

Dual Catastrophe of COVID-19: Massive Pulmonary Embolism and Stroke in a Previously Healthy Young Patient

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Background

- Severe Acute Respiratory Syndrome Corona Virus-2 (SARS-CoV-2) causing the current pandemic of COVID-19, is genetically homologous to SARS-CoV that caused the SARS outbreak in 2002.
- Symptoms of COVID-19 are nonspecific resembling influenza-like illnesses, that may include fever, sore throat, cough, arthralgia, myalgia, diarrhea, with or without the subsequent development of dyspnea. Fever (87.9%) and cough (67.7%) are the most common symptoms.
- Severe COVID-19 may present with acute respiratory distress, respiratory failure, septic shock and multi-organ failure. Disease severity (including oxygen saturation, respiratory rate, blood leukocyte/lymphocyte count and radiologic manifestations) predict poor clinical outcomes.
- There is a tsunami of emerging COVID-19 research signifying that COVID-19 is a multi-organ systemic disease that can cause diverse pathologic changes, such as large vessel stroke, venous thromboembolism, microthrombosis, myocardial injury, neurological sequelae, pulmonary disease, renal and hepatic dysfunction.

Case Description

- We report a 45-year-old Eritrean lady, with no chronic illness, who was last seen in normal state 3.5 hours prior to presentation to the emergency department (ED).
- She suffered 2 weeks' history of dry cough and shortness of breath and a 3-day history of palpitations.
- Her family brought her to ED after a transient loss of consciousness.
- She was found to have right-sided weakness, left gaze deviation, aphasia, mouth deviation, facial twitching, and abnormal jerky movement of her limbs.
- She was rapidly desaturating and hypotensive. Her National Institute of Health Stroke Scale (NIHSS) score was 21. Further clinical and laboratory parameters are shown in the **Table**.
- A computed tomography (CT) of the brain confirmed an acute left middle cerebral artery (MCA) stroke with diffuse brain edema causing a midline shift (Figure 1-A), CT angiography (CTA) showed abrupt cut-off of the contrast opacification in the bilateral internal carotid arteries at the level of the bifurcation and bilateral vertebral arteries (Figure 1-B, 1-C, 1-D).
- She was later intubated due to status epilepticus and drop of oxygen saturation to 76%. A chest X-ray was unremarkable. A CT pulmonary angiogram (CTPA) then confirmed the presence of a massive acute saddle-shaped PE with right ventricular strain and peripheral subpleural ground-glass opacity at the lung base (Figure 1-E, 1-F), CT also showed hypodensities in the left kidney and spleen that likely represented infarcts (Figure 1-G, 1-H).
- She was admitted to the intensive care unit (ICU) on inotropic support and was started on intravenous heparin infusion. Multidisciplinary Pulmonary embolism response team meeting was conducted and concluded that the patient was not a candidate for systemic or catheter-directed thrombolysis for PE due to the perceived risk for higher intracranial hemorrhage and poor neurological outcome.
- Four days after ICU admission, the patient unfortunately died. Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) PCR screen came back positive after the death of the patient.

Conclusions

- To our knowledge, this is the first reported case of COVID-19 associated with large-vessel stroke, PE, renal and splenic infarctions, in a young patient. We concur with previous research that due to curfew and patient's reluctance to present to the hospital may contribute to grave outcomes. As COVID-19 is a great mimicker of multiple diseases, we suggest that, during this pandemic, any young patient presenting with unprovoked arterial and venous thrombosis should be tested for COVID-19.

Patient Characteristics		Normal Ref Ranges
White-cell count (10e9/L)	13.39	3.9-11
Neutrophils (%)	76	30-70
Lymphocytes (%)	15	23-60
Absolute Neutrophil Count (10e9/L)	10.22	1.35 - 7.5
Absolute Lymphocyte Count (10e9/L)	2.06	1.5 - 4.3
Neutrophil-Lymphocyte Ratio	4.96	1-3
Hemoglobin (g/dL)	11.0	11-16
Platelets count (10e9/L)	212.00	155-435
Troponin (ng/L)	4069	0-15.6
BNP (pg/mL)	2557	0-89
Lactate (mmol/L)	3.82	0.5-2.2
D-Dimer (µg/mL)	25.237	0-0.5
Lactate Dehydrogenase (U/L)	1184	125-220
Ferritin (ng/mL)	78.0	10-204
Septic screen	2 negative blood cultures, 1 negative urine culture	

