

Massive Left Ventricular Thrombus in the Setting of COVID-19–Induced Systemic Thrombi

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Case Description

A 58-year-old White man with no known medical history initially presented to the emergency department for fatigue and was ultimately diagnosed with COVID-19. He was in stable condition and discharged to quarantine at home. He returned to the emergency department 2 weeks later with a chief report of progressive pain and swelling of his legs. Initial vitals were remarkable for a heart rate of 115/minute. Physical examination revealed edematous and erythematous lower extremities with weeping wounds. Laboratory workup was remarkable for a white blood cell count of $12.7 \times 1,000/\mu\text{L}$, platelet count of $81 \times 1,000/\mu\text{L}$, troponin I level of 0.678 ng/mL, brain natriuretic peptide level of 4,000 pg/mL, C-reactive protein level of 121 mg/L, lactate level of 3.7 mmol/L, and international normalized ratio of 1.5.

Chest computed tomographic angiography revealed acute emboli of subsegmental pulmonary arteries of the left upper, middle, and lower lobes (Fig. 1). Echocardiogram revealed a severely dilated left ventricle with apical akinesis and an ejection fraction of 10% to 15%. Large, layered thrombi were seen in the apex of the left and right ventricles (Fig. 2). Duplexes of the lower extremities showed acute occlusive calf vein thrombi in the right posterior tibial and bilateral peroneal veins. Arteries were patent in both lower extremities. Venous duplex of the right upper extremity revealed acute superficial venous thrombi in the right basilic and cephalic veins. Cardiac magnetic resonance imaging was performed to assess viability, which revealed significant transmural scarring and a large thrombus ($8 \times$

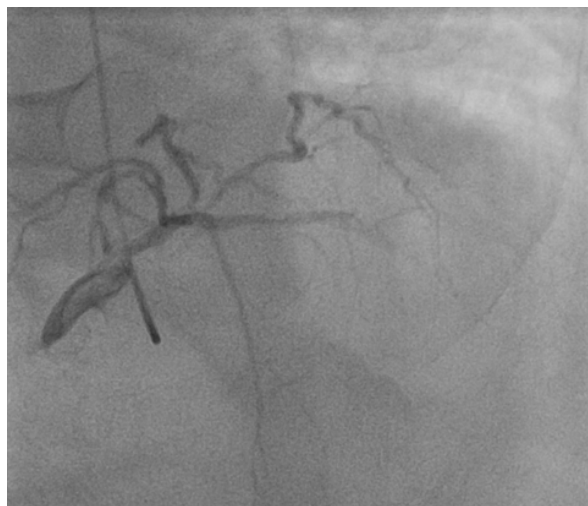


Fig. 1 Left coronary angiogram shows severe triple-vessel disease.

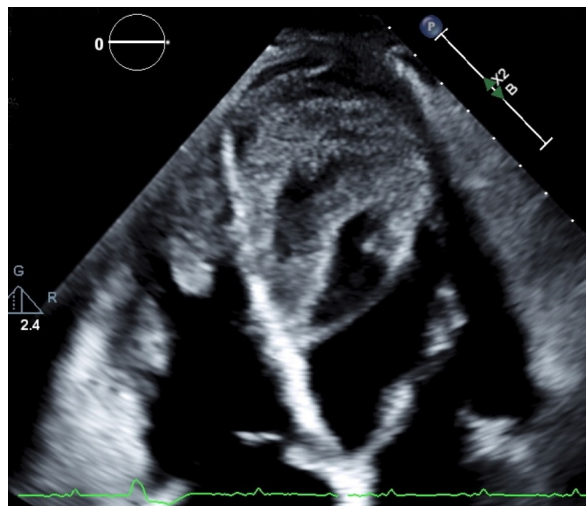


Fig. 2 Echocardiogram shows large, layered thrombus in the apex of the left ventricle and right ventricle.

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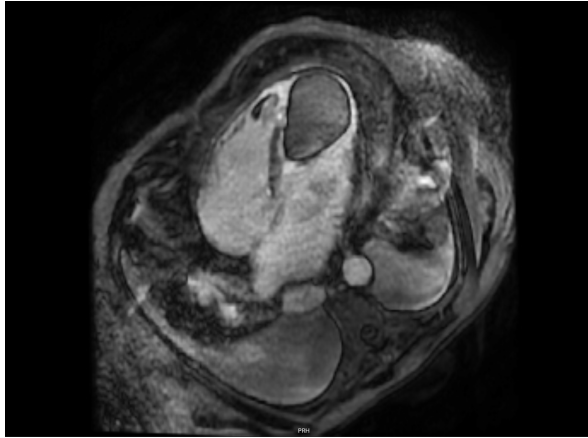


Fig. 3 Cardiac magnetic resonance image shows a large thrombus (8 × 6 × 5 cm) occupying the apical left ventricle.

6 × 5 cm) occupying the mid- and complete apical left ventricle cavity (Fig. 3). Multiple small thrombi in the right ventricle apex were seen.

Given the thrombocytopenia on presentation, there was concern for disseminated intravascular coagulation; however, with such extensive clot burden, the patient was started on a heparin drip. Four days later, he sustained a cardiac arrest secondary to venous thromboembolism. Upon achieving return of spontaneous circulation, he was taken for left heart catheterization, which revealed severe triple-vessel disease. Cardiothoracic surgery was consulted, but it was determined that the patient to be too high risk to undergo coronary artery bypass graft or operative thrombectomy. Ultimately, his clinical status deteriorated, and the patient along with family proceeded with comfort measures.

Comment

SARS-CoV-2 infection primarily affects the lower respiratory tract, but there are reports of COVID-19–induced cardiac complications, including acute coronary syndromes, arrhythmias, myocarditis, and thrombosis.¹ Venous thromboembolism is reported to occur in approximately 30% of patients with COVID-19, but intracardiac thrombus in very rare.² Cardiac thrombus should be considered in the diagnosis of COVID-19 in patients presenting with chest pain and leg swelling.

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References

1. Zheng YY, Ma YT, Zhang JY, Xie X. COVID-19 and the cardiovascular system. *Nat Rev Cardiol.* 2020;17(5):259-260. doi:10.1038/s41569-020-0360-5
2. Kaki A, Singh H, Cohen G, Schreiber T. A case report of a large intracardiac thrombus in a COVID-19 patient managed with percutaneous thrombectomy and right ventricular mechanical circulatory support. *Eur Heart J Case Rep.* 2020;4(6):1-5. doi:10.1093/ehjcr/ytaa308