

Recurrence after patellar dislocation

Redislocation in 37/75 patients followed for 6–24 years

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75 patients had closed treatment for a primary unilateral acute patellar dislocation. All patients were studied clinically, radiographically and for isokinetic thigh muscle performance a median of 11 (6–24) years later. During the follow-up, 37 patients had ex-

perienced recurrent dislocations. The functional outcomes were similar in patients with or without recurrence. Radiographically unstable patellar morphology, spontaneous reduction of the dislocation and low volume of hemarthrosis predisposed to recurrence.

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Recurrence after patellar dislocations has been reported in 2%–50% of the cases depending on the treatment and follow-up time (Jacobsen and Metz 1976, Cofield and Bryan 1977, Boring and O'Donoghue 1978, Larsen and Lauridsen 1982, Jensen and Roosen 1985, Hawkins et al. 1986, Cash and Hughston 1988, Dainer et al. 1988, Harilainen and Myllynen 1988, Hvass et al. 1988, Pedersen and Pedersen 1989, Vainionpää et al. 1990, Harilainen and Sandelin 1993). It has often been discussed whether there is any recurrence in a normal knee—or do all recurrences have some underlying pathogenesis (Hughston et al. 1984).

We evaluated clinical and radiographic findings, as well as the isokinetic muscle test results, in patients who had had closed treatment for a primary patellar dislocation to find variables which could predict recurrence. The outcome was compared between patients with or without recurrence.

Patients and methods

100 patients (63 women) were treated with a cast, splint or brace/bandage for a primary unilateral acute patellar dislocation in our hospital from 1970 to 1988. Patients receiving operative treatment of the primary dislocation or a history of other, subsequent injuries to the same knee were not included. Patients having serious general illnesses (2 patients with recurrence), severe knee pain (1 patient with and 1 without recurrence) or technical reasons (1 patient with and 1 without recurrence) which prevented use of isokinetic muscle performance test at the time of follow-up were excluded as also were 19 patients with initial closed

treatment and no recurrence, but who had residual complaints treated operatively (pain, snapping, "giving-way", subluxations).

Of the remaining 75 patients, 37 with a median age of 19 (12–64) years had had a recurrence and 38 patients with a median age of 28 (11–47) years had had no recurrence at the follow-up study, which was carried out a median of 11 (6–24) years after the injury. This study consisted of clinical and radiographic examinations, the isokinetic thigh muscle performance test and subjective assessment of the outcome. Data about the injury mechanism, initial treatment and background variables were gathered from the patients' files and from an interview at the time of follow-up.

The Cox proportional hazards regression model was used to find factors prognostic for the recurrence. The t-test, Mann-Whitney's U-test (for continuous variables) and Pearson's χ^2 -test (for categorical variables) were used to assess the outcome of treatment. The significance levels refer to the two-tailed test. The results are given as mean (standard deviation), and p-values less than 0.05 were considered statistically significant.

Results

Most measurements were the same in the groups with or without recurrence (Table 1), only two factors had prognostic importance for recurrence. Wiberg-Baumgartl unstable patellar type (2/3–5) showed an increased risk of 2.3 (95% confidence interval 1.1–4.7). This patellar type occurred in 23/37 (0.6) of patients

Table 1. Parameters studied by the Cox proportional hazards model in the patients with conservative treatment of acute patellar dislocation in order to find prognostic factors for recurrence. Mean (SD)

Parameter	Recurrence n 37	No recurr. n 38
<i>Clinical examination</i>		
Body mass index (BMI, kg/m ²)	26 (5)	26 (4)
Q-angle ^a	10 (6)	10 (5)
Generalized ligamentous laxity ^b	10	12
<i>Radiographic examination</i>		
Insall-Salvati index (LT/LP)	1.2 (0.2)	1.2 (0.2)
Sulcus angle (SA)	145 (12)	145 (8)
Lateral patellar displacement (LPD)	3.4 (5.6)	4.0 (5.6)
Wiberg-Baumgartl unstable patellar type (2/3-5)	23	15
<i>Data from the injury, and initial treatment and background variables</i>		
Spontaneous reduction	22	18
Treatment method:		
cast, splint, brace/bandage	21/8/8	27/5/6
Immobilization time (weeks)	2.9 (1.6)	3.6 (1.4)
Family occurrence of patellar dislocation	11	4
Age at the time of injury (years)	21 (9)	27 (11)
Sex M/F	15/22	13/25

^a Q-angle from anterior superior iliac spine over the middle of the patella.

