

Point of Care Ultrasound in Risk Stratification of Acute Pulmonary Embolism



Introduction

We present a case of pulmonary embolism in a young man who benefitted from point of care ultrasound. His management was changed significantly with the results despite initial risk stratification suggesting ambulatory management.

Case report

- A previously healthy 36-year old man presented to hospital with exertional breathlessness for a week and mild left leg swelling.
- At triage, he was noted to have a raised BMI and a resting tachycardia (126 beats per minute); oxygen saturations were 96% on air, with a respiratory rate 20 breaths per minute

Investigations

Bloods

- Raised White cell count & CRP
- Normal Troponin

ECG

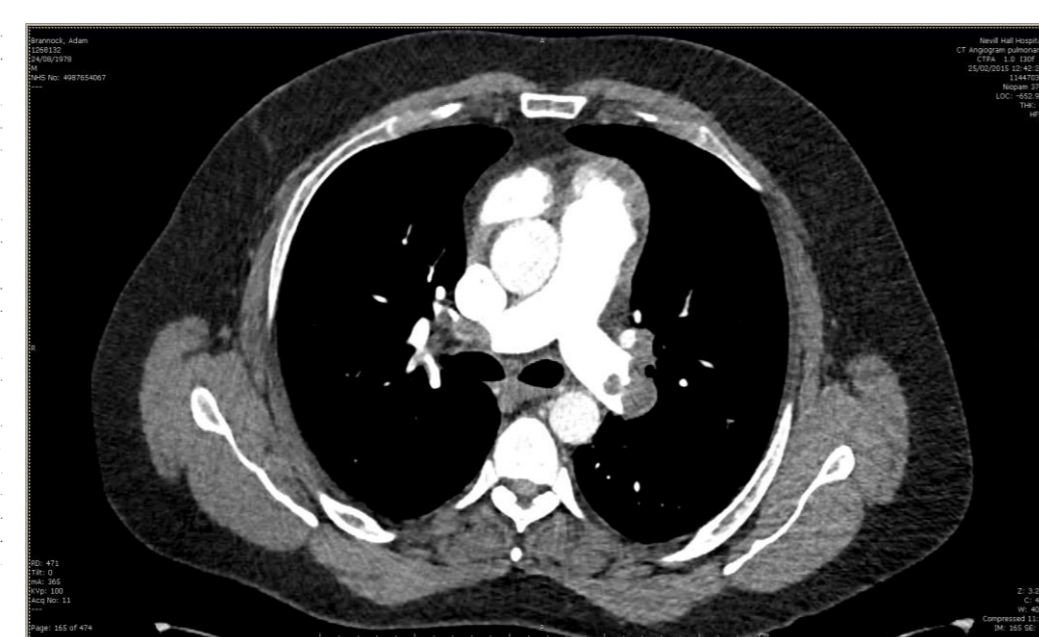


Chest radiograph

- Unremarkable

CTPA

- Bilateral proximal pulmonary emboli (PE)
- No comment on right heart was made



Point of care ultrasound - echocardiogram

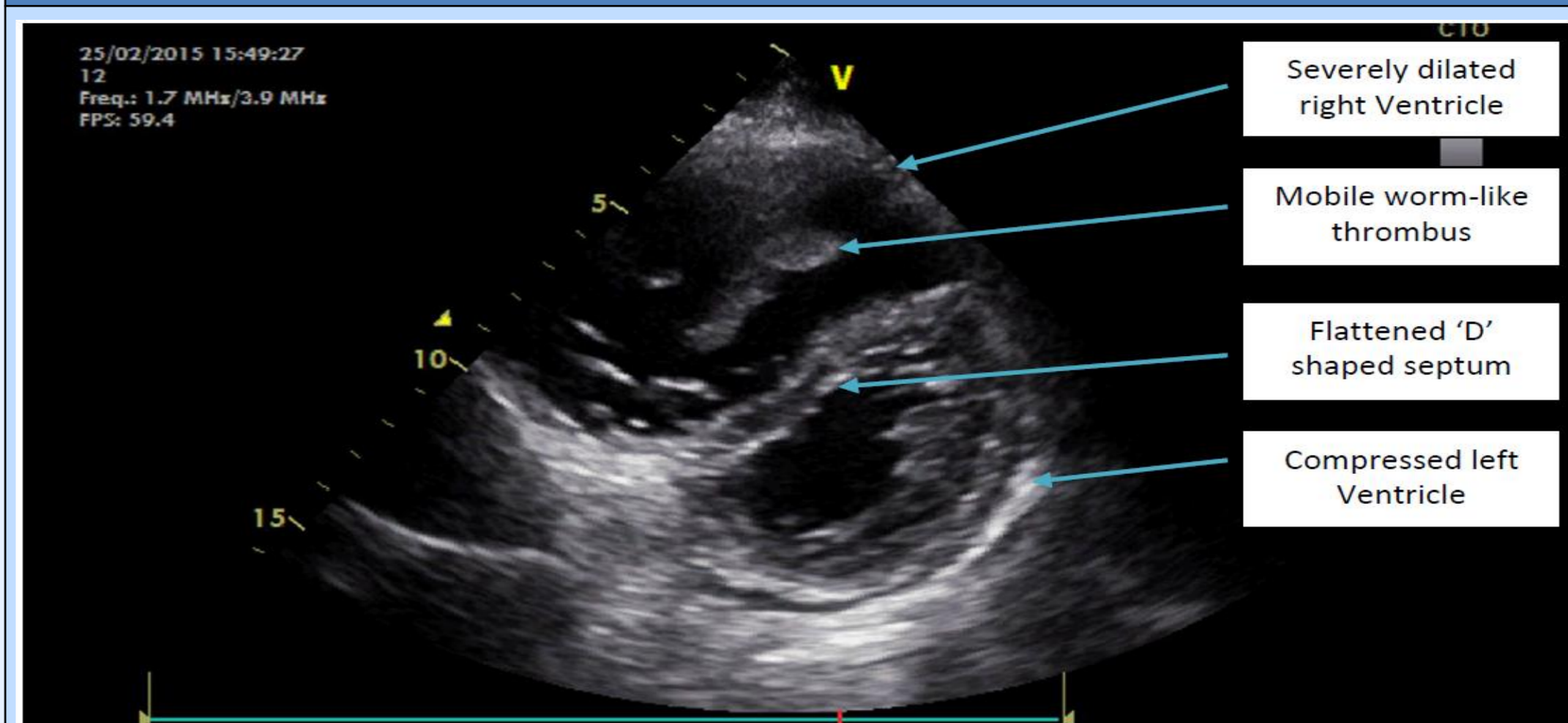


Figure 1. Trans-thoracic echocardiogram: Parasternal short-axis mid LV view showing dilated RV with flattened 'D' shaped LV and thrombotic material within the RV.

