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Delayed Facial Palsy in a Patient With Varicella Zoster Virus Encephalitis

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Dear Editor,

Trigeminal nerve and dorsal root ganglionitis with a painful skin rash and blister in an affected area is the most common neurological manifestation of varicella zoster virus (VZV) infection. There are infrequent reports of VZV causing facial nerve palsy and central nervous system (CNS) infection such as meningitis and encephalitis.[1] However, simultaneous presentation of facial nerve palsy and CNS infection by reactivation of VZV without skin lesion has only rarely been reported. We experienced a case with delayed facial nerve palsy followed by VZV encephalitis without skin manifestation.

A 41-year-old male presented with the sudden onset of a confused mental status. He complained of headaches, fever, chills, nausea, and vomiting that first appeared 3 days previously. He took nonsteroidal anti-inflammatory analgesics, but his symptoms did not improve. He was taking medications for diabetes, hypertension, and dyslipidemia, but there was no other specific past medical history. His blood pressure and blood sugar were relatively well controlled.

Initially, the body temperature was 37.9°C, the pulse rate was 80 beats/min, and the blood pressure was 130/90 mm Hg. No specific abnormal findings were identified in a review of systems and a physical examination. The patient had an initially drowsy and confused mental status. He could not communicate or cooperate with family members and medical staff. Higher cortical functions could not be evaluated because he was very aggressive and confused. Neck stiffness was observed. Brainstem reflexes were normal and long-tract signs were not observed.

Mild neutrophil predominant leukocytosis (12.26×10^9/L, neutrophils 89.1%) was revealed by the complete blood count. Other blood tests including of the erythrocyte sedimentation rate and C-reactive protein, liver function tests, and renal function tests produced normal findings. Hemoglobin A1C was 6.7%. Cerebrospinal fluid (CSF) testing revealed an increased pressure (220 mm CSF), lymphocyte-predominant pleocytosis (242/mm^3, lymphocytes 90%), increased protein (62.0 mg/dL), and normal CSF/serum ratio (122/205). Cultures and staining for bacteria, fungi, and tuberculosis in the serum and CSF were negative. Polymerase chain reactions (PCRs) for herpes simplex, enterovirus, cryptococcus, and tuberculosis were also negative. The PCR for VZV was positive. Brain magnetic resonance imaging produced normal findings.

He was diagnosed with VZV encephalitis and treated intravenously with 10 mg/kg acyclovir every 8 hours for 10 days, despite no painful skin lesion or blister being observed. The treatment with intravenous acyclovir resulted in his mental status returning to clear, allowing him to communicate and cooperate with his family members and medical staff. Higher cortical functions including orientation, memory, language, calculation, and visuospatial recognition were normalized. However, right peripheral type facial nerve palsy occurred on day 14 of hospitalization. A nerve conduction study revealed decreased compound motor action potentials in the right facial nerve. In the blink reflex test, ipsilateral R1 and R2 waves were not

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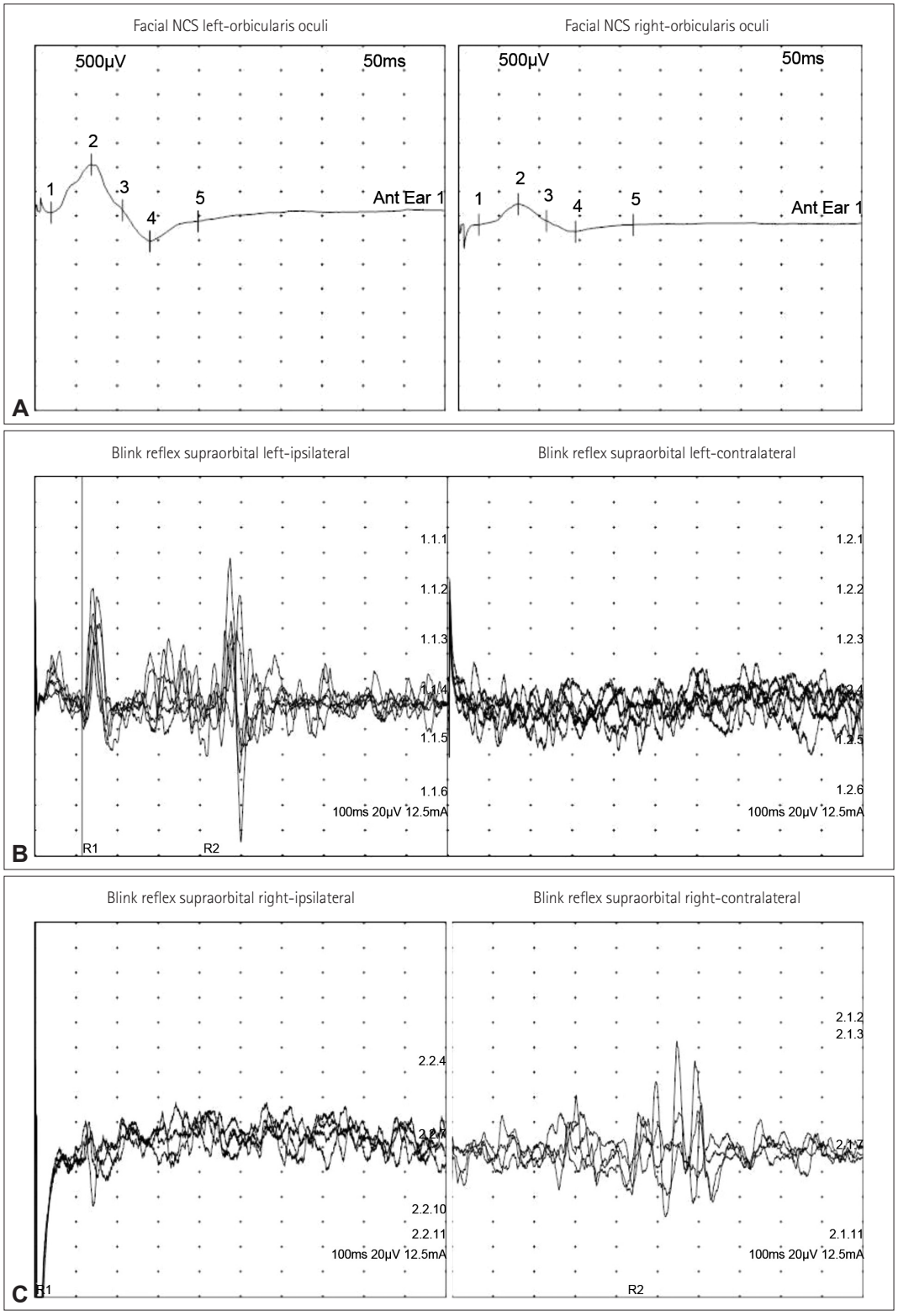

