



# Arthroscopic Latarjet: Tips for Success

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The Latarjet procedure remains the most favored technique in dealing with patients with recurrent shoulder instability, instability secondary to bony Bankart lesions, off-track lesions, bipolar lesions and in patients with Humeral avulsion of glenohumeral ligament (HAGL lesions). Traditionally this procedure has been performed as an open procedure; however, the Arthroscopic Latarjet procedure has been described with similar outcomes to that of open technique. This article describes our preferred technique for the Arthroscopic Latarjet procedure.

Oper Tech Sports Med 27:69-76 Crown Copyright © 2019 Published by Elsevier Inc. All rights reserved.

**KEYWORDS** arthroscopic, Latarjet, instability, shoulder, stabilisation, glenoid bone loss

## Introduction

Arthroscopic soft tissue repair of the capsulolabral complex (Bankart lesion) remains the most common treatment for patients with shoulder instability. The results of arthroscopic soft tissue repair surgery have been comparable to open anterior stabilisation.<sup>1</sup> However, in patients with recurrent shoulder instability, instability secondary to bony Bankart lesions involving more than 18%-25% of the articular surface, off-track lesions including bipolar lesions and in patients with Humeral avulsion of glenohumeral ligament (HAGL lesions) the outcomes of soft tissue reconstruction have been suboptimal and a bone-block procedure has been recommended.<sup>2,3,4</sup> Of the various bone-block procedures a Latarjet procedure or one of its modifications remains the most favored. The Latarjet procedure provides shoulder stability due to 3 main mechanisms:

- It increases the surface area of the glenoid thus preventing engagement of the Hill-Sach's lesions (static component)<sup>5</sup>
- The conjoint tendon provides a dynamic stability in the form of a "hammock" particularly when the shoulder is in abduction-external rotation.<sup>5</sup>
- This is further reinforced with the subscapularis split as the intersection of the conjoint tendon and the inferior

subscapularis add further tension in abduction-external rotation position.<sup>6</sup>

The Latarjet procedure has traditionally been described as an open procedure, however the arthroscopic variant has also been described.<sup>6</sup> There are several advantages of performing an arthroscopic Latarjet procedure. First there is better visualization of the graft placement relative to the articular surface of the glenoid. The arthroscopic technique also allows management of other concomitant lesions like posterior labral repair or a Superior Labrum Anterior to Posterior tear (SLAP) repair. It is easier to visualize the neurovascular bundle particularly medial to the coracoid thus reducing the chances of intraoperative neurovascular injury.

## Tips for Success

The surgical technique will be covered below, allowing the procedure to be performed safely, reliably, and quickly. However, the main tip for success is to operate on the correct patient for the correct indications as outlined above. The outcome of soft tissue stabilization surgery in the young collision athlete with bone loss is poor with high failure and subsequent revision rates.<sup>2</sup> Our primary procedure for this patient group is the Arthroscopic Latarjet.

The procedure may seem initially daunting, but once broken down into its 5 parts, it becomes achievable. Before I started performing this procedure, I visited 2 experienced surgeons, namely Laurant Lafosse in Annecy, France and Emillio Calvo in Madrid, Spain. Become familiar with the anterior shoulder compartment

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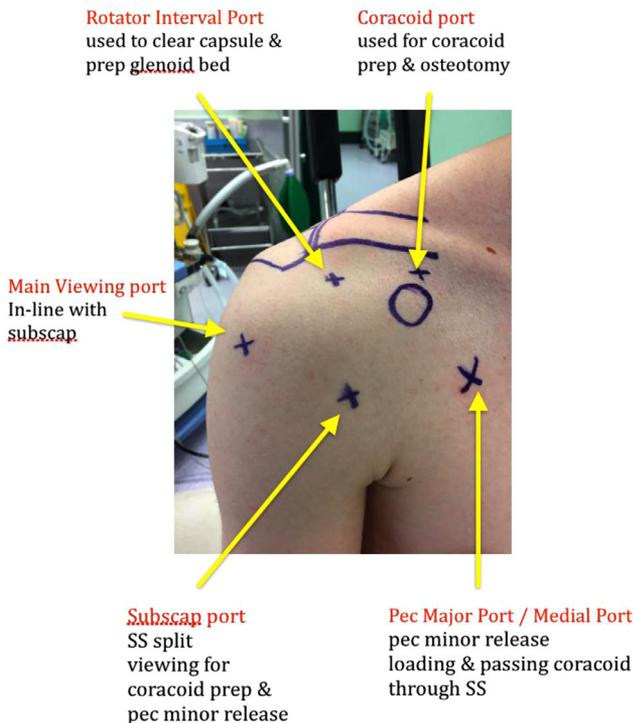


