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Case Report

Ring-Shaped Lateral Meniscus

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Summary: The existence of abnormal-shaped menisci has been long recognized. The presence of discoid menisci in the human knee is considered to be a congenital malformation with a very low rate of incidence except in Asian populations. Since the publication of Watanabe's Atlas, three types of lateral meniscal abnormalities are generally accepted: the complete and incomplete discoid, as well as the Wrisberg-ligament type meniscus. The present case is the second description of a ring-shaped meniscus on the lateral side of the knee and we propose that this variant be included as a fourth variant in a future classification. **Key Words:** Arthroscopy—Discoid meniscus—Ring-shaped.

The existence of abnormal-shaped menisci has been long known.¹ Although these abnormalities can appear in both femorotibial compartments, they are more frequent in the lateral one.²⁻⁴ Since the publication of Watanabe's Atlas,⁵ three types of lateral meniscal abnormalities are generally accepted (Fig 1): (A) the complete and (B) incomplete discoid, as well as (C) the Wrisberg-ligament type meniscus. The complete type is a megameniscus. It is disc-shaped and covers the tibial plateau surface and prevents any contact between the femoral and tibial hyaline cartilages. The incomplete type is the same in every way to the former, except that it is smaller in size. However, in the Wrisberg variant, the meniscus can be discoid or normal-shaped but lacks a posterior horn attachment, the meniscomfemoral ligament (Wrisberg ligament) being, at this level, its only system of fixation.^{2,4-6} The aim of this study is to confirm the existence of a fourth meniscal malformation variant, characterized by a ring-shaped morphology with normal posterior tibial attachment (Fig 1D).

CASE REPORT

A 43-year-old woman referred to our department complained of having anterior right knee pain of a mechanical character over several months. She related that it worsened when walking up and walking down stairs. Physical examination showed no alteration in the limb axis nor in the Q angle, and no pain was experienced at the joint lines. Although there were no signs of patellar instability, palpation of the lateral patellar facet was painful. As the routine radiological examination was absolutely normal, patellofemoral syndrome was diagnosed. We recommended a treatment of nonsteroidal anti-inflammatory drugs and a program of rehabilitation. Three months later, owing to the persistence of patellar tenderness on examination, magnetic resonance imaging was performed. This showed evidence of an alteration of the lateral meniscus (Fig 2). We decided to perform an arthroscopic procedure.

The arthroscopic revision showed the existence of a normally inserted and stable ring-shaped lateral meniscus with no signs of a tear (Fig 3). We considered it to be an incidental finding. The presence of an Outerbridge⁷ grade II chondromalacia in the lateral facet of the patellae was verified, and was then treated by shaving. At 2-year follow-up, the patient showed significant clinical improvement.

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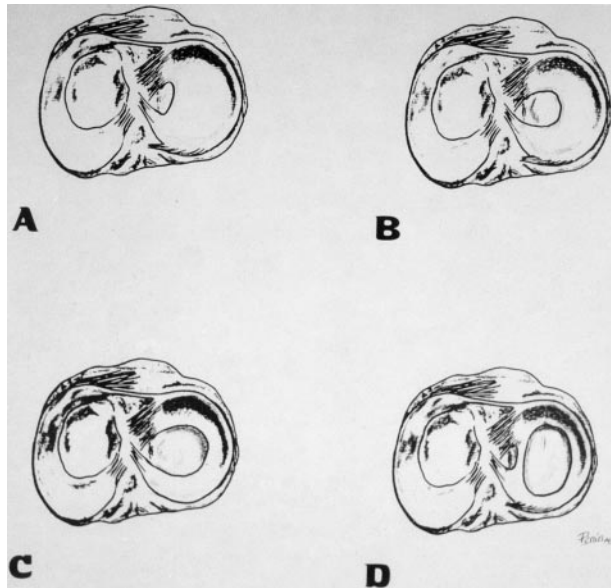


FIGURE 1. The three types of discoid lateral menisci commonly accepted after Watanabe: (A) complete, (B) incomplete, and (C) Wrisberg-ligament type. (D) The ring-shaped meniscus.

DISCUSSION

The presence of discoid menisci in the human knee is considered to be a congenital malformation. Its incidence is very low except in Asian populations,



FIGURE 2. Magnetic resonance image coronal view of the right knee shows an abnormal shape of the lateral meniscus, mimicking a bucket handle tear (black arrows).



FIGURE 3. Intraoperative arthroscopic view showing a normally inserted circular-shaped lateral meniscus without any sign of a tear.

where the incidence rate can reach nearly 20%.^{2,8} Discoid meniscus might be symptomatic or not. Wrisberg ligament variant has been associated with the snapping knee syndrome but the other types are usually incidental findings at arthroscopy, except when they have a tear.^{2,4}

In primates as in other animals, the lateral meniscus is completely circular.⁹ It continues along the posterior cruciate ligament through the Wrisberg ligament, lacking its posterior tibial attachment.^{6,10} Both facts may be related to a highly developed rotation power of the knee.⁶

Although they noted no cases, Chandler¹⁰ and Finder¹¹ put forth the possible existence of ring-shaped menisci in human beings. Smillie³ found two menisci with a central hole among 29 discoid menisci after a follow-up on 1,300 arthrotomies. However, this author thought that the perforation was due to the progressive horizontal cleavage of the deformed meniscus, this being caused by the continuous friction of the femoral condyle and the tibial plateau against the discoid fibrocartilage. McMurray¹² previously reported a similar finding.

Two published articles refer to ring-shaped medial menisci. It was reported that Watson-Jones¹³ made the first description of a ring-shaped menisci in 1930. It was an internal meniscus that blocked extension. However, the same author doubted that his finding corresponded to a congenital abnormality or an old bucket-handle tear. In 1952, Basmajian⁹ reported the finding of an anatomic study of an internal ring-shaped meniscus. However, here again the author had doubts

with regard to whether the origin of the abnormality was congenital or traumatic.

Noble¹⁴ reported the first true congenital ring meniscus. It was a lateral ring-shaped meniscus, which was found by chance during an autopsy, associated with congenital absence of the anterior cruciate ligament. In the clinical records of the patient, there was no history of previous disability of that knee. No subsequent reference to ring-shaped menisci has been found.

As far as we know, the present case is the first description of a ring-shaped meniscus on the lateral side of the human knee without any other associated malformation. The rounded uniform rim with no evidence of a tear of that meniscus suggests that this finding is congenital in origin. Because the commonly accepted classification of lateral meniscal malformations⁵ does not include the ring shape, we propose that the ring-shaped discoid meniscus be included as a fourth variant in a future classification.

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