

## MENISCECTOMY IN CHILDREN

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The results of 42 meniscectomies in 41 children were evaluated 1 to 13 years (mean 5.6 years) after the operation. At the follow-up 11 patients (12 operated knees) had complaints. In four of these patients, all having had removal of the lateral meniscus, roentgenological examination revealed degenerative changes. The results of the clinical and roentgenological follow-up examination showed that insufficiently rigorous appraisal of the indications for surgery had led, in some cases, to unnecessary meniscectomies. The results of operations had not always been satisfactory. The reliability of arthrographic findings alone as an indication for surgery are discussed and the indications for operative treatment are presented.

*Key words:* children; meniscus; operative treatment; results

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In large series of meniscectomies the percentage performed on children is low; for example, 1.5 (Springorum 1959) and 0.16 (Barucha 1967). Typical indications for meniscectomy in childhood are developmental lesions, discoid menisci, meniscal cysts, ganglions and abnormally mobile menisci. According to the authors cited above, these lesions account for 20–24 per cent of all meniscectomies in children, and for 15.5 per cent according to Jeannopoulos (1950).

In adult series a discoid meniscus has been reported to be the indication for surgery in only 2.2 per cent (Smillie 1948) and in 11 out of 16,239 meniscectomies (Barucha 1967). The results of meniscectomies in children seem to compare unfavourably with results in adults (Tapper & Hoover 1969). Among children post-operative complaints and roentgenological changes are frequent (Bhaduri & Glass 1972, Schulitz 1973, Cotta 1976, Baryluk et al. 1977). The results of this surgical treatment in children have been reported, moreover, to be influenced by the sex of the patient, by the side of the knee

from which the meniscus is excised and by the duration of preoperative symptoms (Bhaduri & Glass 1972, Cotta 1976). Because the diagnosis of the meniscal pathology, including the assessment of symptoms and arthrographic findings, is sometimes difficult, many unnecessary meniscectomies tend to be performed – with results that are not always acceptable (Ritchie 1965).

### PATIENTS AND METHODS

In 1978 a clinical and roentgenological follow-up examination was performed on 41 patients (42 knees) who had undergone uni-compartmental meniscectomy at Aurora Children's Hospital, Helsinki, during the years 1965–1977. At the time of the operation, the patients, 22 boys and 19 girls, ranged in age from 6 to 14 years (mean 12.2 years). The meniscectomy was performed on the medial side in 22 knees and on the lateral side in 20 knees – in five of which the meniscus was discoid. Seventeen operations were performed on the left knee, 25 on the right. Antecedent injury to the knee was established with certainty for 36 knees. The interval between the initial symptoms and the operation was less than 6 months in 24

knees, 6–12 months in 10 knees and longer than 12 months in 8 knees. All patients had been examined preoperatively with contrast medium arthrography.

### Preoperative findings

The complaints of 16 patients corresponded to the classical triad of symptoms in meniscal lesions, i.e. pain, intermittent swelling and intermittent locking. The most frequent preoperative complaint, however, was pain (Table 1).

Table 1. Preoperative subjective symptoms of 41 children (42 knees) who subsequently underwent a meniscectomy

Symptom	No. of knees
Pain	39
Intermittent effusion	29
Snapping sensation	27
Feeling of the knee giving way	26
Intermittent locking	22
Acutely locked joint	3

At the time of the preoperative clinical examination the clinical finding was effusion in 21 knees, pain on extension in 11 knees, pain on palpation of the joint space in 11 knees, pain on flexion in 2 knees, gastrocnemius-semimembranosus bursitis in one knee, and multiple exostoses on both knees of one patient. A combination of two or more of these symptoms – listed above – was observed in 12 knees. No clinical symptoms were found at the time of the preoperative examination in 12 knees, in spite of the presence of meniscal lesion in all but one knee – which was confirmed later at the operation.

