


Bilateral vocal fold palsy following COVID-19 infection.

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Significant statement

COVID-19 is responsible for a wide variety of complications. Although neurological impairment is very common in cases of hyposmia or anosmia, other motor and sensory deficiencies have been recorded only rarely. We present a case of bilateral vocal fold palsy in a post-COVID patient. Clinicians should be alert in patients with dyspnea or hoarseness to exclude this rare but debilitating entity.

A 63-year-old male was referred to our Ear, Nose, and Throat Emergency Department with a 2-day history of mild dyspnea accompanied by hoarseness.

The patient's medical history included a recent, prolonged hospitalization due to complications of Severe Acute Respiratory Syndrome Corona Virus 2 (SARS-Cov-2) infection. He was hospitalized because of pneumonia and increased oxygen needs. After 20 days of hospitalization, the patient deteriorated and was intubated. Twelve days after the intubation, pneumonia resolved, and extubation was successful. He remained in the hospital for 15 more days and eventually was discharged with no symptoms. At the time of discharge, he had a normal voice with no dyspnea. However, 15 days later, he presented again to our hospital with the above-mentioned acute symptoms and persistent anosmia that at the time of COVID initial diagnosis. His past medical history was unremarkable for other comorbidities. The patient had never had surgery or irradiated, and he was on medication only for hypertension. He was unvaccinated for SARS-Cov-2 because at the time of infection, vaccines had not been approved.

Flexible endoscopy revealed bilateral paralyzed vocal folds in the paramedian position (Figure 1). The vocal folds were immobile, and no other pathology was seen in the larynx or hypopharynx. Neck examination, laboratory, and immunology blood tests were also normal, with no indication of inflammation or autoimmune disease. Laryngeal electromyography (LEMG) was silent with no reaction and without fibrillation

potentials consistent with neuropathy. Brainstem Magnetic Resonance Imaging (MRI) and Computed Tomography (CT) scan of the neck and thorax did not reveal central nervous system (CNS) pathology or tumor that could affect recurrent laryngeal nerve integrity. Olfactory assessment with the Sniffing Sticks test (Burghardt[®], Wedel, Germany) confirmed the reported anosmia.

Intravenous corticosteroids did not improve the mobility of the vocal folds, and three days after this hospitalization admission, the patient continued to have increased work of breathing and mild inspiratory stridor. A tracheotomy was performed to secure the airway with the hope of future recovery. The patient was discharged with the recommendation of monthly follow-up. Follow-up examinations included endoscopy and LEMG. Seven months later, vocal fold palsy persisted, and a cordotomy has been planned in order to permit decannulation.

Bilateral vocal fold palsy secondary to viral infections is well-documented. Epstein-Barr, Cytomegalovirus, herpes, and influenza viruses are responsible for the majority of cases.¹ In addition, of many "idiopathic cases" are considered to be due to undiagnosed viral infections.

In a systematic review of neurological manifestations of COVID-19 infection, olfactory impairment proved to be as high as 59.45%.² Anosmia and hyposmia are considered specific neurological symptoms of COVID-19, caused by the

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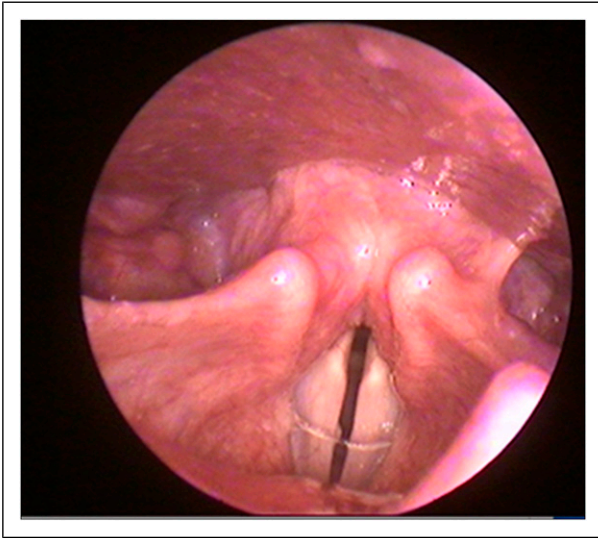


Figure 1. Endoscopic view of the larynx. Bilateral vocal fold palsy in paramedian position.

neurotoxic effect of the virus.³ A current hypothesis suggests that SARS-Cov-2 binds to angiotensin-converting enzyme 2 (ACE2) to enter the nervous system and eventually affects the cranial nerves.⁴

Cranial nerve palsies in post-COVID patients have only been reported recently. Impairment of the third, the fourth, and the sixth cranial nerve has been documented within a few days of infection.⁵ Facial nerve palsy has been recorded in a patient one week after infection, and this entity has been described as COVID-associated Bell's palsy.⁶ Vocal fold paresis has also been reported.⁷

Bilateral vocal fold immobility is not an exclusively neurological phenomenon. Cricoarytenoid joint fixation is not a rare cause. Formerly intubated patients, especially patients with prolonged intubation in Intensive Care Units (ICUs), should be investigated with LEMG to rule out joint fixation due to scarring.

Establishing a relationship between bilateral vocal fold palsy and COVID-19 infection is no easy task, since it is not possible to exclude other factors. It is imperative to follow a diagnostic algorithm to investigate the situation and to secure

the airway without delay when breathing becomes seriously compromised. Clinicians should always consider vocal fold palsy in the differential diagnosis of COVID-19 patients with inspiratory stridor.

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