Technical Note

A Single-Portal Arthroscopic Technique for Type II Slap Lesions in the Beach Chair Position

Zhenlong Liu, M.D., Yajie Wang, M.D., Ping Liu, M.D., Wei Chen, M.D., and Cancan Du, M.D.

Abstract: The options for surgical treatment of an anterior labrum lesion have become extensive. Arthroscopic treatments are widely used as an improved minimally invasive option with a quick recovery. Arthroscopic treatment of the anterior glenoid labrum generally requires the creation of two working portals. However, arthroscopic treatment through a single anterior portal is still successful. Our single-portal technique avoids interference between instruments inserted through the two working portals and minimizes postoperative scarring, pain, and reduction in range of motion. The purpose of this article was to describe our single-portal arthroscopy technique to repair the anterior glenoid labrum.

The labrum has three important functions in shoulder biomechanics, namely, increasing the contact area between the humeral head and scapula, resisting traction stress, and providing a point of insertion for stabilizing structures. Furthermore, the anterior glenoid labrum mainly maintains the stability of the shoulder joint. Type II superior labral anterior posterior (SLAP) lesions are frequently observed in individuals who usually conduct an over-shoulder throw.[1] Burkhart and Morgan proposed that SLAP lesions in throwers occur by a"peel-back"mechanism. Posterior rotation of the biceps tendon strips the biceps anchor point and the upper labrum of the upper glenoid rim.[2]

Regarding frequency of SLAP lesions, in an article by Snyder et al., the most common was type II (55%) followed by type I (21%), type IV (10%), and type III (9%).[3] The rest of the lesions were regarded as "complex". Handelberg and colleagues reviewed 530 cases, found 32 SLAP lesions, of which 53% were identified as type II.[4] SLAP II is the most common type of arthroscopic surgery, accounting for 20-70%.[5] Type II slap lesions occupy the largest proportion.

SLAP tears are usually treated arthroscopically. The treatment often results in a high rate of revision and a low rate of full recovery. However, Eoghan et al. discovered that at their preinjury level, patients had only a modest rate of return to play through long-term follow-up.[6]

Typically, two working portals are needed in the arthroscopic treatment of slap lesions. In fact, one working portal is enough. Our technique reduces pain and minimizes postoperative scarring and reduction in range of motion (ROM). The article describes a single-portal arthroscopic technique for slap lesions and shows the technique in Video 1.

Surgical Technique

Preoperative Evaluation

Physical examination, radiographs, and magnetic resonance imaging are performed before surgery to evaluate rotator cuff injury.

Preparation

The patient is positioned in the beach chair position. Perform sterile preparation and draping. Then outline the anatomic landmarks on the shoulder.

From the Department of Sports Medicine, Peking University Third Hospital, Institute of Sports Medicine of Peking University, Beijing, China (Z.L, Y.W., P.L., C.D.); Beijing Key Laboratory of Sports Injuries, Beijing, China (Z.L., Y.W., C.D.); and Engineering Research Center of Sports Trauma Treatment Technology and Devices, Ministry of Education, Beijing, China (W.C.).

Z.L. and Y.W. are co-first authors and contribute equally to this work.

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Address correspondence to Ping Liu, M.D., Department of Sports Medicine, Peking University Third Hospital, Institute of Sports Medicine of Peking University, Beijing, China. E-mail: bjusmlp@126.com

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Arthroscopic Portal

Create a posterior portal for intra-articular imaging. A spinal needle is used to locate the anterior portal through viewing from posterior portal.

Surgery Procedure

An elevator (Smith & Nephew, Andover, MA) is introduced into the joint to free the torn labrum from the glenoid. The shaver (Smith & Nephew) is inserted into the slap area from the anterior portal to remove frayed labrum and cartilage (Fig 1 and Video 1). Thus, the frayed labrum and the cartilage are debrided. The shaver is removed from the anterior portal, and then, the surgeon uses radio frequency (RF) (Smith & Nephew) to further debride the soft tissue of the bone surface in the slap area (Fig 2 and Video 1). Remove the RF and insert the drill to fresh the bone surface (Fig 3, Video 1).

An awl (Smith & Nephew) is used to pierce the bone cortex at the entry point (Fig 4 and Video 1). Enter the 2.0-mm, 3.0-mm Kirschner wire (Smith & Nephew) and 4.5-mm tap (Smith & Nephew) successively. Pilot holes are drilled at 12:00 clock-face position in the shoulder by using a drill guide. A 4.5-mm Healix Suture Anchor (Depuy Mitek) is inserted into the pilot hole at the 12:00 clock-face position in the shoulder to secure the labrum (Fig 5, Video 1).

