

Arthroscopic Latarjet Procedure Utilizing a Latarjet With Cortical Button Fixation Performed in the Lateral Position



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Abstract: Shoulder instability is a commonly seen pathology. The Latarjet procedure was first described in 1954 to address recurrent instability or patients with glenoid bone loss. Since its introduction, the procedure has been widely adopted and modified, including being performed all-arthroscopically. Various arthroscopic techniques have been described, but we present a technique performed in the lateral decubitus position that takes advantage of a pneumatic arm holder. After arthroscopic diagnosis, multiple accessory portals are established and used to accomplish the technique. Next, the coracoid is prepared and cut using a cannulated drill guide, followed by arthroscopic glenoid preparation using a cannulated drill system to ensure appropriate position of the coracoid. The subscapularis split is performed arthroscopically, and finally the coracoid is fixed with use of the EndoButton device.

Shoulder instability is commonly seen in both contact and noncontact athletes. Treatment of recurrent instability or glenoid bone loss has been successful with coracoid transfer procedures, including the Latarjet, first described in 1954.¹ The goal of this procedure is to restore deficient anterior glenoid and reinforce/retension surrounding soft tissue structures. Since its description, the procedure has increased in popularity and frequency, with good results.²

Good outcomes and advancements in technology have allowed for the description and increased use of arthroscopy in the performance of coracoid transfer procedures since its description.³ Arthroscopic procedures have similarly led to good outcomes.³ Given this increased attention, various surgical techniques have been described by authors from across the globe, reporting



Fig 1. Patient positioning and portal placement. The patient is positioned in the lateral decubitus position with the bed placed in reverse Trendelenburg and rotated toward the patient's back to position the glenoid parallel with the floor. The arm is placed in the pneumatic positioner in 30° of internal rotation and 10° of adduction. The bony landmarks are denoted, and portals are planned in order of creation: the standard posterior portal (P) 1 cm medial and inferior to the corner of the acromion to be more in line with the glenoid face; the northwest portal just distal to the anterosuperior corner of the acromion; the north portal centered over the coracoid and established under direct visualization; the west portal 2 finger breadths lateral to the tip of the coracoid; the east portal 3 finger breadths medial to the tip of the coracoid process to be collinear to the glenoid face; and the south portal 2 finger breadths distal to the tip of the coracoid process under direct visualization.

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Table 1. Portals, as Referenced on a Right Shoulder

Portal name	Abbreviation	Anatomic reference
Posterior portal	P	1 cm inferior and medial to the posterior angle of the acromion
Northwest portal	NW	Distal to the anterosuperior corner of the acromion
North portal	N	Centered over the coracoid; established under direct visualization
East portal	E	3 finger breadths medial to the tip of the coracoid process to be collinear to the glenoid face
South portal	S	Two finger breadths distal to the tip of the coracoid process established under direct visualization
West portal	W	2 finger breadths lateral to the tip of the coracoid

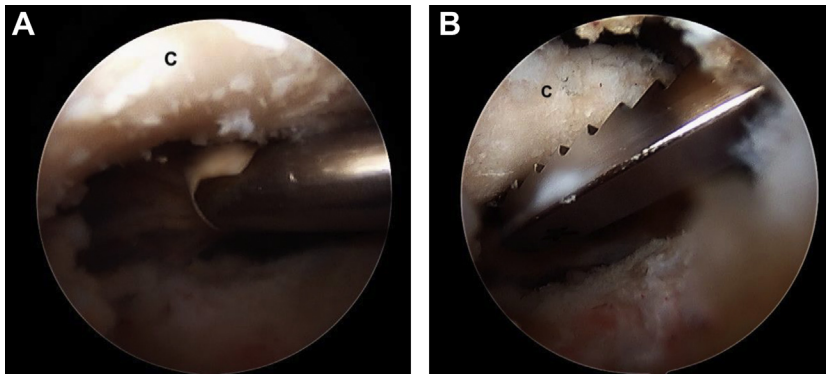


Fig 2. (A) Viewing from the posterior portal, the undersurface of the coracoid (C) and subcoracoid space is visualized. The radio-frequency device tenotomizes the pectorals minor tendon (PM) from the medial coracoid. (B) The oscillating rasp prepares the undersurface of the coracoid via the northwest portal.

