

ARTHROSCOPIC PARTIAL RESECTION OF THE DISCOID MENISCUS IN CHILDREN*

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SUMMARY: Atay ÖA, Doral MN, Aksoy MC, Tetik O, Leblebicioğlu G. (Department of Orthopedics and Traumatology, Hacettepe University Faculty of Medicine, Ankara Turkey). Arthroscopic partial resection of the discoid meniscus in children. 1997; 39: 505-510.

Thirteen children with 14 lateral discoid menisci were reviewed at an average follow-up of 2.7 years. Their average age at the time of the operation was 12.8 years. Most of the children had vague and intermittent painful symptoms, and the classical "clunk" was demonstrable in nine of the 13 patients in clinical examinations. Thirteen children underwent arthroscopic partial meniscectomy for symptomatic discoid lateral meniscus, by performing partial resection. This procedure, modifying the discoid lateral meniscus to the normal semilunar shape, was indicated only when the capsular attachment was intact.

The results were excellent both clinically and radiologically. Furthermore, rehabilitation time was considerably shorter than the time required after open procedures.

Arthroscopic discoid meniscus surgery performed by experienced and skilled hands gives better results. According to the literature and our experiences, it is better to perform open techniques in patients with stiff knees. Additionally, it is technically feasible to use small joint instruments in the pediatric age group. *Key words: arthroscopy, discoid meniscus.*

Young¹, in 1889, was the first to describe a discoid lateral meniscus in a cadaver specimen, and the term "snapping knee syndrome" was attributed to it by Kroiss². The vague and intermittent symptoms associated with this anomaly may cause difficulty and delay in the diagnosis. Arthroscopy allows more precise diagnosis of the lesion, confirms the clinical diagnosis, and can identify an associated tear^{3, 4}. The purpose of this study was to report our experience with the arthroscopic evaluation and with the performance of partial resection of the discoid lateral meniscus, and to determine the short-term results of operative treatment.

Material and Methods

Between 1990 and 1993, 13 children (6 boys, 7 girls) with 14 lateral discoid menisci were treated at Hacettepe University Faculty of Medicine, Department of Orthopedics and Traumatology, by arthroscopic means. Their average age

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at surgery was 12.8 years (range 11 to 20). The mean follow-up was 2.7 years (range two to five). The right knee was involved in five cases and the left in seven. One child had the condition in both knees.

Pain was the predominant symptom in the majority of cases. Ten children (11 knees) complained of a click or clunk in their knees. However, on examination, the "classical" clunk so characteristic of the discoid meniscus was demonstrable in only nine knees.

Details of the pre-operative clinical and physical signs are shown in Table I.

Table I: Preoperative Clinical and Physical Symptoms

Symptoms	Number of Knees
Pain	14
Clunk	11
Swelling	8
Locking	6
Giving way	4

Routine anteroposterior, lateral and intercondylar (tunnel) views were taken. No widening of the lateral joint space was seen. None of the radiographs showed squaring off of the lateral femoral condyle.

Arthroscopy was performed on all patients in an operating room under general anesthesia. Adequate muscle relaxation was considered essential to performing this type of surgery. A tourniquet was placed on the thigh. The fiberoptic scope and a highly sensitive, high-quality video camera were used throughout the study. Several portals were required for adequate visibility and probing of the discoid meniscus. A hook was used to determine the stability of the discoid meniscus and whether or not it was torn.

The accepted method of classification for the discoid lateral meniscus, that of Watanabe et al.⁵, was used. They described three types: complete (Fig. 1), incomplete, or wrisberg's ligament type, based on the degree of coverage of the lateral tibial plateau and the presence or absence of the normal posterior meniscotibial attachment. The management of the meniscus was based on this system of classification. During arthroscopic inspection, six lateral complete discoid menisci and eight lateral incomplete discoid menisci with tears were revealed; none of the discoid menisci was Wrisberg's ligament type.

Complete and incomplete discoid menisci with tears should be partially resected to a stable peripheral rim. All children underwent arthroscopic partial resection. This procedure modified the discoid meniscus to the normal semilunar shape. During the course of these procedures in six knees, partial resection was performed with the help of a shaver or laser (Fig. 2).



Fig. 1: Arthroscopic view of complete lateral discoid meniscus.

