Technical Note

Arthroscopic Biceps Tenodesis Using Interference Screw: End-Tunnel Technique

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Abstract: The conflict between tenotomy versus tenodesis for biceps lesions of the shoulder has not been resolved. We, however, believe that tenodesis is the treatment of choice until proven otherwise. Hence our department has been performing arthroscopic tenodesis for biceps subluxation or partial tears that involved over 50% of its diameters. We introduce our technique of arthroscopic biceps tenodesis in which the biceps tendon is fixed in the sequentially enlarged bony end-tunnel using bioabsorbable interference screws without transosseous drilling. **Key Words:** Biceps brachii—Arthroscopic tenodesis—Interference screw technique.

Biceps lesions are quite common in shoulder disease. However, the lesion is not addressed until the patient presents other major pathology, such as rotator cuff disease.[1] Biceps tendon subluxation from its groove and biceps partial tears are what we commonly see in patients with rotator cuff disease.[1] The clinical results on tenodesis versus tenotomy in these patients are still a matter of controversy.[2-5] Until it is proven otherwise, we believe that arthroscopic tenodesis is the better treatment for most of the biceps long head lesions. Herein we introduce our technique.

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OPERATIVE TECHNIQUE

A standard posterior and anterior portal is made for glenohumeral joint inspection. The routine 15 arthroscopic anatomic points are examined through the posterior and anterior portals.[6] Before amending any other lesions, the long head of the biceps tendon is marked. A spinal needle is introduced percutaneously through the rotator interval tissue near the anterolateral acromial border and pierces the tendon just proximal to the site where it is going to be cut (Fig 1). A No. 0 polydioxanone (PDS) suture (Ethicon, Somerville, NJ) is introduced to the spinal needle and a grasper is used to grab the end from the anterior portal. The spinal needle is removed and the other limb of the PDS is redirected to the anterior portal with a grasper (Fig 1). The 2 ends are held together with hemostat outside. Two more PDS sutures are introduced in the same fashion, making a total of 3 PDS sutures. Next, arthroscopic scissors or a radiofrequency device (Bisector, ArthroWand; ArthroCare, Sunnyvale, CA) is used to completely sever the tendon at the junction to the superior labrum. If there are other pathologic conditions in the glenohumeral joint, they are properly managed first.

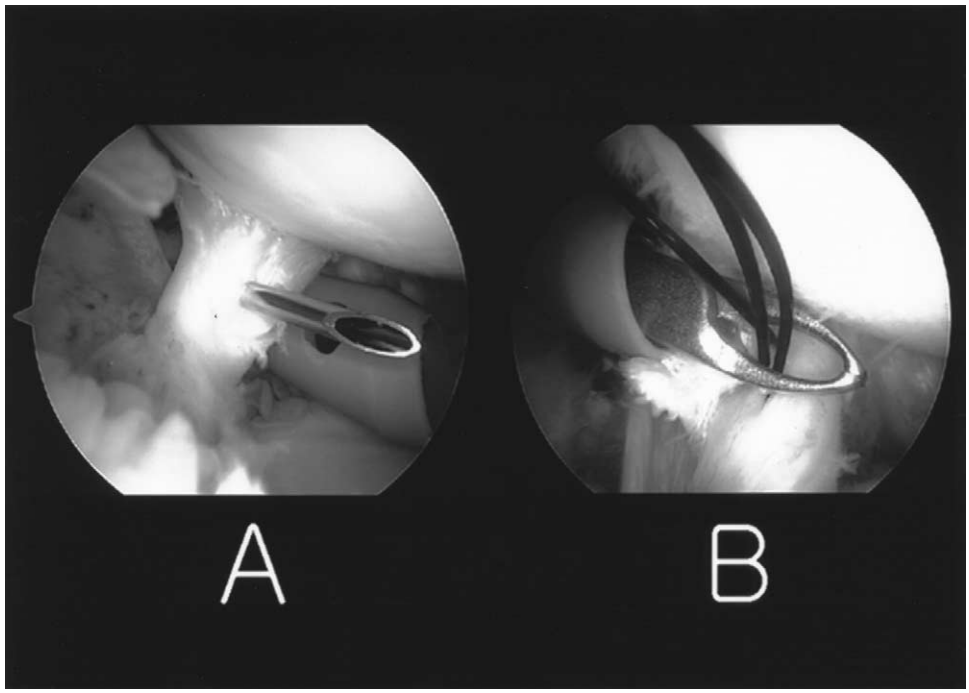

Figure 1. (A) Marking the biceps tendon with the spinal needle. Usually 3 or more PDS sutures are passed just above the site where the tendon is to be severed. (B) The marked PDS suture being pulled out through the anterior portal.

The arthroscope is removed from the joint out of the posterior glenohumeral joint and redirected into the subacromial space through the posterolateral portal 1 cm lateral and anterior to the posterolateral corner of the acromion. The spinal needle is used to establish the anterolateral portal just lateral to the anterolateral corner of the acromion. If there is an associated tear of the rotator cuff tendon, the stump of the biceps tendon and the PDS sutures are easily identified. If the rotator cuff is intact, the rotator interval can be estimated by identifying the PDS sutures. A motorized shaver or radiofrequency device (Bisector, ArthroWand) is used to divide the capsular tissue of the rotator interval over the biceps tendon. The bicipital groove is promptly exposed. The proper placement site for tenodesis is just below the articular cartilage within the bicipital groove. After identifying the proper site and direction with a spinal needle, a punch, which is used for suture anchor fixation (Revo Punch 2.0-mm diameter; Linvatec, Largo, FL; however, any known diameter punch can suit the purpose), is used for initial marking through the anterolateral portal. Afterward, dilators from the anterior cruciate ligament (ACL) kit (Linvatec) are used to make a hole on the humerus. Starting from 6 mm up to 7.5 mm diameter dilators, a 25-mm deep hole is made (Fig 2). All sutures in the stump of the biceps tendon are retrieved through the anterolateral portal. A leader pin (2.0-mm diameter custom-made; however, an ACL guide pin will do), with a custom-made large hole at one end that is big enough for the entire suture limb to pass through, is used for biceps tendon manipulation. Now all of the suture ends are passed through the eyelet of the custom-made leader pin. The leader pin is now introduced to the anterolateral portal with suture limbs hooked (Fig 3). The biceps stump approximates and stays close to the end of the leader pin as we tension the PDS limbs.

We now manipulate the biceps stump and the pin through the humeral hole (Figs 3 and 4A). The deep insertion of the biceps stump and pin is estimated by the pin touching the bony surface of the bottom of the hole. With continuous pressure on the leader pin to the bottom, a 7-mm bioabsorbable interference screw (20-mm length, Linvatec) with guide is inserted into this hole. Next, the screw is introduced through this guide (Figs 3 and 4B). When the screw is half way past the hole locking the biceps tendon, the leader pin is slowly removed while the interference screw is driven in simultaneously. Complete insertion of the interference screw is performed (Fig 5). The remaining PDS suture material is cut with arthroscopic scissors at the edge of the hole. Using a probe, secure fixation is confirmed. The rotator