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Subclavius Botulinum Toxin A (BTX-A) An Option for Thoracic Outlet Syndrome

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INTRODUCTION

A rare aberrant presence of subclavius posticus hypertrophy, because of its unique location in the costoclavicular space, is reported as a cause of Neurogenic Thoracic Outlet Syndrome (NTOS) (1).

METHODOLOGY

Written informed consent was obtained from the patient for publication of this case report. All identifying information has been removed. This report did not require approval from the University Health Network Research Ethics Board (UHN REB), as single-patient case reports are considered exempt from review under institutional policy.

DISCUSSION

Torrianni et al. reported a study of 41 individuals with NTOS treated with Botox injections in the scalene muscles, showing a 69% success rate (2). The target of injection varied in each patient, as determined by clinical examination. The subclavius muscle's origin is the first rib and its costal cartilage, while its insertion is the subclavian groove, and it is shown to cause clavicular depression and first rib elevation, causing NTOS and sometimes neurovascular TOS.

CONCLUSION

BTX-A injections are used to treat pathologic pain due to excessive muscle contraction with significant pain and symptom reduction in 64–69% of TOS patients for up to 3 months. In the case of subclavius muscle hypertrophy, an ultrasound-guided BTX-A injection (Figure 1) may represent a non-surgical, effective, and safe treatment, minimizing the occurrence of pneumothorax and arterial injury

Using ultrasound guidance, the **Subclavius muscle** was injected with 40 units of **BTX-A**. This resulted in an 80% resolution of symptoms for 2 months. An injection repeated later in combination with ASM provided greater symptomatic relief that lasted for four months. Physical therapy was employed in conjunction with surgery, which was continued to be deferred.

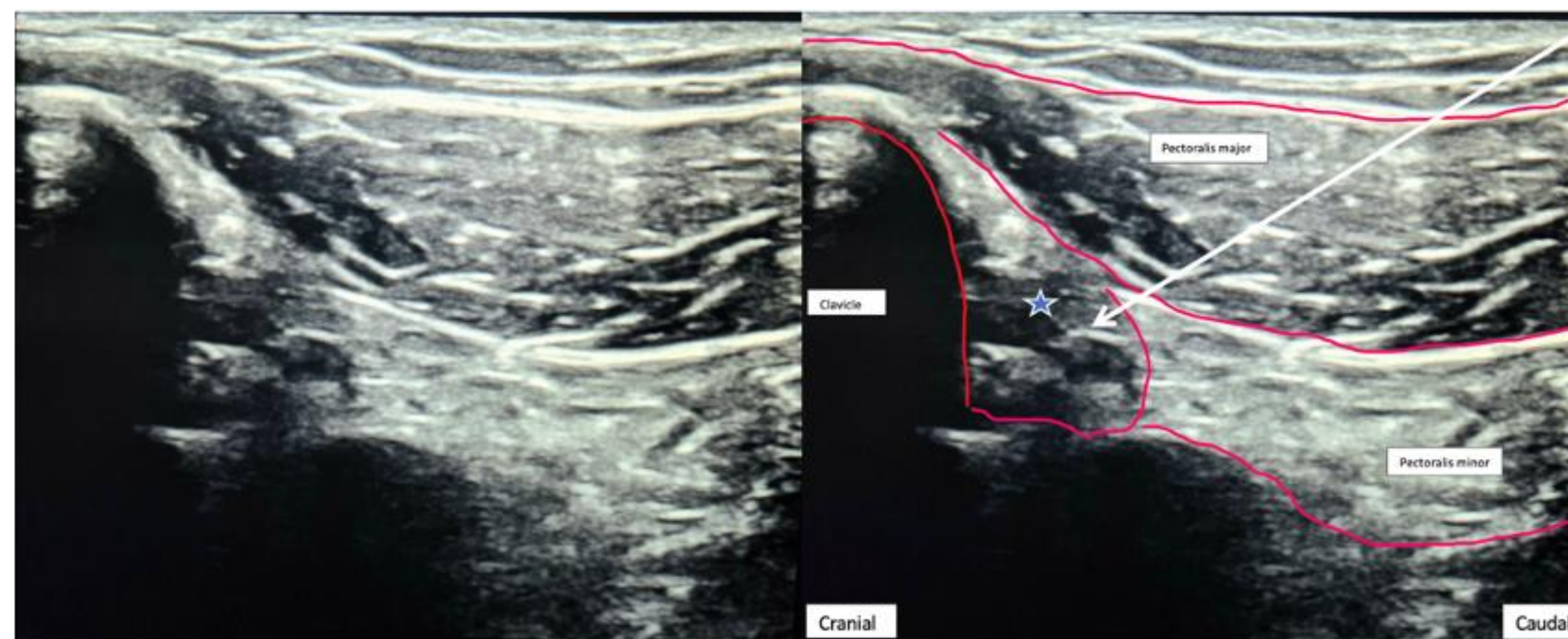


Figure 1. Ultrasound guidance for Subclavius injection

While the *anterior scalene muscle (ASM)* is most commonly implicated, a rare aberrant presence of ***subclavius posticus hypertrophy***, because of its unique location in the costoclavicular space, is reported as a cause of NTOS

