Medial Oblique Meniscomeniscal Ligament of Knee

Avijit Sharma, MD, Jason Payne, MD, M.M. Manring, PhD, and David C. Flanigan, MD

Abstract

An aberrant meniscus attachment was found in the setting of an anterior cruciate ligament injury. An anomalous cordlike attachment ran from the anterior horn of the medial meniscus to the posterior horn of the lateral meniscus through the intercondylar notch. Surgeons should be aware of the anatomical variability in the knee in order to provide the best care for their patients.

We report a case of aberrant meniscus attachment in the setting of anterior cruciate ligament (ACL) injury. An anomalous cordlike attachment ran from the anterior horn of the medial meniscus to the posterior horn of the lateral meniscus through the intercondylar notch. This attachment was previously named the *medial oblique meniscomeniscal ligament*[1] but has seldom been reported in the literature. Prevalence is 1% to 4%.[1,2] This case was treated at Ohio State University Wexner Medical Center in Columbus. The patient provided written informed consent for print and electronic publication of this case report.

Take-Home Points

- Prevalence of the medial oblique meniscomeniscal ligament is 1% to 4%.
- It is important to distinguish this ligament from a meniscus tear on MRI.
- The functional characteristics of this ligament are not well understood.
- What may appear to be a meniscal tear in a younger patient could be a medial oblique meniscomeniscal ligament.
- Dr. Flanigan recommends leaving the ligament intact unless resection is needed to provide better visualization.

Case Report

An 18-year-old man presented with left knee pain after sustaining 2 injuries to the knee. The first injury occurred during a dodgeball game—when the knee buckled on landing from a jump. A "pop" was felt, and the knee swelled immediately. The second injury occurred about 3 months later, during soccer play. The patient was running when his foot slipped and caused the knee to buckle. Again, a "pop" was felt, and there was swelling. Mechanical symptoms of clicking then started. The patient reported no instability episodes. His medical history and family history were otherwise unremarkable. The patient was healthy and had a body mass index of 23.05 kg/m^2.

Physical examination revealed no effusion, erythema, or warmth in the left knee. Range of motion was 0° to 135° in the left knee and 0° to 140° in the right knee. There was no pain on hyperextension of the knee or medial or lateral joint-line tenderness, but there was pain on hyperflexion, and the McMurray test was positive. Ligament examination was negative except for positive anterior drawer, Lachman, and pivot-shift tests.

Radiographs taken the day of the first clinic visit showed no acute osseous abnormality. Magnetic resonance imaging (MRI) showed complete disruption of the proximal fibers of the ACL (**Figures 1, 2**). Also observed was a small oblique tear of the body of the lateral meniscus with slight blunting of the anterior horn of the medial meniscus, which may have been related to a small tear. A pivot-shift contusion pattern with impaction fracture of the lateral femoral condyle was also appreciated. There were no definite cartilage defects identified.

Arthroscopy of the left knee was performed for reconstruction of the ACL and repair of the menisci (**Figures 3, 4**). The suprapatellar pouch and medial and lateral gutters were normal. There was grade 2 fraying of the distal portion of the trochlea medially and laterally in the medial facet of the patella. An aberrant anterior horn medial meniscus attachment was found; it had been interpreted as a tear on MRI. This aberrancy ran through the femoral intercondylar notch and attached to the posterior horn of the

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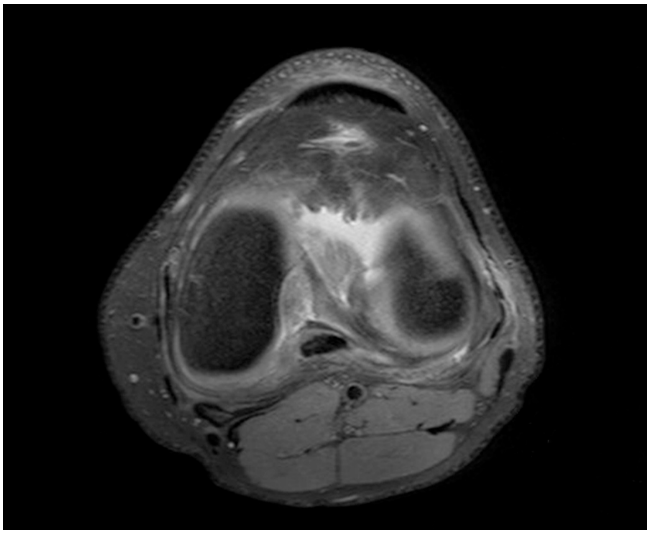

Figure 1. Axial magnetic resonance imaging of the patient's left knee shows medial and lateral menisci and the meniscomeniscal ligament.

Figure 2. Coronal magnetic resonance imaging shows the meniscomeniscal ligament (arrow) running from the medial meniscus toward the intercondylar notch.

