Editorial Commentary: The Shoulder Transpectoralis Portal for Arthroscopic Latarjet: Medial to the Coracoid Can Also Be a Safe Side!

Pascal Boileau, M.D., Ph.D., and Devin B. Lemmex, M.D., F.R.C.S(C).

Abstract: The all-arthroscopic Latarjet is gaining popularity among shoulder surgeons, although the procedure is technically demanding and potentially dangerous, placing the brachial plexus and axillary vessels at risk when using screws for fixation of the bone block from the front. Matsen once wrote that "lateral to the coracoid is the safe side, while medial to the coracoid is the suicide." However, creation of a portal medial to the coracoid during arthroscopic reconstruction of the glenoid is needed to permit accurate positioning of the screws (parallel to the glenoid surface) and coracoid bone block (flush to the glenoid surface). Our own clinical experience with the arthroscopic Latarjet over the last decade has shown us that the safety of the arthroscopic medial transpectoralis portal depends on 3 technical considerations: (1) the portal should always be established in an outside-in fashion from anterior to posterior; (2) passing through the pectoralis major muscle with a relatively superficial trajectory, using a switching stick oriented with a 45° orientation toward the tip of the coracoid; and (3) under visual control of the anterior extra-articular subdeltoid space to end up lateral to the coracoid process. If these conditions are respected, surgeons should not worry: medial to the coracoid can also be a safe side! An inside-out technique (introducing a switching stick from posterior to anterior) is forbidden, as this would end up piercing the neurovascular structures. Once the coracoid has been osteotomized and the conjoint tendon retracted distally, all instruments passing though the transpectoral portal are directly in contact with the neurovascular structures. This is why working through the medial transpectoralis portal should be done only with the help of a cannula or half-pipe. Ideally, the transpectoral portal should not be used as a "working portal" but as a "protecting portal" instead, placing a stick or spreader to protect the neurovascular structures. To avoid working through the anterior medial portal, we have proposed a much safer alternative that consists of drilling the glenoid from posterior to anterior (using a guide and remaining inside the glenohumeral joint) and using cortical-buttons (instead of screws) for coracoid fixation. In this modern technique, the transpectoral portal makes the arthroscopic safe as it allows the introduction of a spreader to retract the subscapularis muscle and protect the neurovascular structures during transfer and fixation of the coracoid bone block.

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Augmentation of the anterior glenoid rim using coracoid autograft as a treatment for shoulder instability was first described by Michel Latarjet in 1954.[1] This procedure has proven itself to be an important arrow in a shoulder surgeon's quiver when faced with the variable challenges that can accompany the treatment of shoulder instability. In its native France, the Latarjet procedure has evolved into a trusted first-line treatment option for those individuals deemed to be at high risk of failure of a traditional Bankart procedure. The Instability Severity Index Score has been critical in identifying these patients and pushing the indications for the Latarjet procedure.[2-6] The Latarjet procedure is specifically indicated for younger patients (<20 years), contact/collision athletes with anterior glenoid or humeral bone losses and/or shoulder hyperlaxity, and for patients with previous failed Bankart repair. It was only natural that the technique for this procedure evolved from an open approach to one that is all-arthroscopic. During this evolution, the safety of the arthroscopic approach has been heavily scrutinized, as it has been associated with

ICR-Nice (P.B.) and Pan Am Clinic (D.B.L.)

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a steep technical learning curve and theoretically places important neurovascular structures at risk.[7,8]

Of critical importance when performing a Latarjet procedure, either open or arthroscopic, is the angle in which the surgeon approaches the glenoid. The trajectory must begin sufficiently medial to achieve appropriate orientation of the screws (parallel to the glenoid surface) and ensure proper positioning of the bone block. If the trajectory is not sufficiently medial, the screws are orientated obliquely and the bone block is overhanging laterally, impinging with the humeral head, which is a cause of shoulder pain, stiffness, and osteoarthritis. This has led to the exploration of arthroscopy portals, medial to the coracoid, that have previously been stigmatized as being excessively dangerous. Matsen once wrote that "lateral to the coracoid is the safe side, while medial to the coracoid is the suicide."[9] The question that arthroscopic surgeons had to answer during the development of the arthro-Latarjet was: How can we safely perform an arthroscopic portal, medial to the coracoid? In the article "The Shoulder Transpectoralis Arthroscopic Portal Is a Safe Approach to the Arthroscopic Latarjet: A Cadaveric Analysis," by Dunn, Petterson, and Plancher,[10] the danger to the various neurovascular structures is quantified and should help relieve some of the anxiety experienced by surgeons when considering more medial portals.

