

## Case Report:

# The Alteration of Clinical and Laboratory Signs and Symptoms of COVID-19 in Re-infection: A Case Report



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## ABSTRACT

**Background:** Patients can be carriers of the virus for a long time or become re-infected or re-infected following the use of immunosuppressive drugs. Clinical manifestations in patients are very diverse and can range from asymptomatic to severe illness with death. Patients may also present with manifestations such as coagulation disorders, cardiac dysfunction and arrhythmias, acute coronary syndrome, kidney injury, liver injury, Refer to diabetic hyperglycemia and ketoacidosis. This is an essential point in the prevention of Coronavirus Disease 19 (COVID-19).

**Case Presentation:** We reported a case in which the Polymerase Chain Reaction (PCR) test was positive after re-negative after 5 months. Moreover, the patient presented different and more severe symptoms than the previous infection, as the genetic difference between the strains increased over time.

**Conclusion:** As a result, immunization may become more complicated, and different clinical pictures occur; thus, this condition can challenge vaccine immunization.

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## 1. Introduction

Coronavirus Disease 19 (COVID-19) is the largest and most severe epidemic since the 1918 flu [1]. The appearance of this disease has created unprecedented challenges for public health [2]. The coronavirus is transmitted mainly through respiratory droplets and close contact with others [3]. Clinical manifestations in infected patients are very diverse and can range from asymptomatic disease to a severe condition and death [4]. In most cases, the virus causes pulmonary pneumonia [5]. Re-infection may occur following some immunosuppressive therapy or in the elderly [6]. Studies have also suggested that patients with defective immune systems are more prone to reinfection [7]. Despite evidence of an acquired immune response after coronavirus infection, studies have indicated that patients with mild symptoms and a weaker immune response with reduced antibody levels, after 2 to 3 months, become re-infected [8]. Eighty species of viral genotypes have been identified. Moreover, as genetic differences between strains increase over time, cross-breeding immunity may become more difficult [9]. According to reports, in the case of a pandemic with other viruses of the coronavirus family,

immunity was established for  $\geq 2$  years, i.e., not the case with COVID-19 [10].

## 2. Case Presentation

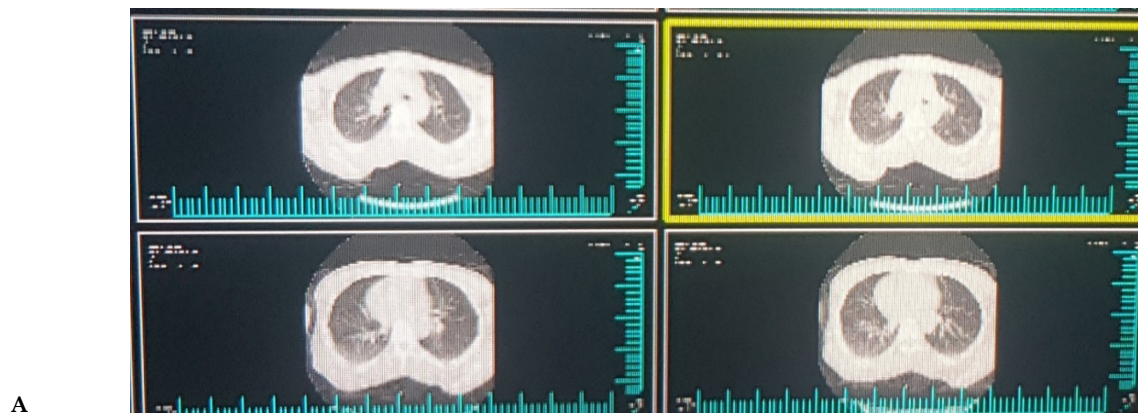
The patient, a 54-year-old man, fell to the ground on April 10, 2020, following dizziness. Besides, he encountered a forehead lesion, after which he was admitted to the hospital emergency room. The patient lived in a disabled nursing home and reported no history of diseases or the use of drugs (Table 1).

