

## Recurrent motor neuropathy of the median nerve: electrophysiologic and ultrasonographic findings

Jayoon Choi<sup>1\*</sup>, Sora Baek<sup>1†</sup>

Kangwon National University Hospital, Kangwon National University School of Medicine, Department of Rehabilitation Medicine<sup>1</sup>

### Introduction

Recurrent motor nerve is a branch of the median nerve which innervates the thenar muscles, and recurrent motor neuropathy (RMN) of the median nerve is considered as a variant type of the carpal tunnel syndrome (CTS) with the rare incidence. In this Case report, we present a case with recurrent motor neuropathy of the median nerve, describing the clinical features, the electrophysiologic and ultrasonographic findings, and the management of recurrent motor neuropathy.

### Case report

A 56-year-old female visited to our hospital, presenting with a thenar area pain and a weakness in the dominant right hand. Clinical examination revealed a severe paresis of thumb abduction (0/5) and thumb opposition (0/5), and atrophy in the right thenar area was found. There was no hypesthesia in the right hand. Nerve conduction studies found that the sensory studies of the median, ulnar and radial nerves were normal. No motor response was recorded in the median nerve to the right abductor pollicis brevis, but no other abnormality was found in the motor studies of the both hands. Electromyography test of the right abductor pollicis brevis Resulted no motor unit action potential as well as no abnormal spontaneous abnormal activity. The test of the other muscles showed no definite abnormal findings. Sonographic evaluation revealed a radially originating, extraligamentously coursing, and thickened recurrent motor branch of the median nerve (1.56mm<sup>2</sup> vs. 0.75mm<sup>2</sup> on the left). The median nerve distal to the transverse carpal ligament was also enlarged (11.43mm<sup>2</sup> vs. 7.29mm<sup>2</sup> on the left) with swollen motor fascicles within the radial side of the median nerve. There was no evidence of the thenar muscle atrophy.

### Conclusion

Recurrent motor neuropathy of the median nerve is a rare form of the carpal tunnel syndrome, which does not have the characteristic features of the carpal tunnel syndrome such as sensory symptoms. To diagnose the carpal tunnel syndrome, the nerve conduction study and the electromyography are commonly used. In this Case report, the ultrasonographic evaluation was also taken to diagnose the recurrent motor neuropathy of the median nerve. We suggest that the ultrasonographic findings are beneficial for the evaluation of the RMN when using with the electrophysiological studies.

**Table 1. Motor Nerve Conduction Studies**

<b>Nerve / Sites</b>	<b>Latency (ms)</b>	<b>Amplitude (mV)</b>	<b>Velocity (m/s)</b>
<b>RIGHT MEDIAN - APB</b>			
Wrist			No response
Elbow			No response
<b>LEFT MEDIAN - APB</b>			
Wrist	2.50	22.5	
Elbow	5.99	22.2	60.2
<b>RIGHT MEDIAN - 2nd L-2nd DI</b>			
Median	2.60	5.2	
Ulnar	2.76	13.4	
<b>LEFT MEDIAN - 2nd L-2nd DI</b>			
Median	2.55	6.8	
Ulnar	2.60	10.5	
<b>RIGHT MEDIAN - PQ</b>			
Elbow	3.02	8.8	
<b>LEFT MEDIAN - PQ</b>			
Elbow	2.60	5.3	
<b>RIGHT ULNAR - ADQ</b>			
Wrist	2.08	13.6	
Elbow	5.31	12.6	65.0
<b>LEFT ULNAR - ADQ</b>			
Wrist	2.29	15.8	
Elbow	5.31	15.7	66.2

APB = abductor pollicis brevis; L = lumbrical; DI = dorsal interosseous;  
PQ = pronator quadratus; ADQ = abductor digiti quinti

**Table 2. Sensory Nerve Conduction Studies**

Nerve / Sites	Latency (ms)	Amplitude (mV)	Velocity (m/s)
<b>RIGHT MEDIAN - Digit II</b>			
Finger-Wrist	2.81	16.9	46.2
Wrist-Elbow	4.17	52.0	51.6
Palm-Wrist	1.98	74.5	42.9
<b>LEFT MEDIAN - Digit II</b>			
Finger-Wrist	2.66	24.4	48.9
Wrist-Elbow	3.91	50.2	53.8
Palm-Wrist	1.88	67.3	45.3
<b>RIGHT ULNAR - Digit V</b>			
Finger-Wrist	2.50	12.8	46.0
Wrist-Elbow	4.22	25.8	52.1
<b>LEFT ULNAR - Digit V</b>			
Finger-Wrist	2.55	16.7	47.0
Wrist-Elbow	3.59	18.9	52.9
<b>RIGHT ULNAR - vs Median Dig IV</b>			
Median	3.07	34.5	45.6
Ulnar	3.07	18.6	45.6
<b>LEFT ULNAR - vs Median Dig IV</b>			
Median	3.02	36.3	46.3
Ulnar	3.02	31.3	46.3
<b>RIGHT RADIAL - superficial</b>			
Forearm	2.40	33.8	41.7
Forearm	2.45	32.5	40.9
<b>LEFT RADIAL - superficial</b>			
Forearm	2.45	38.5	40.9
Forearm	2.40	42.1	41.7

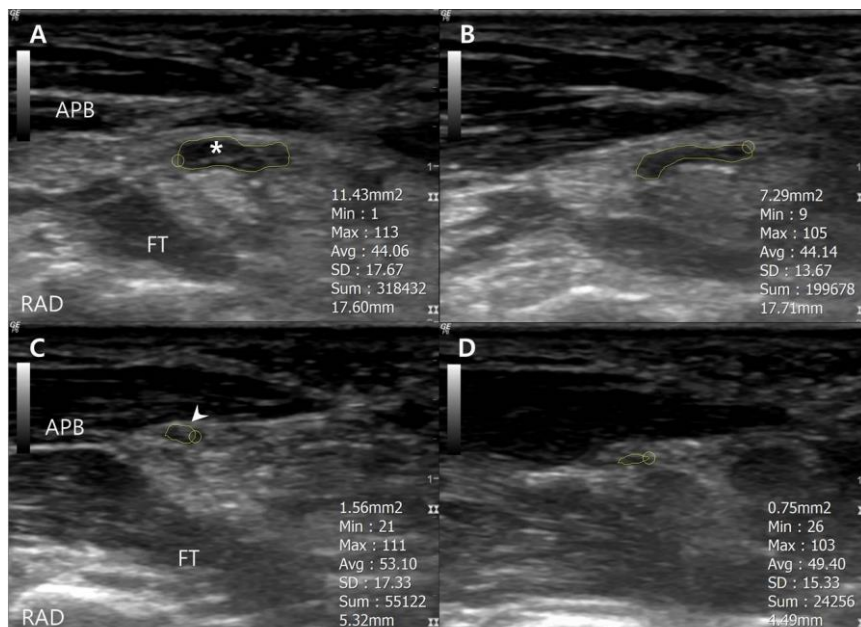


Figure 1. Ultrasound findings of the median nerve and the recurrent motor branch. Right median nerve (A) is enlarged just distal to the transverse carpal ligament compared to left median nerve (B). Swollen radial-side motor fascicles (asterisk) within the median nerve are observed. (C) Thickened recurrent motor branch (arrow head) of right median nerve is found while the median nerve branches distal to the transverse carpal ligament. (D) Left recurrent motor branch of the median nerve at the same level.