Fig 3. (A) Viewing from the posterior portal, the undersurface of the coracoid (C) and subcoracoid space is visualized. The coracoid drill guide is placed through the northwest portal. (B) The 2.8-mm drill is placed bicortically, and the polydioxanone passing stitch is introduced.

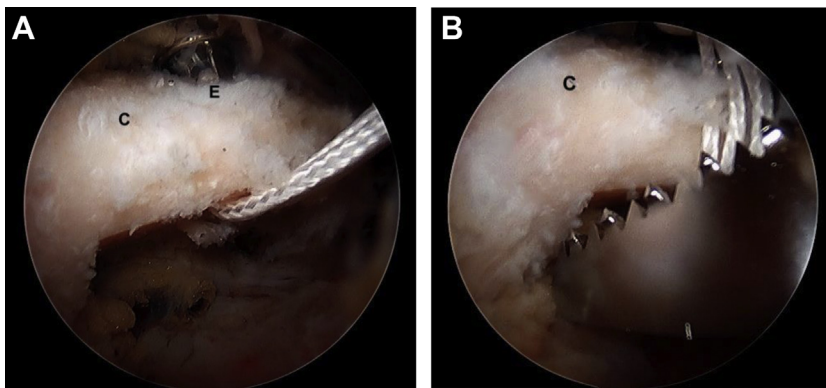
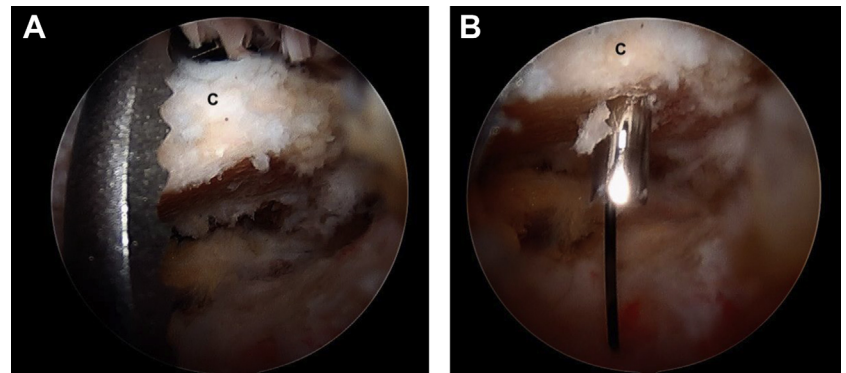


Fig 4. (A) Viewing from the posterior portal, the undersurface of the coracoid (C) and subcoracoid space is visualized. The Endo-Button (E) is brought to the coracoid graft, and the sutures are retrieved through the north portal. (B) The oscillating saw osteotomizes the graft.