Due to the positive D-dimer and  $o_2sat$  of  $<93$ , the patient underwent a lung scan without contrast (Figure 1-A).

Considering the positive PCR test data, the patient was admitted to the isolation ward with a diagnosis of COVID-19. The patient was treated with enoxaparin 40 mg daily, vitamin C 1gr per day, ceftriaxone 1gr every 12 hours, hydroxychloroquine 200 mg every 12 hours, azithromycin 250 mg daily, and atorvastatin 40 mg daily. In the first 3 days of hospitalization, he received 2 liters of nasal oxygen per minute. The patient was reported to have  $>95\%$  oxygen saturation without oxygen therapy. On April 17, due to the improvement of clinical symptoms, PCR tests and scans were performed to con

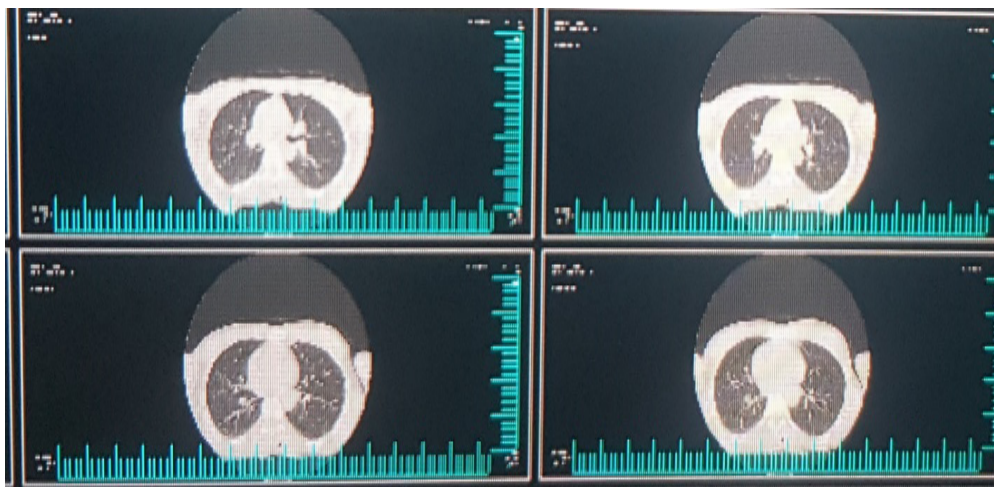
Table 1. Laboratory values

Laboratory Tests	First Hospitalization	Second Hospitalization (20/5/99)	Normal Range
WBC ( $\times 1000/mm^3$ )	5.7	3.8	4.0-11.0
RBC (mlil/ $mm^3$ )	4.89 mlil/ $mm^3$	5.27	4.5-5.5
Hb (g/dL)	14.7	15	13-17
plt ( $\times 1000/mm^3$ )	141	170	140-450
Lymphocytic count	2500	1700	
BS (mg/dL)	84	84	50-140
Bun (mg/dL)	10	20	6-20
Cr (mg/dL)	0.8	0.8	0.5-1.3
CRP	Negative	+3	
LDH (U/L)	330	330	180-400
PH	7.39	7.43	
Pco <sub>2</sub> (mmHg)	40.8	35	
Hco <sub>3</sub> (mEq/L)	25.2	23.4	
D-dimer		Negative	Positive $>200$



