Technical Note

The Accessory Posteromedial Portal Revisited: Utility for Arthroscopic Rotator Cuff Repair

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Abstract: Arthroscopic rotator cuff repair is a technically challenging procedure. Accessory arthroscopic portals have been described that allow for optimal suture anchor placement, suture management, and knot tying. We describe here the usefulness of an accessory posteromedial portal that facilitates direct suture retrieval through the posterior aspect of a rotator cuff tear. This portal is created approximately 4 to 5 cm medial to the posterolateral corner of the acromion and 2 cm inferior to the scapular spine. The accessory posteromedial portal is especially useful when a retracted tear of the infraspinatus or teres minor is encountered. Because these tendons retract in a posterior and medial direction, the accessory posteromedial portal places the tendon-penetrating device in an ideal position for suture passage through the posterior portion of the rotator cuff tear. This portal also allows placement of margin convergence sutures for large U-shaped or L-shaped tears by permitting a direct "hand-off" of the suture to or from a second penetrating device that is placed through a standard anterior portal. If multiple suture anchors are required (as in the case of large or massive cuff tears, or when double-row fixation is employed), sutures can be pulled out through the accessory posteromedial portal to facilitate suture management. **Key Words:** Arthroscopic—Rotator cuff—Repair—Posteromedial—Portal.

Advances in arthroscopic surgical technique about the shoulder have allowed for the treatment of patients with intra-articular and rotator cuff disease while the morbidity of an open procedure is avoided. Recent reports have suggested that the success of rotator cuff repairs performed arthroscopically equals that of repairs performed through a mini-open or open technique.[1-8] In addition to the standard posterior, anterior, and lateral portals used in shoulder arthroscopy, accessory portals are often used to facilitate accurate suture anchor placement, suture management, and arthroscopic knot tying.[9-19]

The most common means of securing the torn edge of the rotator cuff to bone during arthroscopic rotator cuff repair is through the use of suture anchors seated in the tuberosity, the suture limbs of which are passed through the cuff tissue and subsequently tied down to the anchor position. A multiplicity of devices has been designed to facilitate suture passage through the rotator cuff; these involve a variety of suture relay mechanisms. Arguably, the simplest and most expedient technique for passage of suture through the rotator cuff consists of penetrating the cuff tissue at the desired location and retrieving a suture limb directly. The ability to perform this type of direct suture retrieval is contingent, however, on use of the appropriate angle of attack. Nord and Mauck[17] reported on the

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Cite this article as: Glenn RE Jr, McCarty LP III, Cole BJ. The accessory posteromedial portal revisited: Utility for arthroscopic rotator cuff repair. Arthroscopy 2006;22:1133.e1-1133.e5 [doi: 10.1016/j.arthro.2006.01.021].

0749-8063/06/2210-5368$32.00/0

doi:10.1016/j.arthro.2006.01.021

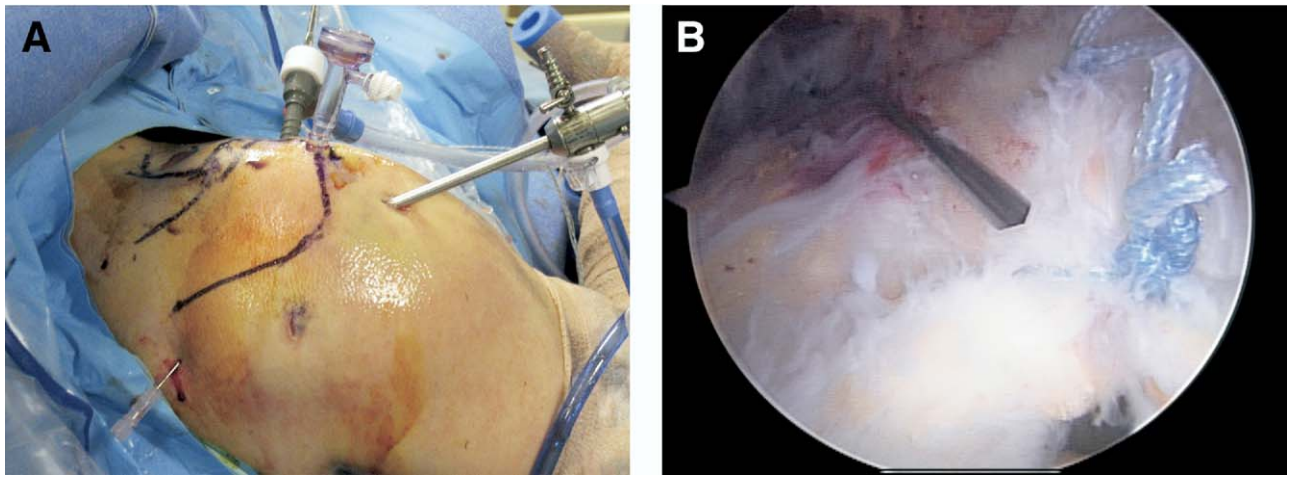

FIGURE 1. (A) External view of a right shoulder demonstrating spinal needle localization of the accessory posteromedial portal. The arthroscope is viewing from the lateral portal. Anterior and superolateral portals are also shown. Note that the accessory posteromedial portal is the same inferior distance from the scapular spine as is the standard posterior portal, but it is translated 4 to 5 cm medially. (B) Arthroscopic image: Note that 2 margin convergence sutures have been placed with the use of standard posterior, anterior, and lateral portals.

