Hemoptysis in COVID-19 pulmonary embolism patient: a case report

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ABSTRACT

**Background:** Coronavirus disease 2019 (COVID-19) is related to hypercoagulability and venous thromboembolism (VTE). The overlapping symptoms of COVID-19 linked to acute respiratory distress syndrome (ARDS) and COVID-19 with concomitant pulmonary embolism (PE) provide a diagnostic difficulty for emergency physicians. This case study aims to evaluate the hemoptysis in COVID-19 pulmonary embolism patient.

**Case presentation:** A 46-year-old woman with COVID-19 complained of a bloody cough (estimated 10 ml). She had COVID-19 five days before presenting. Vital signs were normal, but the respiratory rate went 30 times per minute. A lab test revealed 838.64 ng/ml of D-dimer. A chest x-ray showed bilateral lower lobes opacity. The first HRCT showed consolidation of COVID-19 lesions. The patient was later hospitalized in a negative pressure chamber, given heparin for 72 hours, and discharged on an oral anticoagulant.

**Conclusions:** This is one of the first reports of segmental PE in a COVID-19 patient with no VTE risk factor. Emergency care doctors must be aware of the possible link between COVID-19 and PE. Hemoptysis is uncommon in PE patients and is seldom documented in COVID-19 infections. All suspected or confirmed COVID-19 patients should begin thromboprophylaxis to avoid morbidity and death.

**Keywords:** COVID-19, Hemoptysis, Pulmonary Embolism, Thromboembolism.

INTRODUCTION

Coronavirus disease 2019 (COVID-19) is an ongoing pandemic caused by the severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2). It poses significant problems to healthcare systems worldwide. The scientific evidence for this new virus is developing, and its clinical features are becoming clearer. COVID-19 is widely known for generating proinflammatory and hypercoagulable conditions, with significant increases in lactate dehydrogenase, ferritin, C-reactive protein, D-dimer, and interleukin levels.

Venous thromboembolism (VTE), also known as deep-vein thrombosis (DVT) or pulmonary embolism (PE), is a common consequence in individuals suffering from acute infections. This is associated with high thrombotic risk factors such as inflammation, coagulation system activation, immobilization, and diffuse intravascular coagulation, the latter occurring in individuals with severe illness. However, how often respiratory tract infections resulted in clinically meaningful thrombotic illness was unknown. Diagnosis of VTE, mainly PE, has long been recognized as problematic due to the vague nature of PE’s signs and symptoms. PE symptoms include chest discomfort, shortness of breath, and hemoptysis. Haemoptysis is a symptom of COVID-19 that is infrequently observed. Only a few occurrences have been documented in the literature. Haemoptysis occurred in 10 individuals (0.9%) in a large case series in China that included 1099 hospitalized patients with laboratory-confirmed COVID-19.

Based on those mentioned above, this case study aims to evaluate the unusual case of a female who presented with hemoptysis as a unique symptom of COVID-19.

CASE PRESENTATION

A 46-year-old female with PCR-positive COVID-19 arrived at the emergency room complaining of shortness of breath and hemoptysis (estimated 10 ml). She had been diagnosed with a moderate COVID-19 infection five days before her presentation. The main symptoms of COVID-19 were fever and tension headache. She was treated at home with paracetamol and salbutamol for bronchial asthma. Her heart rate, blood pressure, and oxygen saturation were normal, but she had a respiratory rate of 30 breaths per minute. Her medical examination indicated that she was suffering from minor respiratory distress.

The laboratory test revealed a D-dimer concentration of 838.64 ng/ml. At the time of the first assessment, her D-dimer level was 397 ng/ml (normal). The electrocardiogram (ECG) revealed...
Hemoptysis is the expectoration of blood or blood-tinged sputum from the respiratory system. It is deemed life-threatening when it creates clinical repercussions such as respiratory failure due to airway blockage, as in this instance, or hypotension. Large COVID-19 investigations and case series have either not found hemoptysis or have shown meager rates of 0.9-5 percent. SARS-CoV-2 creates a pro-inflammatory and hypercoagulable condition, as seen by increased lactate dehydrogenase, D-dimer, C-reactive protein, ferritin, and interleukins. Data on the disease’s thromboembolic consequences are becoming available, and increasing papers are documenting thromboembolic events worsening the COVID-19 sickness. A study from Dutch looked at the increased rate of thrombotic problems among 184 COVID-19 patients in the critical care unit. All patients received conventional dosages of thromboprophylaxis, and the cumulative Incidence of thrombotic sequelae was reported to be 31%, with pulmonary embolism being the most common (n = 25, 81%).

While hemoptysis is a very unusual manifestation in COVID-19 patients, it is prevalent in individuals with pulmonary emboli, reaching up to 13%. A recent publication described a patient with SARS-CoV-2 who presented with hemoptysis. The overlap in symptoms between COVID-19 and pulmonary embolism (PE) provides a diagnostic problem for emergency care practitioners. Elevated D-dimer levels (>1.0 mg/dl) have been found as a possible predictor of increased mortality but are not unique to the diagnosis of venous thromboembolism (VTE).

In the final logistic regression model of the Pulmonary Embolism Rule Out Criteria (PERC), hemoptysis was likewise one of the clinical characteristics with the strongest correlation with PE. In addition to clinical symptoms such as hemoptysis, evidence of right heart strain on supplementary bedside diagnostics such as an electrocardiogram (EKG) may be useful in identifying COVID-19 patients at risk for concomitant pulmonary embolism. The limitation of this case report is that the examination still did not use a contrast-enhanced CT. The author suggests a contrast-enhanced CT or echocardiography can be performed in similar cases.

CONCLUSION

This is one of the first reports of segmental PE in a patient infected with SARS-CoV-2 who had no VTE risk factor. Emergency care doctors must be aware of the possible link between COVID-19 and PE. Recognizing abnormal COVID-19 clinical characteristics such as hemoptysis may help guide the imaging technique to diagnose PE. Furthermore, hemoptysis is uncommon in pulmonary embolism patients and is seldom documented in COVID-19 infections. All suspected or confirmed COVID-19 patients should begin thromboprophylaxis to avoid morbidity and death.
CONFLICT OF INTEREST
The authors declare that they have no competing interests.

ETHICAL CONSIDERATIONS
Written informed consent was obtained from the patient to publish this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

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AUTHOR CONTRIBUTION
All authors contributed equally to the study from the conceptual framework until reporting.

REFERENCES