Arch Orthop Trauma Surg (2002) 122:451–453
DOI 10.1007/s00402-002-0425-4

ORIGINAL ARTICLE

**Michael Bohnsack · Wolfram Lipka · Oliver Rühmann
Gabriela Peters · Stefan Schmolke · Carl Joachim Wirth**

The value of knee arthroscopy in patients with severe radiological osteoarthritis

Received: 15 October 2001 / Published online: 2 July 2002

Abstract *Background:* This study was performed to assess the value of knee arthroscopy in patients with radiological signs of severe osteoarthritis. *Methods:* A total of 104 patients (50 men, 54 women, average age 60 years) with radiological knee osteoarthritis grade III/IV were followed up after knee arthroscopy between May 1989 and November 1996. The average follow-up time was 5.4 years after surgery. *Results:* A significant ($p<0.01$) increase in the Lysholm score was found, ranging from 40 points before arthroscopy to 69 points at the assessment. A total of 84 patients (81%) reported an increase in their activities of daily living, 44 patients (43%) were still without any complaints. The total outcome was rated very good or good by 67 patients (65%). Only 21 patients (20%) required further surgery before the assessment. *Conclusions:* Knee arthroscopy is a valuable treatment for patients with pain, swelling, and radiological signs of severe osteoarthritis. It improves the patients' activities of daily living and helps to postpone further surgery.

Keywords Radiology · Osteoarthritis · Knee · Arthroscopy

Introduction

In cases of severe radiological signs of osteoarthritis, a history of pain and swelling in the knee, and a reduced activity level, monocondylar or total knee arthroplasty is most frequently performed in the elderly patient. The clinical long-term results are well known to be excellent or good in most cases. In contrast to this, younger patients with severe knee osteoarthritis and failed conservative treatment often require a quick surgical treatment with low morbidity to gain time until joint replacement becomes necessary [12]. Since the early days of knee arthroscopy, its therapeutic role in the elderly patient and patients with severe degenerative knee disorders has been assessed in several studies and discussed heatedly [1, 3, 4, 6, 11]. In particular, the well-known advantages of arthroscopic surgery, such as reduced soft-tissue trauma, short rehabilitation times, and low complication rates were taken as an argument for the arthroscopic treatment of those patients. While there is general agreement that the procedure provides at least short-term benefits in some patients, few studies have followed the results of arthroscopic debridement for longer than 2 years [8].

This study was performed to assess the value of arthroscopy in cases of severe radiologic signs of knee osteoarthritis, especially concerning its total outcome in patients under the age of 60 years and the necessity of further surgical treatment.

Patients and methods

From May 1989 to November 1996, we performed knee arthroscopy on 104 patients with a history of knee pain, swelling, and radiological signs of severe osteoarthritis, who had a minimum follow-up of 24 months. The objective in the younger patients group (under the age of 60 years) was to gain time until further surgery would become necessary, whereas we decided for arthroscopic treatment for patients over 60 years old according to individual considerations. There were 50 men and 54 women, and their mean age was 60 (range 50–83) years (Fig. 4). The radiographs were graded using the score of Jäger and Wirth [5] (Fig. 1). All patients in our study showed degenerative radiological changes of grade 3 (joint space half, osteophytes, severe subchondral sclerosis) or 4 (joint space less than half, joint destruction, subchondral cysts, tibiofemoral subluxation) in the medial or lateral compartment. The average follow-up was 5.4 years (range 24–118 months) after surgery. The total outcome was rated using the score of Lysholm and Gillquist [7]. The data was analyzed using a statistical programm (SPSS version 10.0; SPSS, Chicago, Ill., USA), especially performing a two-level, single-factor analysis of variance with a significance level of $\alpha=0.05$, a single-factor regression analysis (ANOVA), and the Mann-Whitney U-ranking test.

