

Botulinum Toxin treatment for Thoracic Outlet Syndrome induced by Subclavius muscle hypertrophy.

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Introduction: Thoracic outlet syndrome (TOS) is characterized by different neurovascular signs and symptoms involving upper limbs induced by brachial neurovascular bundle compression. Neurogenic TOS is due to compression of the brachial plexus trunks or cords and constitutes the 95% of all cases of TOS. Generally, anterior and middle scalene hypertrophy are responsible of the reduction of spaces; Subclavius muscle hypertrophy represent a rare condition that can lead to brachial plexus compression (Fig 1).

TOS treatment can be divided into conservative or surgical. Between non-surgical techniques, some reports describe the use of ultrasound guided Botulinum Toxin A (BTX-A) injection to identify and decrease different muscle hypertrophy. We report a case of TOS due to hypertrophy of Subclavius muscle successfully treated with ultrasound guided BTX-A injection.

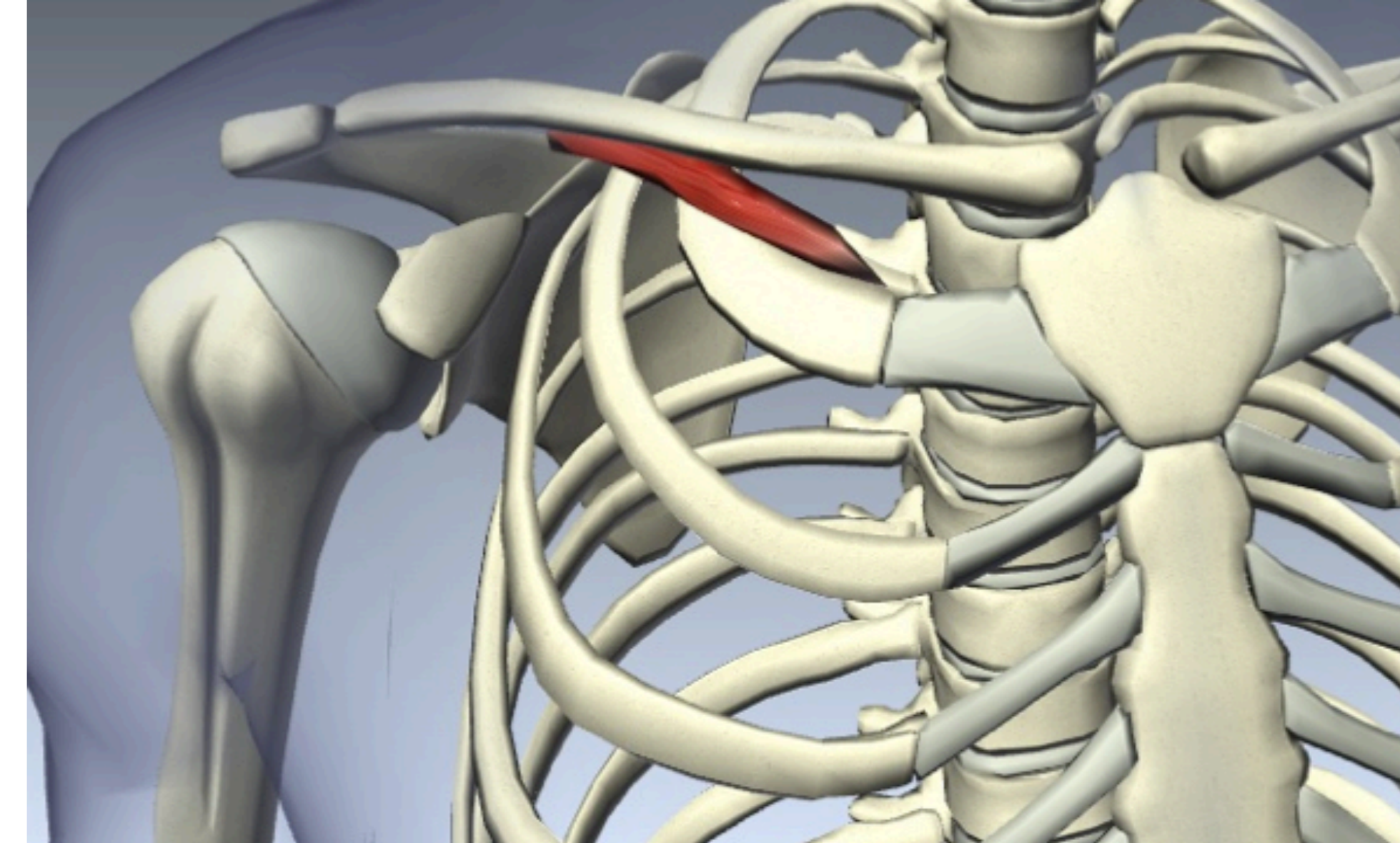


Fig 1

Case report:

