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Pes anserinus transfer for the unstable knee

A 7-year follow-up of 43 cases of ruptured anterior cruciate ligament

On average 7 years postoperatively, we evaluated 43 consecutive patients who had had pesoplasty for chronic injury of the anterior cruciate ligament. Fourteen patients had undergone further surgery during the follow-up period; ten of these had extra- or intra-articular stabilizing procedures, and eight meniscectomies were performed after the index operation. At follow-up of the 33 knees that had not had additional stabilizing surgery, only one-third of the knees had normal radiograms, and the majority had anterolateral rotational instability (pivot shift) which, however, did not exclude satisfactory knee function. We conclude that improvement after transfer of the pes anserinus tendons was due to the simultaneous meniscectomy; we do not believe that the pesoplasty changed the natural course of the chronic rupture of the anterior cruciate ligament.

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Slocum & Larson (1968a) described the pes anserinus transfer for anteromedial rotational instability of the knee. Their case report (1968b) included both acute and chronic anterior cruciate (ACL) ruptures and also knees with isolated medial injuries; it initiated attempts at extra-articular knee ligament reconstruction all over the world. After this method had been used for chronic ACL ruptures, good results were reported at 1–4 years (D'Arcy 1978, Oretorp et al. 1979). However, the results seemed to deteriorate with longer follow-up (Chick et al. 1981, Freeman et al. 1982).

We have studied a consecutive series of 43 patients 5–8 years after pes anserinus transfer for chronic ACL rupture.

Patients and methods

During February 1974 – October 1978, 44 patients at the Orthopaedic Department, Gävle Hospital had a pesoplasty (Slocum & Larson 1968a) for chronic ACL rupture. One patient was excluded from the follow-up because pre-operative radiograms showed advanced osteoarthrosis.

The median age of the patients at injury was 23 (15–40) years; there were nine female and 34 male patients with a median age at surgery of 28 (16–57) years.

The ACL injury was caused by soccer in 32 knees and by traffic accidents in five knees. Eight patients had had surgery prior to the pesoplasty (medial meniscectomy five knees, lateral meniscectomy one knee, and exploratory arthrotomy two knees). Preoperative arthroscopy was performed in 30 knees.

Thirteen of the patients had the pesoplasty performed without a meniscectomy, 26 with simultaneous medial or lateral meniscectomy, and four with both menisci removed at the same time. Other additional procedures were posteromedial capsular reefing (20 knees), advancement of the medial collateral ligament (five knees), lateral retinacular release (nine knees), and distal transfer of the tibial tuberosity (one knee). Postoperatively, the knee was immobilized in a plaster cast for 6 weeks.

Follow-up was possible in all 43 patients 6.5 (5–8) years after the pesoplasty and included a clinical and radiographic examination with weight-bearing projections; the stability of the knee was examined for valgus and varus strain in extension and 30° flexion. Sagittal anterior instability was evaluated as a drawer sign in 90° and 30° flexion (Lachman test, Torg et al. 1976). The test for pivot shift (Galway et al. 1972) was performed according to Slocum et al. (1976), Hughston et al. (1976) and Losee et al. (1978). A pivot shift in any of these tests was interpreted as anterolateral rotational instability.

A knee function score was recorded with a maximum of 100 points (Lysholm & Gillquist 1982, Odensten et al. 1984), reflecting symptoms and pain during walking, running and jumping. Scores over 84 points were rated good or excellent.

Results

Two patients had complications with superficial infection and delayed wound healing associated with postoperative haematoma. In no case was manipulation under anasthesia necessary.

Reoperations

Further extra- or intra-articular stabilizing surgery was performed in 10 patients, five of whom also had meniscectomy done at the same time. These ten cases were considered as failures and were not included in the follow-up examination. Additional surgery in the remaining 33 patients during the follow-up period was meniscectomy in three cases and lateral retinacular release in one case.

Eight of 13 patients with pesoplasty without simultaneous meniscectomy had further surgery versus 6 of 30 patients with pesoplasty combined with meniscectomy ($p < 0.05$ chi-square test with Yates correction). Eight of 30 patients with arthroscopy prior to the index operation had further surgery compared to 6/13 when arthroscopy was not performed (non-significant difference).