A Suture Lasso (Arthrex, Naples, FL) loaded with coiled no. 0 polydioxanone sulfate (PDS) is then introduced into the joint from the anterior portal. The glenoid labrum that is situated in front of the biceps tendon is closed by the lasso (Fig 6 and Video 1). Then, remove the pole of lasso is removed, leaving the PDS coil within the joint (Fig 7 and Video 1). Insert the

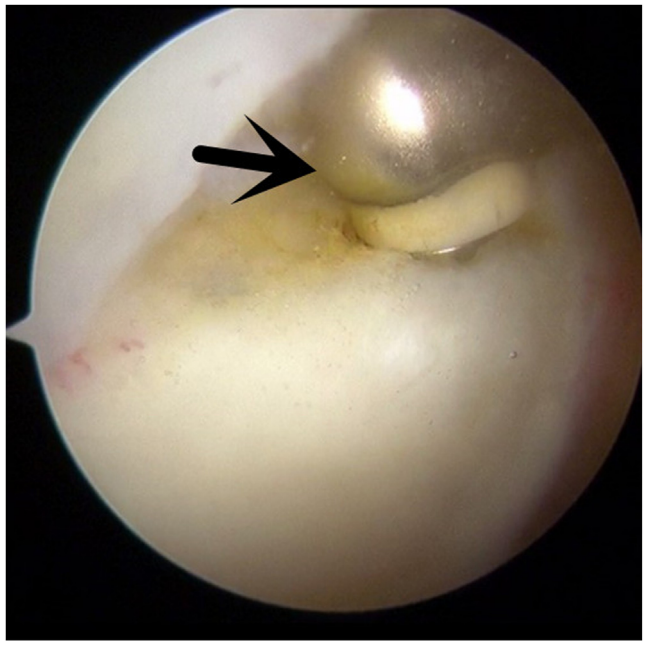

Fig 2. Arthroscopic image viewing from the posterior portal with the patient in the beach chair position. The right shoulder is shown with the radio frequency (black arrow), as it cleans the soft tissue on the surface of the bone bed.

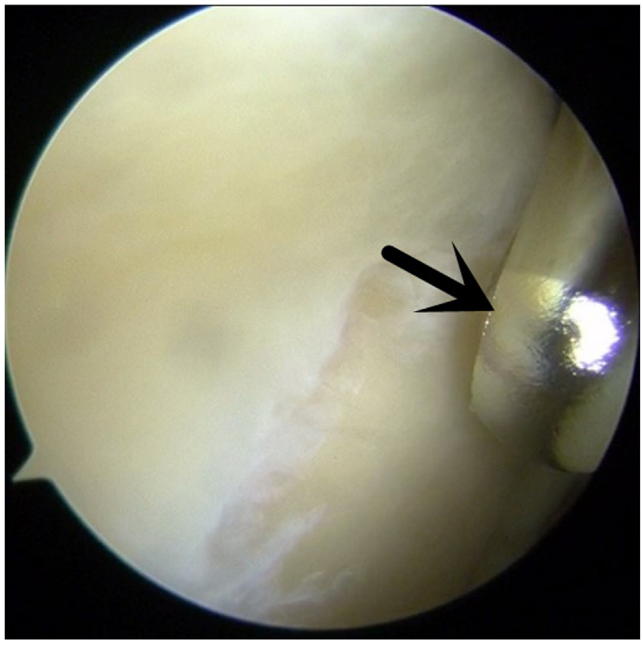

Fig 1. Arthroscopic image viewing from the posterior portal with the patient in the beach chair position. The right shoulder is shown with the shaver (black arrow) as it cleans up damaged tissue.

