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# Two portal technique with antegrade suture passer and knotless anchors for Arthroscopic Bankart repair: A technical note

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ABSTRACT

Arthroscopic Bankart repair is generally accepted as the choice of treatment for labrum and glenoid rim restoration. Recently, the antegrade suture passer has been one of the widely used devices in arthroscopic surgery. This device saves time by combining tissue grasping, suture passage, and suture retrieval into one convenient step. In addition, a knotless anchor is also used for a Bankart repair to prevent knot-induced articular cartilage injuries. Arthroscopic Bankart repair usually uses two anterior portals (anterosuperior accessory portal and anteroinferior working portal) with one posterior viewing portal. The purpose of this technical note was to present a simple and easy technique for Bankart repair using a single anterior working portal with an antegrade suture passer and knotless anchors.


## 1. Introduction

According to the evolution of arthroscopic surgery, the arthroscopic Bankart repair is generally accepted as the choice of treatment to restore the labrum and the glenoid rim.[1,2] In 1991, Wolf et al.[3] described arthroscopic Bankart repair with anchors. It involved the use of two anterior working portals and one posterior viewing portal and intra-articular knot tying. They described that the anteroinferior portal was used for anchor insertion and passing suture loops, and the anterosuperior portal was used for anterior visualization, shuttle relay of suture, and for insertion of a grasper to place tension on the labrum while sutures were passed through the anteroinferior portal.[3]

The antegrade suture passer is a widely used device in arthroscopic surgery. This device saves time by combining tissue grasping, suture passage, and suture retrieval into one convenient step.[4] The antegrade suture passer also uses flexible, small-caliber needles to help minimize damage to the tissue intraoperatively.[4] In addition, knotless anchors are also widely used for Bankart repairs to prevent knot-induced articular cartilage injuries.

In this technical note, our preferred technique for the arthroscopic Bankart repair with a single working portal using an antegrade suture passer and knotless anchors is described. To our knowledge, a similar technique to the one we will present has not yet been formally published in the literature.

## 2. Operative technique

### 2.1. Anesthesia, patient positioning, and portal placement

The patient is positioned in the lateral decubitus position with the affected arm in 10 lbs. of balanced longitudinal and lateral suspension via use of the STAR device (Arthrex, Naples, FL). A standard posterior portal is created for initial intra-articular visualization. Under direct visualization, the anterior working portal (anteroinferior portal) is created through the rotator interval using the outside-in technique. To determine the proper position of the anterior portal, an 18-gauge spinal needle is first inserted just above the subscapularis. After the determination of the anterior portal position, the needle is then removed and a skin incision is made wide enough to insert the working cannula (Dry-Doc cannula, ConMed, USA) (Fig. 1).

### 2.2. Glenoid preparation and anterior labral repair

The anterior labrum is mobilized with an arthroscopic elevator (Arthrex, Naples, FL) and a motorized shaver is used to debride the exposed labral edge to promote healing. Anchor insertion sites are

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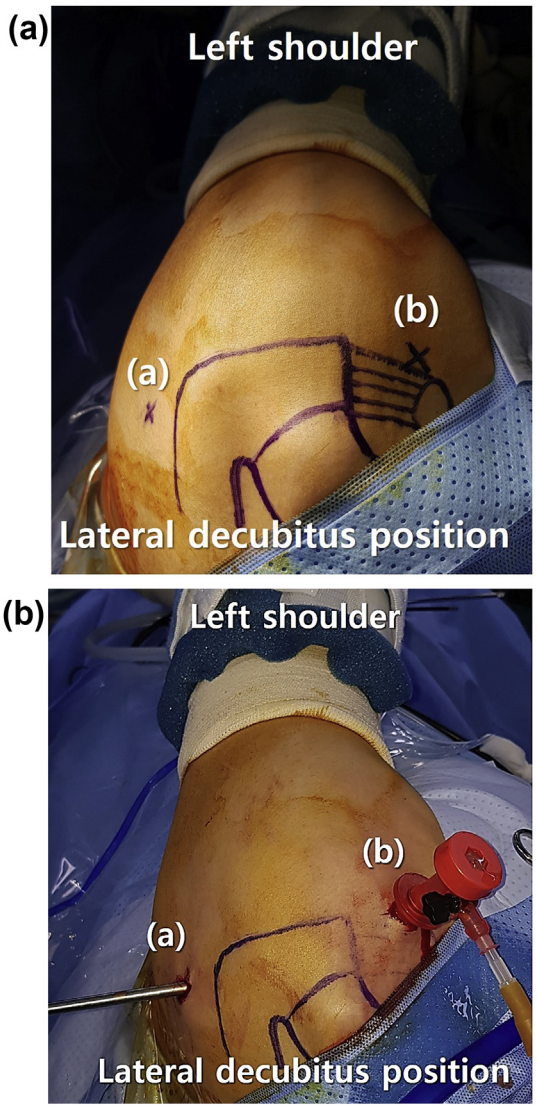


