



A Case of Pulmonary Embolism and Pulmonary Hypertension with suspected concomitant Pulmonary Arteriovenous Malformation



CARDINAL SANTOS MEDICAL CENTER
CARDIOVASCULAR INSTITUTE

Manalili, Maria Kristina C., MD¹, Choa, Vivian D., MD¹, Mendoza, Jeffrey P., MD²

¹Section of Echocardiography, Cardiovascular Institute, Cardinal Santos Medical Center, San Juan, Manila, Philippines

²Section of Vascular Medicine, Cardiovascular Institute, Cardinal Santos Medical Center, San Juan, Manila, Philippines

INTRODUCTION

Venous thromboembolism (VTE) refers to a condition of thrombus formation in the peripheral extremities and/or pulmonary vessels which may develop either spontaneously or provoked by triggering events.¹ According to the study of Cantre and Arellano in 2012, VTE is the third giant killer next to stroke and myocardial infarction.

CASE

In this report, we present the case of a 58-year old Filipina who has been experiencing dyspnea and easy fatigability for one year. On physical examination, she was tachypneic with normal oxygenation at room air. She had an irregularly irregular cardiac rhythm and heave. The cardiac apex was not displaced and there was no appreciable murmur. A transthoracic echocardiogram with agitated saline contrast study showed dilated right cardiac chambers and left atrium (LA), and late appearance of microbubbles in the LA, signaling pulmonary arteriovenous malformation (PAVM). *Fig.1.*

