INTRODUCTION

Shoulder arthroscopy is currently one of the mainstay procedures for the treatment and diagnosis of shoulder disorders [1]. With an estimate of greater than 250,000 shoulder arthroscopies annually, there has been an increasing interest in this procedure since the early 2000s [2]. Shoulder arthroscopy is typically performed in either the beach chair position or the lateral decubitus position. The purpose of this article is to examine each of these positions, and shed light on the advantages and disadvantages each offers. Even though there is no consensus regarding a superior positioning, and the choice is usually determined by surgeon’s experience and preference [3,4], and occasionally by the pathology to be addressed [5].

The two positions require the same preparations prior to the procedure, including shoulder marking and the use of anesthesia (general anesthesia with the possibility of an interscalene nerve block) [6]. The operating room setup required is the same in both positions, requiring an arthroscopy tower, instrument tower, fluid management and suction equipment opposite to the side where the surgeon and assistants are standing (Figure 1). The anesthesia staff and equipment are placed at the head of the surgical table, and a back table with surgical tools behind the surgeon, assistant, and surgical technician [7].

BEACH CHAIR POSITION

It is estimated that around two-thirds of more than 400,000 shoulder arthroscopies are performed in a beach chair position [8]. The patient is put on a “beach chair” table or a standard operating room table with head, neck and torso supported with straps in a neutral position. The patient is positioned with the hips flexed around 45º; this prevents the patient from sliding down the operating table or a standard operating room table with head, neck and torso supported with straps in a neutral position. The patient is positioned with the hips flexed around 45º; this prevents the patient from sliding down the operating table or a standard operating room table with head, neck and torso supported with straps in a neutral position. The patient is positioned with the hips flexed around 45º; this prevents the patient from sliding down the operating table or a standard operating room table with head, neck and torso supported with straps in a neutral position. The patient is positioned with the hips flexed around 45º; this prevents the patient from sliding down the operating
The knees are flexed around 30º; this helps relax the sciatic nerve [9]. The patient is then moved to a 10º to 15º Trendelenburg position, achieving the final upright beach chair position. A strap is placed around the legs and abdomen to secure the patient. All pressure points are padded and the eyes and head are protected (Figure 2) [1,4,10].

The advantages of the beach chair position are numerous. Notably, the beach chair position is relatively safe with regards to incidence of neurovascular injuries [10]. The risk of injury of the musculocutaneous nerve and the cephalic vein injury is diminished by avoiding the vulnerable position when establishing an antero-inferior approach to the shoulder [11,4]. Also, the position places less strain on the brachial plexus since no traction is used to elevate the shoulder [12-13].

Another benefit of the beach chair position is that it allows an easier conversion to an open approach [1]. This is especially important to beginner arthroscopists, who can proceed to an open technique without the need to reposition. The approach also allows the surgeon to approach the anatomy in the same perspective, without the need to reorient themselves.

The most notable disadvantage of the procedure is cerebral hypoperfusion, which can have devastating consequences [14-15]. Although rare, this complication can result from the combination of an upright position and hypotension [13]. However, some studies have shown patients in the beach chair position receiving regional anesthesia of an interscalene nerve block with sedation, rather than general anesthesia, had close to no cerebral desaturation [16,10]. Moreover, placing the patient in a sloppy beach chair, as opposed to being upright, further diminishes this effect. Other cases in the literature have reported that the hyperextension and tilt positioning of
the head in this position causes a decrease in vertebral blood flow, which can lead to infarcts [14]. Yet another disadvantage to the beach chair position is the expense of the equipment required, estimated at $12,000, to place the patient in the position, requiring almost double the cost of implementing the lateral decubitus position, which is approximately $5,000 [4].

LATERAL DECUBITUS POSITION

In the lateral decubitus position, the patient is placed laterally on the nonoperative shoulder with the extremity being operated on exposed. The patient is stabilized by a bean bag or other stabilizing devices. Straps are placed around the chest and hips to ensure stability during the procedure. Pressure points are protected, as well as the eyes and face. An axillary roll placed under the chest is used to protect neurovascular structures. The operative extremity is placed into position using a traction sleeve connected to a traction device. This will expose the joint space and allow better visualization of the joint.