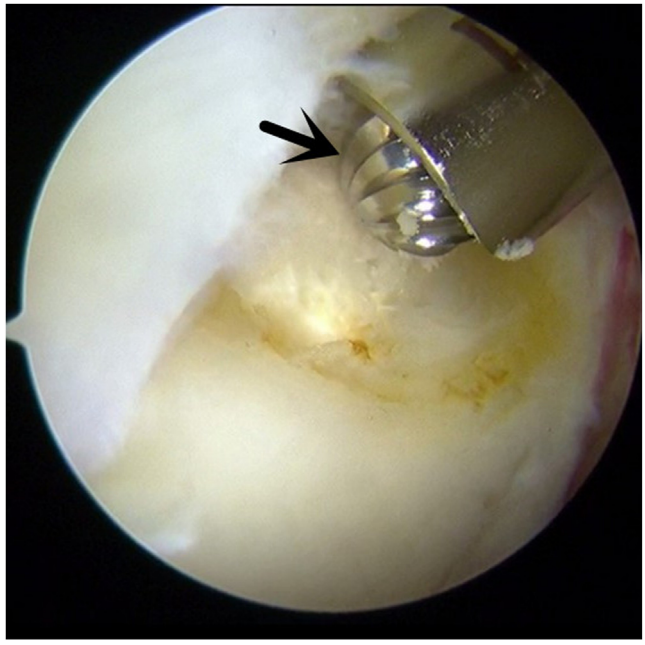

Fig 3. Arthroscopic image viewing from the posterior portal with the patient in the beach chair position. The right shoulder is shown with the drill (black arrow), as it freshens the bone surface.

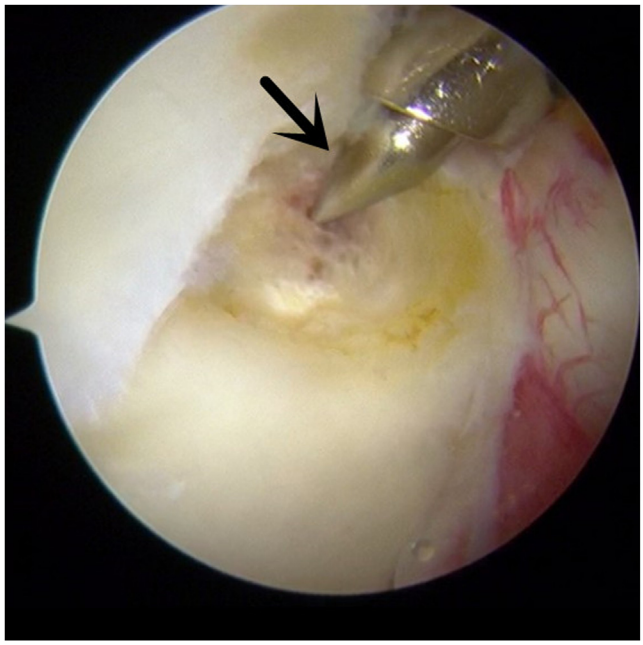

Fig 4. Arthroscopic image viewing from the posterior portal with the patient in the beach chair position. The right shoulder is shown with the awl (black arrow), which drills the nail path.

thread grasper (Smith & Nephew) into the same portal, and use it to grasp the colorful suture and PDS suture coil, pulling them out of body (Fig 8 and Video 1). Thread the colorful suture through the PDS suture coil

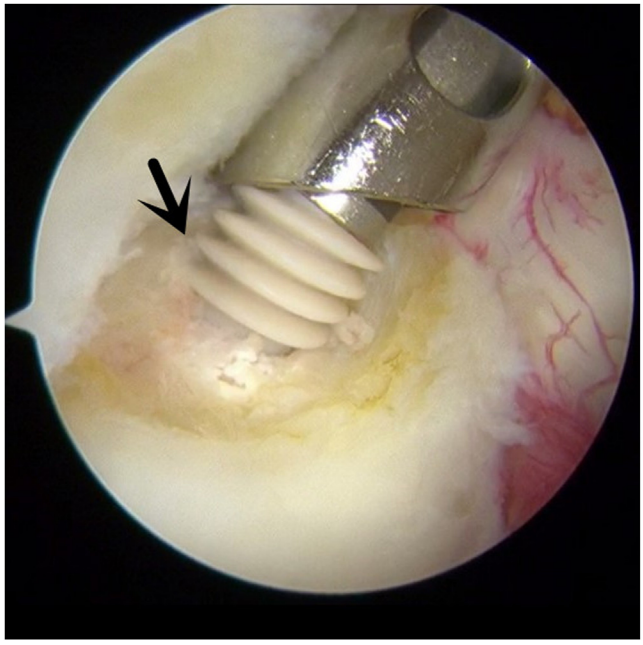

Fig 5. Arthroscopic image viewing from the posterior portal with the patient in the beach chair position. The right shoulder is shown with suture anchor (black arrow) implanted.

