

Statin-induced myopathy mimicking neuromuscular junction disorder : A case report

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Case

This study details the case of a 57-year-old woman who presented with generalized motor weakness for the past three weeks, as well as a recent weight loss of 5 kilograms over three months. She had undergone a gynecological operation seven years prior and was a hepatitis B carrier.

Muscle weakness by Medical Research Council scale was observed as grade 2 in the proximal upper and lower extremities and grade 3-4 in the distal area, with fatigability and positive Gower's sign.

Prominent muscular atrophy was found in the proximal muscles of the limbs. Sensory examination revealed only a complaint of coldness around both knees. The deep tendon reflexes were generally hyporeflexic and there were no observed pathologic reflexes. The patient had no bulbar muscle symptoms, including dysphagia. Moreover, there were no respiratory or autonomic nervous system symptoms present.

Due to the generalized motor weakness with fatigability and lack of sensory or bulbar symptoms, myopathy or neuromuscular junction(NMJ) disease were the likely diagnoses. Also, taking into account rapid weight loss, malignancy-related muscle weakness should be taken into consideration.

She was admitted to the rehabilitation center the day after the outpatient visit. Blood tests were performed including paraneoplastic antibody panel and acetylcholine-related antibody. The only findings that were observed were the presence of leukocytosis and a slight increase in the level of creatinine kinase(CK)(Table 1).

Table 1. Result of laboratory study

WBC (10 ⁹ /L)	17420	Sodium (mEq/L)	138
Neutrophils (%)	90	Potassium (mEq/L)	4.4
Lymphocytes (%)	5	Chloride (mEq/L)	104
Hemoglobin (g/dL)	13.3	Aspartate transaminase (AST) (U/L)	30
Platelet (10 ⁹ /L)	342	Alanine transaminase (ALT) (U/L)	46
Erythrocyte Sedimentation Rate (mm/h)	9	Creatinine Kinase (CK) (U/L)	338
C-Reactive protein (mg/L)	1.03	Lactate Dehydrogenase (LDH) (U/L)	423
		Paraneoplastic antibody	negative
		Acetylcholine receptor antibody (nmol/L)	<0.02

To differentiate diseases related to malignancy, computed tomography(CT) and gastrointestinal endoscopy were performed. A 1.2cm*0.5cm mass was found in the right kidney on CT scan.

(Figure 1)

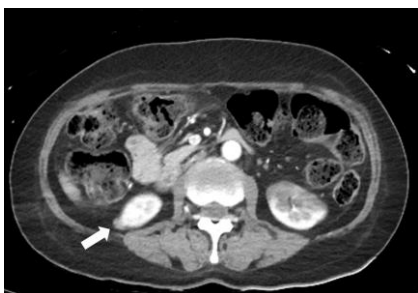


Figure 1. An anomalous mass(white arrow) detected in the right kidney through CT scan

Table 2. Result of nerve conduction study

Nerve/Site	Latency (ms)		Amplitude ^a		CV (m/s)	
	Right	Left	Right	Left	Right	Left
Sensory nerve						
Median - Digit III	3.3	3.1	48	62	-	-
Ulnar - Digit V	3.3	3.2	50	56	-	-
Sural - Ankle	3.5	3.4	43	44	-	-
Superficial peroneal - Foot	3.6	3.5	21	20	-	-
Motor nerve						
Facial - Oculi	4.7	4.6	0.7	0.7		
Spinal accessory - Trapezius	2.0	2.0	1.2	2.2		
Median - APB (wrist)	3.4	3.5	3.4	4.5		
Median - APB (elbow)	7.2	7.1	3.1	4.1	54	56
Ulnar - ADM (wrist)	2.7	2.7	5.3	5.1		
Ulnar - ADM (elbow)	5.6	5.5	4.6	4.4	57	57
Tibial - AHB (ankle)	4.2	3.8	4.6	3.7		
Tibial - AHB (popliteal fossa)	12.1	11.0	4.3	3.5	42	44
Peroneal - EDB (ankle)	4.0	3.1	1.6	0.8	53	47
Peroneal - EDB (fibula head)	9.4	9.2	1.4	0.7		
Peroneal - TA (fibula head)	2.7	2.7	2.6	2.9	69	60
Peroneal - TA (popliteal fossa)	4.0	4.2	2.4	2.7		

^a Microvolt in sensory study and millivolt in motor study

APB : abductor pollicis brevis; ADM : abductor digiti minimi; AHB : abductor hallucis brevis; EDB : extensor digitorum brevis; TA : tibialis anterior

She underwent nerve conduction study(NCS), needle electromyography(EMG), and repetitive nerve stimulation(RNS) tests. The motor NCS showed a decreased amplitude of compound motor action potentials(Table 2). Early recruitment of motor unit action potential was notable in the needle EMG(Table 3). The RNS study did not reveal any post-exercise exhaustion. While there was a 33% increase after 10 seconds of exercise in the abductor digiti minimi, it was not a characteristic sign of post-exercise facilitation (which requires at least a 40% increment).

Based on the above results, it was possible to infer myopathy or NMJ disease(especially Lambert-Eaton myasthenic syndrome). However, it was later discovered that the patient had started taking Rosuvastatin five weeks prior to her symptoms, despite not having high cholesterol. It was immediately discontinued after admission, and the CK level normalized from 338 U/L to 103 U/L.

Conclusion

The muscle weakness improved after one month of cessation. Statin-induced myopathy is considered the most likely diagnosis since the muscle weakness improved after stopping the medication. Careful physical examination are probably the most important items for neurorehabilitation clinicians, but we must learn a lesson that the importance of drug history should not be overlooked.

Table 3. Result of needle electromyography

Muscle	Spontaneous activity			Motor unit action potential				
	IA	Fib	PSW	Amplitude	Duration	Polyphasic	Interference	Recruitment
C4-T1 paraspinal, both	Normal	None	None	Normal	Normal	None	-	-
L2-S1 paraspinal, both	Normal	None	None	Normal	Normal	None	-	-
Deltoid	Normal	None	None	Normal	Normal	None	Reduced	Early
Biceps brachii	Normal	None	None	Normal	Normal	None	Reduced	Early
Flexor carpi radialis	Normal	None	None	Normal	Normal	None	Reduced	Early
Extensor digitorum comm	Normal	None	None	Normal	Normal	None	Reduced	Early
1 st dorsal interossei	Normal	None	None	Normal	Normal	None	Reduced	Early
Gluteus maximus	Normal	None	None	Short	Normal	None	Reduced	Early
Gluteus medius	Normal	None	None	Normal	Normal	None	Reduced	Early
Iliopsoas	Normal	None	None	Short	Small	None	Reduced	Early
Vastus medialis	Normal	None	None	Normal	Normal	None	Reduced	Early
Tibialis anterior	Normal	None	None	Normal	Normal	None	Reduced	Early
Gastrocnemius	Normal	None	None	Normal	Normal	None	Reduced	Early

IA : insertional activity; Fib : fibrillation; PSW : positive sharp wave

^a Needle EMG of extremities was performed on the left side