

## The Evolution of Elbow Arthroscopy

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### Editorial Note

The arthroscopic technique was first introduced to orthopaedic surgery as a diagnostic instrument by Tagaki in 1918. 13 years later, in 1931, Michael Burman first described in the *Journal of Bone and Joint Surgery* the access to the elbow joint arthroscopically. Although in his initial description he concluded that the elbow joint was “unsuitable arthroscopically”, he later changed his opinion after visualizing the anterior compartment in cadavers. Since that time, improved imaging techniques, surgical instrumentation and the acquisition of arthroscopic skills have each contributed to the rise in popularity of the arthroscopic approach to the elbow joint. In 1985, Andrews and Carson [1] described the visualization of the elbow joint with the patient in a supine position, and elbow arthroscopy became a more common procedure between orthopaedics surgeons with special interest in elbow surgery.

The widespread growth of arthroscopic procedures has significantly changed the practice of orthopaedic surgery in general, and the elbow, although probably with a slower growth than other joints, is not an exception.

Over the past several years, the list of indications for elbow arthroscopy has increased and today is a well established procedure for diagnose and treat several conditions affecting the elbow [2]. The success of arthroscopic procedures in other joints has pushed the surgeons to advance the applications of these techniques to the elbow. Elbow arthroscopy decreases the morbidity of an open procedure while provides a complete evaluation of the elbow joint.

However, elbow arthroscopy is a demanding procedure, and neurovascular injuries remain a constant risk because of the proximity of neurovascular structures to the standard portal sites and joint capsule. A thorough knowledge of the neurovascular anatomy and experience with arthroscopic techniques are required to minimize the risk of complications. Other complications include infection, articular cartilage injury, instrument breakage, synovial fistula formation, or tourniquet related complications. Adequate preoperative planning, a thorough history and physical examination, and careful portal placement are necessary to ensure a successful outcome.

Elbow arthroscopy can be performed either on the supine position, lateral decubitus or prone, depending on the surgeons preference and the specific pathology to treat. Currently, it seems that most surgeons are performing the procedure on the lateral or prone position, which allows access to both anterior and posterior compartments of the elbow. A specific elbow arthroscopy support is useful to allow free movement of the scope and instruments. General or regional anesthesia can be used, but the prone or lateral decubitus position may be poorly tolerated if regional anesthesia is administered [3].

With the evolution of the technique and indications, the number of portals used in elbow arthroscopy has increased and today continues its development. The importance of the proximal portals for inspection of the anterior compartment is well established. Other important issues are previous joint insufflation with saline to increase the distance of

neurovascular structures to the joint, use of low pressure pumps, use of retractors to protect the neurovascular structures, and draw the surgical landmarks especially the ulnar nerve to facilitate orientation during the procedure.

Removal of loose bodies or debridements of the arthritic elbow are probably the commonest indications for elbow arthroscopy. Other indications include the treatment of osteochondral lesions, diagnostic arthroscopy, elbow instability, tennis elbow release, posttraumatic arthrofibrosis, ulnar nerve decompression or fixation of intraarticular fractures (radial head, capitellum, coronoid) [4].

The literature regarding elbow arthroscopy is still limited. Comparative studies have emerged over the last years, but there are limited studies comparing the arthroscopic and open procedures. An interesting systematic review has been recently published in order to make evidence-based recommendations for elbow arthroscopy in the current accepted indications [5].

92 Level IV, 5 Level III, and 1 Level II studies have been analyzed. After the literature search and analysis, the results have been: fair-quality evidence for the recommendation for elbow arthroscopy in the treatment of rheumatoid arthritis and lateral epicondylitis; weak of evidence for, rather than against the use of elbow arthroscopy in the treatment of degenerative arthritis, dissecans osteochondritis, radial head resection, loose bodies removal, posttraumatic arthrofibrosis, posteromedial impingement, plica excision, and treatment of fractures; and insufficient evidence to make a recommendation for the treatment of posterolateral rotator instability and septic arthritis.

The evidence supports the use of elbow arthroscopy as is being used currently. However, the evidence today is generally poor, and comparative studies are needed to better define the levels of evidence for each procedure.

Future advances will probably include the use of arthroscopy in the treatment of extraarticular elbow pathology (biceps and triceps pathology or olecranon bursa), ligament injuries, tumors, nerve-related pathology, distal intraarticular humeral fractures, olecranon fractures, children pathology, etc. Also new technology sources as lasers or robotics will probably help the surgeons to better achieve their objectives.

There is no doubt that, although open surgery will continue having

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its important role in elbow surgery, elbow arthroscopy will develop quickly and will be the choice in the management of many elbow disorders.

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