Technical Note

Arthroscopic Suprascapular Nerve Release at the Suprascapular Notch in a Cadaveric Model: An Anatomic Approach

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Abstract: Arthroscopic release of the suprascapular nerve at the suprascapular notch, to our knowledge, has rarely been described. The purpose of this study was to evaluate the feasibility and relevant anatomic landmarks in a cadaveric model that can be identified arthroscopically for reliable and reproducible arthroscopic release of the superior transverse scapular (STS) ligament. In 8 fresh-frozen cadaveric shoulders, arthroscopic release of the STS ligament was performed. The acromioclavicular joint is first identified while viewing through a posterior subacromial portal. The distal clavicle is then followed medially until the most lateral portion of the coracoclavicular (CC) ligaments (trapezoid ligament) is identified. The most medial margin of the CC ligaments (conoid ligament) is identified, and the trapezoid and conoid ligaments are dissected and identified individually. The conoid ligament is followed inferiorly and medially to the base of the coracoid. At the base of the coracoid, the confluence of the trapezoid and conoid ligaments (CC) and the STS ligament is identified. The STS ligament can be identified coursing horizontally across the field of view. The STS ligament may be incised by use of dissecting scissors through a lateral, accessory lateral, or accessory posterior portal, releasing the suprascapular nerve. **Key Words:** Suprascapular nerve—Transverse scapular ligament—Notch—Cadaver.

Suprascapular nerve compression at the osseofibrous canal of the suprascapular notch is a relatively rare entity but has been well described in the literature.[1]

Clinical presentation is characterized by a history of violent or repetitive overhead activities or of direct trauma, with resultant posterolateral shoulder pain, atrophy of the supraspinatus and infraspinatus muscles, and weakness of abduction and external rotation.[1] Suprascapular nerve compression at the suprascapular notch must be differentiated from suprascapular nerve compression at the spinoglenoid notch. Whereas the former generally involves compression at the suprascapular notch with resultant denervation of both the supraspinatus and infraspinatus muscles, suprascapular nerve compression at the spinoglenoid notch is not uncommon and involves only the infraspinatus muscle.[2-7] Suprascapular nerve compression at the spinoglenoid notch commonly involves a posterosuperior labral tear and spinoglenoid cyst.[5-7] Electromyographic analysis and nerve conduction velocity examination can be helpful in differentiating each diagnosis and in determining the involvement of the supraspinatus muscle or infraspinatus muscle (or both).[2-4] Surgical decompression is warranted when nonoperative treatment fails or a discrete lesion is present. Surgery for suprascapular nerve compression at the suprascapular notch has traditionally been performed with an open technique.[8,9]

Arthroscopic release of the suprascapular nerve at

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the suprascapular notch, to our knowledge, has rarely been described in the orthopaedic literature.[10,11] The purpose of this study was to evaluate the feasibility of the relevant anatomic landmarks that can be identified arthroscopically for reliable and reproducible arthroscopic release of the superior transverse scapular (STS) ligament. We describe our arthroscopic technique, which is based on these anatomic landmarks. We performed this technique on 8 cadaveric shoulders, measuring the distance between each of the pertinent anatomic landmarks. The technique is minimally invasive and based on reliable anatomic landmarks that are visualized in a sequential manner.

DESCRIPTION OF TECHNIQUE

Arthroscopic release of the STS ligament was performed in 8 fresh-frozen cadaveric shoulders. There were 3 male and 5 female specimens with a mean age of 67.5 years (range, 49 to 88 years). All shoulders were mounted in the beach-chair position, and relevant anatomic landmarks were identified in a stepwise manner. The distance between each of the landmarks and the steps to identify each were measured. Table 1 summarizes the distances measured. Open dissection was performed to confirm each measurement, to verify transverse scapular ligament release, and to investigate by visual inspection whether overt macroscopic damage to surrounding structures had occurred.

The arthroscope is placed into the subacromial space via a standard posterior portal. A lateral portal for both working and viewing is then established. Arthroscopic fluid pump pressure is maintained at 60 mm Hg. All bursal and fibrofatty tissue is then cleared off of the top of the supraspinatus via a posterior viewing portal and a lateral working portal, and the acromioclavicular (AC) joint is identified. The position of the AC joint is confirmed with either direct palpation of the distal clavicle or a percutaneous needle. The posterior aspect of the AC joint is identified and noted as the initial anatomic landmark.

TABLE 1. *Mean Distances of Each Anatomic Landmark Used to Identify and Release STS Ligament*

Landmark	Distance (mm) (mean ± SD)
Lateral margin of distal clavicle to lateral margin of trapezoid ligament	16.7 ± 1.2
Lateral margin of trapezoid ligament to medial margin of conoid ligament	19.3 ± 2.6
Superior margin of conoid ligament to inferior margin of conoid ligament	15.2 ± 1.4
Lateral margin of STS ligament to medial margin of STS ligament	9.0 ± 0.6

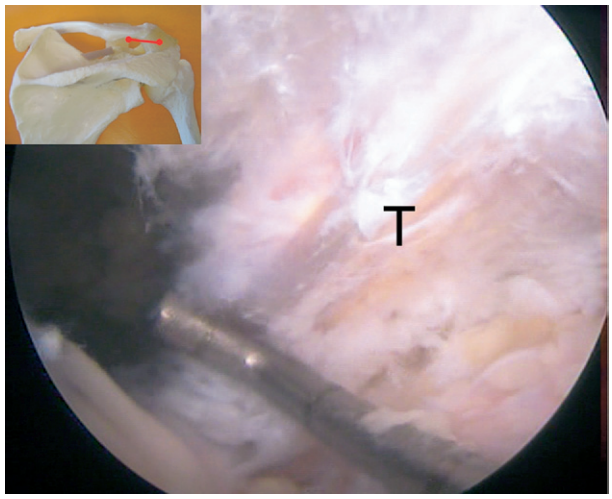

FIGURE 1. Arthroscopic view through a posterior portal showing palpation of trapezoid ligament (T) with a probe. Path of dissection (inset).

The posterior aspect of the distal clavicle is cleared of fibrofatty tissue via the lateral working portal until the lateral edge of the trapezoid part of the coracoclavicular (CC) ligament is identified (16.7 ± 1.2 mm from the lateral tip of the distal clavicle) (Fig 1). Dissection is continued medially. Fibrofatty tissue is cleared from the posterior aspect of the CC ligaments and the underlying supraspinatus muscle belly. We use both electrothermal tissue ablation and a motorized shaver to accomplish this. Care is taken not to injure the underlying supraspinatus muscle.

The medial border of the conoid part of the CC ligament is then identified. Its fibers are seen to pass inferiorly at a 90° angle to the undersurface of the clavicle. The medial border of the conoid part of the CC ligament is identified 19.3 ± 2.6 mm from the lateral edge of the trapezoid part of the CC ligament.

A Neviaser portal is then established,[12] and a probe is directed toward the posterior aspect of the conoid ligament under direct vision. The probe is used to retract the anterior edge of the supraspinatus muscle belly in a posterior direction and enable visualization of the entire length of the conoid ligament (mean length, 15.2 ± 1.4 mm) (Fig 2). In these cadavers we noted that the muscle mass of the supraspinatus was large, and injury to the muscle may occur during dissection of the CC and STS ligaments. When this muscle is large, establishing a Neviaser portal is es-