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Happy hypoxic: Unaware young man with DVTs and pulmonary emboli

Christine Sykalo, Rami Arfoosh

ABSTRACT

Introduction: COVID-19 is a multi-systemic disease announced to be a pandemic by the WHO within three months of the first reported case. It was initially characterized as a respiratory virus; however, hypercoagulability and development of strokes and deep vein thrombosis (DVTs) have been seen. We present a case of a young patient with no past medical history who developed minimally symptomatic bilateral DVTs and pulmonary emboli (PE).

Case Report: A 26-year-old male with no past medical history presented with complaints of cough, fever, and diarrhea. Symptoms started two weeks prior to presentation, and he tested negative on COVID-19 nasal swab within that time frame. His cough was improving; however, he developed inability to keep food down along with bilateral calf pain with ambulation for three days prior to admission. Admission vitals were notable for fever and oxygen saturation of 91% on room air. A duplex ultrasound of the lower extremities showed bilateral thrombosis. Pulmonary computed tomography angiography (CTA) showed bilateral pulmonary emboli with numerous filling defects in the pulmonary arteries, along with peripheral interstitial densities. His COVID-19 nasal swab polymerase chain reaction (PCR) was negative, but the IgG serum antibody was positive. He was treated with steroids and anticoagulation.

Conclusion: Studies have documented that patients with COVID-19 pneumonia have increased risk of lower

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Received: 19 July 2021 Accepted: 04 October 2021 Published: 22 October 2021 limb DVT, despite proper prophylactic treatment. Clinicians must maintain high index of suspicion and a low threshold to order key tests in setting of unexplained hypoxia. We recommend obtaining serologic studies in late presenting patients with negative PCR swabs.

Keywords: COVID-19, Pulmonary emboli, SARS-CoV-2, Venous thrombosis, Young adult

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INTRODUCTION

The coronavirus disease 2019, also known as COVID-19, is a multi-systemic disease [1], which was announced to be a pandemic by the World Health Organization within three months of the first reported case [2]. COVID-19 was initially characterized as a respiratory virus, causing pneumonia and acute respiratory failure. The first autopsies reported that patient laboratory analyses were notable for elevated d-dimer, ferritin, fibrinogen, prothrombin time (PT), and, within 24 hours of death, an increased neutrophil count with relative lymphopenia [3]. The virus was seen to affect multiple organ systems, and was also recognized for its vascular effects. Additionally, articles are now being published on the ongoing symptoms patients experience from COVID-19, and include effects on brain, eyes, skin, and joints [4].

Vascular effects of COVID-19 were recognized initially in critically ill patients; however, hypercoagulability and

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development of strokes and deep vein thrombosis (DVTs) have been seen in non-critically ill patients with COVID-19 as well [5, 6]. Here, we present a case of a young patient with no past medical history who developed minimally symptomatic bilateral DVTs and pulmonary emboli (PE).

CASE REPORT

A 26-year-old male with no known past medical history presented with complaints of cough, fever, and diarrhea. The patient reported working as a landscaper. Two weeks prior to admission, he was at a party, where he drank about one bottle of tequila. He went to work the next day, felt ill, and requested to go home. The patient developed a cough, which was followed by a fever, and then diarrhea. In terms of his close contacts, the patient's mother had a recent upper respiratory illness as well, but she recovered with no medical intervention. The patient did get tested for COVID-19 by nasal swab during his illness, but the results came back negative. The patient reported that his diarrhea was only one loose stool per day. His cough was reported to be non-productive, and he denied any wheezing or hemoptysis. His cough was improving; however, he began developing vomiting after meals two days prior to his admission. He decided to come to the emergency department (ED) because of inability to keep food down. Additionally, he reported bilateral mid-calf pain with ambulation for three days prior to admission, and denied any shortness of breath. He had cough, diarrhea, and fevers for two weeks prior to developing of calf pains.

The patient denied any personal history of clotting or lung disorders, and denied any known diagnoses. He reported no family health issues, except for mother's recent illness, which had cleared. No known family history of hypertension, lung disease, clotting disorders, or strokes was found. Additionally, he denied any tobacco abuse, and admitted to trying methamphetamine once, two years prior. His social history was only notable for binge drinking at parties several times a month.

The vital signs of the patient were all within normal limits, except for a fever of 38.1° C and oxygen saturation of 91% on room air. He was placed on 1-2 liters of oxygen via nasal cannula, which improved his saturation to 100%. On physical exam, the patient was pleasant and cooperative, without increased work of breathing. He was comfortable speaking in full sentences. On auscultation, heart sounds were regular rate and rhythm, without any murmurs. He did have fine inspiratory crackles at the bilateral bases, left more than right. Abdominal exam was unremarkable. Musculoskeletal exam was notable for dorsalis pedis pulses of +1/3, and cold feet. The patient had tenderness to palpation to midline of calves bilaterally, without signs of edema or erythema. Admission labs are shown in Table 1.

