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A Periodical insight into the Neuromuscular Ultrasound field & the Egyptian Neuromuscular Ultrasound Society

# ENMUS Bulletin

ISSUE 9– APRIL 2023

## Practical tip >>>

Tracing the posterior interosseus nerve is sometimes challenging for the novice sonographers. For optimum visualization of the nerve:

- Start by tracing the nerve from the lateral elbow where it bifurcates from the main radial nerve trunk & visually track it to the dorsal forearm.
- As you approach the dorsal forearm, fully pronate the forearm to improve conspicuity of the nerve.
- If you lost it, trace it back and forth several times.
- When you reach the supinator tunnel and you cannot clearly see the nerve between the two supinator heads, Repeated pronation and supination of the forearm can improve its visibility.

## Quote of the issue >>>



'What is meant for you will always, always find you'. By Tosha Silver

## Topic of the issue

### WHEN TO REFER A PATIENT WITH SUSPECTED ENTRAPMENT NEUROPATHY FOR NMUS

By Prof. Eman Tawfik

This topic about NMUS in focal mononeuropathies was addressed before in one of the earliest issues of Bulletin 2 years ago. However, we thought to re-visit it again given its importance and because we are commonly asked this question: when one should refer a patient with suspected entrapment neuropathies for NMUS?

Entrapment neuropathies are the most common cause of referral to the EMG labs. Electrodiagnostic studies represent the gold standard for diagnosis and provide valuable information about the functional status of the nerves. EDX can localize the lesion in many cases, identify the underlying pathology whether demyelinating, axonal or combined, and can determine chronicity & prognosis. However, neuromuscular ultrasound provides insight into the structural aspect of the nerves.

There is a concept among many physicians that NMUS is indicated only when EDX fails to localize the lesion, or normal or borderline. These situations are of course among the indications of NMUS and the diagnostic power of NMUS lie in these situations. However, **NMUS SHOULD BE ROUTINE IN ALL CASES OF ENTRAPMENT NEUROPATHIES** whether confirmed & localized by EDX or not.

**So Why NMUS should be routine?**  
**1. In confirmed cases by EDX, NMUS is needed to:**

1. Confirm the entrapment site.
2. Look for extrinsic factors compressing the nerve & causing entrapment.
3. Check for relevant anatomic variants that can impact the management.
4. To assess nerve mobility, excursion, and vascularity.
5. To exclude tandem lesions.
6. to detect superimposed lesions e.g. CTS on top of diabetic PN.

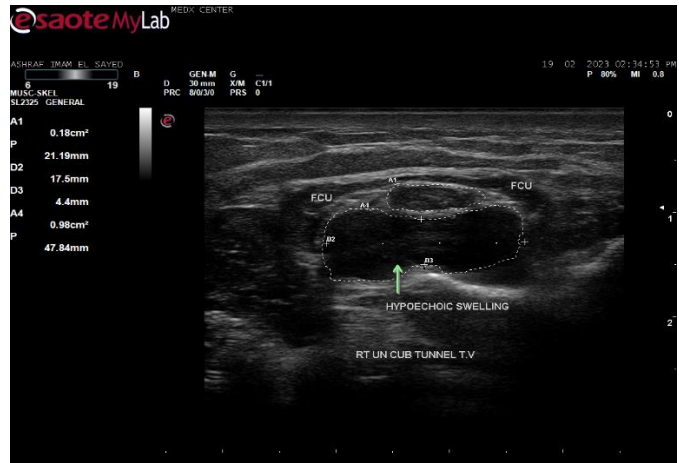
## II. In cases where EDX findings are non-localizable, negative, borderline or confusing:

To localize the lesion. A common scenario is a case of suspected UNE at the elbow but EDX shows severely reduced amplitudes at all stimulation sites. In such case, it is almost impossible to detect conduction block. Moreover, you may find the distal motor latency prolonged which might raise the suspicion of distal entrapment while in fact this demyelination can be simply secondary to the severe axonal lesion due to loss of the fastest conducting fibers. Here, NMUS help tremendously in such cases, it can localize the lesion and exclude the suspected distal entrapment.

