Reconstruction of acute posterior cruciate ligament tears using a synthetic ligament

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ABSTRACT

Purpose of the study
Treatment of recent laxity of the posterior cruciate ligament is not standardized. The purpose of this work was to analyze results of reconstruction with adjunction of a synthetic ligament for major recent isolated or combined laxity of the posterior cruciate ligament (triades, pentades or dislocations). Our hypothesis was that the synthetic ligament acts like a tutor for healing of the torn ligament.

Material and methods
This retrospective analysis included 14 patients (1 woman and 13 men), mean age 27 years. All were competition athletes except one who did not practice sports. Three quarters of the patients were traffic accident victims. The series included three isolated posterior ligament tears, six combined laxities, and five knee dislocations. Average posterior laxity was 24 mm pre-operatively. The procedure was performed 7 to 53 days after the accident. Arthroscopic reconstruction was performed for six patients and arthrotomy for eight. All associated lesions were repaired during the same procedure except for two cases (one anterior cruciate ligament and one popliteal tendon). Posterior cruciate ligament repair was achieved with the adjunction of a polyester ligament (LARS) using a one or two strand technique. Patients were reviewed at 36 months mean follow-up (10-88 months). The IKDC score was determined. A posterior drawer was measured manually with Telos at 70°.

Results
Five stiff knees required either mobilization under anesthesia or arthrolysis. One tear occurred late after the accident during a new trauma. Subjectively, two patients were very satisfied, eight satisfied and three disappointed. Mean knee motion measurements were 6/0/130°. A differential posterior drawer persisted in twelve knees. The Telos measurement of posterior drawer changed from a mean 24 mm to a mean 8 mm. The overall IKDC score was A: 0, B: 7, C: 3, and D: 2. Persistent posterior laxity was the predominant cause of poor scores. Outcome was less satisfactory for all items of posterolateral laxity. There was no difference between the 2- and 4-strand techniques. There were no cases of morbidity (synovitis, spontaneous tear) directly related to the synthetic ligament.

Discussion
The gain in posterior laxity was substantial. Results depended on associated lesions, particularly lateral involvement (stiffness, IKDC score) rather than the repair technique. The synthetic ligament appeared to play the role of a tutor: a single strand measuring 6 mm in diameter is sufficient. This technique spares tendon stock and could be proposed for major posterior cruciate ligament laxity. A longer follow-up will be necessary to confirm the durable stability.

Key words: Knee, posterior cruciate ligament, laxity, ligament reconstruction.

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INTRODUCTION

Standard treatment of isolated or combined tears of the posterior cruciate ligament (PCL) remains to be established.

Functional treatment can be well tolerated for a long period [Shino et al. (1), Shelbourne et al. (2), Chiu et al. (3)]. Dejour et al. (4) demonstrated that an isolated tear of the PCL is often well tolerated after an adaptation period of 12 months on average. This ligament has certain healing capacity [Akisue et al. (5)]. At the SO.F.C.O.T. 1994 symposium, Chambat and Chassaing (6) proposed conservative treatment with functional rehabilitation exercises adapted to the PCL. Nevertheless, Harner and Hoher (7), Janousek et al. (8), and Bendjaballah et al. (9) demonstrated the important interaction between the PCL and the peripheral structures. If the tears involve both the central and peripheral areas, functional outcome can be mediocre. In such situations, it is generally accepted that emergency repair of all lesions, excepting perhaps the anterior cruciate ligament, offers the best results [Chambat and Chassaing (6), Yeh et al. (10), Noyes and BarberWestin (11), Mariani et al. (12), Klimkiewicz et al. (13), Ibrahim (14), Schenck et al. (15), Richter et al. (16), Strobel et al. (17)]. Indeed, unlike anterior laxity, surgical treatment of chronic symptomatic posterior laxity provides insufficient results [Berg (18), Clancy et al. (19)]. If the decision is to repair the PCL in an emergency operation, three techniques can be proposed: direct repair by suture of the torn PCL, use of a transplant, or reconstruction using a synthetic ligament.

We propose a fourth option. This technique is designed to spare as much tendon tissue as possible by using a polyester synthetic ligament. We hypothesized that the synthetic ligament acts like a tutor for the healing process of ligament fibers left in place. We used this technique for recent severe knee sprains with major posterior laxity, alone or combined, or associated with dislocation.

