

Electrodiagnosis of Quadrilateral Space Syndrome: A Case Report

Dholakia Madhuri¹, Sinha Anupam²

Abstract

Quadrilateral space syndrome is a rare occurrence of compression of the axillary nerve within the quadrilateral space. It presents as shoulder pain with weakness due to teres minor atrophy. It can often times be overlooked and undertreated. MRI and electrodiagnostic studies are used to confirm the diagnosis. We present a case of a patient with quadrilateral space syndrome confirmed using both MRI and electrodiagnosis.

Keywords: Electrodiagnosis, quadrilateral space syndrome, axillary nerve.

Case Report:

A 56 year-old male presented to our practice with a two year history of non-traumatic neck and right shoulder pain. He denied any upper extremity radicular pain but did report mild paresthesias in his hands. He denied any bowel, bladder, or balance disturbance. On examination, the patient was neurologically intact without evidence of upper motor neuron signs. He did have mild weakness in right shoulder strength along with positive shoulder impingement signs. MRI of the cervical spine showed evidence of C6-7 foraminal stenosis. The patient had undergone physical therapy and cervical epidural injections with marginal improvement of his symptoms. MRI of the right shoulder revealed mild supraspinatus tearing and fatty atrophy of the teres minor.

Electrodiagnostic testing of the right upper extremity showed normal nerve conduction and needle studies,

except for denervation found only in the teres minor; there was no denervation noted in the cervical paraspinals or remainder of the right upper extremity. The patient was diagnosed with quadrilateral space syndrome (QSS) and referred for physical therapy.

Discussion:

QSS results from compression of the distal branch of the axillary nerve and/or posterior humeral circumflex artery as it exits this anatomic compartment¹. Symptoms result from compression of the axillary nerve, not from arterial occlusion. The quadrilateral space is defined by the long head of the triceps (medially), surgical neck of the humerus (laterally), teres minor (superiorly), and teres major (inferiorly)² (Fig 1). QSS may often present secondary to anterior shoulder dislocation, impingement from a cystic mass, muscular hypertrophy, fibrous bands, gunshot wounds, iatrogenic injury during shoulder surgery, sports injury (most often in overhead athletes), and venous dilation³.

Diagnosis of QSS requires a high index of suspicion from the physician. Examination will reveal pain and/or weakness with shoulder abduction and external rotation. MRI of the shoulder will show isolated atrophy of the teres minor, often without findings in the deltoid. Subclavian arteriography and Doppler ultrasound are useful in diagnosing arterial occlusion^{4,5}. Electrodiagnostic studies (EMG) may show denervation of the teres minor with possible findings in the deltoid as well.

Isolating the teres minor during EMG involves the patient lying on the unaffected side. The needle is inserted one

Author's affiliations:

1 MD, Clinical Instructor

2 DO, Associate Physician

Department of Physical Medicine and Rehabilitation, Thomas Jefferson University

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Correspondence:

Dr. Madhuri Dholakia Madhuri, Clinical Instructor,
Department of Physical Medicine and Rehabilitation, Thomas
Jefferson University, 925 Chestnut Street, Philadelphia, PA 19107
Email: madhuri.dholakia@rothmaninstitute.com

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third of the way between the acromion and inferior angle of scapula along the lateral border. The muscle is activated by externally rotating the shoulder⁶. Needle examination of the supraspinatus and infraspinatus muscles should be normal.

Treatment of QSS initially involves rest and non-steroidal anti-inflammatories, followed by a course of physical therapy. For refractory cases, surgical decompression of the axillary nerve may be considered as well^{3,5}.

Conclusion:

We present a rare case of right shoulder pain and weakness secondary to isolated teres minor atrophy from axillary nerve injury within the quadrilateral space. Quadrilateral space syndrome is often overlooked as a diagnosis in patients presenting with shoulder pain and weakness. Clinicians should be aware of this syndrome, especially in the young athlete, and should rely on both MRI and EMG of the shoulder to confirm the diagnosis.

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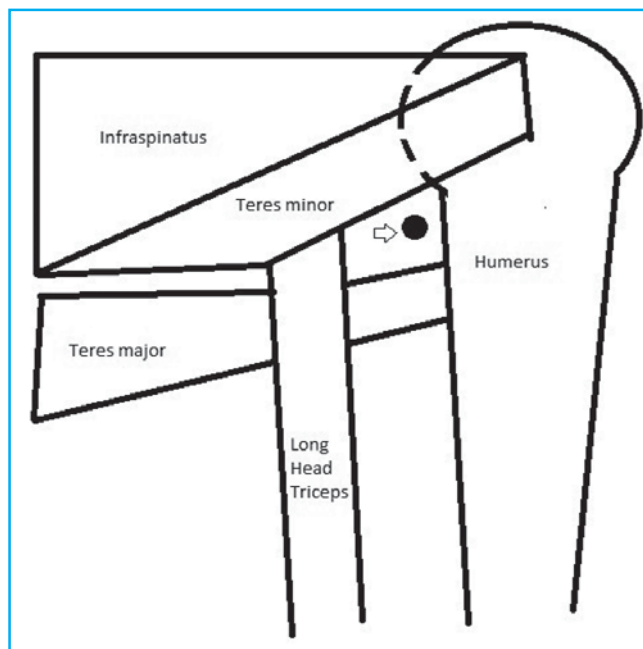


Fig 1- Arrow Pointing to the Axillary Nerve within the Quadrilateral Space



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