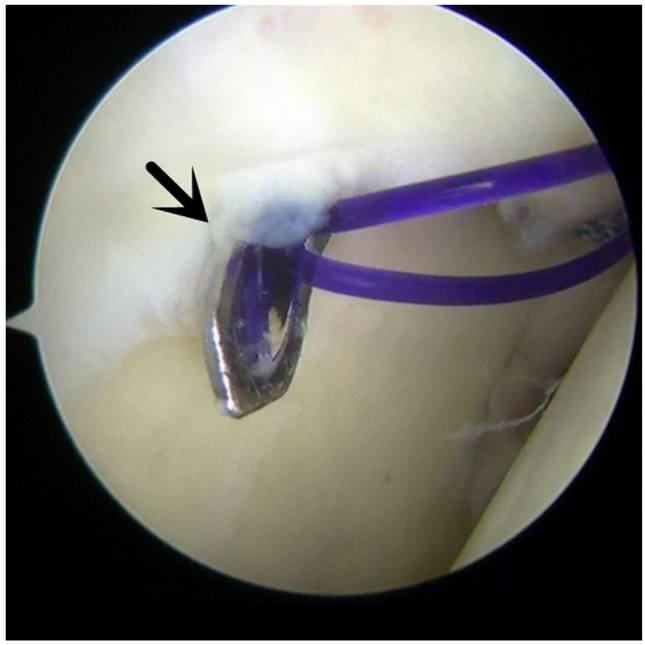

Fig 6. Arthroscopic image viewing from the posterior portal with the patient in the beach chair position. The right shoulder shows that the lasso loaded with coiled no. 0 PDS (black arrow) is introduced to close the glenoid labrum in front of the biceps tendon.

in vitro. Then, grasp the blue suture and PDS suture coil out of body. After that, thread the blue suture through the PDS suture coil. Grasp the ends of blue suture with the help of the thread grasper and tie a slip knot in vitro. Subsequently, push the slip knot into the body

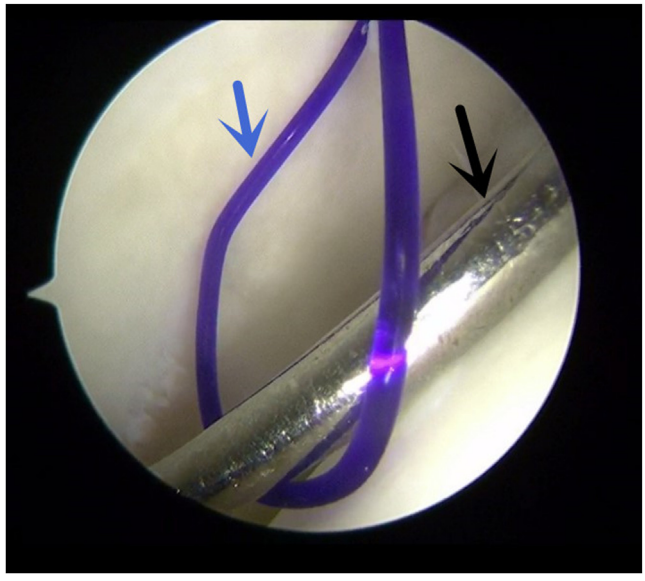

Fig 7. Arthroscopic image viewing from the posterior portal with the patient in the beach chair position. The right shoulder is shown with the probe with groove (black arrow), as it is used to keep the PDS coil (blue arrow) in the body and only remove the pole of lasso.

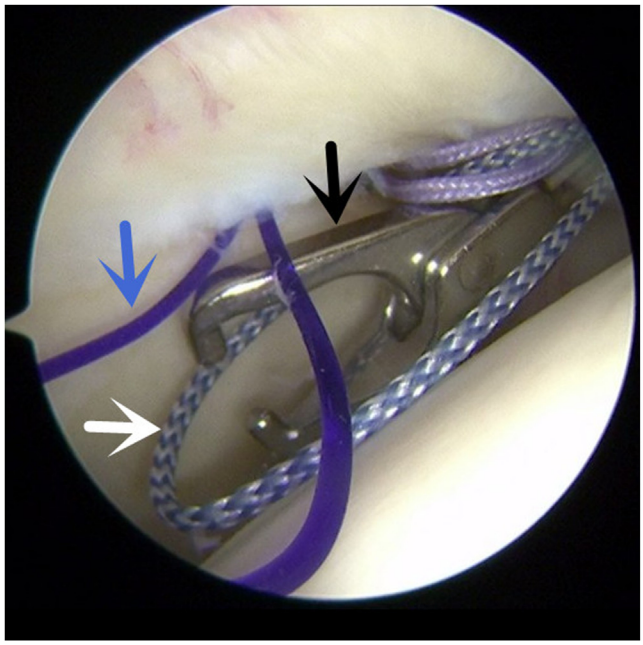

Fig 8. Arthroscopic image viewing from the posterior portal with the patient in the beach chair position. The right shoulder shows that the thread grasper (black arrow) grasps the colorful suture (white arrow) and PDS suture coil (blue arrow) out of body.

using a knot pusher (Smith & Nephew) and cut the suture with scissors (Fig 9 and Video 1). Moving on, grasp the ends of colorful suture with thread grasper and tie a slip knot in vitro. Then, push the slip knot into the body with knot pusher and cut the suture.

