



## Case report

# Herpes simplex laryngitis presenting as airway obstruction in a stroke patient☆☆☆

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## ABSTRACT

We present the second confirmed report of HSV laryngitis in an adult stroke patient, resulting in complicated airway management issues. This rare presentation of laryngeal HSV in a stroke patient can interfere with speech, language, and swallowing functions and confounds the etiology of these issues, which can impact subsequent management.

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## Introduction

Herpes simplex virus (HSV) infections of the larynx are extremely rare, but can create potential complications for airway management and clinical evaluation. Typically, HSV presents in the oropharynx or genitals after direct exposure to secretions. Herpetic involvement of the larynx was first described by Meyer over 130 years ago, but reports since then have been rare. There have only been eleven confirmed cases of laryngeal herpes reported in the literature, with most of these patients presenting with some combination of dysphagia, stridor, hoarseness, dysphonia, or respiratory difficulties [1,2]. Diagnosis requires discerning clinical consideration and confirmatory testing despite varying and nonspecific clinical presentations [3]. We present a case of HSV laryngitis presenting in the setting of airway issues in a patient with intracranial hemorrhage.

## Case report

A 55-year-old woman was admitted to the neurocritical care unit with a large left thalamic intracranial hemorrhage with intraventricular extension after found down by her husband. Her past medical history was significant for diabetes mellitus, hypertension, ovarian cancer, hysterectomy, and oophorectomy. On initial presentation she was afebrile, tachycardic, hypertensive (237/98), and neurological exam was positive for left gaze preferences, inability to follow commands, and lack of spontaneous movement of her right lower extremity. She was intubated secondary to obtundation and inability to protect her airways. Her neurological status began to stabilize within four days, but her ICU course was complicated by failed extubation trials.

After initially being intubated for a period of 10 days, she failed extubation and was reintubated twice due to stridor and increased respiratory effort. The otolaryngology head and neck service performed laryngoscopy which revealed pyriform sinuses with copious secretions, erythematous and edematous arytenoids, mildly edematous vocal cords with a shallow ulcer, and bilateral vocal cord paresis with 2 mm glottic gap. She was given dexamethasone 24 mg for 24 h and a 3-day course of methylprednisone. Three days later, the patient was taken to the OR for placement of a tracheostomy tube. Fibrinoid material was seen along the posterior glottis and palpation of vocal processes showed them to be immobile. Biopsies taken during the procedure

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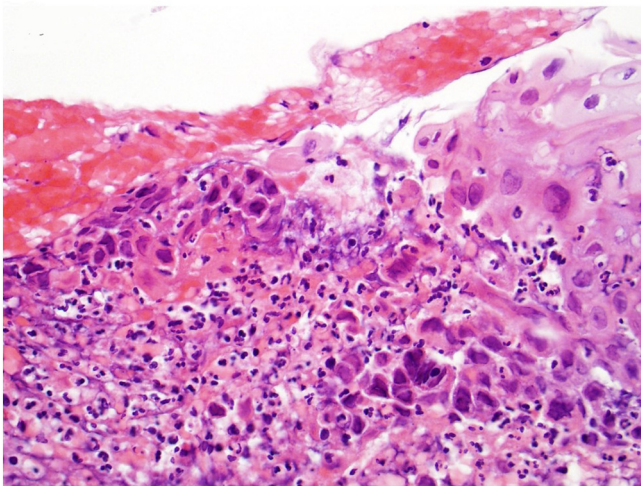
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revealed ulcerative herpes laryngitis with pathology showing large multinucleated cells with atypia under the ulcerated epithelium (Fig. 1), and strong positive HSV immunostaining (Fig. 2). Patient was started on a two-week treatment course of acyclovir 5 mg/kg IV every 8 h, similar to successful regimens in reported literature [1]. Three days later, chest CT revealed bibasilar opacities consistent with aspiration, and the patient was noted to have erythema of the anterior neck and brownish drainage emanating from underneath her tracheostomy tube. Both conditions resolved after treatment with ampicillin/sulbactam and piperacillin/tazobactam and our patient was discharged for acute rehabilitation two weeks later.