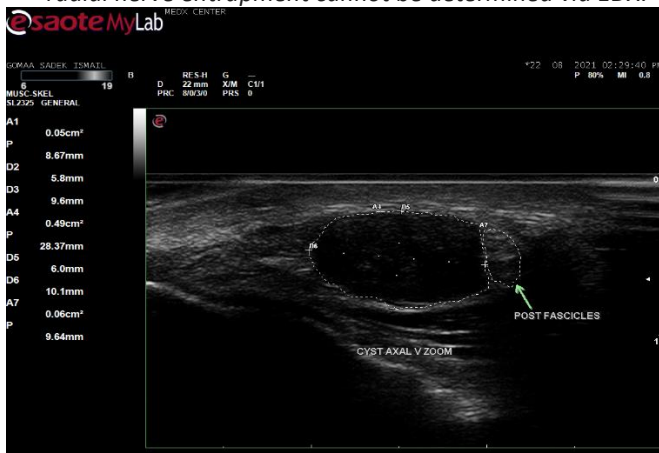
**Below are some examples** of the added value of NMUS in entrapment neuropathies.



*Tandem lesion: PIN entrapment between the two heads of the supinator in a patient with radial nerve entrapment at the spiral groove denoting tandem lesion or Double crush lesion. This 2<sup>nd</sup> site of entrapment away from the primary site of radial nerve entrapment cannot be determined via EDX.*



*A ganglion cyst compressing the ulnar nerve at the cubital tunnel proper level causing UNE. Ultrasound accurately localized the entrapment site and detected an extrinsic factor compressing the nerve denoting that UNE in this case is not idiopathic.*



*Intraneural ganglion cyst involving the anterior fascicles of the common fibular nerve just distal to the fibular head causing proximal fibular neuropathy & conduction block at the fibular head. Ultrasound accurately localized the entrapment site, and determined its cause*



*Marked focal swelling of the ulnar nerve at the ulnar groove in patient whose EDX showed severe axonal nerve lesion, marked delay in distal motor latency, but failed to conclusively localize the lesion. NMUS excluded distal nerve entrapment and localized the entrapment at the elbow.*

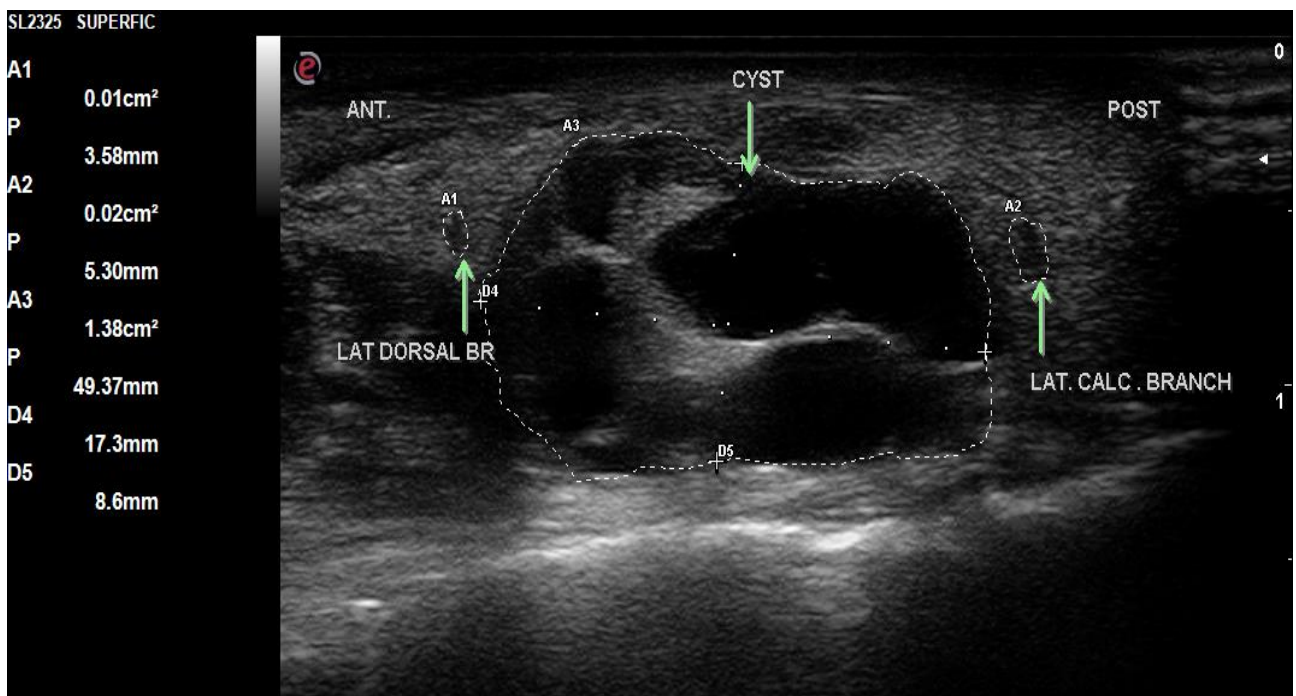
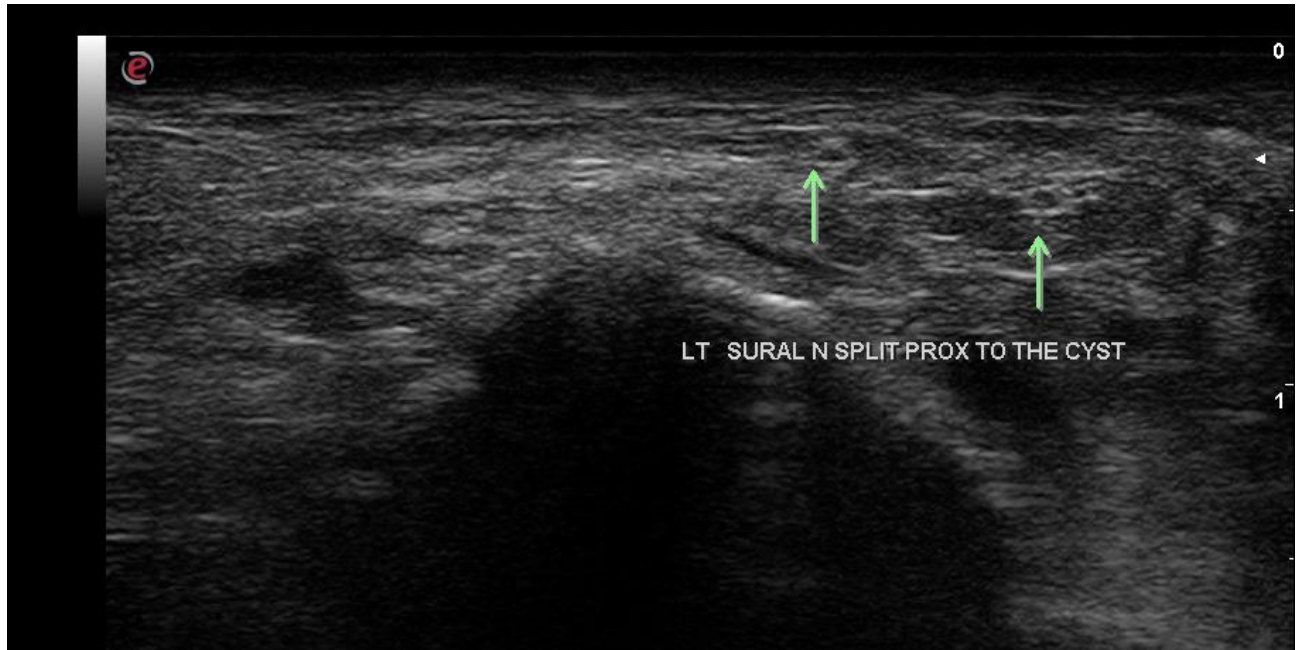
## Case of the Issue