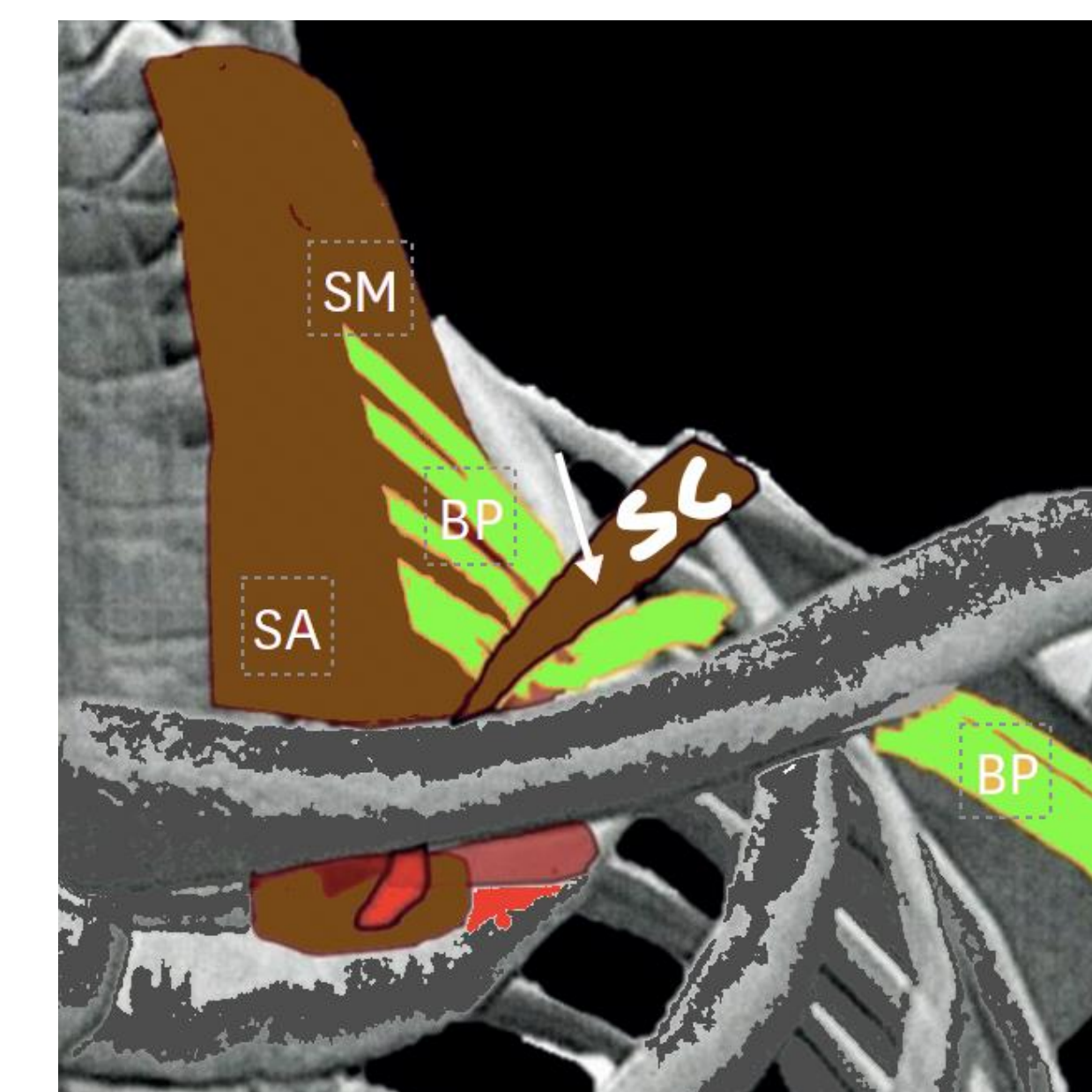


Figure 2. Subclavius anatomy

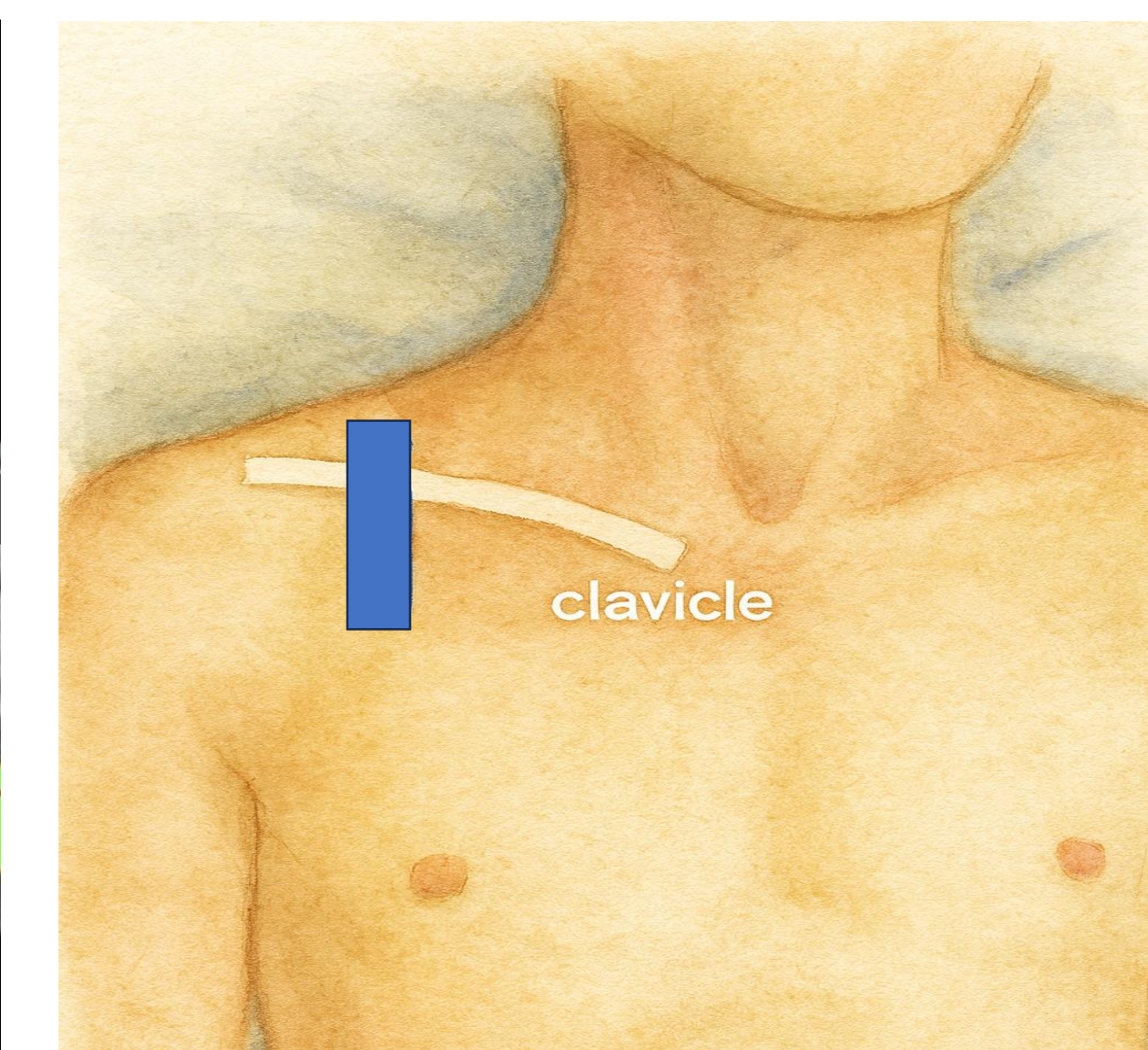


Figure 3. Ultrasound probe position

Patient Profile: A 42-year-old female with a gradual onset of nerve-related issues in the bilateral upper extremities and the ulnar aspect of forearms and hands.

Physical Examination:

- Positive Roos test for worsening of upper extremity sensory changes
- Positive Adson's Test for absent then diminished radial pulse on the right
- Positive Tinel at the right cubital tunnel
- Negative Wright test and Phalen's test

Diagnostics:

- A Doppler Arterial Thoracic outlet and Doppler Raynaud: nerve compression and vascular compression
- **MRI of the thoracic outlet : Subclavius posticus hypertrophy**
- MRI cervical spine showed a C6/7 mild disc bulge, no nerve compression (Right)

REFERENCES

1. Akita K, Ibukuro K, Yamaguchi K, Heima S, Sato T: The subclavius posticus muscle: a factor in arterial, venous or brachial plexus compression? Surg Radiol Anat 22:111–115, 2000
2. Torriani M, Gupta R, Donahue DM. Botulinum toxin injection in neurogenic thoracic outlet syndrome: results and experience using a ultrasound-guided approach. Skeletal Radiol. 2010 Oct;39(10):973-80. doi: 10.1007/s00256-010-0897-1. Epub 2010 Feb 26. PMID: 20186413.)