Technical Note

Arthroscopic All—Intra-articular Revision Eden-Hybinette Procedure for Recurrent Instability After Coracoid Transfer

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Abstract: Failure, in the form of recurrent shoulder instability, following a coracoid transfer procedure presents a challenging problem. Successful treatment with a revision Eden-Hybinette procedure, by both an open and arthroscopic approach using screws to secure the bone graft, has previously been reported. However, both the open and arthroscopic approach have required careful dissection through the distorted soft-tissue anatomy in the anterior compartment in front of subscapularis to gain access to the front of the glenoid through a muscle split. In this article, we describe a modification of an arthroscopic Eden-Hybinette technique that is undertaken intra-articularly and only requires portals through the rotator interval. This technique avoids having to undertake any extra-articular dissection in the anterior compartment and can address potential problems with retained metalwork and pre-existing anchor voids within the glenoid. In this Technical Note, we describe and highlight the pearls and pitfalls of an all—intra-articular arthroscopic revision Eden-Hybinette procedure.

Failure, in the form of recurrent shoulder instability, following a coracoid transfer is rare. However, when it does occur, it can present as a challenging problem. If a revision procedure is to be undertaken, consideration of pre-existing anchors, metalwork, glenoid bone loss, and scar formation with distortion of the normal anatomy, particularly around neurovascular structures, must be considered (Fig 1).

A revision open Eden-Hybinette procedure, using either an autograft or allograft bone block with screw fixation, for a failed coracoid transfer has been shown to give good results.[1,2] More recently, an open technique using suture button fixation to address retained glenoid metalwork and a revision arthroscopic bone block technique, requiring meticulous dissection around the anterior neurovascular structures, have also been described.[3,4]

The aim of this Technical Note is to present a modification of an all intra-articular arthroscopic Eden-Hybinette procedure, using suture button fixation, for the treatment of a failed coracoid transfer.[5] This technique is undertaken using anterior portals passing through the rotator interval only, and so avoids any requirement for dissection of the distorted anatomy in the anterior compartment in front of the subscapularis. The additional advantage of using a posterior drill guide and suture buttons for the fixation is that it is potentially easier to "navigate" around any retained metalwork within the glenoid, less void compromised bone stock is removed, and no further metalwork is left behind, which could aid further surgical options in the future.[4]

Surgical Technique

Management of Existing Metalwork

Patients who require a revision Eden-Hybinette procedure for a failed coracoid transfer will have some form of metalwork, and potentially bone voids, within the glenoid. The coracoid bone block will have usually been fixed with a screw and, following failure,

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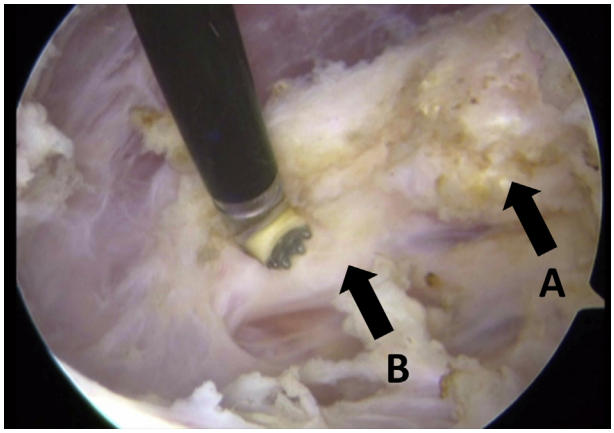

Fig 1. Diagnostic arthroscopy. Viewing the left shoulder from a posterior portal with the 30° scope rotated medially, the rotator interval has been taken down and the top of subscapularis can just be seen at the bottom of the image. The stump of the coracoid has been skeletonized (arrow A), and a band of abnormal fibrous tissue is running from the tip of the coracoid and blending into the anterior compartment (arrow B). The radiofrequency probe introduced from a far lateral portal, while clearing the surrounding tissue, has just created a violent muscular contracture in keeping with stimulation of a nerve.

either the bone block will have failed to heal, broken off, and be stuck within the subscapularis and anterior tissues or the conjoint tendon will have pulled off of the bone. In all of these situations, the screw heads will be protruding from the front of the glenoid and be within the joint, as any capsular repair will have failed following subsequent dislocations (Fig 2).

It is possible to remove screws arthroscopically through the anterior portal, with an appropriate screw driver, at the beginning of the revision procedure. This can be aided by retraction of the scapula, which rotates the glenoid and the screw heads into a more coronal plain (Video 1).

A potential concern is that for technical reasons, it may not be possible to easily remove the screws and so that any further part of the arthroscopic procedure may have to be abandoned. It is important to legislate for this by either warning the patient at the time of explaining and consenting for the procedure or considering undertaking a diagnostic arthroscopy and removal of the screws as a separate procedure prior to the definitive arthroscopic revision procedure.

Management of Retained Metalwork

Any retained metalwork within the glenoid, in the form of previous metal anchors, snapped off screw shafts, or significant bone voids (as the result of resorption of previous bioabsorbable anchors), may compromise implant positioning and screw hold at the time of revision surgery (Fig 3). The advantage of the jigged posterior drill guide system that is used for the arthroscopic Eden-Hybinette technique, is that it is possible to preplan, off of a computed tomography (CT) scan, a drill trajectory that can avoid any retained metalwork within the glenoid.

The preplanned jig position can be determined using an anterior axial CT cut that is tangential to the axis of the glenoid (Fig 4). The offset of the drill guide tip, when positioned flush on the glenoid, is 4 mm medial to the anterior edge of the articular surface. A vertical line is drawn on the CT scan, 4 mm from the articular edge of the lower quadrant of the glenoid. The preset distance between the drill holes on the jig is 10 mm, and the drill hole diameters are 2.8 mm. A position can then be selected along the vertical line where two 2.8-mm-diameter circles, 10 mm apart, can be placed avoiding any of the pre-existing metalwork. This point represents the position for the drill guide.

