AN OPERATION FOR ANTEROMEDIAL ROTATORY INSTABILITY OF
THE KNEE

A PRELIMINARY REPORT

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A method of repair for anteromedial rotatory instability of the knee is described and the results of
operations on 36 knees reviewed. Complete static correction occurred in 30 of these patients (84 per cent),
three patients showed improvement (8 per cent) and three showed no improvement (8 per cent). Although
the operation was not reliable as a correction for valgus instability, it did not increase this instability. This
operation may be combined with other procedures to correct all instabilities or problems of the knee.

There are four single-plane and four rotatory instabilities of the knee and any combination of these
two instabilities may be seen. The single-plane instabilities are medial, lateral, anterior and posterior.
The rotatory instabilities are anteromedial, anterolateral, posteromedial and posterolateral (Ellison 1977).
This paper is only concerned with the attempted correction of the anteromedial instability which is
manifested when the anterior border of the medial condyle of the tibia advances in lateral rotation. This can
be demonstrated by the anterior drawer sign with the knee flexed to 90 degrees and the foot positioned with
30 degrees of lateral rotation. The operation described is designed to add a static component to the dynamic
correction of the pes anserinus transplant (Slocum and Larson 1968).

This report is a sequel to the work of Palmer (1938) and Bartel et al. (1977) which emphasises the impor-
tance of the superficial medial collateral ligament. The procedure does have similarities to the Mauck (1936)
and the O'Donoghue (1973) procedures, but there are important differences.

OPERATIVE PROCEDURE

The aim of this procedure is to advance the superficial medial ligament at the time of the pes anserinus
transplant. A tourniquet is applied and the surgeon is seated for better control of the knee. The line of incision
is placed from the medial epicondyle of the femur to curl gently forward over the joint space and down the
anteromedial aspect of the upper tibia (Fig. 1). The lower border of the sartorius muscle is identified and
with careful dissection the saphenous nerve is located and carefully preserved. In the earlier operations, the
pes anserinus was dissected according to the technique of Slocum and Larson (1968), but in the later cases it was
completely detached from its insertion (Fig. 2). This allows the necessary accurate dissection of the medial
ligament which is readily identified, and is usually separated from the pes anserinus by an adventitious
bursa. Care must be taken to avoid cutting the ligament before its borders are clearly identified. This is
particularly important in the patients with scarring of the ligament. A scalpel, with its blade flat against the bone,
is better than a periosteal elevator for this dissection.

The anterior dissection is straightforward, but the

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posterior dissection is more difficult. The fibres of the ligament blend into the deep capsular fibres and into the anterior arm of the semimembranosus, and the difficulty of the situation is compounded by scar tissue from previous injury or operation. It is necessary to ligate the inferior genicular vessels at the posterior margin of the ligament. The anterior border is clearly identified and incised to the level of the medial femoral epicondyle. The posterior border is also identified and incised to the level of the anterior arm of the semimembranosus and the deep capsular fibres. The inferior end of the ligament is then divided and the ligament carefully detached from its tibial attachment proceeding superiority to these levels. The end of the ligament is then grasped using Kelly forceps and held firmly inferiorly and anteriorly. With the ligament held in position stability should be maintained when an assistant gently elicits an anterior drawer sign with the foot held at 30 degrees of lateral rotation. If no drawer sign is obtained further dissection is unnecessary, thereby preserving as much of the superior attachment of the ligament as possible. If the ligament is still unstable further posterior dissection is carried out. Arthrotomy and correction of the internal derangement is now performed.

The knee is again placed in full medial rotation with 60 degrees of flexion and the ligament is stapled as far anteriorly and inferiorly as possible (Fig. 3). Stability is again reassessed and complete correction of the anteromedial instability noted. It is important that the original stapling is performed only when complete correction has been obtained. Replacement of the staples after further superior dissection produces fraying of the ligament which is undesirable.

The pes anserinus is then attached to the infrapatellar ligament and upper border of the tibia, care being taken not to suture it to the advanced medial ligament (Fig. 4). The tourniquet is then released and haemostasis secured. Closure of the subcutaneous tissues and the skin is performed using interrupted sutures. Suction drainage is always used for the first 24 to 48 hours. Plaster is applied from the upper thigh to the toes with the knee set at 60 degrees of flexion and full medial rotation. This rotation may have to be modified if combined procedures are used. The plaster is maintained for eight weeks.

After removal of the plaster, the patient is given careful instruction to mobilise the knee with a slow progressive active movement and progress is monitored. Partial weight-bearing may be permitted on removal of the plaster to help maintain stability. The knee regains movement progressively until, after three months, a full range has usually been achieved.

CLINICAL MATERIAL

Operations were performed on 42 patients between June 1976 and April 1978. Thirty-six patients were examined personally and the remaining six who were not available were excluded. There were 26 men and 10 women between the ages of 17 and 50 years, with an average of 27 years. The follow-up period varied from 35 months to 15 months, with an average of 25 months. Other procedures were associated with the operation: anterolateral reconstruction was performed on 11 patients, vastus medialis advancement on two and meniscectomies (medial, lateral or both) on 22. Three patients developed infection or suffered delayed healing of the wound.

RESULTS

Gradation of the results was difficult as other pathological conditions were also present—including other instabilities, arthritis and patellar chondromalacia. Therefore, an assessment of total knee function was not made, but results were graded only for the anteromedial instability and the effects of the operation on valgus instability. The anteromedial and valgus instabilities were graded in five millimetre steps: Grade 0 (0–5 millimetres instability); Grade 1 (6–10 millimetres); Grade 2 (11–15 millimetres); Grade 3 (over 15 millimetres). Tables I and II show the grades of instability for the patients after operation.

Table I. Anteromedial instability

<table>
<thead>
<tr>
<th>Change in grade</th>
<th>Number of patients</th>
<th>Percentage of total patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 to 0</td>
<td>21</td>
<td>84</td>
</tr>
<tr>
<td>1 to 0</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>2 to 1</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>1 to 1</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>2 to 2</td>
<td>3</td>
<td>8</td>
</tr>
</tbody>
</table>

Table II. Valgus instability

<table>
<thead>
<tr>
<th>Change in grade</th>
<th>Number of patients</th>
<th>Percentage of patients with instability</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 0—no change</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>1 to 1—not improved</td>
<td>12</td>
<td>52</td>
</tr>
<tr>
<td>1 to 0—improved</td>
<td>11</td>
<td>48</td>
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DISCUSSION

In 33 patients (92 per cent) the anteromedial instability was reduced by the operation, but the valgus instability was reduced in only 48 per cent.

Possible reasons for the failure of the operation included infection, the presence of arthritic changes before operation, failure of the surgical technique, early stretching during the application of the cast or during the

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period in which it was worn, or late stretching. In the group that were improved but not corrected completely (Table I), two patients had infection; in the unimproved group one developed infection. The other causes of failure were not assessable. The success of this operation for valgus correction is probably more dependent upon tightening up the posteromedial capsule. However, the operation is not reliable for correcting valgus instability and should be combined with other procedures to correct all the instabilities and problems of the knee.

In conclusion the operation described has the advantage of improving the results of simple pes anserinus transfer and does not require the automatic removal of the medial meniscus.

I am grateful to Marguerite Drummond, Department of Biomedical Communications, University of British Columbia, for her illustrations.

REFERENCES