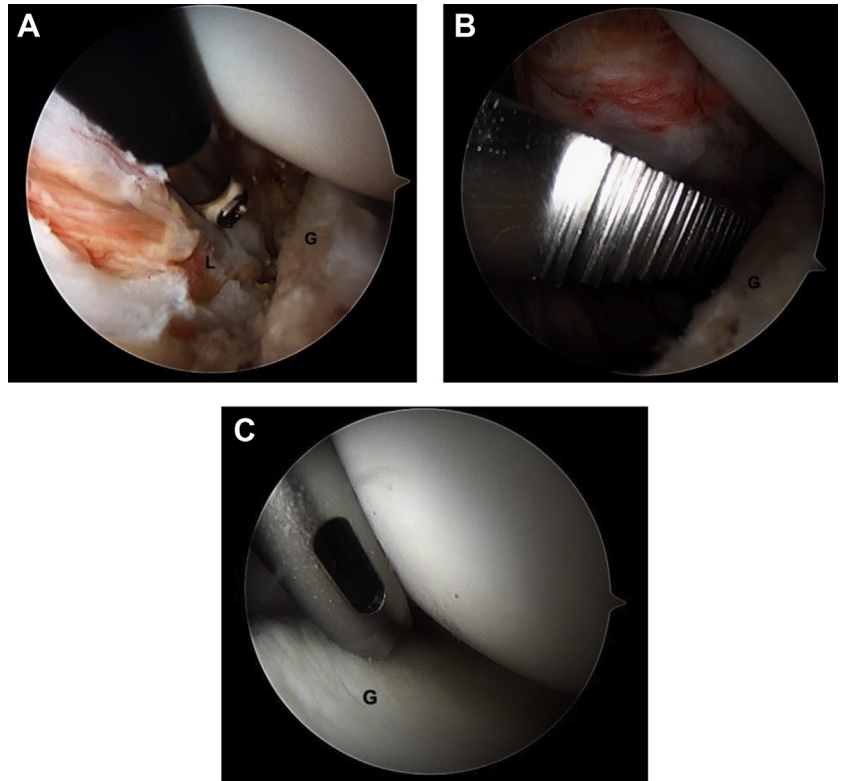


Fig 5. (A) Viewing from the posterior portal, the remaining anterior capsulolabral tissues (L) are elevated from the glenoid neck (G). (B) The oscillating rasp is used to prepare the glenoid neck (G) to a flat surface. (C) Pilot holes are made for the suture anchor repair at the conclusion of the case.

preferences for varied instrumentation and positioning. Boileau et al.⁴ described a technique with the patient in beach-chair position, and Lewington et al.⁵ reported instrumentation and preference for lateral decubitus positioning. A known and frequently discussed drawback of arthroscopically performed coracoid transfer procedures is the steep learning curve and technical difficulty of performing the procedure. With this intimidating technical difficulty as a baseline, we believe surgeons can remove anxiety by positioning the patient the same way they do for all other shoulder arthroscopy procedures.

The purpose of our report is to describe our experience using procedure-specific instrumentation (Latarjet Guiding System; Smith & Nephew Andover, MA) in the

lateral decubitus position with the assistance of a pneumatic arm positioner (Spider 2, Smith & Nephew) in an attempt to facilitate increased surgeon use of the successful procedure.

Surgical Technique

Positioning and Evaluation

The patient is placed in the lateral decubitus position with the bed placed in reverse Trendelenburg and rotated toward the patient's back to position the glenoid parallel with the floor (Fig 1) (Video 1).

The patient is then prepped and draped in a standard manner, and the arm is suspended in a pneumatic arm

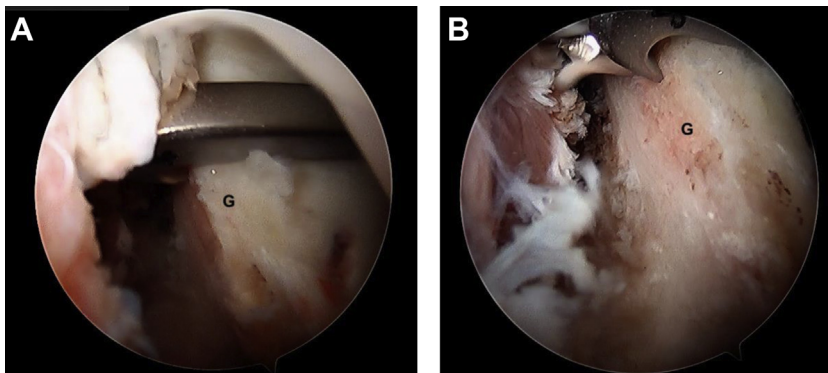


Fig 6. (A) Viewing from the northwest portal, the glenoid drill guide is introduced from the posterior portal and placed flush against the glenoid (G). (B) Through the guide, the 2.8-mm drill bit is drilled bicortically, and a cannulated sleeve is placed through this hole for later instrumentation.