M. Bohnsack (✉) · W. Lipka · O. Rühmann · G. Peters
S. Schmolke · C.J. Wirth
Department of Orthopedic Surgery, Hannover Medical School,
Anna-Von-Borries-Str. 1–7, 30625 Hannover, Germany
e-mail: bohnsack@annastift.de,
Tel.: +49-511-5354340, Fax: +49-511-5354682

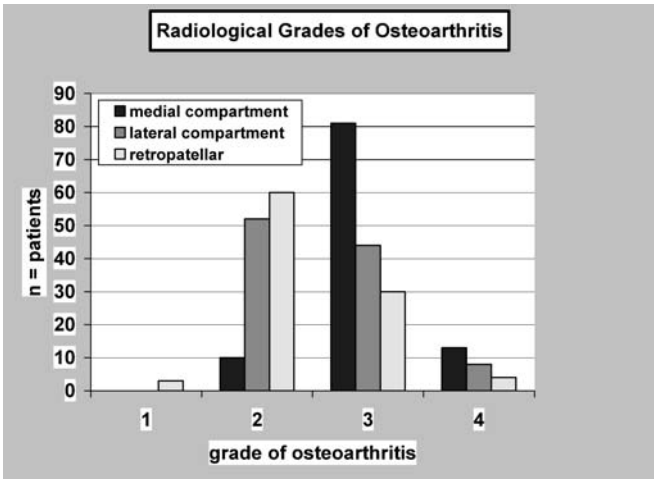

Fig. 1 The grading of osteoarthritis was performed according to the score of Jäger and Wirth [5] on the preoperative standard weight-bearing radiographs

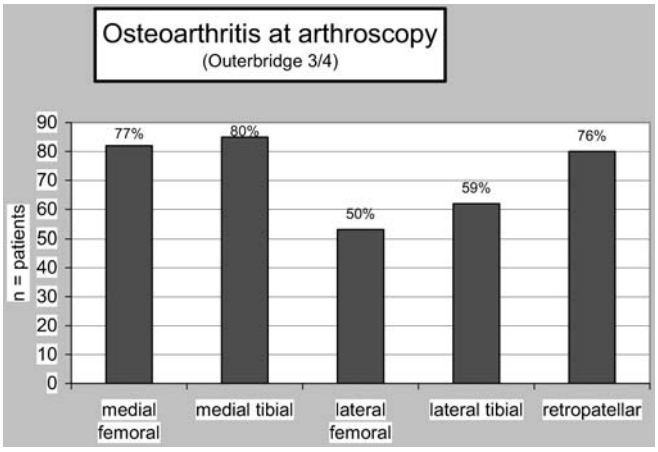

Fig. 2 The intraoperative grading of osteoarthritis was performed according to the Outerbridge score [10]. The figure shows the distribution of osteoarthritis grade 3 or 4 according to the knee compartments at arthroscopy

Results

The meniscal findings at arthroscopy are presented in Table 1. A partial, subtotal, or total meniscectomy was performed in 76 cases [73%; medial meniscectomy on 50 patients (48%) and lateral meniscectomy on 26 patients (25%)]. In 92 patients (89%), we found a local or general synovitis, 29 patients (28%) had a partial or total synovectomy. On the day of surgery, only 11 patients (11%) had an effusion of the knee as a clinical sign of activation. In 11 cases (11%), one or more loose bodies could be removed, in 36 patients (35%), a shaving of the articular surface was performed, and in 1 case (1%), a plica mediopatellaris was dissected. In only 11 patients (11%) was the knee arthroscopy simply diagnostic, without any further surgical procedure. An ACL rupture was found in 13 (13%), a PCL rupture in 2 (3%), a lateralization of the patella in 57 (55%), and a chondromatosis in 1 (1%). The degenerative changes of the articular surface (osteoarthritis) were graded using the classification system of Outerbridge [10] (Fig. 2).

The number of patients who regularly required pain-reducing drugs was 44 before and 20 at the follow-up. A significant ($p<0.01$) increase in the Lysholm and Gillquist score [7] was found, ranging from an average of 40 points before arthroscopy to 69 points at the time of examination for the whole study group (Fig. 3). Patients under the age of 60 years ($n=57$) showed a significantly higher increase in the score rating (38 to 73 points, $p<0.05$) than patients over 60 years ($n=47$; 42 to 68 points), whereas the grade of chondral lesions was equally distributed between both age subgroups. Patients with monolateral signs of osteoarthritis (grade III or IV) on the preoperative radiographs ($n=62$) had a significantly ($p<0.05$) higher increase in the Lysholm score (41 to 74 points) than patients with bilateral radiological osteoarthritis ($n=42$; 39 to 62 points). Meniscectomy or shaving of the articular surface did not have a significant influence on the total outcome of knee arthroscopy. A total of 84 patients (81%) reported a subjective increase in their activities of daily living, 44 patients (43%) were still without any complaints. The total outcome was rated excellent or good by 67 patients (65%). We did not find a significant correlation

