

# THE COLLAPSING COVID-19 PATIENT - ARE YOU CONSIDERING ACUTE PULMONARY EMBOLISM?



AUTHORS: FAREENA ZAHARI, JYO CHONG, NORDIANAH ABDUL RAHMAN, RIDZUAN MOHD ISA  
Institution: *Emergency and Trauma Department Hospital Ampang, Selangor, Malaysia*

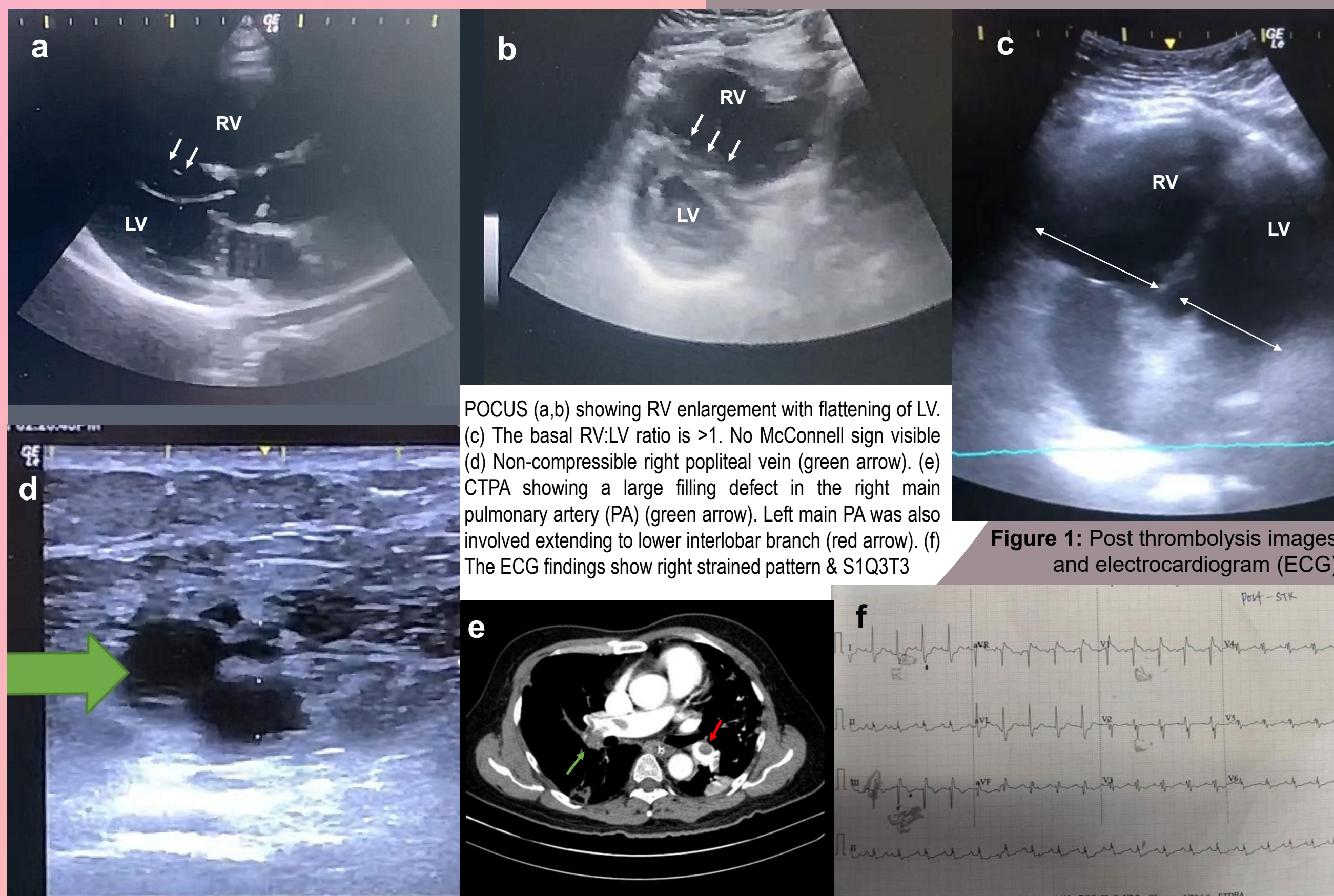
## Introduction

The Coronavirus disease 2019 (COVID-19) is associated with an increased risk of thromboembolism.<sup>1</sup> This case report highlights the diagnostic challenges of pulmonary embolism (PE) in cardiac arrest during the COVID-19 pandemic and emphasizes the role of point of care ultrasound (POCUS) on its diagnostic and therapeutic management.