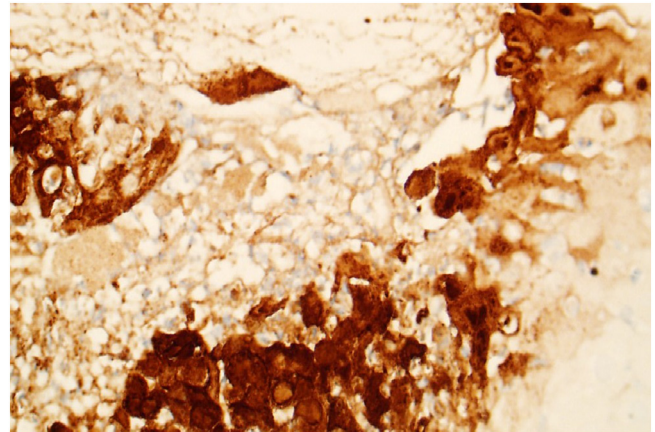
## Discussion

We report the sixth confirmed presentation of HSV laryngitis in an immunocompetent adult, and the second confirmed case in an adult with comorbid stroke. Similar to methods used in a review by Harless et al, a literature search for prior case reports was performed using the search terms herpes laryngitis and herpes supraglottitis on PubMed. Inclusion criteria consisted of adult cases of HSV laryngitis, and diagnoses were considered confirmed only if evaluated by a combination of histology and immunostaining, culture, or serology [1]. Exclusion criteria included cases in the pediatric population, diagnoses of varicella zoster virus (VZV), cases without a confirmed herpes simplex virus diagnosis, and presentations not primarily impacting the larynx. Using these search parameters, no additional case reports of HSV laryngitis meeting inclusion criteria were found after the 2017 Harless et al. case report and literature review [1].

The dearth of observed HSV in the larynx could be due to many factors. First, unlike VZV, HSV transiently impacts the larynx and more often spares the cranial nerves leading to lack of easily observable symptomology [3]. Second, in the case of primary herpes infections, exposure to infectious oral secretions has an anatomically higher chance of impacting the gingiva, pharynx, or tonsils compared to the larynx, where aspiration is usually prevented in healthy individuals by the uvula and soft palate. Interestingly, there have been more reported cases of HSV laryngitis in the pediatric population, possibly owing to vulnerability of airway structures in young children. Given the lack of usual laryngeal risk factors such as immunocompromised status, history of burn wounds, or corticosteroid therapy among others, it is more



**Fig. 1.** Histology showing squamous mucosa with acantholysis, margination of nuclear chromatin, multinucleation, and viral nuclear inclusions.



**Fig. 2.** Positive immunocytochemical stain (brown) for herpes simplex virus.

likely that our patient experienced a reactivation of latent HSV virus, as is also speculated by Vrabec et al. in the only other reported herpes laryngitis in a stroke patient [3]. It is not currently known what factors would cause a reactivation in the larynx, given lack of primary infection there, but presumably, there were patient specific factors that changed the tropism of the virus, as has been speculated in literature [4].

Despite factors weighing against HSV presenting in the larynx, early diagnosis and prompt management of these cases is important. As previously noted, HSV laryngitis has a variable clinical presentation with 70% of patients presenting with dysphonia, 50% with dysphagia, 30% with dyspnea, and 20% with stridor [1]. Our patient was observed to have dysphagia and stridor, but evaluation of dysphonia was difficult due to the tracheostomy. This potentially complicates management of stroke as the ability to speak is often an important indicator of recovery during bedside neurological exams. Without treating underlying laryngeal conditions, it becomes difficult to ascertain whether vocal issues are due to neurological dysfunction or other laryngeal or airway issues. Laryngeal findings most commonly include ulcerations and white exudates, but can more rarely include mass lesions, hypomobility of the vocal cords, which may necessitate surgical reconstruction of the larynx [1]. Our case showed white exudates and ulceration of the mucosa, but also vocal cord hypomobility. Given the wide range of findings, herpetic lesions in the larynx warrant work-up as they can mimic neoplasm, abscesses, syphilis, or tuberculosis [5]. Additionally, treatment of herpes virus is key due to its rare but possible contribution to carcinogenesis [6]. Supporting prior reports, our experience corroborates the rapid response of HSV laryngitis to treatment with acyclovir. Given the relative ease of anti-viral treatment, it is preferable to aggressively treat HSV laryngitis to prevent rare, unwanted future complications.

## Conclusion

This case is the twelfth confirmed case of HSV laryngitis in adults, and the second such case in a patient with CVA. HSV should be considered in patients with airway issues, ulcerations, or laryngeal findings on endoscopy. Adding to prior reports, we emphasize the need for early biopsy and treatment initiation to properly manage these cases. Moreover, our experience highlights the importance of maintaining a wide differential and high index of suspicion when treating stroke patients with airway issues. Treatment of underlying laryngeal and airway conditions is especially important in inpatient settings where evaluating speech and related neurological functions plays an integral role in treatment and management decisions.

## Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

## Credit statement

Tejus Pradeep engaged in conceptualization, data curation, formal analysis, investigation, writing. Rahul Bhoite engaged in conceptualization, investigation, editing. Lisa Rooper contributed in visualization and investigation. Jiaying Zhang contributed with editing and supervision.

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