

Case Report

Acute oropharyngeal palsy with localized sensory impairment resembling symptom distribution of acute pharyngeal-cervical-brachial variant in a patient with Guillain-Barré syndrome

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Abstract: We present the case of a 40-year-old woman who experienced dysarthria and, numbness in her upper extremities and posterior region of her neck. Upon admission to our hospital, neurological examination revealed rhinolalia aperta and an incomplete palatoplegia; however, muscle strength in the neck and limbs was satisfactorily preserved, tendon reflexes were normal, and pathological reflexes were not observed. Cerebrospinal fluid and electrophysiological test results were also normal. On day 3 of hospitalization, a slight backflow of fluid into the nasal cavity was observed upon deglutition, and vibration perception was also impaired in the bilateral arms. Her serum tested positive for immunoglobulin G antibodies against such gangliosides as GT1a, GQ1b, GT1b, and GD1a. Despite normal tendon reflexes, she was diagnosed with a subtype of Guillain-Barré syndrome (GBS), and was treated with intravenous immunoglobulin therapy. Subsequently, her symptoms improved. Due to the combination of oropharyngeal palsy and sensory impairment, it was more likely the GBS subtype in this patient was acute oropharyngeal palsy (AOP) rather than pharyngeal-cervical-brachial (PCB) variant; though interestingly, the patient's sensory disturbance was limited to the posterior neck and upper extremities, which resembles the distribution of motor symptoms in PCB variant. The present case was a rare and important phenotype, demonstrating diversities of GBS variants. We also believe that GBS subtypes may represent a continuum of pathological conditions and not just one static condition. However, further studies involving serological characteristics of anti-ganglioside antibodies and clinical features for GBS are needed to clarify this possibility.

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Introduction

Guillain-Barré syndrome (GBS) is a monophasic peripheral neuropathy typically characterized by acute onset of muscle weakness with a decrease or loss of tendon reflexes. While the term GBS is often considered to be synonymous with acute inflammatory demyelinating polyradiculoneuropathy (AIDP), several clinical reports have now revealed the existence of GBS subtypes¹⁾²⁾. Amongst these, acute oropharyngeal palsy (AOP) is a relatively rare regional variant of GBS. AOP is mainly

characterized by oropharyngeal palsy associated with attenuation/loss of tendon reflexes, no ocular movement impairment, and no obvious muscle weakness in the extremities³⁾. Pharyngeal-cervical-brachial (PCB) weakness is another rare variant of GBS, characterized by localized muscle weakness extending from the oropharyngeal and neck area to the proximal upper extremities, attenuation/loss of tendon reflexes of the upper extremities, and no muscle weakness/abnormal tendon reflexes of the lower extremities⁴⁾. Herein, we report a unique case of a GBS patient presenting AOP with localized sensory impairment resembling symptom distribution of PCB variant.

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Case report

A 40-year-old woman was admitted to our hospital, complaining of numbness that extended from her posterior neck to her upper extremities. Nine days prior to admission, she experienced upper respiratory tract symptoms due to unknown cause, which improved within a few days. Three days prior to admission, she experienced numbness in her upper extremities, which spread to her shoulders and posterior neck. One day prior to admission, she experienced dysarthria. She had no notable medical or family history and no record of drug use. Moreover, she had not received any vaccinations in the months prior to the incident. General physical examination was unremarkable: cranial nerves were normal, except for rhinolalia aperta, dysarthria, and an incomplete palatoplegia with retained gag reflex; muscle strength in the neck and limbs was satisfactorily preserved; tendon reflexes were normal; and pathological reflexes were not observed. Sensory examinations also revealed normal results, despite the paresthesia she was experiencing in her upper extremities that extended to her posterior neck. Motor ataxia was not observed, and her gait was normal.

Results of routine blood and urine examinations, including coagulation and endocrinological tests, were within normal limits, and initial examination of cerebrospinal fluid (CSF) also proved unremarkable (CSF examination: CSF protein, 27.0 mg/m; cell count, 1/mm³). She was negative for autoantibodies associated with collagen diseases, viral antibodies. Culture of stool was negative. Cranial magnetic resonance imaging revealed no obvious abnormalities. A nerve conduction study of the arms also revealed no abnormalities; the short latency somatosensory evoked potentials (SEPs) were within normal limits. Tensilon test was negative, and she also tested negative for anti-acetylcholine receptor antibodies.

On day 3 of hospitalization, a slight backflow of fluid into the nasal cavity was observed upon deglutition. Vibration perception also became impaired in the bilateral arms. Her serum was positive for immunoglobulin G (IgG) antibodies against several gangliosides, such as GT1a, GQ1b, GT1b, and GD1a. Reactivities of these anti-ganglioside antibodies on enzyme-linked immunosorbent assay, expressed as optical density values (normal <0.1), were 0.86 for GT1a, 0.78 for GQ1b, 0.6 for GT1b and 0.39 for GD1a. Antibodies to ganglioside complex were not measured. Despite normal tendon reflexes, she was diagnosed with a GBS subtype, and was treated with intravenous immunoglobulin therapy (IVIg), according to standard protocol. The patient's dysphagia improved on the day following treatment onset, and a few days later, the rhinolalia aperta, and dysarthria had disappeared altogether. Follow-up CSF examination on day 12 of hospitalization revealed albuminocytologic dissociation, which is characteristic of GBS (CSF test:

CSF protein, 45.0 mg/dl; cell count, 0/mm³). Although mild numbness in her fingertips persisted, the patient was able to perform daily activities independently on day 21 of hospitalization, after which she was discharged from the hospital (Fig. 1).