### Operative findings

In 25 knees (59 per cent) arthrotomy revealed a ruptured meniscus – in 15 on the medial and in 10 on the lateral side (Figure 1). A congenital discoid meniscus was removed from five knees. One discoid meniscus showed slight degenerative changes. In 12 knees a meniscectomy was performed, on the lateral side in eight and on the medial side in four, because clinical and arthrographic examination had raised the suspicion of a meniscal lesion. At operation, however, these 12 knees showed no such lesion. The probable cause of the clinical symptoms observed in these knees was, in nine knees, adhesions (removed at surgery) that might have

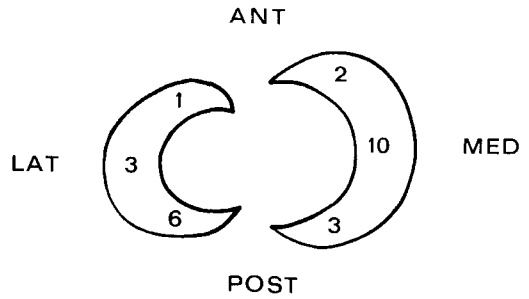


Figure 1. The sites of the meniscal ruptures.

resulted from traumatic injury to the synovia; in one knee, patellar chondromalacia; and in one knee, multiple exostoses. No explanation for the symptoms could be found in one knee. Changes in the joint cartilage were detected in only two knees: in the knee with patellar chondromalacia and in one knee with a cartilaginous loose body unaccompanied by any visible changes in the joint cartilage.

Recovery after the operation was uneventful for all patients except one in whom a haematoma and rupture of the wound resulted in slight instability at follow-up. A remnant of the posterior horn was removed at a later reoperation in three knees because of the persisting pain. In two cases this was on the medial side and in one on the lateral side (discoid meniscus).

## RESULTS

The interval between operation and follow-up ranged from 1 to 13 years (mean 5.6 years). At follow-up 30 patients (71 per cent) were completely symptom-free, and stability, range of motion and roentgenological status of the knee were normal. Eleven patients (29 per cent), one of whom had had a medial meniscectomy on both knees, complained of intermittent pain during physical activity. Among these 11 patients (12 knees) who had persisting postoperative symptoms, the meniscus had been removed from six on the lateral and six on the medial side. Interestingly, of the six lateral menisci removed, three were discoid. Six of these 11 patients also had the feeling of the knee giving way, and two experienced a snapping sensation in the knee joint during strain. In

these 12 knees clinical examination revealed pain on extension in four and slight anterolateral instability, a postoperative complication, in one.

Of these 11 patients (12 knees), moreover, six had had an intact meniscus removed, five from the medial and one from the lateral side. The findings at surgery had been synovial adhesions and folds which might have been caused by trauma. In each case the meniscus was removed because of long-standing symptoms that resembled the symptoms of a meniscal lesion in a knee joint for which the arthrography was positive.

At follow-up bilateral roentgenograms were taken of all patients. They showed pathological changes in four knees (10 per cent): osteochondritis dissecans in two and sclerosis and narrowing of the joint space in two (Figure 2 A

and B). These changes were all on the lateral side after excision of the lateral meniscus, and all were graded as grade III according to Ricklin (1976). From two of these four knees a discoid meniscus had been removed. All these four patients had complaints at follow-up. The interval between the operation and follow-up was over 12.5 years in three of these cases and 3.5 years in one.

## DISCUSSION

Because an accurate history of trauma in childhood is often not available, the mechanism of the trauma that causes the meniscus to tear is naturally often obscure. In our series, the trauma and the date on which it occurred could be established for 36

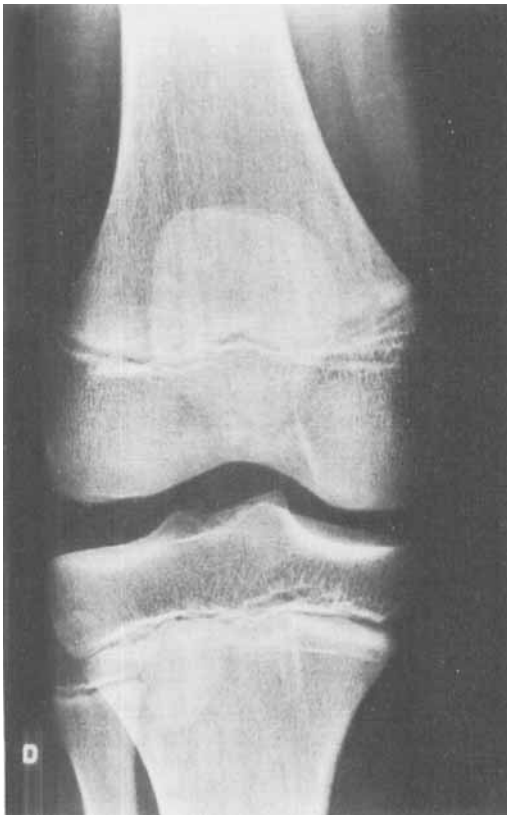


Figure 2A. Preoperative roentgenogram of the right knee joint of a 13-year-old boy.

