통증 및 근골격재활

게시일시 및 장소 : 10 월 18 일(금) 08:30-12:20 Room G(3F)

질의응답 일시 및 장소 : 10 월 18 일(금) 10:32-10:36 Room G(3F)

P 1-56

Anconeus epitrochlearis as a source of chronic compressive ulnar neuropathy: A new treatment

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Introduction

Anconeus epitrochlearis muscle originates from the inferior surface of the medial epicondyle of the humerus and inserts to olecranon process. As ulnar nerve runs beneath this muscle, this anatomical relationship provides the chance to develop entrapment or compression of the ulnar nerve by this muscle (Figure 1). There is no report that the nerve conduction velocity recovered right after the muscle releasing, especially using electrical twitch obtaining intramuscular stimulation (ETOIMS).

Case

In May 16, 2019, a 26-year-old male patient visited a neuromuscular clinic complaining of tingling pain (visual analogue scale, VAS 4-5) on ulnar side of Rt. hand and hypersensitivity of Rt. 4th and 5th fingers which has been persisted after suture of the lacerated lesion in Rt. elbow after a pedestrian traffic accident occurred 2 years ago. He had no weakness and deep tendon reflex of biceps and triceps were normal. Lhermitte and spurling sign was negative. The magnetic resonance image of Rt. elbow taken after the accident revealed no specific lesion in the joint. The first electrodiagnostic study (EDx) performed in January 18, 2018. The motor nerve conduction study (NCS) for Rt. ulnar nerve demonstrated decreased velocity (38.4 m/sec) in the segment between 2cm above and below lateral epicondyle of humerus. Sensory NCS revealed normal for Rt. ulnar nerve. Needle electromyography (EMG) showed increased insertional activities in Rt. flexor carpi ulnaris and adductor digiti minimi muscles. These results were suggestive of Rt. ulnar neuropathy at elbow level. In June 14, 2019, on following 2nd EDx, the motor NCS revealed increased amplitude and increased velocity at the segment between the epicondyle and 2cm above the epicondyle. However, the conduction velocity between the epicondyle and 2cm below the epicondyle was still slow (38.4 m/sec) (Table 1). By physical examination, slight compression of the Rt. anconeus epitrochlearis triggered the

tingling pain on the ulnar aide of Rt. hand. Presuming that the anconeus epitrochlearis muscle compresses the ulnar nerve, ETOIMS was applied using Clavis (Alpine Biomed ApS, Denmark) for the muscle releasing. After confirming the bony landmarks by palpation, a monopolar needle electrode was inserted into the Rt. anconeus epitrochlearis as reference electrode attached onto the nearby skin. The stimulations were delivered with 2-mA intensity, 0.2-ms pulse duration, 2-Hz frequency with unipolar negative square waves for 10 seconds at two stimulation points (Figure 2). Right after the ETOIMS, the conduction velocity got faster from 38.4 m/sec to 66.7 m/sec (Table 1). The tingling pain was relieved (VAS 0) and the hypersensitivity was disappeared. After 1 week, only the minimal hypersensitivity remained.

Conclusion

The anconeus epitrochlearis muscle can cause a chronic compressive ulnar neuropathy. The ETOIMS is effective in releasing the anconeus epitrochlearis and even can restore the conduction velocity.

Table 1. Serial electrodiagnostic studies before and after ETOIMS.

Motor NCS				1st (January 18, 2018)		2nd, before ETOIMS (June 14, 2019)		3rd, after ETOIMS (June 14, 2019)	
Nerve	Stimulating site	Stimulating segment	Recording site	Amp. (μV)	Vel. (m/sec)	Amp. (μV)	Vel. (m/sec)	Amp. (μV)	Vel. (m/sec)
Rt. ulnar	Below 4cm		Rt. ADM	11.2		21.2		19.4	
	Below 2cm	Below 2cm - below 4cm	Rt. ADM	11.1	64.0	20.85	64.0	17.9	66.7
	Epicondyle	Epicondyle - below 2cm	Rt. ADM	11.0	38.4*	20.85	38.4*	17.9	66.7
	Above 2cm	Above 2cm - epicondyle	Rt. ADM	10.9	48.0	20.53	76.8	16.8	80.0
	Above 4cm	Above 4cm - above 2cm	Rt. ADM	10.9	76.8	19.03	76.8	16.4	80.0

Sensory NCS			1st (January 18, 2018)		2nd, before ETOIMS (June 14, 2019)	
Nerve	Stimulating site	Recording site	Lat. (msec)	Amp. (μV)	Lat. (msec)	Amp. (μV)
Rt. Ulnar	Wrist	5th digit	2.81	9.5	2.24	42.8
Rt. Dorsal ulnar	Forearm	4th web			1.30	23.6

Needle EMG	1st (January 18, 2018)				2nd, before ETOIMS (June 14, 2019)			
Muscles	SA	MUAP	R.P	I.P	SA	MUAP	R.P	I.P
Rt. deltoid	No ASA	NMU	Normal	Complete	No ASA	NMU	Normal	Complete
Rt. biceps	No ASA	NMU	Normal	Complete	No ASA	NMU	Normal	Complete
Rt. triceps	No ASA	NMU	Normal	Complete	No ASA	NMU	Normal	Complete
Rt. FCR	No ASA	NMU	Normal	Complete	No ASA	NMU	Normal	Complete
Rt. FCU	Increased IA	NMU	Normal	Complete	No ASA	NMU	Normal	Complete
Rt. APB	No ASA	NMU	Normal	Complete	No ASA	NMU	Normal	Complete
Rt. ADM	Increased IA	Polyphasic	Normal	Complete	No ASA	NMU	Normal	Complete
Rt. PSM C8	No ASA	NMU	Normal	Complete	No ASA	NMU	Normal	Complete
Rt. PSM T1	No ASA	NMU	Normal	Complete	No ASA	NMU	Normal	Complete