- ✓ A right-handed 47-year-old man admitted with a one year history of cramps and hypotrophy in the right-hand associated to numbness and paresthesias.
- ✓ He worked as a forest ranger and had a history of gun shooting during animal hunting and training sessions of skeet shooting.
- ✓ Neurological examination showed mild hypotrophy and weakness of right intrinsic hand muscles.
- ✓ EMG revealed low amplitude of ulnar CMAP and SAP associated to chronic denervation of right first dorsal interosseous.
- ✓ Cervical and brachial plexus MRI showed no abnormalities.
- ✓ Brachial plexus echography revealed isolated Subclavius muscle hypertrophy with compression of the lower part of the brachial plexus (Fig 2a).
- ✓ Ultrasound guided BTX-A injection was performed in right subclavius muscle (abobotulinumtoxin A 100 units) and repeated after 3 and 8 months with a complete improvement of strength and reduction of cramps and sensory symptoms for at least 3 months after each treatment (Fig 2b, 2c).

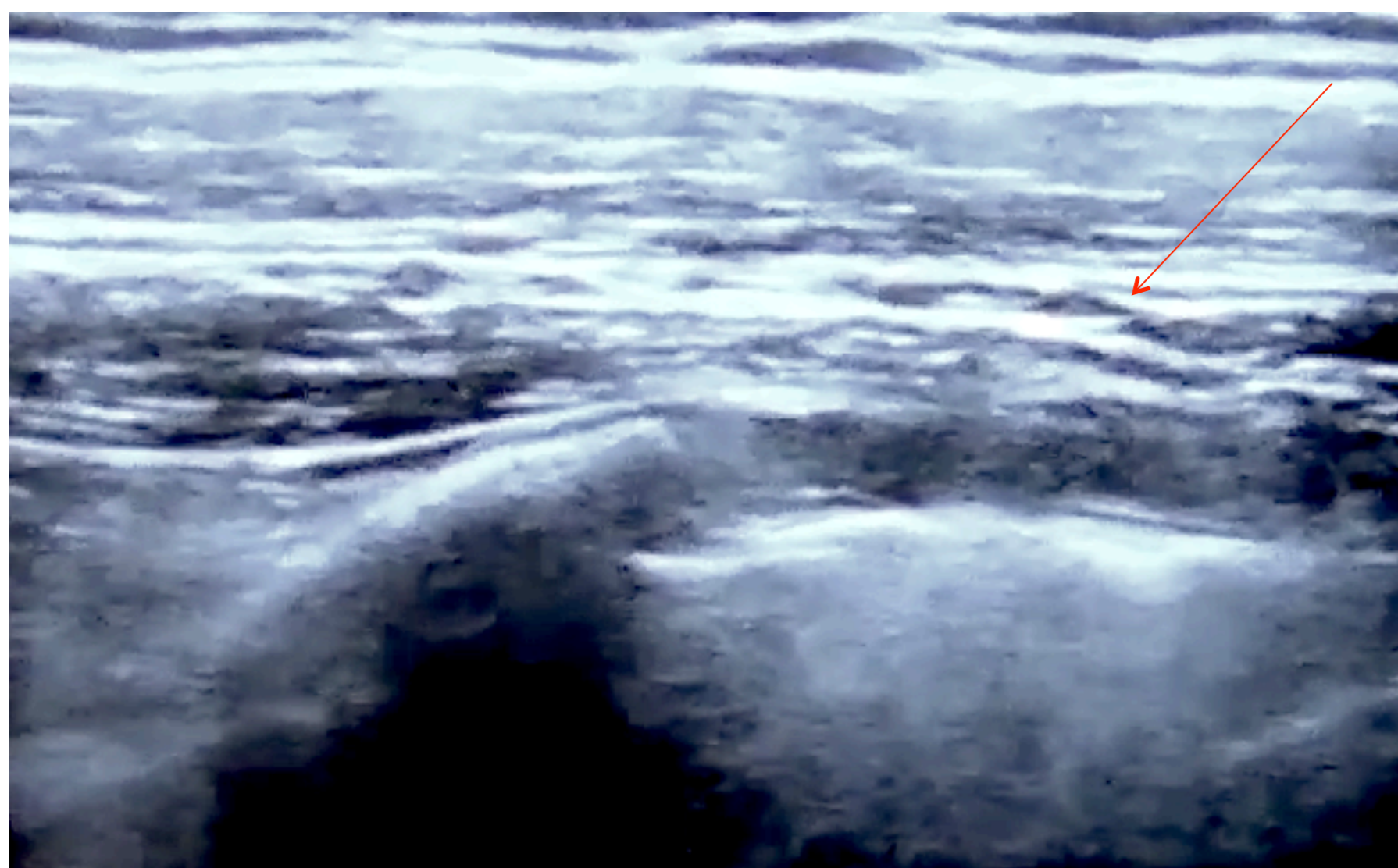


Figure 2a: Subclavius muscle hypertrophy before treatment (red arrow).

