

# Arthroscopic Management of Elbow Fractures



Leslie A. Fink Barnes, MD, Bradford O. Parsons, MD\*,  
Michael Hausman, MD

## KEYWORDS

- Elbow trauma • Elbow arthroscopy • Arthroscopic-assisted fracture treatment • Coronoid
- Lateral condyle • Medial condyle

## KEY POINTS

- Keep pump pressure low (25–30 mm Hg) to avoid postfracture compartment syndrome.
- Joint distension, proximally placed portals, and gentle elbow flexion increase working space from nerves.
- Assess fracture alignment after reduction, then introduce fixation percutaneously with Kirschner wires (K-wires), cannulated screws, or suture lasso configuration.
- Elbow stability should be evaluated after fracture fixation to determine whether ligament repair is required.
- Fracture healing should be prioritized rather than motion in cases of severe comminution or questionable fixation.

## INTRODUCTION: NATURE OF THE PROBLEM

Fractures and trauma about the elbow are challenging to treat, in that exposure to certain parts of the elbow may destabilize the elbow or put neurovascular structures at risk. Further, stiffness is a frequent complication, ranging from capsular fibrosis to heterotopic ossification with a bony block to motion. Therefore, arthroscopic-assisted fracture management about the elbow has several advantages, including improved visualization, better wound healing, preservation of collateral ligaments and critical soft tissue structures, and the opportunity for early motion to minimize complications from stiffness. In affording a view of the entire articular surface through small portals,

arthroscopy facilitates visualization of intra-articular fractures, and assessment of all joint surfaces for concurrent chondral injury and of cartilaginous pediatric fractures not readily seen on radiographs. Arthroscopic assistance for percutaneous fixation of lateral condyle fractures is especially useful in pediatric patients in whom much of the condyle is radiolucent cartilage.<sup>1,2</sup> Arthroscopic treatment of elbow trauma has shown good results in the pediatric population, and may minimize insult to the epiphyseal blood supply because of less soft tissue stripping than in open surgery.<sup>3</sup>

Elbow arthroscopy has attendant risks and the potential for complications. The overall complication rate has been reported to be as low as 2%

---

Disclosures: Dr B.O. Parsons is a paid consultant for Arthrex and Zimmer. Dr M. Hausman is an unpaid consultant for Checkpoint Surgical NDI, a paid consultant for Stryker, and receives royalties from Smith & Nephew. Dr L.A. Fink Barnes reports no conflicts of interest.

Leni and Peter W. May Department of Orthopaedics, Icahn School of Medicine at Mount Sinai Medical Center, 5 East 98th Street, Box 1188, New York, NY 10029, USA

\* Corresponding author.

*E-mail address:* [bradford.parsons@m Mountsinai.org](mailto:bradford.parsons@m Mountsinai.org)

Hand Clin 31 (2015) 651–661

<http://dx.doi.org/10.1016/j.hcl.2015.06.011>

0749-0712/15/\$ – see front matter © 2015 Elsevier Inc. All rights reserved.

among experienced surgeons, but included in the complication rate is the potential for major nerve transection.<sup>4</sup> Other series have reported major and minor complications at a rate of 12%, which included joint space infection, and transient nerve palsies of the ulnar nerve, posterior interosseous nerve, and sensory cutaneous nerves but no permanent neurologic deficits.<sup>5</sup> Therefore, knowledge of elbow anatomy and arthroscopic techniques is essential for successful management of these injuries. As with all new techniques, a learning curve entailing additional time is a disadvantage of this technique.<sup>6</sup>

Several types of elbow fractures are amenable to arthroscopic or arthroscopic-assisted fracture fixation, including coronoid fractures, lateral condyle fractures, capitellum fractures, and coronal shear fractures of the distal humerus. Arthroscopic radial head fracture treatment has been described but, in our experience, is technically challenging and treatment is not facilitated or improved with arthroscopy. In addition, arthroscopy can be used for assessment of valgus instability before open repair or reconstruction.

## SURGICAL TECHNIQUE

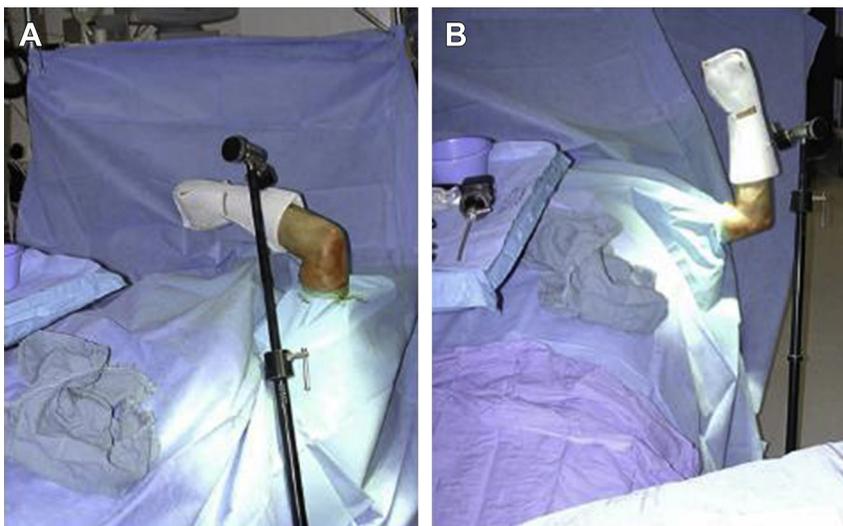
### *Preoperative Planning*

Preoperative planning includes radiographs of bilateral elbows, including stress radiographs where appropriate to detect terrible triad injuries or collateral ligament instability. Advanced imaging, such as a computed tomography (CT)

scan, is usually indicated for articular fractures; in skeletally immature patients, MRI may be preferred. Three-dimensional reconstructions are helpful. In the operating room before surgery, a stress examination under anesthesia is a helpful adjunct to assess instability using the minifluoroscope.<sup>7,8</sup> Regional anesthesia may be used for postoperative pain management, but some surgeons prefer to avoid this in order to obtain an immediate postoperative neurologic assessment.

## PREPARATION AND PATIENT POSITIONING

Elbow arthroscopy can be performed in the lateral decubitus or supine positions, and a tourniquet is used. For lateral decubitus positioning, patients are positioned using an inflatable beanbag with a padded axillary roll. The upper arm is supported by an arm holder attached to the side of the operating table (Western elbow holder, Smith & Nephew, Nashville, TN) with the triceps and olecranon facing upwards. For supine positioning, a sterile arm holder is used to secure the elbow, such as a McConnell arm holder (McConnell Orthopedic Manufacturing Co, Greenville, TX) or a pneumatic arm holder (Spider, Smith & Nephew, Nashville, TN), so that the forearm is raised superiorly and the olecranon is facing the surgeon (**Fig. 1**).<sup>9</sup> Some surgeons prefer lateral patient positioning because it affords easier access to the posterior elbow joint. However, most of the work for fracture procedures



**Fig. 1.** The preferred patient positioning for elbow arthroscopy: supine with a McConnell arm positioner. (A) Positioned for access to the posterior compartment. (B) Positioned for anterior elbow access. (From Hsu JW, Gould JL, Fonseca-Sabune H, et al. The emerging role of elbow arthroscopy in chronic use injuries and fracture care. *Hand Clin* 2009;25(3):306; with permission.)

Download English Version:

<https://daneshyari.com/en/article/4058958>

Download Persian Version:

<https://daneshyari.com/article/4058958>

[Daneshyari.com](https://daneshyari.com)