THE TREATMENT OF PATELLAR INSTABILITY BY LATERAL RELEASE

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A simple procedure of using a Smillie knife to release the lateral patellar retinaculum and the capsule in the unstable patella syndrome is described. The syndrome includes recurrent dislocation, recurrent subluxation and acute dislocation of the patella. Arthroscopy, to exclude any other pathology such as chondromalacia patellae, is performed before proceeding to closed lateral release.

The results of this procedure are as good as those after more major surgical procedures. In a small percentage of patients a second operation such as tibial tubercle transfer or patellectomy may be necessary, especially in patients with an underlying congenital abnormality; but in many patients this type of major surgery has proved unnecessary.

The unstable patella includes recurrent dislocation where the bone has to be physically repositioned after every dislocation, recurrent subluxation where the bone moves out of its normal groove but returns spontaneously, and acute dislocation usually following trauma. Recurrence implies two or more episodes.

There are two types of recurrent dislocation: one in which there is an underlying pathology such as an abnormal patella, a deficient lateral femoral condyle, a high patella, an unduly lateral attachment of the ligamentum patellae, genu valgum, genu recurvatum, or contracture of the lateral patellar retinaculum and capsule; and a second variety in which trauma precipitates an acute dislocation in a normal knee, but the medial patellar retinaculum and capsule heal with undue lengthening, so that the patella can subsequently dislocate easily with minor trauma.

Recurrent subluxation of the patella is often overlooked. The usual presenting symptoms are pain, a feeling of instability, or so-called locking (really a momentary painful catch of movement). There is usually little to find on clinical examination apart from slight quadriceps wasting or minimal swelling. However, one test has been consistently helpful in diagnosis, namely the apprehension test, in which lateral pressure on the patella induces in the patient a feeling of apprehension lest displacement may follow.

Hauser (1938), in his classic paper, described six different types of operation for recurrent dislocation, and Marion and Barcat (1950) described over 100 surgical techniques. There are, however, only three basic objectives in all these procedures: (1) to release the tight lateral patellar retinaculum and capsule; (2) to correct any abnormal tracking of the patella due to an unduly lateral attachment of the ligamentum patellae; and (3) to reef a lax medial patellar retinaculum and capsule.

The three most popular operations are the Hauser procedure, the Roux–Goldthwait procedure for children (Roux 1888; Goldthwait 1895), and the semitendinosus tenodesis procedure (Galeazzi 1922). All three are major surgical procedures, which involve a long skin incision, several weeks of immobilisation in plaster, and prolonged rehabilitation. Moveover they have possible complications such as secondary osteoarthritis (Crosby and Insall 1976), a painful bursa over the screw or staple, a stress fracture of the tibia through the graft site, peroneal nerve palsy, infection, and stiffness (Chrisman, Snook and Wilson 1979). Harrison (1955) and Heywood (1961) reported a high rate of unsatisfactory results with the Hauser procedure and Bowker and Thompson (1964) reported a high failure rate with the Goldthwait procedure. Macnab (1952) also was disappointed with the long-term results of operative treatment, particularly because severe chondromalacia might ensue, and McFarland (1948) went so far as to recommend primary patellectomy because of his disenchantment with alignment procedures.

Since 1972 in the Enfield District Hospitals we have practised a simple procedure for the unstable patella. A preliminary arthroscopic examination is performed to assess the patellar articular surface and to exclude other pathology; this is followed by a closed release of the lateral retinaculum of the patella using a Smillie knife inserted through the same incision as that used for the
arthroscopy. No attempt is made at this stage to
distinguish between patients with congenital abnormali-
ties and those without, although a record of any such
abnormalities is made.

A large proportion of the patients so treated have no
further trouble. However, a small proportion continue to
have symptoms of patellar instability, and it is interesting
to note that these patients all have some underlying
congenital abnormality. Such patients then undergo a
tibial tubercle transfer (through a small transverse incision) or a patellectomy if there is severe patellofemoral
pain and arthroscopic evidence of severe chondromalacia
patellae. By delaying these procedures to a second stage
we hope we have spared many patients unnecessary
major surgery, prolonged immobilisation and possible
complications. Moreover the patients, many of whom
are young girls, have been spared an unsightly scar.

