



Quadrilateral Space Syndrome: A Case Report

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Introduction

Any process causing compression of the structures in the quadrilateral space (QS) results in Quadrilateral Space Syndrome (QSS). Hypertrophy or edema of one of the muscles bordering the QS can lead to neurovascular impingement. Similarly, injury to adjacent structures or growth of a mass within the space may result in impingement. Symptoms are aggravated by forward flexion, external rotation or abduction of the humerus.

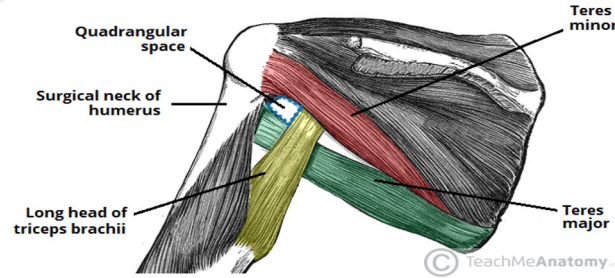
(1,2)

Initial treatment for QSS is conservative. Patients are advised to make lifestyle changes such as increasing activity and fitness to minimize symptoms. Physical therapy aims to strengthen the rotator cuff muscles and the glenohumeral joint and ultimately changed any fibrous tissue from previous injury. Surgical decompression of the quadrilateral space, may be indicated in severe cases, or after six or more months of failed conservative treatment. Ultrasound-guided corticosteroid injections may be used to decrease inflammation and impingement of the axillary nerve. Surgical decompression of the axillary nerve in the QS has been effective in multiple severe cases. As is the case with most chronic musculoskeletal pathology, surgery is considered after failure of months of conservative treatment.

(5, 6, 8)

Image Description

To the right is a diagram showing the QS through which the axillary nerve travels. (10)



Case Description

A 22 Year old Male with a history of hypertension, obesity and multiple left shoulder dislocations presented with a 2 year history of recurrent left shoulder pain that radiates to his left wrist, which started when he slipped on ice and landed on his left shoulder. Pharmacologic treatments with ibuprofen, oxycodone, acetaminophen, pregabalin and morphine were unsuccessful. A diagnosis was difficult to pinpoint due to the overlap of symptoms with other upper extremity pathology as well as a paucity of imaging findings.

Imaging Results

- CT shoulder: moderate hill-sachs deformity
- Right Upper Extremity Angiogram: normal
- MRI C-spine brachial plexus: no significant findings
- X-ray C-spine: normal findings
- EMG: neurologic changes suggesting partial chronic upper brachial plexus lesion involving C5 and C6 roots

Previous unsuccessful procedures

- left suprascapular nerve block with fluoroscopy
- left stellate ganglion block with fluoroscopy
- QS injection with fluoroscopy
- glenohumeral joint injection with fluoroscopy

All of the aforementioned procedures resulted in brief pain relief or no relief.

Trigger point injections of the suprascapular, supraspinatus and trapezius muscles demonstrated a modest, short-term improvement as the patient reported improved quality and length of sleep. His clinical course was complicated by a left shoulder dislocation approximately two weeks after the injections and subsequent rotator cuff surgical repair four weeks after injection. Despite these treatments, this patient required oxycodone, acetaminophen, gabapentin, celecoxib and muscle relaxers. Eventually, he underwent arthroscopy with anterior capsulorrhaphy and coracoid process transfer.

Discussion

QSS is often difficult to diagnose given that its symptoms overlap with other conditions of the upper extremity. Thus, it may be overlooked in the clinic. Patients often present with a non-localized shoulder pain, paresthesia and tenderness over the space. MRI and physical exam may demonstrate atrophy of the deltoid or teres minor muscle from chronic axillary nerve impingement. Additionally, angiography may demonstrate vascular insufficiency when the arm is placed in a provocative position. Thus, QSS presents similarly to thoracic outlet syndrome, cervical radiculopathy, suprascapular nerve entrapment and parsonage-turner syndrome.

(1)

There exists no standard diagnostic tool or strategy for QSS. Consequently, patients may go years without proper diagnosis. Modern imaging and EMG allow for accurate, detailed diagnoses of many upper extremity conditions. Recently, musculoskeletal ultrasound (US) findings showing compression of the posterior humeral circumflex artery and axillary neuropathy can be correlated with symptoms to make formal diagnoses.

Based on case reports, musculoskeletal US has been effective in diagnosing QSS when other modalities failed. US showed the compression of the posterior humeral circumflex artery in the QS. Additionally, unilateral axillary nerve edema was noted on the affected arm compared to the contralateral side.

(2, 5, 6, 7)

Initially, patients are advised to make lifestyle changes such as increasing activity and exercise. Physical therapy aims to strengthen the rotator cuff muscles and the glenohumeral joint. Surgical decompression of the QS may be indicated in severe cases, or after six or more months of failed conservative treatment. Procedural alternatives, including US guided steroid injections are utilized to decrease axillary nerve inflammation.

(5, 6, 8)

Image Description

Fluoroscopic image demonstrating contrast in the QS.

References

