



# A Patient with COVID-19 Imitating Neurological Symptoms

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## ABSTRACT

There is new information emerging day by day on the SARS-CoV-2 virus, which is a serious threat all over the world, and its infection picture. During the COVID-19 pandemic process, it has been shown that COVID-19 is not a disease restricted with a simple lower respiratory tract infection, but it can also cause severe conditions such as vertigo, headache, unconsciousness, encephalopathy and stroke by affecting the nervous system. Therefore, in patients presenting with neurological symptoms during the pandemic process, due attention should be given to the possibility of COVID-19 infection.

**Keywords:** Coronavirus, transient ischemic attack, neurological symptoms

## ÖZ

### Nörolojik Semptomları Taklit Eden COVID-19 Hastası

Tüm dünyada ciddi tehdit oluşturan SARS-CoV-2 virüsü ve yapmış olduğu enfeksiyon tablosu ile ilgili gün geçtikçe yeni bilgiler ortaya çıkmaktadır. COVID-19 pandemi sürecinde COVID-19'un sadece basit bir alt solunum yolu enfeksiyonu ile kendini sınırlamayıp sinir sistemini de etkileyerek baş dönmesi, baş ağrısı, bilinç bozukluğu, ensefalopati ve inme gibi durumlara neden olabildiği bilinmektedir. Bu nedenle pandemi sürecinde nörolojik semptomlar ile başvuran hastalarda COVID-19 hastalığı açısından dikkatli olunmalıdır.

**Anahtar Kelimeler:** Koronavirüs, geçici iskemik atak, nörolojik semptomlar

## INTRODUCTION

The outbreak of the novel Coronavirus infectious disease-2019 (COVID-19) caused by the SARS-CoV-2 virus, which originated in Wuhan, China, has rapidly turned into a pandemic leading to myriad health problems in all countries of the world. The disease, which often starts with complaints of muscle pain, headache, fever and cough, can show different symptoms and clinical presentations. Recent studies show that COVID-19 can present with neurological symptoms, and cerebrovascular disease is one of the most common comorbidities (1,2). Especially for the elderly patients with chronic diseases, the difficulties can be encountered not only in the treatment process but also in diagnosis. In the presented case, an elderly patient admitted to the emergency department presented with ischemic stroke symptoms, contrary to expected COVID-19 symptoms such as fever (80.4%), cough (63.1%), fatigue (46%) and expectoration (41.8%), and etc.; however, SARS-CoV-2 RNA-PCR result was found positive later on, and bilateral, widespread COVID-19 lung involvement on computed tomography (CT) imaging was described (3).

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**CASE**

A 74-year-old male patient was brought to the emergency with complaints of confusion, hallucination, and paralysis of his right arm. He had been diagnosed with Alzheimer’s for seven years and was able to do his daily routine with the support of someone else. His daughter reported that her father had confusion for the last two days and severe hallucinations such as seeing his house flooded. In addition, she reported that he had weakness in his right arm for the last two hours. In the first neurological evaluation, it was detected that he had confusion, he could partially answer the questions and could not do the requested commands. Motor examination revealed 3/5 strength in the upper right extremity. On the other hand, no loss of strength was observed in other extremities. His vital signs were as follows: fever, 37.4°C; blood pressure, 90/50 mmHg; pulse, 108 beats/min; respiratory rate, 22 breaths/min; oxygen saturation, 90% on air; blood glucose on test strips, 105 mg/dl. The patient was administered with 2-4 l/min O2 support and IV hydration with 500 cc SF. Due to pre-diagnostic presentations of cerebrovascular accident (CVA), right after collecting blood samples, head computed tomography (CT) and magnetic resonance imaging (MRI) were requested. There were no findings of hemorrhage or ischemia. Hence, bedside ultrasound (US) was performed in the patient whose hypotension and confusion continued. There was no abnormality in the heart’s structure. Global ejection fraction (EF) was also found to be normal. Inferior vena cava (IVC) collapsed at a rate of 50-70%. Hepatization sign was bilaterally observed on thorax ultrasound examination (Figure 1). Laboratory results were as such: WBC= 13.800 10<sup>3</sup>/ul, Hgb= 11.2 g/dl, Plt= 278, AST= 45 U/l, ALT= 55 U/l, Glucose= 109 mg/dl, D-dimer= 1872 ng/ml, Na= 152 mmol/l, K= 4,1

