



# Single Working Portal Technique for Knotless Arthroscopic Bankart Repair

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**Abstract:** Arthroscopic Bankart repair is widely accepted as the method of choice in restoring the labrum to the glenoid rim. It has been shown to have comparable outcomes with open stabilization. This usually involves the use of 2 portals anteriorly: one anterosuperior accessory portal and another anteroinferior working portal. The aim of this Technical Note is to present a simple and reproducible technique for Bankart repair using a single working portal anteriorly without an accessory portal.

Open repair of the Bankart lesion has traditionally given good to excellent results. With the evolution of minimally invasive surgery, arthroscopic Bankart repair is now widely accepted as a method of restoring the labrum to the glenoid rim, with reported results similar to those of open stabilization.<sup>1-3</sup>

The original arthroscopic Bankart procedure was described by Wolf et al.<sup>4</sup> using Mitek anchors. It involved the use of 1 posterior viewing portal and 2 anterior working portals with intra-articular knot tying. According to the authors, the anteroinferior portal was used for all instrumentation such as drilling holes for anchors and passing suture loops, whereas the

anterosuperior portal was used for anterior visualization during debridement of the anterior glenoid rim and for insertion of a grasper to place tension on the labrum while sutures were passed through the anteroinferior portal.

Our technique involves the use of a knotless suture anchor through a single working portal anteriorly instead of two for Bankart repairs. This has the advantage of being more time and cost efficient ([Video 1](#)).

Patients who underwent surgery had a classic Bankart lesion secondary to a traumatic anterior shoulder dislocation. All had at least 2 episodes of dislocation with persistent instability and had failed conservative treatment. Surgery was performed within 6 weeks of the last documented dislocation. No surgery was performed for patients who had a first episode of dislocation. Patients with a significant bony Bankart or Hill Sachs lesion will require a Latarjet procedure. Associated SLAP tears or cuff tears are addressed at the same time.

## Equipment

The following items are required to perform 2-portal arthroscopic Bankart repair using knotless anchors:

- Standard shoulder arthroscopy equipment including a 30° standard 4.0-mm arthroscope (Stryker, Kalamazoo, MI)
- Arthroscopic rasp or ring curette (DePuy Mitek, Raynham, MA)
- Pushlock knotless suture anchor (Arthrex, Naples, FL)
- 45° curved suture passer (Arthrex)

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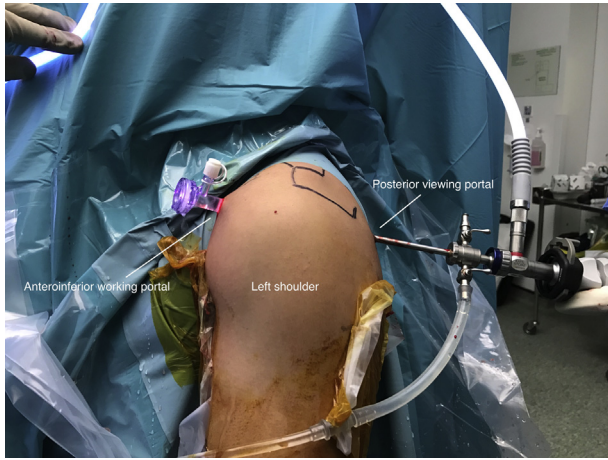
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**Fig 1.** The patient is positioned here in the beach chair position. This technique can also be performed with the patient in the lateral decubitus position. A standard posterior viewing portal and a single anterior working portal are shown.