The distance from this point down the vertical line to the inferior edge of the glenoid can then be measured. This can then be used as a reference point at the time of surgery to position the drill guide.

Patient Positioning

Having obtained informed consent, the patient is anesthetized with a general anesthetic and an interscalene nerve block. Prophylactic antibiotics are administered before commencing the procedure. We prefer to use an iliac crest autograft bone block, harvested from the ipsilateral side. However, an allograft bone block is also an option.

The patient is initially positioned in the beach-chair, making sure that the scapula is completely free and accessible. Having secured the patient, the back of the table is then lowered until the patient is flattened sufficiently to gain full surgical access to the ipsilateral iliac crest. The shoulder and iliac crest are then prepped, the

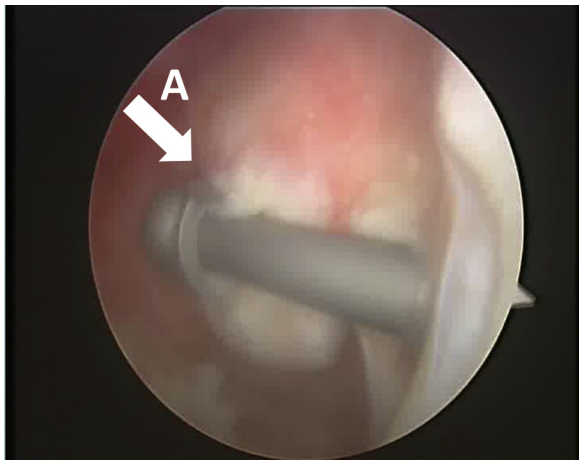

Fig 2. Arthroscopic view, from the posterior portal, of a left shoulder showing an exposed screw shaft and head following a failed coracoid transfer. The coracoid bone has resorbed (arrow A) and the conjoint tendon has snapped off.

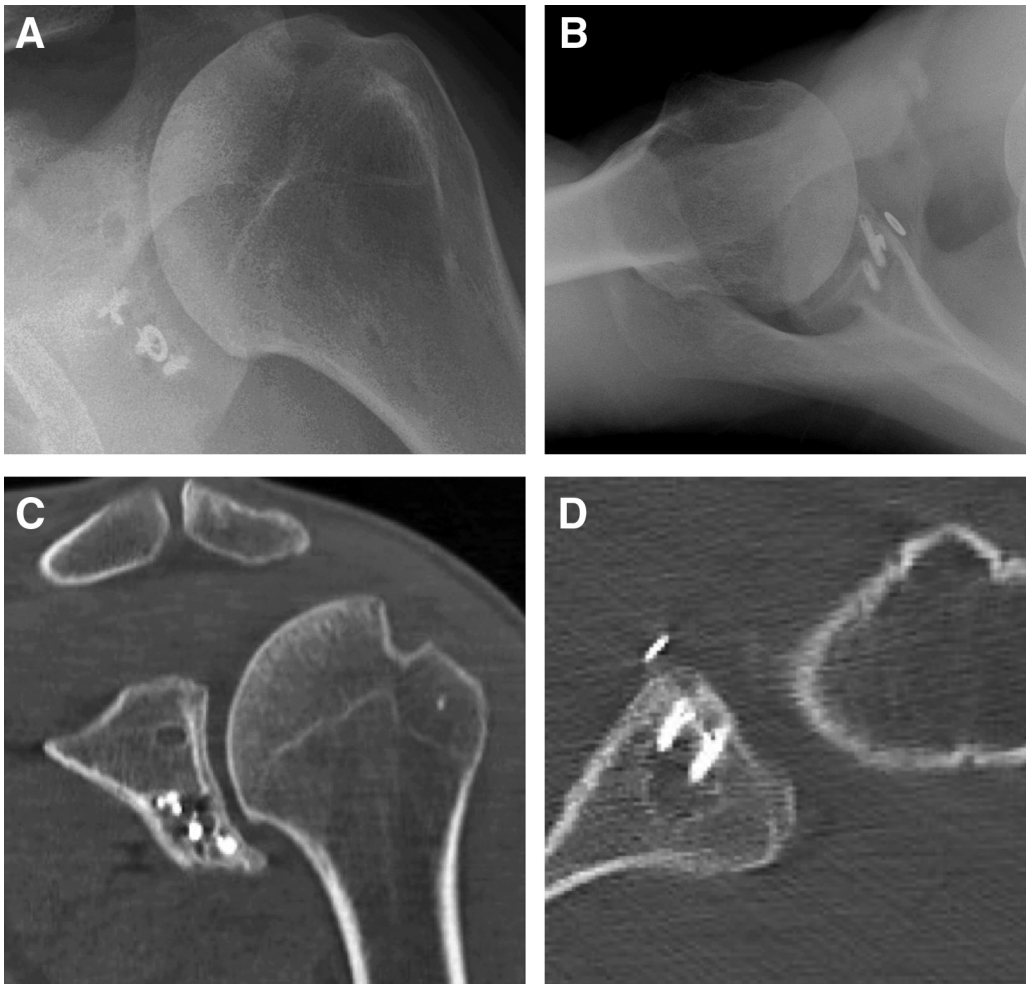

Fig 3. Preoperative imaging of a patient who had had 3 previous stabilization procedures of the left shoulder, including a coracoid transfer, that had failed and requiring a revision arthroscopic bone block procedure. The coracoid fixation screw had previously been removed. (A, B) AP and axial plain radiographs showing 3 metal suture anchors within the glenoid and a washer. Previous drill holes and bone voids can also be seen. (C, D) Coronal and axial CT scans showing the retained metalwork within the glenoid with significant bone voids. A Hill-Sachs lesion can be seen in the humeral head on the coronal view. (AP, anteroposterior; CT, computed tomography.)

iliac crest is square-draped, and the shoulder is then draped over this.