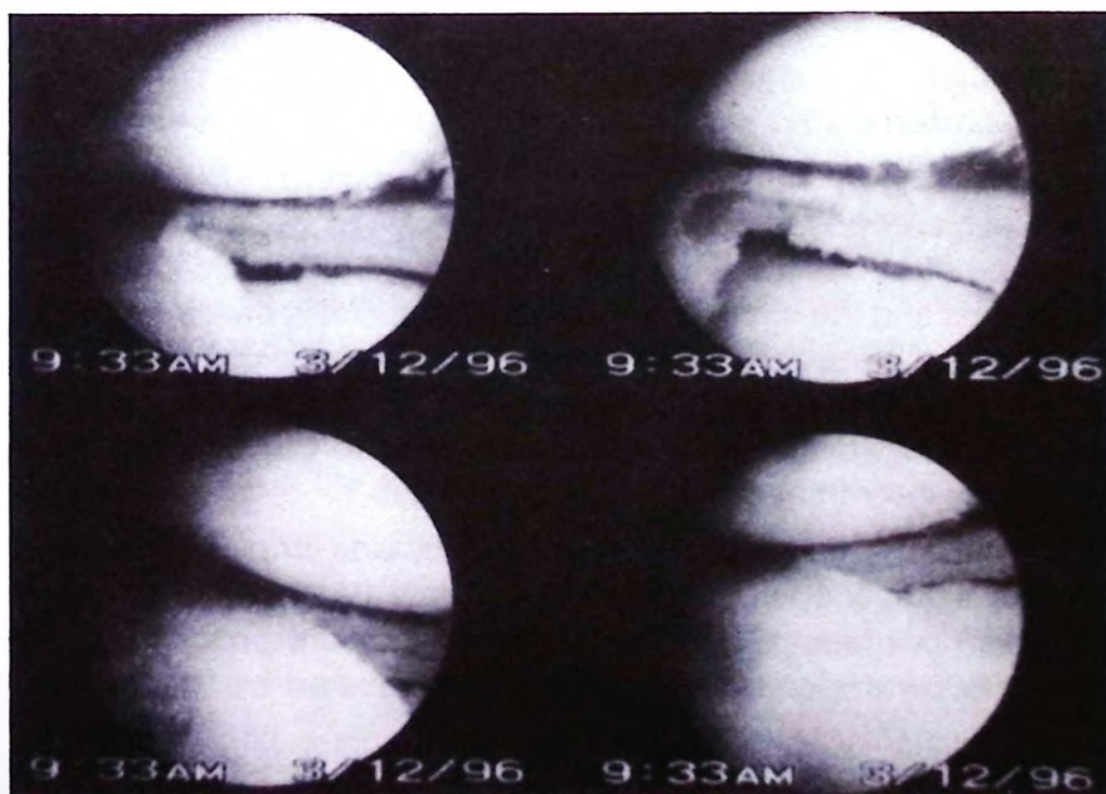


Fig. 2: Arthroscopic partial resection of complete lateral discoid meniscus and views of partially resected meniscus.

No infections or episodes of significant bleeding were encountered.

After the operation, aggressive proprioceptive physiotherapy was performed. Overall, clinical and radiological controls of 13 children were reviewed at a mean of 2.7 years.

Results

The clinical results were analyzed according to the IKDC (International Knee Documentation Committee), Tegner activity scale⁶, and Lysholm scores⁷. According to IKDC, all patients were in group A. Through the Tegner activity scale, eight were found as the mean (range 7-10), and by the Lysholm score, a mean of 94 (range 88-100) was found.

No degenerative changes were seen in the lateral compartment and radiographs showed no narrowing of the joint space in the mean 2.7 years of follow-up.

The results of partial resection of the discoid meniscus were excellent both clinically and radiologically in all 13 children. Furthermore, the period of rehabilitation after this procedure was much shorter than the time required after open procedures.

Discussion

The present series has revealed several points of interest. Pain was the most common pre-operative symptom rather than the conventionally described "clunk"⁸. The pathomechanism of the pain is not well understood, but could be related to free nerve endings⁹.

Contrary to Picard¹⁰, we do not feel that radiographs play a significant role in diagnosis. In our series, no knee had the classical lateral joint space widening which has been described in previous reviews^{11, 12}.

The classification proposed by Watanabe⁵ has gained worldwide popularity. In fact, Watanabe et al.'s is the accepted method of classification for the discoid lateral meniscus, and the management of the meniscus is based on this system. Total meniscectomy is recommended for the Wrisberg's ligament type of discoid because the posterior meniscotibial attachment is deficient^{11, 13}. Most authors agree that the intact discoid lateral meniscus, of the complete or incomplete type, should not be removed^{11, 13}.

In the earlier part of the series, before arthroscopy was employed, differentiation between complete, incomplete and Wrisberg's ligament types of discoid meniscus was not made. Since then, our management protocol has evolved and we now follow the classification system suggested by Watanabe et al.⁵

In our study, difficulty in introducing the arthroscope laterally was the first indication of the anomaly. Various authors have recommended arthroscopic partial or total meniscectomy for discoid lateral menisci^{3, 4, 11, 12}. This is a difficult technique requiring considerable skill and experience.

In children, total resection of a discoid meniscus is performed only when it is unavoidable, although it has been said that the prognosis after total meniscectomy is better in children than in adults¹⁴. However, significant degenerative changes are inevitable, especially after a lateral discoid meniscectomy^{14, 15}.

Recent biomechanical research has highlighted the importance of the meniscus in compensating for the incongruity between femur and tibia, in load transmission, in providing for rotation, as a shock absorber, in the provision of stability and in the elastohydrodynamic lubrication of joint surfaces¹⁵.

Partial resection or repair of peripheral tears of the meniscus have been performed in adults in order to preserve these functions of the meniscus¹⁵.

In children, we perform partial resection of the free edge of the discoid meniscus, modifying it to the normal semilunar shape, for the following reasons: to allow the residual meniscus to function in a manner similar to that of the normal meniscus, to prevent some of the instability resulting from the meniscectomy, to minimize the extent of operative intervention, and to shorten the rehabilitation period.

We recommend an arthroscopic partial lateral meniscectomy for torn, complete or incomplete discoid menisci with a stable posterior meniscotibial attachment. However, in children with Wrisberg's ligament type or hypermobile discoid menisci, we believe the partial meniscectomy to be inappropriate, as it leaves an unstable rim of meniscus which may cause symptoms in the future. Therefore, a total meniscectomy should be recommended in such circumstances.

There are, however, some doubts concerning the long-term results of partial resection of the discoid meniscus. The arrangement of collagen fibers is different in the semilunar and the discoid cartilage and it is possible that further injury or degeneration of the residual meniscus may occur after the operation. However, should the long-term results be as good as the early results, this arthroscopic partial resection would be advisable, in experienced and skilled hands, for treatment of symptomatic discoid meniscus in children. In cases of patients with stiff knees, however, according to both the literature and our experiences, it is better to perform open techniques. Additionally, it is technically feasible to use small joint instruments in the pediatric age group.

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