



Horner's Syndrome and Segmental Sympathetic Denervation Following Herpes Zoster Brachial Plexopathy

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Dear Editor,

Varicella-zoster virus (VZV) reactivation may cause not only zoster but also serious neurological and ocular disorders, as well as multiple visceral and gastrointestinal disorders.¹ The neurological complications of zoster include chronic pain (postherpetic neuralgia), multiple cranial palsies, meningoencephalitis, VZV vasculopathy, and myelopathy.² However, Horner's syndrome is a rare complication of herpes zoster, and can be either cranial or thoracic.^{3,4} Here we report on a patient with zoster brachial plexopathy after zoster infection who presented with Horner's syndrome and the manifestation of segmental sympathetic denervation.

A 63-year-old female with herpes zoster of the sixth cervical dermatome of the left shoulder developed left arm paresis. Skin lesions had appeared on the shoulder 2 weeks previously and were treated with antiviral drugs at a local clinic. An examination revealed healing lesions characteristic of herpetic vesicles over the left C7–C8 dermatomes. A neurological examination revealed left-sided ptosis and subtle miosis. Other cranial nerves were normal, as were facial sensation and power. She had weakness of the deltoid, supraspinatus, and infraspinatus muscles and of the biceps, wrist extensors and flexors, and finger flexors (all MRC grade 4/5). The biceps tendon reflex and triceps tendon reflex were preserved. EMG findings were consistent with left brachial plexopathy. Her serum was positive for VZV immunoglobulin M and immunoglobulin G. MRI showed hyperintensities in the left supraspinatus, infraspinatus, and pectoralis major muscles (Fig. 1A), consistent with denervation change following herpes zoster plexopathy. No significant findings were observed for the structures around the cervical nerve root, sympathetic trunk, or carotid artery.

Intravenous methylprednisolone was administered at 250 mg for 5 days. She complained of anhidrosis of the left face and anterior neck, which was examined using digital infrared thermal imaging and the starch iodine test (Fig. 1B and C). The finger wrinkle test for evaluating distal sympathetic denervation produced skin wrinkles on the right fingers, while the left fingers remain unwrinkled (Fig. 1D).

The herpes zoster virus usually invades sensory nerves but can also invade motor nerves, especially the anterior horn cell or anterior spinal nerve root. Complications caused by zoster are mainly limited to sensory symptoms and pain.⁵ The dermatomal and myotomal involvement in these cases suggests direct diffusion of the virus from the dorsal root ganglions to the anterior horn cells or brachial plexus.⁶ The involvement of the brachial plexus is infrequently reported, and concurrent manifestation of sympathetic nerve injury is rarely reported.^{3,7}

The oculosympathetic pathway from the posterolateral hypothalamus descends through the pontine and mesencephalic tegmentum, synapsing in the intermediolateral cell's column of the spinal cord from levels C8 to T2.^{3,8} These fibers from the cord exit to form the paravertebral sympathetic chain, proceeding through the stellate ganglion to synapse in the