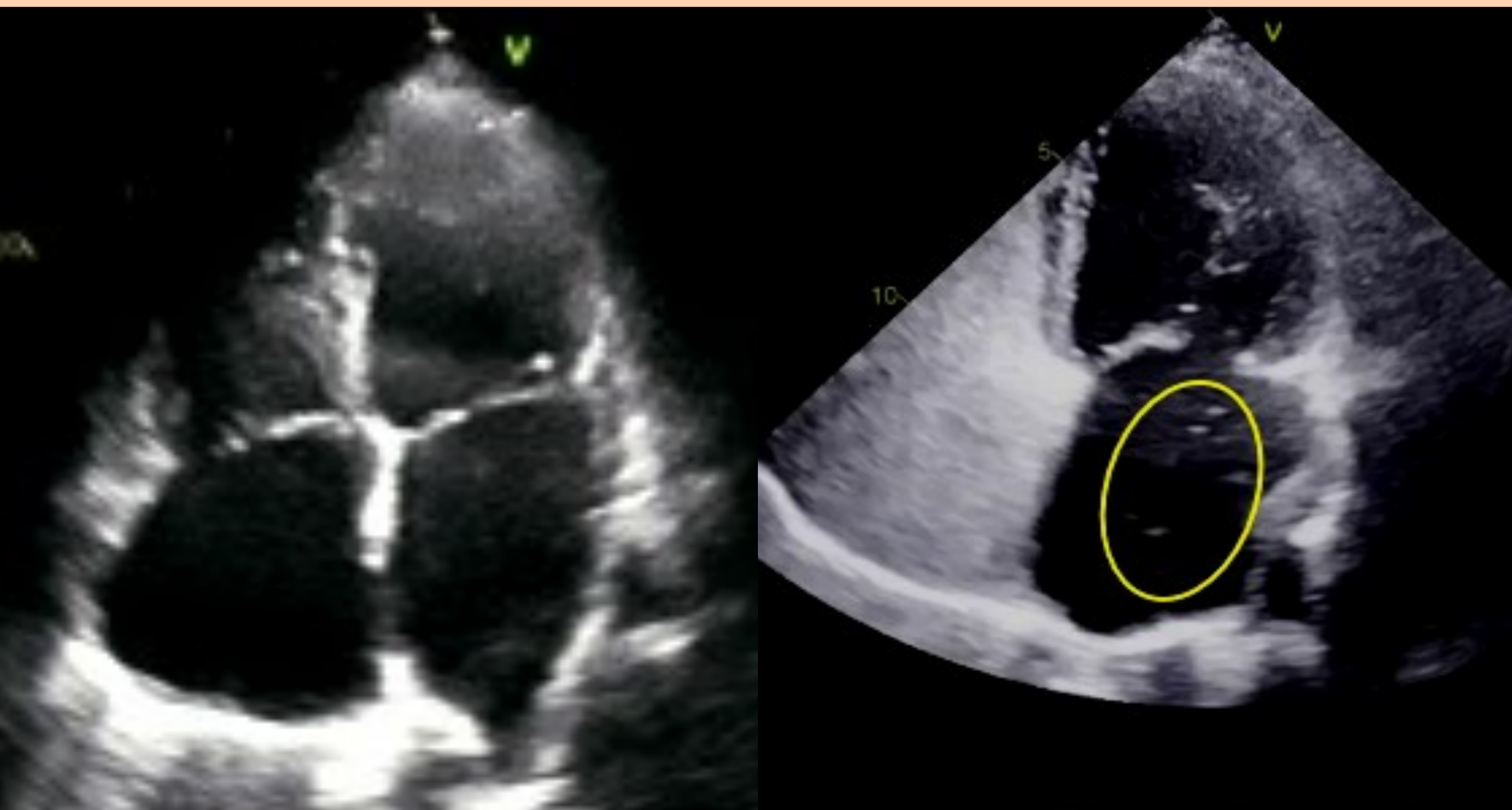


Fig.1. Dilated RV, RA and LA (right) and late appearance of microbubbles in LA on agitated saline contrast study (left).

The LV had adequate systolic function and restrictive filling pattern (E/A of 2.7). The dilated RV had a normal TAPSE and RVFAC of 17 mm and 35%, respectively. However, the RV strain showed global longitudinal strain of -15.5% and free wall strain of -19.1%, which imply a subclinical RV diastolic dysfunction. *Fig.2.*