Bone Block Harvest and Preparation

The autograft is harvested using a standard approach and dissection over the anterior end of the iliac crest. A 20-mm-long tricortical graft is harvested using an osteotome cutting down to just over 10 mm at either end. Bone wax is inserted into the exposed cancellous bone in the donor site and the wound closed in layers.

The tricortical graft is then fashioned to a 20 × 10 × 10-mm block. It is then positioned and secured into a custom clamp (Smith & Nephew, Andover, MA; Fig 5). A drill guide arm attached to the clamp, with two 2.8-mm drill holes 10 mm apart (corresponding to the glenoid drill guide), is then rotated over the graft. This can be moved up and down to choose the optimal position for the spaced drill holes in the bone block. When the best position has been selected, the guide is locked into position and the holes drilled through the bone block using the drill with its outer sheath.

Having drilled the bone block, 2 suture button devices (Smith & Nephew) are inserted into the drill holes with the sutures being passed through from the cortical surface, so that the button and eyelet are engaged into the cortical bone. Having loaded the suture buttons into the bone block, the sutures are passed through a 15-mm cannula, which would be used for arthroscopic insertion, and the bone block then pulled through the cannula to check for easy passage. If there is any difficulty in passing the bone block it can be trimmed, using a bone nibbler, until it passes through freely.

Intra-articular Glenoid Preparation

Having prepared the bone graft, the shoulder joint is examined arthroscopically, initially viewing from a

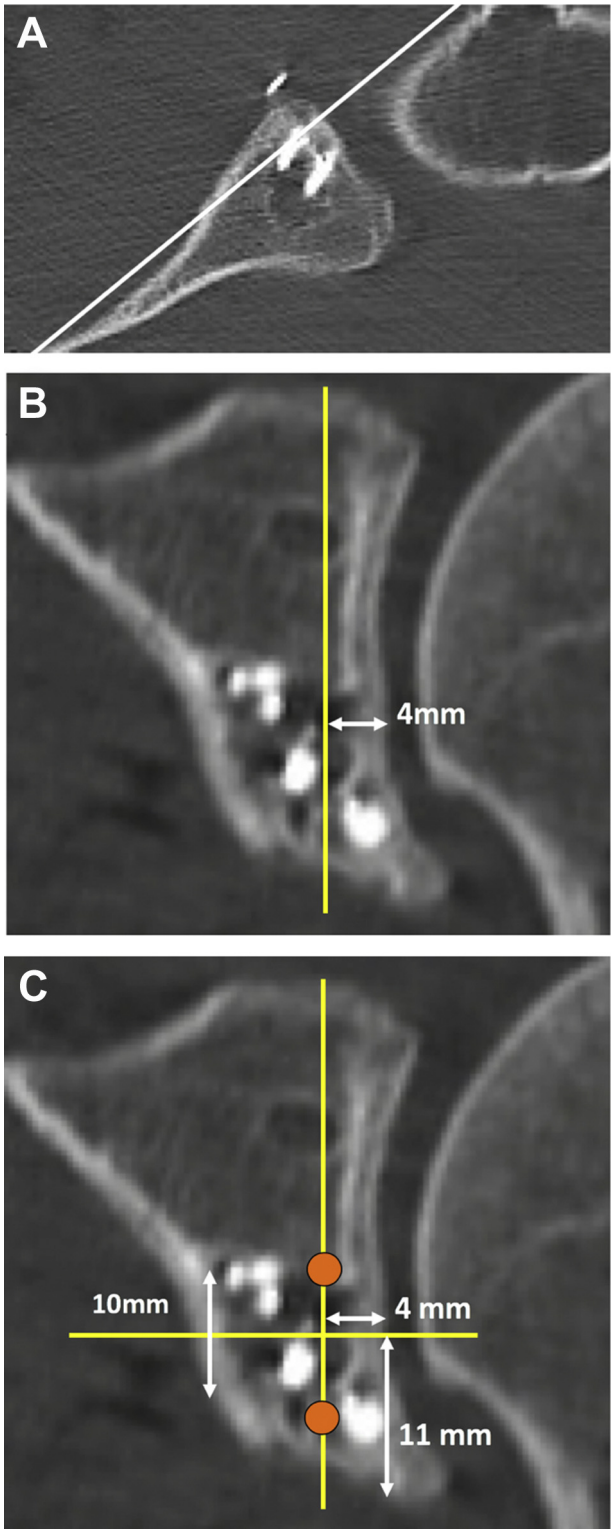

Fig 4. Preoperative planning CT scan of the left shoulder for the patient in Fig 3. (A) Scout view of the selected tangential axial cut from the front of the glenoid. (B) Chosen axial image with vertical line 4 mm from the edge of the lower quadrant of the glenoid, corresponding to the position of the tip of the drill guide. (C) Position selected for two 2.8-mm drill holes 10 mm apart on the 4-mm vertical line, avoiding the metal anchors. (CT, computed tomography.)

posterior portal. A standard anterior portal is then established, with a cannula, through the rotator interval. A far lateral portal is next established, again with a cannula, using a spinal needle and outside-to-in technique so as to determine the correct position of insertion. This should be just anterior to the long head of biceps medial pulley with an angle of entry 1 cm above and parallel to the superior edge of the subscapularis tendon. Any residual tissue, old sutures, and metalwork from previous surgery are then removed from the front of the glenoid using a combination of the shaver and radiofrequency probe.

The arthroscope is then repositioned to the anterior portal; this gives a good view of the anterior surface of the glenoid and its articular surface. The burr is introduced through the far lateral portal, which provides an excellent angle of insertion parallel to the front of the glenoid. The glenoid is then prepared, creating a bleeding, flat decorticated surface with sufficient medial extension to accommodate the graft (Fig 6A).