**Figure 1** Surgical theatre.

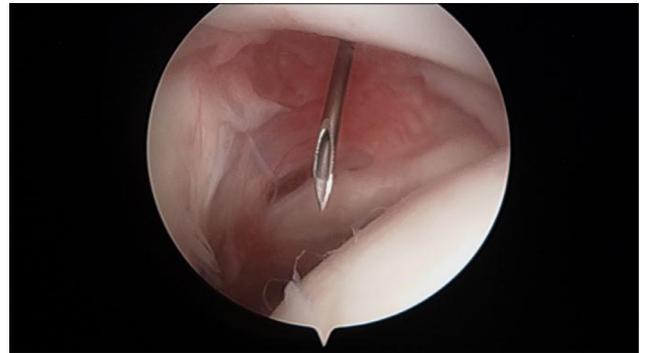
and subdeltoid space during routine arthroscopic procedures. The next step is to perform the procedure in a cadaveric setting and then if possible with a local mentor.

Initially I had each of the 5 steps and port positions printed, laminated, and attached to the laminar flow curtain in my theatre. Each of the 5 steps is straightforward; the difficulty is linking them together and letting the procedure flow. See theatre image below [Figure 1](#).

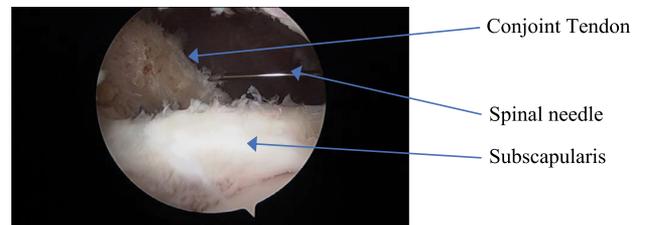
## Surgical Technique



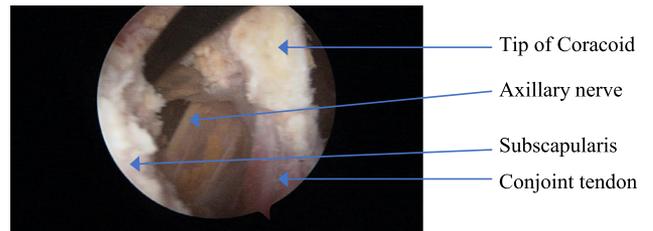
**Figure 2** Arthroscopy ports for arthroscopic Latarjet.



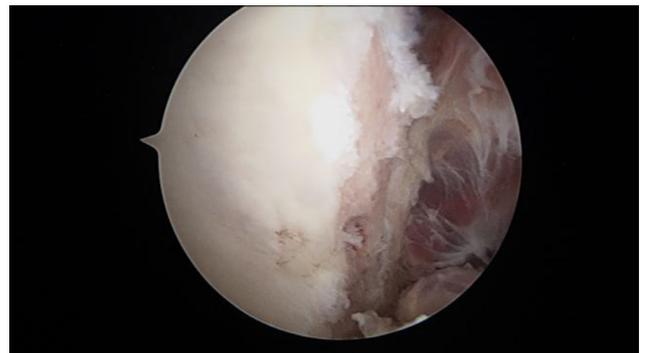
**Figure 3** Initial rotator interval port.



