



Surgical technique for arthroscopic onlay suprapectoral biceps tenodesis with an all-suture anchor

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The long head of the biceps is a frequent pain generator in the shoulder. Tendinopathy of the long head of the biceps may be treated with biceps tenodesis. There has been great debate about the optimal technique for biceps tenodesis, without a clear distinction between different techniques. Biceps tenodesis fixation may include interference fixation, suspensory fixation, all-suture anchors, and soft tissue fixation. In this technical note, we describe an all-arthroscopic onlay suprapectoral biceps tenodesis with an all-suture anchor.

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The long head of the biceps tendon is a common pain generator in the anterior shoulder, with conditions including tendinopathy, tendon tears, superior labral injuries, and biceps tendon instability. Treatment options for a patient with a painful or injured long head of the biceps tendon include tenotomy and tenodesis. Whereas tenotomy is shown to offer pain relief, this procedure alone may lead to a bothersome cosmetic deformity through the arm.^{7,15} As a result, multiple tenodesis techniques have been developed to transfer the origin of the long head of the biceps to the proximal humerus.

Open^{3,6,9,10} and arthroscopic^{2,4,12,14} techniques have been described that allow the management of long head of the biceps disease. The use of biceps tenodesis has increased recently, with Werner et al reporting a 1.7-fold increase between 2008 and 2011.¹⁶ This same study found a rising incidence of arthroscopic tenodesis during the same time.¹⁶

In this technical note, we describe a novel technique for an arthroscopic biceps tenodesis. **Table I** offers a summary of key steps for the procedure, and **Video S1** demonstrates performance of this technique.

Surgical technique

Positioning of the patient

We prefer to perform the procedure in the beach chair position, although the same steps may be accomplished in the lateral

decubitus position. After an interscalene nerve block, general anesthesia or sedation is induced, and the patient is positioned in the sitting position. The operative arm is held in a pneumatic arm holder (SPIDER2; Smith & Nephew, Andover, MA, USA).

Initial exposure and preparation

Glenohumeral diagnostic arthroscopy is performed through a standard posterior portal (**Fig. 1**) with a 30° arthroscope. The intra-articular structures are evaluated in a systematic fashion, and disease at the long head of the biceps is confirmed by pulling the extra-articular portion of the tendon into the joint for inspection (**Fig. 2**). Once the plan for biceps tenodesis is confirmed, a tenotomy is performed with a low-profile basket through a standard anterior rotator interval portal, releasing the biceps flush with the superior labrum. The biceps tendon may be tagged before tenotomy with a suture or with a spinal needle, although we do not routinely perform this step. Any remaining stump of biceps tendon is débrided with a shaver.

Once all other planned procedures are completed, including labral débridement, subacromial decompression, rotator cuff repair, acromioplasty, and distal clavicle excision as indicated, the arm is positioned in 60° of forward flexion and 10°–20° of internal rotation with the elbow flexed to 60°. While viewing through a standard lateral portal, a spinal needle is used to localize an anterolateral portal. This portal is generally located 2 cm inferior and 2 cm lateral to the anterior rotator interval portal. The spinal needle can be used as a probe to find the long head of the biceps tendon and to ensure that the portal location is appropriate. The skin is incised with a No. 11 blade, which can then be used deep to incise along the lateral border of the biceps sheath. Alternatively, a radiofrequency ablation

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Table 1
Key steps for arthroscopic suprapectoral biceps tenodesis with an all-suture anchor

The arm is positioned in 60° of forward flexion, 10°–20° of internal rotation.

An anterolateral portal is localized approximately 2 cm inferior and 2 cm lateral to the standard anterior rotator interval portal.

A lateral portal is used to view in the subacromial space while working through the anterolateral portal.

The sheath around the long head of the biceps is opened with a No. 11 blade or radiofrequency device.

The tendon is pulled from the sheath and then controlled with a tissue grasper.

