

## A case of glossopharyngeal zoster diagnosed by detecting viral specific antigen in the pharyngeal mucous membrane

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### Abstract

Glossopharyngeal nerve paralysis caused by varicella zoster virus reactivation is rare. We present a case of glossopharyngeal zoster confirmed by direct immunofluorescence staining for virus antigens. A 35-year-old man presented with right-sided, severe swallowing pain and dysgeusia. Physical examination showed a loss of ipsilateral gag reflex. White spots on the posterior wall of the right pyriform sinus were seen by laryngofibroscopy, and a loss of taste on the right posterior part of the tongue was confirmed by gustometry using the filter paper disc method. The varicella zoster virus antigen was revealed by direct immunofluorescence staining by fluorescein isothiocyanate labelled mouse monoclonal antibody specific for varicella zoster virus glycoprotein, using samples obtained from the mucosal lesion by abrasion with a cotton swab. The patient was treated by intravenous administration of acyclovir. His throat pain and dysgeusia completely resolved. We discuss the advantages of direct immunofluorescence staining for varicella zoster virus antigen for the diagnosis of glossopharyngeal zoster.

**Key words:** Glossopharyngeal Nerve; Fluorescent Antibody Technique; Herpes Zoster

### Introduction

It is known that the glossopharyngeal nerve is often involved in multiple cranial nerve paralysis caused by varicella zoster virus reactivation. However, varicella zoster virus induced, isolated glossopharyngeal palsy or neuralgia unassociated with other lower cranial nerve paralyses is rare.<sup>1–3</sup> On the other hand, most cases of glossopharyngeal nerve disorder have been thought to be 'idiopathic'.<sup>4</sup>

We present the first case report of glossopharyngeal nerve disorder caused by varicella zoster virus reactivation, which was diagnosed by direct immunofluorescence staining for viral antigens on samples from the pharyngeal mucosal lesions.

### Case report

A previously healthy, 35-year-old man presented with sore throat, otalgia and dysgeusia for the last three days. He had visited some clinics and been treated with antibiotics and nonsteroidal anti-inflammatory drugs, under a diagnosis of bacterial pharyngitis.

The patients felt dysgeusia on the right posterior part of the tongue, and all his other symptoms, including his sore throat and otalgia, were restricted to the right side. He complained that he was almost unable to eat anything because of severe swallowing pain that radiated to the ear.

Physical examination showed a loss of gag reflex on the patient's right side, without paralysis of the soft palate or tongue. There were no eruptions or vesicles on the skin of the head and neck, including the external ear.

Laryngofibroscopy was performed and revealed small, white spots dotted about the posterior wall of the right pyriform sinus (Figure 1a), with normal mobility of the

vocal folds and the pharyngeal constrictors. Laboratory studies were almost normal, including white blood cell count and c-reactive protein concentration. A loss of taste on the right posterior part of the tongue was confirmed by gustometry using the filter paper disc method (Sanwa Kagaku, Nagoya, Japan) (Figure 2).

Direct immunofluorescence staining using fluorescein isothiocyanate labelled mouse monoclonal antibody specific for herpes simplex viruses and varicella zoster virus glycoprotein (Denka Seiken, Tokyo, Japan) was performed on samples obtained from the mucosal lesion by abrasion with a cotton swab under indirect laryngoscopy. This test revealed varicella zoster virus antigen (Figure 3).

The patient was admitted and treated by intravenous administration of acyclovir 5 mg/kg every eight hours for seven days. The white spots on the pyriform sinus disappeared. However, after admission, the patient began complaining of right-sided cheek pain and headache, and, three days after admission, a new mucosal lesion was found on the posterior wall of the oropharynx (Figure 1b). For right sided cheek pain and headache that he started complaining after admission, 400 mg of carbamazepine was administered orally. The white spot on the oropharynx also soon disappeared. The patient's sore throat, cheek pain and headache gradually reduced, and he was discharged eight days after admission. Although his dysgeusia had completely resolved three weeks after discharge, the patient's lost gag reflex had not been restored even after eight months' follow up.

On enzyme immunoassay, the patient's serum varicella zoster virus immunoglobulin G titres were 1:78 on the day of admission and 1:>128 (upper limit) one week after admission.

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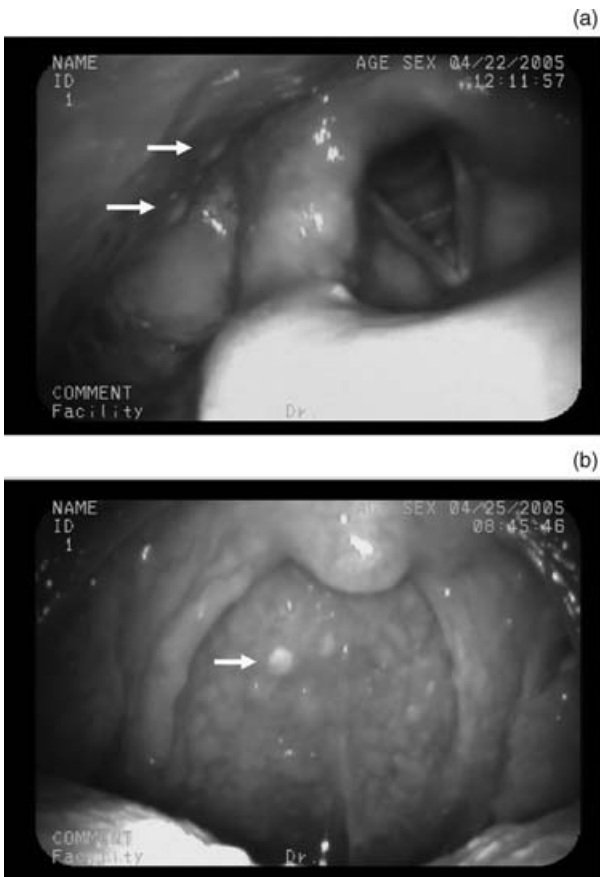


FIG. 1

(a) Initial laryngofibrosopic findings. Small white spots appear on the posterior wall of the right pyriform sinus (arrows). (b) A white spot subsequently found on the posterior wall of the oropharynx (arrow), after the mucosal hypopharyngeal lesions had disappeared.