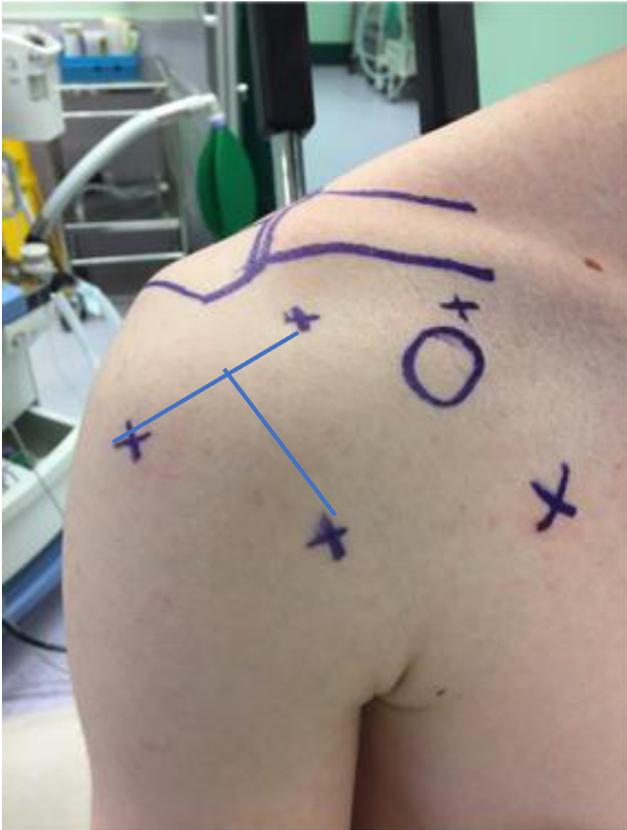
**Figure 4** Main (In-line Subscap) viewing port.



**Figure 5** Axillary nerve (viewing from main in-line subscap port).



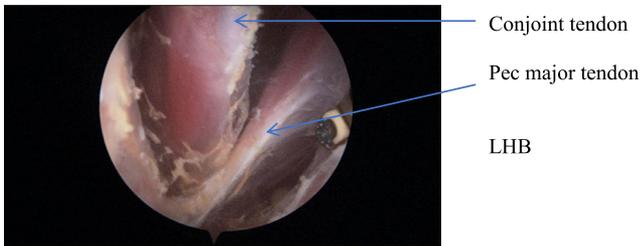
**Figure 6** Glenoid bed preparation for coracoid graft (previous failed soft tissue stabilization with cyst around old glenoid anchor).



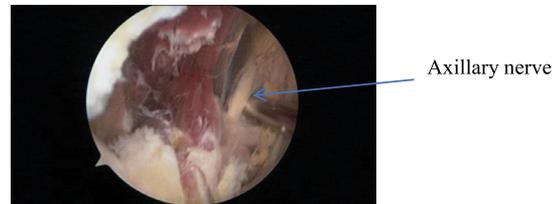
**Figure 7** Subscap split port identified using Getel T method.



**Figure 9** Medial port identification.



**Figure 8** Pec major visualization (main viewing port looking inferiorly).



**Figure 10** Subscapularis split and visualization of the axillary nerve and glenoid bed, looking through the subscapularis split.

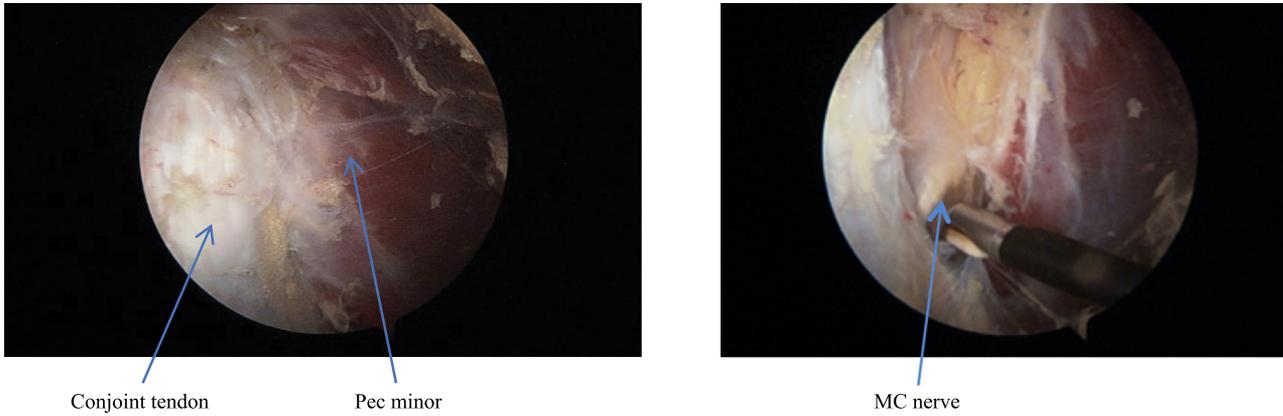
The arthroscopic Latarjet technique can be divided into 5 major steps: -

1. Joint visualization, exposure, and preparation
2. Subscapularis split
3. Coracoid graft harvesting
4. Coracoid graft transfer
5. Coracoid graft fixation

