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Letter to the Editor

Dorsal ulnar cutaneous neuropathy

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Ulnar nerve lesions are commonly encountered by the electromyographer and occasionally represent a dilemma since routine studies of the ulnar nerve often provide inadequate information to localize an ulnar nerve lesion in the forearm or wrist. The distal ulnar nerve gives off the dorsal sensory branch in the distal forearm, the dorsal ulnar cutaneous nerve (DUCN). Focal injury to the DUCN may more frequently occur than has been previously thought because DUCN is positioned such that it can receive acute trauma or be chronically traumatized while writing, wearing a tight wristwatch band, or after hand-cuff injury. We present a thirty-nine year-old man complaining of sensation loss on the dorsal aspect of his last two fingers. His complaints started two months ago when a heavy object fell on his forearm.

A thirty-nine year-old right handed man has been admitted to our EMG laboratory because of sensation loss on the dorsal aspect of the fourth and fifth digits of his left hand. His complaints started two months ago when a heavy object fell on his forearm. He had no weakness and there was sensory loss on the dorsal aspect of his last two fingers.

Nerve conduction studies revealed an absent left DUCN response. The right DUCN response was easily obtainable by the method described by Jabre (Jabre et al., 1980). Motor evoked potentials of the left ulnar nerve with stimulation at the wrist and recording from abductor digiti quinti(ADQ) and first dorsal interosseus (DI) muscles showed a normal amplitude and distal latency. Ulnar motor and sensory conduction velocities measured in the tract across the elbow (from 5cm proximal to 5 cm distal to the sulcus ulnaris) and the tract below the area from elbow to wrist were within normal limits (Table 1).

Left median sensory and motor conduction studies demonstrated no abnormality. Needle EMG of the left ADQ and flexor carpi ulnaris (FCU) muscles showed no activity at rest. Recruitment and morphology of motor units were also within normal limits.

The DUCN branch of the ulnar nerve is the sensory branch of the dorsal medial hand (Hoffman *et al.*, 1988). This sensory branch leaves the main trunk at an average of 6 to 8 cm proximal to the ulnar styloid and becomes cutaneous as it passes between the FCU tendon and ulna but DUCN may also anomalously arise from superficial radial nerve (Peterson *et al.*, 1992).

Table1

Ulnar Nerve Conduction (NC) Studies, Left Arm

	Nerve Conduction Velocity (m/sec)	*Amplitude* (microvolt/ mV)
Sensory NC		
DUCN	NP	
Digit V-wrist	40.9 (37.3)	14.4 microvolt (7.0)
Mixed NC		
Wrist-Elbow	61.8 (49.8)	10.0 microvolt (5.2)
Elbow-Axilla	61.2 (48.2)	12.0 microvolt (8.6)
Motor NC		
Distal latency (ms)	2.6 (3.3)	12.0 mV (7.0)
Elbow-Wrist	68.7 (49.9)	12.0 mV (7.0)
Elbow	57.11 (39.6)	12.0 mV (7.0)
Axilla-Elbow	54.7 (52.0)	12.0 mV (7.0)

*DUCN : Dorsal ulnar cutaneous nerve
*NP : No potential obtained
(**) : Numbers in parentheses represent normal values.

The DUCN supplies sensation to the dorsal ulnar aspect of the wrist and hand and to the dorsal surface of the last two digits. Preservation of sensation on the dorsal ulnar aspect of the hand is a recognized clinical finding in nerve lesions to the distal forearm or wrist, ie, below the origin of the dorsal ulnar cutaneous branch of the nerve (Kim *et al.*, 1981).

In DUCN conduction studies, it is important to use a standardized technique and to measure and maintain optimal temperature of the arms under study to prevent erroneous results and misdiagnosis (Young *et al.*, 2000). DUCN conduction is useful in identifying distal ulnar lesions, especially those within or just proximal to the canal of Guyon. This study can also help in distinguishing distal entrapment syndromes from compression at or near elbow, because DUCN conduction would be expected to be abnormal or absent in the presence of lesions at or above elbow (Kim *et al.*, 1981).

However, a normal DUCN potential is quite often observed in an ulnar neuropathy at the elbow. Selective involvement of individual fascicles at the site of injury is the proposed mechanism. For this reason, the DUCN and other distally recorded responses may be normal in the setting of a proximal lesion if those particular fascicles are spared (Steward, 1987).

Our patient was admitted to our EMG laboratory complaining from sensation loss on dorsal aspect of the fourth and fifth digits of his left hand. On his neurologic examination, he had no weakness and there was sensory loss on the dorsal aspect of his last two fingers which necessitated the performing of routine ulnar nerve conduction studies plus DUCN conduction study. He had an absent left DUCN response, while on the right side it was easily obtainable. Dutra' de Oliveria stated that reduction in amplitude or no response of a sensory nerve action potential (SNAP) may imply variation in the innervation of the dorsomedial aspect of the hand and advised the consideration of a possible variation in cases with an abnormal response (Dutra de Oliveria *et al*., 2000). But in our case according to our clinical assessment the condition was shown to be an isolated neuropathy of the DUCN and our electromyographic examination has confirmed our clinical diagnosis.

We would emphasize the importance of performing DUCN conduction studies especially in cases presenting as ulnar neuropathy who has a normal routine ulnar nerve conduction studies because electrophysiologic study of DUCN is the only way of identifying isolated injuries to this branch.

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