The case:

An 18-year-old man with no prior surgical history presented with left knee pain after sustaining a basketball injury and was diagnosed with transient patellar dislocation. Magnetic resonance imaging was ordered to further assess the extent of injury.

Figure: Coronal fat-suppressed magnetic resonance image of the knee (A). Sagittal fat-suppressed proton density magnetic resonance image of the knee (B).

Your diagnosis?

For answer, see next page.
An 18-year-old man with a history of multiple patellar dislocations presented with left knee pain following patellar dislocation during a basketball game. The diagnosis of transient patellar dislocation was made and magnetic resonance imaging was ordered to assess for complications of transient patellar dislocation, integrity of the medial patellofemoral ligament, and other internal derangement of the knee.

Magnetic resonance imaging revealed a diminutive-appearing medial meniscus, which was otherwise normal in morphology without a tear or displaced fragment (Figure 1). The patient reported no mechanical symptoms, such as catching or locking, and did not have positive signs for a meniscal tear on physical examination. Based on these factors, a meniscal tear resulting in the diminutive meniscus was ruled out as a possible etiology. Additionally, there was no prior history of surgery on the affected knee, and prior surgical debridement of the meniscus was also ruled out as a possible cause. Exclusion of these common etiologies for a diminutive meniscus and consideration of the patient’s young age led to the diagnosis of a congenitally hypoplastic meniscus.

A diagnostic arthroscopy performed when the patient underwent surgical reconstruction of the patellofemoral ligament to address the patellar instability revealed a diminutive but otherwise normal-appearing medial meniscus (Figure 2). The operative findings confirmed the presence of congenital medial meniscal hypoplasia.

**Meniscal Development**

The menisci differentiate directly from mesenchymal tissue and assume their characteristic adult shape early in gestation. They develop around the eighth week, become more well defined around the ninth week, and become increasingly vascularized later in the prenatal period. There are no immediate changes to the menisci after birth, but decreased vascularity and growth of the menisci are observed over time. Compared with the medial meniscus, the lateral meniscus shows a greater degree of developmental...
variation. This might in part explain the increased occurrence of congenital meniscal abnormalities in the lateral compartment. The anterior cruciate ligament arises from the same mesenchymal tissue as the meniscus, and congenital abnormalities of the anterior cruciate ligament and meniscus may occur simultaneously.

Discussion

Congenital meniscal abnormalities are rare. The most common congenital meniscal abnormalities include discoid menisci and abnormal meniscal horn attachment, whereas conditions such as meniscal hypoplasia and agenesis remain rare. There are few reports of congenital meniscal hypoplasia in the literature. One such case was discovered during an investigation of knee pain.

However, in other reports, as well as in the current case, meniscal hypoplasia was an incidental finding during the work-up of other knee complaints. Twyman and Ferris described 2 cases of medial meniscal hypoplasia, the first of which was discovered during investigation of a fixed flexion knee deformity in the background of other physical deformities. The second case was found during arthroscopic repair of a torn anterior cruciate ligament. Similarly, Tetik et al reported a case of lateral meniscal hypoplasia found on magnetic resonance imaging performed following trauma to the knee. The first case of bilateral lateral meniscal hypoplasia was reported by Ohana et al in 1995. In this case, lateral meniscal hypoplasia was found bilaterally after 2 separate traumatic knee injuries required arthroscopic intervention. In 2006, Monllau et al reported the first case of bilateral medial meniscal hypoplasia in a woman with long-term knee pain. Mitsuoka et al reported a case of both lateral meniscal and anterior cruciate ligament hypoplasia associated with osteochondritis dissecans of the medial femoral condyle.

Previously, a hypoplastic medial meniscus had been described as having a normal posterior horn that becomes absent as it approaches the anterior horn. Interestingly, the current case showed the opposite pattern, with evidence on magnetic resonance imaging of posterior horn hypoplasia, which was later confirmed during arthroscopy (Figure 2).

Although a rare condition, congenital meniscal hypoplasia should be considered when a patient presents with a small meniscus with otherwise normal morphology in the absence of prior meniscal injury or surgery. It should not be mistaken for a meniscal tear or other abnormality. Because this condition is usually an asymptomatic incidental finding, treatment is aimed at correcting accompanying pathologies that are likely the cause of the patient’s symptoms.

References