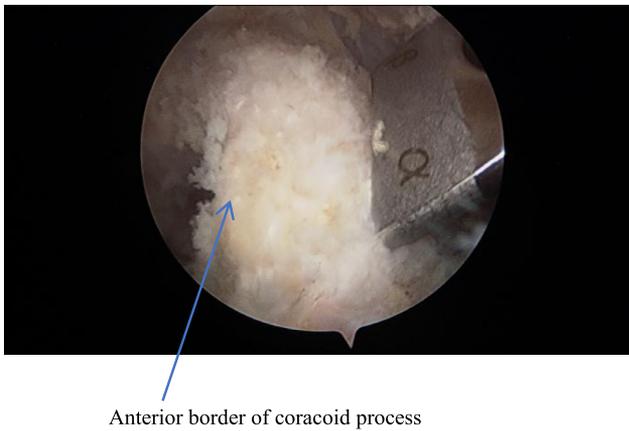
### Joint Visualization, Exposure, and Preparation

We routinely perform this procedure with the patient in the 'beach-chair' position using the Trimano (Arthrex, Naples, FL) arm support system to get the shoulder in the desired position

intraoperatively. Rotate the head away from the surgical site. This allows access to the coracoid port later in the procedure. Initially enter the joint using a standard posterior viewing portal with a 30° scope. Figure 2 shows the ports we use for arthroscopic Latarjet. Once a diagnostic arthroscopy is performed the anterior portal is created in the rotator interval (RI) using an outside-in technique with the help of a spinal needle. This has to be high in the RI, it will facilitate access for glenoid neck preparation and prevent scissoring of instruments used in the main viewing port (Fig. 3). The middle glenohumeral ligament is cleared and a plane is created between the capsule



**Figure 11** Pec Minor visualization and musculocutaneous nerve, viewing from subscap split port, radio frequency (RF) wand in medial port.



**Figure 12** Drill placement on the coracoid process, parallel to the anterior surface.

and subscapularis. Using the same high anterior portal, RI clearance is also performed and a plane created anterior to subscapularis between the subscapularis and conjoint tendon. The posterior surface of the coracoid, the coracoacromial ligament and the conjoint tendon are all visualized now. The

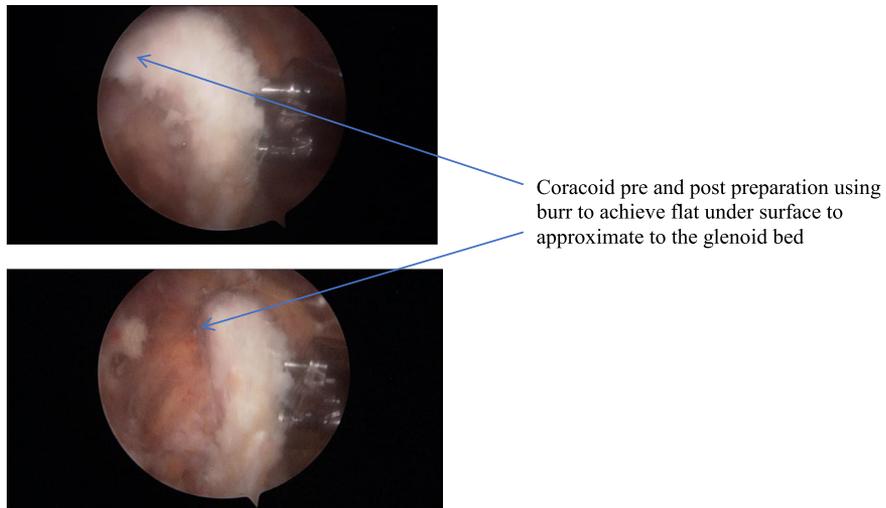
coracoacromial ligament is released from the coracoid process to expose the superior surface of the coracoid, the surface through which the wires and drill holes will go.

The under surface of the coracoid is cleared as this will be the surface in contact with the glenoid neck. So far all the RI clearance has been performed through the single high RI port. Next the main viewing port is made, which is parallel and 1 cm anterior to the superior border of the subscapularis (Fig. 4) Using a switching stick in the main viewing port, railroad the scope cannula and move the optic to view through the main in-line subscap viewing port.

