OPEN AND CLOSED MENISCECTOMY

A COMPARATIVE ANALYSIS

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We reviewed 230 patients an average of 34 months after they had undergone partial or total meniscectomy by surgeons of different experience in a busy unit. Open and arthroscopic meniscectomies were compared. Arthroscopic partial meniscectomy resulted in a significant reduction of inpatient stay and earlier return to work and sport.

Analysis of the type of meniscal damage showed that arthroscopic removal of "bucket handles" achieved better results than open techniques. Comparatively poor results were found for lateral meniscectomy.

The advantages of arthroscopy in the diagnosis of meniscal lesions has been accepted for a decade (Jackson and Abe 1972; Dandy and Jackson 1975). More recently, the advantages of closed as compared with open meniscectomy has received similar emphasis from a number of centres (Northmore-Ball, Dandy and Jackson 1983; Tregonning 1983; Bergström et al. 1984). Arthroscopic surgery requires the learning of new techniques and the acquisition of expensive instruments; the unconverted surgeon may feel that the excellent reported results can only be emulated by an enthusiast in a personal series. This paper therefore reviews the results of open and closed meniscectomy performed by surgeons of all grades of experience in a busy orthopaedic unit.

METHODS AND MATERIALS

A total of 700 patients who had undergone arthroscopy either at the Westminster Hospital, London, or at Queen Mary's Hospital, Roehampton, were reviewed. Patients were excluded if they had had a previous operation on the knee, if instability was detected on examination either clinically or under anaesthesia, if there was any other intra-articular abnormality, or if any simultaneous surgical procedure had been performed. This left 230 who had undergone simple open or arthroscopic meniscectomy; these patients formed the population of this study.

The mean age of the 230 patients was 30.7 years (range 7 to 67 years); nearly half of them were in their third decade (Fig. 1). Men and boys formed 90% of the series and there were equal numbers of left and right knees. The clinical findings were recorded and examination was repeated under general anaesthesia. Arthroscopy was then performed, using a thigh tourniquet. The patients were grouped according to the operation performed: 41% had open complete meniscectomy, 28% had open partial meniscectomy, and 31% had arthroscopic partial meniscectomy. The meniscal lesions were recorded in relation to the operation performed as being medial or lateral (Fig. 2), and also classified as tears of a discoid meniscus, bucket-handle tears, peripheral detachments, horizontal cleavage tears or flap tears (Table I).

At postoperative assessment, emphasis was placed on residual symptoms and on the level of general and sporting activity, with the time taken after operation to

Table I. Type of injury and of operation in 230 meniscectomies

<table>
<thead>
<tr>
<th>Type of meniscectomy</th>
<th>Open complete</th>
<th>Open partial</th>
<th>Arthroscopic partial</th>
</tr>
</thead>
<tbody>
<tr>
<td>To a discoid meniscus</td>
<td>6</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Bucket-handle tear</td>
<td>6</td>
<td>20</td>
<td>14 44 7 35</td>
</tr>
<tr>
<td>Peripheral detachment</td>
<td>9</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>Horizontal cleavage</td>
<td>7</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>Flap tear</td>
<td>13</td>
<td>11</td>
<td>4 9 19</td>
</tr>
<tr>
<td>All</td>
<td>41</td>
<td>53</td>
<td>14 50 16 56</td>
</tr>
</tbody>
</table>
achieve this level. Results were graded according to the criteria of Tapper and Hoover (1969), but patients who had not recovered to the level and standard of activity enjoyed before their injury were included in the fair group. A patient with an excellent result had no symptoms. A good result could have minor symptoms after vigorous activity, but no other complaints. A patient with a fair result had symptoms preventing vigorous activity, while a poor result left significant symptoms which interfered with everyday life. Excellent or good results were graded as satisfactory and a fair or poor result as unsatisfactory.

Patients were reviewed either personally or by questionnaire. The mean period of follow-up was 34 months, but the three groups were not equal in this respect (Table II), because there was a relative change in preference from open to closed meniscectomy during the period under review.

