



Case Presentation

Sonographic Findings in Subcoracoid Impingement Syndrome: A Case Report and Literature Review

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Abstract

Subcoracoid impingement syndrome is a rare and underrecognized cause of anterior shoulder pain. Currently, subcoracoid impingement syndrome is understood to involve impingement of anatomic structures such as the subcoracoid bursa and subscapularis tendon within the coracohumeral space, and there are no reports of sonographic findings in subcoracoid impingement syndrome other than the impingement of thickened subscapularis bursa. Here we report a case of subcoracoid impingement syndrome, including a novel sonographic finding, arthroscopic findings, and a proposed pathophysiology.

Introduction

Subcoracoid impingement syndrome is a rare and often-overlooked cause of anterior shoulder pain. It has been described as any process that reduces the capacity of the coracohumeral space, leading to the impingement of the subscapularis tendon, muscle, or bursa upon the coracoid process and resulting in anterior shoulder pain [1]. Symptoms of subcoracoid impingement typically include a dull pain in the anterior shoulder worsened by forward flexion, adduction, and internal rotation of the shoulder, which is the anatomic position of maximal impingement of the subscapularis tendon, or subcoracoid bursa under the coracoid process. In this anatomic position, the coracoid process most closely approximates the lesser tuberosity of the humeral head [2-6].

Currently no information is available about the prevalence of subcoracoid impingement syndrome in the literature, and the etiology is not well understood. Current theories suggest that subcoracoid impingement is multifactorial in nature and may include idiopathic, iatrogenic, and traumatic causes [7]. Even though imaging studies can support the diagnosis, subcoracoid impingement syndrome remains primarily a clinical diagnosis that should be considered in the differential diagnosis of anterior shoulder pain. Plain radiographs

are usually of low clinical yield but may reveal bony abnormalities. The primary imaging evaluation is computed tomography or magnetic resonance imaging (MRI) assessment of the coracohumeral space, although there is conflicting diagnostic value in the literature. Sonographic detection of subcoracoid impingement due to edema and inflammation of the subscapularis bursa has been reported [3,4], but there are otherwise no other reports of sonographic findings in this condition. Here, we report a case of subcoracoid impingement syndrome with both sonographic and arthroscopic findings and a new proposed underlying pathophysiology.

Case History

A 39-year-old man with 4-5 months of right anterior shoulder pain presented to the physical medicine & rehabilitation clinic at a tertiary medical center. There was no known preceding trauma, previous shoulder pain, or old shoulder injuries reported. The patient reported the development of a sudden, sharp, anterior shoulder pain after lifting a gallon of milk. Initial conservative management consisting of 2 months of physical therapy resulted in only mild improvement of the pain. The pain was described as constant, aching, and worse with any shoulder motion or activity. On physical examination, there was no swelling, erythema,

or warmth. The patient localized the tenderness to the region between the bicipital groove and the coracoid process; palpation as well as both active and passive internal rotation reproduced his symptoms. There was limited internal rotation, reduced strength on the empty can test, and his pain was reproduced with resisted internal rotation and belly-press test. Findings from the Yergason test, Neer test, Hawkins-Kennedy maneuver, crossed arm impingement test, and O'Brien test were all negative. An ultrasound-guided subacromial corticosteroid injection yielded no improvement in symptoms.

MRI of the shoulder revealed a minor insertional supraspinatus tear that did not correlate with the patient's anterior shoulder pain or physical examination. Given the anterior location of his pain, his examination findings that were not consistent with subacromial impingement, and his lack of response to ultrasound-guided subacromial injection, subcoracoid impingement was considered, and a diagnostic ultrasound was performed to evaluate for any sonographic findings consistent with this diagnosis [3]. Sonopalpation located the tenderness over the subscapularis and the conjoint tendon of the biceps short head and the coracobrachialis. A transverse axis view of the anterior shoulder at the level of the coracoid process showed no evidence of pathology involving the subscapularis bursa or tendon. There were no notable calcific lesions within the coracohumeral interval. There was no evidence of bony impingement of the subscapularis by the coracoid process on dynamic evaluation of the shoulder with passive maximum internal and external rotation.