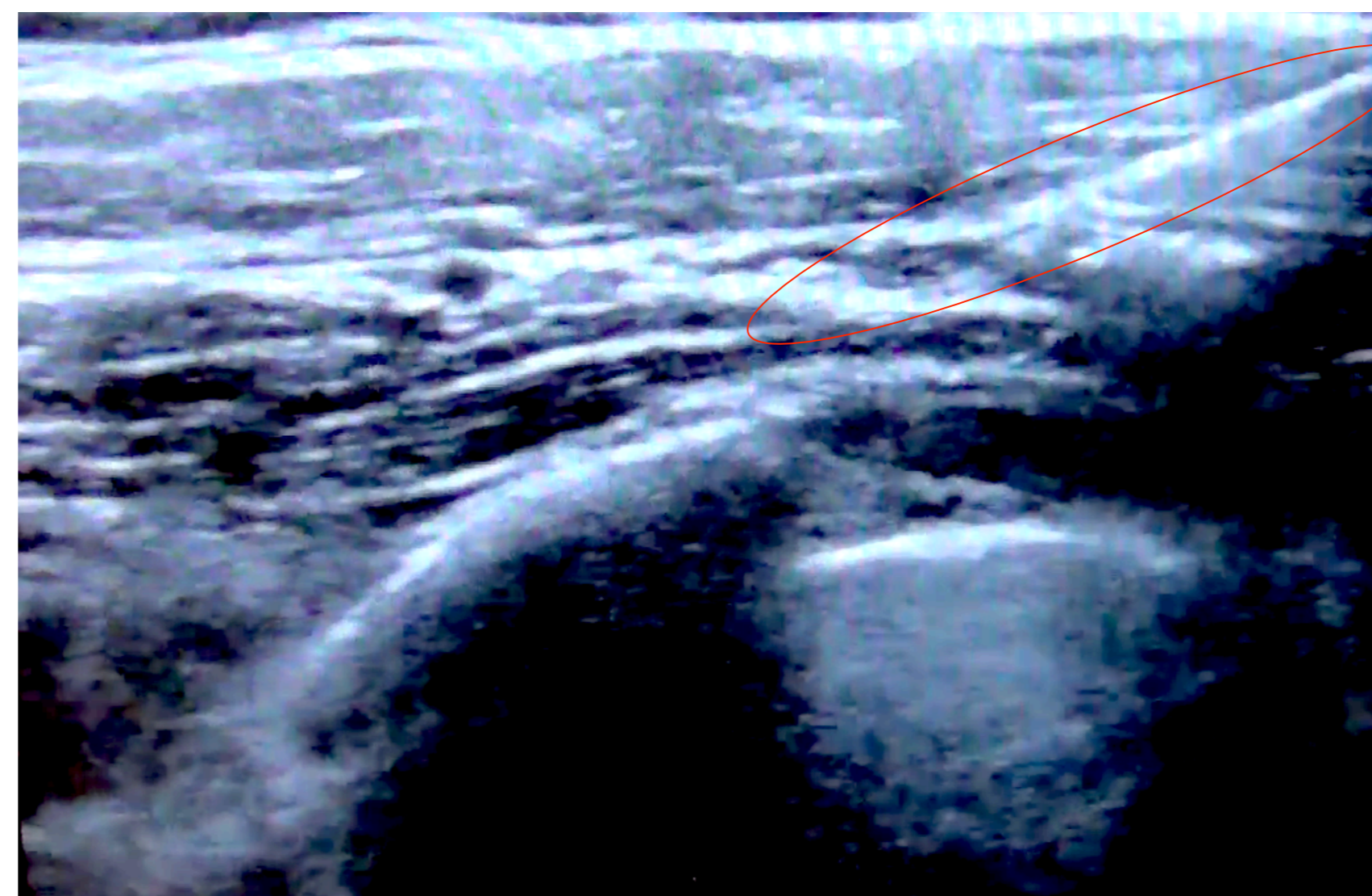


Figure 2b: Needle insertion (red circle).

