



Case Report

COVID-19 Reinfection: A Case Report

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Background

To date, there are close to 51 million documented cases of the novel SARS-COV-2 worldwide according to the World Health Organization. Over 10 million cases were reported in the United States alone [1]. With restrictions of lockdown loosening based on economic concerns, politicization of the pandemic, and public noncompliance, enforcement of social distancing practices has reduced [2]. This has resulted in increasing discussion regarding the value of herd immunity to slow the spread of the novel coronavirus. Infection trends support that the number of cases in the U.S. continues to climb. This also brings into question how effective antibodies are in conferring immunity for individuals who have recovered from the infection. While there have been reports of reinfection presented in the media in China, South Korea, India, and Europe [2], they have been largely anecdotal and have not been verified. The first report of reinfection was by Kai-Wang To et al in China, finding this case was due to true reinfection, rather than reactivation of initial infection. In this study, whole-genome sequencing at the time of both infections showed evidence those viral genomes belonged to different clades/lineages, indicating they were phylogenetically distinct. Although the patient had evidence of SARS-CoV-2 IgG seroconversion after the initial infection, it did not confer immunity [4]. Another case was published in the U.S. in July by Duggan et al in U.S. where a patient presented with two symptomatic episodes of respiratory illness with COVID positive RT-PCR tests, testing negative twice with symptomatic recovery in between presentations [5]. Our case report presents a similar story, demonstrating that the development of antibodies with recovery from infection may not be protective.

Objective

To demonstrate COVID-19 reinfection in a patient with positive IgG antibodies is possible.

Case Report

In the middle of June 2020, a 65-year-old male with a complex past medical history including chronic systolic heart failure (EF <30%) and COPD presented with shortness of breath, productive cough, and subjective fevers. He reported being exposed to a friend who had tested positive for COVID 19 in the last week. In the emergency room, he had a COVID-19 PCR test which resulted as positive for COVID-19. His chest x-ray is seen in (Figure 1(a,b)). He was admitted to the hospital and treated for COVID-19 pneumonia with prednisone, Lasix, and his home inhalers. His breathing improved and he was discharged in stable condition. Eighty-six days post-discharge, the patient presented again with repeated symptoms of dyspnea. Due to recent diagnosis with COVID-19 pneumonia, he was re-tested on hospital days one and two. He subsequently had two negative COVID-19 PCR nasopharyngeal swabs, suggesting that the patient had recovered from his prior infection. He was treated for an acute exacerbation of COPD complicated by acute on chronic systolic heart failure. He was discharged home after a five-day hospitalization with improvement in dyspnea.

Ninety-seven days post the first discharge, the patient presented for a third time with shortness of breath, cough, malaise, subjective fever, and abdominal pain. The patient was tested for

a fourth time with COVID-19 PCR from a nasopharyngeal swab and was found to be positive. The patient also tested positive on the second day of re-hospitalization for COVID-19 IgG antibodies. This suggests that reinfection with COVID-19, despite having IgG antibodies, is possible.

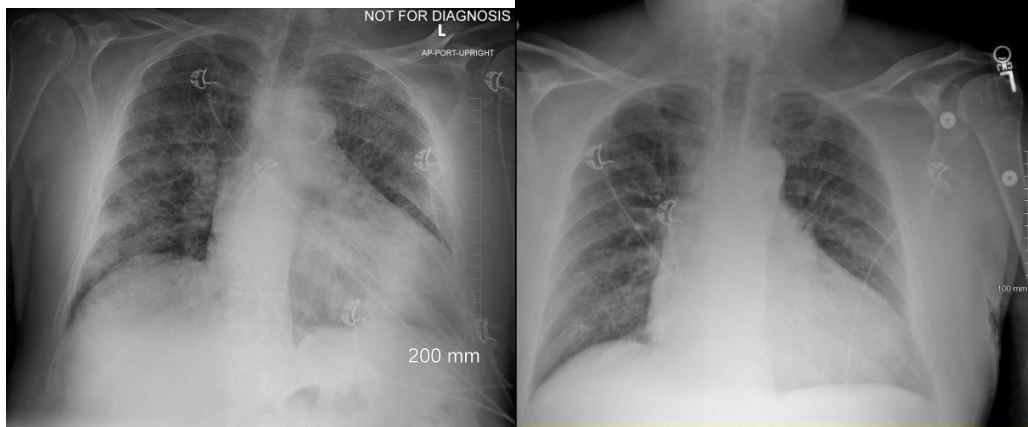


Figure 1: (a) Chest X-ray from initial COVID-19 diagnosis with diffuse patchy infiltrate bilaterally. (b) Chest X-ray from second COVID-19 diagnosis which was significant for signs of CHF.

Discussion

In both our case report and that reported by Duggan et al. [5] there was evidence of resolution of SARS-CoV-2 infection based on two negative RT-PCR tests between instances of infection. However, neither study documents whole-genome sequencing nor the possibility of false-negative tests cannot be ruled out, despite each case reporting two negative tests. A new study by Deng et al describes a failed attempt of reinfection with the same strain of SARS-CoV-2 [6]. This evidence, in combination with the study by Kai-Wang To et al, opens the discussion to the possibility of reinfection of individuals with a new, evolved strain of SARS-CoV-2. While cases of reinfection need continued exploration with whole- genome sequencing to further characterize infections, the aforementioned studies support that re- infection is possible, bringing into question the effectiveness of IgG protection following infection, treatment with convalescent plasma, and the level of protection a vaccine may provide.

References

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