Drill Guide Positioning and Glenoid Drilling

Having prepared the glenoid, a slit cannula is introduced through the posterior portal between the humeral head and glenoid articular surface. To protect the articular surfaces the cannula is depressed inferiorly and the aiming arm for the posterior glenoid jig (Smith & Nephew) introduced along its longitudinal axis, with the 4-mm offset pointing inferiorly along the cannula until it is past the front edge of the glenoid. Once the aiming arm has been inserted, the slit cannula is removed and the arm rotated 90° so that the 4-mm offset tip is pointing medially. The arm is elevated between the articular surfaces so that it sits flush to the glenoid articular surfaces and the aiming tip is sitting 4 mm medially over the front edge of the glenoid.

The height of the bone block on the glenoid should ideally be positioned at the top of the lower quadrant of the glenoid. The offset tip of the aiming arm is then adjusted so that it sits in the desired position.

For a case where there is retained metalwork, the desired position for the aiming tip on the front of the glenoid is preplanned, as described earlier. The vertical distance from the inferior edge of the glenoid to this point has been calculated and, using the width of the jig, which is 3 mm, the tip is "advanced" up the front of the glenoid to the desired position (Fig 6B).

Once the tip of the jig is in position, through a 2-cm incision made over the back of the scapula, the 2 drill guide bullets are slotted into the back of the jig and ratcheted down onto the posterior surface of the scapula. Once in position, the jig system is securely fixed into place (Fig 7).

While continuing to view from the far lateral portal, the assistant drills a 2.8-mm drill bit, with its outer sleeve, down each of the drill guide tubes. As each hole

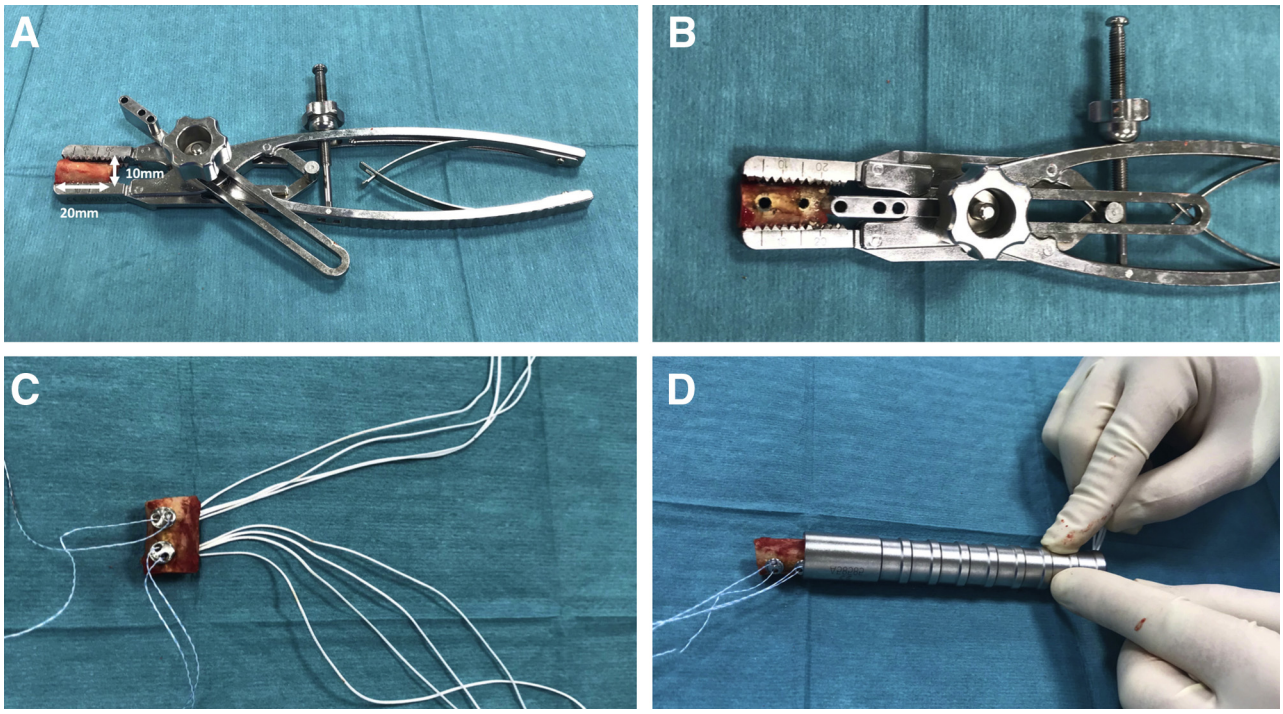

Fig 5. Graft preparation. (A) A tricortical autologous bone graft has been harvested from the iliac crest, trimmed to size (20 x 10 x 10 mm) and loaded into the custom clamp. (B) Using the drill guide from the clamp, two 2.8-mm drill holes have been made in the bone graft 10 mm apart. (C) Suture buttons have been inserted into each drill hole, with the buttons loaded into the cortical bone. (D) The tails of the suture buttons have been passed through the 15-mm cannula, and the graft construct is being pulled through to check for easy passage.

is being drilled, the anterior glenoid is viewed, to check that the drills are exiting the bone at the correct position. The drill bits are then pulled out, leaving the outer sleeves positioned in the bone (Fig 6C).

Graft Insertion and Positioning

Having drilled the 2 glenoid drill holes, with the outer sleeves left in situ, the sutures from each of the graft suture buttons are then passed through the drill holes using a suture shuttle technique.

First, the arthroscope is repositioned into the posterior portal. The cannula from the anterior portal is removed and, using the radiofrequency probe, the split in the rotator interval is extended superiorly and inferiorly. This is to allow sufficient space for the 15-mm graft insertion cannula, which is then inserted.