Amp., amplitude; Vel., velocity; Lat., onset latency; ASA, abnormal spontaneous activity; IA, insertional activity; NMU; normal motor unit; MUAP, motor unit action potential; R.P, recruitment pattern; I.P, interference pattern; FCR, flexor carpi radialis; FCU, flexor carpi ulnaris; APB, abductor pollicis brevis; ADM, adductor digiti minimi; PSM, paraspinal muscle; ETOIMS, electrical twitch obtaining intramuscular stimulation; *, decreased amplitude.

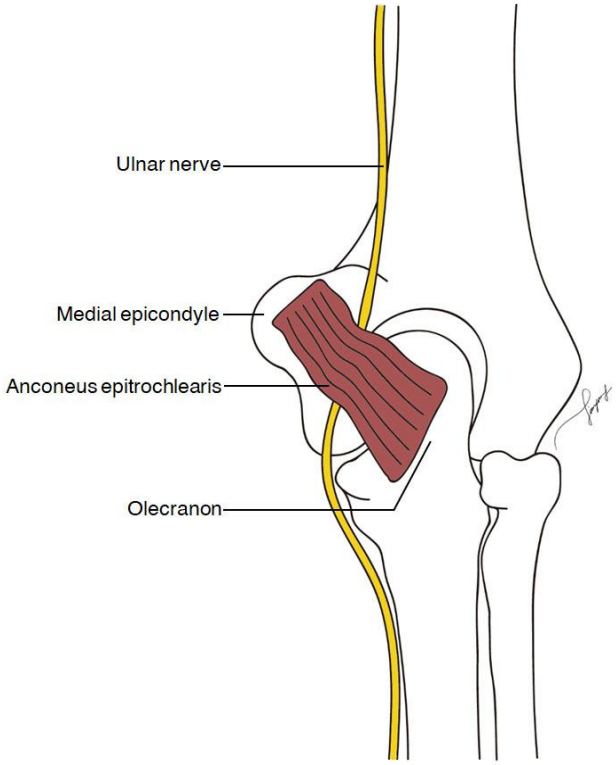

Figure 1. Anatomical relationship between anconeus epitrochlearis muscle and ulnar nerve.

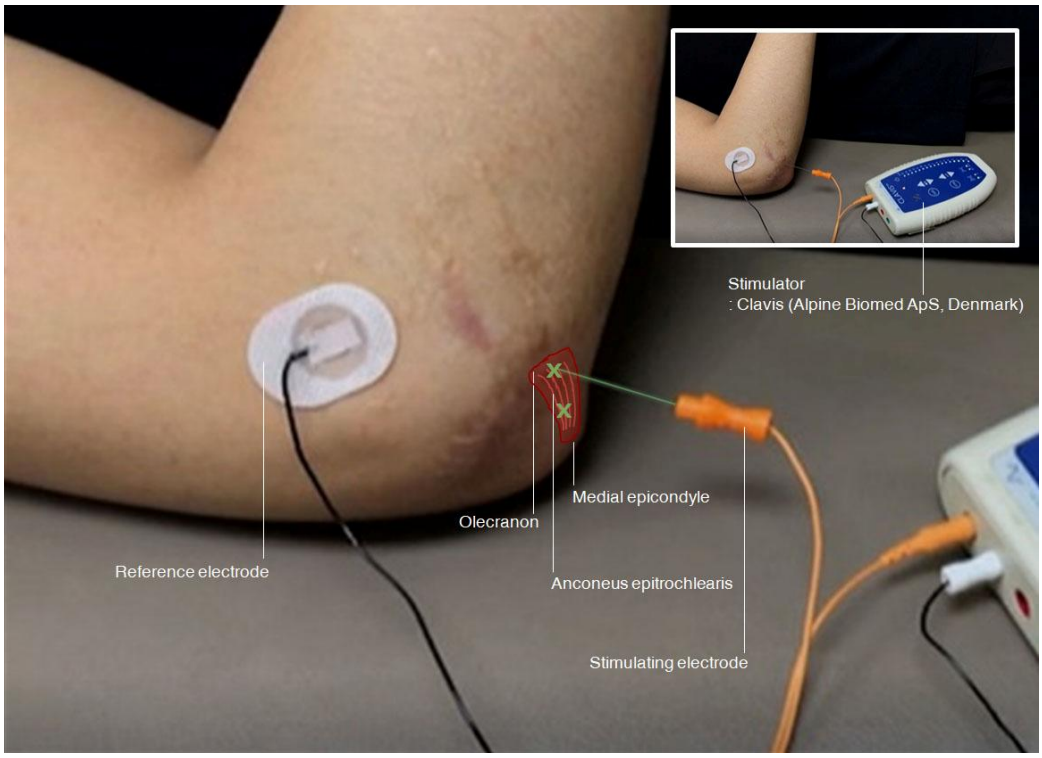

Figure 2. ETOIMS in the Rt. anconeus epitrochlearis muscle.