Discussion

The cardinal symptoms observed in this patient were rhinolalia aperta, incomplete palatoplegia, and localized numbness extending from the posterior neck to the upper extremities. A common clinical feature of AOP and PCB variant is oropharyngeal paralysis, which generates sensory impairment in AOP and motor weakness in PCB^(3,4). O'Leary CP et al. described the first report regarding AOP, in which sensory disturbance in the distal limbs and perioral paresthesia were observed in all patients⁽³⁾. Since the patient exhibited a combination of oropharyngeal palsy and sensory impairment, it was more likely that the GBS subtype in the patient was AOP rather than PCB. However the observed sensory disturbance was limited to her posterior neck and upper extremities, which resembled the distribution of motor symptoms in PCB, and thus might suggest that the clinical phenotype was considered as transitional type of AOP and PCB variant. In addition, very mild form of PCB variant should be also taken into account, because there was a possibility that muscle weakness might appear in the regions presenting sensory symptoms with disease progression.

Several anti-ganglioside antibodies have been shown to play a pathogenic role in the development of GBS^(1,2). On a molecular biological level, gangliosides are known to exist in clusters, forming microdomains that contain cholesterol at the surface of the plasma membrane⁽⁵⁾, where they act as specific determinants in cellular recognition and cell-to-cell communication. Accumulating evidence indicates that gangliosides are localized in the peripheral nervous system myelin and axolemma, and that degeneration of myelin and axons accounts for the loss of sensory and motor function. Interestingly, both AOP and PCB are associated with anti-GT1a and anti-GQ1b antibodies^(2,3), however clinical phenotype is partially different between the GBS subtypes. Thus, clinical manifestations of each GBS subtype may not be estimated by the positive pattern of anti-ganglioside antibodies.

Although accurate localization of the GT1a antigen remains unknown, the glycolipids extracted from the vagus and glossopharyngeal nerves of humans contain the GT1a antigen, suggesting a contribution of anti-GT1a antibodies in oropharyngeal paralysis^(6,7). The GQ1b carbohydrate antigen is strongly present in the paranodal myelin of the cranial nerves that control the extraocular muscles⁽⁸⁾, and anti-GQ1b antibodies are frequently observed in patients with GBS subtypes of Miller Fisher

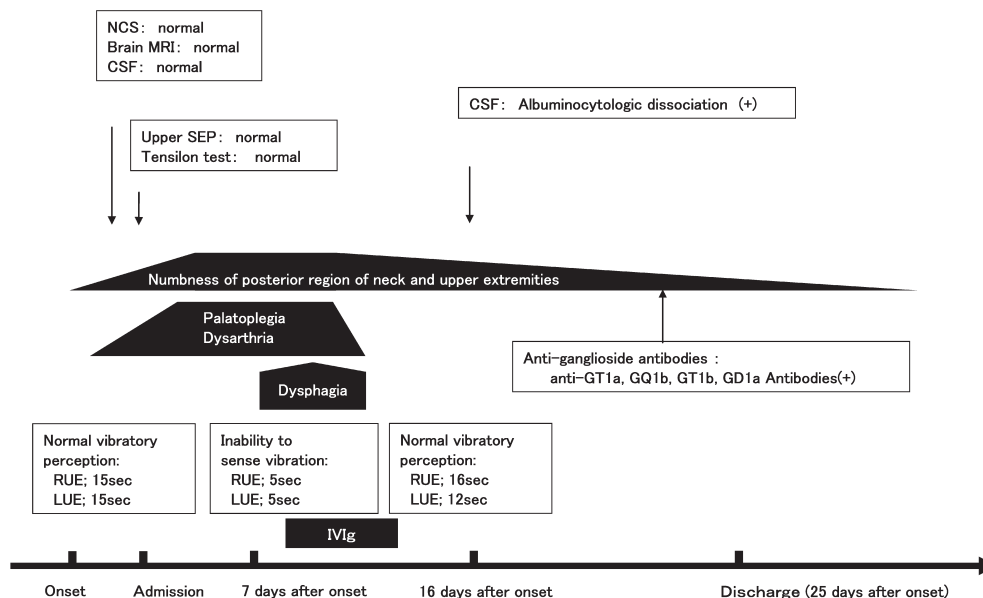


Fig. 1 Clinical course of the patient.

NCS: nerve conduction study, SEP: short latency somatosensory evoked potential, CSF: cerebrospinal fluid examination, RUE: right upper extremity, LUE: left upper extremity. The patient had increased difficulty in swallowing after admission. She was treated with intravenous immunoglobulin therapy, after which the symptoms rapidly improved. Although slight finger numbness persisted, she was discharged from the hospital and was able to enjoy independent daily living.

syndrome (MFS) and Bickerstaff's brainstem encephalitis (BBE). Sensory ataxia is common in MFS, and it is associated with high levels of anti-GQ1b and anti-GT1a antibodies⁹⁾. It has been suggested that the fine specificity of the anti-GD1a antibody in each patient determines the clinical feature¹⁰⁾.

Overlap of PCB variant and MFS, overlap of PCB variant and BBE, and conversion of AOP variant into PCB variant have all been reported in the literatures^{11)~14)}. In addition, a study on PCB variant also indicated that many cases overlap with the pure GBS phenotype¹⁵⁾. These observations indicate the possibility that GBS subtypes may be a continuum of pathological conditions and not one static condition. Common serological features of AOP and PCB variant include the presence of the antibodies to GT1a and GQ1b antigens²⁾³⁾; therefore, the anti-GT1a, anti-GQ1b, and anti-GD1a antibodies detected in this patient might indicate a serological relationship between PCB variant and AOP. Further studies involving serological characteristics of anti-ganglioside antibodies and clinical features for GBS are needed to clarify this possibility.

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※ The authors declare there is no conflict of interest relevant this article.

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