

# Shoulder Arthroscopy: The Basics

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Shoulder arthroscopy is a commonly performed and accepted procedure for a wide variety of pathologies. Surgeon experience, patient positioning, knowledge of surgical anatomy, proper portal placement, and proper use of instrumentation can improve technical success and minimize complication risks. This article details the surgical anatomy, indications, patient positioning, portal placement, instrumentation, and complications for basic shoulder arthroscopy. (*J Hand Surg Am.* 2015;40(4):817–821. Copyright © 2015 by the American Society for Surgery of the Hand. All rights reserved.)

**Key words** Arthroscopy, complications, shoulder, portals, surgical technique.

**S**HOULDER ARTHROSCOPY IS AN accepted treatment for a wide variety of pathologies. Improving instrumentation has increased the scope of the injuries that can be treated. Continued progression of surgeon skill, anatomic understanding, and technology will allow arthroscopic treatment of more complex shoulder pathology.

## INDICATIONS

Indications for shoulder arthroscopy are widespread. Intra-articular indications include biceps tears, labral tears, subscapularis tears, chondral injuries, loose bodies, early degenerative changes, adhesive capsulitis, and shoulder instability. Indications for subacromial arthroscopy include rotator cuff tears, subacromial bursitis/impingement, and acromioclavicular osteoarthritis. Expanding arthroscopic indications include coracoclavicular reconstructions, Latarjet and bone block procedures, suprapectoralis biceps tenodesis, and suprascapular nerve decompressions.

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Received for publication December 5, 2014; accepted in revised form January 8, 2015.

No benefits in any form have been received or will be received related directly or indirectly to the subject of this article.

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0363-5023/15/4004-0031\$36.00/0  
<http://dx.doi.org/10.1016/j.jhssa.2015.01.002>

## CONTRAINDICATIONS

Contraindications include active infection, especially on the skin within the surgical field. Acne within the surgical field is a relative contraindication as *P. acnes* is a known pathogen found in shoulder infections.

## SURGICAL ANATOMY

Bony landmarks are palpated and marked. These include the acromion, the acromioclavicular joint, and the coracoid. The coracoid serves as an important landmark, as the lateral side is considered the “safe” side for portal placement. The medial side of the coracoid puts neurovascular structures at risk, and portal placement in most cases is discouraged.

Neurologic structures at risk include the axillary nerve, which is at risk with anterior, posterior, and lateral portals. Portals are considered “safe” if placed within 3 cm of the lateral border of the acromion.<sup>1</sup> Posterior and posterolateral portals are typically greater than 3 cm from the axillary nerve.<sup>2–4</sup> The axillary nerve is also at risk with anteroinferior labral repairs and capsular releases, and care should be taken to avoid capsular releases or plications greater than 1 cm lateral to the anteroinferior glenoid.<sup>5</sup> The musculocutaneous nerve is at risk with portals placed medial to the coracoid.<sup>6</sup> The suprascapular nerve is at risk with anchor placement just posterior to the biceps tendon, especially when placed from an anterior portal,<sup>7</sup> or posterior-superior capsular releases.

Vascular structures at risk include the cephalic vein with anterior portals.<sup>2</sup> Simple pressure and skin



**FIGURE 1:** Typical beach-chair set-up with pneumatic arm position.

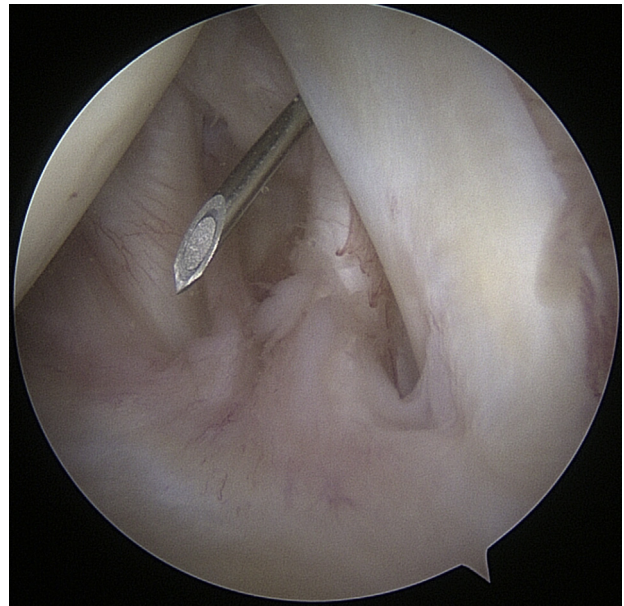
closure is often sufficient to tamponade bleeding. Arterial bleeding is rare, and often is controlled with pump pressure and cauterization.

### TECHNIQUE

Most surgeons prefer general anesthesia, as this allows for better pain control and relaxation. Drawbacks to this technique include decreased mean arterial pressure and cerebral hypoperfusion in the beach-chair position, with the potential of a devastating neurologic event. We typically also utilize regional anesthesia, often as an interscalene block or indwelling nerve anesthetic catheter. Benefits of this technique include the decreased need for narcotics intraoperatively. In addition, regional anesthetic along with sedation significantly decreases cerebral deoxygenation events in the beach-chair position, when compared with general anesthesia.<sup>8</sup> A disadvantage of regional anesthesia includes the inability to perform a postoperative neurological check if one is warranted.

### Instrumentation

The most commonly used arthroscope for shoulder arthroscopy is the 4.0-mm 30° scope. Most cases can be completed using a 30° scope only. A 4.0-mm 70° arthroscope should always be available, and can be especially helpful with humeral avulsion of the glenohumeral ligament lesions, Remplissage techniques,



**FIGURE 2:** Localization of the anterosuperior portal through an outside-in technique.

distal clavicle resections, arthroscopic-assisted coracoclavicular reconstructions, and subscapularis repairs.

A wide variety of cannulas should be available, and will vary based on the procedure being performed. Typically, 5.5-mm blunt-tipped cannulas are used as the primary penetrating instruments for portal placement. Blunt tips are preferred to minimize the risk of iatrogenic injury, especially to articular cartilage. Often, 8.25-mm cannulas are utilized for “instrumentation” portals, as they allow most arthroscopic passing instruments to pass easily. Additionally, 6.5-mm and smaller cannulas are often used for suture management. Threaded cannulas, or those with locking mechanisms, are preferred to minimize the propensity for falling out of the joint. Either gravity or a pump system can be used in most situations. Careful control of pressures, typically around 60 mm Hg, should be utilized to prevent excessive soft-tissue swelling, making instrumentation and cannula use more difficult.

### Patient positioning

Patient positioning is typically determined by surgeon experience. Portal placement is the same for both lateral decubitus and beach-chair positions. For the beach-chair position, a head positioning device is typically necessary to provide proper head control with close to 90° of head elevation. It is important that all bony prominences are well padded and the head control device is well placed with the ears free of pressure. There are several advantages to the

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