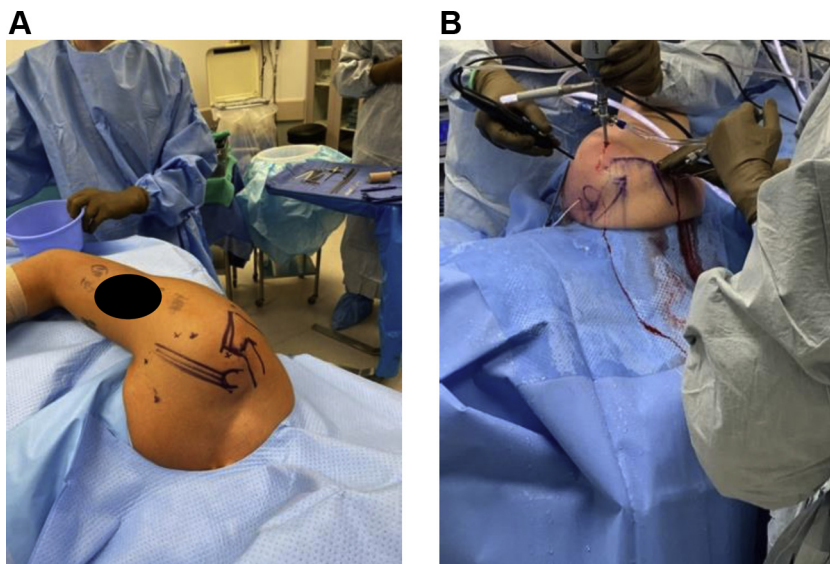


Fig 7. (A) The arm is repositioned into 20° of adduction, 10° of internal rotation, and 15° of forward flexion. This forward-flexed position allows increased access to the anterior subdeltoid space and the subscapularis. (B) The surgeon moves anterior to the patient, the northwest portal becomes the viewing portal, and the north portal functions as a working portal for the radiofrequency probe.

positioner (Spider 2). A standard posterior portal incision is made 1 cm inferior and medial to the posterior angle of the acromion (Table 1). A 70° arthroscope is placed into the glenohumeral joint, and a diagnostic exam is performed. The second portal made is the northwest (NW) portal, positioned off the anterosuperior corner of the acromion. Through the NW portal, a heat ablation device is used to remove soft tissue, bursa, and fascial adhesions from the subcoracoid space and rotator interval. After evacuation of the rotator interval, the coracoacromial ligament is released from the coracoid process.

Coracoid Preparation

After exposure of the coracoid process, the north portal centered over the coracoid is established under direct visualization. At this point, the arm is positioned in 20° of internal rotation and 10° of adduction. This positioning removes tension from the subscapularis, allowing for more working space to better remove soft tissue from the coracoid, while allowing the brachial plexus to fall away from the area of operation. Care is taken to avoid the musculocutaneous nerve, which lies just medial to the coracoid and conjoined tendon. Through the north portal, a tenotomy of the pectoralis minor is performed (Fig. 2A). A high-speed oscillating rasp via the NW portal is then used to abrade the undersurface of the coracoid (Fig. 2B).

Another anterior portal, the south portal, is made 2 finger breadths distal to the tip of the coracoid process. A polydioxanone (PDS) suture is then passed through the south portal and around the conjoined tendon to retract the coracoid distally postosteotomy. The coracoid drill guide (Smith & Nephew) is then placed through the north

portal, and a 2.8-mm drill creates a hole bicortically through the coracoid with 5 mm margins (Fig. 3A, B).

