

Arthroscopic Meniscectomy and Meniscopeasty for a Torn Discoid Medial Meniscus: Case Report, Surgical Technique, and Literature Review

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What to Learn from this Article?

Orthopedic surgeons must have basic knowledge of imaging modalities.

Abstract

Introduction: Normal menisci of the knee are semilunar structures. Sometimes, a meniscus may be found to be thickened and disc like and is called a discoid meniscus. Such a discoid variant is usually found in the lateral meniscus. Its occurrence in the medial meniscus is extremely rare.

Case Report: We report a case of an 18-year-old female, who presented to us with knee pain and was found to have a discoid medial meniscus with a tear. We operated on her arthroscopically and performed meniscectomy and meniscopeasty. Postoperatively, the patient was free of her knee pain.

Conclusion: Discoid medial meniscus is a rare phenomenon which can present as a cause of knee pain. If discoid meniscus is symptomatic, the management includes arthroscopic meniscectomy and meniscopeasty.

Keywords: Meniscopeasty, discoid medial meniscus, arthroscopic meniscectomy.

Introduction

The menisci are semilunar discs of fibrocartilaginous tissue which play critical roles in knee joint biomechanics [1]. Menisci function to (a) distribute forces equally across the joint surface, (b) stabilize the contact between the femur and tibia, (c) aid in joint proprioception, and (d) aid in lubrication [2, 3]. Normal menisci are shaped-like crescent moons, in fact, the word "meniscus" comes from the Greek word for crescent. A discoid meniscus is a thickened disk-like morphologic variant of a

normal meniscus [4]. Discoid meniscus is a relatively rare condition of the knee more frequently found in the lateral meniscus. Discoid medial menisci are even rare. Smillie [5] reported that 467 patients had a discoid lateral meniscus and only 7 had a discoid medial meniscus in 10,000 meniscectomies. There have been only few case reports with anomalous discoid medial meniscus. We describe a case of discoid medial meniscus which was symptomatic due to a large intrasubstance horizontal tear.

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Case Report

An 18-year-old female patient presented to our outpatient department with pain in her left knee of 3 years duration. There was a history of fall 3 years ago. She felt pain while walking and while standing up from squatting position. The patient gave no history of locking episodes. On clinical examination, there was no obvious swelling over her left knee. There was no tenderness around the knee except for tenderness over the medial joint line. The patient complained of pain during terminal flexion. There was no laxity in the knee. McMurray test was positive for the medial meniscus. Rest of the examination of the knee was unremarkable.

The patient had already been treated with physiotherapy and occasional analgesics. We decided to image the left knee. The radiographs of the knee revealed no abnormality (Fig. 1). We performed magnetic resonance imaging (MRI) scan of the knee and expected it to show a medial meniscal tear. Initial reporting by the radiologist confirmed a medial meniscal tear without a mention of it being discoid. However, because the body of the meniscus was seen in 4 consecutive sagittal sections of the MRI scan (Fig. 2 and 3), we suspected a discoid medial meniscus and got



Figure 1: Radiograph of the knees showing no abnormality.



Figure 2: Magnetic resonance imaging showing continuity between the anterior and posterior horns on 4 consecutive 5 mm sagittal cuts.

the scan reported again. This time, the radiologist reported it as a torn discoid medial meniscus. We decided to perform arthroscopic partial meniscectomy and meniscoplasty for the patient.

Arthroscopy confirmed a discoid medial meniscus occupying the entire medial tibial plateau (Fig. 4). The anterior part of the discoid meniscus was attached along the anterior cruciate ligament (ACL) (Fig. 5). However, no obvious tear could be visualized (Fig. 6). We then trimmed the lateral edge of the meniscus lying toward the intercondylar region which revealed a large cleavage tear completely restricted to the interstitial part (Fig. 7). We resected the upper and lower flaps till a stable peripheral semilunar rim of meniscus was obtained (Fig. 8). Postoperatively, the patient was started on a physiotherapy protocol to preserve range of motion and muscle strength. Weight bearing was started after pain due to surgery subsided. 2 weeks postoperatively, the patient attained full range of motion and was pain-free even on terminal flexion.