With the arthroscope positioned back into the far lateral portal, a No. 0 PDS (polydioxanone) suture is inserted into the posterior end of the superior outer sleeve, by the assistant. The suture is fed down the sleeve and, as it appears out of the sleeve on the anterior glenoid, is grasped by a suture retriever and pulled out of the 15-mm cannula at the front of the joint. This process is then repeated for the inferior

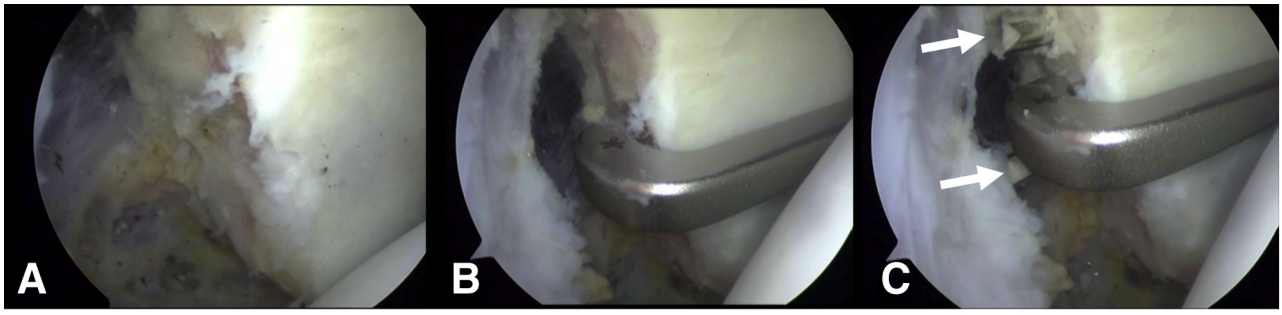

Fig 6. Glenoid preparation. Arthroscopic view of the left anterior glenoid with the scope in the far lateral portal. (A) The anterior glenoid has been fully prepared with a flat, decorticated surface. (B) The drill guide has been inserted and the tip positioned 11 mm up from the inferior edge of the glenoid. (C) The superior and inferior drill holes have been made, and the drill bits have been removed, leaving the 2 outer drill sleeves in position (black arrows).

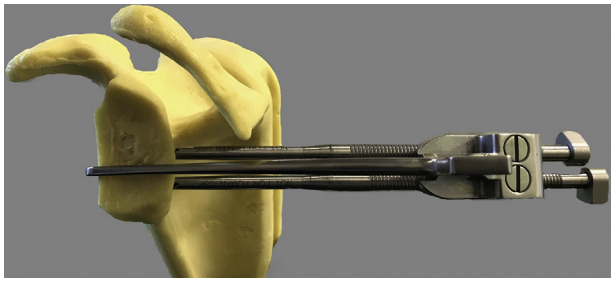

Fig 7. Jig fixation. The guide arm and tip have been placed in the desired position on the left anterior glenoid. The 2 drill guide bullets have been inserted and ratcheted down onto the posterior glenoid.

sleeve. Meticulous suture management is needed to avoid the sutures crossing within the cannula (Fig 8).

The tail from one of the bone-graft suture buttons is then attached, using a simple knot, to the PDS suture from the superior sleeve. Again, making sure that none of the sutures cross, the tail from the second suture button is attached to the PDS suture from the inferior sleeve.

Inserting a probe down the 15-mm cannula to help with suture management, the assistant then pulls, from the back, on the superior PDS suture. This will pull the bone block into the cannula by its superior end. By continuing to pull on the superior suture, while taking up the slack on the inferior suture, the bone block is dragged down the 15-mm cannula by its superior end and into the joint. Once the posterior end of the bone block has passed out of the 15-mm cannula and into the joint, the inferior PDS suture is pulled tight. This will flip the bone block into a vertical position, and then both of the sutures can be pulled equally, approximating the bone block onto the anterior glenoid.

Graft Fixation

Once the graft is in a satisfactory position, both of the outer sleeves are pulled out of the bone posteriorly. The sutures from the 2 suture buttons are then pulled tight and, using the probe to control rotation, the bone graft is then pulled very tightly onto the prepared bone on the anterior glenoid.

While maintaining the tension on the inferior sutures, the 2 looped sutures from the superior button are separated and each passed through a separate eyelet in a posterior button. Once loaded, by pulling the 2 suture loops apart, the button is pushed down onto the posterior cortex of the glenoid (Fig 9).