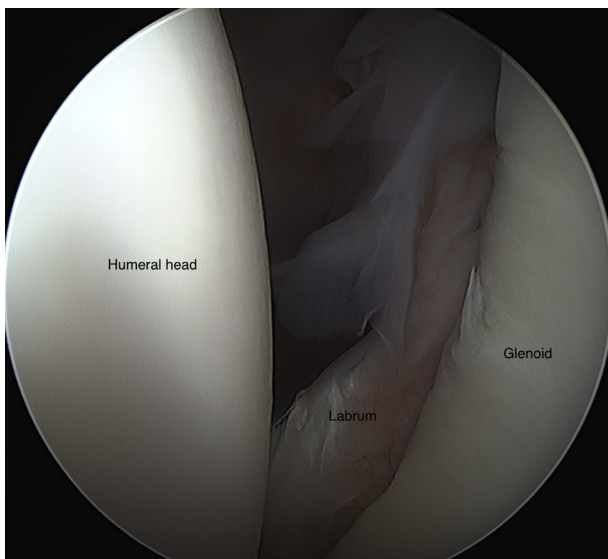
### Surgical Technique

#### Step 1: Setup and Patient Positioning

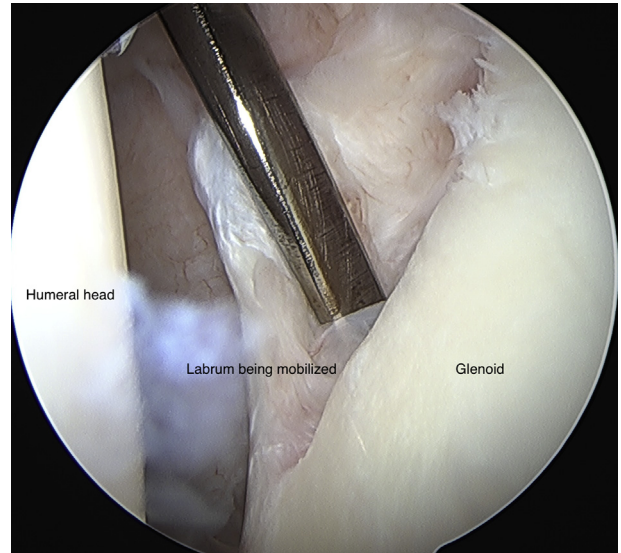
The procedure can be performed with the patient in the beach chair or lateral decubitus position. The monitor is positioned at the foot of the patient for the most comfortable viewing position (Fig 1).

#### Step 2: Portal Placement

The standard posterior viewing portal is created 2 cm inferior and 2 cm medial to the posterolateral corner of the acromion. After the glenohumeral joint is evaluated, the anterior working portal can be created through the rotator interval using the outside-in technique. An 18-gauge spinal needle is first inserted lateral