**Fig. 1.** Left shoulder of patient is placed in the lateral decubitus position. (a) as a standard posterior viewing portal and (b) as a single anterior working portal are shown.

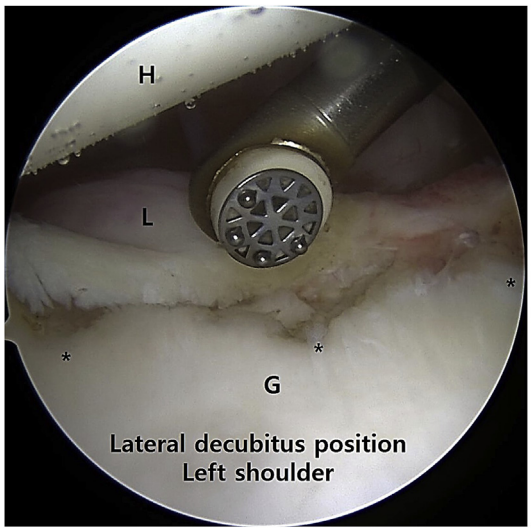


**Fig. 2.** Anchor insertion sites were marked with arthrocare on the glenoid surface, 1–2 mm toward the articular cartilage of the rim. H: humeral head, L: labrum, G: glenoid, Asterik: anchor insertion sites.

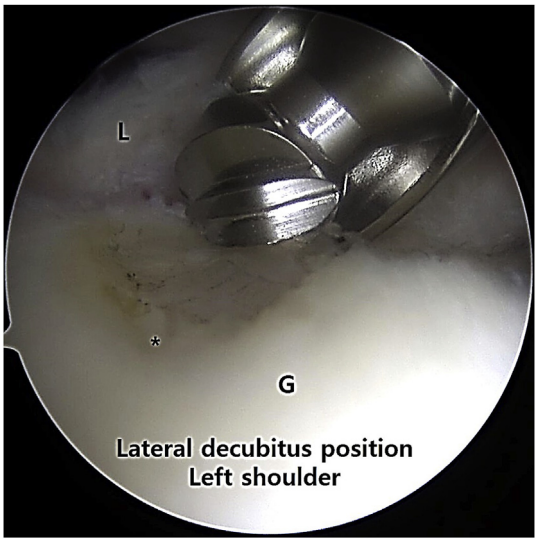


**Fig. 3.** The anterior glenoid neck being prepared with a burr. H: humeral head, L: labrum, G: glenoid, Asterik: anchor insertion site.

marked with electrocautery device on the glenoid surface, 1–2 mm toward the articular cartilage of the rim (Fig. 2). A bleeding bed along the glenoid neck is formed using a burr and arthrocare (Quantum 2; Smith & Nephew Inc., Austin, TX, USA) (Fig. 3).

First, Number 2 Fiberwire (Arthrex, Naples, FL) is loaded with the Arthrex Scorpion (Arthrex, Naples, FL). This antegrade suture passer is used to penetrate the detached labrum at approximately 1 cm lateral to the glenoid (Fig. 4).

A drill hole is created on the glenoid surface for the 2.9 mm PushLock anchor, 1–2 mm toward the articular cartilage of the rim (Fig. 5). 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 the previously created drill hole to the appropriate depth for the 2.9 mm PushLock anchor (Arthrex, Naples, FL) (Fig. 6).

Additional anchors are placed as necessary until the 2 o'clock position in the right shoulder and the 10 o'clock position in the left shoulder can be achieved. In all cases, three or four suture anchors are used (Fig. 7).