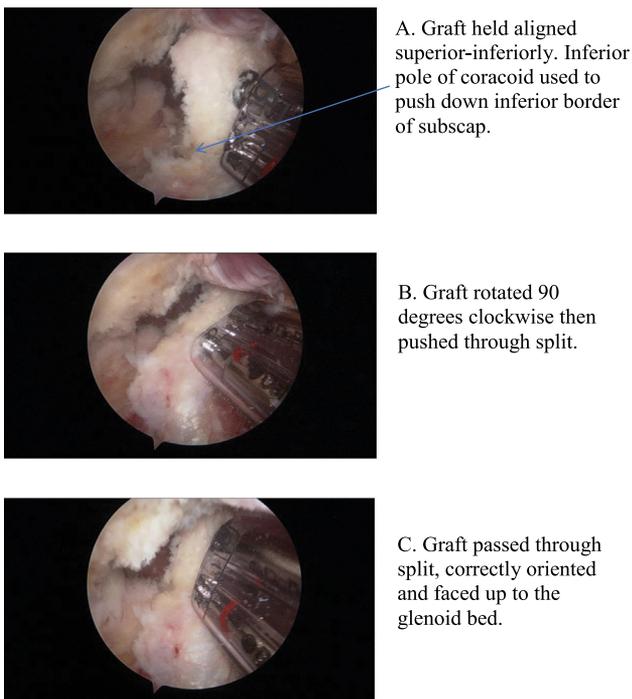
Using this portal as the viewing portal and a radio frequency wand in the RI port, release medially in the plane between the subscapularis and conjoint tendon. Further medially the Axillary nerve can be visualized (Fig. 5). The glenoid neck is prepared using a shaver or a bone-burr to achieve a flat, bleeding glenoid bed for graft incorporation (Fig. 6). Next create the port to enable the subscapularis split and clearance of the conjoint tendon down to the pectoralis major. To create this port, draw a line between the RI port and main viewing port, half way along this line drop a perpendicular line of the same length between the 2 ports (Fig. 7), a method I learnt from Mark Getelman MD.



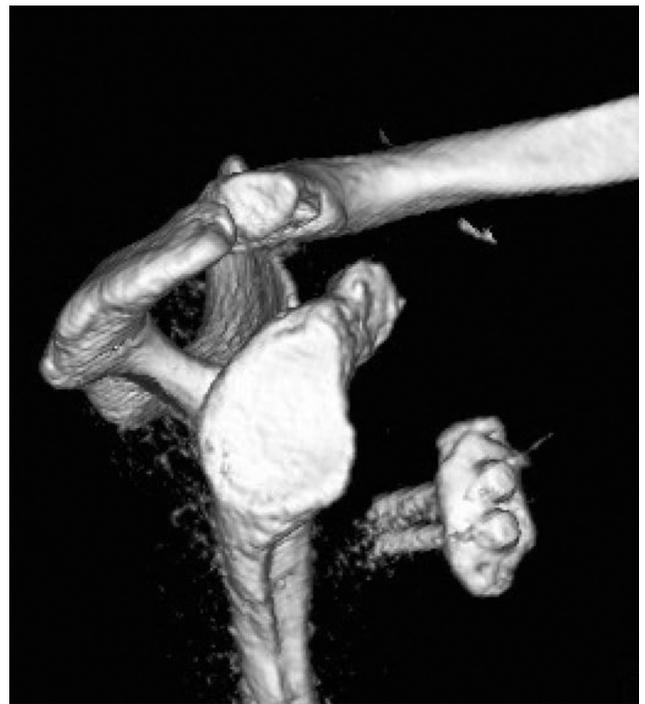
**Figure 13** Top hat placement in coracoid and coracoid osteotomy.