CLINICAL MATERIAL AND METHODS
Between March 1974 and October 1979, 39 patients had
closed lateral retinacular release of the patella performed
for recurrent dislocation or subluxation, or for acute
dislocation. The youngest patient was aged 13 at the time
of operation, the oldest 35; the average age was 20. Of
the 39 patients, 37 had unilateral and 2 had bilateral
involvement, making a total of 41 operations (Table I).
The follow-up period varied from 3 years 4 months to 9
years 11 months, with an average of 6 years. Nine
different surgeons, two of consultant grade and seven of
registrar grade, carried out the operations.

Table I. Clinical details of the 39 patients

<table>
<thead>
<tr>
<th>Type</th>
<th>Patients</th>
<th>Knees</th>
<th>Sex</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unilateral</td>
<td>Bilateral</td>
<td>Right</td>
</tr>
<tr>
<td>Recurrent dislocation</td>
<td>14</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Recurrent subluxation</td>
<td>8</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Acute dislocation</td>
<td>15</td>
<td>0</td>
<td>8</td>
</tr>
</tbody>
</table>

The presenting symptoms are given in Table II and
the signs in Table III. Routine anteroposterior and lateral
radiographs of the knees and skyline views of the patella
were taken when the patient was first seen. Three patients
showed lateral patellar tilt, one a loose body attached to
the patella, one Osgood–Schlatter’s disease and one an
osteochondral fracture.

Clinical examination showed that five patients had
chondromalacia patellae, one a torn medial meniscus and
one had laxity of joints. Arthroscopic examination
showed that 13 patients had chondromalacia, in 12 there
was a haemarthrosis, and the osteochondral fracture also
was seen.

Operative technique. A preliminary arthroscopic exami-
nation of the affected knee is carried out through an
anterolateral portal. Through the same stab wound in the
skin a Smillie knife is passed into the lateral patellar
retinaculum and capsule (Fig. 1). If the knife is positioned
correctly firm resistance is felt when it is pushed and cuts
through the retinaculum and capsule. The height of the
patella is measured and the lateral patellar retinaculum
and capsule are released above the patella also, by an
amount equal to the patellar height; during this procedure
the knife is deviated slightly laterally so as to avoid
cutting the vastus lateralis muscle and the lateral
genicular vessels. The tip of the knife can be palpated
through the skin and the extent of the release can be
carefully controlled.

The knife is then reversed and the lateral patellar
retinaculum and capsule are cut downwards, lateral to
the insertion of the ligamentum patellae. The patella is
now moved medially to check whether the release has
been adequate, and the knee is flexed and extended
several times to see if the patella is tracking normally in
its groove. One absorbable stitch is usually adequate to
close the skin wound (Fig. 2) after which a padded crêpe
bandage is applied to the knee.

Table II. Presenting symptoms

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Knees</th>
<th>%</th>
</tr>
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<tbody>
<tr>
<td>Pain</td>
<td>36</td>
<td>88</td>
</tr>
<tr>
<td>Swelling</td>
<td>24</td>
<td>58</td>
</tr>
<tr>
<td>Giving way</td>
<td>20</td>
<td>49</td>
</tr>
<tr>
<td>Locking</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>Weakness</td>
<td>5</td>
<td>12</td>
</tr>
<tr>
<td>Recurrent dislocation</td>
<td>16</td>
<td>39</td>
</tr>
<tr>
<td>Acute dislocation</td>
<td>13</td>
<td>32</td>
</tr>
</tbody>
</table>

Table III. Presenting signs

<table>
<thead>
<tr>
<th>Signs</th>
<th>Knees</th>
<th>%</th>
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</thead>
<tbody>
<tr>
<td>Quadriceps wasting</td>
<td>19</td>
<td>46</td>
</tr>
<tr>
<td>Positive apprehension test</td>
<td>18</td>
<td>44</td>
</tr>
<tr>
<td>Patellofemoral tenderness</td>
<td>12</td>
<td>29</td>
</tr>
<tr>
<td>Patellofemoral crepitus</td>
<td>5</td>
<td>12</td>
</tr>
<tr>
<td>Clicks</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Lateral tracking of patella</td>
<td>11</td>
<td>27</td>
</tr>
</tbody>
</table>

After-care. The patient is allowed out of bed next day
and is allowed to take full weight on the leg with the knee
extended. Static quadriceps exercises and gentle knee
movements (up to 30° of flexion) are permitted, but more
vigorous or extensive movements are discouraged during
the first week in order to minimise effusion or bleeding.
After the first week more flexion is allowed and
quadriceps strengthening exercises are instituted. By the
end of the second week the patient is able to return to
normal activity. Most patients can go home by the fifth
day though a few may need to stay longer.
The residual symptoms in the patients categorised as good were all due to chondromalacia patellae.