MATERIAL AND METHODS

Study population

This consecutive retrospective series included 14 patients (13 men and 1 woman), mean age 27 years, who underwent surgery between January 1995 and December 2001 (table I).

Eleven patients were traffic accident victims and three had had a sports accident. The left knee was involved in ten patients.

The PCL tear was isolated in three knees. It was combined in six (posteroposterolateral in three and posteroposteromedial in three). The tears resulted from knee dislocation in five patients: complete dislocation of the central pivot associated with lateral tear in three and medial tear in two.

We distinguished three groups of knees as a function of the extent of the lesions: three isolated posterior tears, six combined tears, and five dislocations.

We also divided the knees according to lateral or medial involvement: isolated posterior laxity (n = 3), lateral involvement (n = 6), medial involvement (n = 5).

Initial objective knee laxity measured on the stress films was 24 mm (range 15-57).

The operation was performed on average 18.5 days after trauma (range 7-53). Three patients underwent surgery more than 21 days after trauma (25, 37, 53 days).

Operative technique

The Lars® ligament is an artificial ligament made of polyester (fig. 1) [Laboureau et al. (20)]. This synthetic ligament has a functional central part composed exclusively of free fibers aligned in parallel longitudinally. Because of this original structure, the free intra-articular fibers can absorb deformations caused by flexion and torsion without transmitting them entirely to the regions submitted to friction in the bone tunnels. The portions lying within the tunnels are knitted.

Two types of this ligament, containing 60 and 80 fibers, were used. Overall tear resistance is 2500 N for the 60-fiber ligament and 3500 N for the 80 fiber ligament. Maximal stretch before rupture varies from 7.6 to 11.3% depending on the ligament, remaining less than that of the PCL. Because of its general structure, the Lars® ligament exhibits very minimal lengthening remodeling.

Six PCL reconstructions were performed arthroscopically and eight during an open procedure. The choice depended on whether or not the PCL tear was isolated and on the need to reconstruct other ligaments. Arthroscopy was the indication of choice for isolated tears.

The eight open reconstructions all involved one or more peripheral tears. The medial para-patellar medial approach was used.

An isometric single-strand reconstruction of the PCL was performed in eight knees and an anatomic two-strand reconstruction in six. Considering the study hypothesis, the PCL fibers were spared in all knees but were not sutured. The synthetic ligament was inserted as a sort of tutor.

All of the associated lesions were repaired (excepting one anterior cruciate ligament and one popliteal tendon) during the same procedure by autologous reconstruction or direct suture depending on the intraoperative findings. Reconstruction of the lateral lesions was associated with a second Lars® ligament in three knees. Only one of the four meniscal tears were repaired.

The knee was immobilized with a posterior orthesis a few days postoperatively. Immediate mobilization of the knee was authorized for a maximal flexion of 90° for the first six weeks. An extension orthesis was worn in general for six weeks between rehabilitation sessions. Weight-bearing was immediate, with the orthesis.
Table I. – The series.

<table>
<thead>
<tr>
<th>Name</th>
<th>Age (yr)</th>
<th>Preoperative data</th>
<th>Procedure</th>
<th>Results at last follow-up</th>
<th>Follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Lesions</td>
<td>Laxity (mm)</td>
<td>Delay (d)</td>
<td>Tech</td>
</tr>
<tr>
<td>YD</td>
<td>27</td>
<td>PCL</td>
<td>19</td>
<td>13</td>
<td>Ao 1(80)</td>
</tr>
<tr>
<td>SC</td>
<td>35</td>
<td>PCL</td>
<td>18</td>
<td>53</td>
<td>Open 2(60)</td>
</tr>
<tr>
<td>PV</td>
<td>25</td>
<td>PCL</td>
<td>15</td>
<td>8</td>
<td>Ao 2(60)</td>
</tr>
<tr>
<td>OG</td>
<td>35</td>
<td>CL</td>
<td>-</td>
<td>37</td>
<td>Ao 2(60)</td>
</tr>
<tr>
<td>CS</td>
<td>24</td>
<td>CL</td>
<td>27</td>
<td>14</td>
<td>Ao 1(80)</td>
</tr>
<tr>
<td>GB</td>
<td>18</td>
<td>CL</td>
<td>-</td>
<td>12</td>
<td>Ao 1(60)</td>
</tr>
<tr>
<td>EJ</td>
<td>25</td>
<td>CM</td>
<td>-</td>
<td>15</td>
<td>Open 1(80)</td>
</tr>
<tr>
<td>MO</td>
<td>22</td>
<td>CM</td>
<td>15</td>
<td>25</td>
<td>Open 2(60)</td>
</tr>
<tr>
<td>MB</td>
<td>27</td>
<td>CM</td>
<td>-</td>
<td>17</td>
<td>Open 1(80)</td>
</tr>
<tr>
<td>PC</td>
<td>39</td>
<td>DL</td>
<td>18</td>
<td>7</td>
<td>Open 1(60)</td>
</tr>
<tr>
<td>SB</td>
<td>18</td>
<td>DL</td>
<td>-</td>
<td>16</td>
<td>Open 2(60)</td>
</tr>
<tr>
<td>SG</td>
<td>26</td>
<td>DL</td>
<td>-</td>
<td>14</td>
<td>Open 1(60)</td>
</tr>
<tr>
<td>CC</td>
<td>19</td>
<td>DM</td>
<td>57</td>
<td>21</td>
<td>Open 1(80)</td>
</tr>
<tr>
<td>LM</td>
<td>36</td>
<td>DM</td>
<td>-</td>
<td>7</td>
<td>Open 2(60)</td>
</tr>
</tbody>
</table>