**Figure 14** Loading the graft onto the guide using the cannulated drill sleeves and coracoid preparation with burr.

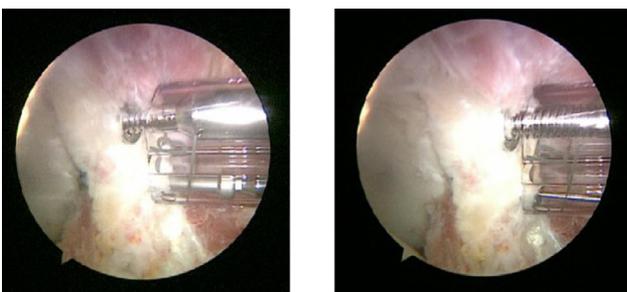


**Figure 15** A,B,C. Coracoid graft passage through subscapularis split A.



**Figure 17** Early graft displacement.

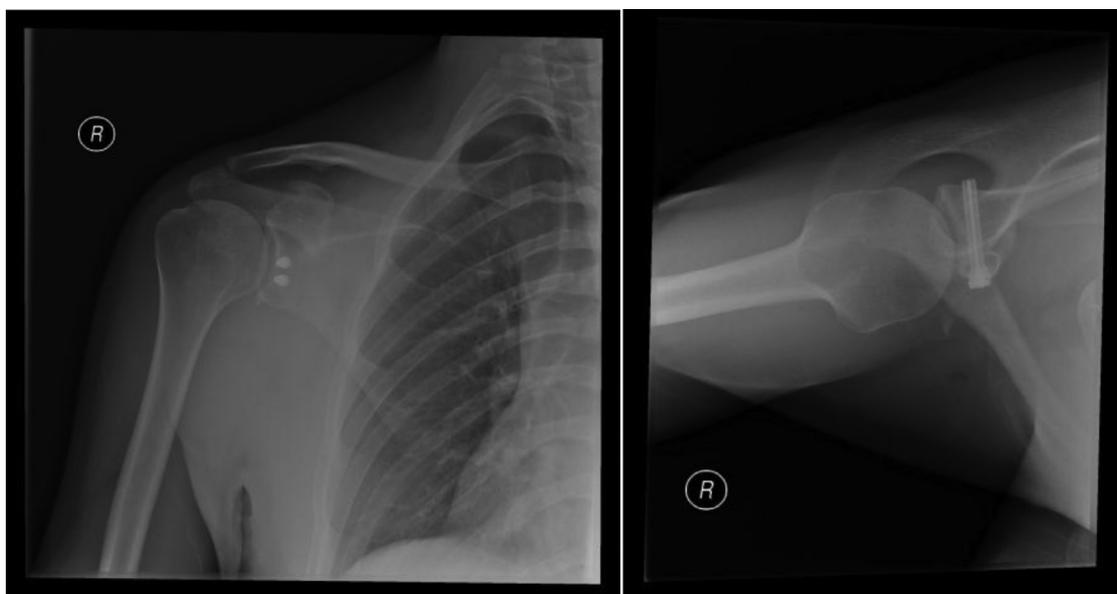
Inferiorly the clearance is achieved until the superior border of the Pectoralis major is visualized (Fig. 8)



**Figure 16** Final graft placement.

### Subscapularis Split

Pass a long switching stick through the posterior port flush with the glenoid face, advance the switching stick through the subscapularis. The level of the split is determined either from inside the joint or from the subdeltoid space. From inside the joint, the switching stick from the posterior port is leveled at the 4:30 clock face position of the glenoid, advance straight through the subscapularis from this position. From



**Figure 18** Postop plain films.

the subdeltoid space, use the upper border of the subscapularis as a reference point, position the split two-thirds the way down the tendinous part of the subscapularis which equates to about half way down the whole musculotendinous insertion.

The Medial port is the one that concerns most surgeons, it is actually very safe. It is medial to the conjoint tendon, but at that position the plexus is moving away from the field of view into the axilla. Locate the medial port from the outside as per [Figure 9](#). It's an extrapolation of the glenohumeral joint line from the posterior port. It is also identified using an outside in technique. With the switching stick passed through the subscapularis, use a spinal needle from anteriorly to locate the correct port position. When the tip of the spinal needle touches the switching stick in plane, the port is correct. Passing a short switching stick from this subscapularis split port the conjoint tendon along with the brachial plexus is retracted medially and the long switching stick from the posterior port is advanced anteriorly through the subscapularis and lateral to the conjoint tendon. Thus both the long (posterior port) and short (anterior subscapularis split port) switching sticks are used to retract the conjoint tendon medially. Check that the axillary nerve is medial to the long switching stick. A radio frequency probe, introduced through the subscap splitting/inferior port, is used to create the split in the subscapularis working from the switching stick laterally, with the knowledge that the axillary nerve is safe being medial to the switching stick. Care is taken to be parallel to the upper border of the subscapularis. Split the muscle medially, keeping the axillary nerve in view, until the prepared glenoid neck is fully visualized ([Fig. 10](#)).