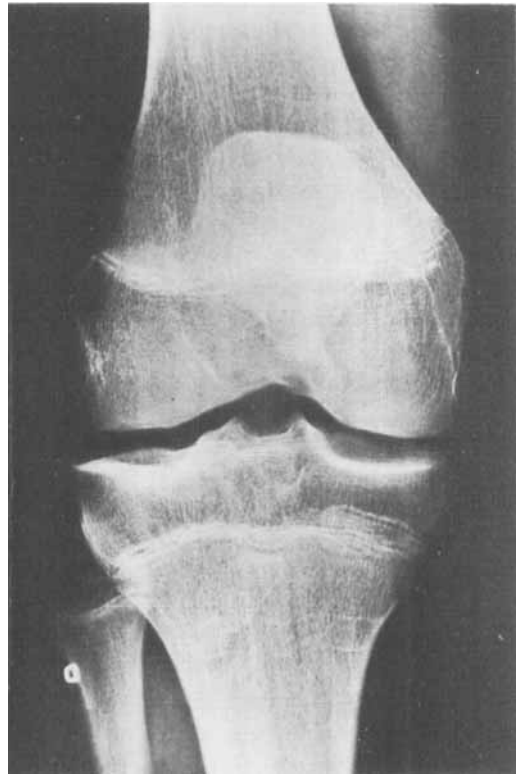


Figure 2B. The same knee joint seen 3.5 years after the lateral discoid meniscus had been removed. Note the arthritic changes.

patients, i.e. 86 per cent, which is a high percentage compared with the 47 per cent reported by Baryluk et al. (1977). By far the largest number of meniscal lesions (in 36 knees) were seen in patients older than 10 years, which conforms with the observations of Ritchie (1965), Bhaduri & Glass (1972) and Schulitz (1973).

Many investigators seem to agree that arthrography is more difficult to evaluate in children than in adults (Barucha 1967, Schettler 1972, Stenström 1975). Our results point to the high incidence of false positive interpretations of arthrographic findings which, in turn, lead to unnecessary meniscectomies. The incidence of unnecessary meniscectomies has been reported by Ritchie (1965) to be 15.8 per cent, and by Barucha (1967) to be 15.6 per cent in the age group 11–14 years and even higher, 22.2 per cent, in the age group under 10 years. A more critical appraisal of the indications, a careful operative exploration of the meniscus and a preoperative arthroscopy might have prevented as many as 12 of the 42 meniscectomies reported here, an observation we share with Laasonen & Wilppula (1976). That the results of meniscectomies in children tend not to be very satisfactory becomes apparent even after a short follow-up period. In our series the percentage of symptom-free patients was 71. The corresponding figure reported by Bhaduri & Glass (1972) was 41 per cent, by Schulitz (1973) 30 per cent, by Cotta (1976) 51 per cent, and by Baryluk et al. (1977) 75 per cent.

Tapper & Hoover (1969) observed, moreover, that the duration of preoperative symptoms has no bearing on the long-term effects of meniscectomy. This conforms with our experience as well as with that of others (Schulitz 1973, Cotta 1976). Some investigators have observed that the results of meniscectomies differ in male and female patients. Co-workers Schulitz (1973) and Cotta (1976) reported poorer results in male patients; Bhaduri & Glass (1972) and Ricklin (1976) reported poorer results in female

patients. For adult series the latter observation seems to be more prevalent (Tapper & Hoover 1969, Dietschi 1973). Of the 11 patients in our series who complained of persisting symptoms at follow-up, 8 (67 per cent) were female.

## CONCLUSIONS

The results after meniscectomy in children are not encouraging, and the results after removal of a lateral, especially discoid, meniscus seem not to be satisfactory.

Arthrographic findings are not reliable indications for surgery because they can often be falsely positive. Reliance on arthrographic findings has resulted in a large number of unnecessary meniscectomies. Surgery should not be considered until after the knee has been carefully observed and the existence of major symptoms, restricted motion, locking, effusion and disabling pain, has been established. Minor and intermittent symptoms call for conservative treatment.

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