### 2.3. Postoperative rehabilitation

A small abduction pillow is used for 6 weeks and pendulum exercises were started one week postoperatively. Passive and active assisted forward flexions were initiated to work towards 90° two weeks postoperatively. At four weeks, passive and active assisted external rotations of 20° were allowed. Active muscle strengthening exercises with bands were started at 6 weeks. At 18 weeks after surgery, patients were allowed to return to sports.

## 3. Discussion

First and foremost, portals for arthroscopy should prevent damage to adjacent neurovascular structures.[5] Moreover, portals should allow for a good view of the intraarticular structures and allow easy access of intraarticular pathology to facilitate easy debridement or repair.[5] The arthroscopic technique described by

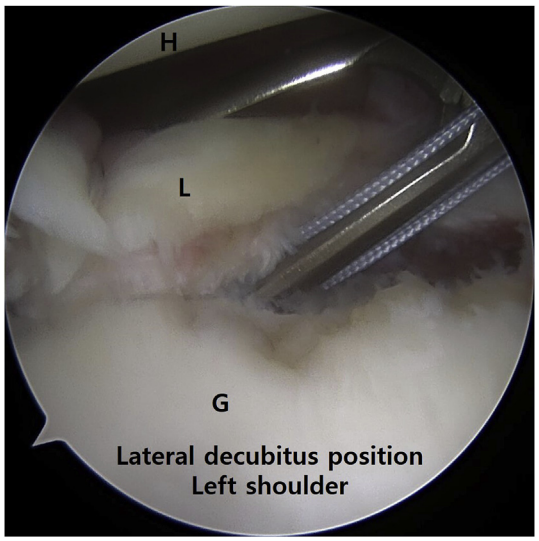


**Fig. 4.** The Number 2 Fiberwire loaded antegrade suture passer is used to penetrate the detached labrum. H: humeral head, L: labrum, G: glenoid, Asterik: anchor insertion site.

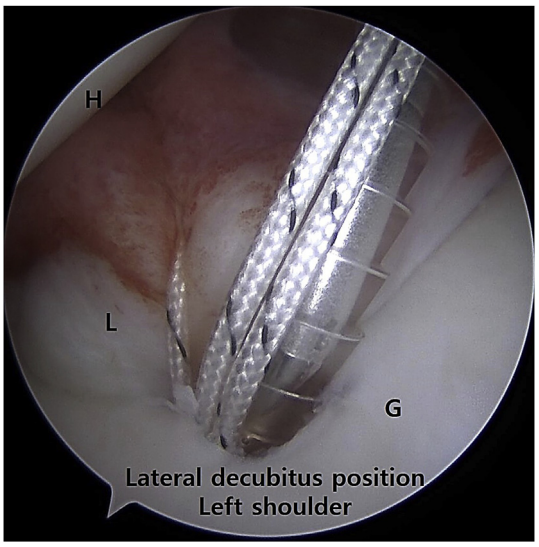


**Fig. 6.** Both ends of the fiberwire are then passed through the distal ring of the 2.9 mm Pushlock anchor, which is then inserted and tapped into the drill hole to the appropriate depth as marked on the inserter.
H: humeral head, L: labrum, G: glenoid.

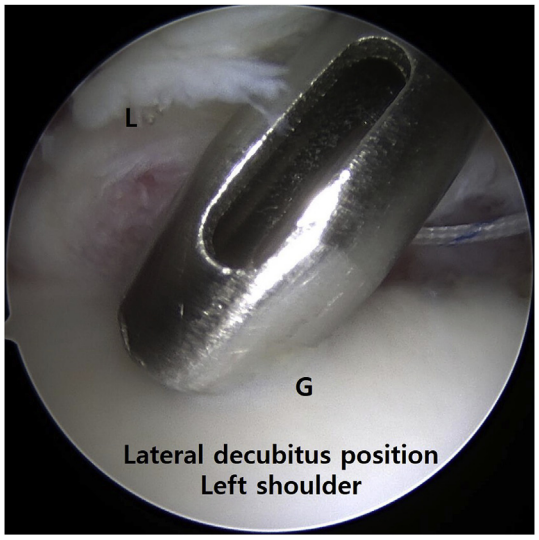


**Fig. 5.** A drill hole placed at the previous marked site that is on the glenoid surface 1–2 mm from the glenoid rim. L: labrum, G: glenoid.