A duplex ultrasound of the bilateral lower extremities showed venous thrombosis of the bilateral posterior

Table 1: Admission labs

Arterial blood gas	pH of 7.415, $\mathrm{pCO}_{_2}$ of 34, and $\mathrm{pO}_{_2}$ of 78
Troponin	Negative
Triglycerides	294 mg/dL (range 30–149 mg/dL)
Ferritin	586 ng/dL (range 5.0–244 ng/dL)
D-dimer	>4.000 ug/mL (range < 0.400 ug/ mL)
Lactate dehydrogenase	586 ng/mL (range 5.0–244 ng/mL)
C-reactive protein	6.03 mg/dL (range 0.00–0.60 mg/ dL)
Erythrocyte	19 mm (range 0–15 mm)
sedimentation rate	
COVID-19 nasal swab	Negative, PCR
Coronavirus 2 IgG Ab	Positive, serum

tibial veins and left peroneal vein. A transthoracic echocardiogram showed ejection factor of 55–60%, and normal size, wall thickness, and shape of ventricles and atria, without evidence of RV strain (Figures 1 and 2).

The patient was started on a heparin drip, and he received intravenous dexamethasone for four days. He received only one day of Remdisivir, which was then stopped, as patient had significant improvement. He was weaned off supplemental oxygen, and discharged on apixaban and additional six days of 4 mg oral dexamethasone.



Figure 1: Evidence of peripheral interstitial density having the appearance of a probable atypical viral pneumonia.



Figure 2: Pulmonary CT angiogram showed bilateral pulmonary emboli with numerous filling defects in the pulmonary arteries. Red arrow demonstrates one of the emboli.

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DISCUSSION

Studies have documented that non-critically ill patients with COVID-19 pneumonia have increased risk of lower limb DVT, despite proper prophylactic treatment. Of note, average age of the studied patients was 71.3, having multiple comorbidities, including hypertension, diabetes, and dyslipidemia [5]. Notably few reports have been published showing the effects of COVID-19 in patients under the age of 30, and the ones published, mostly show young patients to have strokes associated with COVID-19, frequently without an identifiable source for the stroke [6].

Other than age, timeline of illness is also of great importance, and detection rates vary. Serological testing has shown, during the second week of illness, that PCR is positive in 54.0% of patients, and antibody assays grow to be positive in 89.6% of patients, compared to 66.7% for PCR and 38.3% positive antibody assays during the first week of illness [7]. It is important to recognize that late presenting patients, such as ours, are much more likely to test negative by PCR, and require high index of suspicion and additional testing for proper diagnosis. This is also supported by current Infectious Diseases Society of America (IDSA) guidelines on the diagnosis of COVID-19 serologic testing as well as a systematic Cochrane Database review, showing that antibody testing, specifically IgG, is preferred after the two to three illness week period [8, 9].

Our patient developed coagulopathy after two weeks of illness with COVID-19, and recognition of late presentation was crucial for our patient. We were unable to identify other case reports of young patients, under the age of 30, with no co-morbidities, who were diagnosed with PE and DVT secondary to COVID-19. Our goal is to raise awareness of the vascular effects of COVID-19 specifically in the younger patient population. Specifically pointing out the development of calf pain from DVT's after 11–14 days of illness, once the patient already had developed IgG antibodies.

Additionally, we would like to urge providers to do alcohol screening on all patients during the pandemic, as there has been a notable increase in alcohol consumption in US adults during this time [10]. There is no data available showing alcohol abuse to have worse prognosis of COVID-19 illness; however, this was the only known concern in the patient's history.

CONCLUSION

In conclusion, COVID-19 is still currently active, and continues to be a threat to the lives and health of people across the globe. We would like to raise awareness of the effects it can have on seemingly healthy and young individuals, and recommend having a high index of suspicion of PE in patients with acute hypoxic respiratory failure, even if they lack other classic symptoms. Finally, we urge providers to hold open discussions with patients on topics of mental health and alcohol abuse, especially during the vulnerable times of the pandemic.

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Author Contributions

Christine Sykalo – Conception of the work, Design of the work, Acquisition of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Rami Arfoosh – Conception of the work, Revising the work critically for important intellectual content, Final



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approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

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Conflict of Interest

Authors declare no conflict of interest.

Data Availability

All relevant data are within the paper and its Supporting Information files.

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