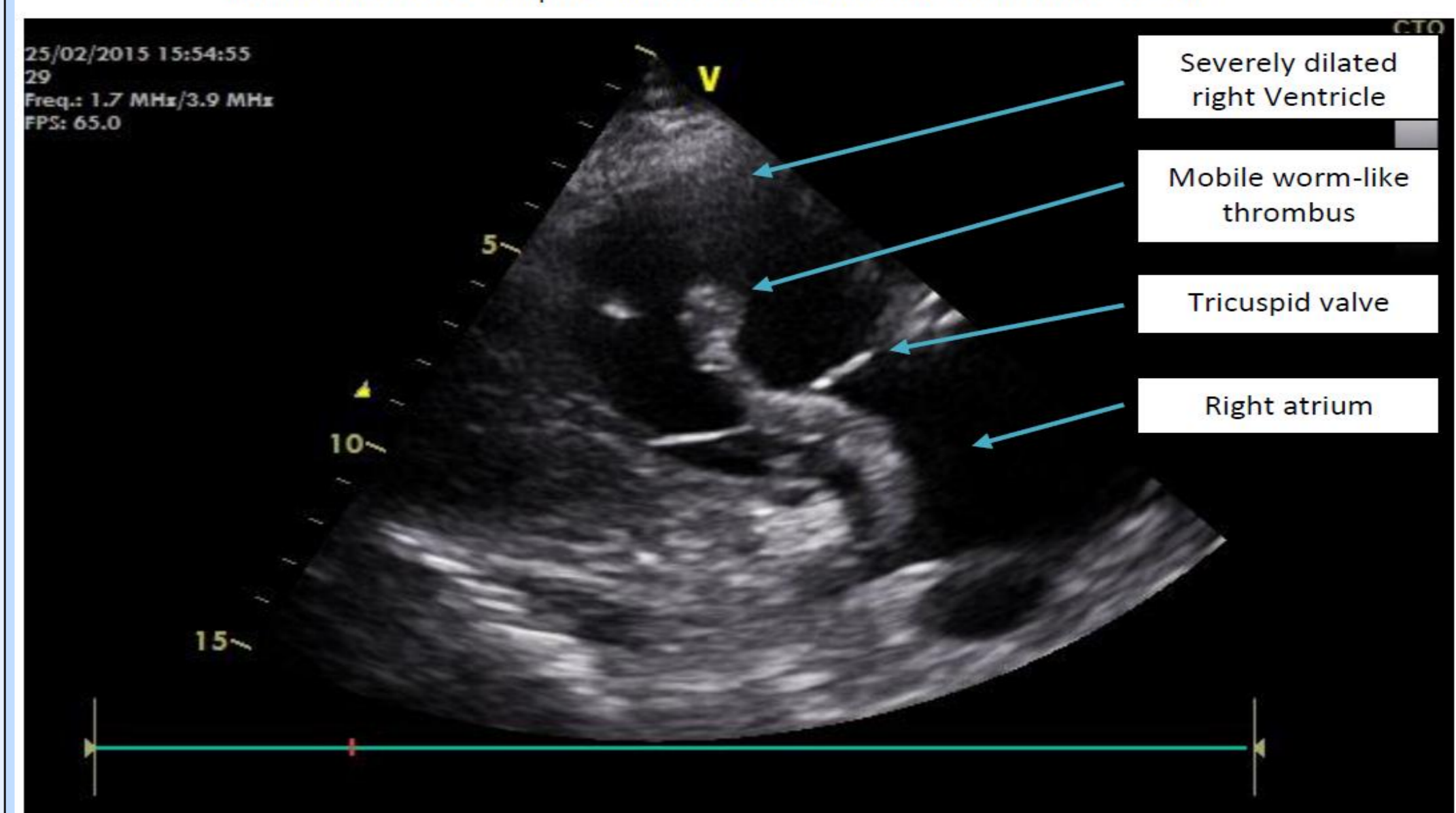


Figure 2. Trans-thoracic echocardiogram: Right ventricular inflow view showing mobile thrombus transversing the tricuspid valve into the right ventricle.

Dilemma

Intermediate Risk PE with Low PESI¹ Score (66)

- Meets ambulatory criteria but tachycardic a week from index event!

Likely cardiovascular instability hence

- Point of care ultrasound (Echocardiogram + FAMUS DVT² scan performed

Diagnosis

Intermediate risk PE with high risk features

- Mobile right atrial thrombus + right heart dysfunction
- Proximal deep vein thrombosis (DVT)

Immediate management:

- Intravenous heparin + monitoring in coronary care unit
- Rescan and re-evaluate in the morning

Further management

Risk assessment was revised in view of higher risk features

- Haemodynamic status + Right heart dysfunction
- Residual clot load (mobile, worm-like cardiac thrombus + proximal residual deep vein thrombosis)

THROMBOLYSED WITH ECHO EVIDENCE OF CLOT (heart and leg) RESOLUTION (immediately post thrombolysis)

Discussion

Intermediate risk PE can pose a management challenge³. It requires personalised decision making with experienced clinicians. Important factors to identify⁴ include degree hypoxaemia, haemodynamic status, serum lactate, troponin, evidence of right heart dysfunction, residual DVT and particularly right atrial thrombus.

This patient with PE was at apparent relatively low risk using the PESI score. With pressure on hospital beds it would have been tempting to discharge him to ambulatory management. With point-of-care ultrasound, his risk stratification and management were altered significantly.

This case highlights the value of point-of-care ultrasound performed by acute physicians out of hours in various scenarios including the 'simple' low risk PE.

References

1. Aujesky D, Obrosky DS, Stone RA, Auble TE, Perrier A, Cornuz J, Roy PM, Fine MJ. Derivation and validation of a prognostic model for pulmonary embolism. *Am J Respir Crit Care Med* 2005;172(8):1041-1046.
2. Smallwood N, Dachsel M, Ramprasad M, Tabiowo E, Walden A. Focused Acute Medicine Ultrasound (FAMUS) – point of care ultrasound for the Acute Medical Unit. *Acute Medicine* 2016;15(4):193-196.
3. The Task Force for the Diagnosis and Management of Acute Pulmonary Embolism of the European Society of Cardiology (ESC). 2014 ESC Guidelines on the diagnosis and management of acute pulmonary embolism. *Eur Heart J* 2014;35(43):3033-3073.
4. Condliffe R, Elliot CA, Hughes RJ, Hurdman J, Maclean RM, Sabroe I, van Veen JJ, Kiely DG. Management dilemmas in acute pulmonary embolism. *Thorax* 2013;0:1-7.