The groove is exposed distal to the upper border of the pectoralis major. The fibrocartilage transitional zone of the bicipital groove is identified.

An all-suture anchor is placed immediately distal to the fibrocartilage zone.

A cinch stitch is placed around the tendon.

The tendon is tensioned appropriately with the tissue grasper while an arthroscopic knot is tied.

The proximal stump of the tendon is truncated with the radiofrequency device.



Figure 1 The skin is marked, outlining the clavicle, acromion, and coracoid as well as a standard anterior, posterior, lateral, and anterolateral portal.

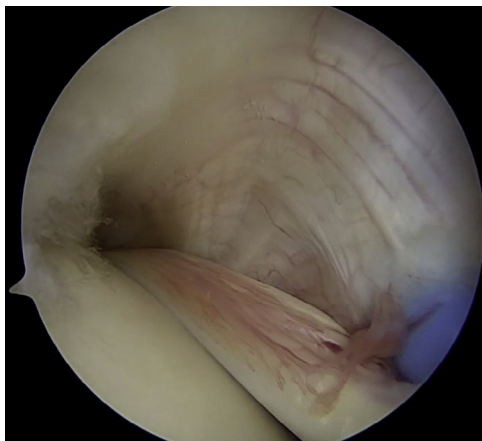


Figure 2 Through a standard posterior portal during diagnostic arthroscopy, the long head of the biceps tendon is identified and tenosynovitis is identified along the course of the biceps tendon.

device may be used through this portal to open the biceps tendon sheath.

Once the sheath is open, the long head of the biceps tendon is pulled out of the sheath using a probe or looped suture retriever.

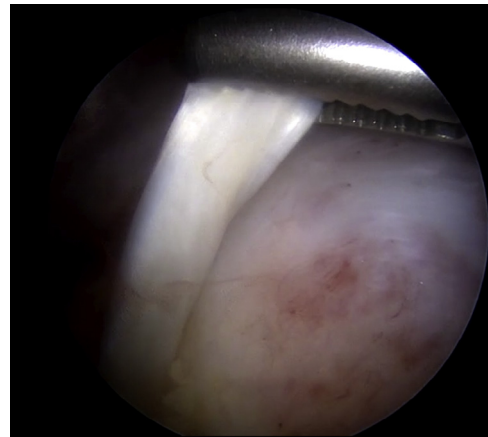


Figure 3 A grasper placed in the posterior portal is used to grasp the proximal aspect of the biceps tendon to manipulate the tendon during the rest of the procedure.

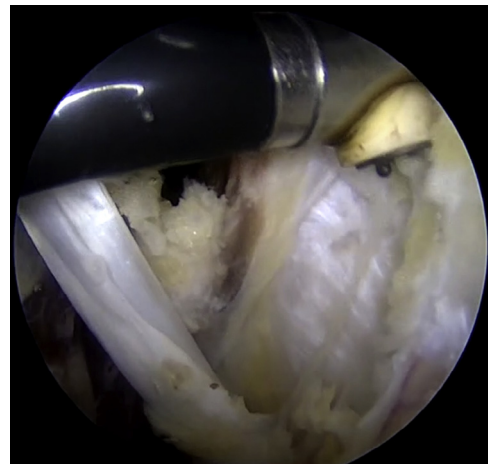


Figure 4 With the biceps tendon moved anteriorly and laterally using the grasper, a radiofrequency ablation device is used to open the biceps tendon sheath and to débride soft tissue. The shiny fibrocartilage signifies the transitional zone of the bicipital groove.

A tissue grasper is inserted through the posterior portal, and the biceps tendon is passed to the tissue grasper. The tendon is held in the grasper for the remainder of the procedure, allowing control of tendon position and eventually length for the tenodesis (Fig. 3).

With the grasper, the tendon is held anteriorly and medially. A radiofrequency device is used through the anterolateral portal to release tissue along the course of the biceps tendon (Fig. 4). This débridement is done carefully distally as crossing vessels are often

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