In the recurrent dislocation group a 14-year-old girl had three dislocations within a two-year period. She had a closed lateral retinacular release of her left patella in October 1979. Her knee was satisfactory until eight months later when she again dislocated her left patella. After this she had symptoms of giving way with retropatellar pain. A patellectomy was carried out in November 1980. At operation the patella was found to be severely chondromalacic. This patient has been placed in the worst category. Another patient with recurrent dislocation, a 35-year-old man, had three dislocations of his right patella within an 18-month period. A lateral retinacular release was carried out but, even years later, he still felt that his right knee was weak and tended to give way. This has restricted his sporting activities but not his day-to-day activities. On clinical examination he has lateral tracking of his patella and he still has a positive apprehension test. He has been placed in the fair to poor category.

A 14-year-old girl had recurrent dislocation of both patellae on several occasions. Arthroscopic examination and lateral patellar retinacular release of her right knee was carried out in December 1976 and of her left knee in April 1978. She continued to have recurrent subluxations of her patellae. The Q-angle of her knees was 20°. A tibial tubercle transfer of her right knee was carried out in September 1982 and this knee is now free of symptoms, but she is awaiting operation on her left knee. She has been placed in the fair to poor category.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Knees</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excellent</td>
<td>24</td>
<td>59</td>
</tr>
<tr>
<td>Good</td>
<td>11</td>
<td>27</td>
</tr>
<tr>
<td>Fair to poor</td>
<td>5</td>
<td>12</td>
</tr>
<tr>
<td>Worse</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

A 17-year-old girl had three dislocations of her right patella within a two-year period. She had a closed lateral retinacular release in April 1977 and was symptom free until December 1980 when she tripped and fell heavily, dislocating her patella again. This reduced easily after which she was given physiotherapy consisting of quadriceps strengthening exercises and was allowed to resume normal activities. Her knee was not immobilised. At review in February 1983 she was symptom free and has been classified as a good result. We felt that the dislocation of her patella in 1980 was not a true recurrence but was the result of a fall which could have caused dislocation even in a normal knee.

In the recurrent subluxation group a 20-year-old girl had an eight-year history of pain and giving way of her left knee since she knocked it at the age of 12. Clinically she had quadriceps wasting, a positive apprehension test.

**RESULTS**

There were no complications after the operation, the results of which were graded according to Crosby and Insall's (1976) criteria:

- **Excellent**—No pain, normal activity including all sports, full range of movement, knee subjectively normal.
- **Good**—Occasional discomfort, feeling of stiffness or instability. No participation in contact sports, slight loss of flexion, knee considered improved or normal by the patient.
- **Fair to poor**—Pain most of the time, symptoms altered but including recurrent subluxation or significant loss of flexion; further surgical treatment required in some instances.
- **Worse**—Pain increased, subluxations more frequent.

Tables IV and V show the details. The overall results were 86% excellent or good and this percentage was similar in all three groups (recurrent dislocation, recurrent subluxation and acute dislocation). The results of recurrent subluxations were the best (90%), followed by acute dislocations (87%) and recurrent dislocations (81.5%).
and an audible click in the knee on walking. During flexion the patella subluxated laterally. The tibial tubercle was more lateral than normal. In November 1974 a closed lateral retinacular release was carried out. She was symptom free for five months then started to develop pain and giving way once more. Although she was advised to have a second procedure (tibial tubercle transfer) she declined. At review in February 1983 she still had symptoms but was able to cope with normal activities. She has been classified as a fair to poor result.

The value of lateral retinacular release was questioned by Madigan, Wissinger and Donaldson (1975), but Hughston (1968) maintains that the tight lateral retinaculum must be released for adequate realignment of the patella. Similarly, Zimbler et al. (1980) advocated an extensive lateral retinacular release. Reefing of the medial retinaculum, however, is not devoid of risk; if done too tightly, it can predispose to excessive pressure on the patellofemoral articulation leading to degenerative changes.

