APTA Journal of Clinical Electrophysiology & Wound Management

Pickens S, Greathouse D. Clinical and Electrophysiological Evaluation of a Patient with an Ulnar Neuropathy in the Hand. *JCEWM*. 4(1). doi:10.55566/JCEWM-D-25-00002

Electrodiagnostics

Clinical and Electrophysiological Evaluation of a Patient with an Ulnar Neuropathy in the Hand

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Keywords: ulnar neuropathy, nerve conduction studies, needle electromyography

https://doi.org/10.55566/JCEWM-D-25-00002

Journal of Clinical Electrophysiology and Wound Management

Vol. 4, Issue 1, 2026

SUMMARY

The most common site for lesions of the ulnar nerve is at the elbow.[1-7] The second most common site for localized compromise of the ulnar nerve is at or distal to the wrist.[1-7] Based on clinical findings, electrophysiological studies, and clinic-anatomic correlations, classification systems for identifying an ulnar nerve lesion at or distal to the wrist have been developed.[1,6]

This case details the clinical exam, electrophysiological testing, and interventions for a 61-year-old male with a referring diagnosis of left ulnar neuropathy at the elbow. The findings of the clinical exam suggested a left ulnar neuropathy in the hand distal to the innervation of the hypothenar muscles including weakness of the ulnar intrinsics (dorsal and palmar interossei, lumbricals 3-4, and adductor pollicis). Electrophysiological testing, including nerve conduction studies (NCS) and needle electromyography (EMG), demonstrated findings consistent with a chronic, left ulnar neuropathy involving the deep motor branch in the palm of the hand distal to the innervation of the hypothenar muscles (type IV[6]).

Four weeks following the electrophysiological testing, the patient had surgery of the left ulnar nerve at the wrist, palm, and at the elbow. Nine weeks following this surgery, the patient reported resolution of the numbness and tingling (N/T) in the left D4-D5, twitching in the left first dorsal interosseous (FDI), and improved strength and fine motor control in ulnar intrinsic innervated muscles (fine movements). The patient stated he had some “minor difficulty with his use of the left thumb but he was on the up and up and had no regrets after having the surgery.”

1. BACKGROUND

The most common site for lesions of the ulnar nerve is at the elbow. The second most common site for localized compromise of the ulnar nerve is at or distal to the wrist approximating Guyon’s canal.[1-7] The potential etiology of deep motor branch of the ulnar nerve mononeuropathy include cumulative trauma disorders, tumor, vascular disease, cysts, laceration, and anomalous muscle development.[4-7] Based on clinical findings, electrophysiological studies, and clinic-anatomic correlations, classification systems for identifying lesions of the ulnar nerve at or distal to the wrist have been developed.[1,6]

Electrophysiological testing, including nerve conduction studies (NCS) and needle electromyography (EMG), provides a means to classify the chronicity, severity, distribution, and extent of involvement in patients with peripheral neuropathy.[1-3] In most cases of patients with suspected ulnar neuropathy, the clinician is attempting to differentiate an ulnar neuropathy at the elbow, wrist, or hand from a medial cord or inferior trunk brachial plexopathy, or a C8-T1 radiculopathy.[1-7] The results of the clinical and electrophysiological testing may also be used to identify the need for further evaluation by a hand surgeon including surgical exploration.[1-7]

2. CASE STUDY

SUBJECTIVE

A 61-year-old left hand dominant male was evaluated in an orthopaedic clinic for a ligamentous sprain of the left wrist secondary to a fall on an outstretched hand that occurred 6 weeks prior to the date of electrophysiological testing. During this examination, the physician incidentally noted weakness and atrophy of the left FDI and weakness in the left ulnar intrinsics. The patient was treated for the left wrist sprain with a wrist splint and was referred for electrophysiological studies for a suspected left ulnar nerve neuropathy at the elbow.

At the time of the electrophysiological testing, the patient reported a 3-year history of intermittent left-hand numbness and tingling (N/T) in the palmar aspect of the left D4-D5 and hypothenar eminence that occurred primar-

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