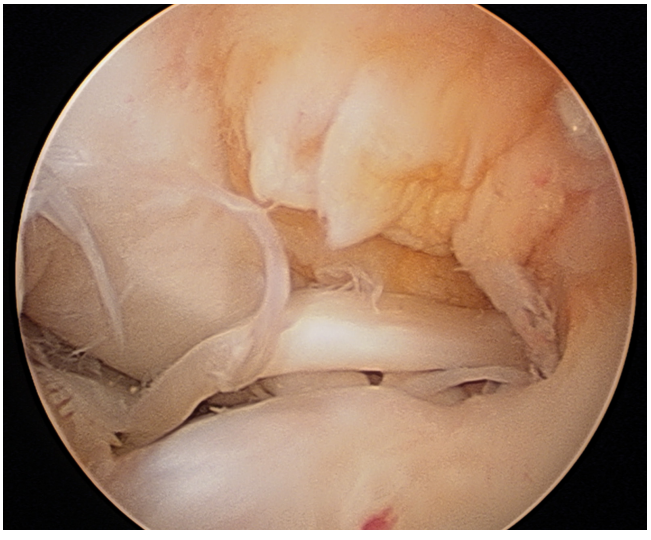

Figure 3. Arthroscopy shows the meniscomeniscal ligament running from the anterior horn of the medial meniscus into the intercondylar notch.

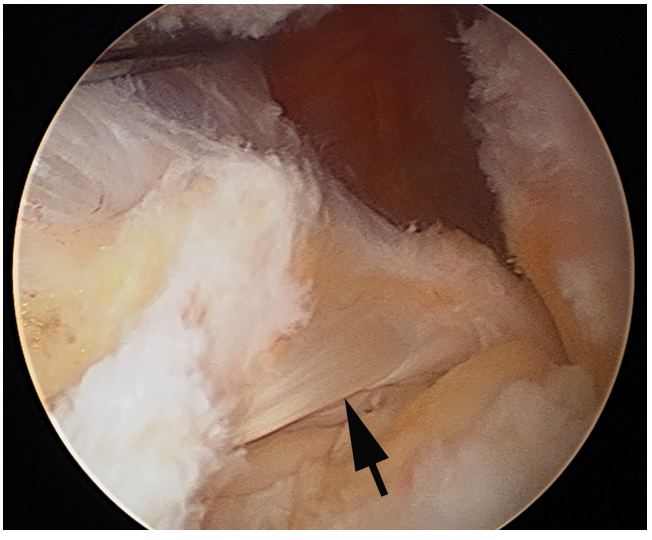

Figure 4. Arthroscopy shows the meniscomeniscal ligament under remnant of the anterior cruciate ligament in the intercondylar notch (arrow).

lateral meniscus (**Figures 5A-5H**) (watch the video online at www.amjorthopedics.com).

Discussion

The medial and lateral menisci typically are separate fibrocartilaginous structures acting as a cushion for the knee, but normal variant connections between the structures have been described. These connections include the anterior transverse meniscal ligament, the posterior transverse meniscal ligament, and the medial and lateral oblique meniscomeniscal ligaments.[3] In the present case, a medial oblique meniscomeniscal ligament was identified. Its path between menisci was traceable on coronal and axial views. Video taken during arthroscopy also clearly showed its path and its relationship to other structures in the knee. To Dr. Flanigan's knowledge, this ligament was not previously described with video. It is important to distinguish this ligament from a horizontal tear of the meniscus, given the potential for misinterpretation on MRI. A horizontal tear is a degenerative change that often occurs in older patients. Our patient was 18 years old at time of injury. In addition, the surface of his lower meniscus was smooth, whereas in a tear the edge is irregular and