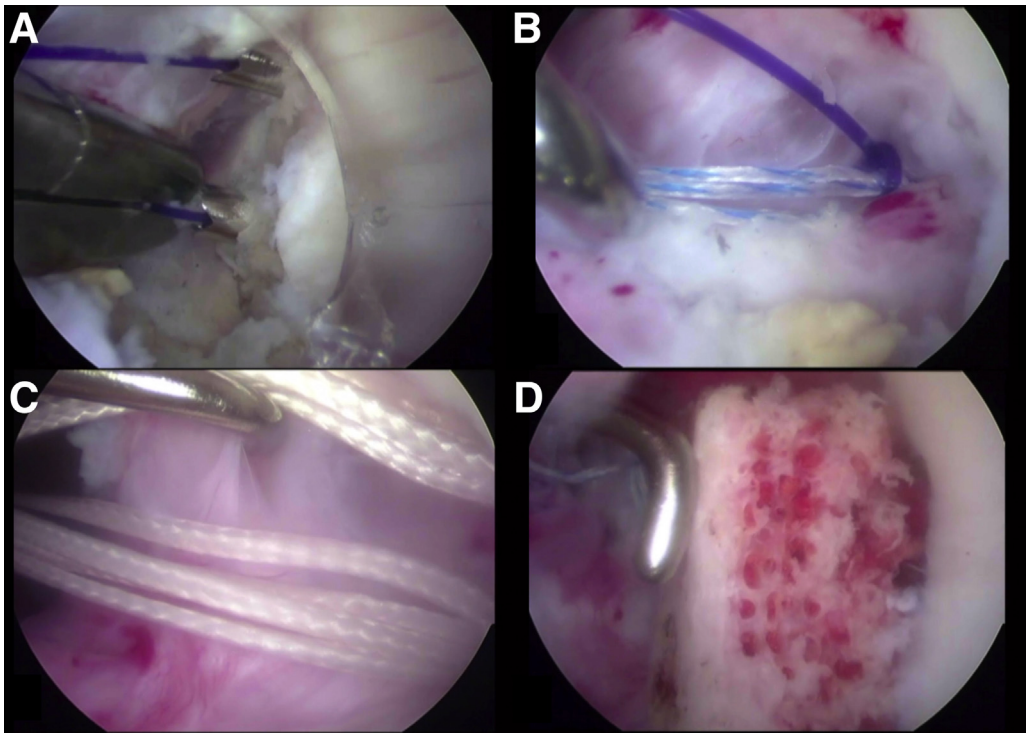

Fig 8. Graft insertion. Arthroscopic view of the left anterior glenoid with the scope in the far lateral portal. (A) No. 0 PDS shuttle sutures have been inserted through the back of the outer drill sleeves and are being retrieved by a grasper and pulled out through the anterior 15-mm cannula. (B) The tail of the inferior suture button has been attached to the inferior No. 0 PDS shuttle suture and is being pulled backward through the inferior drill hole. (C) The sutures from the superior suture button have been shuttled through the superior drill hole. The probe is being used to make sure that the sutures do not cross in the cannula. (D) The sutures from both suture buttons have been pulled backward through the drill holes, and the bone graft has been "dragged" into the joint and flipped into position. The probe is being used to control rotation. (PDS, polydioxanone.)

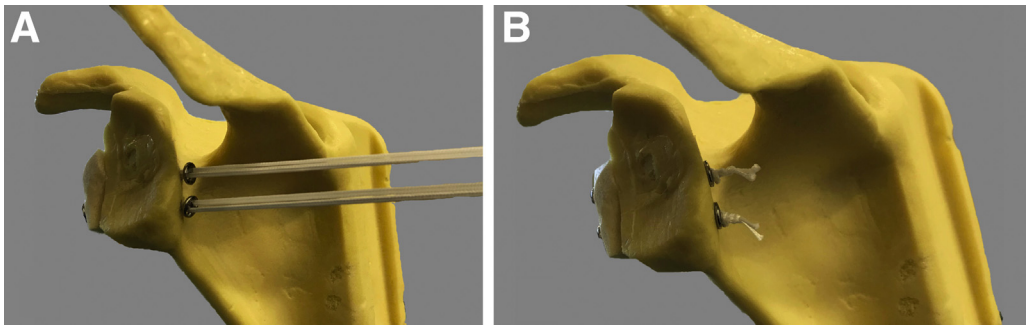

Fig 9. Posterior button insertion (left shoulder). (A) The posterior buttons have been loaded onto the sutures and passed down onto the posterior glenoid. (B) The sutures have been tensioned to 100 N and tied, securing the construct.

A sliding Nice knot is then tied between the 2 looped sutures and tightened. The knot then tightly holds the suture button down. The suture is then loaded into a tensioner and tightened to 100 newtons of force. Viewing the joint from the lateral portal, the bone block and superior suture button can be seen to visibly tighten down onto the glenoid. The tensioner is then removed from the sutures and 3 half-hitches are then passed to lock off the knot. This process is then repeated for the inferior suture button.

Once both of the posterior buttons have been fully secured, the graft is inspected and probed to check for fixation strength. If there is any graft lateral overhang, it can be gently burred back, flush to the level of the glenoid articular surface (Fig 10).

When undertaking an arthroscopic Eden-Hybinette bone graft as a primary procedure, the anterior joint capsule is usually present. Following graft fixation, this can be reattached to the anterior edge of the glenoid using suture anchors. However, the joint capsule is usually absent in a revision situation.

Rehabilitation

After surgery, check radiographs are taken and the shoulder is kept in a shoulder immobilizer for 3 weeks. The patient then undergoes a standard shoulder stabilization program under the supervision of the physiotherapists.

A check CT scan is undertaken at 4 months after surgery to assess graft healing (Fig 11). Return to full overhead activities and contact sport is allowed once the graft has healed.

Discussion

Failure and recurrent instability following a coracoid transfer presents a difficult problem. If a revision Eden-Hybinette bone graft procedure is to be contemplated there are 2 important factors to be considered. These are the distorted soft tissue anatomy around the anterior subscapularis and any existing metalwork within the glenoid from previous procedures.

The soft tissue anatomy around the anterior subscapularis after a coracoid transfer will be scarred and distorted, and the axillary and musculocutaneous nerves are likely to be in an abnormal position.[3,6,7] Preoperative magnetic resonance images have been used to try and assess the soft tissue anatomy, and a coracoid neo-tendon has been described.[8] However, although a magnetic resonance image may offer additional information, it does not provide a sufficiently detailed assessment to fully appreciate the anatomy.

