

**Incidence of concomitant disputed neurogenic thoracic outlet syndrome with rotator cuff tear and its effect on post-operative management and outcome. - A clinical case report.**

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**Background:** Rotator cuff (RC) tears are one of the most common injuries affecting the shoulder. Acute tears occur typically due to macro trauma related to a fall or a sudden loaded movement. A few studies have shown the prevalence of greater tuberosity fractures, anterior dislocations and peripheral neurological injuries associated with traumatic rotator cuff tears. Disputed neurogenic thoracic outlet syndrome (nTOS) is a controversial and often overlooked set of symptoms related to compression/irritation of the brachial plexus due to a singular trauma to the shoulder girdle and/or the neck or work related repetitive stress injury. To my knowledge, the concurrent occurrence of traumatic rotator cuff tear and nTOS has not been discussed in the literature.

**Purpose:** The objective of this clinical case presentation is to describe the rare occurrence of nTOS in a patient with a rotator cuff tear, and how the post-operative rehab was altered to facilitate an optimum outcome.

**Case Description:** A 41 year old female sustained a fall on ice that resulted in a large rotator cuff tear. The patient was managed with arthroscopic rotator cuff tear within a week of the fall and was referred for rehab, 5 days post op. At her initial therapy session, on a 0-10 VAS, the patient presented with pain and heaviness along the scapular / periscapular area (3-4/10), shoulder and the upper arm (2-5/10), with a self-described "deep ache" along the forearm (2-3/10) and paresthesia in the ulnar 3 fingers. Her DASH score was at 79.5/100. The patient reported similar symptoms, albeit at a higher intensity, in the days leading up to the surgery. The patient began post- op rehab, 1-2 times a week, with passive ROM protocol (90 degrees forward flexion/scaption at 2 weeks post op; 125 degrees at 4 weeks post op). At 6 weeks, the sling was discontinued and PROM was progressed to within tolerance in all planes, with the introduction of AAROM, AROM and scapular exercises. At 8 weeks, the patient's ROM progress was on target, but she reported varied pain levels of 2-5/10 in the shoulder, with worsening symptoms of deep ache, heaviness and pain along the scapular area, the upper arm, and forearm, with associated intermittent altered sensation and paresthesia along the hand and the digits, not following any specific dermatomal pattern. Her DASH score was at 77.3/100. These symptoms were worse at night and with overhead movements of the arm but did not include any motor deficits. Presence of cervical radiculopathy and cubital tunnel syndrome were ruled out and the patient was referred for a neurological consult. The patient was eventually diagnosed with post traumatic nTOS/ brachial plexus traction injury. The rehab treatment plan was modified accordingly with focus on unloading the brachial plexus through patient education, postural control, specifically in relation to scapular mechanics, taping, ROM and neural mobilization. This was coupled with the already established RC rehab program.

**Outcomes:** The patient reported significant reduction in sensory symptoms and functional improvement within 4 weeks of the introduction of the modified rehab program. At 12 weeks post op her pain rating had reduced to 0-1/10 in the upper extremity with minimal paresthesia at night; DASH score was at 38.6. Strengthening and dynamic stability program was initiated without any return of sensory symptoms. At 16 weeks, the patient had complete resolution of all sensory symptoms with a DASH score of 13.6.

**Discussion:** Although her mechanism of injury was not dissimilar to other traumatic RC tears, this patient's fall also affected the brachial plexus. We hypothesized the worsening of sensory symptoms to the discontinuation of the sling at 6 weeks, with the weight of the arm and poor scapular mechanics further loading the already compromised brachial plexus. Through a modified rehab program, we were able to alleviate the patient's symptoms resulting in an excellent outcome for this patient.