### Coracoid Graft Harvesting

Viewing from the subscap port just above the axillary fold and working through the medial port, the Pectoralis minor tendon is released from the coracoid. The plane between the

conjoint tendon and the pectoralis minor tendon is determined medial to the coracoid tendon inferiorly and the release is done superiorly to the coracoid. The musculocutaneous nerve is often located inferiorly between the conjoint tendon and inferior border of the pec minor ([Fig. 11](#)). Once the Pectoralis minor tendon is completely released from the coracoid along with other soft tissues it facilitates the mobilization and transfer of the coracoid graft through the subscapularis split. Clear the superior aspect of the coracoid until the fibers of coracoclavicular ligaments are seen. Using a spinal needle from outside to in, create the coracoid port. The spinal needle is passed so that it lies perpendicular to the plane of the coracoid both medial-lateral and superior-inferior. Make a 2 cm skin incision, blunt dissect down to the coracoid to ensure that the cephalic vein is not damaged during drill insertion. We use the arthroscopic Laterjet drill guide (DePuy) to predrill the coracoid. This has 2 slots “ $\alpha$  and  $\beta$ ” through which 2 guide wires are passed parallel to each other. The  $\alpha$  guide-wire is distal toward the tip of the coracoid and the  $\beta$  toward the base. Pass the first guide wire through the  $\alpha$  slot about 1 cm proximal to the tip of the coracoid and in the mid line of the coracoid in the anteroposterior plane. The  $\beta$  wire is passed in line with the anterior surface of the coracoid. The coracoid should be viewed from different portals to ensure that the wires are parallel and in the middle of the coracoid ([Fig. 12](#)). Now drill over the guide-wires using a step-drill and insert top hats in the predrilled slots.

Create a stress riser on the undersurface of the coracoid at its base using a shaver before the osteotome to prevent propagation of fracture down the glenoid neck. Now bring the curved osteotome from the coracoid port and complete the osteotomy ([Fig. 13](#)). Once the coracoid is completely osteotomized and free, pass the coracoid graft holder through the medial port. Insert the cannulated screw sleeves through the top hats and drill holes in the coracoid. You will now have control of the graft. Free the coracoid of the remaining

soft tissue attachments and prepare the coracoid graft using a shaver, aiming to achieve a flat underside of the glenoid to optimally fit to the glenoid graft bed (Fig. 14).

### Coracoid Graft Transfer

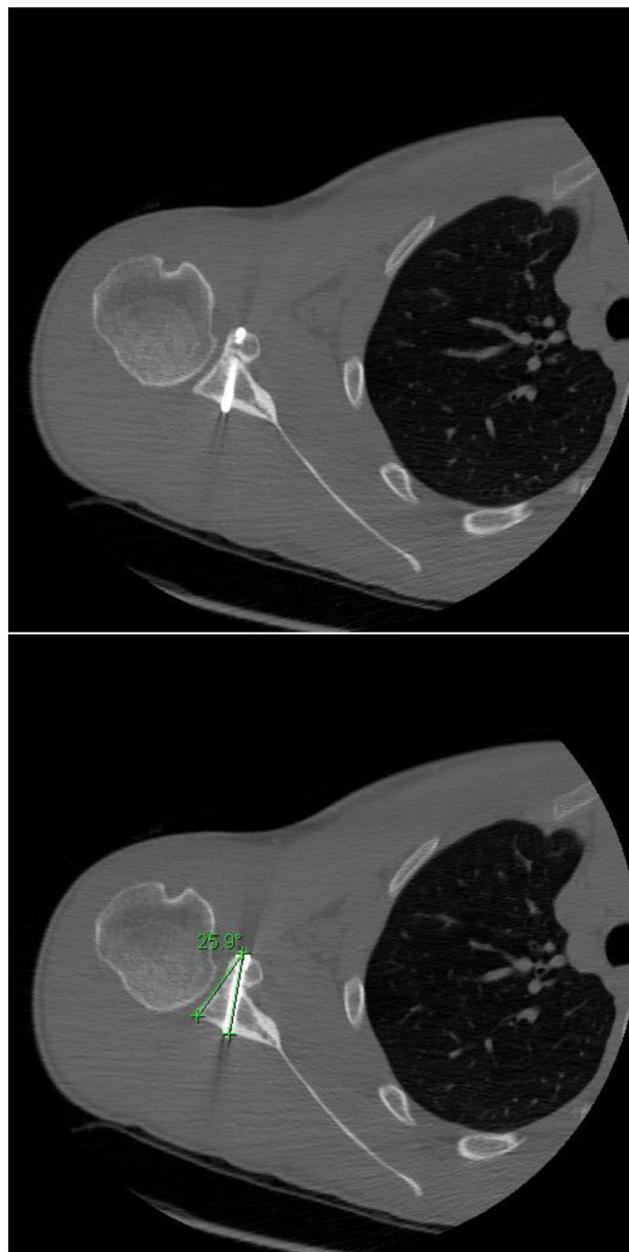
Once the coracoid is adequately prepared, pass the graft through the subscapularis split. To ease the passage pass a long switching stick through the posterior port passing it through the subscapularis split and either lift the superior half up or the inferior half down. Now pass the coracoid graft through the split in a rotating maneuver (Fig. 15). Initially use the tip of the coracoid to push inferiorly the lower half of the split subscapularis. Rotate the graft 90° (clockwise for a right shoulder) so that it is horizontal and will pass through the split easier. Advance the graft through the split, rotate back to the vertical position once through the subscap.

