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Why is Nerve Ultrasound Scan Necessary for Peripheral Nerve Lesions?

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CASE 1

A 22-year-old man presented with an inability to extend his left-hand fingers that started 1 year earlier. He had no history of trauma. Neurological examination revealed weakness of the extensor muscles of his left finger (1/5). Previously, cervical magnetic resonance imaging (MRI), brachial plexus MRI, and electroneuromyography (ENMG) were performed. On ENMG, chronic neurogenic involvement of muscles innervated by the left posterior interosseous nerve (PIN) was observed. Cervical and brachial plexus MRI revealed normal findings. Thus, the patient was referred to us for rehabilitation for PIN entrapment neuropathy.

Before planning the rehabilitation program, diagnostic ultrasound (US) was performed to track the radial nerve. Swelling of the PIN was noted within the supinator muscle as it exited the muscle, with enlarged and hypoechoic nerve fascicles in both the short- and long-axis views (Figure 1a). Vascularity was noted on power Doppler (PD) (Figure 1b, Supplemental Video 1).

CASE 2

A 34-year-old man presented with an 18-month history of extension weakness in his right-hand fingers. He had previously visited a neurologist, and cranial, cervical, and shoulder MRI and ENMG were performed. On ENMG, chronic axonal injury of the PIN was diagnosed. The patient was referred to us for rehabilitation.

In both short- and long-axis views, US revealed a hypoechoic swelling of the radial nerve with an area of 35 mm^2 before its entrance into the supinator muscle (Figure 2a). Vascularity was observed on PD (Figure 2b; Supplemental Video 2). Although the lesion began more proximal to the PIN branching, he could extend his wrist in radial deviation. On the physical examination, the pattern of weakness suggested that the lesion predominantly affected the PIN fibers.

In both cases with the prediagnosis of peripheral nerve sheath tumor (PNST) of the PIN, surgery was planned. During surgery, the fusiform masses were resected (Figure 3a, b), and tendons were transferred because muscle atrophy of the extensor compartment innervated

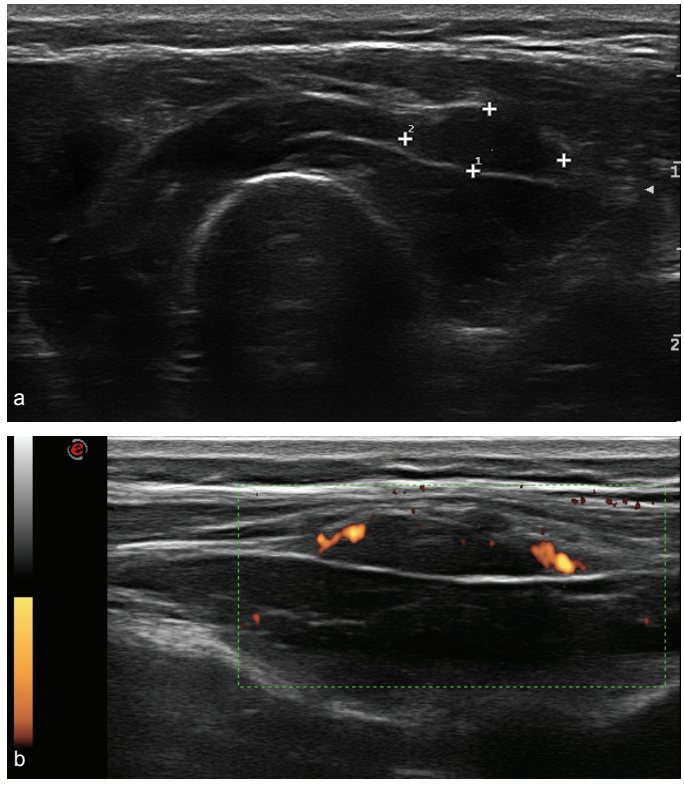

FIG. 1. a) Short-axis view of the enlarged posterior interosseous nerve within the supinator muscle, b) Long-axis view of the enlarged posterior interosseous nerve with vascularity on power Doppler.

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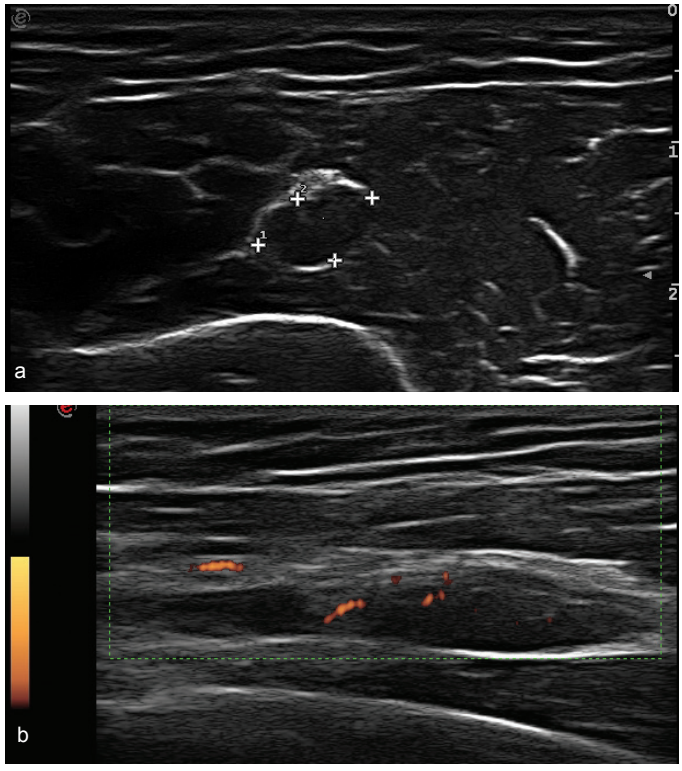