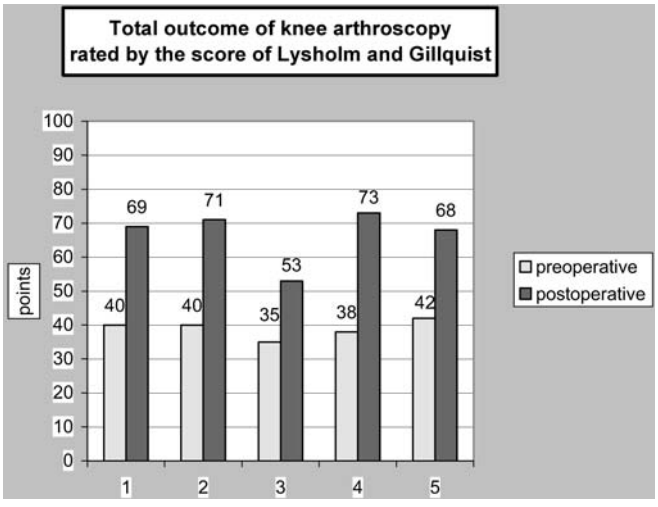

Fig. 3 Rating of the knee arthroscopy using the Lysholm and Gillquist score [7]. Group 1: all patients ($n=104$), group 2: all patients who had no further surgery until the examination ($n=93$), group 3: patients with radiological signs of osteoarthritis grade 4 in the medial or lateral compartment ($n=21$), group 4: patients <60 years ($n=57$), group 5: patients >60 years ($n=47$)

Table 1 Meniscal findings at knee arthroscopy; n=patients (percent of the total group)

	Medial meniscus	Lateral meniscus
Degenerative	49 (47%)	34 (33%)
Torn meniscus	15 (15%)	8 (8%)
After meniscectomy	21 (20%)	11 (11%)
Normal	19 (18%)	51 (49%)

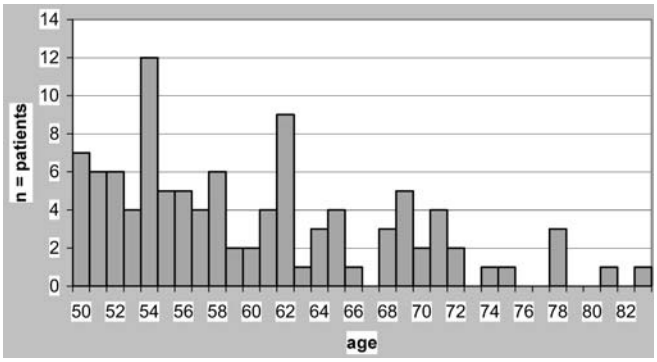

Fig. 4 Age distribution of the evaluated patient group (n=104)

Outerbridge medial	Outerbridge lateral	patients (n)	Lysholmscore preoperative	Lysholmscore follow-up
4°	1°/2°	17	44	67
4°	3°	25	37	68
4°	4°	14	36	64
3°	1°/2°	15	51	74
3°	3°	10	37	73
3°	4°	13	41	75
1°/2°	3°	8	25	64
1°/2°	4°	2	25	56

Fig. 5 The surgical outcome (average rating according to the Lysholm score) was not significantly correlated to the intraoperative grade of osteoarthritis

between the intraoperative grade of osteoarthritis and the subjective or objective surgical outcome (Fig. 5).

Only 21 patients (20%) required further surgery in an average period of 33.1 months (range 5–98 months) following knee arthroscopy. Eight patients (8%) of this group underwent a total knee arthroplasty (5–98 months postoperative) and 3 patients (4%) a monocondylar knee arthroplasty (10–58 months postoperative). Two patients (3%) had a high tibial osteotomy (8–60 months postoperative), 4 patients (5%) another knee arthroscopy (8–72 months postoperative), whereas another 4 patients (4%) did not specify their further operation. There was no significant difference in the radiological or arthroscopic diagnosis or treatment between this group and the patients who did not require further surgery following arthroscopy.

