RECOGNITION OF AMYOTROPHIC LATERAL SCLEROSIS DURING PAIN MEDICINE EVALUATION FOR SUSPECTED NEUROGENIC THORACIC OUTLET SYNDROME

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INTRODUCTION

Neurogenic thoracic outlet syndrome (nTOS) presents with upper extremity pain, weakness, and functional impairment, often prompting referral for a diagnostic anterior scalene block. However, atypical motor findings may signal an underlying motor neuron disorder.

We present a patient referred for suspected nTOS in whom the physical examination, not imaging, raised suspicion for a motor neuron disorder and prompted expedited neurologic evaluation and a diagnosis of amyotrophic lateral sclerosis (ALS).

METHODS

Clinical history, imaging, procedural and operative reports, and electrodiagnostic testing were retrospectively reviewed. The patient underwent an ultrasound-guided diagnostic right anterior scalene block (1% lidocaine), followed by Neurology referral for concerning motor findings.

10/10 → 2.5/10

Pain after the scalene block, yet motor deficits persisted

NEUROLOGY EXAM & EMG

Lower motor neuron	Upper motor neuron
Severe R > L UE weakness	Hyperreflexia
Diffuse atrophy	Ankle clonus
Bilateral fasciculations	Positive Hoffmann sign
EMG: active denervation, cervical & thoracic	Positive pectoral reflex

IRB: Exempt; devoid of patient-identifiable information per University of Illinois Chicago policy.
Consent: Informed consent for publication was obtained from the patient.
Disclosures: The authors report no conflicts of interest.

CASE PRESENTATION

A 61-year-old woman presented with a two-year history of progressive right shoulder pain, profound right upper extremity weakness, and diffuse muscle atrophy following hospitalization for chronic pancreatitis. Weakness later progressed to the contralateral upper extremity.

Prior imaging showed rotator cuff pathology and multilevel cervical degenerative disease; brachial plexus MRI revealed no structural abnormality explaining the deficits.

She was referred to Pain Medicine by Orthopedic Surgery; after the block, our concerns were discussed directly with Orthopedic Surgery and Neurology.

EXAM FINDINGS THAT CHANGED THE DIAGNOSIS

Motor deficits with intact sensation
On examination, profound diffuse motor weakness and atrophy with no corresponding sensory loss: a pure motor pattern, unlike the sensory involvement expected in nTOS.

Atypical distribution
Weakness and atrophy prominently involved the deltoid, outside the lower-trunk C8–T1 distribution typical of nTOS.

Atrophic anterior scalene
On ultrasound, the muscle was markedly atrophied rather than hypertrophied, scarred, or fibrotic.

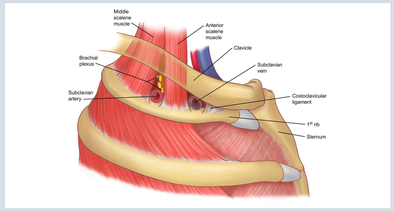


Figure 2. Thoracic outlet anatomy: the brachial plexus and subclavian vessels pass between the scalene muscles and over the first rib.

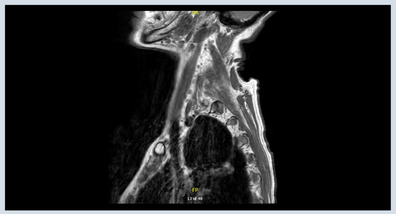


Figure 3. Shoulder MRI: deltoid atrophy, outside the C8–T1 distribution expected in nTOS.

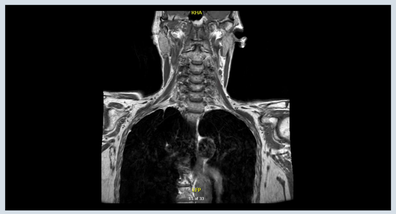


Figure 4. Brachial plexus MRI: no structural lesion or compression to explain the motor deficits.

CLINICAL TIMELINE

Sep 2023	Hospitalization for chronic pancreatitis and hepatic abscess; onset of progressive right shoulder pain and RUE weakness after a traumatic transfer
Jul–Aug 2025	Shoulder MRI: rotator cuff pathology, atrophy. Cervical MRI: multilevel degenerative changes. Brachial plexus MRI: no structural pathology
Oct 6, 2025	Referred by Orthopedic Surgery to Pain Medicine for suspected neurogenic TOS
Oct 21, 2025	US-guided right anterior scalene block: pain 10/10 → 2–3/10. Concerns discussed directly with Orthopedic Surgery and Neurology; urgent neurologic evaluation recommended
Nov 20, 2025	Right brachial plexus neurolysis, scalenectomy, pectoralis minor release, and neurostimulator placement
Dec 11, 2025	Neurology: upper and lower motor neuron findings concerning for motor neuron disease
Dec 17, 2025	EMG: active denervation. Diagnosed with ALS; riluzole started
Dec 23, 2025	Significant improvement in chronic pain; persistent motor deficits. Neurostimulator lead removal planned

Figure 1. Progression from unilateral UE pain and weakness to bilateral motor deficits, nTOS evaluation, and ALS diagnosis. *Orange = key diagnostic steps.*

DISCUSSION

Imaging showed only rotator cuff pathology and cervical degenerative change, and the scalene block relieved the pain. It was the physical examination that prompted neurologic evaluation and the ALS diagnosis: a pure motor deficit with intact sensation, deltoid atrophy, fasciculations, and upper motor neuron signs.

Communication mattered as much as the findings. The patient reached Pain Medicine through Orthopedic Surgery, and after the block we raised our concerns directly with the referring surgeons and with Neurology rather than returning a report. Active working relationships across specialties turn a bedside observation into an expedited diagnosis.

Examine, *do not just image*, and speak directly with the referring and consulting services.

KEY TAKEAWAYS

1. The physical exam, not imaging, changed the diagnosis: motor deficit with intact sensation pointed away from nTOS.
2. A good response to a diagnostic block does not exclude a coexisting neurologic disease.
3. Direct conversation with the referring and consulting services, Orthopedics and Neurology, shortened the path to diagnosis.

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