

Echocardiographic diagnosis of a Pulmonary Embolism using the aortic arch view

Ehab Jaradat, RDCS , Cardiac Investigations, Mayo General Hospital

Presentation and clinical history

Patient was 26y Male , 79.00 kg , Heavy smoker who attended to the ER @6:00Am with the following symptoms :

- shortness of breath
- tachycardic,
- dizziness,
- sharp chest pains,
- bluish colour
- sweating

Initial investigations

Chest X-ray:

Pulmonary artery enlargement and cardiomegaly.

ECG :

low voltage , sinus tachycardia, ST depression & T wave Inverted overall the leads .

Arterial blood gas measurements :

low oxygen saturation

Patient suffered a cardiac arrest at 6:35am and was successfully resuscitated. Clinically a pulmonary embolus was suspected and the patient was transferred to CCU where he suffered another cardiac arrest at 7:45am, again he was successfully resuscitated. An echo was performed at 8:10am

Echocardiography findings

Parasternal window was technically difficult due to the clinical scenario. An apical four chamber view demonstrated classic findings consistent with a pulmonary embolus

- Massively dilated right ventricle

- Elevated pulmonary artery pressure of 85mmHg, derived from the tricuspid regurgitation

The suprasternal view clearly showed the aortic arch **fig 1** with the presence of a large thrombus partially occluding the pulmonary artery (circled)



Fig 1 Pulmonary embolus clearly seen in right pulmonary artery at 825am

The patient was transferred to the Cath Lab and a catheter was placed in the pulmonary artery and connected to a TPA (tissue plasminogen activator) drip.

Six hours after the intervention repeat echocardiography demonstrated marked reduction in size of the embolus



RV dimensions had returned to normal and PA pressure had also returned to 21mmHg, within the normal range

Conclusion

In this particular case the suprasternal view confirmed the presence of a pulmonary embolus and in this unstable patient further confirmation by way of Computed Tomography (CT) was not required. It was also possible to track the

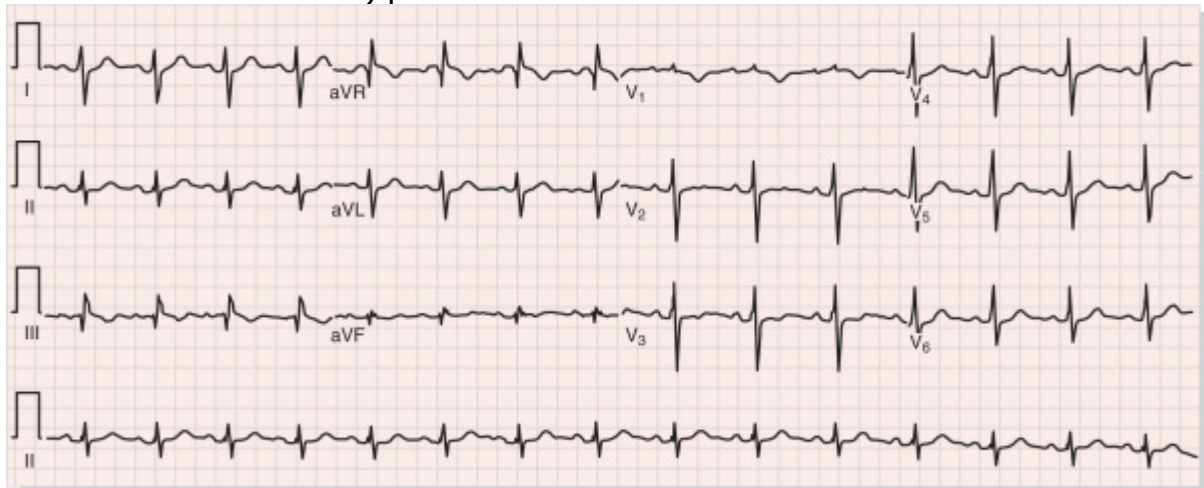
resolution of the pulmonary embolus following treatment using follow-up echocardiography studies.



Clinical Perspective from the Editor

Signs and symptoms of a PE include
Otherwise unexplained dyspnea
Chest pain, either pleuritic or "atypical"
Tachypnea
Tachycardia
Low-grade fever
Tricuspid regurgitation murmur
Accentuated P2

The ECG classically shows a S1(swave in lead I) Q3(Q wave in lead III) T3(T wave inversion in lead III) pattern



ECHOCARDIOGRAPHY.

Echocardiography ([Table 72-10](#)) is normal in about half of unselected patients with acute PE. Therefore echocardiography is not recommended as a routine diagnostic test for PE. However, it is a rapid, practical, and sensitive technique for detection of right ventricular overload among patients with established and large PE. Moderate or severe right ventricular hypokinesis, persistent pulmonary hypertension, a patent foramen ovale, and free-floating thrombus in the right atrium or right ventricle help identify patients at high risk of death or recurrent thromboembolism. For those patients in whom transthoracic imaging is unsatisfactory, transesophageal echocardiography can be carried out.

TABLE 72-10 -- Echocardiographic Signs of Pulmonary Embolism

RV enlargement or hypokinesis, especially free wall hypokinesis, with sparing of the apex (the McConnell sign)
Interventricular septal flattening and paradoxical motion toward the LV, resulting in a "D-shaped" LV in cross section
Tricuspid regurgitation
Pulmonary hypertension with a tricuspid regurgitant jet velocity >2.6 m/sec
Loss of respiratory-phasic collapse of the inferior vena cava with inspiration
Dilated inferior vena cava without physiological inspiratory collapse
Direct visualization of thrombus (more likely with transesophageal echocardiogram)

LV= left ventricle; RV = right ventricle

After 24 hours repeat echocardiography showed complete resolution of the pulmonary embolus.