The anatomic description of the transpectoralis major arthroscopic portal in this article highlights the proximity of neurovascular structures in both superficial and deep planes of the shoulder. Specifically, the at-risk anatomy is described in relation to a standardized transpectoralis major portal located 49.9 ± 4.5 mm distal and 36.4 ± 3.6-mm medial to the tip of the coracoid. In the superficial plane, the cephalic vein and lateral pectoral nerve were found within 10 mm of the portal site. In the deep plane, the axillary nerve and lateral chord of the brachial plexus were within 30 mm of portal trajectory, whereas the axillary artery and musculocutaneous nerve were more than 30 mm away from portal trajectory. The authors were careful to note that the conjoint tendon and pectoralis minor overlay and protect these structures. However, it must be acknowledged that the pectoralis minor is released off of the coracoid and the conjoint tendon is retracted anteriorly after the coracoid osteotomy during the arthro-Latarjet, thus leaving these deeper neurovascular structures exposed.

The limitations of this study were few and well accounted for. It is mentioned that older cadavers do not accurately represent the patient population typically undergoing the arthroscopic Latarjet procedure; however, there simply isn't a good way around this.

The Nice Experience

Using the transpectoralis major portal, or "East" portal, as we originally defined it when describing the arthroscopic Latarjet technique 10 years ago,[11,12] is typically what makes surgeons the most anxious during this procedure. It requires detailed knowledge of the arthroscopic anatomy of the anterior shoulder and a mastery of the 70° arthroscope (although the procedure can be performed with a 30° scope). In addition, operating around neurovascular structures in such close proximity goes against the typical principles of orthopaedic surgery, where an "out of sight, out of mind" philosophy is preached when discussing nerves and vessels. Following the anterior circumflex vessels from lateral to medial, we always identify and protect the axillary and musculocutaneous nerves ("The three sisters bring us to the two brothers"). This allows us to proceed confidently, as we know exactly where these structures are and can readily protect them when passing through the subscapularis.

To make it safe and reproducible, there are technical considerations to take into account when using the "East" portal. First, this should always be established in an outside-in fashion from anterior to posterior. The inside-out technique that uses a switching stick to be placed from posterior to anterior through the subscapularis and out of the skin places the neurovascular structures at significant risk. This technique is constrained by the osseous anatomy of the patient's glenohumeral joint and eliminates the safety benefits of the transpectoralis portal. As such, we landmark our skin incision just as Dunn, Petterson, and Plancher describe in their article. Second, the medial portal should be established with a switching stick or a long half-pipe under visual control from the anterior extra-articular subdeltoid space with the scope placed in the anterolateral portal. Third, the stick or half-pipe must be oriented 45° toward the tip of the coracoid. This relatively superficial trajectory allows us to work safely in the anterior extra-articular space of the shoulder. Once the coracoid had been osteotomized and the conjoint tendon retracted, the neurovascular structures must be protected with a cannula, a half-pipe, or a spreader. If these conditions are respected, surgeons should not worry, medial to the coracoid can also be a safe side!

Surgeons must realize that even though the transpectoral portal can be established safely with an outside-in technique, drilling through the glenoid and tightening screws from this medial portal remains potentially dangerous. Once the coracoid has been osteotomized and the conjoint tendon retracted distally, the instruments are in contact with the neurovascular structures when they are reoriented toward the anterior glenoid neck. This is why working through the medial transpectoralis portal should be done only with the help

of a cannula or half-pipe. Ideally, the transpectoral portal should not be used as a "working portal" but as a "protecting portal" instead, placing a stick or spreader to protect the neurovascular structures. To avoid working through the anterior medial portal, we have proposed a much safer alternative that consists of drilling the glenoid from posterior to anterior (using a guide and remaining inside the glenohumeral joint) and using cortical-buttons (instead of screws) for coracoid fixation. In this modern technique, the transpectoral portal makes the arthroscopic procedure safe, as it allows the introduction of a spreader to retract the subscapularis muscle and protect the neurovascular structures during transfer and fixation of the coracoid bone block.

We applaud the work done by Dunn, Petterson, and Plancher. This paper deepens our understanding of the risk profile associated with the arthroscopic Latarjet procedure and brings us one step closer to accepting it as common practice. Based on our surgical experience, the keys to performing this procedure safely using the transpectoralis major portal are as follows: (1) detailed knowledge of anterior arthroscopic shoulder anatomy; (2) familiarity with the use of a 70° arthroscope, (3) systematic identification of the axillary and musculocutaneous nerves; and (4) systematic use of specifically designed cannulas and/or retractors to protect the neurovascular structures after osteotomy of the coracoid.

The arthroscopic Latarjet is a technically demanding procedure, with a steep learning curve, as much of the operation is performed outside of the glenohumeral joint in the anterior subdeltoid space. Thus, the technique can be recommended only to experienced surgeons with advanced arthroscopic skills and familiarity with the normal and abnormal anatomy encountered during the open Latarjet procedure. Training on cadaveric specimens and transition from open to mini-open and, finally, to all-arthroscopic is recommended.

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