신경근육재활 및 전기진단

게시일시 및 장소 : 10 월 18 일(금) 13:15-18:00 Room G(3F)

질의응답 일시 및 장소 : 10 월 18 일(금) 15:45-16:30 Room G(3F)

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Clinically diagnosed iatrogenic botulinum toxin intoxification : a case report

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Introduction

Botulism is caused by the exotoxin of Clostridium botulinum, which acts by blocking the presynaptic release of acetylcholine. Although safety has been verified, it has been reported that iatrogenic botulism(IB) can be caused by systemic spread of botulinum toxin which is used therapeutically or cosmetically. Although it is nearly impossible to conclusively prove IB because of the diversity of underlying diseases and dosage of patients, Nerve conduction study (NCS) and electromyographic (EMG) examination can be useful support to diagnose IB.

Case report

A 52-year-old male patient came to the emergency room. Five days before admission, the patient underwent botulinum toxin injection to mitigate right posterior neck pain and headache. Ptosis developed in the right eye a day after. On the day before admission, the pronunciation of patient became sloppy and slowing food became difficult. On the morning of hospitalization, suspicious symptoms of laryngospasm occurred and it became very difficult to breathe. The vocal cord gap of the patient was narrowed compared to normal adult male. Intravenous immunoglobulin therapy and intravenous pyridostigmine therapy started, but his symptoms gradually worsened and later that day, the patient underwent tracheostomy. Five days later he fell into respiratory failure and ventilator care was started. Strength of proximal muscle of upper extremity and neck flexor muscle was generally trace grade according to the manual muscle test(MMT). NCS and EMG examination were done at hospital day 83 to support the confirmation of his diagnosis. Motor NCS presented decreased amplitudes of compound muscle action potential(CMAP) in right common peroneal nerve, spinal accessory nerve and axillary nerve(Table 1). Needle EMG showed abnormal spontaneous activities at rest in several muscles. Increased insertional activities were observed at rest in first dorsal interosseous muscle (Table2). Repetitive nerve stimulation test presented decrement pattern more than 10% of CMAP in right spinal accessory nerve recorded at trapezius muscle and right axillary nerve

recorded at middle deltoid muscle on resting state (Figure1). Based on his history, he was diagnosed with IB. Comprehensive rehabilitation therapy including gait training, pulmonary rehabilitation and dysphagia therapy was continued. After a month, the patient was tolerable enough to exchange tracheostomy to retainer. At the time of discharge, the patient could walk independently.

Conclusion

Early diagnosis of botulism is crucial because it is life-threatening with airway involvement. NCS and EMG examination supported the diagnosis of IB. Treatment of IB requires prevention of sequelae and management of symptoms such as dyspnea in the acute phase. In this case, pyridostigmine was applied to relieve severe sequelae of IB. In our case, the patient gradually recovered over several weeks after comprehensive rehabilitation therapy and application of pyridostigmine.

Table 1. Motor nerve conduction study showed decreased amplitudes of compound muscle action potential(CMAP)s in right common peroneal nerve recorded at extensor digiotrum brevis muscle, spinal accessory nerve recorded at trapezius muscle and axillary nerve recorded at middle deltoid muscle.

Sensory Nerve Conduction Studies

Nerve / Sites	Onset Lat ms	Peak Lat ms	Amp µV	Vel. m/s	Dist. cm
R MEDIAN - Digit III					
Wrist	2.60	3.50	45.2	53.8	14
Palm	1.45	2.10	63.2	48.3	7
R ULNAR - Digit V					
Wrist	2.55	3.45	43.1	54.9	14
R SUP PERONEAL - Ankle					
Lat Leg	3.20	3.95	13.5	43.8	14
R SURAL – Mid calf					
Calf	3.05	3.95	23.1	45.9	14