The role of lateral retinacular release in acute dislocation of the patella is controversial and some surgeons may not agree that surgery is necessary. In acute dislocation, however, the medial retinaculum is damaged and healing may be inadequate if the knee is not immobilised for at least three weeks; even after three weeks' immobilisation healing may leave some laxity if the damage was extensive. Releasing the undamaged lateral retinaculum prevents it from leading to abnormal tracking of the patella. None of the patients treated for acute dislocation of the patella by lateral release has so far had a recurrence. Moreover, the patient so treated is able to drive and to resume work within a week.

The Q-angle (Crueilhier 1847) is subtended by a line from the anterior superior iliac spine to the centre of the patella and a line from the centre of the patella to the centre of the tibial tubercle; it is a measure of the placement of the tibial tubercle. The normal Q-angle is 14°; if the tibial tubercle is laterally placed the Q-angle is greater than 14°. The failure rate after procedures like the Hauser or the Roux–Goldthwait may be due to the fact that these are effective only when the Q-angle is more than 14°; with smaller angles they may exacerbate the condition. In such knees proximal realignment operations, such as advancement of the vastus medialis over the medial proximal pole of the patella, are better

### Table V. Results of each individual condition

<table>
<thead>
<tr>
<th>Grade</th>
<th>Recurrent dislocation (16)</th>
<th>Recurrent subluxation (10)</th>
<th>Acute dislocation (15)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Knees</td>
<td>%</td>
<td>Knees</td>
</tr>
<tr>
<td>Excellent</td>
<td>7</td>
<td>44</td>
<td>6</td>
</tr>
<tr>
<td>Good</td>
<td>6</td>
<td>37.5</td>
<td>3</td>
</tr>
<tr>
<td>Fair to poor</td>
<td>2</td>
<td>12.5</td>
<td>1</td>
</tr>
<tr>
<td>Worse</td>
<td>1</td>
<td>6</td>
<td>0</td>
</tr>
</tbody>
</table>

In the acute dislocation group, a 12-year-old girl had been attending the orthopaedic clinic with symptoms of chondromalacia patellae of her left knee for about two years. In March 1979, while running, she dislocated her left patella. On examination she had patellofemoral crepitus, tenderness and swelling of the knee, quadriceps wasting, lateral tracking of the patella and a positive apprehension test. An arthroscopic examination in April 1979 revealed chondromalacia patellae. A closed lateral retinacular release was carried out. She developed acute appendicitis whilst in the ward and had an appendicectomy; consequently she stayed in hospital for 12 days. At review in February 1983 she still had slight pain and patellofemoral tenderness. She has been placed in the fair to poor category.

A 15-year-old boy dislocated his left patella whilst lifting a heavy weight at work. He had a closed lateral retinacular release in March 1977. He was symptom free until November 1977 when he dislocated his left patella again while doing heavy work. This reduced easily but he had a further dislocation in July 1982 whilst dancing vigorously. He has an unduly lateral attachment of his ligamentum patellae and may require a tibial tubercle transfer. He has been placed in the fair to poor category.

DISCUSSION

Closed lateral retinacular release of the patella appears to be a safe and reliable procedure. A very small scar, early mobilisation and early return to work make this surgical procedure very attractive to patients who are prepared to have a second-stage operation if necessary.

We feel that preliminary arthroscopic examination of the affected knee is important as it provides information regarding the state of the articular surfaces of the knee and the presence of any other lesion. However, we feel that the lateral retinacular release should not be done arthroscopically from within the joint as advocated by some surgeons. McGinty (personal communication, 1983) reported troublesome bleeding using this technique; our series was free of this complication probably because the retinacular release was extrasynovial. We do not feel that the synovial membrane should be incised in a lateral retinacular release. Furthermore, it is important to release the lateral attachment of the ligamentum patellae far distally (Hughston 1968; Baker et al. 1972) and this is not possible through the arthroscope.
(Zimbler et al. 1980). The simple procedure we have described can be considered a preliminary step to either distal or proximal realignment procedures and therefore the Q-angle need not be measured unless one has to proceed to one of these operations. In conclusion, we would like to stress that our procedure is very simple, has been carried out by both consultants and registrars, and has had consistently good results—certainly as good as those following more complicated and more major surgical procedures.

We would like to thank Mr. Basil Helal for allowing us to include his patients in our study.

REFERENCES


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