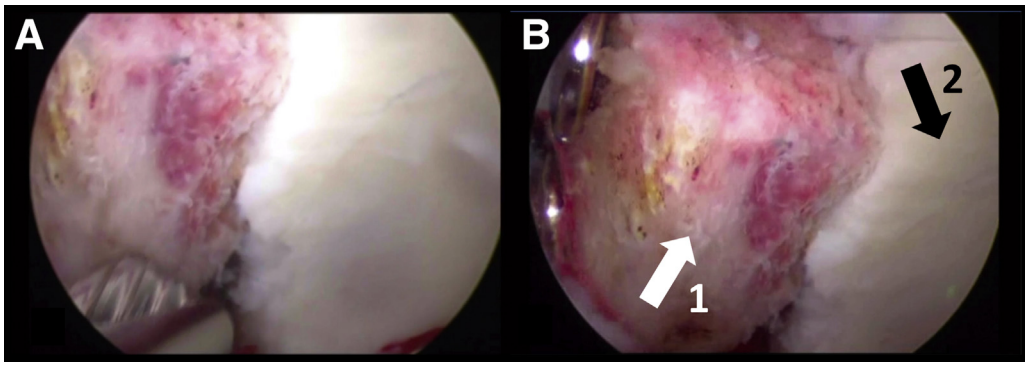

Fig 10. Graft fixation. Arthroscopic view of the left anterior glenoid with the scope in the far lateral portal. (A) The graft has been positioned, the sutures tensioned, and the posterior suture buttons inserted and tied down, securing the graft. A burr, introduced through the anterior portal, is being used to remove any lateral overhang from the graft. (B) Final fixation: the graft (arrow 1) has been fixed onto the anterior glenoid (arrow 2) with its lateral edge flush to the glenoid articular surface.

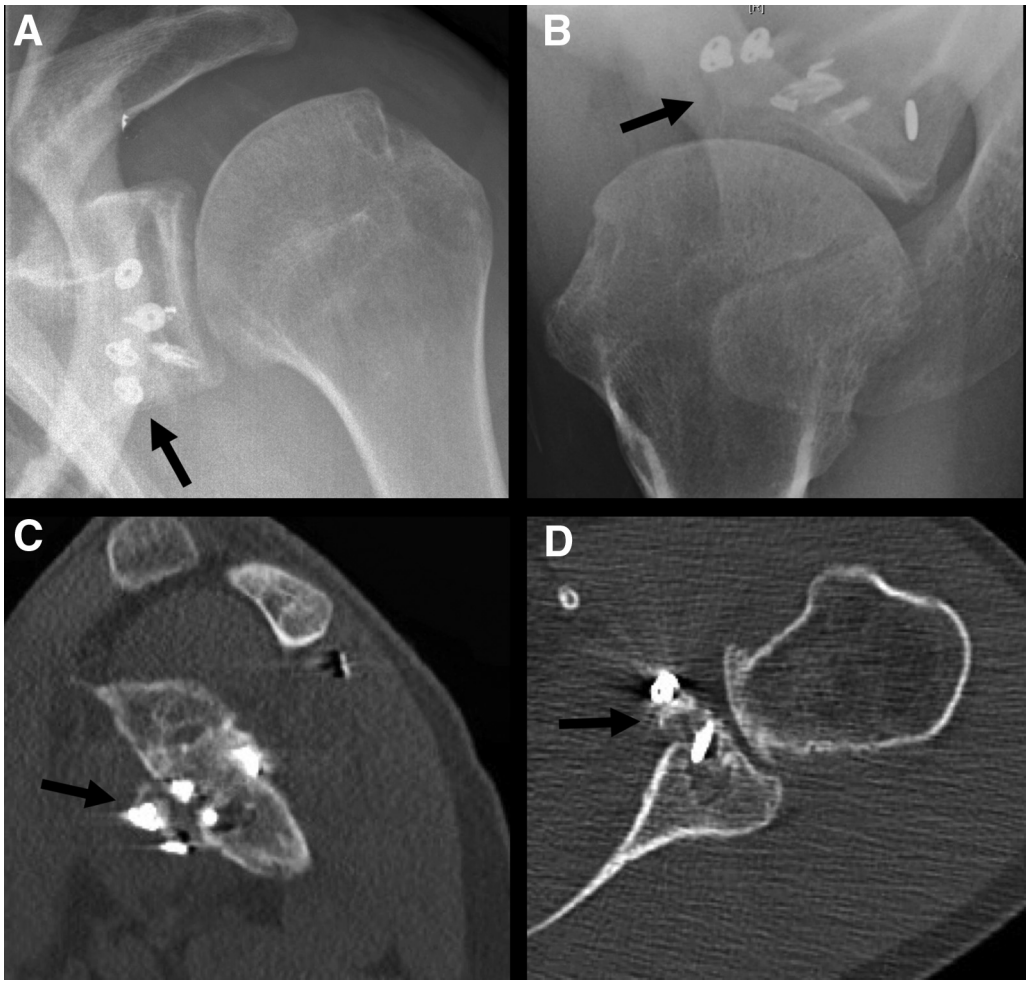

Fig 11. Postoperative imaging (4 months after surgery) of the patient from Fig 3. (A, B) AP and axial plain radiographs of the left shoulder showing the bone graft (black arrow) positioned in the inferior quadrant on the anterior glenoid with the anterior and posterior suture buttons. (C, D) Sagittal and axial CT scans of the left shoulder showing the graft having united onto the front of the glenoid. (AP, anteroposterior; CT, computed tomography.)

It is important to establish the mechanism of failure, as this may be an important determinant with regard to the choice of subsequent treatment. If the original coracoid graft fixation screws are intact, failure may be owing to either the bone graft healing, then resorbing and the conjoint tendon detaching, or the graft failing to unite or breaking off. In this situation, screw removal at the time of revision surgery is likely to be achievable.

If the fixation screws have bent or snapped, leaving the screw shafts in the glenoid, or if there is significant other retained glenoid metalwork or resorbed anchor bone voids, this may create a more challenging problem. It may be difficult to remove the bent screws, and attempting to extract the retained metalwork could significantly compromise glenoid bone stock.