use of a modified Neviaser portal for direct suture retrieval through the supraspinatus. The location of the modified Neviaser portal permits an orientation that is ideal for passing a penetrating device directly through the torn edge of the supraspinatus, but we have not found this portal to necessarily facilitate direct suture retrieval through the posterior aspect of the rotator cuff, particularly when a large tear has occurred with posteromedial retraction. Declercq et al.[12] have described the use of an accessory posteromedial portal for arthroscopic subacromial decompression and distal clavicle excision. We have adapted the portal originally described by Declercq for reduction of and direct suture retrieval through the posterior aspect of the rotator cuff during arthroscopic repair with use of the suture anchor technique.

SURGICAL TECHNIQUE

Positioning

For suspected rotator cuff disease, we prefer to place the patient in the modified beach-chair position, but the accessory posteromedial portal is equally useful with lateral decubitus positioning.[12] Care must be taken when a patient is placed in the modified beach-chair position to leave the posterior shoulder widely accessible, thus creating the appropriate angle of attack when the accessory posteromedial portal is used. Specially designed "shoulder tables" may facilitate this, but we have found that translating the patient's torso such that the ipsilateral scapula rests almost completely off the edge of the table and placing a rolled towel along the medial border of the scapula produces adequate protraction to permit unrestricted access to the posterior aspect of the shoulder. A standard padded bolster is placed along the ipsilateral torso to stabilize the patient's position.

Portal

The skin incision for the accessory posteromedial portal is located approximately 4 to 5 cm medial to the posterolateral corner of the acromion, and 2 cm inferior to the scapular spine (Fig 1A). To visualize the portal's entry point into the subacromial space, resection of the subacromial bursa is carried out not only anteriorly and laterally, but posteriorly and medially as well. A lateral portal may be used for viewing; a motorized shaver or thermal device introduced through the posterior portal allows excellent visualization of, and broad access to, the bursa in the posterior and medial aspects of the subacromial space. A thorough subacromial bursectomy executed in this fashion also greatly enhances visualization of the infraspinatus and teres minor, which can facilitate accurate recognition of the tear pattern. Arthroscopic bursectomy that extends posteriorly and medially often causes bleeding from arborizations of the suprascapular artery. We have found that infiltration of this area immediately follow-