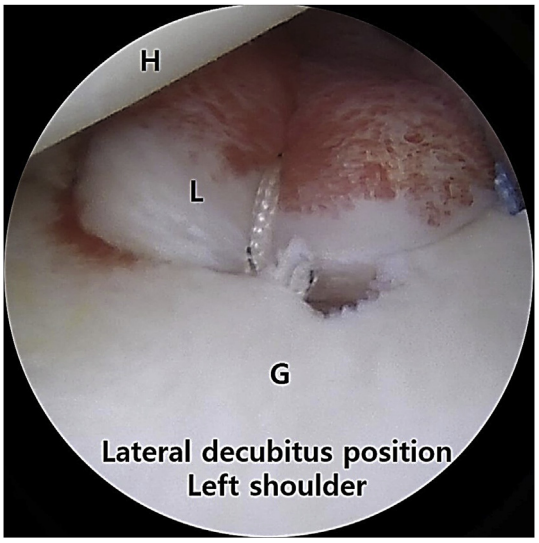


**Fig. 7.** View through posterior portal after completed repair using 3 anchors. H: humeral head, L: labrum, G: glenoid.

Wolf in 1991 is considered as the standard for arthroscopic Bankart repairs.[3] The posterior viewing portal is located in an interval between the teres minor and the infraspinatus tendons, although this portal passes through the latter tendon.[3] The surgeon can, if necessary, switch to viewing from an anteriosuperior portal to observe the posterior intra-articular shoulder anatomy. However, the posterior viewing portal with 70° scope allows an excellent view of most intraarticular structures and pathology.

The anterior working portals both pass through the rotator interval; one just above the subscapularis tendon and the other just anterior to the long head of the biceps.[3] These two portals lie in the "intra-articular triangle," as described by Matthews et al.[6] This triangle is bounded by the glenoid rim, humeral head, and the long head of the biceps tendon. The anterior inferior portal allows access of the anterior inferior labrum and glenoid.[3,5,6]

The arthroscopic Bankart repair requires the use of suture anchors, of which there are two varieties: those that require knot tying and those that do not.[7,8] The knot-tying suture anchors are predominantly used, especially for intra-articular labral procedures.[9,10] There are several knot-tying techniques available; however, it is recommended that all stacked half-hitch knots be locked with three reversing half-hitch knots on alternate posts after the initial sliding knot is made.[11] Because the volume of the knot-tying could be problematic in the joint, one of the essential techniques in knot-tying suture anchors is placement of the knot, which should be located away from the articular surface.[12,13] It is a widely-accepted belief that this helps to prevent knot-induced damage to the articular cartilage.[13] However, Kim et al. described that knot migration occurs from the capsule toward the glenoid surface after shoulder motion through a cadaveric study.[13] They described that knot movement to an unintended location could lead to damage to the articular surface.[13] Therefore, one way to prevent this knot-

induced problem is to use knotless anchors. Despite most clinical studies exhibiting satisfactory results with knotless anchors in the Bankart repair,[14–16] one comparative clinical study showed that knotless anchors had a higher redislocation rate than the knot-tying suture anchors.[17] In addition, there are reports of arthropathy occurring after the use of knotless anchors intraarticularly.[18,19] Different designs of knotless anchors have recently been made available that have comparable characteristics to knot-tying suture anchors, which may increase their popularity among shoulder surgeons.[13,18,19]

With the evolution of arthroscopic surgery, various suture passing methods have been described. The antegrade suture passage is an effective and convenient method, and combines tissue grasping, suture passage, and suture retrieval into one step without the shuttle relay procedure.[4] Recently, this device has been used for not only arthroscopic rotator cuff repair but also the arthroscopic Bankart repair.

In this technical note, we describe an anterior inferior portal that was used for arthroscopic Bankart repair without an anterior superior portal. An anterior superior portal is not necessary when using the antegrade suture passage and knotless anchors. This single working portal technique with antegrade suture passage and knotless anchors is a simple and easy procedure that saves time and is less invasive.

## Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jajs.2019.01.003.

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