Case Report

Bell's Palsy Caused by SARS-CoV-2

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Keywords

Facial paralysis · COVID-19 · SARS-CoV-2 · Neurologic manifestations

Abstract

The COVID-19 pandemic, caused by the SARS-CoV-2 virus, has led to major healthcare and everyday life challenges. Every day, new disease associations and systemic manifestations are being explored and reported. Peripheral facial nerve paralysis or Bell's palsy has been reported to be caused mainly by viral infections. This case represents a COVID-19-positive patient with Bell's palsy making SARS-CoV-2 as the most likely culprit of his condition.

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Published by S. Karger AG, Basel

Introduction

Peripheral facial nerve paralysis is a lower motor neuron facial nerve palsy, usually of unknown origin. However, viral infections are still the most common cause like herpes zoster or herpes simplex virus [1]. COVID-19 is a newly emerging disease caused by SARS-CoV-2. The disease became a pandemic in 2019 creating a lot of challenges in its management [2]. It mainly causes respiratory symptoms and respiratory failure; however, neurological symptoms have also been reported [3, 4].

There are not many theories of central nervous system (CNS) pathogenesis; however, one idea suggests that SARS-CoV-2 binds to angiotensin-converting enzyme 2 (ACE2) receptors. These receptors are prevalent in CNS, especially on neurons and glial cells, and this might be responsible for the neurological manifestations of the disease [5]. Neurological symptoms reported in the literature include common symptoms such as headaches, altered sensorium, hyposmia, and hypogeusia and less common presentations, including encephalitis, ischemic stroke, acute myelitis, cerebral hemorrhage, and Guillain-Barré syndrome [6]. However, scattered cases have been reported of patients presenting with Bell's palsy simultaneously with

COVID-19 in the medical literature. We present a case of a patient presenting with Bell's palsy, and when investigated, he was found to be COVID-19 positive.

Case Presentation

A 58-year-old gentleman presented to the emergency department after he had a positive test for the SARS-CoV-2 virus 2 days back. He complained of right-sided facial droop, left-sided mouth deviation, and incomplete closure of the right eye with loss of right-sided forehead wrinkles. All these symptoms started 1 day ago. The patient denied cough, shortness of breath, or any other respiratory symptoms. He had no past medical conditions. The vital signs of the patient were within normal limits apart from his elevated temperature to 38.4°C. Upon physical examination, his chest was clear, with no abnormal findings apart from facial findings. There were no other neurological deficits. No rash or vesicles were appreciated in the head, face, or neck. Thus, antipyretics with other supportive measures were commenced. A set of blood tests in addition to chest X-ray were arranged. The patient blood tests results were unremarkable, and the chest X-ray was normal (Fig. 1).

A diagnosis of facial nerve palsy was considered, and the ED doctor ordered a brain CT scan with intravenous contrast. CT brain result was typical, and a space-occupying lesion or cerebral venous thrombosis was excluded (Fig. 2). The diagnosis of the peripheral facial nerve was confirmed. The patient was discharged to home quarantine isolation with prednisolone 20 mg for 7 days, along with supportive medications and a neurology outpatient clinic appointment. On our follow-up with the patient 2 weeks later, his facial weakness was improving gradually, and he did not have symptoms of deterioration or any life-threatening condition.

Discussion

We described a case of peripheral facial nerve paralysis in which SARS-CoV-2 was concomitantly found. Although the virus mainly affects the respiratory system, it can affect other systems or organs, like the cardiovascular system or the eye as well [7, 8]. Neurological symptoms were reported in about 36.5% of patients with COVID-19 in one retrospective review [9]. Another cohort study found that 8.9% of patients with COVID-19 had peripheral nervous system involvement [10].

Multiple other etiologies of facial paralysis were considered; however, no other cause other than COVID-19 infection could be found. Skin and ear lesions and dermatomal pain could not be found on physical examination. Thus, herpes zoster oticus as a cause was excluded. Another diagnosis put out of the differential diagnosis was HIV despite its worldwide spread. Local laws mandate the screening of HIV as a part of a medical checkup for a residency permit. No neurological deficits were appreciated by examination, and CT brain with contrast was negative, so the presence of brain tumors or cerebrovascular accidents was also excluded. Lyme disease was also unlikely due to the absence of other disease features and the absence of the causative vector in the region. Other causes, such as vasculitis or other autoimmune illnesses, were implausible as there were no other systemic findings.

Although herpes simplex infection can cause Bell's palsy with no visible symptoms, but given the pandemic setting, it was also considered less likely. Hence, the primary etiology to be considered was SARS-CoV-2. In comparison, other causes were dropped and highly unlikely. However, it is still wise to assume that the patient developed the 2 illnesses concomitantly.

Fig. 1. Chest X-ray showed no lung collapse or consolidation with no signs of COVID-19 infection. (The images are reversed one instead of the other) Here the chest x-ray image and not the brain CT. Please put the chest x-ray image here.

Fig. 2. Brain CT with intravenous contrast showed no signs of infarction, hemorrhage, space-occupying lesion, or cerebral venous thrombosis. The images are reversed one instead of the other) Here the brain CT image and not the chest x-ray. Please put the brain CT image here.

Coronaviruses, in general, have a neuroinvasive predisposition. Hence, SARS-CoV-2 could quite likely behave similarly [11], and this could be explained due to its high affinity to ACE2 receptors, which are available throughout the nervous system. ACE2 receptor distribution could suggest that the neurological symptoms caused by SARS-CoV-2 may be due to direct or indirect effects. In this case, facial nerve palsy might be explained by the immune reaction induced by COVID-19 infection.

Conclusion

In summary, although Bell's palsy can be caused by the usual causes known in the literature, peripheral facial palsy might be the only presenting symptom of COVID-19 infection. This could be caused by an immune reaction triggered by the disease or could be due to direct damage by the virus. Hence, more research is needed to prove a causal relationship.

Statement of Ethics

The patient's written consent to the publication including the images has been taken. The study is exempt from ethics committee approval as no procedures were done on the patient, and a written consent was obtained from the patient.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

Funding Sources

This research did not receive any specific grants from funding agencies in the public, commercial, or not-for-profit sectors.

Author Contributions

M.A.-K. contributed to conceptualization, methodology, software, investigation, data curation, writing – original draft, visualization, and project administration. M.M.E. contributed to software, validation, writing – review and editing, visualization, and supervision.

Data Availability Statement

The case report data are available. However, legal approval would be required.

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