A 45-year-old woman was referred for nerve ultrasound because of chronic swelling at the dorsolateral surface of the left foot with possible nerve compromise. The swelling was located just below the lateral malleolus, well defined, and was not painful, but the patient complained of neuropathic pain along the leg and lateral aspect of the foot. Scanning focused on the swelling and the nerves that are in its vicinity including superficial fibular nerve, deep fibular nerve, and sural nerves.

Scanning revealed a well-defined anechoic oval, multilocular, non-compressible, avascular swelling with posterior acoustic enhancement consistent with ganglion cyst. The cyst measures 11.6 x 12.7 mm in the transverse view with a cross-sectional area of 1.37 mm<sup>2</sup>. The sural nerve was readily visualized along the scanned path, its echotexture was preserved, and its CSA was within average values at different levels including the dorsal foot levels.

The ganglion cyst is extra-neural (i.e. it is not continuous with the sural nerve), but the two terminal branches of the sural nerve lie very close and adjacent to the cyst with the lateral calcaneal branch of the sural nerve lies anterior to the cyst and the lateral dorsal cutaneous branch lies posterior to it (towards posterior heel). Although there is no focal swelling of the sural nerve branches at the level of the cyst, but the cyst location being very close to the two branches represent a space occupying lesion and can causes irritation and nerve compromise. The deep and the superficial fibular nerves were away from the cyst.

**Concluding tips:** Small nerves and even their branches can be assessed via ultrasound. Ultrasound determined the nature of the swelling, allowed mapping the nerves in its vicinity, and identified their relations to the cyst. This is important for proper surgical planning to avoid iatrogenic injury of these tiny branches.



*ENMUS news >>>>*

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