

## **Bell's Palsy Associated with COVID-19 Infection: A Case Report**

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### **ABSTRACT**

The coronavirus disease 2019 (COVID-19) has a wide range of symptoms. Also, this novel infectious disease may trigger a vast range of neurological involvements. The current report describes a case of COVID-19 complicated with Bell's palsy. A 64-year-old woman was admitted due to abrupt left hemi-facial weakness. On exam, her left hem-facial expression ability was impaired so that her face seemed asymmetrical during smiling, and numbness around the left nasolabial fold was detected. Furthermore, her ability to wink and drooping the eyebrow were impaired. Her brain computed tomography (CT) scan did not show any abnormalities. Though, a lung CT scan was performed which demonstrated bilateral ground-glass opacity (GGO), along with RT-PCR results indicative of COVID-19. A diagnosis of Bell's palsy in the setting of COVID-19 infection was made. She received the antiviral agents and corticosteroids. On the two week follow-up, her symptoms had improved. During the COVID-19 epidemic, any newly occurred neurological involvement raises the suspicion of COVID-19 infection.

**Keywords:** Bell's palsy; COVID-19; corticosteroids

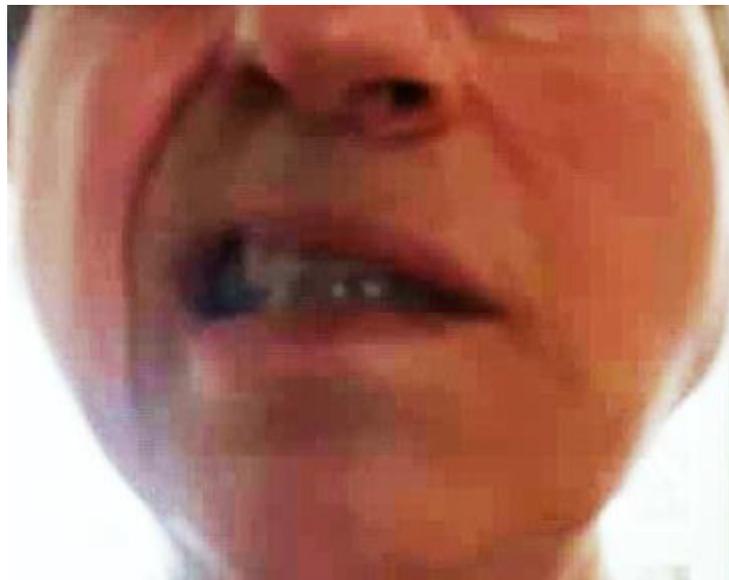
## **INTRODUCTION**

Bell's palsy, also known as acute peripheral facial palsy of unidentified reason, is caused by the acute onset of the lower motor neuron (LMN) problems of the facial nerve.<sup>1</sup> Several etiologies have been proposed to explain facial nerve palsy (FNP). Some of them emphasize that this is due to a viral infection that results in inflammation. Some studies revealed that herpes simplex virus (HSV), as the likely cause of most cases of Bell's palsy.<sup>2</sup> However, other viruses might be responsible for this phenomenon. Furthermore, recent studies have shown that coronavirus disease 2019 (COVID-19) or severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection might also lead to neurological symptoms. A pandemic has occurred in COVID-19 during which several neurological manifestations of the disease have been reported and there are still many unknown aspects of it. The possibility of COVID-19 being involved in this field should be considered. The neurologic manifestations of COVID-19 most commonly include myalgia, headache, altered sensorium, hyposmia or anosmia, and hypogeusia or dysgeusia.<sup>3</sup> But, COVID-19 can also present with other CNS manifestations such as stroke, encephalo-myelitis, or peripheral nervous manifestations such as Guillain-Barré syndrome (GBS) and Bell's palsy. Here, we present a COVID-19 patient who developed Bell's palsy.

