

# Knee function after arthroscopic meniscectomy

## A prospective study

In a prospective study, operation under arthroscopy was done in 100 consecutive patients (11 women and 89 men) with a lesion of one meniscus. Meniscectomy was done in 86 patients with medial meniscus tears and in 14 with lateral tears. After 2 weeks, 85 patients were back at work.

*Key words:* arthroscopic operation; arthroscopy; knee; meniscus.

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Since the first arthroscopic meniscectomy by Watanabe in 1962, the technique has been employed increasingly frequently. The present prospective study is concerned with the short-term functional recovery after arthroscopic meniscectomy used as a routine method of treatment.

## Patients and methods

Operation under arthroscopy was done in 100 consecutive patients, 11 women and 89 men (mean age 35 (16-66) years), with a lesion of one meniscus. Patients were selected for arthroscopy after clinical diagnosis of the meniscus tear, and all in whom the diagnosis was confirmed at operation were included in the series. Of the 100 patients, 86 had medial and 14 lateral meniscus tears. The type of meniscus lesion in relation to age is shown in Figure 1. Knee function was assessed before operation and at follow-up with a scoring scale adopted for meniscus lesions (Lysholm & Gillquist 1982). Patients with a score of 77-90 had mild or moderate symptoms on vigorous physical activity. Patients with a score above 90 points had no significant symptoms at all, and the result was judged excellent. Patients were asked to classify their knee function after operation into three groups: excellent, good, and fair/poor (excellent = as good as intact knee; good = some impairment, fair/poor = as before operation or worse).

All operations were performed under general or regional anaesthesia. Diagnostic arthroscopy was done as described by Gillquist & Hagberg (1976) and Gillquist et al. (1979) and the arthroscopic operations were as described by Gillquist et al. (1982). A mechanical leg-holder was always used, and operations were

usually performed with a television-camera attached to the arthroscope.

A simple printed training programme was given to all patients after operation.

In 87 patients, a follow-up examination was carried out in the hospital. Thirteen patients answered a questionnaire. Thigh-muscle strength was measured with a Cybex II isokinetic dynamometer (Lumex, Bayshore, New York). Isokinetic measurements of knee extensors and flexors in both legs were made at an angular velocity of 30°/s, and isometric measurements were made with the knee in 60° flexion.

The mean follow-up time was 10 (6-17) months. The distribution of patients over the follow-up range was fairly even.

The coefficient of variation for the score evaluation was  $\pm 2.8$  per cent, and for the Cybex measurement  $\pm 13$  per cent. Common statistical methods were used to test differences in mean values.

## Results

The mean operating time, including 15 min of diagnostic arthroscopy and time for photographic documentation, was  $38 \pm 15$  min for the medial meniscus and  $39 \pm 18$  min for the lateral meniscus. The operating time for the 19 total meniscectomies was  $48 \pm 13$  min, i.e. longer than for the 57 partial meniscectomies ( $33 \pm 14$  min) or the 24 bucket handle excisions ( $39 \pm 13$  min).

Sixty-seven patients were treated as out-patients. Twenty-eight patients remained in hospital for 1 day and five patients for not longer than 4 days. At the first postoperative examination, 28 patients showed effusion in the treated

knee, but only five were aspirated. No infections or reoperations occurred during the follow-up period. All patients regained the full range of motion.

Before operation the commonest symptoms were pain, swelling, and catching, with all patients showing at least one of these symptoms. At follow-up, 84 per cent had no problems at all.

The mean score before operation was  $63 \pm 14$  and at follow-up  $90 \pm 6$  ( $p < 0.001$ ). There was no significant difference in score between medial and lateral meniscus tears. Patients with bucket-handle tears had a significantly lower score ( $52 \pm 17$ ) than others ( $p < 0.01$ ), owing to greater problems with catching, pain, and in general more extensive mechanical derangement of the knee compared to other tears. At follow-up after operation there were no significant differences in score between different types of tears (Table 1).

In no patient was the postoperative score unchanged or decreased.

The patients' own opinions about the result of the operation tallied with the final scores (Table 2).

Thigh-muscle strength was measured in both legs in 87 patients 10 (6–15) months after operation. In 10 patients, three women and seven men, five of whom were over 40 years old, it was significantly weaker than in the intact leg. Degenerative changes in the joint were noted in six, and instability due to an old rupture of the anterior cruciate ligament in four. These 10 patients also showed a significant increase in score from  $64 \pm 7$  before operation to  $79 \pm 11$  ( $p < 0.01$ ) at follow-up, but their mean final scores were significantly lower than those of other patients ( $p < 0.01$ ).