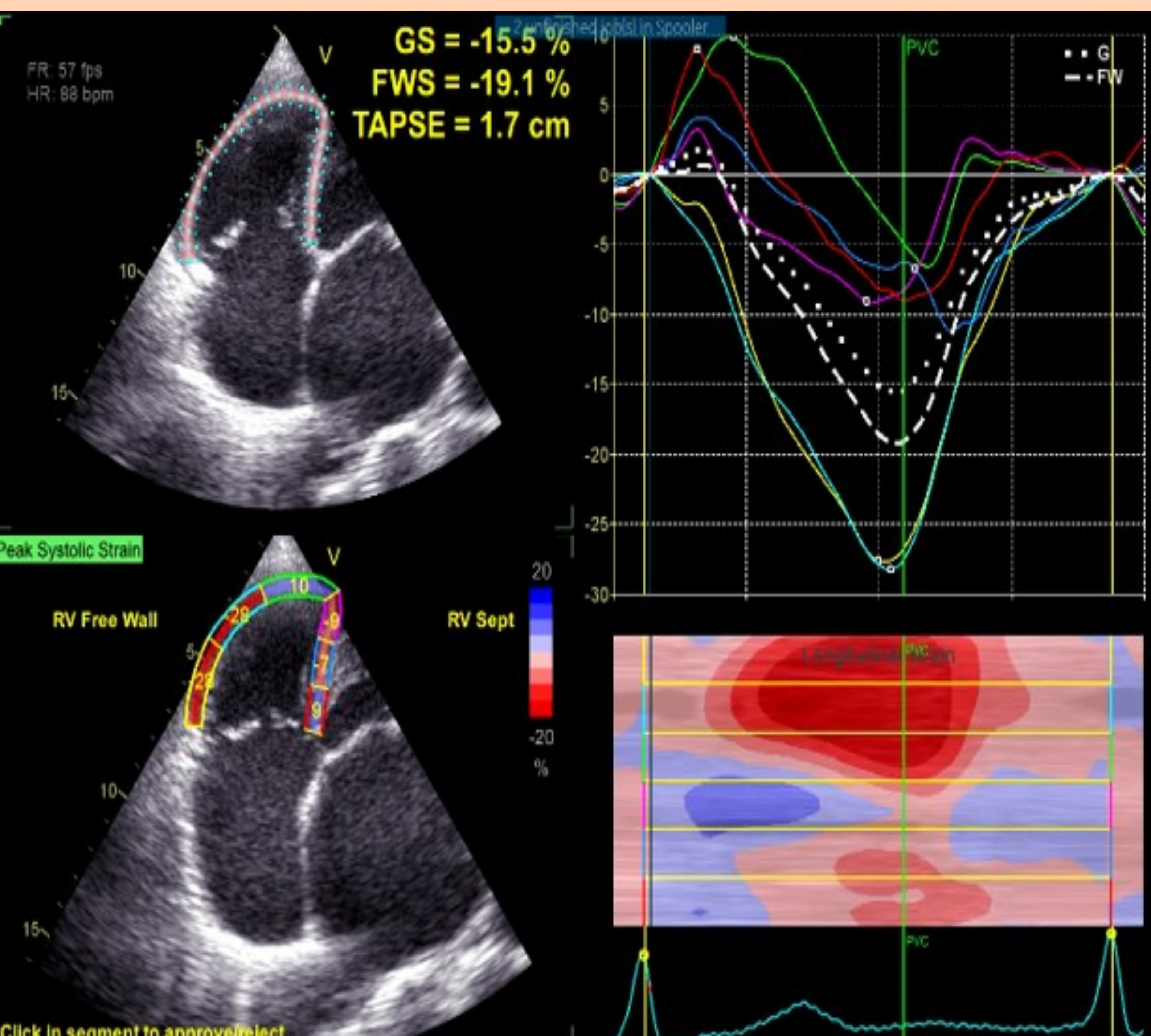


Fig.2. RV strain via speckle tracking using RV focused apical view.

CTPA showed dilated pulmonary trunk with filling defects in the right pulmonary artery—consistent with pulmonary embolism and pulmonary hypertension. *Fig.3.* No PAVM was seen in the CTPA, hence we can surmise that it could be small and is not the primary culprit for the symptoms of our patient. The patient was then started on anticoagulant and phosphodiesterase-5 inhibitor.