Motor Nerve Conduction Studies

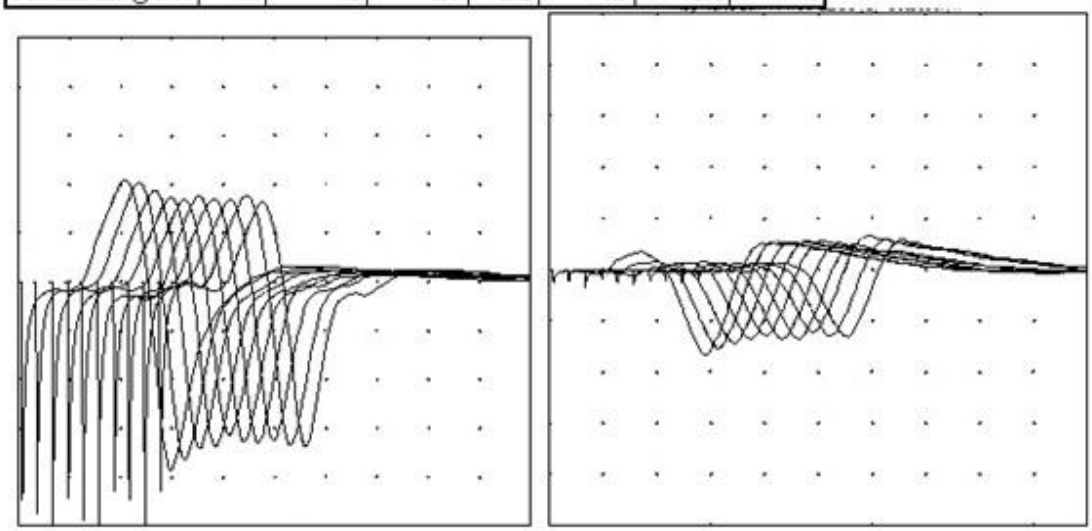
Nerve / Sites	Onset Lat ms	Peak Lat. ms	Amp. mV	Dur. ms	Dist. cm	Vel. m/s
R MEDIAN - (APB)						
Wrist	3.95	6.45	7.2	6.70	7	
Elbow	8.45	11.00	6.8	6.75	25	55.6
R ULNAR - (ADQ)						
Wrist	2.95	6.15	11.2	5.20	7	
B Elbow	7.40	10.90	9.9	5.45	25	56.2
R COMM PERONEAL						
Ankle	5.65	10.60	0.8	8.55	8	
Fib Head	13.05	18.40	0.8	12.20	31.5	42.6
R TIBIAL (KNEE) - ADH						
Ankle	5.00	8.10	12.4	4.40	8	
popliteal	14.20	17.40	9.9	4.85	38	41.3
R COMM PERONEAL - Tib Ant						
Fib Head	2.45	8.70	4.6	14.70		
Knee	4.45	10.25	4.4	12.60	8	40.0
R SPINAL ACCESS - Trapezius						
Neck	2.60	11.85	2.5	16.00		
R AXILLARY - (Deltoid)						
Erb's	5.15	19.30	0.8	62.50		

Table 2. Needle EMG study presents Abnormal spontaneous activities at rest in right cervical paraspinalis, middle deltoid, biceps, flexor carpi radialis and extensor digitorum communis muscles. Increased insertional activities were shown at rest in first dorsal interosseous muscle.

EMG Summary Table									
	Spontaneous					MUAP			Interference
	IA	Fib	PSW	Fasc	H.F.	Amp	Dur.	PPP	Pattern
B. CERV PSPINAL	N	None	1+	None	None				
R. DELTOID	N	None	2+	None	None	N	N	N	N
R. BICEPS	N	None	2+	None	None	N	N	N	N
R. EXT DIG COMM	N	None	2+	None	None	N	N	N	N
R. FLEX CARPI RAD	N	None	1+	None	None	N	N	N	N
R. FIRST D INTEROSS	Inc	None	None	None	None	N	N	N	N
R. VAST MEDIALIS	N	None	None	None	None	N	N	N	N
R. TIB ANTERIOR	N	None	None	None	None	N	N	N	N
R. GASTROCN (MED)	N	None	None	None	None	N	N	N	N

▪ Rep Nerve Stim

Muscle / Train	Ampl. mV	Ampl Dec %	Ampl Fac %	Area mVms	Area Dec %	Area Fac %	d. Ampl2 %
R ABD DIG MIN (UL) – 3 Hz							
3Hz	11.5	-2	100	30.9	-5.1	100	-2.4
3Hz	11.8	-2.5	103	32.2	-5.5	104	-3.3
R ABD DIG MIN (UL) – 3Hz after Rapid RNS							
@ 0:00	12.3	-2	100	33.2	-4.3	99.4	-1.4
@ 1:00	12.3	-3.2	100	33.6	-4.3	101	-2.7
R TRAPEZIUS (U) – 3 Hz							
3Hz	2.9	-28.3	100	27.4	-38.2	100	-31.7
3Hz	4.6	-15.9	70.8	18.4	-19.7	36.2	-21.3
R DELTOID – 3 Hz after exercise							
Baseline 3Hz	0.6	13.7	100	12.9	-19	100	4.2
Post exercise @ 1:00	0.8	20.7	131	12.6	1	97.5	7.1
Post exercise @ 2:00	0.7	23.2	116	14.0	-4.9	108	17.7
Post exercise @ 3:00	0.8	14.9	130	16.2	-3	125	17
Post exercise @ 4:00	1.0	2.2	166	17.2	-6.4	133	-3
Post exercise @ 5:00	0.8	7.2	139	15.2	0.5	118	4.6



<Rt. Trapezius> <Rt. Deltoid- Base>

Figure1. Repetitive nerve stimulation test. decrement pattern more than 10% of CMAP in right spinal accessory nerve recorded at trapezius muscle and right axillary nerve recorded at middle deltoid muscle on resting state were observed.