

DIAGNOSTIC AND SURGICAL ARTHROSCOPY OF THE SHOULDER

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The Clinical Practice of Shoulder Arthroscopy



Arthroscopy of the shoulder is gaining acceptance in present-day orthopedics.¹⁹ Just as established knee surgeons were hesitant to use arthroscopy in the 1970s, so were the shoulder surgeons of the 1980s. We know now what happened to arthroscopic knee surgery. We are now about to learn what this surgical method will do for shoulder surgery. How did it get started? Who did the first shoulder arthroscopy? What is the state of the art in shoulder arthroscopy? How are these techniques applied to the shoulder? What are the pitfalls of shoulder arthroscopy? What must the surgeon know about shoulder problems to successfully apply these methods? What are the principles of arthroscopy that must be embraced for a beneficial outcome? A brief historical review of the development of arthroscopy in general will be helpful to the surgeon approaching shoulder arthroscopy.

HISTORICAL BACKGROUND

Knee arthroscopy was first performed in Japan by Professor Kenji Takagi in 1918 using the urological cystoscope.¹⁰⁰ In 1921, Eugen Bärcher of Germany used gas for arthroscopy, often performing the procedure with the patient under local anesthesia.¹³ In 1925, Phillip Kreuzer, an American, first reported arthroscopic meniscectomy.⁶³ In 1931, Michael Burman at New York Hospital for Joint Diseases reported arthroscopic inspection of both the knee and the shoulder in cadavers¹⁸ (Fig. 1-1). Like so many other events in medicine, a seed was planted, but a germination period was necessary before growth of shoulder arthroscopy started. Dr. Masaki Watanabe, a student of Takagi, developed various size arthroscopes and demonstrated technique in many joints, including the shoulder.^{101,102}

In the late 1960s Robert Jackson in Toronto,⁵⁵ Ward Cassells^{22,23} in Wilmington, Delaware, and the late Dick O'Connor of West Covina,^{78,79} California visited Watanabe. These three surgeons brought the ideas and techniques of Watanabe to North America. Their presentations

on arthroscopy of the knee were greeted with little more than curiosity. Other first generation arthroscopists included John Joyce, John McGinty, Royer Collins, Kenneth DeHaven, Robert Metcalf, and myself in the United States. The European pioneers were Harold Eikelaar of the Netherlands,³⁴ Jan Gillquist of Sweden,⁴² A. N. Henry of Great Britain,⁵¹ and W. Glinz of Switzerland.⁴⁵ A progression was made from diagnostic arthroscopy to application of arthroscopic techniques to most of the established open surgical procedures of the knee.

Pioneers were considered misled. Perhaps they did not know what they were doing. Sometimes the word crazy was used. Arthroscopy was viewed as a fad or at best a passing phase in orthopedics like ostemere or the hanging hip operation. It was considered unnecessary because its opponents could see better by cutting the knee open. Others thought it was harmful in that the arthroscope often scratched the joint. Interestingly, this criticism of superficial joint damage usually came from a surgeon who specialized in total joint replacement. Stronger criticisms included labels like unnecessary, unethical, and even immoral surgery. If that was not bad enough, many of the procedures were categorically deemed MALPRACTICE. It is no wonder that there were few pioneers.

It was unique that arthroscopy developed outside of academia. Unlike the development of total joint replacement, the training programs were not involved. Knee arthroscopy was popularized by surgeons in private practice without existing reputations, and it was unlikely that they would gain one with this procedure in those days.

Throughout the 1970s very few surgeons performed arthroscopy of the knee, let alone the shoulder. At that time arthroscopy was not professionally or economically threatening to the surgical community. It was thought that the arthroscopic surgeon was looking for a practice niche.

Yet the pioneers persisted. The medical profession changes by evolution, not revolution. Much to my surprise



FIG. 1-1 Dr. Micheal Burman, 1901-1975. His vision for arthroscopy was demonstrated in cadaver experiments in 1931. (Courtesy Serge Parisien.)

the sports medicine sector of orthopedics was slow in accepting and learning arthroscopy. Nonetheless, it was in the sports arena that arthroscopy found the exposure it needed. In the 1970s a man on the street could more easily grasp the value of arthroscopy than most orthopedists. He read about its benefit each day in the sports pages. Athletes, trainers, and surgeons alike were expounding the procedure, and reporting less morbidity, same day surgery, and a quick recovery.

Public opinion affects a surgeon's market share, and patients began to seek out those who would perform knee surgery by arthroscopy. Patients would not believe any doctor who tried to explain that knee arthroscopic surgery would not work or that a torn cartilage was too big to pull out through a scope. Thus established knee surgeons were prodded to accept and learn arthroscopic techniques.

Now, some 20 years later, arthroscopic surgery of the knee is accepted standard in orthopedic surgery. As our experience with the knee grew, practitioners and the public began seeing the value of applying the principles of arthroscopic surgery to other areas, such as the shoulder. Despite proven successes, skeptics remain. Just last year, I was telling a sage and renown knee surgeon that there was some reluctance on the part of the established shoulder surgeons to accept the value of arthroscopy to the shoulder. He replied, "I don't understand that, arthroscopy should be good for the shoulder. I am still not sure of its place in knee surgery."

This perspective of pioneers of arthroscopy of the knee joint is important as we hear about and watch our colleagues that are developing an interest and skills in arthroscopic surgery of the shoulder.

