

Discoid medial meniscus

Varied presentation of 3 knees

S. Vidyadhara, MS, DNB, Sharath K. Rao, MS, Sripathi Rao, MS.

ABSTRACT

Discoid medial meniscus is a rarity. We present 2 cases, one with bilateral discoid medial menisci, and the other with both medial and lateral discoid menisci in the same knee. The radiological, MRI and arthroscopic findings in these knees and their association with various synovial plicae have been described. Both patients had good results after arthroscopic subtotal meniscectomy.

Saudi Med J 2006; Vol. 27 (6): 888-891

A discoid meniscus is a thick meniscus, discoid in shape rather than having the normal semilunar configuration. Discoid meniscus is considered an uncommon lesion; discoid medial meniscus is rare and involvement of the medial meniscus bilaterally or its presence with lateral discoid menisci in the same knee is extremely rare. Unlike discoid lateral meniscus, etiological, clinicoradiological, and MRI features of discoid medial meniscus have not been well described in the literature. All the 3 discoid medial menisci in our series were symptomatic.

Case Reports. *Patient One.* A 29-year-old lady presented with pain in the right knee of one year duration, without any significant trauma. She had a recurrent swelling of the knee but no history of clicks, locking or instability. The increasing discomfort interfered with her daily life, which prompted her to seek a specialist opinion. Her left knee was asymptomatic. The quadriceps was wasted and there was mild effusion of the right knee joint. The medial joint line was tender. McMurray and

Apley's tests were negative, and she had no signs of instability. The knee had a full range of pain free movement. The radiograph was normal. There were no additional findings on examination under anesthesia. Arthroscopic surgery performed under spinal anesthesia revealed complete discoid medial meniscus with complex tear (**Figure 1a**), incomplete discoid lateral ring meniscus, suprapatellar plica (with medial and lateral shelves), and pathological medial parapatellar and inferior plicae (**Figure 1b**). In view of the meniscal tear extending up to the peripheral rim of the meniscus, subtotal medial meniscectomy with excision of the medial parapatellar and inferior plicae was carried out. The discoid lateral ring meniscus was left alone, as there was no tear or degeneration. The patient was mobilized on the first postoperative day. The result was graded as excellent using the Ikeuchi scale at the end of 6 years. There was no reduction in knee joint space on radiographs at the last follow-up.

Patient 2. An 8-year-old boy presented with pain over the anteromedial aspect of the right knee of one year duration. This was associated with swelling on

From the Department of Orthopedics, Kasturba Medical College, Manipal, Karnataka, India.

Received 13th August 2005. Accepted for publication in final form 8th February 2006.

Address correspondence and reprint request to: Dr. S. Vidyadhara, Department of Orthopedics, Kasturba Medical College, Manipal 576104, Karnataka, India. Tel. +91 9344833993. Fax. +91 (820) 2571934. E-mail: vidya007@gmail.com