Findings at follow-up

The average range of motion of the operated knees was normal. The circumference of the thigh on the operated side was reduced by more than 2 cm in two patients and 1–2 cm in 16. No knee had instability for valgus strain in extension, while 12 knees had mild instability when tested in 30° flexion. All patients had a positive anterior drawer sign with the foot in neutral position, still more pronounced with the knee in slight flexion (Lachman test, Torg et al. 1976). Twenty-nine of 33 patients had a positive pivot shift and 19 of these recognized the jerk as unpleasant.

The radiographic examination showed 11 normal knees, nine knees with peripheral osteophytes only, and 13 knees with reduced joint space. Of nine knees with both menisci removed, two had normal radiograms, six had osteophytes, and one narrowing of the joint space. Two out of four knees with preserved menisci had normal roentgenograms and two had osteophytes.

Table 1. Activity level after pes anserinus transfer related to clinical and radiographic findings in 33 patients. No patients had low or unlimited activity.

	Activity level		
	Ordinary	Rather high	High
Radiograph[a] N, O, A	1, 3, 1	5, 2, 7	5, 4, 5
Pivot shift[b] –, +, s	1, 4, 4	3, 11, 5	0, 14, 10
Lachmann[c] +, ++	1, 4	8, 6	9, 5
Meniscectomy –, uni, bil	1, 2, 2	2, 10, 2	1, 8, 5
Posterior capsular reefing –, +	2, 3	6, 8	8, 6
Lateral release –, +	1, 4	5, 9	2, 12

[a]N = normal, O = osteophytes, A = reduced joint space.
[b]s = patient recognizes jerk.
[c]+ = slight, ++ = severe.

The mean knee function score was 87 points. In ten patients the score was excellent (average 97 points), in 20 patients good (average 86 points) and in three poor (average 64 points). Nine patients with both menisci removed had a mean score of 85 points.

At follow-up, the activity level was not related to the degree of instability and radiographic findings, nor to meniscectomies and additional surgery during the index operation (Table 1). No patient reached the unlimited activity level, but several patients with minor knee trouble were playing soccer in lower divisions.

Discussion

Our observation that 10/43 patients had been reoperated confirms the report by Paterson & Trickey (1981) that meniscectomy alone made further stabilizing surgery unnecessary in three-fourths of 40 patients with chronic ACL ruptures. Like Freeman et al. (1982) and Chick et al. (1981), we question the effect of pes anserinus transfer for the ACL deficient knee: it is the meniscectomy that improves the patient, not the pesoplasty. This statement,

however, is not in accordance with the findings of Oretorp et al. (1979) in their series of 78 knees with chronic anteromedial rotational instability treated by extra-articular ligament repair including pesoplasty; they felt that "meniscectomy alone failed to improve function in most patients." D'Arcy (1978) followed 51 patients with the same type of instability for 3 years after pes anserinus transfer and concluded that the majority of his patients had a substantial improvement in stability. However, in one-third of his cases the anterior cruciate ligament was not torn. Perhaps anteromedial rotational instability with intact ACL is the correct indication for a pes anserinus transfer if, indeed, these patients need surgery at all. Twenty-nine of our 33 patients had a positive pivot shift at follow-up, the same frequency as reported by Chick et al. (1981). However, neither instability nor abnormal radiograms excluded good knee function.

In our series, patients with preoperative arthroscopy needed fewer late operations for injured menisci. This stresses the importance of a careful examination of both menisci when the ACL injured knee is treated. The high incidence of 8/43 meniscectomies after the index operation in our patients, versus 2/36 (Chick et al. 1981), 4/51 (D'Arcy 1978), and 2/78 (Oretorp et al. 1979), is remarkable and may to some extent be explained by our relatively long follow-up time. Furthermore, we were able to review all our patients; in other long-term, follow-up series the drop-out for final review has been 80 per cent (Chick et al. 1981) and 50 per cent (Freeman et al. 1982). Naturally, we may have missed some meniscal injuries, notably when arthroscopy was not performed before the index operation. However, like Oretorp et al. (1979), we believe that most of our meniscal ruptures were late manifestations of chronic anterior instability.

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