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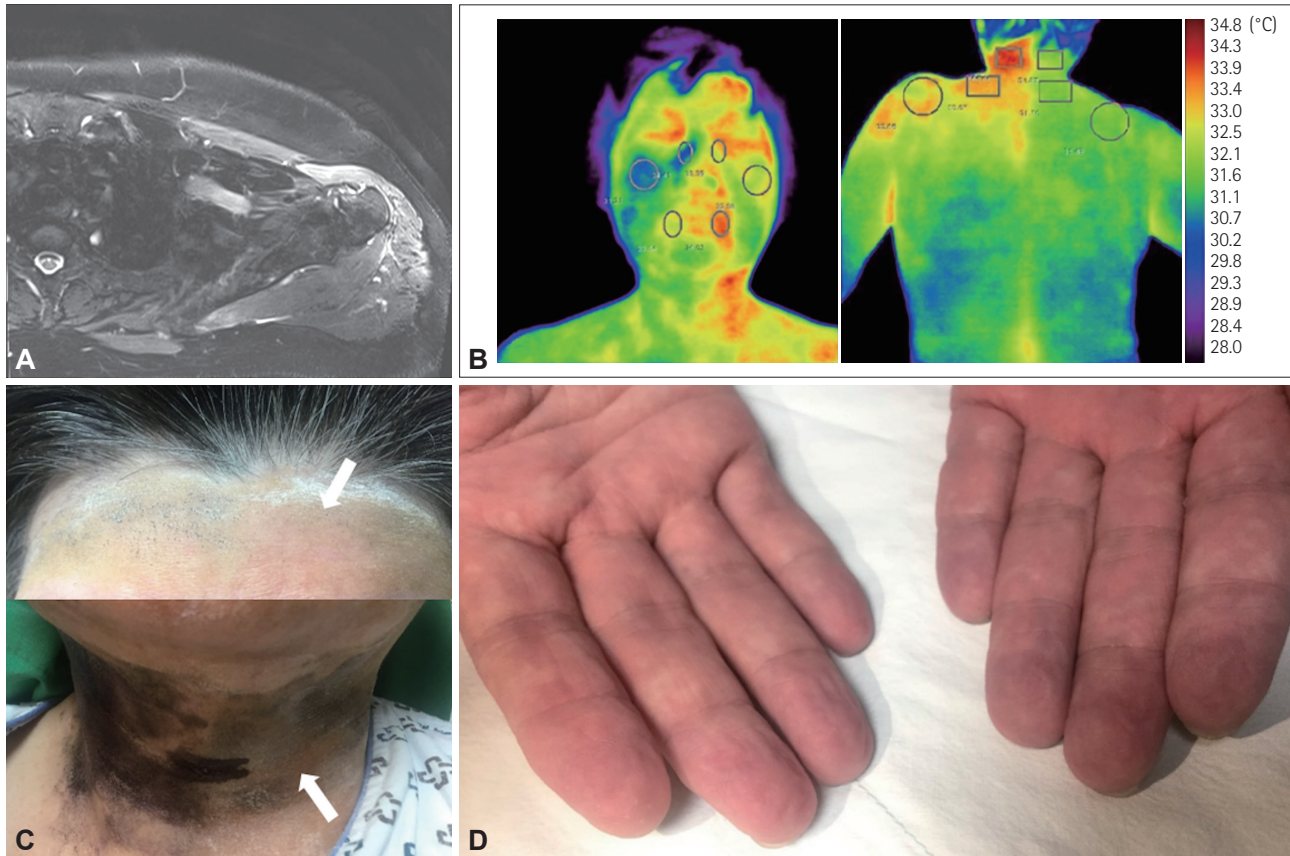


Fig. 1. Imaging and clinical findings of the patient. A: Shoulder MRI showed slight signal changes in the deltoid, pectoralis major, and infraspinatus muscles. B: Digital infrared thermal imaging showed that the temperature was lower on the right side of the face and shoulder than on the left. C: The starch test revealed anhidrosis on the left forehead and neck (arrows), while it showed color changes by sweating on the right. D: The finger wrinkle test involving warm water immersion produced skin wrinkles on the right fingers but not the left fingers.

superior cervical ganglion.

In the present case, zoster-related inflammation may have caused lesions of the preganglionic sympathetic chain and brachial plexus, resulting in the patient presenting the combination of arm paresis and Horner's syndrome with segmental sympathetic denervation. Sympathetic denervation on the arm and cranial part was supported by the findings of digital infrared thermal imaging and the starch iodine and finger wrinkle tests.⁹

This case was a rare instance of zoster brachial plexopathy being complicated with sympathetic denervation. This case suggests that neurological manifestations of VZV are associated with inflammation, and the diverse presentations with sympathetic denervation were revealed by various tests.

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Conflicts of Interest _____
The author have no potential conflicts of interest to disclose.

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