

Cortical Stroke in Parietal Lobe Misdiagnosed as Carpal Tunnel Syndrome

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A 56-year-old woman presented with the numbness and pain in the left hand in the 1st, 2nd and 3rd finger area that developed suddenly 7 days prior to admission. In nerve conduction velocity test, the deterioration of nerve conduction velocity as well as the reduction of the potential amplitude were detected. After diagnosis of carpal tunnel syndrome, the open median nerve release was performed. Nonetheless, the preoperative symptoms did not change. The magnetic resonance images (MRI) of brain revealed a cerebral infarction in sensoricortical area of parietal lobe. The patient was referred to the department of neurology, and after conservative treatment, her symptoms were improved.

KEY WORDS : Cortical stroke · Carpal tunnel syndrome · MRI.

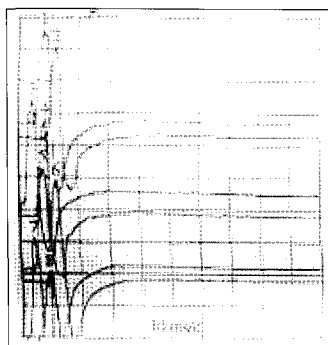
Introduction

Carpal tunnel syndrome (CTS) is the most common nerve entrapment disorder. It is characterized by pain, paresthesia and, ultimately, muscle wasting of the hand owing to median nerve compression at the wrist^{1,6)}. Two classic tests (Tinel test and Phalen test) and nerve conduction velocity are frequently used for assessing nerve entrapment. However, they are only moderately sensitive (20 to 70%) and specific (70 to 83%). Nerve conduction velocity (NCV) test is the definite diagnostic method of CTS^{1,4)}. We experienced a patient who had the cortical stroke of parietal lobe mimicking typical CTS symptoms with the pattern limited to the median nerve that was initially detected by NCV. Hence, it was mistakenly treated with surgical

release. Here, we report a unusual case of cortical infarct that was misdiagnosed as CTS.

Case Report

A 56-year-old woman with diabetes and hypertension visited our institute due to dysesthesia and tingling sense in the left hand area deteriorated from 7 days prior to admission with regard to the pain, severe tingling sensation was noted in the first, second, and the third finger areas of the left hand, but there was no pain in fifth finger. Both Phalen and Tinel signs were negative. In the NCV test, however, the finding of the prolongation of the motor nerve latent period and the reduction of the amplitude of the complex action potential



Nerve	Stimulation Site	Recording Site	Dist (mm)		LatOn (ms)		NP Amp (mV)		CVOn (m/s)	
			L	R	L	R	L	R	L	R
Median	Wrist	Thenar eminence	N/A	N/A	5.3	4.1	5.6	6.2	N/A	N/A
Median	Elbow	Thenar eminence	210	220	8.9	8.5	5.5	6.3	58.3	50.0
Ulnar	Wrist	Hypothenar emin	N/A	N/A	1.9	1.9	6.2	7.0	N/A	N/A
	Prox elbow	Hypothenar emin	220	230	5.6	5.6	5.9	6.6	59.5	62.2

Fig. 1. Nerve conduction study showing prolonged latencies of both median nerve indicating carpal tunnel syndrome.

• Received : November 21, 2006 • Accepted : February 6, 2007

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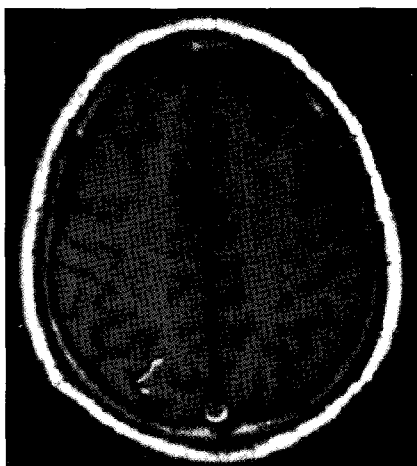


Fig. 2. FLAIR magnetic resonance image showing high signal intensity on sensory cortex of right parietal lobe.

