

A Review Paper

Selection Criteria for Knee Arthroscopy in the Osteoarthritic Patient

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ABSTRACT

In the current literature concerning arthroscopy in the osteoarthritic patient, there are few well-controlled studies with long-term follow-up that establish selection criteria. The effectiveness of abrasion arthroplasty has not been proved in prospective studies. Prospective factors that are associated with a better outcome include normal limb alignment, a history of mechanical symptoms, minimal roentgenographic degeneration, and a short duration of symptoms. Variables associated with poor outcomes include varus or valgus malalignment, loading symptoms, severe roentgenographic degeneration, previous surgeries, and chronic symptoms. Advanced age, per se, is not a contraindication to arthroscopy.

Rapid advances in arthroscopic technology have resulted in its widespread popularity in the orthopaedic community. In recent years, there has been renewed interest in the diagnostic and therapeutic uses of arthroscopy in degenerative conditions of the knee. Although the short-term partial relief of pain in patients with degenerative disease has been well established,¹⁻⁵ the success of arthroscopy in long-term symptomatic relief or its ability to affect the natural history of the degenerative process has not been adequately documented.³

Because of the favorable risk-benefit ratio of arthroscopy when compared with more invasive procedures (eg, unicompartamental arthroplasty, total knee arthroplasty, or realignment osteotomy), the procedure is often offered as a temporizing measure to patients in whom it may be of only short-term benefit. The physician and patient must decide whether a fair result from a relatively minor procedure such as arthroscopy is preferable to a good or excellent result from a procedure with higher morbidity but more predictability such as arthroplasty or osteotomy.

This decision can be made only if accurate selection criteria for a given surgical procedure are established. In order to avoid an unnecessarily high failure rate from an indiscriminate use of arthroscopy in the osteoarthritic patient, orthopaedic surgeons must attempt to identify accurately those subsets of patients who may benefit most from such a technological application.

Because of the great variability of the osteoarthritic patient population with regard to roentgenographic disease, duration of symptoms, age, tibiofemoral alignment, activity, severity of lesions, and other variables and the variety of arthroscopic and therapeutic options, analysis and comparison of the available literature is difficult. Establishing absolute criteria for arthroscopy in the degenerative knee is impossible on the basis of current studies. Nevertheless, careful analysis of the literature does allow recognition of relative indications and

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contraindications for this procedure. We will review the current literature and focus on the variables of age, chondrocalcinosis, duration of symptoms, history of previous surgery, limb malalignment, severity of degenerative disease, and mechanical symptoms.

HISTORICAL REVIEW

In 1941, Magnuson⁶ was among the first to introduce the concept of joint debridement, pointing out that "thorough removal of all mechanical irritating products of joint degeneration will, in a large percentage of cases, render the patient symptom-free." Prior to the widespread application of arthroscopy, his surgical procedure required arthrotomy and a wide surgical exposure. It gradually lost popularity due to the long rehabilitation and considerable morbidity of the procedure.⁷

The beneficial effect of simple lavage of the knee without mechanical debridement has been reported by Burman et al,¹ Watanabe et al,² Jackson,³ and others. Following irrigation of the joint, large fibrinous and cartilaginous fragments are frequently found in the irrigated solution. It is assumed that enzymes, prostaglandins, and other chemical irritants are also lavaged from the joint along with microscopic and macroscopic debris. Removal of offending irritants is thought to be one of the many mechanisms of short-term pain relief following arthroscopy of the degenerative knee.^{3,8}

Introduction of abrasion arthroplasty, advocated by Johnson⁹ in 1981, added another therapeutic use of arthroscopy. Proponents initially recommended abrasion to the level of subchondral bleeding bone of large areas of the femur and tibia. Although it was initially thought that abrasion arthroplasty stimulated regeneration of articular hyaline cartilage, it is now well known that the resurfacing tissue consists of fibrocartilage.¹⁰ The ultimate fate of this fibrous tissue is not known, but most investigators believe that it is less resistant to mechanical loads than the original hyaline cartilage and eventually undergoes degenerative changes leading to osteoarthritis.¹¹

Preliminary favorable results reported by Friedman et al¹² and Johnson¹³ have not been validated in recent studies. Rand¹⁴ compared 131 patients undergoing arthroscopy and limited debridement with 28 patients undergoing arthroscopy and abrasion arthroplasty, evaluating them at 3-year follow-up. He noted that the "results of abrasion arthroplasty are unpredictable" and that abrasion arthroplasty offers little benefit over limited debridement.¹⁴ Similarly, in a retrospective study of 126 patients with unicompartamental disease, Bert and Maschka¹⁵ found at 5-year follow-up that abrasion arthroplasty had a lower success rate than minimal debridement alone.

In light of these and other studies,^{7,16} current trends are toward minimal debridement of no more than loose articular fragments, chondral flaps, osteophytes, or other debris that is likely to directly cause impingement or other mechanical symptoms.

SELECTION CRITERIA

Age

The role of arthroscopy, meniscectomy, partial meniscectomy, and arthroscopic debridement has been extensively evaluated in the osteoarthritic patient. In a retrospective study of 66 patients, Lotke et al¹⁷ evaluated the late results of meniscectomy in patients whose average age was 55.6 years. He found that age, per se, does not influence the result and that a traumatic meniscal tear in a normal joint that is treated with debridement will do "reasonably well," regardless of the patient's age.

Similarly, Jackson and Rouse,¹⁸ in a review of partial arthroscopic meniscectomy in 68 patients over the age of 40, "clearly showed that the patient's age at the time of meniscectomy did not adversely affect the eventual result."

Wouters et al,¹⁹ in their questionnaire-based survey of 57 patients who had undergone a variety of arthroscopic procedures, stated that age does not have a statistically significant effect on the postoperative subjective rating. They found that the average age of patients with good subjective results was

Table. Data on the Use of Arthroscopy in the Osteoarthritic Patient

Authors	Number of Patients	Average Age	Total Follow-up	Preoperative Roentgenograms	Intraoperative Degenerative Joint Disease
Lotke et al ⁷	66	55.6	10.8 years	Yes	Yes
Jackson and Rouse ¹⁸	68	53.2	2.5 years	No	Yes
Wouters et al ¹⁹	57	62	33 months	Yes	Yes
Baumgaertner et al ²⁰	44	63	33 months	Yes	Yes
Ogilvie-Harris and Fitsialos ²¹	441	58	4 years	Yes	Yes
Salisbury et al ²²	52	N/A	27 months	Yes	Yes
Boe ²⁸	39	55	22 months	Yes	Yes
McBride et al ²⁹	45	56	35 months	No	Yes

61.5 years, compared with 60.1 years for those with poor subjective results.

Advanced age, when considered as an independent variable, is clearly not a contraindication to arthroscopy.

Chondrocalcinosis

Baumgaertner et al²⁰ compared the results of arthroscopic debridement in 12 knees having chondrocalcinosis with 33 knees that did not have chondrocalcinosis. They noted a