Discussion

According to the Framingham study [2], the number of people 65 years and older is increasing 2.5 times faster than the overall population. As the prevalence of knee osteoarthritis is 30% in those patients, and knee osteoarthritis is more likely to result in disability than osteoarthritis of any other joint, there is a high demand for therapeutic solutions. Timoney et al. published a mid-term follow-up (4.2 years) of arthroscopically treated severely osteoarthritic knees and found a 63% success rate, although he noted deterioration of results over time, too [13]. In our study, the success rate was similar with an overall excellent or good clinical outcome for 65% of all patients at a mean follow-up of 5.4 years postoperative. We found a significant (p<0.01) increase in the Lysholm and Gillquist score [7] for all patients in our study, which was even significantly (p<0.05) higher for the patients under the age of 60 years than for the patients over 60 years old. Several clinical studies found that moderate or severe degenerative changes on the preoperative standard radiographs had a statistically significant negative effect on the arthroscopic outcome, whereas their reported rates of good or excellent results after knee arthroscopy in osteoarthritic patients vary between 21% and 80% [9, 14, 15]. In addition, the subjective contentment of the patients in our study and their increased daily activity through knee arthroscopy plus the fact that only 20% of them required further knee surgery until the follow-up were the most important factors for us.

In conclusion, knee arthroscopy is a valuable treatment for patients with radiological signs of severe osteoarthritis. It improves their activities of daily living and helps to postpone further surgery. The necessity of further surgical treatment cannot be predicted by either the radiological or the arthroscopic diagnosis or treatment.

References

1. Altman RD, Gray R (1983) Diagnostic and therapeutic uses of the arthroscope in rheumatoid arthritis and osteoarthritis. Am J Med 75: 50–55
2. Felson DT, Naimark A, Anderson J, et al (1987) The prevalence of knee osteoarthritis in the elderly: the Framingham osteoarthritis study. Arthritis Rheum 30: 914–918
3. Hambidge JE, Handley C (1994) Arthroscopy in the elderly. J Med Corps 140: 29–31
4. Harwin SF (1999) Arthroscopic debridement for osteoarthritis of the knee: predictors of patient satisfaction. Arthroscopy Mar 15: 142–146
5. Jäger M, Wirth CJ (1986) Praxis der Orthopädie. Thieme, Stuttgart, p 980
6. Linschoten NJ, Johnson CA (1997) Arthroscopic debridement of knee joint arthritis: effect of advancing articular degeneration. J South Orthop Assoc Spring 6: 25–36
7. Lysholm J, Gillquist J (1982) Evaluation of knee ligament surgery results with special emphasis on use of a scoring scale. Am J Sports Med 10: 150–154
8. McGinley BJ, Cushner FD, Scott WN (1999) Debridement arthroscopy. 10-year followup. Clin Orthop 367: 190–194
9. Novak PJ, Bach BR Jr (1993) Selection criteria for knee arthroscopy in the osteoarthritic patient. Orthop Rev 22: 798–804
10. Outerbridge RE (1961) The etiology of chondromalacia patellae. J Bone Joint Surg Br 43: 752–757
11. Roos EM, Ostenberg A, Roos H, Ekdahl C, Lohmander LS (2001) Long-term outcome of meniscectomy: symptoms, function and performance tests in patients with or without radiographic osteoarthritis compared to matched controls. Osteoarthritis Cartilage 9: 316–324
12. Shannon FJ, Devitt AT, Poynton AR, Fitzpatrick P, Walsh MG (2001) Short-term benefit of arthroscopic washout in degenerative arthritis of the knee. Int Orthop 25: 242–245
13. Timoney JM, Kneisl JS, Barrack RL, Alexander H (1990) Arthroscopy in the osteoarthritic knee: long term follow-up. Orthop Rev 19: 371–379
14. Wouters E, Bassett FH, Hardaker WT, Garrett WE (1992) An algorithm for arthroscopy in the over-50 age group. Am J Sports Med 20: 141–145
15. Yang SS, Nisonson B (1995) Arthroscopic surgery of the knee in the geriatric patient. Clin Orthop 318: 50–58