RESULTS
The mean time in hospital after partial or complete open meniscectomy was 6.7 days (range 2 to 21 days) and 5.9 days (range 2 to 28 days) respectively. After arthroscopic meniscectomy the mean stay was 2.4 days (range 1 to 7 days). The mean time of return to work was 2.1 weeks in the arthroscopic group (range 3 days to 6 weeks), compared with 4.9 weeks after an open partial meniscectomy (range 1 to 12 weeks) and 5.6 weeks after open complete meniscectomy (range 1 to 16 weeks). The period before return to active sport is shown in Figure 3. After six weeks 86% of the arthroscopic partial group had been able to recommence sport as compared with 25% of the open groups.

The grade of results for all meniscectomies is shown in Figure 4 which also gives separate figures for medial and lateral meniscectomy. This shows that arthroscopic partial meniscectomy produced better results overall than an open operation. In particular, open partial meniscectomy gave satisfactory results in only two-thirds of the patients. It was our impression that an open opera-

![Figure 1](image1)

Figure 1—The age in years of 230 patients at the time of operation, expressed as a percentage of the whole series for each decade. Figure 2—Types of operation on the lateral and the medial meniscus in 230 patients, expressed as a percentage for each meniscus, with the number of operations analysed shown in each column. OCM, open complete meniscectomy; OPM, open partial meniscectomy; APM, arthroscopic partial meniscectomy.

![Figure 2](image2)

Table II: Follow-up in months of 230 meniscectomies

<table>
<thead>
<tr>
<th>Operation</th>
<th>Range</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open complete</td>
<td>6 to 94</td>
<td>42.2</td>
</tr>
<tr>
<td>Open partial</td>
<td>7 to 82</td>
<td>37.7</td>
</tr>
<tr>
<td>Arthroscopic partial</td>
<td>5 to 60</td>
<td>20.2</td>
</tr>
<tr>
<td>All</td>
<td>5 to 94</td>
<td>34.1</td>
</tr>
</tbody>
</table>
tion was less satisfactory than an arthroscopic procedure on the lateral side, but on the medial side the results were equally satisfactory.

For bucket-handle lesions only, analysis showed more satisfactory results after arthroscopic than after open lateral meniscectomy, but the numbers were insufficient for proper evaluation. No such difference was seen after treatment for medial bucket-handle tears, where more than 85% had satisfactory results in all three groups of operations. However, it was noticeable that only half the group undergoing open meniscectomy had an excellent result, whereas more than three-quarters of those having an arthroscopic partial meniscectomy were symptom-free.

There were few complications, all in the open groups. They included three cases of deep venous thrombosis, two of haematoma and one of wound dehiscence.

**DISCUSSION**

Our results confirm the overall economic and therapeutic advantages of arthroscopic partial meniscectomy over open operations. Other authors have reported shorter inpatient stay and earlier return to work and sport (Lysholm and Gillquist 1981; Northmore-Ball and Dandy 1982; Goodfellow 1983), but we have been able to evaluate these procedures in general use by surgeons with the differing experience of registrar, senior registrar and consultant.

The mean time in hospital for those patients undergoing open partial or complete meniscectomy was 6.5

![Graph](image1)

The reported time of return to sport after meniscectomy by different techniques is shown in the graph. The size of the columns represents the percentages of satisfactory (white) and unsatisfactory (black) results within each group; the numbers of cases are shown within the columns.
days; for arthroscopic meniscectomy it was 2.5 days. The latter figure may be reduced to a single day, and in some straightforward cases day-care arthroscopic surgery may be used.

Earlier return to work was very clearly shown; after open meniscectomy five and a half weeks was required, as against two weeks for the arthroscopic group. Return to sport was achieved by the end of the sixth week in only 25% of the open meniscectomy cases but in 86% of the arthroscopic group.

The relatively poor results of lateral meniscectomy, particularly after open partial meniscectomy, were noted but we were unable to explain them. Other reviews of meniscectomy by open operation have shown this difference (Johnson et al. 1974; Smillie 1978). In our series arthroscopic partial medial meniscectomy was an improvement in terms of the number of excellent results recorded, and we formed the impression that a closed procedure was also preferable on the lateral side. In terms of an earlier return to normal activities the arthroscopic procedure for both sides was preferable to the open operation.

The results of our review demonstrate that the advantages of partial arthroscopic meniscectomy extend to general use of the techniques in a busy orthopaedic unit by surgeons of differing experience.

REFERENCES