Method

Thirteen of the fourteen patients attended the follow-up visit and were examined. One patient was contacted by telephone and completed a questionnaire. None of the patients were lost to follow-up. The IKDC grid (first method) was used for the clinical assessment in Hefti et al. (21) (table II). Posterior laxity was measured on the Telos films in thirteen patients. Measurements were taken in the medial compartment. The standard x-ray protocol included a weight-bearing AP view, a 30° flexion view, a lateral view, and a patellofemoral view.

Mean follow-up was 34 months (range 9-80). The small number of knees included in this study did not allow statistical comparisons between the different groups.

RESULTS

Results are summarized in Table I.

Complications

Seven patients developed one or more complications: stiff knee (n = 5), septic arthritis (n = 1), reflex dystrophy (n = 2).

Among the five patients who had a stiff knee, three initially presented combined posteroposteromedial tears and two a dislocated knee with lateral tears. The knee was mobilized under general anesthesia in two of these patients and early arthroscopic arthrolysis was performed in three.

The case of septic arthritis resulted from a superinfection of the proximal locking orifice of a tibial nail. The synthetic ligament did not appear to be the cause of this infection and joint washout was sufficient to preserve the implant.

We did not have any cases of chronic synovitis or osteolysis.

The synthetic ligament tore in one patient who had an isolated tear of the PCL. This secondary tear occurred during a soccer game two years after the operation.

Time to functional recovery

The mean time required to recover prior activity level was 11.5 months (range 9-16). At last follow-up, two patients had not yet achieved their former level of activity.

IKDC Score

Physical and sports activities

Physical activity level declined in six patients after their knee trauma: the decline was related to knee function. Lateral involvement had a more negative impact.

Subjective assessment

Ten patients were satisfied or very satisfied. Lateral involvement had a more negative impact.

Symptoms

The IKDC scores revealed good and very good (class A and B) outcome in thirteen knees. There was one fair outcome (class C) and no poor outcomes (class D). Lateral involvement had a negative impact.

Joint Motion (table III)

Mean flexion was 130° (range 125-145°) after mobilization or arthrodesis as needed.

The deficit in extension was classed A (< 3°) in thirteen knees. One patient was in class B (3-5° deficit).

Joint motion was comparable for isolated and combined tears. Less favorable outcome for both flexion and extension were observed in patients with dislocation.

Clinical laxity

Posterior drawer at 70°: thirteen patients were examined for knee laxity. A posterior drawer was observed in three knees. Residual laxity was noted for ten knees scored + (n = 7) or ++ (n = 3). This laxity persisted even after repair of isolated tears of the PCL. The posterior drawer was more pronounced in knees with lateral tears.

Overall ligament score: among the thirteen knees examined, the ligament score was normal or nearly normal in nine. Results were much less favorable for lateral tears.

Radiographs

There was no evidence of degenerative disease at last follow-up.

One-leg jump

Nine patients were able to perform a one-leg jump on the affected side. One patient was unable to perform this test. Lateral tears had a negative impact.

Overall IKDC Score (table IV)

Among the thirteen knees examined, the overall IKDS scores were: grade A (n = 0), grade B (n = 7), grade C
### Table II. – IKDC grid.