## Case description

We report on a 62 years old slightly overweight gentleman, with no previous medical illness. He developed a witnessed non shockable cardiac arrest in the ambulance while he was enroute to the hospital. An Advance Cardiac Life Support protocol was initiated and continued in the resuscitative zone of the emergency department. A provisional diagnosis of massive PE with obstructive shock was made following the evidence of right ventricular (RV) dysfunction on bedside ECHO and a positive two-point compression test over the swollen right lower limb suggestive of deep venous thrombosis (DVT). A sustained return of spontaneous circulation (ROSC) was only achieved after the IV administration of thrombolysis, and a subsequent CT pulmonary angiogram (CTPA) confirmed the diagnosis of PE.

Further history revealed that he had cough for 1 week associated with lethargy and dyspnea. PCR for COVID-19 was positive. However, no obvious risk factors for PE were noted.



POCUS (a,b) showing RV enlargement with flattening of LV. (c) The basal RV:LV ratio is >1. No McConnell sign visible (d) Non-compressible right popliteal vein (green arrow). (e) CTPA showing a large filling defect in the right main pulmonary artery (PA) (green arrow). Left main PA was also involved extending to lower interlobar branch (red arrow). (f) The ECG findings show right strained pattern & S1Q3T3

Figure 1: Post thrombolysis images and electrocardiogram (ECG)

## Discussion

PE has been associated with 5-13% of cardiac arrest patients with pulseless electrical activity (PEA) as its most common presenting rhythm.<sup>2-3</sup> However, with the spread of the COVID-19 pandemic and the hypercoagulable nature of the disease, it is unclear if the prevalence of PE in cardiac arrest has increased. The diagnostic challenges also occur in these cohort of patients as there are wide overlapping of symptoms associated with COVID-19 and PE.<sup>4</sup> Well's score was demonstrated to be unreliable.<sup>5</sup> Therefore, a strong clinical suspicion and the use of POCUS is essential to identify a PE related obstructive shock and to distinguish it from other important causes of COVID-19 associated cardiac arrest.<sup>4,6-7</sup>

## Conclusion

We reaffirm the use of POCUS in COVID-19 related cardiac arrest. POCUS is an important bedside tool that can help in the rapid identification of thromboembolic events manifestation of COVID-19 disease during the current pandemic and it is potentially lifesaving.

**Declaration:** The authors do not have any conflict of interest to declare

## References

- Loo J, Spittle DA, Newnham M. COVID-19, immunothrombosis and venous thromboembolism: biological mechanisms Thorax 2021;76:412-420.
- Summers K, Schultheis J, Raiff D, Dahhan T. Evaluation of Rescue Thrombolysis in Cardiac Arrest Secondary to Suspected or Confirmed Pulmonary Embolism. The Annals of Pharmacotherapy. 2019 Jul;53(7):711-715.
- Levine GN et al. Recent Innovations, Modifications, and Evolution of ACC/AHA Clinical Practice Guidelines: An Update for Our Constituencies: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. Circulation. 2019; 139:e879-e886.
- Stals M, Kaptein F, Kroft L et al. Challenges in the diagnostic approach of suspected pulmonary embolism in COVID-19 patients. Postgrad Med. 2021 Aug;133(sup1):36-41.
- Kirsch B, Aziz M, Kumar S, et al. Wells Score to Predict Pulmonary Embolism in Patients with Coronavirus Disease 2019. Am J Med. 2021;134(5):688-690.
- Tsou, PY, Kurbedin, J, Chen, YS, et al. Accuracy of point-of care focused echocardiography in predicting outcome of resuscitation in cardiac arrest patients: a systematic review and meta-analysis. Resuscitation 2017; 114: 92-99.
- Yadav, R., Bansal, R., Budakoty, S., & Barwad, P. (2020). COVID-19 and sudden cardiac death: A new potential risk. Indian heart journal, 72(5), 333-336.