## **CASE REPORT**

A 64-year-old woman presented to the neurology department with abrupt onset left hemifacial weakness. She did not mention any preceding malaise, fever, myalgia, arthralgia, respiratory, or gastrointestinal symptoms, but she complained of a new-onset headache. Her past medical history was no significant but she reported close contact with her husband that

was hospitalized for COVID-19 pneumonitis. On admission, her vital signs were stable, with oxygen saturation (SpO<sub>2</sub>) of 97%. On exam, her left hem-facial expression ability was impaired so that her face seemed asymmetrical during smiling, and numbness around the left nasolabial fold was detected (Figure 1). Also, her ability to wink and drooping the eyebrow were impaired, but her speech had not changed. No lymphadenopathy or redness was found. Other neurological exams were normal. Her extremities forces were of full strength with no focal neurological deficit.



**Figure 1:** Face with asymmetrical during smiling, and numbness around the left nasolabial fold.

Her laboratory tests, including human immunodeficiency viruses (HIV) antibody and serologic tests of HSV and varicella-zoster virus (VZV) were negative for active disease. Also, her brain computed tomography (CT) scans and then brain magnetic resonance imaging (MRI) did not show any abnormalities. However, a lung CT scan was performed because of the current COVID-19 pandemic and the patient's history of close contact with her family member that has a confirmed COVID-19 infection. Some patients with COVID-19 have a

clear and typical involvement of the disease in pulmonary CT scan, although that they do not have any signs of pulmonary involvement, so in some cases, CT is used as a diagnostic tool for the disease. Such as our patient that demonstrated bilateral ground glass opacity (GGO), indicative of COVID-19 due to the current epidemic and her recent close contact with a COVID-19 patient. The patient underwent specimen collection for real-time reverse-transcriptase polymerase chain reaction (RT-PCR) for SARS-CoV-2 which was confirmative for COVID-19 infection. Also, the anti-SARS-CoV-2 IgM titer was higher than the upper limit of normal (ULN), which was suggestive of recent COVID-19 infection.

A diagnosis of FNP in the setting of COVID-19 infection was made; therefore, the patient was advised to take precautionary isolation measures, along with being started on the antiviral agents Lopinavir/ritonavir (Kaletra) 400mg BID and dexamethasone 4mg BID. On two week follow-up, her symptoms had improved significantly, with a reduced degree of her facial weakness and complete recovery of her smell, and taste and one month later her facial palsy improved but not resolved and her repeated nasopharyngeal COVID19 RT-PCR becomes negative and then patient did not return for follow-up .

## **DISCUSSION**

Bell's palsy presents with abrupt onset of unilateral weakness of the face. FNP can be partial or complete. Facial paralysis should be found out to be either due to a central pathology in the upper motor nerves above the pons, or the result of a peripheral lesion of the seventh cranial nerve below the pons. <sup>4</sup> The hallmark to distinguish between these two conditions is the involvement of the upper face in the peripheral type and sparing of this anatomic region in the central type. Our patient seemed to be involved with the peripheral type.

Peripheral FNP can be either idiopathic (Bell's palsy) or secondary to underlying reasons. The most common underlying causes of secondary FNP include infections, surgery, trauma, autoimmune disorders, cancer, or medications.<sup>5</sup> Our patient's precipitating factor appeared to be COVID-19 infection; however, due to the absence of any symptoms attributable to this infection, CT scan findings, and serology test result might have been mere incidental findings of asymptomatic COVID-19 infection, with no association with her Bell's palsy.

Infections are among the most prevalent causes of FNP. The most well-known cause has been reactivation of latent HSV from seventh cranial nerve ganglion leading to inflammation. SARS-CoV-2 in the current pandemic has been manifested by a broad range of symptoms such as various neurological complications. Some of these complications include cerebrovascular accidents, Guillain-Barré syndrome (GBS), encephalopathies, and encephalitis.<sup>6</sup> Up to now, COVID-19 as an underlying reason for Bell's palsy has been reported quite rarely. A broad differential diagnosis exists for peripheral FNP. Not considering her lung CT scan and serology test results, the most common underlying condition might have been HSV and herpes zoster (HZ) infections which are usually accompanied by severe pain and sometimes cutaneous eruptions.<sup>7</sup> Our patient did not demonstrate any listed above symptoms. However, cerebrovascular events, either primary or in the context of COVID-19 must be considered in these conditions. Our patient had no risk factors of cerebral ischemia or hemorrhage and her consciousness, extremity motor, and sensory exams were intact. Furthermore, malignancies of the head and neck region should be considered, which may manifest as inflammation and resulting compression of cranial nerves. But neither of them was presented in our patient.

