

## Thoracic Outlet Decompression Unmasks Symptoms of Suprascapular Nerve Compression

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Thoracic outlet syndrome (TOS) remains a challenging diagnosis to discern and is based largely on clinical symptoms. Symptoms are secondary to compressive neuropathy primarily affecting the lower roots of the brachial plexus, including paresthesia, weakness, muscle atrophy, and pain.<sup>1</sup> Due to misdiagnosis, there is often a delay between symptom onset, accurate diagnosis, and appropriate treatment. In many patients, this delay can last years. Furthermore, success rates of thoracic outlet decompression (TOD) vary from resolution of all symptoms to persistent pain, paresthesia, or recurrence of preoperative complaints.<sup>2</sup> The overall success rate for TOD ranges from 43% to 96% but is limited by subjective terms to define improvement or success.<sup>3</sup>

Suprascapular nerve (SSN) neuropathy is another condition that can be challenging to diagnose without delay, as symptoms are nonspecific and range from dull pain located in the superior or posterolateral shoulder, muscle weakness, atrophy, or functional impairment.<sup>4,5</sup> The SSN originates from the upper trunk of the brachial plexus and is at the greatest risk for entrapment at the suprascapular notch or the spinoglenoid notch. Successful SSN decompression rates are reported to be up to 97% based on the evaluation of postsurgical electrodiagnostics.<sup>4</sup>

The aim of this communication is to describe our challenges in diagnosis and a possible link between TOS and SSN compression. We noted that symptoms of SSN compression were discerned or unmasked after patients underwent TOD. Furthermore, symptoms of TOS and SSN compression improved only after both neuropathies were surgically treated. We have encountered several patients with symptoms consistent with TOS, namely paresthesias of the upper extremity, specifically exacerbated by lifting the arm overhead. Further diagnostic determination of TOS was confirmed with exacerbation of symptoms when palpating the supraclavicular area and

by provocative maneuvers (eg, elevated arm stress test). An anterior scalene muscle block along with Baltimore Therapeutic Equipment exercises, as described by Braun et al,<sup>6</sup> aided in diagnosing the condition. Nerve conduction studies are completed along with evaluation of the median antebrachial cutaneous nerve, if possible. Most patients generally also received axial imaging of the neck and shoulder. The surgical approach for TOD utilized a primarily supraclavicular approach. After surgical decompression, preoperative symptoms continued to affect some patients, and SSN neuropathy became evident. The identification of SSN neuropathy included continuation of some of the above-noted symptoms along with pain localized to the suprascapular notch. Symptoms were temporarily relieved using an anesthetic injection in the location of the suprascapular area that elicited the most pain on palpation. Of the past 12 patients treated for TOS, three achieved symptomatic improvement only after the entrapped SSN was also released using a posterior approach. We propose that a proportion of patients with remaining symptoms after TOD may have an associated SSN neuropathy, which seems to become evident only after TOD.

It is possible some patients may only have had SSN compression and not co-occurring TOS. Given the lack of purely objective tests for TOS and SSN entrapment, the diagnosis is largely based on history and examination. Based on presentation and workup of our patients, the symptoms were initially consistent with a diagnosis of TOS, and there did not seem to be symptoms of an SSN irritation.

Concomitant TOS and SSN entrapment are exacerbated by repetitive overhead activities, as this can be an inciting factor of both disorders. Several questions have arisen from this possible association, including the following: How common is the co-occurrence of these entrapment neuropathies? What diagnostic criteria can aid in distinguishing the correct diagnosis of SSN entrapment when TOS symptoms are present before surgical intervention? Can SSN neuropathy lead to a more general plexus irritation causing symptoms to radiate down the arm? Little data are available on the association between the two disorders. We are interested to understand whether others have noted the co-occurrence of these conditions and would welcome any diagnostic or treatment insight.

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Received for publication February 23, 2022; accepted May 17, 2022.

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*Plast Reconstr Surg Glob Open* 2022;10:e4429; doi: [10.1097/GOX.0000000000004429](#); Published online 11 July 2022.

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**DISCLOSURE**

*The authors have no financial interest to declare in relation to the content of this article.*

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