Dislocated Double-layered Lateral Meniscus Mimicking the Bucket-handle Tear

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Abstract

Various shapes of congenital abnormalities of the meniscus have been reported. Among them, the double-layered meniscus is rare. This article describes a 22-year-old man with a double-layered lateral meniscus who reported right knee pain with no history of trauma.

The double-layered lateral meniscus included both the upper and lower meniscus. The anterior and posterior edge of the upper meniscus was attached to the lower lateral meniscus, and its periphery was not connected to the capsule and the lower meniscus. In addition, the upper meniscus was dislocated into the intercondylar notch, mimicking a bucket-handle tear. However, the lower meniscus was normal in appearance, so a bucket-handle or horizontal tear of the meniscus was ruled out of the differential diagnosis.

Although this is a rare case, clinicians should be aware of this anomaly due to the potential for a double-layered meniscus to contribute to a bucket-handle or horizontal tear of the lower meniscus. Therefore, early diagnosis and proper treatment of a double-layered meniscus are needed before an additional injury occurs to a normal meniscus.

Figure: Coronal T1-weighted magnetic resonance images showing a bucket-handle tear (A) and the butterfly appearance of the medial margin (B) of the lateral meniscus.
Anomalies of the meniscus tend to more commonly affect the lateral meniscus and are more prevalent in Asian than American or European populations. Among various meniscal anomalies, a discoid meniscus is the most common anomaly, and other meniscal anomalies are rare.

This article describes a rare case of a double-layered meniscus in a young man. Few reports of patients with a double-layered meniscus are available in the English literature. In addition, the patient had a dislocated upper meniscus that mimicked a bucket-handle tear. To the authors’ knowledge, a meniscal anomaly mimicking a bucket-handle tear has not been previously reported.

Case Report

A 22-year-old man with no history of trauma reported right knee pain that began in military training 6 months prior to visiting the authors’ outpatient clinic. On physical examination, he had full range of motion with lateral joint line tenderness, a positive McMurray test on the lateral side, and normal gait. No signs of locking, clicking, or giving way were observed. Stable ligamentous findings were made, and his neurovascular examination was normal. Radiographs were nonspecific.

On coronal magnetic resonance images, a displaced meniscal fragment was identified within the intercondylar notch, and the medial margin of lateral meniscus had a butterfly appearance (Figure 1).

The patient underwent an arthroscopic procedure on the right knee. During arthroscopy, the lateral meniscus was found to be displaced medially within the intercondylar notch, and as in a bucket-handle tear (Figure 2). The meniscus was mobile and was easily reduced using a probe.

On examination of the lateral compartment after reduction of the dislocated meniscus, an accessory semicircular meniscus was seen over the original lateral meniscus. It extended from the posterior horn to the anteromedial segment of the lower meniscus, and its periphery was not connected to the lower meniscus and capsule (Figure 3).

The upper meniscus was easily dislocated and impinged on the femoral condyle and tibial plateau, so the upper accessory meniscus was completely resected.

The remaining lower meniscus was normal-sized with a smooth surface and was glossy in appearance, as would be seen in a normal meniscus. The 3-mm longitudinal tear on the posterior portion of the lower normal meniscus was incomplete and stable, so the authors elected observation instead of operative repair. The patient’s symptoms significantly improved postoperatively.

Discussion

Reports of congenital anomalies of the meniscus include discoid meniscus, incomplete discoid meniscus, Wrisberg meniscus, ring-shaped meniscus, double-layered meniscus, accessory meniscus, accessory discoid meniscus, partial deficiency of the meniscus, abnormal band formation, hypoplasia, congenital absence of the menisci, and congenital separation meniscus. Among these, the double-layered lateral meniscus in the current report is a rare condition of the meniscus and has been reported with a prevalence of .06% to .09%. Causes of such variations are multifactorial, including congenital and developmental influences, but clinical presentations, pathology, and epidemiology of variations are still unclear.

In the current patient, the anterior and posterior edge of upper meniscus was attached to the lower lateral meniscus, and...
its periphery was not connected to the capsule and the lower meniscus. These findings were similar to previous reports.\(^2,3,5,6\) In addition, the upper meniscus in the current patient was dislocated into the intercondylar notch, mimicking the bucket-handle tear. In a typical bucket-handle tear, the 2 ends of the bucket handle are continuous in the medial margin of the meniscus, whereas the dislocated meniscus in the current patient was connected to the upper portion of the lower meniscus. Furthermore, the volume and width of the remnant meniscus was normal after resection of upper meniscus.

The condition in this report should be differentiated from a horizontal tear of the meniscus. A horizontal tear is considered a degenerative change with irregular cleavage that frequently occurs in the patients older than 30 years. However, the current patient was 22 years old, and the surface of lower meniscus was smooth. Based on these findings, the authors concluded that the anomaly was different from the acquired changes induced by degeneration or trauma.

Two reports described the magnetic resonance imaging findings of the double-layered meniscus, revealing the abnormal signal or high intensity in the lateral meniscus.\(^5,6\) However, they were not specific findings in the double-layered meniscus.\(^5,6\) The current authors cautiously suggest that the butterfly appearance seen in the current case is the pathologic magnetic resonance imaging finding of a double-layered meniscus.

The clinical importance of a double-layered meniscus is thought to potentially contribute to a bucket-handle or horizontal tear of the lower meniscus complicated with a double-layered meniscus.\(^5\) Therefore, the authors believe that early diagnosis and proper treatment of a double-layered meniscus are needed before additional injury of the normal meniscus occurs.

**REFERENCES**