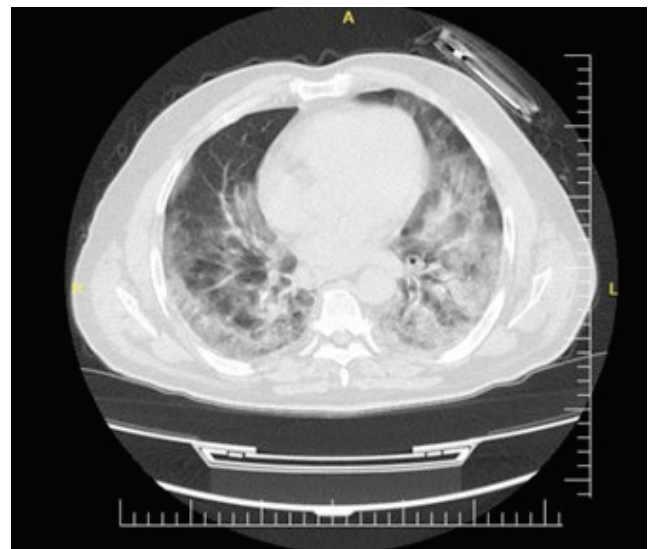


**Figure 1.** Hepatization sign in thorax ultrasonography exam. The disappearance of A-lines and appearance of liver-like echogenicity under the pleura due to consolidation developed by lung pneumonia.

WBC	13800 10 <sup>3</sup> /ul
Hgb	11.2 g/dl
Plt	278
AST	45 U/l
ALT	55 U/l
Glucose	109 mg/dl
D-dimer	1872 ng/ml
Na	152 mmol/l
K	4,1 mmol/l
Urea	78 mg/dl
Creatine	1.6 mg/dl
CRP	63 mg/l

mmol/l, Urea= 78 mg/dl, Creatine= 1.6 mg/dl, CRP= 63 mg/l (Table 1). Therefore, it was thought that the patient might have a lung infection and sepsis and that the cause of hypotension and confusion might be sepsis. Due to these reasons, thorax CT and complete urinalysis were requested. In thorax CT, there were bilateral, diffuse ground glass (GGO) view (Figure 2). Then, RNA PCR was performed with combined throat/nasal swab sampling for COVID-19 and the result was positive.

The patient was monitored in the emergency department, and oxygen support and hydration therapy were continued. During this period, patient’s consciousness improved, and 3/5 strength loss of upper right extremity detected in the previous motor examination spontaneously recovered. High flow oxygen, antiviral drugs and antibiotics were given. After 11 days of treatment, the patient, who had no new symptoms, was discharged.



**Figure 2.** Diffuse, bilateral ground glass view in thorax CT.

Patient consent was acquired from one of the patient's relatives.

## DISCUSSION

Many studies show that COVID-19, though having a natural affinity to respiratory systems, can also lead to the development of neurological symptoms (4,5). Other studies have shown that coagulation parameters are impaired in patients with COVID-19; correspondingly, they have reported that stroke and thrombotic events such as myocardial infarction and disseminated intravascular coagulation are associated with severe acute respiratory syndrome as a consequence of a hypercoagulable state. They have also reported that severe infection may trigger acute ischemic stroke due to intravascular events as well as hypoxia (6,7).

In our patient, the presence of COVID-19 pneumonia explained confusion, desaturation and hypotension in the patient. However, this presence did not explain the loss of strength in the right upper extremity manifesting for two hours before and lasted for 45 minutes after admission, which disappeared spontaneously. In light of these findings, it was thought that the patient actually had transient ischemic attack (TIA).

Severe COVID-19 infection can induce the release of pro-inflammatory cytokines. Accordingly, tissue factor (TF) expression by endothelial and mononuclear cells, coagulation activation and thrombin generation occur (8,9). In our case, unlike previously described stroke patients, there were no risk factors for stroke. There may be a tendency to thrombus due to the inflammation cascade triggered by COVID-19 pneumonia respiratory syndrome.

It has already been proven that D-dimer level, which is a degradation product of cross-linked fibrin and is a frequently used marker of hypercoagulable and thrombotic events, is increased in patients with acute ischemic stroke (10). Similarly, in our case, D-dimer level was as high as 1872 ng/ml.

Another important point is that the use of bedside US has significantly accelerated the diagnosis time. Pneumonia detected by US indicated the possibility of COVID-19 although the patient did not have any common symptoms and history.

## CONCLUSION

Based on previous studies, we believe that COVID-19 infection can predispose patients to thromboembolic events and cause TIA. It should be kept in mind that the clinical picture of patients associated with COVID-19 infection may present neurological signs and symptoms in the foreground. As research gains progress in the related literature, it is pre-

dicted that each new case study and clinical study will provide invaluable and more consistent insights into the management of SARS-CoV-2 and other possible complications that may develop in relation to COVID-19 and its potential relations with neurological diseases.

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