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Introduction

The most common neurologic symptom of herpes zoster infection is postherpetic neuralgia, but herpes zoster occasionally invades motor neurons causing paresis. Previous studies have reported that the most prevalent cause of zoster associated limb paresis is plexopathy, followed by radiculopathy and mononeuropathy. This report presents a rare case of herpes zoster-induced brachial plexopathy combined with cervical roots irritation, showing both preganglionic and postganglionic lesions.

Case Presentation

A 62-year-old male patient visited a neurosurgery outpatient clinic with a complaint of right upper limb weakness 2 months ago. A week before the paralysis appeared, he was diagnosed with herpes zoster at a local clinic and was prescribed with antiviral drugs and a topical ointment. He had a medical history of hypertension and hyperlipidemia.

Neurological examination of the right upper limb using the Medical Research Council Scale showed muscle weakness in 1/5 of shoulder flexion, 2/5 of elbow flexion, and 4/5 of wrist extension. He had mild paresthesia in right thumb and index finger. The biceps reflex was reduced, but the triceps reflex was intact.

Sensory nerve conduction study (NCS) showed reduced amplitudes of sensory nerve action potentials in the right lateral antebrachial cutaneous and radial nerves (Table 1). Motor NCS showed reduced amplitudes of compound muscle action potentials in right radial nerve recording at the extensor indicis proprius muscle, axillary nerve recording at the deltoid muscle, musculocutaneous nerve recording at the biceps brachii muscle. Needle electromyography (EMG) showed abnormal spontaneous activities at rest in the right C4-T2 paraspinalis, supraspinatus, infraspinatus, teres major, deltoid, biceps brachii, extensor digitorum communis, and flexor carpi radialis muscles (Table 2). Therefore, the electrodiagnostic findings were reasonable for right brachial plexopathy, mainly involving upper trunk and posterior cord, which appeared to be accompanied by middle to lower cervical roots irritation.

Cervical spine computed tomography showed mild bulging disc in C3-4, small right central disc protrusion in C4-5 without root compression, and diffuse bulging disc in C5-6. Brachial plexus magnetic resonance imaging showed edema and enhancement of the right C5 and C6 nerve roots, and edema of the upper trunk, posterior cord level of right brachial plexus, compared with the left side (Fig 1).

Conclusion

Herpes zoster may trigger paresis by invading motor neurons. Differentiating locations of lesions may help patients receive appropriate treatment, such as selective nerve root block for radiculopathy. Previous study of zoster-associated paresis with radiculoplexopathy have shown poorer prognosis than either radiculopathy or plexopathy alone. Thus, to provide an appropriate treatment and predict disease progression, we recommend clinicians to examine NCS and EMG in patients with herpes zoster-induced paresis.

Table 1. Results of nerve conduction studies

Study	Nerve	Latency (R/L, ms)	Amplitude (R/L, mV/ μ V)	Velocity (R/L, m/s)
Sensory nerve conduction	Median	2.4/2.6	18.1/11.5	
	Ulnar	2.5/2.6	11.6/13.7	
	Radial	1.6/1.6	4.1*/15.0	
	MABC	1.2/1.4	9.9/9.4	
	LABC	1.5/1.6	5.8*/17.9	
Motor nerve conduction	Median: Wrist-Elbow	3.4/3.4	6.3/7.7	56/60
	Ulnar: Wrist-Below Elbow	2.8/2.7	6.3/9.5	59/59
	Radial: Forearm-Below Spiral Groove	2.5/2.2	1.9*/3.5	61/65
	Axillary: Erb's point	3.8/3.1	0.1*/12.0	
	MCN: Erb's point	4.6/4.6	0.4*/7.0	

Amplitudes are measured in millivolt (mV, motor) and microvolt (μ V, sensory).

R, right; L, left; MABC, medial antebrachial cutaneous; LABC, lateral antebrachial cutaneous; MCN, musculocutaneous.

* Abnormal findings are represented with asterisks; an abnormal finding was defined by a greater than 50% reduction of amplitude or 30% delay of latency compared to the unaffected side, or no response of sensory nerve action potential and compound motor action potential.

Table 2. Results of needle electromyography

Muscle	Spontaneous activities	MUAP	Recruitment pattern	Interference pattern
C4-T2 paraspinalis. L	Nml			
C4-6 paraspinalis. R	Fib 1+, PSW 1+			
C6-T2 paraspinalis. R	Fib 1+, PSW 2+			
Supraspinatus. R	Fib 2+, PSW 3+			No MUAP
Infraspinatus. R	Fib 2+, PSW 3+			No MUAP
Rhomboid major. R	Nml	Nml	Nml	Nml
Teres major. R	Fib 1+, PSW 1+			No MUAP
Serratus anterior. R	Nml	Nml	Nml	Nml
Deltoid. R	Fib 1+, PSW 2+			No MUAP
Biceps. R	Fib 2+, PSW 2+	Nml	Nml	Single
Triceps. R	Nml	Nml	Nml	Reduced
Extensor digitorum communis. R	PSW 1+	Long and polyphasic	Nml	Nml
Extensor indicis proprius. R	Nml	Nml	Nml	Nml
Flexor carpi radialis. R	PSW 1+	Nml	Nml	Reduced
Flexor carpi ulnaris. R	Nml	Nml	Nml	Nml
1 st dorsal interosseous. R	Nml	Nml	Nml	Nml
Abductor pollicis brevis. R	Nml	Nml	Nml	Nml

MUAP, motor unit action potential; L, left; R, right; Nml, normal; Fib, fibrillation potential; PSW, positive sharp wave.

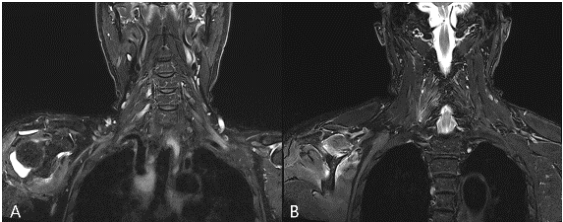


Fig 1. Contrast enhanced coronal T2-weighted brachial plexus MRI of the patient. (A) Edema and enhancement of right C5,6 root and edema of upper trunk, posterior cord level of brachial plexus compared with the left side. (B) Diffuse T2 hyperintensity of right erector spinae muscle and rotator cuff muscles.