IMAGE FOCUS

doi:10.1093/ehjci/jeaa115

Acute pulmonary embolism in conjunction with intramural right ventricular thrombus in a SARS-CoV-2-positive patient

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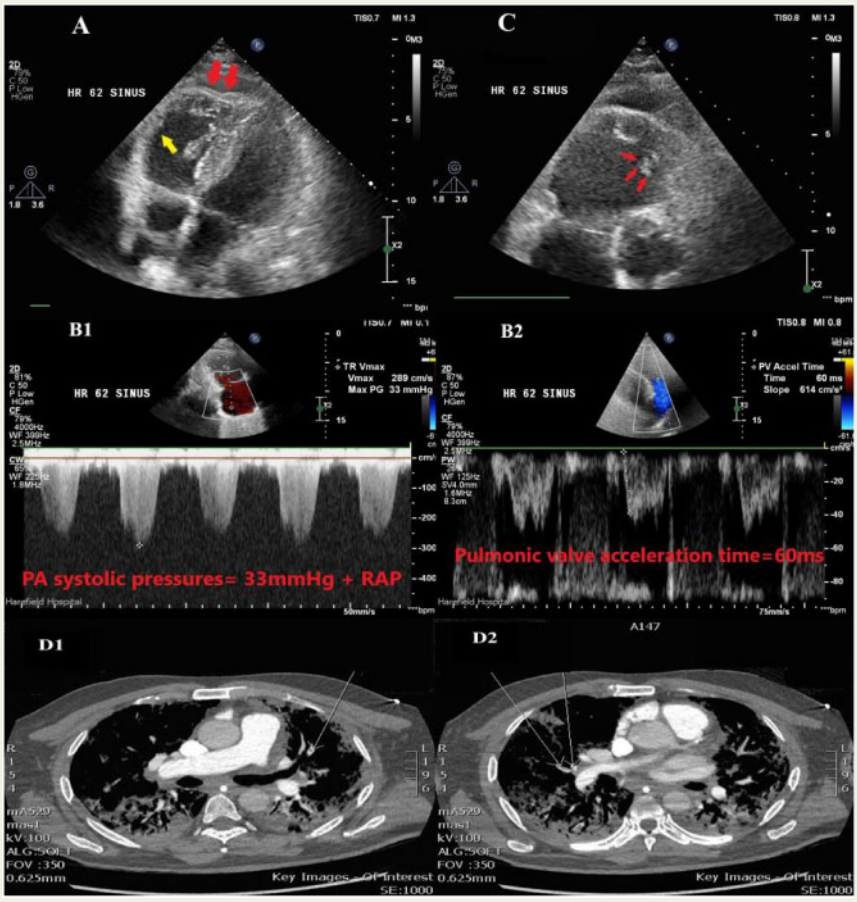
We were presented with a 60-year-old SARS-CoV-2- (Covid-19) positive gentleman who was transferred to our intensive care unit from a district general hospital. The patient was intubated and required mechanical ventilation prior to transfer for type 1 respiratory failure secondary to pneumonitis. His past medical history included hypertension and hypercholesterolaemia. Admission blood tests demonstrated markedly elevated troponin I of 593 ng/L and C-reactive protein of 360 mg/L. D-dimer levels were elevated at 32 228 ng/L. Bedside echocardiogram showed a dilated right ventricle (base 45 mm, mid 42 mm) with severely impaired right ventricular (RV) systolic function. Basal–mid RV free wall segments were akinetic, while apical segments were normokinetic (*Panel A;* Supplementary material online *Video S1*), suggestive of McConnell's sign. Estimated pulmonary artery systolic pressure was 33 mmHg + right atrial pressures (*Panel B1*), and pulmonic valve acceleration time was 60 ms (*Panel B2*) indicative of the 60/60 sign. Combined, both signs are a sensitive marker for acute pulmonary embolism. Additionally, echo imaging showed a small, highly mobile mural thrombus within the RV free wall (*Panel C;* Supplementary material online *Video S2*). Subsequent CT pulmonary angiogram confirmed multiple filling defects in the inferior lingula (*Panel D1*) and in the segmental pulmonary artery branches to the lateral segment of the right middle lobe (*Panel D2*). The patient was thrombolysed and remains in intensive care.



Incoming data from China and Europe suggest that COVID-19 may be associated with a hypercoagulable state and increased risk for venous thrombo-embolism. An association between COVID-19 pneumonia and pulmonary emboli can be challenging for intensive care clinicians given the overlap in symptoms between both. We found bedside echocardiography (McConnell's and 60/60 sign) to be sensitive in early detection of acute pulmonary embolism, which can aid management in COVID-19-positive patients.

(*Panel A*) Apical 4-chamber view. Akinetic right ventricular basal–mid free wall (yellow arrow) and normokinetic apical segments (red arrows) indicative of McConnell's sign. We suggest watching Supplementary material online *Video S1*. (*Panel B*) The 60/60 sign is present when the pulmonary valve acceleration time is $\leq$60 ms and the tricuspid regurgitation pressure gradient is $\leq$60 mmHg. (*Panel C*) Small, highly mobile, right ventricular thrombus: red arrows. We suggest watching Supplementary material online *Video S2*. (*Panel D*) CT pulmonary angiogram showing bilateral pulmonary emboli: white arrows.

Supplementary data are available at *European Heart Journal - Cardiovascular Imaging* online.