Dysphonia as the main presenting symptom of COVID-19: a case report

Ahmad M. Eltelety, Ahmed A. Nassar

Department of Otolaryngology, Faculty of Medicine, Cairo University, Cairo, Egypt

Correspondence to Ahmed A. Nassar, MBBCh, MSc, MD, 4 Mohamed Yousef Othman Street, Al Zohour District, Omraneya, Giza 12552, Egypt Tel: +20 100 196 0709; e-mail: ahmedaminnassar1@kasralainy.edu.eg

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The spectrum of illness associated with COVID-19 is wide, ranging from asymptomatic infection to life-threatening respiratory failure. Herein, the authors are presenting a case in which the main symptoms expressed by a patient infected with SARS-CoV-2 were simultaneous gradual change of voice with loss of olfaction but without nasal obstruction.

Keywords:
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Introduction

The 2019 novel coronavirus disease (also known as 2019-nCoV or COVID-19) is caused by the distinguished severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), which infects the human respiratory epithelial cells [1].

The spectrum of illness associated with COVID-19 is wide, ranging from asymptomatic infection to life-threatening respiratory failure. Symptoms are mild in ~80% of cases and often include fever, fatigue, and dry cough [2].

Smell and taste disorders have also been reported in patients with COVID-19. The rates of self-reported smell or taste abnormalities ranged between 34 and 87% [3].

In the management of this pandemic, the identification of patients with mild symptoms is important to break the chain of viral transmission. To our knowledge – based on PubMed search – this is the first report of a patient with COVID-19 presenting essentially with hoarseness of voice. These nonspecific symptoms can represent the main manifestations of this disease.

Case presentation

A 27-year-old male patient presented on April 29, 2020, with hoarseness of voice that started a week ago. On further questioning, he admitted to a slowly diminishing ability to smell that progressed to complete anosmia in the absence of congestion or any other nasal symptoms that lasted for the same duration of change of voice. Over that week, the food he normally enjoys tasted 'bland.' The patient denied any history of smell disorders before this presentation. Further review of symptoms was negative. Medical, surgical, and social history were noncontributory.

Transcervical laryngeal ultrasound was performed, images of which reported right true vocal fold immobility.

His initial complete blood count showed a normal leukocyte count with lymphopenia (200/μl). Other laboratory values were insignificant.

Computed tomography with intravenous contrast was obtained with fine cuts from the skull base to the mid-chest to exclude any hidden neoplastic pathology. Examination of the images failed to show any anatomical abnormality or pathological conditions that might be contributing to the right true vocal fold immobility.

A nasopharyngeal swab was obtained to test for SARS-CoV-2 via nucleic acid amplification test which came back positive confirming the diagnosis of COVID-19.

Supportive treatment and medically supervised isolation in a care facility were commenced. The 2-week follow-up nucleic acid amplification test for SARS-CoV-2 was negative and the patient was deemed cured.

Before discharge, the patient expressed marked improvement of the sense of taste and smell; however, he denied similar improvement of the

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quality of his voice. The patient was advised to self-quarantine for another 14 days on returning home. On day 8 of the self-quarantine, the patient admitted to significant improvement of his voice quality. His voice continued to gradually improve over the course of the following days. A follow-up transcervical laryngeal ultrasound was performed on 4 June and reported return of normal right true vocal fold mobility.

The patient's informed written consent had been taken concerning participation for this particular case report.

Discussion

Coronaviruses (CoV) are large, enveloped, positive-sense RNA viruses divided into three genera: alphacoronavirus, betacoronavirus, and gammacoronavirus [4]. These viruses infect humans and numerous animal species, generally causing upper or lower respiratory tract, gastrointestinal, neurological, or hepatic diseases. Currently, there are 7 CoV that can infect humans, including human coronavirus (HCoV)–229E, HCoV-NL63, HCoV-HKU1, HCoV-OC43, MERS-CoV, SARS-CoV-1, and SARS-CoV-2 [5].

Although HCoV is typically associated with respiratory tract disease, 3 HCoV have been shown to infect neurons: HCoV-229E, HCoV-OC43, and SARS-CoV-1 [6].

Viral neuroinvasion could plausibly be achieved by several routes, including transsynaptic transfer across infected neurons, entry via the olfactory nerve, infection of vascular endothelium, or leukocyte migration across the blood–brain barrier [6].

The SARS-CoV-2 virus shares close sequence homology to SARS-CoV-1. Both viruses use spike proteins on the viral surface to bind to the angiotensin-converting enzyme 2 receptor on mammalian host cells, then use transmembrane protease serine 2 to prime the spike. In humans, angiotensin-converting enzyme 2 is expressed in airway epithelium, kidney cells, small intestine, lung parenchyma, and vascular endothelium throughout the body and widely throughout the central nervous system [7].

The occurrence of olfactory dysfunction after upper respiratory tract viral infections is well described in literature accounting for 22–36% of patients. A wide panel of respiratory viral pathogens – including rhinoviruses, parainfluenza virus, Epstein-Barr virus, and some coronaviruses – is the culprit by inducing nasal mucosal inflammation and olfactory neuritis [8].

In this report, we described a patient with COVID-19 who presented with anosmia and hoarseness of voice.

Mao *et al.* [3] reported peripheral nervous system symptoms attributed to COVID-19; the most common complaints were hypogeusia (5.6%) and hyposmia (5.1%).

Over the past 2 decades, other studies have suggested that viral pathogens may be responsible for vagal neuropathies leading to vocal fold paralysis. Bhatt *et al.* [8] investigated 107 patients presenting with idiopathic unilateral vocal fold paralysis from 2002 to 2012, revealing that 38 of 107 (35.5%) patients reported symptoms of upper respiratory tract infection at the onset.

With the identification of the current COVID-19 pandemic, it was confirmed that hyposmia/anosmia could be the only presenting symptom for the disease [9]. The expected outcome is complete resolution over a period of 2–3 weeks. The management is usually supportive while the use of steroids remained controversial given the risk of increase viral replication [10]. In contrast to olfactory dysfunction, voice dysfunction is not a well-recognized feature of COVID-19. A review of the recent and evolving literature failed to reveal any similar conditions of combined cranial neuropathies caused by the 2019 novel coronavirus.This report comes in accordance with other reports which indicate that patients presenting with olfactory dysfunction usually have milder forms of disease and better outcome [10]. The paucity of reports of recurrent laryngeal neuropathy caused by COVID-19 makes it impractical to predict the final outcome.

Large, multi-institutional studies should be conducted to allow for appropriate evaluation of the actual incidence of recurrent laryngeal neuropathy and appreciation of the disease characteristics, natural history, and appropriate management. Based on this report, clinicians should maintain high index of suspicion, such that subtle changes in voice, especially if associated with other manifestations of cranial neuropathy, should prompt testing for COVID-19 and evaluation of voice by a non-aerosol-generating procedure like the transcervical ultrasound. Treatment is usually supportive, while steroid use continues to be an issue of controversy. Otolaryngologists are encouraged to adequately

document and report the natural history, management, and the outcome of both, the coronavirus infection and the voice quality.

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All data generated or analyzed during this study had already been included in this manuscript. Patient's case file was retrieved from the medical record section of the institution. The clinical data had been collected from the prospectively maintained computerized database and the case file. The follow-up status was updated from the above-mentioned manner.

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Conflicts of interest

There are no conflicts of interest.

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