Open carpal tunnel release was performed, but, tingling sensation, pain, and other symptoms did not improve despite the surgery. Considering the past history of diabetes and hypertension, brain MRI scans were done for screening of cerebral infarction, and regional cerebral infarction in the sensory cortex of the parietal lobe was detected (Fig. 2). The patient was transferred to the department of neurology, and following a conservative treatment, she was discharged after the improvement of previous symptoms.

Discussion

The specific symptom of carpal tunnel syndrome is tingling sensation of the fingers in the median nerve innervating area with characteristics becoming more severe at night than during the day time. It is detected commonly in patients with occupations using the wrist frequently. In addition to clinical symptoms, it could be diagnosed by typical nerve conduction findings. However, occasionally, it is difficult to differentiate from radiculopathy and peripheral polyneuropathy. It would be even more difficult to distinguish than infarction in sensory cortex as in our case. Nevertheless, clinical features caused by brain infarction are frequently associated with the risk factors of infarction such as hypertension, diabetes, etc. In our patient, the symptoms that started 7 days prior to admission manifested concomitantly with hypertension and diabetes. Hence, we should have considered symptoms as those caused by cerebral infarction especially when other typical signs of CTS were not evident.

Two classic tests (Hoffman-Tinel test and Phalen test) are frequently used for assessing nerve entrapment. However, the sensitivity and specificity of these provocative tests are relatively low. One study based on 100 individuals without carpal tunnel syndrome, for example, found a positive Tinel

were shown. Similarly, in the sensory nerve conduction velocity test for the median nerve, the decrease of nerve conduction velocity speed and displacement findings were detected (Fig. 1). Hence, it was considered to be typical carpal tunnel system (Lt : severe, Rt : moderate).

test in 45 patients³⁾. Although the Phalen test is somewhat better, it is still positive in 20% of healthy subjects. Another report showed that the sensitivity and specificity of the Hoffman-Tinel test and phalen test were from 0.60 to 0.67 from 0.47 to 0.75 respectively³⁾.

NCV test for sensory and motor nerves is not only of help to definitely diagnose carpal tunnel syndrome, but also it is essential for the differential diagnosis from other conditions showing symptoms similar to carpal tunnel syndrome. The findings that could be obtained readily by electric stimulation test may be summarized as the reduction of nerve conduction velocity in the first to third finger as well as in the wrist area through the sensory nerve conduction velocity test for the median nerve or the prolongation of latencies due to the reduction or loss of the amplitude of polarization, or the detection of the depolarization of the abductor pollicis brevis. Although conventional nerve conduction studies show sensitivities and specificities of approximately 90%, about 15-25% of patients suspected of having clinical CTS have normal electrodiagnostic results^{2,8)}. Moreover, the prevalence of abnormal electrical study results among working asymptomatic populations is high, from 9 to 16%, resulting positive predictive values as low as 33%⁵⁾. It should be emphasized that most of these asymptomatic subjects do not subsequently develop CTS. The differentiation between cortical sensory loss and nerve entrapment is usually based upon the distribution of sensory loss and involvement of specific modalities of sensation. Sensory disturbances due to cortical lesions are usually limited to one or two parts of the body, are more prominent in the upper limb where they can be limited to one, two or more fingers and spare the trunk^{3,7)}. It involves mainly discriminative modalities of sensation such as stereognosis, topesthesia and pain sense. It may be also accompanied by some motor dysfunction. Therefore, as in our case, clinical symptoms of CTS as well as showing abnormal results on NCV may not represent actual CTS. In such clinical setting, special attention and careful evaluation are mandatory to make the accurate diagnosis with consideration of possible cortical stroke of parietal lobe.

Conclusion

Cortical stroke of parietal lobe may show symptoms similar to the peripheral neuropathy such as carpal tunnel syndrome. Particularly, patients with concomitant diabetes or hypertension need to be evaluated for such possibilities and every effort should be made to obtain correct diagnosis.

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