). After liberating the anterior base portion of the bucket-handle tear, the arthroscopic grasper is inserted at the anteromedial portal to hold the released anterior base end of the torn meniscus (Fig 2). The arthroscope is switched to the posteromedial portal and the torn meniscal fragment is manipulated by the grasper to move toward the intercondylar notch so that the posterior horn of the medial meniscus can be clearly visualized. While visualizing the posterior base of the bucket-handle tear through the arthroscope in the posteromedial portal and with the grasper holding the anterior base through the anteromedial portal, the scissors are inserted at the anterolateral portal and passed through the intercondylar notch between the medial femoral condyle and posterior cruciate ligament to reach and excise the posterior base of the torn medial meniscus fragment, while taking care not to damage the posterior cruciate ligament (Figs 3 and 4). After excising the posterior base, the grasper holding the anterior portion of the torn meniscal fragment is pulled out with the excised meniscal fragment in one piece (Video 2). The inner margin of the partially resected medial meniscus is

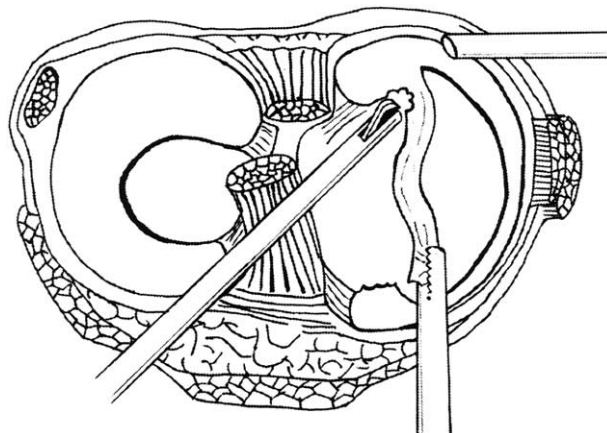
trimmed using basket forceps and a motorized shaver. If an anterior cruciate ligament tear is combined, arthroscopic anterior cruciate ligament reconstruction can be subsequently performed.

## DISCUSSION

The medial meniscus bucket-handle tear frequently accompanies anterior cruciate ligament injury and it may already involve degenerative change or deformation of the torn fragment at the time of surgery, thus making reduction and repair difficult. When a tear extends to the avascular zone, at a relatively inner portion of posterior horn of the medial meniscus, it may be easily resected by instrumentation through the anterior portals. However, if a bucket-handle tear extends to the peripheral portion of the posterior horn, it is very difficult to thoroughly visualize and resect the posterior base of the bucket-handle torn fragment. Although various methods for resecting bucket-handle tears of the meniscus have been introduced, we suggest using the posteromedial portal for accurate visualization and resection of the posterior base of the bucket-handle tear in the medial meniscus posterior horn. One should also inspect for other injuries at the posteromedial compartment, such as a double longitudinal or posteriorly displaced flap tear of the medial meniscus posterior horn and cartilage damage of the posteromedial femoral condyle, which may be difficult to detect by viewing through the anterior portal alone. Moreover, the posteromedial approach prevents one



**FIGURE 3.** While viewing the posterior compartment through the posteromedial portal, the posterior base of the torn meniscus is resected using the scissors. Note the combined double longitudinal tear of the medial meniscus posterior horn.



**FIGURE 4.** Schematic presentation showing the arthroscope in the posteromedial portal, the grasper holding the anterior base through the anteromedial portal, and the scissors inserted in the anterolateral portal and passed through the intercondylar notch to excise the posterior base of the torn meniscus.

from damaging cartilaginous structures or cruciate ligaments in the posterior compartment during an attempt to resect a torn meniscal fragment. Use of the posteromedial portal for excising medial meniscus bucket-handle tears in one piece is a safe and efficient method.

## Appendix

### Supplementary data

Supplementary data associated with this article can be found, in the online version, at [doi:10.1016/j.arthro.2004.06.024](https://doi.org/10.1016/j.arthro.2004.06.024).

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