THE DEVELOPMENT OF SHOULDER ARTHROSCOPY

I performed my first shoulder diagnostic arthroscopy in 1974. This was followed by periodic referral cases throughout the 1970s as I did not have a shoulder practice. The acceptance of shoulder arthroscopy was first reflected in the results of a survey of the American Academy of Orthopaedic Surgeons (AAOS) Educational Committee in 1978. That report indicated that arthroscopy of joints other than the knee was performed by only 7% of the respondents, but the specific incidence of shoulder arthroscopy was not available. According to an independent survey in 1981, only 5% of orthopedic surgeons performed arthroscopy of joints other than the knee. By 1983, 26% of orthopedic surgeons reported that they performed arthroscopy on joints other than the knee. No specific numbers were available for the shoulder.

The shoulder joint became a focus of interest for the arthroscopic surgeon for several reasons. One was socioeconomic. As more surgeons performed arthroscopy on the knee, there was a dilution of the potential patients for knee arthroscopy. At the same time there was a large patient population with shoulder problems. In that the shoul-

der patient presented a diagnostic enigma to most orthopedic surgeons, arthroscopic inspection was reasonable. Subsequently, just like the knee experience, arthroscopic techniques were applied to established shoulder surgical procedures. The growth of shoulder arthroscopy in the '80s is faster than that of the knee in the '70s because the surgeon did not have to learn arthroscopic techniques, but only transfer known technical skills from the knee to the shoulder. Also, patients have become accustomed to requesting arthroscopy as the method of treatment, if possible. The modern emphasis on outpatient surgery with cost savings is another impetus for arthroscopy.

An AAOS survey in 1990 showed that 81% of 14,185 respondent orthopedic surgeons perform arthroscopy; 42% (5958) of those surgeons perform arthroscopy of the shoulder.⁶¹ Shoulder arthroscopic procedures account for 12% of all arthroscopies; knee, 81%; ankle, 4%; elbow, 2%; and wrist, 2%. This report also indicated that 93% of arthroscopies of any kind are performed on an outpatient basis.

Shoulder arthroscopy had its pioneers. They included, among others, the following alphabetical group: James R. Andrews, Birmingham, Alabama; Louis U. Bigliani, New York, New York; Richard Caspari, Richmond, Virginia; David A. Detrisac, East Lansing, Michigan; Harvard Ellman, Los Angeles, California; James C. Esch, Occanside, California; Gary M. Gartsman, Houston, Texas; ; Michael R. Gross, Omaha, Nebraska; Leslie S. Matthews, Baltimore, Maryland; Stephen S. Snyder, Van Nuys, California; Russell R. Warren, New York, New York; Masaki Watanabe, Japan; A.M. Wiley, Toronto, Canada.

Utilization and Potential for Overutilization

The experience of arthroscopic utilization in the knee joint went from no one doing the procedure to almost everybody doing it in a short period of time. This now has happened with shoulder arthroscopy.

This development has caused an interesting twist in patient management. Since many patients now ask for arthroscopy, the doctor in good conscience must often talk many patients out of this procedure when their condition is not suitable. However, for those surgeons of another persuasion, a patient request means additional surgical cases. I know of one Mid-Western clinic in which a surgeon performed 80 operations on every 100 new patients in 1984 and 104 arthroscopies on every 100 new patients in 1985. The operations were performed within an average of 21 days from the initial visit. No case went unscoped, undiagnosed, or unbilled. Colleagues with the same type of practice in the same clinic performed surgery at one half this rate. Did they lack clinical diagnostic skills? Were they withholding treatment? I think not.

The potential for overutilization of arthroscopy continues. The indication for arthroscopy must be clearly defined and must include the expectation of patient benefit.

Organized Medicine

The International Arthroscopy Association was formed in 1974. Requirements for membership were state medical licensure and the ability to fill out a one page application and sign your name to a check for \$50. A survey taken a few years later showed that 20% of the membership not only had never attended a society meeting, but had yet to perform arthroscopy.

The Arthroscopy Association of North America (AANA) was formed in 1982. The AANA's membership requirements are more stringent. They go beyond requiring attendance at meetings and performing arthroscopic surgery. The numbers and types of procedures are considered. The applicant's past and potential contributions to the society are weighed. AANA now has over 900 members.

Continuing Education

At first, the only educational experience available to the surgeon interested in shoulder arthroscopy was to personally visit one of the few knee arthroscopists who were transferring techniques to the shoulder joint.

The educational experience was broadened with continuing education courses by individuals, AANA, and AAOS. Still, the training programs were slow to react. This was due in part to a lack of interest by training program chairpersons. Only 20% of program chairpersons were involved in arthroscopic training by 1983.

The educational programs were initially didactic, with motor skill laboratories finally gaining popularity. Howard Sweeney developed the first knee model simulator for the motor skills laboratory. Models now exist for the shoulder. Because arthroscopy is technically intensive, motor skill laboratories continue to be included in most continuing education courses. Companies that market instrumentation offer motor skill experiences. One company has constructed a permanent motor skill laboratory; AANA plans a similar facility in Chicago, Illinois.

The educational process experience in the '70s with the knee has repeated itself in the '80s for the shoulder. The arthroscopist with knee joint skills started to explore the possibility in the shoulder in practice. Likewise, the shoulder surgeon explored arthroscopic techniques to the shoulder. One group went to arthroscopic meetings; the other went to shoulder meetings. The majority of registrants at recent conventional shoulder surgery courses have been arthroscopists. They attend these courses to learn about shoulder problems and open surgery with plans to utilize arthroscopy in their patient management. There is a demand for education and use of arthroscopic techniques in the shoulder. In the mid 1980s, over 1000 orthopedists attended seminars in our city (East Lansing, Michigan) in a period of 18 months. Now topics on arthroscopy are commonly integrated with meetings on the shoulder joint.

The practicing surgeon's continuing educational pro-