The described arthroscopic revision suture button Eden-Hybinette technique offers a potential solution to some of the above issues. The posterior drill guide system is able to create accurate drill holes parallel to the glenoid articular surface from back to front and, because of the flexibility of the suture buttons, the bone graft can be pulled into the joint via a "safe" portal in the rotator interval and positioned onto the front of the glenoid. This avoids the need to disturb the anatomy in front of subscapularis.[9] Fixing the bone graft using a traditional screw fixation, whether as an open or arthroscopic procedure, involves dissecting through the abnormal anatomy in front of the subscapularis and then either undertaking a subscapularis split or tenotomy. This is necessitated to obtain the correct angle of access to drill and then insert the graft fixation screws parallel to the glenoid articular surface.

The smaller-diameter drill holes required for the suture button technique and the ability to preplan, and then accurately replicate at surgery, the drill trajectory to avoid any retained metalwork within the glenoid is potentially advantageous over the blind drilling of 4.5-mm drill holes used in a traditional screw fixation

Table 1. Advantages and Disadvantages

	Arthroscopic Suture Button Fixation Technique		Open Screw Fixation Technique	
	Advantage	Disadvantage	Advantage	Disadvantage
Exposure	All intra-articular technique avoiding dissection of distorted anatomy anterior to the subscapularis and does not require a subscapularis split	Unable to remove any broken metalwork from a detached coracoid graft. May have difficulty removing intra-articular screws	Able to remove broken metalwork from the anterior compartment and better access for removing "difficult" intra-articular metalwork	Requires dissection around the distorted anatomy anterior to the subscapularis and requires a subscapularis split
Glenoid preparation	Complete view and safe medial access to the whole of the anterior glenoid. Even burring with barrelled arthroscopic burrs			Limited view and exposure to the anterior and medial glenoid through the subscapularis split. Less even burring with standard ball burr
Management of retained glenoid metalwork and bone voids	Preoperative CT scan planning to assess drill guide position and drill trajectory to avoid retained metalwork. Suture button fixation does not rely on any cancellous bone hold	If a safe drill guide trajectory (4 mm medial to the articular surface) cannot be planned around any retained metalwork, the procedure cannot be undertaken	Can use a wider bone graft, with screw holes offset medially, to avoid laterally positioned retained metalwork	"Blind" drilling of the glenoid may potentially hit retained metalwork
Graft insertion and fixation	Graft can be accurately inserted into the joint through the cannula under direct vision	Difficulty with suture management on insertion		Less accurate positioning of the graft. Potential issues with blind drilling and hitting retained glenoid metalwork and screw thread hold in bone voids
Concomitant intra-articular pathology	Any additional concomitant pathology (SLAP tear, rotator cuff tear, large Hill-Sachs) can be assessed and addressed arthroscopically			Difficult to fully assess the whole joint for any additional concomitant pathology and to address it
Overall technique	Minimal access, all—intra-articular technique	Requires advanced arthroscopic skills and special equipment with added cost	Requires no special equipment and standard, or cannulated, partially threaded screws	Potential neurovascular damage during anterior dissection and potential compromise to the subscapularis following split

technique. Also, the fact that the suture button fixation is obtained by the tension created between the buttons either side of the bone block and the posterior bone cortex of the glenoid, and so does not rely on cancellous bone hold, avoids any fixation compromise from bone voids.[10]

There are a number of limitations to a revision arthroscopic suture button technique (Table 1). These include a high level of arthroscopic skills, and it would certainly be advisable to already be conversant with this technique for primary procedures. It requires specialized equipment with an increased cost. Also, this technique is only suitable to treat intra-articular pathology. Additional steps, or a different procedure, would be required to address pathology around the anterior subscapularis, such as broken screw heads, if there is any difficulty in removing pre-existing screws or if a clear trajectory around any retained metalwork in the glenoid cannot be achieved at the time of preoperative CT planning.

References

1. Lunn JV, Castellano-Rosa J, Walch G. Recurrent anterior dislocation after the Latarjet procedure: Outcome after revision using a modified Eden-Hybinette operation. *J Shoulder Elbow Surg* 2008;17:744-750.
2. Griesser MJ, Harris JD, McCoy BW, et al. Complications and re-operations after Bristow-Latarjet shoulder stabilization: A systematic review. *J Shoulder Elbow Surg* 2013;22:286-292.
3. Giannakos A, Vezeridis PS, Schwartz DG, Jany R, Lafosse L. All-arthroscopic revision Eden-Hybinette procedure for failed instability surgery: Technique and preliminary results. *Arthroscopy* 2017;33:39-48.
4. Tytherleigh-Strong GM, Morrissey DI. Failed Latarjet procedure treated with a revision bone block stabilization using a suture-button fixation. *J Shoulder Elbow Surg* 2017;26:e102-e107.
5. Taverna E, D'Ambrosi R, Perfetti C, Garavaglia G. Arthroscopic bone graft procedure for anterior inferior glenohumeral instability. *Arthrosc Tech* 2014;3:e653-e660.
6. Butt U, Charalambous CP. Complications associated with open coracoid transfer procedures for shoulder instability. *J Shoulder Elbow Surg* 2012;21:1110-1119.
7. Delaney RA, Freehill MT, Janfaza DR, Vlassakov KV, Higgins LD, Warner JJ. 2014 NEER Award Paper: Neuromonitoring the Latarjet procedure. *J Shoulder Elbow Surg* 2014;23:1473-1480.
8. Smolen D, Went P, Tomala D, Sternberg C, Lafosse L, Leuzinger J. Identification of a remodeled neo-tendon after arthroscopic Latarjet procedure. *Arthroscopy* 2017;33:534-542.
9. Boileau P, Gendre P, Baba M, et al. A guided surgical approach and novel fixation method for arthroscopic Latarjet. *J Shoulder Elbow Surg* 2016;25:78-89.
10. Gendre P, Thelu CE, d'Ollonne T, Trojani C, Gonzalez JF, Boileau P. Coracoid bone block fixation with cortical buttons: An alternative to screw fixation? *Orthop Traumatol Surg Res* 2016;102:983-987.