Discussion

Discoid medial meniscus was reported for the first time by Cave and Staples in 1941 [6]. It is an extremely rare anomaly with an incidence

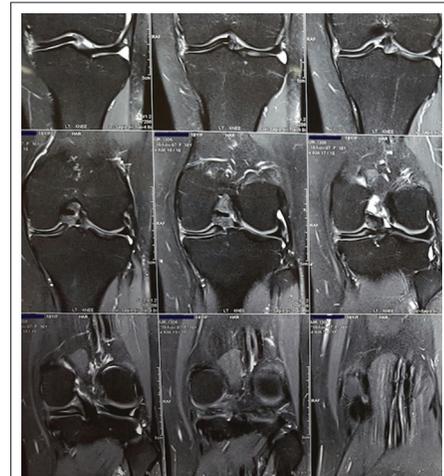


Figure 3: Magnetic resonance imaging showing discoid medial meniscus in coronal cuts.



Figure 4: Discoid medial meniscus as seen at arthroscopy.



Figure 5: Anterior horn of discoid medial meniscus (#) seen to be continuous with the anterior cruciate ligament (*).



Figure 7: The horizontal interstitial tear as seen after resecting the lateral edge in the intercondylar region.



Figure 6: The lateral edge of discoid medial meniscus seen in the intercondylar region showing no evidence of tear.



Figure 8: Peripheral stable rim obtained after meniscoplasty.

of 0.1-0.3% [7]. Smillie [5] implicated defective disappearance of the meniscal center during fetal development, with persistence of a fetal stage into adulthood. According to Kaplan [8], discoid lateral meniscus is a pathologic entity developing under certain conditions and influenced by mechanical factors such as posterior segment hypermobility; however, he had no explanation for discoid medial meniscus.

Clinically, the most frequent symptoms in discoid medial meniscus are medial knee pain, iterative effusion, and locking in flexion none of which are specific. Knee snapping is rarer than in discoid lateral meniscus. Pain and effusion are more probably due to the meniscal tear than to the discoid shape of the meniscus. Locking may be due to the discoid shape as such, with the thick central region passing forward of the medial condyle [9]. Radiographs, in selected cases, may show a widened medial joint space with squaring of the femoral condyles [10] or depression of the tibial plateau [11]. The MRI is usually diagnostic, showing discoid medial meniscus with associated tears, and anomalies of attachment of the meniscal horns. The diagnosis requires continuity between the anterior and posterior horns on three consecutive 5 mm sagittal slices [12]. Tachibana *et al.* and Lee *et al.* recommend the systematic MRI of the

asymptomatic contralateral knee [12, 13]; they consider the incidence of bilateral cases to be underestimated. As the abnormality is congenital, they believe it to be usually bilateral. We performed MRI of the opposite asymptomatic knee of our patient, but the medial meniscus of the opposite knee was not discoid.

Anomalies associated with the discoid medial meniscus have also been reported. These include depression of the tibial plateau, anomalous attachment of the anterior horn to the ACL, meniscal cyst, pathologic medial patellar plica, and discoid lateral meniscus on the same knee [11, 13, 14, 15, 16, 17, 18]. The most frequent anomalies are associated with anomalous insertion of the ACL [15, 17, 18]. Kim *et al.* reported anterior transposition of the anterior horn of the medial discoid meniscus below the anterior edge of the tibia plateau.

Asymptomatic discoid medial menisci should be left alone. Patel believes that the discoid meniscus should be preserved if "severe symptoms are not present" [19]. The treatment of symptomatic discoid medial meniscus is essentially surgical. Arthroscopy identified the type of discoid meniscus and associated tears/unstable flaps. Partial meniscectomy, with excision of the central anomalous discoid meniscus and preservation of stable peripheral

rim, is the preferred treatment. Several tears are amenable to arthroscopic repair. The patients must always be counseled that they are always at a higher risk for meniscal injuries in the future due to the abnormal morphology of the meniscus and hence might require lifestyle and activity modification [20]. Kim *et al.* have described a surgical technique of arthroscopic excision of the symptomatic discoid medial meniscus in one piece which leads to less formation of foreign bodies and is a time-saving technique [21].

Conclusion

Discoid medial meniscus is a rare phenomenon which can present as a cause of knee pain. If discoid meniscus is symptomatic, the management

includes arthroscopic meniscectomy and meniscopectomy. The opposite knee must be screened to look for the presence of bilateral discoid medial menisci. The patient must be advised to exercise precautions and activity modification to prevent future symptoms.

Clinical Message

Orthopedic surgeons must have working knowledge about interpretation of imaging modalities such as MRI. Rare abnormalities if found on MRI should be dealt with appropriately.

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