Fig. 1. Facial NCS and blink reflex in the patient. A: A facial motor NCS revealed decreased compound motor action potentials and delayed distal latency on the right side. B: Ipsilateral R1 and R2 waves were normally induced, but the contralateral R2 wave was not induced by left supraorbital stimulation during the blink reflex test. C: Ipsilateral R1 and R2 waves were not induced and the contralateral R2 wave was normally induced by right supraorbital stimulation during the blink reflex test. NCS, nerve conduction study.

induced by right supraorbital stimulation, and the contralateral R2 wave was not induced by left supraorbital stimulation (Fig. 1). He was treated with oral steroids for 4 weeks, and his facial weakness was normalized.

A diagnosis of encephalitis or focal neurological deficits by reactivation of VZV can be confirmed by the VZV PCR or antibody testing of CSF along with typical neurological symptoms and signs.[1-4] It is known that one-quarter of VZV encephalitis cases is not accompanied by skin lesions.[5] It is therefore important to confirm VZV encephalitis through PCR or VZV antibody testing in CSF even if encephalitis is suspected without skin lesions.

The VZV PCR of CSF is the most sensitive test for diagnosing VZV encephalitis. However, the VZV PCR can be converted to negative in CSF at 7−10 days after the initial reactivation of VZV due to the immune resistance against this virus. The antibody against VZV begins to be detected in CSF at that time,[2,5,6] and so it would be better to interpret the results of the VZV PCR or antibody testing while considering the CSF sample timing. In the present case, the positive PCR and the negative antibody result against VZV in the CSF are reasonable findings considering that the CSF sampling was performed 4 days after symptom onset.

It is controversial whether VZV encephalitis or a focal neurological deficit is caused by direct nerve invasion or is secondary to vasculopathy. VZV can escape from the ganglion and replicate in the artery to cause vascular disease in immunocompromised patients. Inflammatory cells had mainly infiltrated around the blood vessels of the gray matter in an autopsy of a person who died from VZV encephalitis.[5] Antiviral agents and steroids are known to produce good therapeutic responses in patients with VZV encephalitis and facial nerve palsy, as shown in the present case.

Facial nerve palsy in patients with VZV encephalitis is mostly reported in Ramsay-Hunt syndrome,[3,5,7] which is the most common form of facial nerve palsy in patients with VZV reactivation. To the best of our knowledge, delayed unilateral facial nerve palsy accompanied by VZV encephalitis without a painful skin lesion and ganglionitis of the cranial and spinal nerves have not been reported previously. The cause of delayed facial paralysis in patients with VZV encephalitis is not well known, and so needs to be elucidated in further studies.

Ethics Statement

The patient gave informed consent to the case report.

Availability of Data and Material

The datasets generated or analyzed during the study are available from the corresponding author on reasonable request.

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Conflicts of Interest

Kyong Jin Shin, an assoicate editor of the *Journal of Clinical Neurology*, was not involved in the editorial evaluation or decision to publish this article. All remaining authors have declared no conflicts of interest.

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