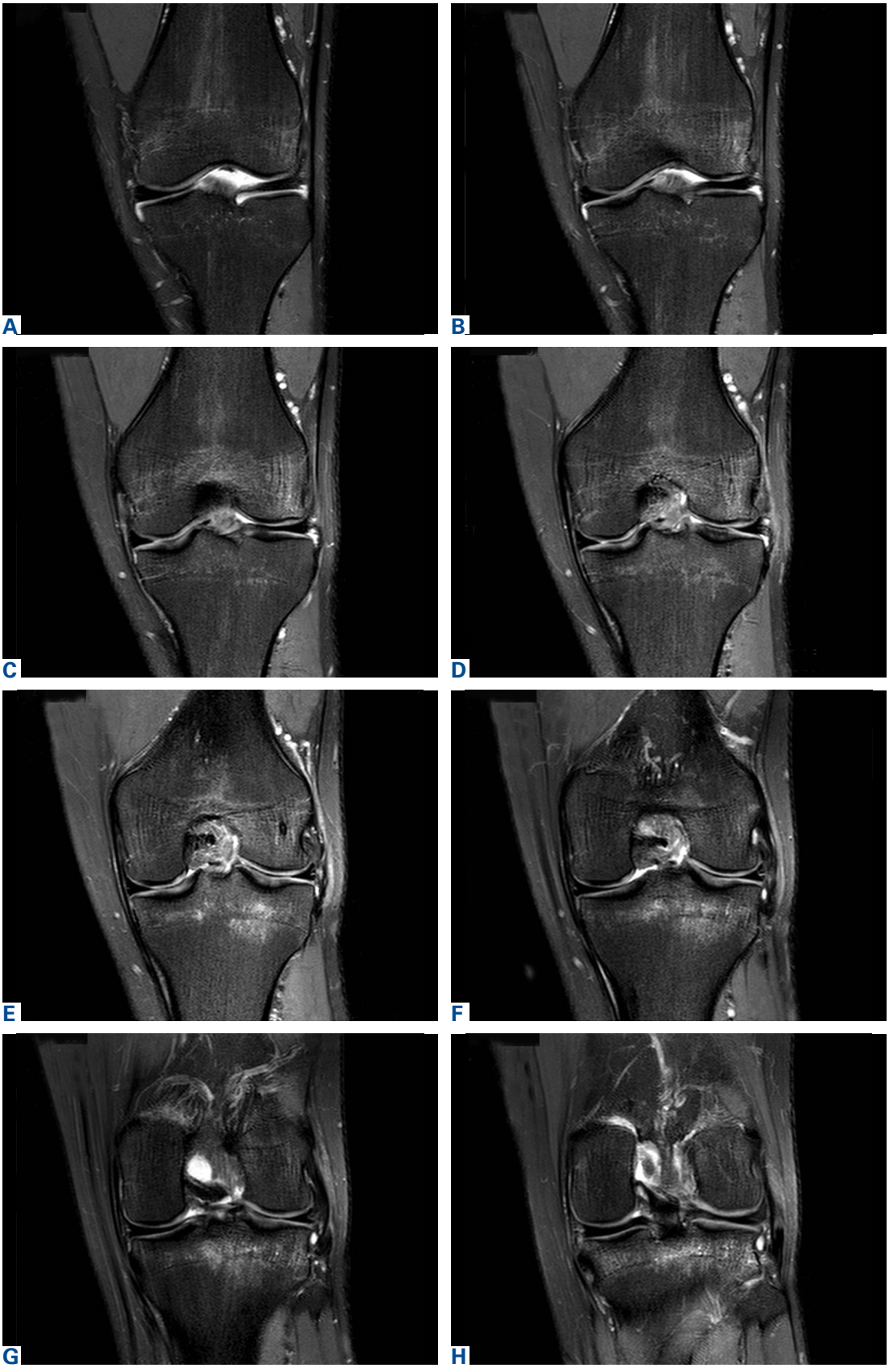

Figure 5. (A-H) Anterior to posterior magnetic resonance imaging slices show the meniscomeniscal ligament running from the anterior horn of the medial meniscus to the posterior horn of the lateral meniscus.

discontinuous. Dr. Flanigan prefers to leave this ligament intact unless resection would provide better visualization during arthroscopy. His reasoning is that the functional characteristics of the ligament are not well understood.

There are few reports on the medial oblique meniscomeniscal ligament.[1] Sanders and colleagues[1] found 3 cases of this normal variant. In the first, the ligament was interpreted as a flap tear on MRI; in the other 2 cases, the ligament was correctly identified. Kim and Laor[2] and Dervin and Paterson[4] also described this variant in case reports.

There are many abnormalities of the meniscus. In our literature review, we found reports on various anomalies, including discoid meniscus,[5] ring-shape meniscus,[6,7] accessory meniscus,[8] double-layer meniscus,[9-12] abnormal band formation,[13,14] hypoplasia,[15] Wrisberg meniscus,[6] and congenital absence of meniscus.[16] These variations have multifactorial causes, including congenital and developmental influences.

In a recent case report, Giordano and Goldblatt[14] described an abnormal band of lateral meniscus extending from the posterior horn to the anterior-mid portion of the same meniscus. Lee and Min[13] described the same band earlier, in a 2-patient case report.[13] One patient presented symptomatically, nontraumatically, and the other with a posterior cruciate ligament tear. Each case was deemed congenital given the characteristic appearance and bilaterality of the anomaly.

In an 11-patient case series in Finland, Rainio and colleagues[17] described an attachment from the anterior horn of the medial meniscus inserting into the ACL—a crescent band from the upper surface of the anterior horn that attached along the upper two thirds of the ACL.

At 2-year follow-up, our patient was doing well with rehabilitation and experienced only minimal symptoms. Radiologists and surgeons should be able to identify such variants. Knowing the common and rare variants, radiologists can help surgeons by identifying normal anatomy from pathology and providing a more clinically relevant report. Surgeons should be aware of the anatomical variability in the knee in order to provide the best care for their patients.

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This paper will be judged for the Resident Writer's Award.