^b Generalized ligamentous laxity including hyperextension of the knee and elbow and passive apposition of the thumb (Rünov 1983).

Table 2. The time schedule for recurrent dislocations in the patients given primary closed treatment of acute patellar dislocations

Years after dislocation	Number of recurrences
< 0.5	3
0.5-1	4
1-2	8
2-3	14
3-4	3
4-5	2
> 5	3

with recurrence and in 15/38 (0.4) of patients without recurrence. Spontaneous reduction of the dislocation gave an increased risk of 1.8 (95% CI 0.9-3.6). Dislocation was reduced spontaneously in 22 (0.6) of the patients with recurrence and in 18 (0.5) of the patients without recurrence. Analysis of unstable patellar type and spontaneous reduction together showed no association and no further prognostic importance for recurrence.

The volume of knee joint aspirate (blood in all cases) was higher in the patients without recurrence (92 mL SD 63; 95% CI: 55-128) than in those with recurrence (49 mL SD 24; 95% CI: 35-63). This factor was

Table 3. Results of follow-up examination in the patients with conservative treatment of acute patellar dislocation with or without recurrence. None of the parameters revealed a statistically significant p-value. Mean (SD)

Parameter	Recurrence n 37	No recurr. n 38
<i>Clinical examination</i>		
Knee extension deficit	5	6
Knee flexion deficit	9	8
Retropatellar crepitation	23	25
<i>Radiographic examination</i>		
Patellofemoral arthrosis ^a	8	11
<i>Isokinetic muscle test^b</i>		
Quadriceps 60°/s	13 (7)	9 (11)
Hamstring 60°/s	6 (13)	6 (18)
Quadriceps 180°/s	5 (10)	3 (16)
Hamstring 180°/s	-1 (17)	0 (11)
<i>Subjective assessment</i>		
Patellofemoral score ^c	80 (14)	83 (14)

^a Patellofemoral arthrosis according to Iwano et al. (1990), grades 2-4.

^b Cybex 6000 extremity system, Lumex Inc., Ronkokoma, NY, USA. Percentual deficits of peak torques between the uninvolved and involved knees.

^c Scoring of patellofemoral disorders, maximal sum score being 100 points (Kujala et al. 1993).

excluded from the regression analysis, because aspiration was performed in 31 cases only.

The shortest time between the primary dislocation and the first local recurrence was 3 weeks, the longest was 6.5 years. 11 patients had repeated recurrences (Table 2). The long-term outcomes were similar in the two groups, as assessed clinically, radiographically and isokinetically (Table 3).

Discussion

Previous studies have indicated young age, positive family history, generalized ligamentous laxity, wide sulcus angle (SA), increased lateral tilt (LPA, LPT) and shift (LPD) as predisposing factors for recurrence (Carter and Sweetnam 1958, Cash and Hughston 1988, Kujala et al. 1989, Mäenpää and Lehto 1995). Whether the unstable patellar type is a sign of instability of the patellofemoral joint is a matter of discussion. Cross and Waldrop (1976) showed a correlation between patellar subluxation and patellar morphology. Larsen and Lauridsen (1982) and Harilainen and Myllynen (1988) found no correlation between patellar morphology and tendency to (re)dislocation. Some authors (Hughston et al. 1984) have also stated that patellar morphology is not much help in everyday clinical practice.

We found a twice as high incidence of recurrent dislocation in patients with an unstable patellar type

(2/3-5). Wiberg (1941) and Baumgartl (1966) described 6 types of patella where types 1 and 2 are considered normal. Types 3, 2/3, 4 have a small convex medial facet and type 5 (Jägerhut) has no central ridge or medial facet.

Spontaneous reduction of the dislocation predicted recurrence and the volume of the hemarthrosis was smaller in patients with recurrence than in patients without. These findings may be associated with patellar morphology; less force is required to dislocate and reduce an unstable patella (type 2/3-5) and therefore less intraarticular damage with smaller hemarthrosis occurs. Similar observations have been reported recently by Stanitski (1995), who stated that patients with acute patellar dislocation but no joint laxity had articular lesions 2.5 times more frequent than those with laxity.

The long-term outcomes of primary closed treatment were similar in patients with or without recurrence. Knee flexion deficit and subjective assessment of healing were slightly worse in patients with recurrence, but knee extension deficit, retropatellar crepitation and patellofemoral arthrosis were slightly more marked in patients with no recurrence. Thus, in our series, recurrence did not seem to predispose to patellar joint degeneration.

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