With the transducer positioned slightly more caudal, however, there was significant displacement of the proximal conjoint tendon by the subscapularis on maximum passive external rotation (Figure 1) with the bowing of the conjoint tendon on longitudinal view (Figure 2) along with the reproduction of patient's pain.

Comparison with the asymptomatic contralateral side demonstrated no significant displacement in both transverse and longitudinal views (Figures 3 and 4). An ultrasound-guided diagnostic block to the muscle belly of the subscapularis was performed with 2 mL of 1% lidocaine, with notable postinjection improvement in pain on palpation and strength on resisted internal rotation as well as the belly press test. On the basis of the results of the diagnostic block and with the hope of longer duration of pain relief, the patient received an ultrasound-guided steroid injection of the subscapularis intramuscularly at the next appointment, which led to greater than 50% improvement of his overall symptoms. The patient was referred to orthopedics for consideration of decompressive surgery.

The patient was evaluated by orthopedics, and a computed tomography scan was obtained for further evaluation of the coracohumeral interval, which measured 11.2 mm (Figure 5). Further nonsurgical management was recommended, and patient underwent conservative treatment for the next 4 months to include rest, nonsteroidal anti-inflammatory drugs, activity modification, physical therapy, and dextrose prolotherapy targeting the conjoint tendon and the lateral side of the coracoid process. A magnetic resonance arthrogram of the shoulder was obtained, which demonstrated no excessive pathology.

Given the failure of conservative treatment, the patient returned to orthopedics and eventually underwent a diagnostic arthroscopy for presumed subcoracoid impingement syndrome. Intraoperative findings were notable for the abnormally thickened middle glenohumeral ligament (MGHL) contacting the subscapularis tendon with an abnormal soft-tissue connection between the 2 structures, and fibroadipose tissue obscuring the conjoint tendon (Figure 6). These findings were felt to contribute to a decreased space between the base of the coracoid process and the subscapularis tendon. There

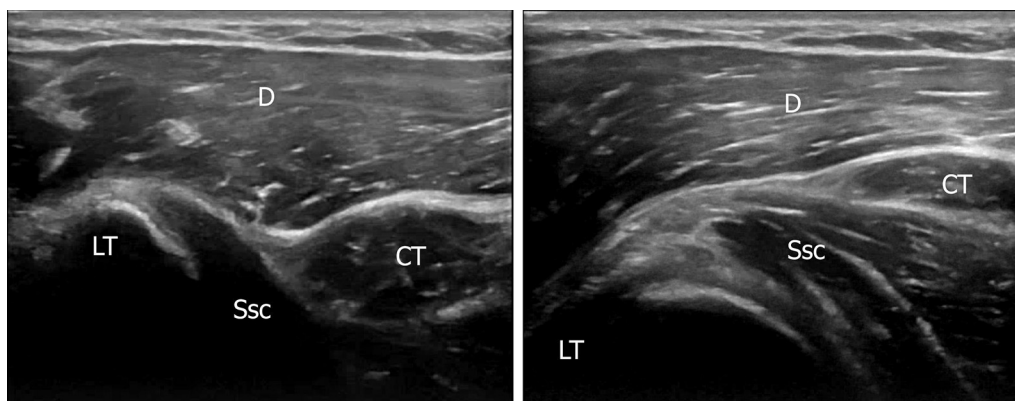


Figure 1. Transverse-axis view of anterior shoulder caudal to the coracoid process, with the shoulder in neutral rotation (left). The subscapularis (Ssc) is deep to the conjoint tendon (CT) proximally, and inserts on the lesser tubercle (LT) distally. The deltoid is the most superficial muscle (D). The conjoint tendon is at essentially same plane of depth compared to the lesser tubercle. On maximum passive shoulder external rotation (right); however, the conjoint tendon is displaced by the subscapularis, along with reproduction of pain.

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