Active knee joint subluxation: its influence on the prognosis of ligament reconstruction

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Voluntary subluxation of the knee, known as active pivot shift, can be observed in a minority of patients with anterior cruciate ligament deficiency knees. We compared a group of 7 patients exhibiting voluntary subluxation of the knee joint with a group of 61 patients undergoing a similar operative procedure who did not demonstrate this sign. Despite similar age and similar operative procedures, the former group remained handicapped and regained the ability to subluxate the knee. We conclude that patients who exhibit voluntary subluxation of the knee joint are poor candidates for knee-ligament reconstruction.

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A few of the patients suffering from a tear of the anterior cruciate ligament can actively subluxate their joint (Hey-Groves 1920, Palmer 1938). Peterson et al. (1984) coined the term "active pivot shift" to describe 4 patients who could sublux their knee while sitting with the joint flexed to 90° and the foot internally rotated. In another study, Gurtler et al. (1987) classified the phenomenon as a Grade 4 positive Lachman sign. They recommended a combined reconstruction including an intraarticular reconstruction of the anterior cruciate ligament and an extraarticular reefing of the posteromedial corner.

Our study was conducted to evaluate whether or not voluntary subluxation is of prognostic significance in knee-ligament surgery.

Patients and methods

A series of 61 patients underwent reconstruction of the anterior cruciate ligament. The series included patients treated in our department from October 1981 to May 1985, and has been previously reported by Halperin et al. (1987). We have compared these patients to 7 other patients treated in our department from January 1985 to January 1987 for anterior cruciate ligament insufficiency who demonstrated active subluxation of the knee joint. The average age of the 7 patients with a voluntary subluxation of the knee joint was 23 (20–35) years, which did not differ from that of the group as a whole. All the operations were performed by 1 of the authors (N.H.), and consisted of intraarticular reconstruction of the anterior cruciate ligament as described by Clancy et al. (1982). In selected cases, reefing of the posteromedial corner was also undertaken. The decision to augment the intraarticular repair with an extraarticular procedure was made during the operation.

The results of treatment of these patients were graded according to the form of The Hospital for Special Surgery (Marshall et al. 1977, Sherman et al. 1988). A minimal follow-up period of 3 years was available for all the patients included in the study.

Results

Both groups had a similar score preoperatively, while the postoperative score was worse in the smaller group (Table 1). All 7 cases were considered failures as evidenced by limited function and subjective complaints. A discrepancy between the objective clinical findings and the degree of disability existed in these patients. Thus, they appeared very handicapped; 3 of them were actually

Table 1. Clinical knee score of patients operated on for anterior cruciate ligament instability. Mean (range)

Active pivot test	Preoperative score (maximum 50)	Postoperative score (maximum 50)
Yes (n 7)	29 (25–30)	25 (20–28)
No (n 61)	31 (27–33)	41 (38–45)

using crutches. The average knee function score was 2 out of 18 possible points. However, the signs elicited during physical examination were relatively minor.

The ability to voluntarily subluxate the knee joint was achieved already 1 week to 2 months after the operation.

The radiographs taken after a follow-up period of a minimum of 2 years demonstrated a more rapid rate of deterioration (joint space narrowing, osteophyte formation, and periarticular osteopenia) of the knee of patients with active subluxation. The radiographic score during the last follow-up period in these patients was lower when compared with the larger group.

Discussion

The failure of operative treatment of these patients with an active pivot shift sign was evidenced not only by a limited function postoperatively, but also by a more rapid development of arthrosis.

The reasons for this adverse clinical course are not fully known. Presumably, an ability to actively sublux the joint is a more severe type of instability as compared with that of patients without an active subluxation of the joint. This view is also held by Gurtler et al. (1987). The latter authors actually graded this type of instability as a Grade 4 pivot shift, and suggested that a combined reconstruction, i.e., both intraarticular and extraarticular, could be performed. From our experience, even such a procedure is not adequate, because all such patients redeveloped their ability to voluntarily subluxate their joint despite a stable knee immediately after the operation.

We conclude that reconstructive operations in patients exhibiting the active pivot shift sign have a high failure rate. Candidates for anterior cruciate ligament reconstruction should be examined for the presence of this sign.

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