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

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Practical tip >>>

Exerting least pressure by the probe is very important during nerve & muscle scanning, So how to know you are exerting the least pressure?

- By observing full vein expansion if there is a nearby vein.
- Or observing the skin layer on the screen. It will appear flat if you are exerting excessive pressure and will appear slightly curved at both ends if your exerting the least pressure.

Quote of the issue >>>



Happy 2021

“Limit your ALWAYS and your NEVERS “

Topic of the issue

Indications of neuromuscular ultrasound in focal neuropathies

(By Prof. Eman Tawfik, Professor of Physical Medicine & Rehabilitaton, Faculty of Medicine, Ain Shams University & President of the Egyptian Neuromuscular Ultrasound Society)

Focal neuropathies are the most common mononeuropathies and a frequent cause for referral to EMG labs.

A commonly asked question is when to do neuromuscular ultrasound for a patient with focal neuropathy ?

Many physicians refer patients to NMUS examination when electrodiagnostic tests are negative or borderline or non-localizing **BUT** this is not quite true..Neuromuscular ultrasound is valuable & mandatory in focal neuropathies even if EDX tests are conclusive as we shall know now:

I. Value of NMUS in focal neuropathies confirmed by electrodiagnostic tests:

1. Confirms & refines localization (**Figure 1**).
2. Excludes or detects structural compressive factors that may be the cause of entrapment.

3. Identifies anatomical variants that impact diagnosis & management (**Figure 2**).

4. Assesses nerve mobility.
5. Identify superimposed lesions.
6. Post surgeries to identify structural causes of non-improvement or recurrent entrapments.

II. Value of NMUS in focal neuropathies not confirmed or cannot be localized by electrodiagnostic tests:

1. Failed localization by EDX tests (**Figure 3**).
2. Borderline EDX findings.
3. Negative EDX tests in presence of high clinical suspicion of focal neuropathy.

III. Additional value:

Can enhance safety & diagnostic sensity of NCS and EMG studies as in cases of altered anatomy or when anatomical landmarks are non

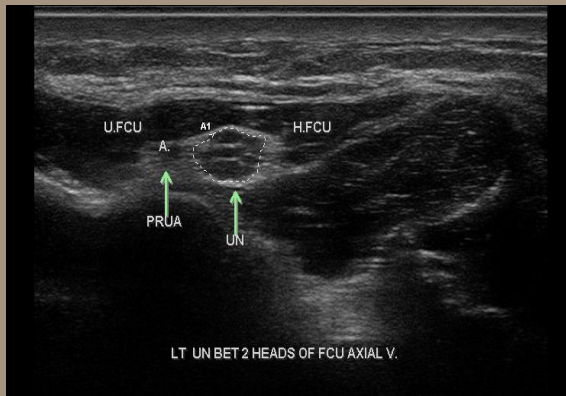


Figure 1: NMUS further refines the entrapment site in a patient with ulnar neuropathy at the elbow and precisely identifies the entrapment site at the level of cubital tunnel proper

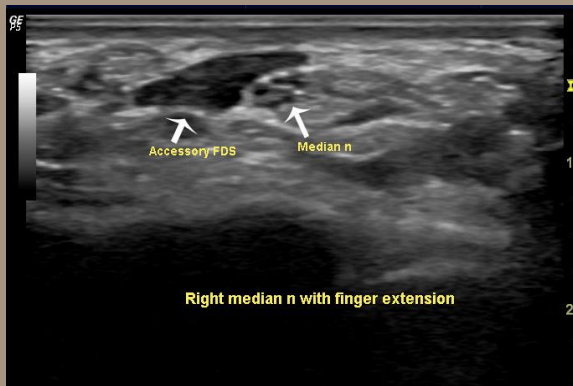


Figure 2: NMUS identifies anatomical variant that can impact the management. Here, it identified an accessory FDS muscle within the carpal tunnel, intruding on the median nerve on finger extension.

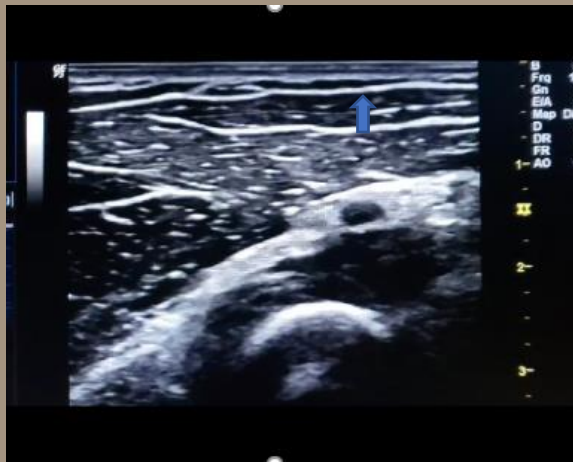


Figure 3: NMUS identifies the entrapment site when EDX cannot. In this case, NMUS localized the entrapment site of the deep radial nerve (arrow) under ligament of Froste before it enters the supinator tunnel.

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- Walker FO, Cartwright MS, Alter KE, et al. Indications for neuromuscular ultrasound. Expert opinion and review of the literature. *Clin Neurophysiol*. 2018;129:2658-2679.

Case of the Issue

(By A. Prof. Marwa Hany Hammad, Assistant professor of Physical Medicine & Rehabilitation, Faculty of Medicine, Zagazig University)

A 36 years old male shot with a gun, ghafir/cartridge gun, in the middle of his Lt leg presented with weakness and loss of sensation in his Lt leg and foot. Motor nerve conduction study revealed no response to stimulation of the Lt tibial and fibular nerves with no signs of re-innervation in EMG. Sensory nerve conduction study of the Lt superficial peroneal nerve also revealed no response to stimulation.

NMUS of the Lt tibial nerve tracked from the sciatic nerve down to the tarsal tunnel revealed good continuity and accepted cross sectional areas compared to the sound leg, however, the nerve appeared kinked and surrounded by some hypoechoic tissue with some alteration in its fascicular structure opposite to the area of the gunshot (figure 1). The Lt fibular nerve tracked from the sciatic nerve down through the fibular tunnel revealed within normal appearance and cross sectional areas proximal, within and distal to the tunnel compared to the sound leg. The Lt Deep peroneal nerve tracked down to the anterior compartment of the leg revealed interrupted continuity showing separated proximal and distal stumps (figure 2). The superficial peroneal nerve was tracked from lateral midleg down to the ankle revealed an abrupt hypoechoic swelling of CSA (31mm²) in the nerve after piercing the lateral compartmental leg fascia (figure 3). Long axis view of the Lt superficial peroneal revealed a neuroma in-continuity (figure 4).

Concluding Tip

NMUS scanning in the context of traumatic nerve injuries unveils the diverse underlying etiologic pathologies of nerve injury that cannot be depicted by electro-diagnosis alone. Knowing the nature of the injury by visualizing injured nerves guides us to the optimal management of each case minimizing future disability.



Figure (1) Lt tibial nerve (long axis): kinked appearance of the nerve near to the site of the gunshot



Figure (2) Lt Deep peroneal nerve (long axis): separated two ends of the nerve (proximal and distal nerve stumps).



Figure (3) Lt Superficial peroneal nerve (short axis): Abrupt increase in CSA of the nerve (31mm²) with hypo-echogenicity



Figure (4) Lt Superficial peroneal nerve (long axis): Hypoechoic swelling in continuity with the nerve

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