

Pulmonary Embolism after Successful COVID-19 Treatment

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Abstract

The novel COVID-19-related disorders have become a global health problem since the pandemic emerged in China. Herein, we present a case of late pulmonary embolism development after successful COVID-19 treatment. A 45-year-old male was admitted to the emergency department with shortness of breath. He was diagnosed with mild COVID-19 pneumonia 10 days ago which was treated with hydroxychloroquine and oseltamivir for 5 days. He did not receive anticoagulation during this period. His second polymerase chain reaction test for COVID-19 came negative at the day before the second admission. He was diagnosed with pulmonary embolism and received anticoagulation therapy with heparin. COVID-19-related complications appear to still happen after treatment. Hence, follow-up of these patients is essential in order to reduce the burden of COVID-19. Thromboprophylaxis is certainly required during hospitalization. Moreover, the duration of thromboprophylaxis may be extended in some patients.

Keywords: COVID-19, pulmonary embolism, thromboprophylaxis

INTRODUCTION

The novel COVID-19-related disorders have become a global health problem since the pandemic emerged in China. Initially, it was identified with acute respiratory distress syndrome, but the clinical scenarios varied rapidly as the number of cases multiplied. Herein, we present a case of late pulmonary embolism development after successful COVID-19 treatment.

CASE REPORT

A 45-year-old male was admitted to the emergency department with shortness of breath. At physical examination, his heart rate was 140 bpm, blood pressure was 100/80 mmHg, and oxygen saturation at room temperature was 91%. He did not have fever. D-dimer was 4.2 ng/mL, C-reactive protein was 119 mg/L, and troponin and blood analysis was within normal limits. His electrocardiogram revealed sinus tachycardia [Figure 1]. He was diagnosed in another hospital with mild symptomatic moderate COVID-19 pneumonia 10 days ago, which was treated with hydroxychloroquine and

oseltamivir for 5 days at home. He was not hospitalized. He had subfebrile fever (<38°C). Thorax computed tomography (CT) was interpreted by a radiologist who has been working on COVID-19 cases since the beginning of the pandemic. CT demonstrated bilateral typical pneumonia with bilateral peripherally located ground-glass opacities. He did not have dyspnea, hypoxia, nor other related respiratory and circulatory complications, nor associated laboratory findings such as high D-dimer levels. Hence, although thorax CT was without dye injection, pulmonary embolism was not suspected at first admission [Figure 2]. Realce, although thorax CT was without dye injection, pulmonary embolism confirmed the infection of COVID-19. He did not receive anticoagulation during this period because firstly, he was not bedridden, secondly, at that period of time (March 2020), anticoagulation was not routinely recommended in patients who were not hospitalized. His second polymerase chain reaction (PCR) test for COVID-19 came negative at the day before the second admission. He had

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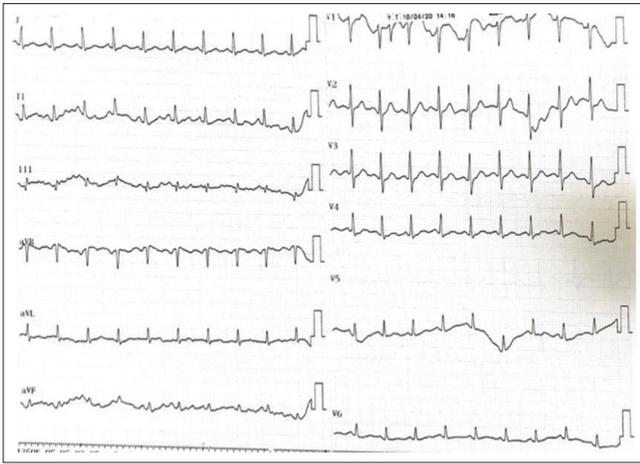