<table>
<thead>
<tr>
<th>Name:</th>
<th>First name:</th>
<th>Birthdate:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date of examination:</td>
<td>Date of trauma:</td>
<td>Date of operation:</td>
</tr>
<tr>
<td><strong>Trauma:</strong></td>
<td>Domestic</td>
<td>Traffic</td>
</tr>
<tr>
<td></td>
<td>Sports (no pivot no contact)</td>
<td>Sport (pivot no contact)</td>
</tr>
<tr>
<td><strong>Time trauma/surgery (months):</strong></td>
<td>Acute (&lt; 2 wk)</td>
<td>Subacute (2-8 wk)</td>
</tr>
<tr>
<td><strong>Knee examined:</strong></td>
<td>right/left</td>
<td>Other knee: normal/injured</td>
</tr>
<tr>
<td><strong>Postoperative diagnosis:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Surgical procedure:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Menisci:</strong></td>
<td>Med: Normal</td>
<td>1/3 resection</td>
</tr>
<tr>
<td></td>
<td>Lat: Normal</td>
<td>1/3 resection</td>
</tr>
<tr>
<td><strong>Morphotype:</strong></td>
<td>Laxity/normal/stiffness</td>
<td>Genu varum</td>
</tr>
<tr>
<td><strong>Activity level:</strong></td>
<td>Before trauma</td>
<td>I II III IV</td>
</tr>
<tr>
<td></td>
<td>Current</td>
<td>I II III IV</td>
</tr>
</tbody>
</table>

**GROUP** | **SCORE IN EACH GROUP** | **GROUP SCORE**
---|---|---
A: normal | B: nearly normal | C: abnormal | D: very abnormal | A | B | C | D

### Subjective assessment

<table>
<thead>
<tr>
<th>Knee function</th>
<th>A: normal</th>
<th>B: nearly normal</th>
<th>C: abnormal</th>
<th>D: very abnormal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change activity level (0-3)</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

| A | B | C | D | A | B | C | D |

### Symptoms or maximal activity level

<table>
<thead>
<tr>
<th>Pain</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Swelling</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimal instability</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Major instability</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| A | B | C | D | A | B | C | D |

### Joint motion: examined side -/-/-; other side -/-

<table>
<thead>
<tr>
<th>Extension deficit</th>
<th>&lt; 3°</th>
<th>3-5°</th>
<th>6-10°</th>
<th>&gt;10°</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flexion deficit</td>
<td>0-5°</td>
<td>6-15°</td>
<td>16-25°</td>
<td>&gt;25°</td>
</tr>
</tbody>
</table>

| A | B | C | D | A | B | C | D |

| Ligament examination | | | | |
|---|---|---|---|
| Lachman | -1 to 2 mm | 3-5 mm | 6-10 mm | > 10 mm |

*The lowest score in each group is retained.

**The lowest score from the first four groups is retained for the final score.
TABLE II. – IKDC grid.

<table>
<thead>
<tr>
<th>Ant. drawer 70°</th>
<th>-1 to 2 mm</th>
<th>3-5 mm</th>
<th>6-10 mm</th>
<th>&gt; 10 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post. drawer</td>
<td>0-2 mm</td>
<td>3-5 mm</td>
<td>6-10 mm</td>
<td>&gt; 10 mm</td>
</tr>
<tr>
<td>Med. laxity</td>
<td>0-2 mm</td>
<td>3-5 mm</td>
<td>6-10 mm</td>
<td>&gt; 10 mm</td>
</tr>
<tr>
<td>Lat. laxity</td>
<td>0-2 mm</td>
<td>3-5 mm</td>
<td>6-10 mm</td>
<td>&gt; 10 mm</td>
</tr>
<tr>
<td>Pivot test</td>
<td>Neg.</td>
<td>+</td>
<td>++</td>
<td>+++</td>
</tr>
<tr>
<td>Inverted pivot</td>
<td>same</td>
<td>discrete</td>
<td>moderate</td>
<td>Major</td>
</tr>
</tbody>
</table>