The traction device is a pulley system connected to weights, usually around 15 kilograms, although it may vary by the surgeon’s preference. These pulleys can be adjusted to abduct and forward flex the shoulder. (Figure 4).

There are several advantages to performing shoulder arthroscopy in a lateral decubitus position. Those include a lesser risk for cerebral hypoperfusion, a larger access to the glenohumeral joint and lower recurrence rates when addressing arthroscopic shoulder instabilities [5].

One of the major advantages of performing shoulder arthroscopy in a lateral decubitus position is the reduced risk of cerebral hypoperfusion and ischemia. The head is positioned at the same level of the body using padding, and the neck position is neutral with the body. This overall decreases the risk of devastating decrease in cerebral perfusion and consequently desaturation. Moerman et al. reported a decrease in 20% of cerebral oxygen saturation in 80% of those patients undergoing shoulder arthroscopy in the beach chair position as opposed to the lateral decubitus [17]. Moreover, the position provides an easier and larger access to the glenohumeral joint and subacromial space. The traction placed on the shoulder joint also allows for better visualization of labral tears [6]. Intrarticular visualization of labral tears is facilitated by the lateral traction on the humerus. Furthermore, the choice of the lateral decubitus position could result in better outcomes when addressing labral pathology [5]. A meta-regression analysis studying around 4000 shoulder arthroscopies in 2014 revealed lower recurrence rates with arthroscopic anterior shoulder stabilization done in the lateral decubitus position compared to the beach chair position [5].

Even though lateral decubitus position offers several advantages, it also has its own set of drawbacks. Operating room time in the lateral decubitus position is arguably much longer, and requires assistance. The position lacks flexibility whenever it is necessary to resort to

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**FIGURE 3.** Advantages and disadvantages of the beach chair position for shoulder arthroscopy.

**FIGURE 4.** Lateral decubitus position.
Figure 5. Advantages and disadvantages of the lateral decubitus for shoulder arthroscopy.

Advantages

- Less risk of cerebral hypoperfusion
- Lower recurrence rates
- Increase access to glenohumeral joint and subacromial space
- Better visualization of labral tears

Disadvantages

- Harder conversion to open procedure
- Increase risk of neurovascular injury
- Regional anesthesia not well tolerated

The patient is positioned supinely in the reverse position and will need repositioning. The leg plate on the operating side is removed to make space and the head is maintained in neutral position. The arm is then strapped to a traction device to position the shoulder in a 45° of forward flexion and 30° of abduction. The initiation of arthroscopy is with a posterior portal slightly lateral to the glenohumeral joint line, an anterior-superior portal and anterior-inferior portal can then be made. The remainder of the procedure is the same as in the lateral decubitus and the beach chair positions [19].

This position is described to combine the advantages of both the lateral decubitus and beach chair with minimal disadvantage. The supine position provides better access to the joint, while having the patient’s head and operating table far from the surgical field and the arm not hanging in the way. The supine position also allows easier conversion to the open procedure without repositioning or redraping. Lastly, it entails an easier setup than the alternative positions [19].

CONCLUSION

Shoulder arthroscopy is a common procedure indicated for diagnosis to treatment of conditions ranging from intra-articular to extra-articular pathology. Shoulder arthroscopy continues to be increasingly popular as surgeons have become more comfortable with the treatment of more complex shoulder problems arthroscopically. Although both the lateral decubitus and beach chair positions for shoulder arthroscopy procedures have respective advantages and disadvantages (Figures 3 & 5), it is difficult to determine a superior method. Furthermore, the recent introduction of the supine position suggests that current techniques are still being challenged and improved.

Each position requires certain indications, precautions, and surgeon preference. The major disadvantage of both positions continues to be neurovascular injury, even though it is rare with both positions, and at times avoidable with proper patient safety precautions. Current literature comparing the different positions remains limited. Further research on long-term outcomes is required to adequately compare the rate of complications and successes, and recurrence between the two positions.

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