The west portal is then made 2 finger breadths lateral to the tip of the coracoid. A PDS suture is passed through the coracoid from superior to inferior and retrieved through the west portal, which can then shuttle an EndoButton device (Smith & Nephew) into the superior aspect of the coracoid. The white suture from the EndoButton is retrieved through the north portal, and the blue suture is retrieved through the south portal (Fig. 4A). A high-speed oscillating saw (Smith & Nephew) is then placed through the NW

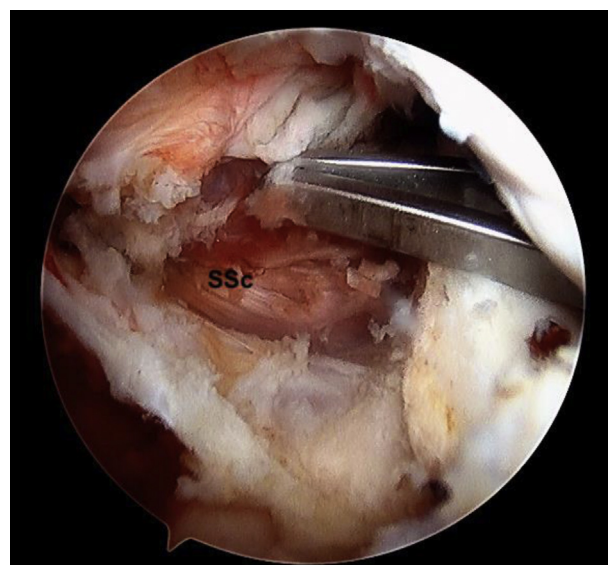
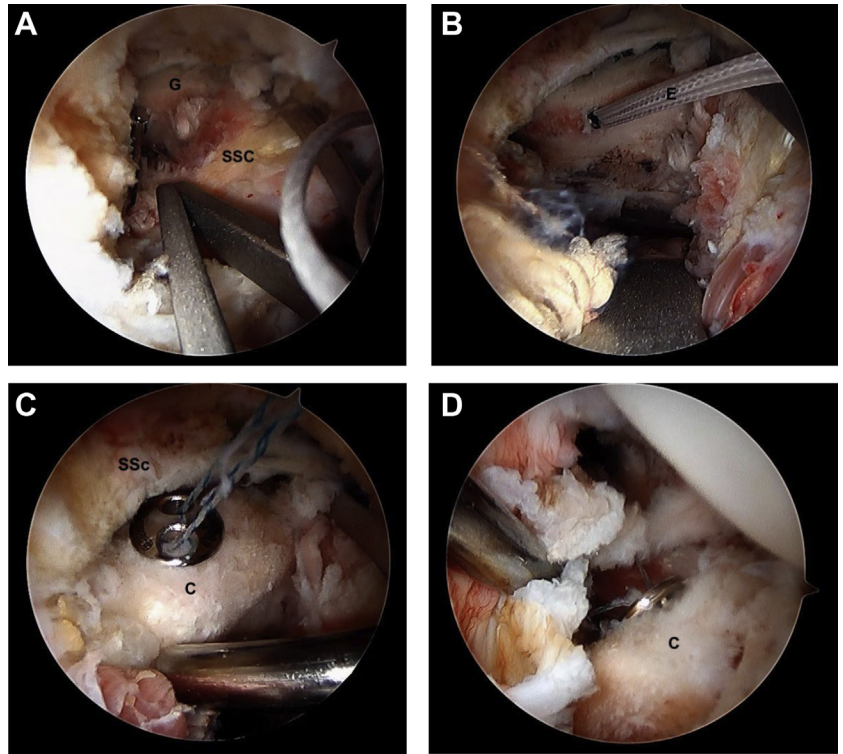


Fig 8. Viewing from the northwest portal, the subscapularis spreader is introduced through the posterior portal across the glenoid and through the subscapularis (SSc).