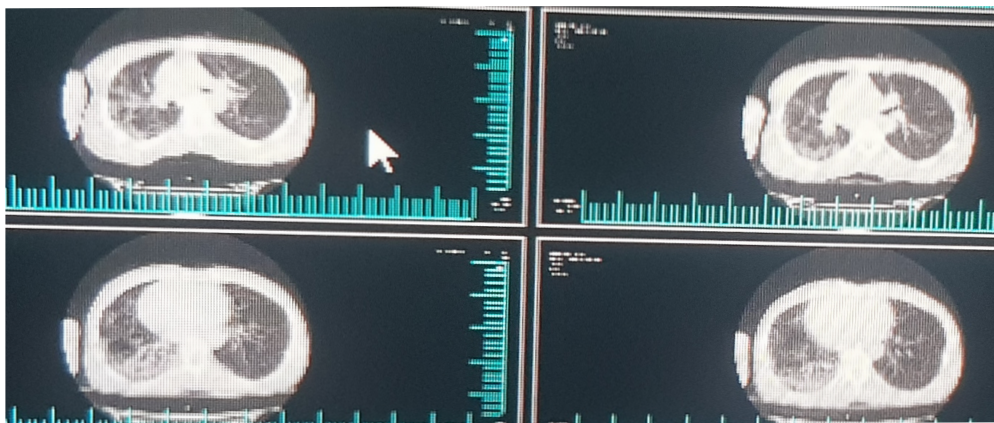
A

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B

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C

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**Figure 1.** Lung scan

A: Lung scan at the time of the patient's first hospitalization; B: Scan the patient's lungs at discharge; C: Scan the patient at the time of readmission

firm the existence of suitable conditions for discharge. Furthermore, after presenting a negative PCR test and the improvement of lung condition, the patient was discharged for re-scan (Figure 1-B).

On the 20<sup>th</sup> of August 2020, the patient has referred to the emergency room again due to fever and chills, shortness of breath, and body pain. He was tachypnea; in examining the patient's vital signs presented 84% o<sub>2</sub>sat, blood tests, and CT scans were performed for the patient

again (Figure 1-C). According to positive PCR and tests (Table 1), the patient was admitted to the isolation ward. Next, the patient received oxygen with a nasal catheter 4 liters per minute and was treated with ceftriaxone, interferon beta1b, enoxaparin, methylprednisolone, and atazanavir. Moreover, the patient was discharged after 7 days with the improvement of clinical symptoms and PCR test before discharge according to hospital protocol and negative PCR test.

### 3. Discussion

The possibility of recurrence of COVID-19 is a major public health concern. This is because it can lead to an increase in the prevalence of the disease in the community [11]. The presented patient was referred for the second time after 5 months with different initial symptoms. The patient presented at the first visit without respiratory symptoms and with neurological symptoms. Besides, pulmonary involvement was accidentally diagnosed. The patient was discharged with a negative test and controlled scan. In the second pulmonary involvement, most of the PCR test was positive again and the patient presented respiratory symptoms. Therefore, infection with coronavirus cannot guarantee immunity for subsequent infections [12]; predisposing factors for re-infection can be treating the first course of the disease [6]; PCR testing of the throat to ensure that the virus is cleared. This is also challenging and may provide false-negative results, which may require two samples to be taken from two different parts (throat & stool) for two consecutive days [9]. The patient may also be exposed to a higher rate of the virus in the second infection, or, similar to that in dengue fever, antibodies in the blood from the previous infection may exacerbate the symptoms in the new infection [13]. Additionally, ineffective control of viral infection may lead to the replication of the virus after the cross-sectional suppression of symptoms. It is unclear whether all patients provide a protective response; and if so, the duration of this response remains unrecognized [14]. Inflammation is caused by an inappropriate immune response [6]. The patient presented more severe symptoms in the readmission, compared to the initial case; such a case can raise questions about the effects of infection severity on the immune response and host susceptibility, which can have critical epidemiological consequences [15]. The change in the patient's initial symptoms of re-infection may be due to infection with a new strain of the virus [16].

### 4. Conclusion

We reported a case in which the Polymerase Chain Reaction (PCR) test was positive after re-negative after 5 months. Moreover, the patient presented different and more severe symptoms than the previous infection, as the genetic difference between the strains increased over time. As a result, immunization may become more complicated, and different clinical pictures occur; thus, this condition can challenge vaccine immunization.

### Ethical Considerations

#### Compliance with ethical guidelines

The participants were informed of the purpose of the research and its implementation stages.

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#### Authors' contributions

All authors equally contributed to preparing this article.

#### Conflict of interest

The authors declared no conflict of interest.

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