FIG. 2. a) Short-axis view of the enlarged radial nerve before its entrance into the supinator muscle, b) Long-axis view of the enlarged radial nerve with vascularity on power Doppler.

by the PIN was apparent on US. Histopathological studies of the resected masses confirmed the diagnosis of schwannoma.

With US, direct visualization of peripheral nerves can be achieved; nowadays, it has become an important diagnostic tool to diagnose the cause of nerve damage.[1] Unlike electrophysiological studies, US can provide information about the morphological features of the nerve.[2]

Schwannomas and neurofibromas are benign PNSTs. In the US evaluation of a PNST, a solid hypoechoic mass was typically seen connected to a peripheral nerve. The internal flow activity of the lesion obtained with PD imaging was more likely to suggest a schwannoma.[3]

US is a useful modality in the evaluation of almost all pathologies of the peripheral nerves and should be routinely performed before starting a rehabilitation program. In these cases, performing US changed the diagnosis and treatment. Surgery was performed instead of rehabilitation.

Informed Consent: Written informed consents were obtained from the subjects.

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Conflict of Interest: No conflict of interest was declared by the authors.

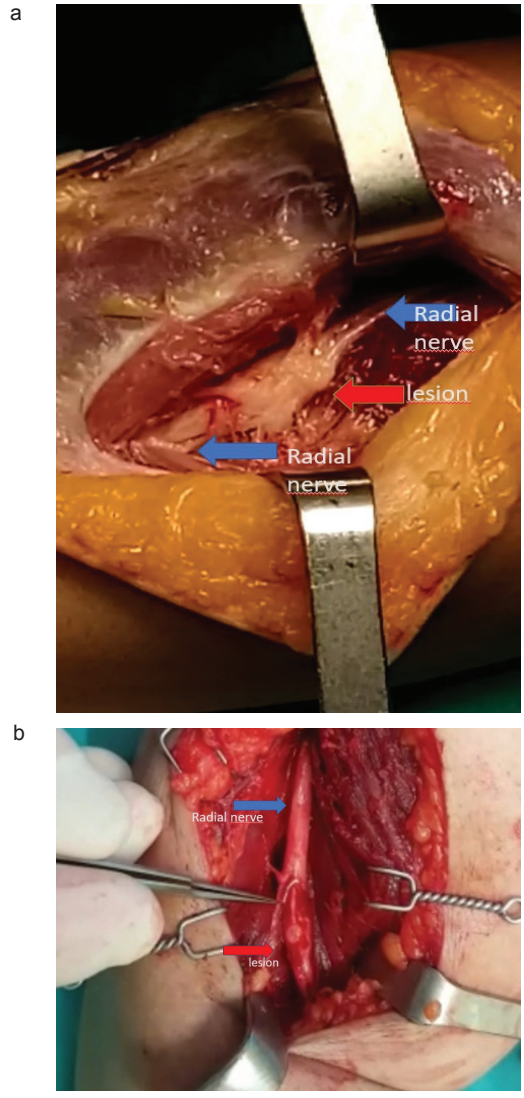

FIG. 3. a) Intraoperative view of the posterior interosseous nerve lesion in case 1, b) Intraoperative view of the radial nerve lesion in case 2.

Video 1. In this short axis view, swelling of the PIN was demonstrated in the supinator muscle as it exited the muscle.

10.4274/balkanmedj.galenos.2023.2023-1-84.video1

Video 2. Hypoechoic swelling of the radial nerve before its entrance into the supinator muscle was seen in the short-axis view.

10.4274/balkanmedj.galenos.2023.2023-1-84.video2

REFERENCES

1. Martinoli C, Bianchi S, Pugliese F, et al: Sonography of entrapment neuropathies in the upper limb (wrist excluded). *J Clin Ultrasound*. 2004;32:438-450. [Crossref]
2. Kaymak B, Ozcakar L, Cetin A, et al: A comparison of the benefits of sonography and electrophysiologic measurements as predictors of symptom severity and functional status in patients with carpal tunnel syndrome. *Arch Phys Med Rehabil.* 2008;89:743-748. [Crossref]
3. Gruber H, Glodny B, Bendix N, et al. High-resolution ultrasound of peripheral neurogenic tumors. *Eur Radiol.* 2007;17:2880-2888. [Crossref]