

Patellectomy – a 20-year follow-up

Twenty-seven patients with 28 patellectomies were re-examined after an average of 20 years. Twelve knees rated as excellent, ten as good and six as fair.

Even though 12 patients had strenuous work, only three patients had changed occupation. Quadriceps power was on average two-thirds that of the opposite limb. Radiographs showed incipient femoro-tibial arthrosis in four patients only.

**John Jakobsen
Knud S. Christensen
Ole S. Rasmussen¹**

Departments of Orthopaedic Surgery and ¹Diagnostic Radiology, Aalborg Hospital, Aalborg, Denmark

Correspondence: Gugvej 125, DK-9210 Aalborg, Denmark

Brooke (1937), supported by Watson-Jones (1945), reported excellent function after patellectomy and concluded that the patella was not important in man. Since then there have been numerous reports based on clinical (Table 1), biomechanical (Hungerford & Barry 1979, Kaufer & Arbov 1971, Kaufer 1979) and animal (Bruce & Walmsley 1942, DePalma & Flynn 1958, Garr et al. 1973) studies, the majority of which have indicated that the patella is important for normal function of the knee joint. As a result of this, the popularity of patellectomy has decreased.

As far as we know, there have been no studies with follow-up periods of more than 7–8 years. We report a series with an observation time of 20 years on average.

Patients and methods

Between 1954 and 1974, 41 patellectomies were performed at the department of Orthopaedic Surgery, Aalborg Hospital. At follow-up, 20 (11–31) years later, six patients were dead, one was amputated, two were living outside Denmark, four were impossible to locate and one refused to participate. Twenty-seven patients (20 males, 7 females), one with bilateral patellectomy, were examined (16 left, 12 right). The mean age of the patients at operation was 31 (17–63) years.

The indication for patellectomy was chondromalacia in 12 cases and fracture of the patella in 16. Of the latter, 12 were performed as an emergency procedure and the rest half a year to 2 years after the fracture. The mean postoperative immobilization time was 4 (1–6) weeks.

There was no difference between the chondromalacia and the fracture group with respect to follow-up period, age at patellectomy and immobilization period.

Each patient was interviewed and examined in accordance with the Kettelkamp & Thompson Knee Scoring Scale I (1975). This rating emphasizes pain and function. Occupation before and after the patellectomy was recorded, as were the patients' own assessments of the knee function. Quadriceps muscle bulk was assessed by comparing the mid-thigh circumference 14 cm above the medial joint line. Quadriceps power was measured isometrically (except in five patients, who were examined outside Aalborg), using a strain-gauge dynamometer with the knee flexed 30, 60, 90, and 120 degrees. The best of two readings was taken for each limb for comparison. Finally, standard radiographs were made in two projections.

Results

Twelve knees were rated as excellent, ten as good, and six as fair. There was no difference between the chondromalacia group and the fracture group. Only three patients had had to change occupation after the patellectomy, even though 12 had strenuous jobs. The patients assessed 11 knees as excellent, 12 as good, and five as fair. Only one patient reported change of the knee function during the follow-up period; his knee function deteriorated from good to fair.

The average quadriceps atrophy was 2 (0–4) cm. The average quadriceps power was two-thirds of that of the opposite limb. There was

no difference in the relative power at 30, 60, 90, and 120 degrees of flexion. Only two patients complained of reduced quadriceps power.

Radiographs showed osteophytes in four knees, but no reduction of joint space. Two of these were operated for chondromalacia, and both had postoperative dislocation of the extensor mechanism, which required re-operation with transfer of the tendon insertion. The third knee underwent patellectomy 2 years after fracture of the patella, and the fourth knee had an excision of the medial meniscus at the same time. Three of these patients were without symptoms, and the joints were graded as good or excellent. The fourth had pain after unusually heavy activity and was graded as fair. Calcification or ectopic bone formation in the patellar tendon was present in 23 knees, considerable in two knees, moderate in seven and slight in 14 knees. There was no correlation between the amount of these deposits and the results.

The one case of bilateral patellectomy was a male shipyard worker aged 60, who was operated at age 37 for chondromalacia. He assessed both knees as excellent, had no problems in his job, and was able to walk or even run 10 km; he only complained of problems in squatting, a complaint that almost all the patients had. Radiographs did not show any arthrosis.

Discussion

Compared to other studies (Table 1), our results following patellectomy seem encouraging as 22 of 28 knees were rated good or excellent and none were rated poor. This was in good accordance with the patients' assessments.

It is notable that only three patients had to change occupation, even though 12 patients had strenuous work (e.g. bricklayer or construction worker). Apart from these three, none of the patient had ever had problems at work because of the knee, except when squatting.

Animal studies have shown that patellectomy unequivocally causes progressive degenerative alterations in the knee joint (Bruce & Walmsley 1942, DePalma & Flynn 1958, Garr

Table 1. Results after patellectomy for chondromalacia or fracture

	No.	Rating (fraction)			Average follow-up (yrs)
		Good or excellent	Fair	Poor	
Wilkinson (1977)	31	22 (0.7)	0	9	8
Einola et al. (1976)	28	6 (0.2)	18	4	7
West (1962)	42	31 (0.7)	6	5	5
Mishra (1972)	26	18 (0.7)	5	3	5
Stougaard (1970)	48	15 (0.3)	14	18	6
Steurer et al. (1979)	31	30 (0.9)	0	1	8
Present study	28	22 (0.8)	6	0	20

et al. 1973). Our study, with a follow-up period of 20 years, indicates that patellectomy does not result in arthrosis.

Patellectomy is sometimes necessary in comminuted fracture of the patella, and may be justified in rare cases of severe chondromalacia patellae. Contrary to current opinion, we found rather good function after this operation, which does not seem to predispose to arthrosis.

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