Fig 9. (A) Viewing from the NW portal, a second subscapularis spreader is introduced from the east portal and penetrates the subscapularis (SSc) from anterior, meeting the jaws of the first spreader near the glenoid (G). (B) A suture from the EndoButton (E) is retrieved through the glenoid drill sleeve. (C) The coracoid graft (C) is pulled in past the split subscapularis (SSc) flush with the glenoid neck (G). (D) Final tension of the coracoid graft (C) is achieved with a suture tensioner placed through the posterior portal.



portal to osteotomize 15 to 20 mm of the coracoid (Fig. 4B).

Glenoid Preparation

With the arm still in the adducted internal rotation position, the anterior glenoid is prepared through the NW portal by using an ablation device to remove the anterior labrum while preserving its tissue, as well as the anterior capsule. The high-speed oscillating rasp is then used to abrade the glenoid between 3 and 6 o'clock (Fig. 5 A-C). Two drill holes are placed close to the 3 and 6 o'clock positions for preparation of later capsulolabral repair.

The arthroscope is moved to the NW portal, and the arm is repositioned to 60° of abduction and 10° of internal rotation, which allows for sufficient space in the glenohumeral joint to pass the necessary instrumentation. The glenoid drill guide (Smith & Nephew) is inserted into the posterior portal with aid of the half-pipe and placed flush against the glenoid at the 5 o'clock position (Fig. 6A). A second posterior incision is then made to insert a 2.8-mm drill and sleeve through the guide. A hole is drilled in the glenoid from posterior to anterior, and the drill sleeve is left in place for shuttling the EndoButton sutures (Fig. 6B).

Subscapularis Split and Graft Fixation

The surgeon moves anterior to the patient, and the arm is repositioned to 20° of adduction, 10° of internal

rotation, and 15° of forward flexion (Fig. 7A, B). The forward flexion at this point is key, as it allows for more space to work in the anterior subdeltoid space. If possible, it is beneficial at this point to have an additional arthroscopy monitor positioned behind the patient's to allow for optimal ergonomics for the surgeon. After repositioning, the low-profile subscapularis

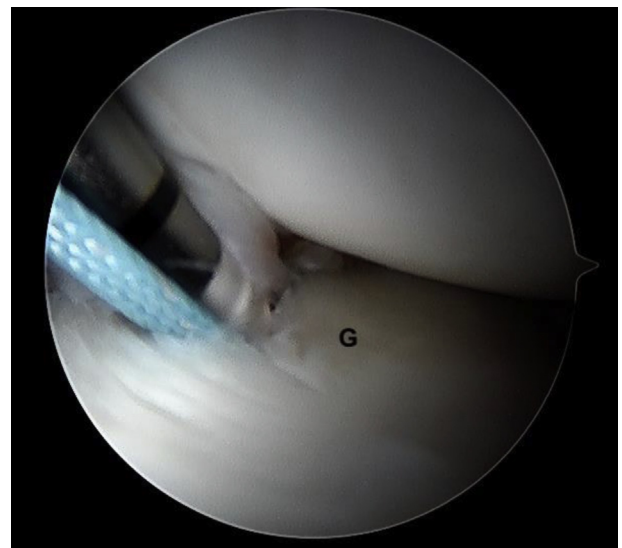


Fig 10. Viewing the anterior glenoid face (G) from the posterior portal, the capsulolabral tissues are repaired with knotless suture anchors.

Table 2. Advantages and Disadvantages

Advantages	Disadvantages
Smaller incisions	Requires advanced mastery of shoulder arthroscopy
Accuracy and reproducibility of graft placement	Steep learning curve
Camera visualization of placement of coracoid bone block	Need to reposition torso if the procedure aborted for an open technique
Smaller subscapularis muscle split	Requirement of specific instrumentation
Capability to perform capsulolabral shift	Requirement of arm positioner device
Lateral decubitus positioning, which allows optimal glenohumeral joint visualization	
Minimal switching between viewing portals	

spreader (Smith & Nephew) is inserted through the posterior portal to spread the subscapularis musculature (Fig. 8).