Twenty-eight patients (mean age 48 (31–66)

Table 1. Mean score and standard deviation before and after arthroscopic meniscectomy in different types of meniscus lesions

Type of meniscus lesion	Mean score	
	Pre-operative	Post-operative
Bucket-handle	$52 \pm 16$	$91 \pm 6$
Flap-tear	$64 \pm 10$	$90 \pm 7$
Horizontal-tear	$70 \pm 8$	$89 \pm 7$
Vertical-tear	$70 \pm 9$	$92 \pm 3$
Radial-tear	$58 \pm 19$	$92 \pm 3$

Table 2. Distribution of patients with regard to own opinion of knee function and the score at follow-up

	Score		
	<77	77–91	>91
Excellent	1	14	41
Good	3	28	12
Fair/poor	–	1	–

years) had degenerative joint changes at the time of meniscectomy, most of them mild to moderate, and usually involving only a single compartment. For all 28, there was a significant improvement in score at follow-up (preop.  $62 \pm 10$ ; postop.  $88 \pm 9$ ;  $p < 0.001$ ). However, there was a significant difference between the final score in patients with and without degenerative changes ( $88 \pm 9$  and  $92 \pm 4$ ;  $p < 0.01$ ).

Ninety-eight patients were employed at the time of operation and two were pensioners. Sixty-two per cent of the 98 patients were back at work after 1 week, and 85 per cent after 2 weeks (Figure 2). Patients with degenerative changes or instability required no more sick leave than those with a meniscus lesion only.

After operation, 94 patients had maintained, four had increased, and two had reduced their activity level. Eighty-four patients took part in physical fitness programmes. Forty-seven per cent had resumed sports within 2 weeks and 86 per cent with 4 weeks.

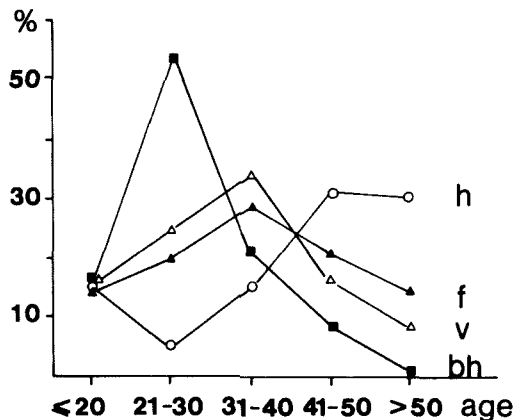


Figure 1. Type of meniscus tear in relation to age in 100 tears (per cent of different tears of each age group). Five patients with radial tears were excluded. (bh = bucket-handle, f = flap, h = horizontal, v = vertical).

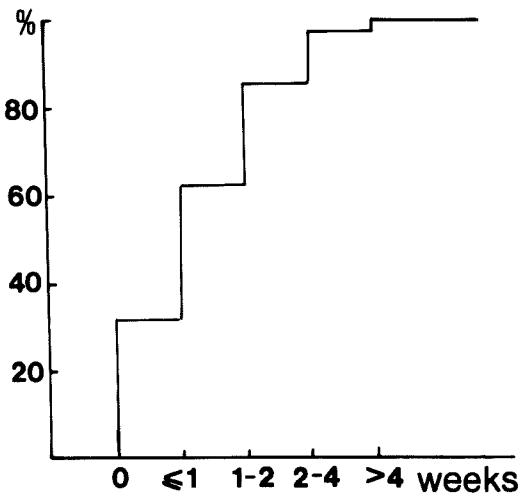


Figure 2. Proportion of patients needing sick leave among 98 employed at the time of operation.

## Discussion

This prospective study shows that arthroscopic meniscectomy results in good functional recovery with a brief operating time, short sick-leave, and early resumption of sports activity. The findings tally with those of earlier retrospective studies (Lysholm & Gillquist 1981, Gillquist & Oretorp 1982, Northmore-Ball & Dandy 1982). Since the retrospective study of Lysholm & Gillquist (1981), the operating time and number of complications have decreased. Earlier results after arthroscopic operation of lateral meniscus lesions were apparently less favourable than those of medial meniscectomy (Gillquist & Oretorp 1982, Lysholm & Gillquist 1981). This is not substantiated in the present study. However, our patients with lateral meniscus lesions were rather young and none showed degenerative joint changes.

Like previous reports (Oretorp & Gillquist 1979, Cargill & Jackson 1976, McGinty et al. 1977), this study shows that the removal of a bucket-handle or partial meniscectomy is sufficient for a good result in most cases. Total meniscectomy should be done only when no normal meniscus tissue can be saved. Arthroscopic total meniscectomy is more complicated than partial, and the operating time is a little longer, but the end result does not differ significantly from that of partial meniscectomy (Gillquist et al. 1982).

The presence of degenerative changes in the joint at the time of meniscectomy is associated with poor results (Appel 1970, Lysholm & Gillquist 1981, Jackson 1968, Northmore-Ball & Dandy 1982). Our patients had mild or moderate degenerative changes and their symptoms were mainly derived from the meniscus lesion. The results of operation were usually good but at follow-up knee function remained poorer than that in patients with no cartilage degeneration.

The thigh-muscle strength after arthroscopic meniscectomy returns to normal in most cases after 2 months (Hamberg et al. 1982). Patients with persistently reduced thigh muscle strength at follow-up in this study had obvious problems from degenerative joint changes or ligamentous instability.

In elderly patients, convalescence after arthroscopy is often prolonged. In our study, knee function in such patients was generally within the good/excellent group at follow-up and comparable to that in younger patients. The arthroscopic operation is less traumatic and may therefore be better than open meniscectomy in elderly patients. It is our opinion that the arthroscopic operating technique facilitates the treatment of all meniscus lesions.

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