**Discussion**

This case, with absence of taste in the unilateral, posterior part of the tongue but normal pharyngolaryngeal mobility, was thought to be due to isolated glossopharyngeal nerve paralysis. The result of gustometry, a reliable indicator of glossopharyngeal nerve function,<sup>5</sup> supported this diagnosis. The afferent pathway of the gag reflex is predominantly supplied by the glossopharyngeal nerve; absence of a unilateral gag reflex thus suggests a disorder of the ipsilateral glossopharyngeal nerve.

For definite diagnosis of viral infection, serological, immunological or histopathological confirmation is essential. The use of fluorescein isothiocyanate labelled monoclonal antibody to detect varicella zoster virus antigen came into practical use around 1990. It enables rapid, highly reliable detection of varicella zoster virus; the turn-around time is only one to two hours, and both the specificity and sensitivity are >90 per cent.<sup>6-8</sup> There have been very few reports of the use of this method for the diagnosis of pharyngolaryngeal varicella zoster virus infection.<sup>9</sup> The current report is the first of glossopharyngeal zoster diagnosed with a monoclonal antibody based, direct immunofluorescence technique.

Early initiation of antiviral treatment is the key to successful control of herpes zoster, because antiviral therapy with acyclovir acts by incorporation and interruption of

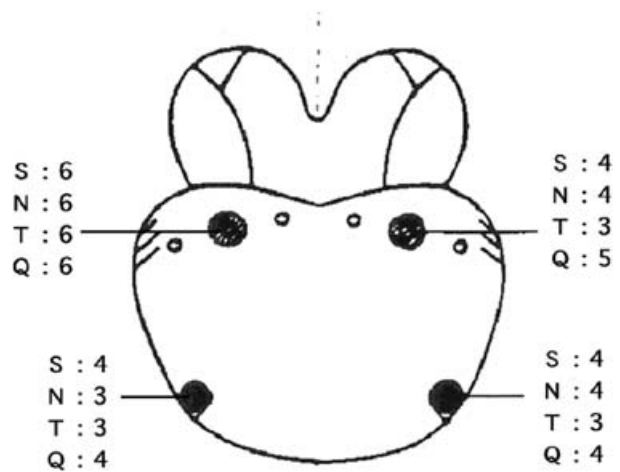


FIG. 2

Results of the filter paper disc method, showing the taste recognition thresholds of the bilateral glossopharyngeal nerve and chorda tympani areas. The thresholds for the four primary tastes were examined using five concentrations (from 1 as thinnest to 5 as thickest; 6 indicates no response). S = sweet (sucrose); N = salty (NaCl); T = sour (tartaric acid), Q = bitter (quinine (HCl))

viral deoxyribonucleic acid synthesis and so is effective only when the virus is multiplying.<sup>10,11</sup> Thus, early, definitive diagnosis which can justify the administration of antiviral agents is critically important.<sup>11-14</sup>

The pharyngolaryngeal mucosal lesions seen in varicella zoster virus reactivation are often missed during physical examination because they are usually transient and non-specific.<sup>15</sup> The small mucosal lesions in the presented case appeared and then vanished, from the pyriform sinus and the oropharynx. In varicella zoster virus pharyngolaryngeal lesions, diagnostic yield is thought to be dependent on the timing and method of examination of the local findings. It is suggested that there might be not a few number of undiagnosed glossopharyngeal disorder caused by varicella zoster virus among the 'idiopathic' cases.

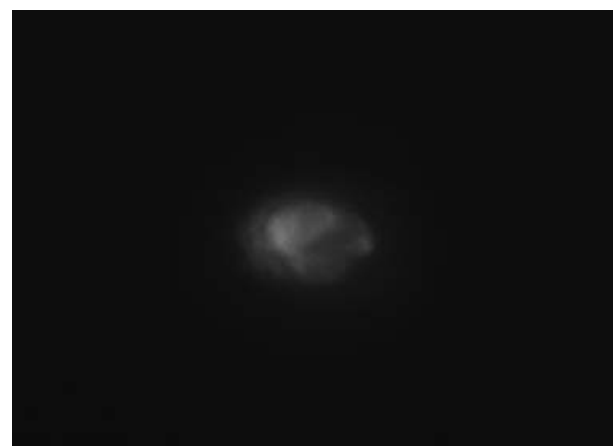


FIG. 3

The result of direct immunofluorescence staining for varicella zoster virus antigens by fluorescein isothiocyanate labelled monoclonal antibody; infected cells show a fluorescent glow.

- **Glossopharyngeal nerve paralysis caused by varicella zoster virus reactivation is rare. This paper describes a man presenting with severe, right-sided swallowing pain and dysgeusia**
- **The diagnosis of glossopharyngeal zoster was confirmed by direct immunofluorescence staining for viral antigens**
- **The patient was treated by intravenous administration of acyclovir. His throat pain and dysgeusia completely resolved**

Varicella zoster virus reactivation should be included in the differential diagnosis of acute, unilateral throat pain and dysgeusia, and precise endoscopic examination, followed by direct immunofluorescence staining for varicella zoster virus antigen, may provide an effective alternative method of diagnosis.

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