Knee Arthroscopic Posteromedial Portal Placement Using the Medial Epicondyle

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Abstract: Posteromedial portals in the knee are used for numerous procedures, including posterior cruciate ligament reconstructions, meniscal transplantation, repair of posterior meniscal tears, removal of loose bodies, and synovectomy. Iatrogenic injury to the sartorial branch of the saphenous nerve is a known complication of posteromedial portal arthroscopy; thus, a reproducible technique for creating posteromedial portals in the knee is critical. The medial epicondyle is an easily identifiable bony landmark and palpable even in patients with a higher body mass index. Use of the medial epicondyle as a landmark for posteromedial portal placement is a reliable technique. This article describes cadaveric neurovascular relationships to the posteromedial portal using the described technique. [Orthopedics. 2015;38(6):366-368.]

Posteromedial portals in the knee are used for numerous procedures, including posterior cruciate ligament (PCL) reconstructions,1 meniscal transplantation,2 repair of posterior meniscal tears,3 removal of loose bodies,4 and synovectomy.5 Injury to the saphenous neurovascular bundle is a known complication of posteromedial portal arthroscopy.6,7 Damage to the sartorial branch of the saphenous nerve can lead to saphenous neuritis or permanent loss of sensation.8

One common method of creating a posteromedial portal is the transillumination technique, whereby the arthroscope is placed through the notch and the light source is rotated to transilluminate the posteromedial aspect of the knee.9 This gives the surgeon an idea of where to most effectively place the portal and avoid the saphenous neurovascular bundle.10 Unfortunately, particularly in patients with an elevated body mass index (BMI), it is not always possible to easily visualize the best location for posteromedial portal placement. Ahn et al11 noted that the bony prominence of the fibular head can be used as a landmark in establishing posterolateral portals when use of the transillumination technique was not possible. The current article describes a similar approach to portal placement using a bony landmark on the medial side of the knee.

The medial epicondyle is an easily identifiable bony landmark and palpable even in patients with a higher BMI. In this article, the described technique demonstrates posteromedial portal placement using the medial epicondyle as a reference. In addition, the neurovascular relationships of the posteromedial portal using the described technique in cadaveric specimens are presented.

Materials and Methods

Portal position is made with the knee flexed to 90°. The location for posteromedial portal placement is defined by first measuring 2.5 cm inferior (distal) from the medial epicondyle and then 2.5 cm posterior from this initial point. The resulting posteromedial portal location is thus defined as being 2.5 cm inferior and 2.5 cm posterior from the medial epicondyle with the knee in 90° of flexion (Figure 1). A 1-cm incision through the skin only is made over the defined portal location in a vertical orienta-
tion. With the arthroscope in the notch and visualizing the posteromedial aspect of the knee, a hemostat is then introduced through the portal into the joint. The superficial and deep tissue layers are spread to facilitate cannula placement.

**Cadaveric Portal Dissection to Assess the Relationship to the Neurovascular Bundle**

Posteromedial portal placement was performed using the aforementioned technique on 10 fresh-frozen cadaveric knees. The cadaver knees were then removed from the mount in 90° of flexion. A longitudinal incision was made directly over the medial aspect of the knee, which was carried through the skin and subcutaneous layer to the level of the superficial fascia. Careful dissection of the subcutaneous layer was carried anterior and posterior to expose the site of the portal within the fascia and the location of the saphenous neurovascular bundle. Care was taken not to disturb the location of the neurovascular bundle in relation to the portal site. A metric ruler was then used to determine the distance from the portal to the neurovascular bundle. This was defined as the shortest point from any portion of the portal to any portion of the neurovascular bundle (Figure 2). Dissection of the knees was performed with the knees in 90° of flexion to maintain the neurovascular structures in the same orientation as during portal placement.

The height and mass of the cadaver specimens were obtained, and the BMI was calculated. Body mass index values were then compared with the distances from the portal to the neurovascular bundle.

**Statistical Methods**

Pearson correlation coefficients were used to determine relationships between the distance from the portal to the neurovascular bundle and the BMI from the cadaveric donors. SPSS version 20 statistical software (IBM, Armonk, New York) was used to perform the statistical analyses.

**RESULTS**

The posterior horn of the medial meniscus and the tibial PCL insertion were visualized and easily probed through the portal in all specimens (Figure 3). No portal violated the saphenous neurovascular bundle in any cadaver specimen. The median distance from the portal to the neurovascular bundle was 29.5±20 mm. In one specimen with a lower BMI, the distance from the portal to the saphenous neurovascular bundle was 3 mm (Table). The remaining distances between the saphenous neurovascular bundles and the portals ranged from 10 to 62 mm (Table). In all specimens, the neurovascular bundle was always found to be posterior to the portal.

The correlation coefficient between cadaveric BMI and distance from the portal to the neurovascular bundle as BMI was r=0.54 and P=.05, respectively.

**DISCUSSION**

This technique for posteromedial portal placement creat-
ed a functional posteromedial portal with no neurovascular injury in cadaveric specimens. The posterior horn of the medial meniscus and the tibial PCL insertion were visualized and easily probed through the portal in all specimens.

Surgeons should consider this technique for creating a posteromedial portal, particularly in patients with a higher BMI where the transillumination method of portal placement may be more difficult. When using this technique in patients with a low BMI, the neurovascular bundle may be more at risk, so care should be taken to incise only the skin followed by gentle blunt dissection to the joint.

**CONCLUSION**

This technique for posteromedial portal placement produced good access to the posteromedial structures in the knee, and no violation of the saphenous neurovascular bundle occurred. Patient BMI is related to the distance between the portal and neurovascular bundle.

**REFERENCES**