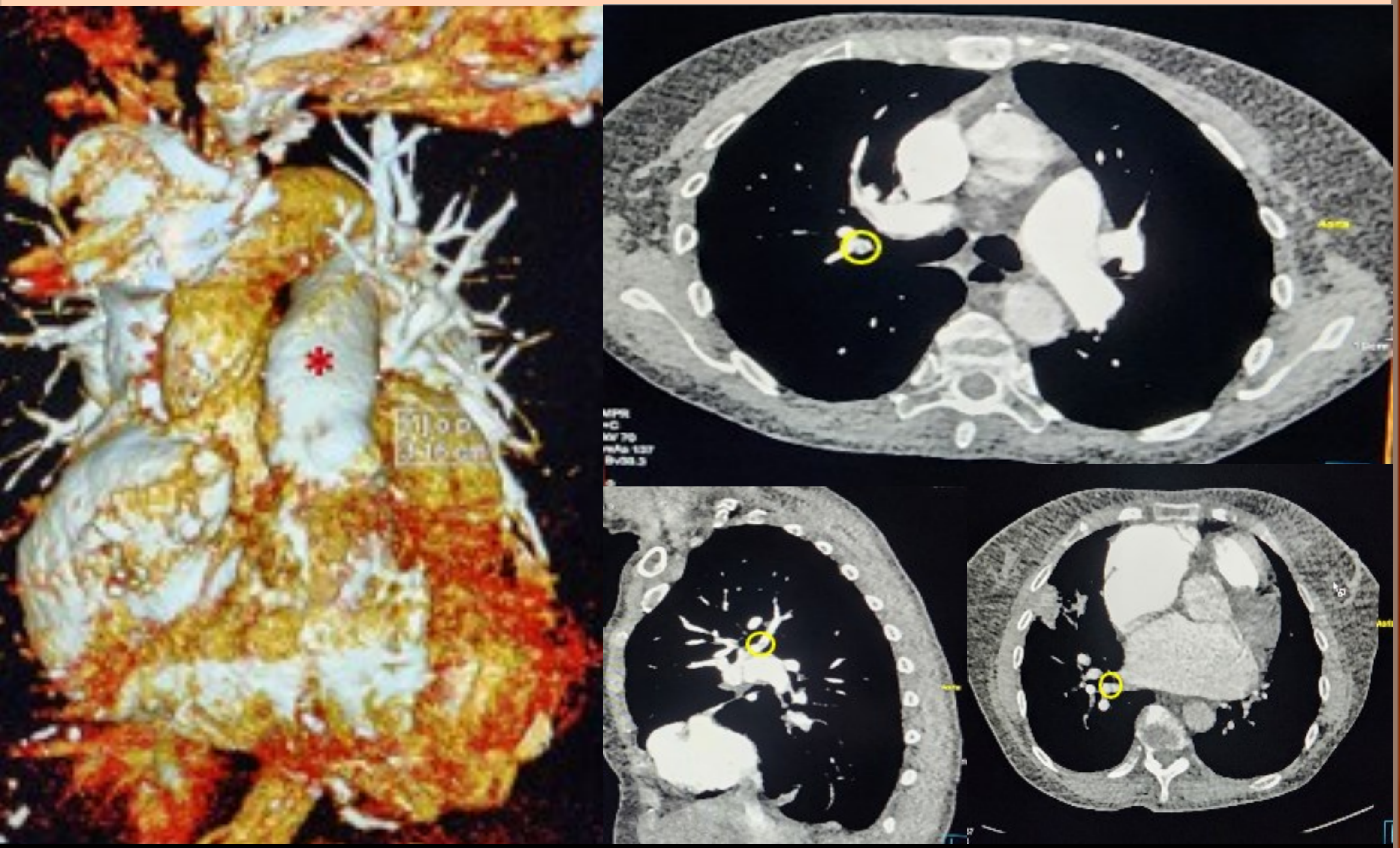


Fig.3. 3D CT pulmonary angiogram (right) showing the dilated pulmonary trunk (red asterisk), and filling defects (yellow circle) in the right pulmonary artery (left).

DISCUSSION

Chronic thromboembolic pulmonary hypertension (CTEPH), one of the known sequelae of pulmonary embolism (PE), can lead to right-sided heart failure and death.⁴ Right heart catheterization (RHC) remains to be the confirmatory test for CTEPH.⁶ However, due to the invasive nature of RHC, studies believe that CTEPH remains to be underdiagnosed. Current guidelines recommend the use of echocardiography as the initial step among patients suspected of PE and CTEPH. PE alone may result to RV dilatation and/or hypokinesia or dyskinesia. However, the review of Tadic *et al* in 2021 concluded that standard RV parameters—RVFAC and TAPSE—have limited prognostic power due to load dependency and complexity of RV geometry. The use of strain can overcome such limitations, and subsequently detect subclinical RV damage even when the standard RV parameters appear to be normal. In our patient, her RVFAC and TAPSE were within normal limits, but her RV GLS imply subclinical dysfunction.

CONCLUSION

As a surrogate for right heart catheterization, echocardiography may be employed in estimating cardiac pressures and hemodynamic evaluation. The use of newer parameters such as strain via speckle tracking, gives additional insight as to the systolic and diastolic functions of chamber/s Being investigated. Such advancements will prevent delay of initiation of treatment in various cardiovascular diseases.



Echo clips

References

