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Sports Tips & Tricks: Lateral Decubitus Positioning of Shoulder Arthroscopy

Introduction

Shoulder arthroscopy has become a common orthopaedic procedure as it offers a minimally invasive surgical approach to treat a variety of shoulder pathologies. There are two patient positioning options: beach chair and lateral decubitus position. Both positions have certain advantages. The beach chair position provides a more anatomic, upright positioning with easier conversion to open procedures. The lateral decubitus position allows increased visualization of the glenohumeral joint with access to the posterior and inferior aspect of the glenoid. The following tips provide a general guide for a lateral decubitus positioning for shoulder arthroscopy. It is not meant to suggest one particular positioning over another, but rather a review for surgeons and trainees if a lateral decubitus positioning is decided for patient positioning in shoulder arthroscopy.

Surgical Consideration

Patient Positioning

The setup of the lateral decubitus position starts with the patient in a supine position on a beanbag (Olympic Vac-Pac, Natus Medical Incorporated, Middleton, WI). After the induction of anesthesia, the patient's eyes should be covered with tape or lubricated to prevent corneal abrasion, and sequential compression device placed on the lower extremities for deep venous thrombosis prophylaxis. With coordination with the anesthesia team, the surgical assistant and surgeon turn the patient onto the nonoperative side. A well-padded axillary roll should be placed under the nonoperative axilla. Similarly, the bean bag itself can serve as an adequate axillary roll provided it is positioned and compressed proximal to the axilla. Both knees should be bent, and foam padding should be placed on bony prominences to prevent pressure injuries. The lateral aspect of the downed knee should also be padded to prevent pressure injuries to the common peroneal nerve. Once the patient is properly positioned, a safety strap is placed around the patient and the vacuum suction is turned on for the beanbag to maintain deflation and position.

Traction Setup

After the operative arm is sterilely prepped and draped, the operative arm is placed in sterile stockinette and wrapped in a self-adherent wrap such as Coban (3M Healthcare, St. Paul, MN). The operative arm is then firmly placed into the arm-holding shoulder device, such as the STaR sleeve with the lateral decubitus shoulder traction device (Arthrex, Naples, FL), or the Spider (Smith and Nephew, Andover, MA). Approximately 15 degrees of forward flexion and 45 degrees of abduction will provide good visibility with 10-15lbs of traction. Regardless of the traction device, surgeons should utilize minimum traction necessary to minimize the risk of traction injuries to the neurovascular structures. Forward flexion lessens the threat of traction injury to the upper trunk of the plexus.

Portal Placement

In the lateral decubitus position, the posterior portal is usually established slightly more lateral than your typical posterior portal in beach chair position. In beach chair, the classic teaching on posterior portal's location is to be placed 2 cm inferior and 1 cm medial to the posterolateral corner of the acromion, but in lateral decubitus, the portal will be typically in line with the posterolateral border of the acromion. One can also establish the posterior portal by identifying a soft spot that is parallel to the glenoid in the midportion of the glenohumeral joint. This can be accomplished by taking one hand and stabilize the acromion and using the other hand to translate the patient's humeral head anteriorly and posteriorly relative to the acromion. Once the joint is identified, an incision is made and the arthroscopy trocar can be inserted, aiming towards the coracoid process.

Discussion

Shoulder arthroscopy can be performed with the patient in either the beach chair position or the lateral decubitus position. There are advantages and disadvantages for each patient positioning. The purpose of this review was to give a general overview of lateral decubitus position. One of the major advantages of the lateral decubitus position is the increased

visualization of the glenohumeral joint. With the operative shoulder in traction, it provides especially good visualization of the posterior and posteroinferior glenoid, decreasing the need to create additional portals that can disrupt the rotator cuff¹. Procedures such as posterior instability and capsular releases are greatly facilitated in the lateral position. In addition, rotator cuff repair may be facilitated in the lateral position as the continual downward traction on the arm may facilitate humeral head coverage. Also, compared to the beach chair position, there is less likelihood of cerebral desaturation². This is especially true when the patient is under general anesthesia; The main disadvantage is the increased risk of neuropraxia due to the traction device³. However, forward flexion and judicious use of traction over 10lbs will mitigate this risk.

Patient positioning can play a crucial role in the outcomes of particular shoulder pathologies. In anterior shoulder instability patients, shoulder arthroscopy performed in the lateral decubitus position has shown lower recurrence rates than arthroscopy performed in the beach chair position⁴. A meta-analysis of sixty-four anterior shoulder stabilization studies has shown that the average overall recurrent instability rates were 14.65% in the beach chair group while the rates were 8.5% in the lateral decubitus position group. Other factors like patient selection, adequate capsular tensioning, and sutures anchor placements are important, but patient positioning can also be critical for the success of an arthroscopic stabilization procedure.

Ergonomics in the operating room is also an important factor to consider. Lateral decubitus position has been suggested to allow surgeons to operate with their arms at the sides, rather than in an abducted position, which potentially can increase comfort and decrease fatigue⁵. However, there can be an increase in neck and shoulder strain when the surgeon reaches across the patient's shoulder while using

the anterior portal. One can reduce this by moving the operating table obliquely to the anesthesiologist so that it will afford easier access anteriorly. As occupational injuries and work-related musculoskeletal symptoms in orthopaedic surgery are common^{6,7}, surgeons should take note of their own ergonomics in the operating room and adjust factors like operating room table height, monitor position, length of arthroscopic equipment, and working distance from surgical field to minimize strain and decrease the risk of work-related injuries.

Overall, regardless of which shoulder arthroscopy positioning used, surgeons should be familiar with the setup, the major advantages and disadvantages of each positioning, and select the appropriate positioning for the improved patient outcomes as improper setup can create additional technical difficulties and complexity in shoulder arthroscopy.

Reference

1. Provencher MT, Romeo AA, Solomon DJ, *et al.* Arthroscopic preparation of the posterior and posteroinferior glenoid labrum. *Orthopedics*. 2007;30(11):904-905.
2. Murphy GS, Szokol JW, Marymont JH, *et al.* Cerebral oxygen desaturation events assessed by near-infrared spectroscopy during shoulder arthroscopy in the beach chair and lateral decubitus positions. *Anesth Analg*. 2010;111(2):496-505.
3. Peruto CM, Ciccotti MG, Cohen SB. Shoulder arthroscopy positioning: lateral decubitus versus beach chair. *Arthroscopy*. 2009;25(8):891-896.
4. Frank RM, Saccomanno MF, McDonald LS, *et al.* Outcomes of arthroscopic anterior shoulder instability in the beach chair versus lateral decubitus position: a systematic review and meta-regression analysis. *Arthroscopy*. 2014;30(10):1349-1365.
5. Hamamoto JT, Frank RM, Higgins JD, *et al.* Shoulder arthroscopy in the lateral decubitus position. *Arthroscopy Techniques*. 2017;6(4):e1169-e1175.
6. McQuivey KS, Deckey DG, Christopher ZK, *et al.* Surgical ergonomics and musculoskeletal pain in orthopaedic surgery residents: a multicenter survey study. *J Am Acad Orthop Surg Glob Res Rev*. 2021;5(3):e20.00119.
7. Davis WT, Sathiyakumar V, Jahangir AA, *et al.* Occupational injury among orthopaedic surgeons: *The Journal of Bone and Joint Surgery-American Volume*. 2013;95(15):e107-1-6.