Bilateral discoid medial Meniscus
Two case reports
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Abstract
Rationale: Discoid meniscus is an anatomical congenital anomaly more often found in the lateral meniscus. A discoid medial meniscus is a very rare anomaly, and it is difficult to diagnose a bilateral discoid medial meniscus because not all the discoid medial menisci are asymptomatic. Herein, we report 2 cases of bilateral discoid medial meniscus.

Patients concerns: Case 1: a 23-year-old man presented with complaints of pain and occasional clicking of the right knee for 6 years, the left knee was asymptomatic. Case 2: a 51-year-old woman had a 1-month history of pain and a feeling of “giving away” in both knees.

Diagnoses: Based on physical examination and magnetic resonance imaging (MRI) findings, they were diagnosed with bilateral discoid medial meniscal tears.

Interventions: Case 1: partial meniscectomy and reshaping were performed for the torn discoid medial meniscus of the right knee only. Case 2: partial medial meniscectomy and reshaping were performed for the torn discoid medial meniscus on both knees.

Outcomes: The postoperative pain and the recovery of joint function were observed. The average follow-up time of 2 patients was 1 year. The Lysholm score of 2 patients was improved from 55 to 95 and 40 to 90 respectively. The pain of knee joint was relieved and the symptoms of disharmony were obviously improved.

Lessons: We recommend preservation of the discoid medial meniscus in asymptomatic patients. Meniscectomy and reshaping for injured discoid medial meniscus produces promising short-term results.

Abbreviations: MRI = magnetic resonance imaging, ROM = range of motion.

Keywords: arthroscopy, knee joint, medial discoid meniscus

1. Introduction
Discoid meniscus, also called disk cartilage, is a type of meniscus with an atypical shape, thicker, covering a bigger surface of tibial plateau than a normal meniscus. The anomaly is commonly seen in the lateral meniscus. A discoid medial meniscus is a very rare anomaly, and it is difficult to diagnose a bilateral discoid medial meniscus. The reported incidence rates for discoid lateral menisci range from 1.2% to 5.2% and the incidence is much lower for discoid medial meniscus (0.12%–0.3%).[1,2] However, the real incidence of medial bilateral discoid menisci is difficult to determine because an unknown percentage of discoid menisci may be asymptomatic.[3] We herein report 2 cases of bilateral discoid medial menisci with tear on single side of 1 case and 2 sides of another case, which was successfully treated by arthroscopy.

Written informed consent was obtained from both patients for the publication of this case report. This case report was approved by ethics committee of our hospital (Institutional Review Board of The Third Hospital of Hebei Medical University).

2. Case reports
2.1. Patient 1
In December 2014, a 23-year-old man presented with complaints of pain and occasional clicking of the right knee for 6 years. The pain increased with climbing stairs and squatting. The left knee was asymptomatic.

Physical examination: The patient’s muscle strength was normal. There is no obvious swelling of the right knee joint, his skin temperature and color is normal, the floating patella test is negative, his medial McMurray test was negative, while his lateral McMurray test was positive. The range of motion (ROM) was 0° to 130° of flexion in the patient’s right knee. No ligament instability was noted. The Lysholm score was 55. Although the contralateral left knee was asymptomatic, the patient asked us to do a left knee magnetic resonance imaging (MRI) examination for him. The MRI of the both knees showed
that there is a medial discoid meniscus in both knees with a tear in the right knee (Fig. 1A, B). For the symptomatic right knee, arthroscopy was planned. Under lumbar anesthesia, with anteromedial and anterolateral arthroscopy portals, an arthroscopy of the right knee was performed. A complete medial discoid meniscus with a partial complex tear in red zone of the body and posterior horn was found (Fig. 1C). Partial medial meniscectomy and reshaping were performed (Fig. 1D). The patient was reviewed at 1 year and was asymptomatic and with the Lysholm score was 95.

