Unilateral Meniscomeniscal Ligament

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abstract

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Four normal variants of meniscomeniscal ligaments have been previously reported in the anatomy, arthroscopy, and radiology literature. The anterior and posterior transverse meniscal ligaments are the 2 most commonly observed, with a reported frequency of 58% and 1% to 4%, respectively. The last 2 variants include the medial and lateral oblique meniscomeniscal ligaments and account for a combined frequency of 1% to 4%.

This article describes 2 patients with unilateral meniscomeniscal ligaments observed on magnetic resonance imaging. One patient had a unilateral lateral meniscomeniscal ligament extending from the anterior horn of the lateral meniscus to the posterior horn of the lateral meniscus and underwent conservative management. The second patient had a unilateral medial meniscomeniscal ligament with a concomitant medial meniscus tear and underwent arthroscopic intervention. The ligament was stable intraoperatively and, therefore, was not resected. Both patients had resolution of their symptoms.

These 2 variants are additions to the previously described 4 normal intermeniscal ligament variants. The functions of the 2 new variants described in this article are poorly understood but are thought to involve meniscal stability. Accurate descriptions of normal variants can lead to the proper management of anomalous rare structures and prevent false imaging interpretations because these structures can closely mimic a double posterior cruciate ligament sign. Furthermore, an understanding of the various normal variants of intermeniscal ligaments can prevent unnecessary surgery that could result in further iatrogenic meniscus injury.
Four normal variants of menisco-meniscal ligaments have been reported in the anatomy, arthroscopy, and radiology literature. The first and most prevalent is the anterior transverse meniscal ligament, with a frequency of 58%. The second most frequently encountered variant is the posterior transverse meniscal ligament, with a reported frequency of 1% to 4%. The last 2 variants include the medial and lateral oblique menisco-meniscal ligaments, with a combined frequency of 1% to 4%. The oblique menisco-meniscal ligaments run from the anterior horn of 1 meniscus to the posterior horn of the opposite meniscus. The ligament is named for its anterior meniscal origin and has received increased attention because it is often mistaken for a displaced bucket handle meniscus tear on magnetic resonance imaging (MRI).

This article describes 2 patients with a unilateral variant to add to the 4 previously described normal variants. The difference between the oblique and unilateral menisco-meniscal ligaments is subtle and differs in their attachment to the posterior horn of the contralateral or ipsilateral meniscus.

**CASE REPORTS**

**Patient 1**

A 44-year-old woman presented with an approximately 3-month history of severe knee pain localized to the medial joint line. She reported persistent pain while navigating stairs and with prolonged weight bearing. Her symptoms had been managed conservatively with observation and physical therapy.

Physical examination was significant for a moderate effusion with pain on deep flexion. Medial joint-line pain was elicited with circumduction maneuvers. Magnetic resonance imaging revealed an oblique tear of the posterior horn medial meniscus. In addition, coronal and sagittal MRIs demonstrated a rounded low-signal structure arising from the anterior horn and inserting on the posterior horn of the medial meniscus (Figures 1, 2).

The patient underwent surgical intervention. Intraoperatively, the knee was found to have a complex medial meniscus tear as demonstrated on the MRI and was treated with a partial medial meniscectomy. A unilateral menisco-meniscal ligament was also identified and traced from the anterior to the posterior horn of the medial meniscus (Figure 3). Although the ligament was not attached to the intercondylar spine along its entirety, minimal displacement occurred with probing. The ligament also resisted displacement to the weight-bearing portion of the joint and was deemed stable and left intact. Postoperatively, the patient made a full recovery with full resolution of symptoms.

**Patient 2**

A 14-year-old boy presented with right knee pain after sustaining a rotational injury during football practice. On examination, the knee was ligamentously stable with a moderate effusion but demonstrated medial joint-line tenderness with circumduction maneuvers. Magnetic resonance imaging findings included bony edema of the medial femoral condyle, lateral tibial plateau, and a blind-ending ligamentous structure adjacent to the intercondylar notch interpret-
ed as a lateral menisco-meniscal ligament (Figure 4).

The patient underwent conservative management and had a quick recovery. At 8-week follow-up, he had no mechanical symptoms of locking or instability.

**DISCUSSION**

The unilateral menisco-meniscal ligament is a relatively uncommon structure. To the authors’ knowledge, it has not been previously reported in the anatomy, arthroscopy, or radiology literature. It extends from the anterior horn to the posterior horn of the corresponding meniscus. Similar to the oblique menisco-meniscal ligament, diagnostic imaging may mistake this variant for a displaced bucket handle meniscus tear due to its orientation. However, the ligament is a distinct structure with visible longitudinal fibers, and it is resistant to displacement by arthroscopic probing.

Sanders et al. reported 3 patients with oblique menisco-meniscal ligaments on MRI, each traversing from the anterior horn of the medial meniscus through the intercondylar notch and inserting on the posterior horn of the lateral meniscus. They cautioned that the oblique menisco-meniscal ligament mimicked the appearance of a double posterior cruciate ligament sign on MRI and could thus be mistaken for a bucket handle meniscus tear. Dervin and Paterson reported a similar case in a 41-year-old patient who was found to have an oblique menisco-meniscal ligament at the time of arthroscopic intervention. They reported that the ligament could be mistaken for an anterior cruciate ligament stump due to its proximity to the anterior cruciate ligament as it traverses the intercondylar notch.

Cadaveric studies have suggested increased excursion of the anterior horn of the medial meniscus at 30° of knee flexion with transection of the anterior transverse meniscal ligament, although the clinical relevance is unknown.

**CONCLUSION**

Similar to the oblique menisco-meniscal ligament, the exact function of the unilateral menisco-meniscal ligament is poorly understood. Surgeons should be aware of the anatomic diversity of intermeniscal ligaments and the possible presence of oblique and isolated unilateral variants so as not to unnecessarily resect a normal structural variant and risk potentially causing further injury.

**REFERENCES**