### Coracoid Graft Fixation

Once the graft is passed through the subscapularis split and seated on the glenoid bed (Fig. 16.) pass a long guide-wire through the  $\alpha$  drill sleeve all the way exiting posteriorly through the skin. Remove the drill sleeve, drill over the guide wire measuring the length of the screw off the drill. Insert the appropriate length cannulated screw over the guide-wire but do not completely tighten the screw. Repeat the same process for the proximal screw through the  $\beta$  slot. Once both the screws are seated remove the guide-wires from posteriorly, and do a final tightening of the graft to achieve the desired amount of compression. Finally check through various portals that the graft is flush with the glenoid articular surface and that the conjoint tendon has adequate excursion through the subscapularis split to allow adequate external rotation.

### Postoperative Management

Postoperatively all the patients undergo a structured protocol-based rehabilitation program under the supervision of a musculo-skeletal therapist. The patients remain in a polysling for 4 weeks during which they can perform active and passive assisted range of motion exercises. Once the sling comes off at 4 weeks, they undergo more rigorous physiotherapy where they are allowed full range of movements both active and passive and also commence working on strengthening exercises. At 8 weeks postoperatively we routinely obtain a CT scan to assess graft incorporation to the glenoid. At this stage provided the patient has clinically recovered and the CT scan shows satisfactory bone graft incorporation, patients are allowed to increase their activity with a view to returning to contact sport at the 3-4 month postop mark. We routinely follow our patients for a minimum of 6 months. Using this technique, the senior author has performed over a 100 Arthroscopic Latarjet procedures with excellent/good results in the vast majority of the patients. The surgical time is comparable to an open Latarjet procedure at approximately 1 hour. Our complication profile is low, no infections, 2 temporary musculocutaneous nerve injuries lasting



**Figure 19** Postoperative axial CT scan.

less than 3 months, no axillary nerve injuries. Regarding the graft, we had 3 graft fractures, 1 following repeat trauma and 2 due to poor drill hole position in the graft. We have had 2 cases where the graft fixation failed early, within 1 week. One of which was because only 1 screw was used in the coracoid, therefore insufficient fixation. The second was good screw position in the graft but poor patient choice (Fig. 17).

So far we have revised 3 arthroscopic Latarjet's for recurrent instability, all these cases were poorly controlled epileptics with large glenoid bone loss. We do not perform this procedure on this group of patients; we use a large iliac crest allograft.

Figure 18 shows postop plain films; Figure 19 shows a postoperative axial CT scan. There has been a drive to achieve a screw to glenoid face angle of 15°. As you can see



**Figure 20** CT sagittal en face glenoid view.

from the CT scan, an angle of  $25^\circ$  was achieved. To help reduce the screw to face angle traction is taken off the shoulder before inserting the guide wires, the arm pushed posteriorly, which has the effect of retracting the scapula and retroverting the glenoid face. We think it is more important to achieve a good graft to glenoid position rather than a

radiographical screw to face angle. Figure 20 shows an en face view of the glenoid postoperatively. The superior screw is uncovered due to bone remodeling. This is a form of lysis of the graft but always involves the superior screw. Due to the placement of the screw in the coracoid, just posterior to the midline axis, the screw heads are not prominent in the joint; they are on the glenoid neck.

With the correct training, the Arthroscopic Latarjet procedure is a safe, reliable, low risk procedure used to treat patients with bone loss instability.

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