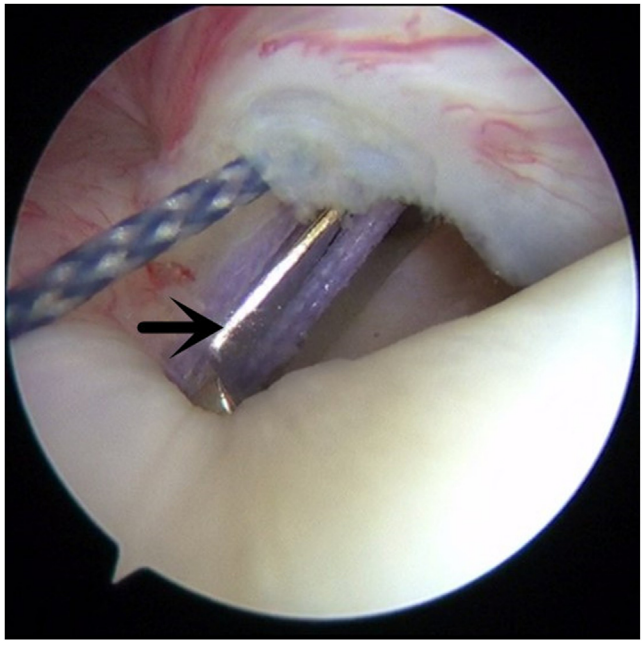

Fig 9. Arthroscopic image viewing from the posterior portal with the patient in the beach chair position. The right shoulder is shown with the knot pusher (black arrow) as it pushes the slip knot into the body.

Table 1. Advantages and Disadvantages of Our Technique

Advantages
Less invasiveness compared with open surgery
Decreased risk of postoperative pain with fewer portals
Decreased operative time of creating working portal with arthroscopic approach
Less scarring and better aesthetics
Disadvantages
Requires precise anterior portal placement
The traction wire of lasso may be removed along with the pole of the lasso
The sutures introduced through a single portal may get knotted

Discussion

Type II SLAP lesions are frequently observed in throwers who usually conduct an overhead throw. Throwing athletes may complain of pain and reduction in ROM, such as reduced throwing speed. They may also complain of intermittent clicking or mechanical symptoms in the shoulder, particularly during the cocking phase.[7] Conservative treatment is preferred in most cases. However, when the effect of conservative treatment does not meet expectations, surgical treatment will be undertaken. Arthroscopic slap repair is the most commonly used surgical treatment. The advantages are reflected in slight injury, quick recovery, and minimally invasive operation. To some extent, it is superior to open surgery.

There is controversy over arthroscopic treatment. Historically, open surgery was performed, but many advanced techniques have since been developed.[8] Recurrence rates following arthroscopic surgery are reported to be around 10% to 30%, lower than with open surgery. However, recurrence rates after arthroscopic repair have recently decreased to 5.3% in recent years.[9] Recent report shows that no differences are found between two surgical methods in other postoperative complications.[10,11] Besides, it is reported that the incidence of scapulohumeral periarthritis is lower after arthroscopic surgery.[12,13]

Pain relief usually tops the list of patients' expectations. Multiple studies have shown that arthroscopic treatment is more effective in relieving pain than open surgery. Decreases in pain on the visual analog scale from preoperative values to the value at follow-up evaluation was significantly greater for the arthroscopic treatment.[13] Eduard reports that patients with an arthroscopic repair had significantly better pain relief than those with an open repair. Compared with open repair, arthroscopic repair causes higher ROM and less scarring.[14]

Recently, most arthroscopic SLAP repair depends on the use of 2 working portals. The technique is easy to perform and causes slight injury. However, the distance between 2 working portals is close. They may interfere with one another, which makes it difficult to insert 2 instruments at the same time. Besides, 2 working portals are more likely to damage the rotator cuff. When constructing the anterior working approach, it is preferred to enter through the rotator cuff interval, but 2 anterior portals may pass through the rotator cuff directly and cause damage to the rotator cuff in order to widen the gap between the working portals. To solve these problems, we describe an anterior single-portal arthroscopy technique, which have advantages and disadvantages (Table 1). The single portal enters through the rotator interval and reduces the damage to the rotator cuff. Also, a single-portal technique could minimize postoperative scarring, pain, and reduction in ROM to some extent.

Disclosure

The authors report no conflicts of interest in the authorship and publication of this article. Full ICMJE author disclosure forms are available for this article online, as supplementary material.

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