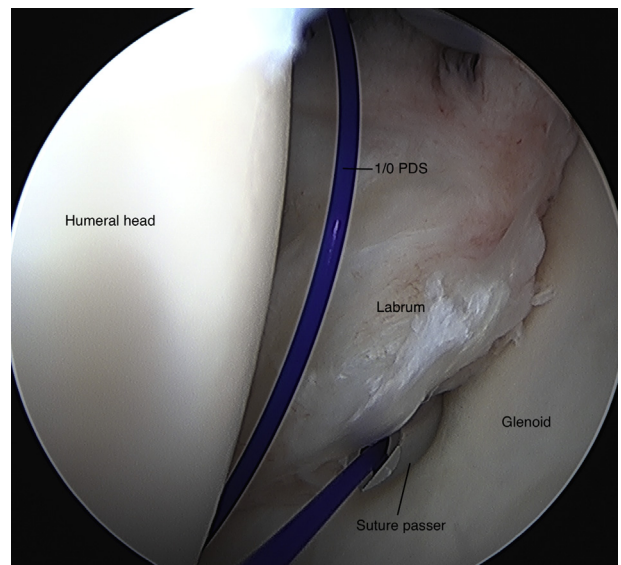


**Fig 2.** The view of the Bankart lesion from the posterior viewing portal.

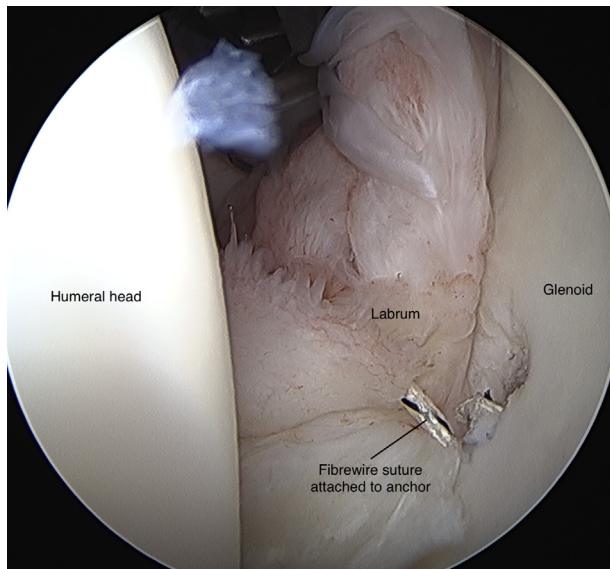


**Fig 3.** The anterior glenoid neck being prepared with a rasp and anterior labrum mobilized.

to the conjoined tendon and just above the subscapularis to determine the most appropriate position for the anterior portal. This helps to identify where the skin incision should be made to ensure the appropriate angle of approach. The needle is then removed and a skin incision just large enough to admit the working cannula is made. A switching stick is inserted into the



**Fig 4.** A 1/0 polydioxanone (PDS) suture being passed through the detached labrum using a 45° curved suture passer (Arthrex). It is crucial to ensure that a significant length of the PDS suture (approximately 10 cm) is passed into the glenohumeral joint. This is to ensure that the fiberwire can be passed through the labrum by tying the end of the PDS suture to the fiberwire using a half hitch knot. The leading end of the PDS suture is then pulled out of the joint, pulling the fiberwire in tow such that the fiberwire eventually passes through the labrum.



**Fig 5.** A 2.9-mm Pushlock anchor (Arthrex) is placed into a drill hole placed 1 to 2 mm from the glenoid rim at an angle approximately 70° to the glenoid.

glenohumeral joint in the same direction as the spinal needle followed by insertion of the cannula (Fig 2).

### Step 3: Preparation for Bankart Repair

The anterior labrum is mobilized adequately and a motorized shaver is used to debride the exposed labral edge to promote healing. An arthroscopic rasp and burr are used to decorticate the anterior glenoid neck (Fig 3).

### Step 4: Bankart Repair

A 45° curved suture passer (Arthrex) loaded with 1/0 polydioxanone (PDS) is passed through the anterior portal and used to penetrate the detached labrum at the most inferior position approximately 1 cm lateral to the glenoid. Once through the labrum, a significant length of PDS suture (approximately 10 cm) is passed into the glenohumeral joint while the suture passer is carefully

removed through the anterior portal, taking care to ensure that the leading end of the PDS suture remains through the labrum and within the joint (Fig 4).

With the tail end of the PDS suture outside of the anterior portal and completely unloaded from the suture passer, the tail end is tied to a fiberwire with a half hitch knot.

An arthroscopic grasper is inserted through the anterior portal to retrieve the leading end of the PDS suture slowly out of the joint, pulling the fiberwire in tow such that the fiberwire eventually passes through the labrum and with both ends out of the anterior portal.

A drill hole is created on the glenoid surface at an angle of approximately 70° to the glenoid, and 1 to 2 mm from the glenoid rim. The first drill hole is created adjacent to the lowest point of the detached labrum near the point of passage of the first loop of the fiberwire. Both ends of the fiberwire are then passed through the distal ring of the Pushlock anchor, which is then inserted and tapped into a drill hole to the desired depth 2.9 mm Pushlock (Arthrex) (Fig 5).

Additional anchors are placed as necessary up till the 3 o'clock position for the right shoulder and the 9 o'clock position for the left shoulder. In all cases, 3 or 4 suture anchors are used (Table 1).

## Discussion

Portals for arthroscopy should first and foremost be safe from damage to adjacent neurovascular structures. Secondly, they should give a good view of intra-articular structures and allow easy access to intra-articular pathology to facilitate easy debridement or repair. The arthroscopic technique described by Wolf in 1991 is considered the standard for arthroscopic Bankart repairs.<sup>4</sup> The posterior viewing portal is through an interval between the teres minor and the infraspinatus tendons although for all intents and purposes this portal would pass through the latter tendon.