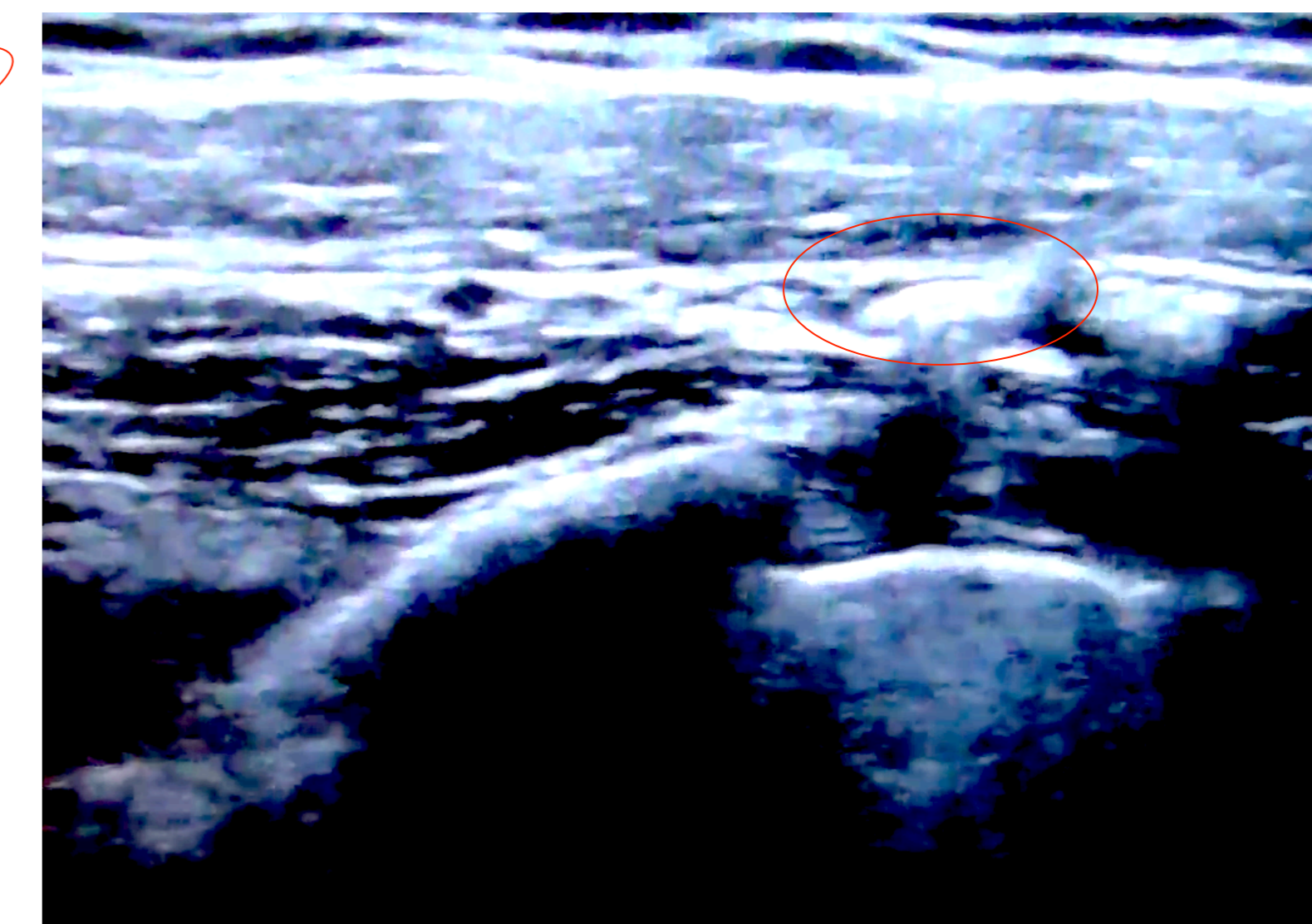


Figure 2c: In red circle toxin distribution into Subclavius muscle belly.

Discussion: Neurogenic TOS is a rare and underestimated condition. A clinical and instrumental approach including neuroimaging and ultrasound techniques could be useful for correctly diagnose brachial plexus compressions, including hypertrophy of muscles of the costoclavicular space. In our patient, brachial plexus echography revealed the rare condition of Subclavius hypertrophy. The ultrasound guided BTX-A injection of this muscle led to a complete resolution of the symptoms. Indeed BTX-A represents non-surgical technique effective on neurogenic TOS due to muscle hypertrophy if supported by EMG and ultrasound evaluation.

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