Figure 1: The electrocardiogram of the patient during admission

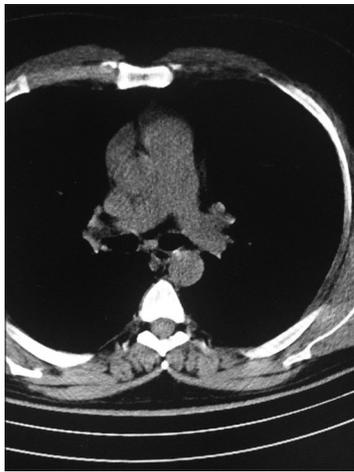


Figure 2: Computed tomography of the patient demonstrating no pulmonary embolism during admission for COVID-19

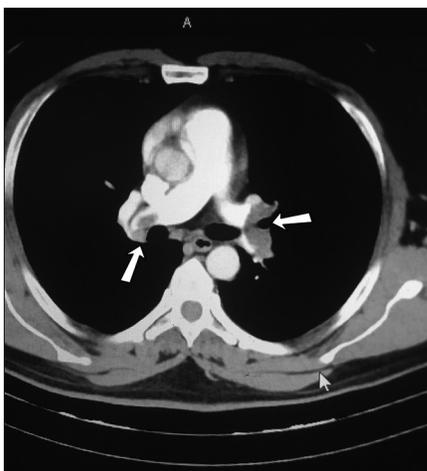


Figure 3: Computed tomography showing bilateral pulmonary embolism

a history of hypertension for 5 years, which was under control with amlodipin treatment. He did not have predisposing factors for venous thrombosis. A chest CT angiography revealed pulmonary embolism in both right pulmonary artery and left

pulmonary artery [Figure 3]. Meanwhile, it was observed that the pneumonic infiltration was not resolved yet. He was consulted to infectious diseases department, and they decided not to continue COVID-19-specific treatment as CT was not worse than the initial one and PCR for COVID-19 was negative. Lower limb Doppler ultrasound revealed deep-venous thrombosis in the left leg. Right heart chambers were not dilated, left ventricular ejection fraction was 60%, and pulmonary artery systolic pressure was estimated to be 35 mmHg echocardiographically. He was diagnosed with pulmonary embolism and received anticoagulation therapy with intravenous unfractionated heparin for the first 24 h, followed by subcutaneous heparin. Edoxaban 60 mg o. d. was prescribed at discharge.

He remained in the hospital for a further 7 days before being discharged in stable condition, with O₂ saturation increased to 98%, negative PCR, and normal laboratory tests.

DISCUSSION

As our knowledge about the pathophysiology of COVID-19 evolves, it has been clear that the infection is associated with hypercoagulation.^[1,2] The most featured underlying mechanism is hypoxia-triggered thrombosis due to the activation of hypoxia-induced transcription factors which regulate thrombus formation.^[2] The number of COVID-19-related pulmonary embolism cases rose after Xie *et al.* and Danzi *et al.* published the first cases.^[1,3-6] To our knowledge, our case is the first in the literature that presents pulmonary embolism development after specific COVID-19 treatment while PCR for the virus is negative. Humanitas COVID-19 Task Force authors reported 7.7% rate of thromboembolic events in 388 patients with COVID-19, especially within 24 h of admission.^[7] Most of the patients (100% of patients in the invasive care unit and 75% of patients in the general ward) received thromboprophylaxis.^[7] Besides, they pointed out the importance of developing more specific tests to define venous thromboembolism and more sophisticated thromboprophylaxis options especially in ambulatory COVID-19 patients.^[7] Yet, unfortunately, our patient did not receive thromboprophylaxis during his first hospital admission, neither did he experience any thrombotic events at that time.

CONCLUSION

COVID-19-related complications appear to still happen after treatment. Hence, follow-up of these patients is essential in order to reduce the burden of COVID-19. Thromboprophylaxis is certainly required during hospitalization. Moreover, the duration of thromboprophylaxis may be extended in some patients.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients

understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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