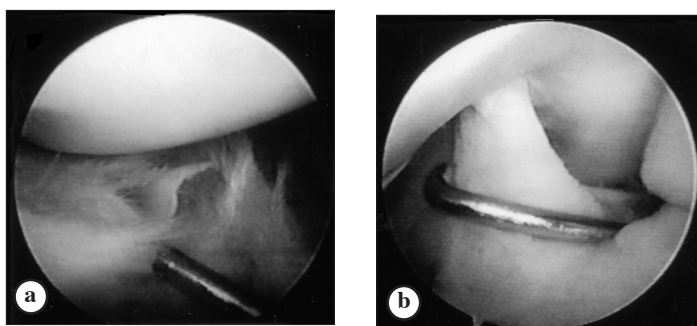


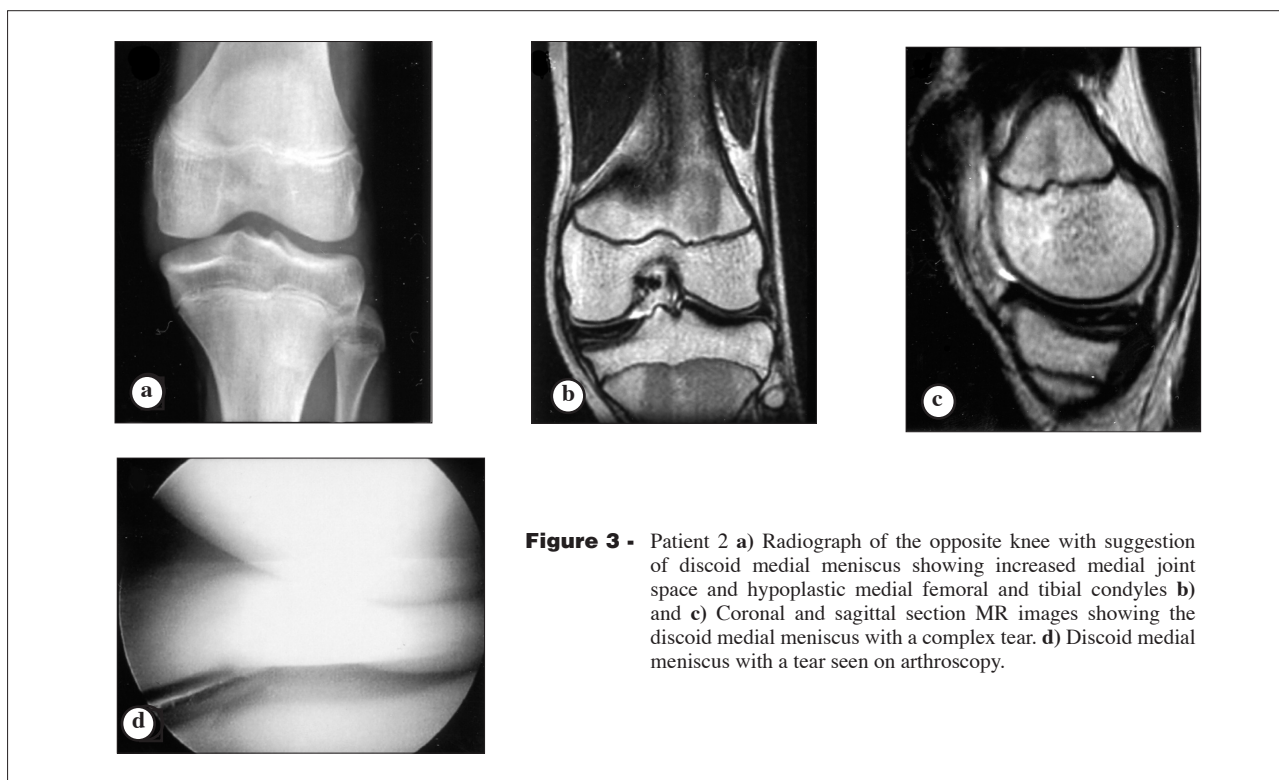
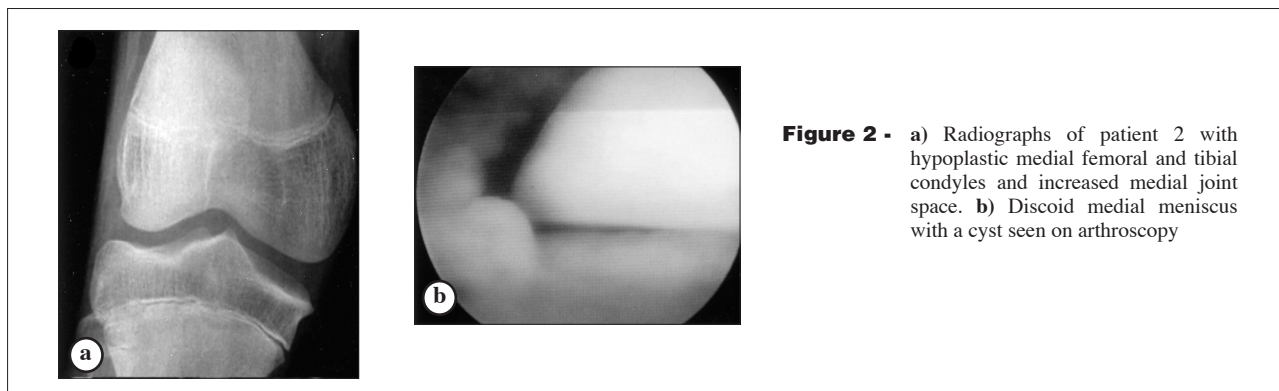
Figure 1 -Patient one. a) and b) Arthroscopic views showing complex discoid medial meniscus with a complete tear along with a pathological inferior plica.