**Behavioral signs**

<table>
<thead>
<tr>
<th>FP</th>
<th>none</th>
<th>moderate</th>
<th>painful</th>
<th>severe</th>
</tr>
</thead>
<tbody>
<tr>
<td>FTM</td>
<td>none</td>
<td>moderate</td>
<td>painful</td>
<td>severe</td>
</tr>
<tr>
<td>FTL</td>
<td>none</td>
<td>moderate</td>
<td>painful</td>
<td>severe</td>
</tr>
<tr>
<td>Scar (sensitive, irritation)</td>
<td>none</td>
<td>discrete</td>
<td>moderate</td>
<td>Major</td>
</tr>
</tbody>
</table>

**Radiograph**

<table>
<thead>
<tr>
<th>FP space</th>
<th>normal</th>
<th>&gt; 4 mm</th>
<th>2-4 mm</th>
<th>&lt; 2 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>FTM</td>
<td>normal</td>
<td>&gt; 4 mm</td>
<td>2-4 mm</td>
<td>&lt; 2 mm</td>
</tr>
<tr>
<td>FTL</td>
<td>normal</td>
<td>&gt; 4 mm</td>
<td>2-4 mm</td>
<td>&lt; 2 mm</td>
</tr>
</tbody>
</table>

**Function: single-leg jump (% other side)**

<table>
<thead>
<tr>
<th>90-100%</th>
<th>76-90%</th>
<th>50-75%</th>
<th>&lt; 50%</th>
</tr>
</thead>
</table>

**Overall evaluation**

| A | B | C | D |

*The lowest score in each group is retained.

**The lowest score from the first four groups is retained for the final score.

(n = 4), grade D (n = 2). None of the knees had a normal score (grade A), even after repair of an isolated tear of the PCL. Lateral tears had a negative impact.

Telos: posterior drawer at 70°

Mean differential posterior laxity measured with Telos in thirteen knees was 7.3 mm on average (range 0-16 mm). In seven patients with pre and postoperative measurements, mean differential laxity improved from 24 mm to 8.8 mm, giving a gain of 15.2 mm (63%) (fig. 3).

DISCUSSION

Functional treatment of isolated grade 1 or 2 tears of the PCL (posterior laxity < 10 mm) is generally proposed [Harner and Hoher (7), Cosgrove and Jay (22), St-Pierre and Miller (23), Veltri and Warren (24), Margheritini et al. (25), Chambat (26)]. This leaves a residual laxity which is generally well tolerated, despite a correlation between the degree of residual laxity and clinical symptoms [Boynton and Tietjens (27)]. Functional treatment of a damaged PCL can be proposed only if the tear is isolated. The prognosis in the event of combined laxity is poor without treatment [Boynton and Tietjens (27)].

Early surgical treatment is considered appropriate when laxity is “isolated”, but greater than 10 mm [Veltri and Warren (24)], when it is combined with peripheral, especially lateral, lesions, and when it results from knee dislocation [Chambat and Chassaing (6), Klimkiewicz et al. (13), Ibrahim (14), Schenck et al. (15), Margheritini et al. (25), Chambat (26), Harner et al. (28), Martinek et al. (29), Wascher et al. (30), Noyes and Barber-Westin (31)]. The objective is to repair all lesions. In this context, repair can be accomplished by simple suture, an autograft, or an allograft. However, to simplify the surgical procedure (especially for isolated tears of the PCL) and to spare autograft...
material in the event of combined laxity, we have opted for a synthetic ligament.

Most publications examining the use of synthetic ligaments have concerned series of anterior cruciate ligament reconstructions. In the 1980s, this therapeutic option produced disappointing results [Larson (32)], followed by many failures and complications which led to the abandonment of artificial ligaments in this indication [Gillquist (33), Moyen and Lerat (34), Molé et al. (35)].

Use of artificial ligaments for chronic disorders is thus not an acceptable alternative. It is however acceptable for fresh tears of the PCL. The PCL is an intra-articular, but extrasynovial, ligament. Thus, unlike the anterior cruciate ligament, the PCL has a capacity for healing. Similarly, because of the extrasynovial position of the synthetic implant [Christel and Djian (36), Chambat and Selvat (37), Petersen and Tillmann (38)] synovial reactions should not be a problem. Our hypothesis, like that put forward by Dürsel et al. (39) and de Bosch et al. (40), is that the synthetic ligament acts like a tutor for PCL healing early after a tear, guiding the physiological repair and limiting elongation of the healed ligament by preventing the posterior laxity induced by the tear. This type of hypothesis assumes that surgical repair is performed early after trauma. In our series, only three patients underwent surgical repair more than 21 days after injury.