2.2. Patient 2

In March 2017, a 51-year-old woman was being admitted to our hospital for a 1-month history of pain and giving way in both knees. In the physical examination, her muscle strength were normal, there is no obvious swelling in both knees, her skin temperature and color is normal, the floating patella test is negative, her medial McMurray test was positive in both knees, while her lateral McMurray test was negative. There is a restriction in knee joint ROM, with right knee extension 0° and flexion 120° and left knee extension 0° and flexion 110°. No ligament instability was noted. The Lysholm score was 40. MRI revealed complete discoid medial meniscus with a tear in both knees (Fig. 2A, B). An arthroscopy was performed on the both knees in the same manner. A complete medial discoid meniscus was found in the left knee with a complex tear in white zone affecting the body (Fig. 2C), meanwhile, a complete medial discoid meniscus was found in the right knee with a longitudinal tear in red zone affecting the body (Fig. 2D). Partial medial meniscectomy and reshaping were performed on both knees. At a 12-month follow-up, her pain and ROM restriction disappeared with negative McMurray testing. Her Lysholm score was improved to 90.

3. Discussion

Since the report by Cave and Staples in 1941,[4] discoid medial meniscus still remains mysterious and bilateralism is exceedingly rare. The actual incidence of discoid medial meniscus is difficult to ensure because most patients are asymptomatic like the case 1 of this article. There are few reports of medial discoid meniscus,[5–9] almost all of them are case reports.

The etiology of discoid meniscus is controversial. Smillie[10] postulated that the discoid shape is normal in the embryo, then failure of absorption of the central portion, which persists during the fetal stage, leads to “congenital discoid meniscus”. Kaplan et al [11] suggested discoid lateral menisci develop due to abnormal motion caused by absence of posterior tibial attachment. Raheel[12] reported a case with familial discoid medial meniscus tear in 3 members of a family. We have reasons to believe that the discoid meniscus could be associated with genetic abnormality.
But no theories of genetic etiology for discoid meniscus have been brought forward to date.

The symptoms of a torn discoid medial meniscus are usually similar to those caused by a tear of a normal meniscus. In the lateral discoid menisci, the finding of “snapping knee” may help to make the diagnosis whereas in the medial menisci it is less specific.[13] In our cases the main complaint of patient was clicking of joint.

Medial discoid meniscus may be asymptomatic and found incidentally after MRI requested for other reasons like the case 1 of this article. Sometimes we could find some abnormalities such as widening of the medial joint margin and cupping of the medial tibia plateau which associated with discoid medial meniscus in plain radiographs,[14] but none of these were present in our patients. MRI has improved the diagnosis of discoid meniscus. The presence of the “bow tie” sign in more than 3 slices of sagittal plane of MRI suggests the occurrence of discoid meniscus.[15] In coronal plane of MRI, we can make the diagnosis of discoid meniscus when the ratio of the minimal meniscal width to the maximal tibial width is more than 20%.[16] However, arthroscopy is still the gold standard for diagnosing discoid meniscus.

Patel et al.[17] recommend that the discoid meniscus could be preserved if severe symptoms are absent and advocate partial resection of a torn symptomatic meniscus. In our cases, we performed a partial meniscectomy in both cases until a stable peripheral rim occurred. The patient was doing well at the 1-year follow up. In general, the results of partial meniscectomy in discoid medial meniscus are good.

Nowadays, Suture of torn menisci is becoming more prevalent. The development of different surgical techniques and surgical devices has facilitated this procedure. Enrique[6] reported 1 patient who had discoid medial meniscus and is treated with meniscorrhaphy, the patient had an excellent result and had no symptoms at 2-year follow-up.

In conclusion, discoid medial meniscus is a rare abnormality. Good quality radiography and MRI are helpful when making the preoperative diagnosis. Bilateralism should be ruled out in every case of discoid medial meniscus so that the patient can take precautions to avoid a similar injury in the contralateral asymptomatic knee in the future. Early arthroscopic meniscoplasty is indispensable in the case of discoid medial meniscus tearing.

Author contributions
Writing – original draft: Xiaolong Yang.
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Figure 2. A and B: Coronal MR images of both knees show a complete discoid medial meniscus with tear; C and D: Arthroscopic images show discoid medial meniscus with a complex tear in left knee and a longitudinal tear in right knee.
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