the medial aspect of the knee and mild limp while walking. On examination, he had a medial joint line tenderness and swelling anteromedially, prominent on extension. There was a flexion deformity of 10 degrees, and further flexion of 10-140 degrees was possible. A clunk was present on terminal extension. McMurray's test was negative. The opposite knee was clinically normal. The preoperative radiograph showed hypoplastic medial tibial and femoral condyle and an increased medial joint space (**Figure 2a**). Arthroscopy carried out in June 2000 revealed a complete discoid medial meniscus with a cyst (**Figure 2b**). There was no associated tear on the first look arthroscopy, however, because of the presence of the meniscal cyst, an intrasubstance tear was suspected and arthroscopic meniscectomy, leaving behind 6 mm rim of meniscus, was performed. The anteromedial meniscal cyst mechanically blocking the knee extension was excised completely, and its wall was curetted from within the joint using the arthroscope. The medial and inferior plicae were shaved off. He was allowed weight bearing and the knee was mobilized as tolerated from the first postoperative day. Six months later, he developed pain and swelling of the left knee following a twisting injury. He had a mild limp and quadriceps wasting. The knee was in a fixed flexion deformity of 15° and McMurray's test was positive for medial meniscal tear. Radiograph revealed an increased medial joint space and hypoplastic medial tibial and femoral condyles (**Figure 3a**), and MRI showed evidence of discoid medial meniscus with a horizontal tear and depressed medial tibial plateau exposing the subchondral bone (**Figures 3b and 3c**). With a preoperative clinicoradiological diagnosis of discoid medial meniscus in mind, arthroscopy was carried out in February 2001, which showed an incomplete discoid medial meniscus with a horizontal tear (**Figure 3d**). Arthroscopic subtotal medial meniscectomy was carried out in view of the tear

extending up to the periphery. The inferior plica was excised. He was mobilized on the first postoperative day. He was last reviewed after 4-years, and was doing well with a full range of movement of both knees. The result was excellent in right knee and good in the left as graded using the Ikeuchi scale. The standing anteroposterior radiograph of the knees revealed no decrease in the joint space in both the knees.

Discussion. The discoid meniscus of the knee is an abnormally wide and thick meniscus that widely covers the articular surface of the tibial plateau, and is easily damaged as a result. Discoid lateral meniscus is a well-studied and documented entity of the knee, whereas discoid medial meniscus is an extremely rare pathology. There are no more than 35 cases of medial discoid menisci reported in the literature. Medial and lateral discoid menisci in the same knee,¹⁻⁵ as well as bilateral medial discoid menisci in the same patient,⁶⁻⁹ are extremely rare. Our second patient had the symptoms of pain and swelling of right knee from the age of 7 years, and is the youngest patient in the literature to have symptomatic discoid medial meniscus. Only one other patient in the literature had presented with a cyst.¹⁰

Our patients had a radiological evidence of discoid medial meniscus described in the literature, such as hypoplasia of the medial tibial and femoral condyles, and increased medial joint space.⁹ But none had any lytic lesion in the distal femoral condyle. Both MRI and arthroscopy did show the presence of depressed medial tibial plateau with exposed subchondral bone in one of the knees.⁸ Although the condition can be well treated with open surgery, advancement in the arthroscopic technique has made postoperative rehabilitation better. The decision as to how much of the meniscus to resect depends on the tear pattern. Under normal circumstances, the meniscectomy should be performed in symptomatic knees leaving



behind 6 mm of peripheral rim of meniscus. In cases with the tear (horizontal most commonly), the amount of meniscectomy is dictated by the extent of the tear. Sparing of as much of the normal looking balanced peripheral meniscus is a rule in children. Although subtotal or total meniscectomy has been associated with the early reduction in the knee joint space, this finding was not noticed in reported knees of this series. Racial differences in the incidence of discoid menisci exist. Generally, the incidence is less than 5% for Caucasians. Ikeuchi reported the incidence of 16.6% in Japanese patients.¹¹ Prior to 1950, most reports stated that the etiology of discoid meniscus could be explained by a developmental arrest of the meniscus in the embryo. Kaplan observed that the discoid shape