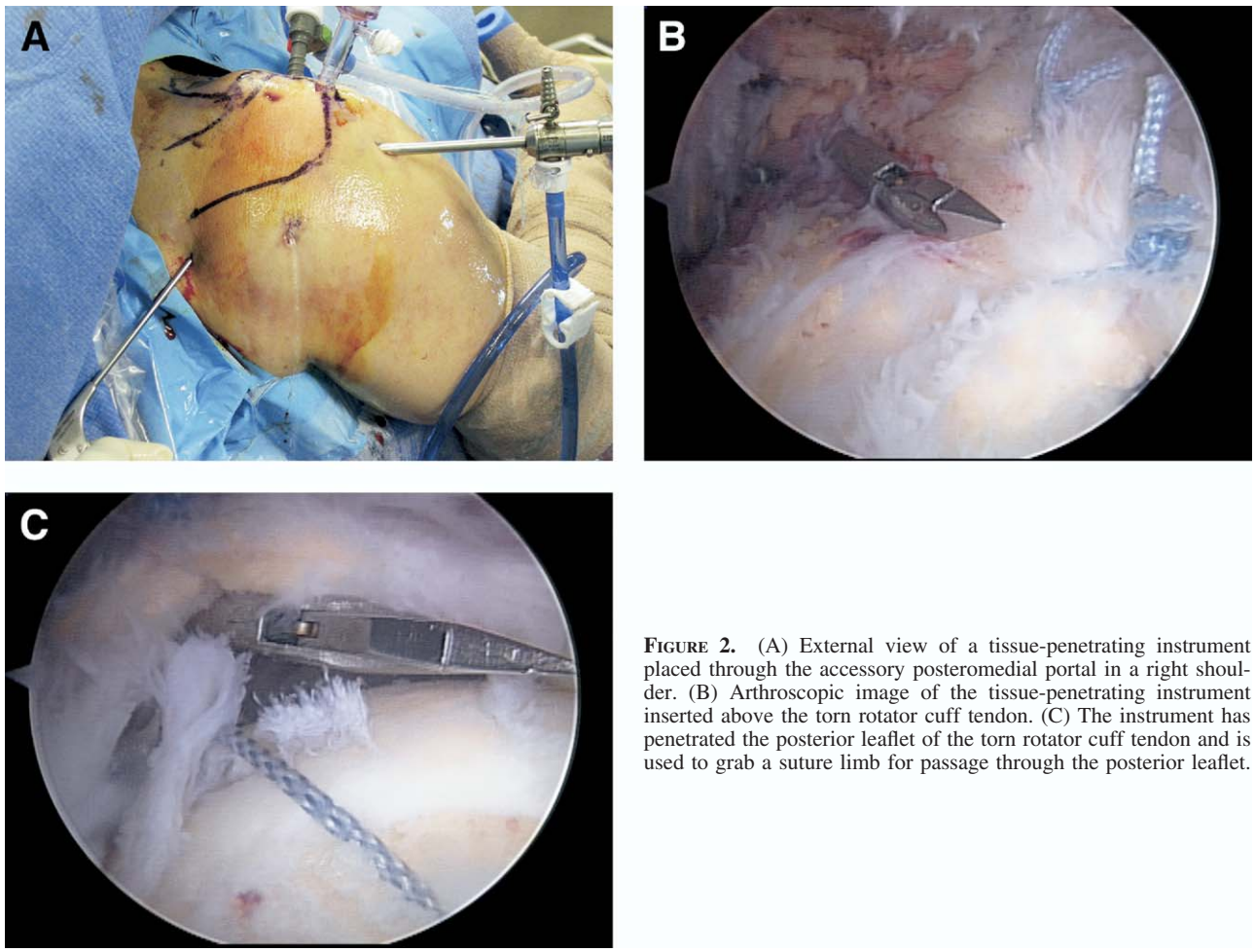

Figure 2. (A) External view of a tissue-penetrating instrument placed through the accessory posteromedial portal in a right shoulder. (B) Arthroscopic image of the tissue-penetrating instrument inserted above the torn rotator cuff tendon. (C) The instrument has penetrated the posterior leaflet of the torn rotator cuff tendon and is used to grab a suture limb for passage through the posterior leaflet.

ing prep and drape with 0.5% marcaine plus epinephrine (1:200,000 concentration) improves postoperative analgesia and significantly reduces bleeding. In addition, the judicious use of a radiofrequency device before a motorized shaver is used for posteromedial bursectomy can help to minimize bleeding in this region.

On completion of the bursectomy, an 18-gauge spinal needle is used in outside-in fashion to establish the appropriate angle of attack for direct suture retrieval through the posterior aspect of the rotator cuff (Fig 1B). This procedure is performed while the subacromial space is viewed from the standard lateral portal. A 3-mm skin incision is made, and a sharp, penetrating suture grasper or suture shuttling device is placed through the posteromedial portal along the angle established through spinal needle localization (Fig 2A, 2B). Care is taken to remain superficial to the infraspinatus and teres minor until the torn edge of the cuff is encountered, so that iatrogenic injury to the suprascapular nerve is avoided. The tip of the penetrating instrument is used to pierce the rotator cuff at the desired point of suture passage and to retrieve anchor suture limbs (Fig 2C). Simple variations in the depth of penetration allow one to easily establish medial and lateral rows for double-row suture anchor fixation, when this is desired. Stabilization of the torn edge of the rotator cuff with a grasper introduced through an anterior or accessory anterolateral portal can further facilitate direct suture retrieval from the accessory posteromedial portal. The accessory posteromedial portal also allows placement of margin convergence sutures for large U-shaped or L-shaped tears by permitting a direct "hand-off" of suture to or from a second penetrating device placed through a standard anterior portal.[20] If multiple suture anchors are required (as in the case of

FIGURE 3. External view of a right shoulder showing suture limbs exiting the accessory posteromedial portal, as well as the standard posterior portal, to facilitate suture management when multiple suture anchors are used.

large or massive cuff tears, or when double-row fixation is employed), sutures can be pulled out through the accessory posteromedial portal to facilitate suture management (Fig 3).

DISCUSSION

Diagnostic arthroscopy of the glenohumeral joint, as well as simple procedures in the subacromial space (e.g., arthroscopic subacromial decompression, distal clavicle excision), can generally be accomplished through standard posterior, anterior, and lateral portals.[21,22] Accessory portals, however, often prove extremely useful when labral and rotator cuff pathology is addressed.[9-14,16,19] Many such accessory portals have been described, including the superolateral portal,[16] the posterolateral portal,[14] the anteroinferior (or 5 o' clock) portal,[11] the posteroinferior (or 7 o'clock) portal,[10] the port of Wilmington,[23] the Neviaser portal,[24] the modified Neviaser portal,[17] and the subclavian portal.[17] We have found that the posteromedial portal, originally described by Declercq et al.,[12] can be adapted in such a way that it greatly facilitates suture passage through the posterior rotator cuff during arthroscopic rotator cuff repair. The directness of this approach eliminates the need for curved or angled suture relay devices, thus simplifying and accelerating what can, at times, prove to be a tedious process of suture management. The accessory posteromedial portal is especially useful when a retracted tear of the infraspinatus or teres minor is encountered. Because these tendons retract in a posterior and medial direction, the accessory posteromedial portal places the tendon-penetrating device in an ideal position for suture passage through the posterior portion of the rotator cuff tear.

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