**Table 1.** Pitfalls and Pearls

Pitfalls	Pearls
Potentially challenging to get a good "bite" of the inferior portion of the labrum without the aid of another instrument such as a grasper that is usually introduced via an additional anterosuperior portal	If the initial suture passed through the inferior most portion of the labrum is deemed inadequate, the first suture can be used to provide traction; this will help with the placement of another suture using the lasso in the ideal position
The polydioxanone suture that is initially introduced and used subsequently as a shuttling suture can slip off the fiberwire	Make sure that the half hitch knot tied to the fiberwire is secure. In addition, tie the half hitch knot at least 8 to 10 cm away from one end of the fiberwire to avoid the polydioxanone suture slipping from the fiberwire when shuttling through the labrum
When introducing the drill sleeve to determine the placement of the drill hole through the cannula, it can get entangled with the fiberwire sutures already within the cannula	When introducing the drill sleeve, place gentle traction on the fiberwire sutures that are within the cannula to avoid this problem
Poor tensioning of sutures when placing the knotless anchor can result in inadequate repair	Having introduced the knotless anchor into the joint, apply gentle traction on the fiberwire sutures to bring the labrum adjacent to the eyelet on the knotless anchor. Maintaining gentle tension on the sutures, place eyelet into the drill hole before tapping knotless anchor in to ensure an adequate and secure repair

**Table 2.** Advantages and Disadvantages

Advantages	Disadvantages
One less surgical scar	Unsuitable for knot tying anchors
Cheaper, one less cannula used	due to potential issues with
Shorter operative time	suture management
Avoid potential risk to the cephalic vein from an additional anterior superior portal	

This portal allows an excellent view of most intra-articular structures of the shoulder and most intra-articular pathology. The surgeon can, if necessary, switch to viewing from an anterior portal to observe the posterior intra-articular shoulder anatomy. The anterior working portals are both through the rotator interval, one just above the subscapularis tendon (Wolff's anterior inferior portal) and the other just anterior to the long head of the biceps (Wolff's anterior superior portal). These 2 portals lie in the "intra-articular triangle," as described by Matthews et al.<sup>5</sup> This triangle is bounded by the glenoid rim, the humeral head, and the long head of the biceps tendon. Anatomical dissection in 20 cadaveric shoulders and clinical data from 30 shoulder arthroscopies performed using this landmark for the placement of anterior portals in that study demonstrated its utility and safety.

The low anterior 5 o'clock portal through the subscapularis tendon once used to repair low anterior labral tears<sup>6</sup> is no longer used in view of its proximity to the cephalic vein, the axillary nerve, and the musculocutaneous nerves when the patient is in the beach chair position.<sup>7</sup> The nerves were closer to this portal if the patient was in the lateral decubitus position.<sup>8</sup> In fact, Wolff's anterior inferior portal is sufficient to access the anterior inferior labrum and glenoid.

We use only Wolff's anterior inferior portal for our 2-portal technique. Pearsall et al.<sup>7</sup> have shown that Wolff's anterior inferior portal was approximately 4 mm from the cephalic vein. We use the outside-in technique when creating portals, as recommended by Lo et al.<sup>9</sup> to further reduce risks to neurovascular structures. Knotless anchors were used as they provide a direct, secure, low profile suture anchor repair.<sup>10</sup> Studies have shown that both knot tying and knotless repairs have comparable good outcomes.<sup>11,12</sup> For our 2-portal technique to be successful, the initial PDS suture should be able to slide out of the acupass so that a significant length can remain in the joint as the acupass is withdrawn.

We find that the anterior superior portal is not necessary when using knotless anchors. We would not

recommend the 2-portal technique with arthroscopic knot tying as there is potential for suture entanglement within the cannula. The advantages of this 2-portal technique for knotless labral repair are one less surgical scar, saves the cost of an additional cannula, and shorter operative time. The placement of an additional anterior superior portal is also not completely risk free either. The cephalic vein is potentially at risk with possible complications of hemorrhage into the joint and rarely the development of a venous pseudoaneurysm (Table 2).<sup>13</sup>

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