resulted from abnormal stresses on the hypermobile menisci lacking the normal attachment of the posterior horn to the lateral intercondylar tibial tubercle.¹² Since there is knee motion in utero, the discovery of a discoid meniscus in very young children is consistent with this theory. Kaplan's theory, however, does not explain the partially duplicated lateral meniscus, double layered lateral meniscus, ring shaped lateral meniscus, or the unusual deformity of medial meniscus reported by Riachi & Phares.¹³ It is only at the very early phase of development, during the embryonic period that the plate of undifferentiated mesenchyme from which the meniscus develops resembles a disc in any way. Synovial plicae are the remnants of mesenchymal tissue that occupies the space between

the distal femoral and proximal tibial epiphyses in the 8-week-old embryo. The incomplete resorption leaves synovial pleats in most of the knees.⁹ The superior and the inferior plicae are most common (50-65%) followed by medial (25-30%) and lateral (1-3%).¹⁴⁻¹⁵ In addition to the various bony anomalies associated with the discoid lateral meniscus, a persistent vertical septum type of infra patellar plica was reported by Reider et al.¹⁶

The etiology of discoid meniscus has been only partially explained. Our cases present both medial and lateral discoid menisci in the same knee, also bilateral discoid medial menisci coexisting with various synovial plicae and meniscal cyst, diagnosed and treated arthroscopically.

References

1. Choi NH, Kim NM, Kim HJ. Medial and lateral discoid menisci in the same knee. *Arthroscopy* 2001; 17: E9.
2. Husson JL, Meadeb J, Cameau J, Blouet JM, Masse A, Duval JM. Medial and lateral discoid menisci in the same knee.
3. Jeannopoulos C. Observations on discoid menisci. *J Bone Joint Surg (Am)* 1950; 32: 649-652. Approach of a case. *Bull Assoc Anat (Nancy)* 1985; 69: 201-208.
4. Nathan PA, Cole SC. Discoid meniscus - A Clinical and Pathologic study. *Clin Orthop* 1969; 64: 107-113.
5. Yanez-Acevedo A. Bilateral discoid lateral menisci and unilateral discoid medial menisci. *Arthroscopy* 2001; 17: 772-775.
6. Akgun I, Heybeli, Bagatur E, Karadeniz N. Bilateral discoid medial meniscus: an adult patient with symmetrical radial tears in both knees. *Arthroscopy* 1998; 14: 512-517.
7. Augfe WK, Keading CC. Bilateral discoid medial meniscus with extensive intrasubstance cleavage tears: MRI and arthroscopic correlation. *Arthroscopy* 1994; 10: 313-318.
8. Lowenberg DW, Fieldman ML. Magnetic resonance imaging diagnosis of discoid medial meniscus. *Arthroscopy* 1993; 9: 704-706.
9. Pinar H, Akseki D, Karaoglan O, Ozkan M, Uluc E. Bilateral discoid medial menisci. *Arthroscopy* 2000; 16: 96-101.
10. Stern A, Hallel T. Medial discoid meniscus with cyst formation in a child. *J Pediatr Orthop* 1988; 8: 471-473.
11. Ikeuchi H. Arthroscopic treatment of the discoid lateral meniscus. Technique and long term results. *Clin Orthop* 1982; 167: 19-28.
12. Kaplan EB. Discoid lateral meniscus of the knee joint. Nature, mechanism and operative treatment. *J Bone Joint Surg (Am)* 1957; 39: 77-87.
13. Raichi E, Phares A. An unusual deformity of the medial semi lunar cartilage. *J Bone Joint Surg (Br)* 1963; 45: 146-147.
14. Dupont JY. Synovial plicae of the knee. Controversies and review. *Clin Sports Med* 1977; 16: 87-122.
15. Ogata S, Uthoff HK. The development of synovial plicae in human knee joints: An embryologic Study. *Arthroscopy* 1990; 6: 315-321.
16. Reider B, Marshall JL, Warren RF. Persistent vertical septum in the human knee joint. *J Bone Joint Surg (Am)* 1981; 63: 1185-1187.