Through the west and south portals, a heat ablation device is used to perform a subscapularis bursectomy and identify the anterior circumflex vessels and, more medially, the axillary and musculocutaneous nerves. The east portal is established 3 finger breadths medial to the tip of the coracoid process to be collinear to the glenoid face. The second low-profile subscapularis spreader is placed from anterior to posterior through the east portal, meeting the jaws of the first spreader, and separating the subscapularis in line with its muscle fibers (Fig. 9A). This creates a safe window to shuttle the coracoid to the glenoid while protecting the musculocutaneous and axillary nerves. The white suture is retrieved from the north portal and passed through the sleeve of the glenoid drill guide from anterior to posterior, seating the coracoid against the glenoid (Fig. 9B, C).

A suture tensioner (Smith & Nephew) is used through the posterior portal to seat the posterior EndoButton and tension the coracoid. The shoulder is then taken through range of motion to confirm stability (Fig. 9D).

Capsulolabral Repair

Once stability is tested, the arm is once more repositioned. The shoulder is placed in 60° of abduction with a bump placed in the axilla to help support the weight of the arm. The arm also is placed in neutral rotation with roughly 10° to 15° of elbow flexion to avoid excessive tension on the coracoid block. The arthroscope is placed back into the posterior portal, and the

capsulolabral tissues are repaired to the previously drilled holes with knotless suture anchors (Microraptor Knotless; Smith & Nephew), creating a superior shift and making the coracoid extra-articular (Fig. 10).

Postoperative Care

Portal sites are closed with nonabsorbable sutures, and an absorptive bandage is applied. A shoulder immobilizer with abduction bolster is used at all times for 2 weeks. Range of motion is begun at that time in addition to isometric scapular stabilization exercises. By 8 weeks, restrictions on range of motion are lifted, and concentric and eccentric strengthening is begun.

Discussion

Results from the arthroscopic Latarjet procedure have been reliably good and comparable to open techniques. Joty et al.⁶ compared the outcomes of open versus arthroscopic Latarjet, concluding that open and arthroscopic Latarjet provide similar outcomes. Dumont et al.⁷ reported on long-term outcomes of arthroscopic Latarjet procedure with encouraging outcomes. They reported no patients with recurrent dislocation in their retrospective study of 62 patients with a 5-year minimum follow-up. Additionally, early-term complication rates have been reported as similar between open and arthroscopic Latarjet procedures.³ This information, combined with the advantages of arthroscopy as opposed to open surgery, guided the senior authors' adoption of this technique.

We believe our technique has distinct advantages. First, using suture cortical button fixation removes the

Table 3. Pearls and Pitfalls

Pearls	Pitfalls
Carefully plan out all portals before beginning	Failure to debride all soft tissue around coracoid will complicate visualization after osteotomy
Adequately clear off anterior aspect of subscapularis to allow for precise placement of the splitting device	Osteotomy made with multiple passes of saw will lead to irregular surface
Deliberately place coracoid drill guide to allow for adequate bone block size	
Place arm in forward flexion when working in the anterior subdeltoid space	
Use of antegrade suture-passing device allows improved capture of capsulolabral tissues	

risk of screw breakage and negates the need for secondary surgery (Table 2). Additionally, Weick et al.⁸ addressed concerns regarding suture fixation and reported high rates of osseous healing using the cortical button fixation technique used here. Use of the specific drilling guide system mentioned allows for safe, accurate, and reproducible graft placement. The senior author has not had to burr a prominent coracoid graft since adoption of the technique-specific instrumentation. Lastly, we feel our technique provides distinct advantages for surgeons whose preferred patient positioning for shoulder arthroscopy is lateral decubitus, and we offer a few pearls and pitfalls in Table 3. We believe this positioning helps with orientation and instrument utilization.

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