In Bell's palsy, magnetic resonance imaging (MRI) of the brain may demonstrate facial nerve enhancement, although show no abnormality in our patient.<sup>8</sup> MRI and cerebrospinal fluid (CSF) analysis might be beneficial in investigating the presence and causes of FNP;

nevertheless, FNP is mainly diagnosed on a clinical basis similar to our patient who had inconclusive imaging result and did not consent to lumbar puncture, so that only history and physical exam helped us to make a diagnosis. Electrodiagnostic testing is beneficial in differentiating the severity of nerve fibers involvement and conduction impairment. The electromyography (EMG) and nerve conduction velocity (NCV) testing of the facial nerve in our patient revealed abnormality of the left facial nerve.<sup>9</sup>

The treatment with corticosteroids is the most widely accepted medication for Bell's palsy.<sup>10</sup> Steroids exert their maximum benefit when administered as soon as possible, preferably within 3 days after the onset of FNP. However, their benefit in the settings of COVID-19 is somehow controversial. In the recent case, we came to this agreement that a short course of prednisolone treatment is tried, along with being aware of the potential adverse effects of COVID-19 infection. Our patient received 60 mg of oral prednisone per day, started on the second day of admission. We tapered the dose of prednisolone after the 6th day of treatment, up to the total 10 days of therapy duration, with tight blood glucose control.

It is not yet agreed upon adding antiviral agents to corticosteroids for FNP treatment in the setting of HSV infection; however, many authorities believe the additional efficacy of antivirals in FNP treatment.<sup>10</sup> In our patient, our main purpose for starting on Kaletra was preventing further SARS CoV-2 replication.

## **CONCLUSION**

During the current COVID-19 epidemic, any newly occurred neurological symptom or sign should raise the suspicion to COVID-19; therefore being aware of these complications is vital to prevent any delay in the diagnosis and treatment.

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## COMPETING INTERESTS

All authors declare no conflict of interest.

## REFERENCES

1. Yoo MC, Soh Y, Chon J, et al. Evaluation of Factors Associated With Favorable Outcomes in Adults With Bell Palsy. *JAMA Otolaryngology–Head & Neck Surgery* 2020;146(3):256-263.
2. Zhao H, Zhang X, Tang YD, Zhu J, Wang XH, Li ST. Bell's Palsy: Clinical Analysis of 372 Cases and Review of Related Literature. *European neurology* 2017;77:168-72.
3. Balkhair A, Al Jufaili M, Al Wahaibi K, et al. " Virtual Interdisciplinary COVID-19 Team": A Hospital Pandemic Preparedness Approach. *Oman Medical Journal*. 2020 Nov;35(6):e190.
4. Toulgoat F, Sarrazin JL, Benoudiba F, et al. Facial nerve: From anatomy to pathology. *Diagnostic and Interventional Imaging* 2013;94(10):1033-1042.
5. Toulgoat F, Sarrazin JL, Benoudiba F, et al. Facial nerve: From anatomy to pathology. *Diagnostic and Interventional Imaging* 2013;94:1033-42.
6. Owusu JA, Stewart CM, Boahene K. Facial Nerve Paralysis. *The Medical clinics of North America* 2018;102:1135-1143.
7. Shah S, Singaraju S, Einstein A, Sharma A. Herpes zoster: A clinicocytopathological insight. *Journal of oral and maxillofacial pathology : JOMFP* 2016;20(3):547.
8. Gupta S, Mends F, Hagiwara M, Fatterpekar G, Roehm PC. Imaging the Facial Nerve: A Contemporary Review. *Radiology Research and Practice* 2013;2013:248039.
9. Yamout B, Zaytoun G, Nuweihed I. The role of facial nerve conduction studies and electromyography in predicting the outcome of Bell's palsy. *European Journal of Neurology* 2011;4:348-351.
10. Numthavaj P, Thakkinstian A, Dejthevaporn C, Attia J. Corticosteroid and antiviral therapy for Bell's palsy: a network meta-analysis. *BMC Neurol* 2011;11:1-1.