Very few comparable series have been reported. Dejour et al. (41) presented a prospective series of 17 patients who underwent emergency treatment of knee dislocation. These patients had an injured central pivot associated with lateral or medial injuries. The surgical procedure was suture or stapling to repair the peripheral structures and open suture of the PCL reinforced with a synthetic ligament (Ligastic®). The subjective outcomes were very satisfactory for seven patients, satisfactory for nine and disappointing for one. The posterior drawer at 70° declined from 18 to 9 mm. The authors concluded that correction of posterior laxity can be further improved but that no complications related to the synthetic ligament were observed.

In their series of 129 patients with an isolated tear of the PCL, Chiu et al. (3) reported reconstruction of the PCL in 46 patients using an artificial ligament (Leeds-Keio, Dacron or Goretex). These patients presented major laxity or were athletes. The treatment was performed in an emergency setting, before day 21 in most patients. The authors observed excellent outcome in 82% of patients and good outcome in 15% (excepting Goretex repairs which exhibited many tears).

Bercovy uses a double-strand polyester system to reinforce certain PCL sutures. He has not yet published his results, but outcome has been good in the patients examined by Chambat and Chassaing (6).

These are small groups of patients with various situations so comparisons are hazardous with other functional or surgical techniques.

In our patients, there was little (+) or no residual posterior laxity in three-quarters of the knees. Boynton and Tietjens (27) scored posterior drawer + in 5 knees, ++ in 15, and +++ in 10 after functional treatment of isolated PCL tears. Similarly, Shino et al. (1) reported that all patients had a posterior drawer scored ++ after functional treatment.

Our results with a synthetic ligament are similar to those obtained with suture or autografting. Richter et al. (42)
reported little (+) or no posterior drawer after suture in 87% of knees. For autografting, Mariani et al. (12) found a posterior drawer of less than 7 mm in all knees, Ibrahim (14) little (+) or no posterior drawer in 75%, and Martinek et al. (29) in 86%.

However, even though the functional outcomes are similar, the technique proposed here for isolated laxity has the advantage of avoiding autograft harvesting with its known mini-invasiveness and morbidity. Nevertheless, we do not think our technique can be proposed for laxities measuring less than 10 mm since in these cases the outcome is good after functional treatment.

For combined laxities, the use of a synthetic tutor has several advantages:

— sparing autograft material for reconstruction of the anterior cruciate or peripheral lesions,
— fewer incisions and detachments,
— possible immediate weight-bearing and mobilization due to the solidity of the repair.

Poor outcome, particularly stiffness, is a drawback related more to the gravity of the initial lesions than to use of an artificial ligament which, in our series was not the direct cause of any morbidity.

The less favorable results were observed in patients with knee dislocation or peripheral injury. In this context of severe knee injury, arthrolysis is an integral part of the therapeutic strategy [Irrgang and Fitzgerald (43)].
CONCLUSION

Since we are dealing with a rather controversial topic - ligament reconstruction of the central knee pivot using an artificial material - our conclusions must necessarily be prudent.

Two thirds of the knees in our series were considered nearly normal despite the gravity of the initial injury. Less satisfactory results were however related to associated injury, particularly lateral involvement, and were not related to the use of the synthetic ligament.

The strategy of early repair of isolated or combined tears of the PCL using a synthetic ligament can offer satisfactory results. The gain in posterior laxity is considerable, with an average improvement from 24 to 8 mm. The synthetic ligament thus appears to effectively play the role of a tutor. We did not observe any case of tunnel lyses or synovitis.

For isolated laxity, the surgical indication is exceptional and can only be considered for major laxity (differential > 10 mm). The procedure is simple, minimally invasive, and provides satisfactory results, but there is no argument for broadening indications to laxities measuring less than 10 mm.

For combined laxity, indications are wider. If a surgical procedure is performed, all lesions should be repaired.

The use of a synthetic ligament for the reconstruction of the PCL does not induce any morbidity and spares tendon tissue. Results appear to be stable with time and comparable to those obtained with other techniques at the follow-up of our series. However, because we are dealing with serious injuries, the risk of joint stiffness is important so that knee mobilization or secondary arthroscopic arthrolysis are part of the treatment.

Long-term measurements of the laxity figures will be needed to confirm the stability of the objective results demonstrating the reality of the healing process of the PCL around the synthetic tutor.

References


