CASE REPORT

Massive pulmonary embolus and a precariously positioned thrombus: teetering on a knife edge!

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SUMMARY

Pulmonary embolism (PE) is a common condition seen regularly by emergency physicians. The authors describe a patient who presented with shortness of breath and syncope. He also experienced drowsy, clammy and sweaty episodes. He was tachycardic, tachypnoeic and saturating at 92% on air. A chest X-ray was normal but an ECG showed S1Q3T3. A CT pulmonary angiography performed showed bilateral pulmonary emboli with a large inferior vena cava (IVC) thrombus. Echocardiography revealed severely dilated right ventricle and atrium, severe right ventricular impairment, pulmonary hypertension, large mobile friable clots seen extending into the tricuspid valve. A multidisciplinary team decided the safest management approach was intravenous heparin. The patient recovered and repeat echocardiography 5 days later showed significantly smaller clots. The extension of an IVC thrombus into the heart and prolapsing into the tricuspid valve is an extremely rare presentation. Furthermore this case demonstrates the importance of echocardiography when diagnosing and generating bespoke management plans for PE.

BACKGROUND

Pulmonary embolus is an extremely common disease regularly encountered by emergency physicians. There are well-defined protocols regarding the management of pulmonary embolism (PE).¹

Furthermore, this case highlights the value of echocardiography in the diagnosis and management of acute pulmonary embolic disease.

CASE PRESENTATION

A 58-year-old previously healthy man was admitted to A&E with shortness of breath on exertion and pleuritic pain in his right hypochondrium, chest

and back. He had a witnessed drowsy, clammy sweaty and unresponsive episode 1 day prior to admission. His respiratory rate was 22 breaths per minute, blood pressure 122/97, heart rate of 100 and saturating at 92% on air. On examination there were no features of note. Chest X-ray was normal but an initial ECG showed S waves in lead 1, Q waves in lead 3 and inverted T waves in lead 3. The patient's blood samples demonstrated a peak troponin of 1200 and a raised D dimer. Therapeutic fragmin was initiated.

INVESTIGATIONS

A CT pulmonary angiography (figure 1) was performed which showed massive pulmonary emboli. The imaging also suggested the presence of a thrombus extending from the inferior vena cava (IVC) into the right atrium (RA). This patient had no risk factors for the development of (PE). Furthermore, he had no family history of spontaneous venous clots.

An echocardiogram was subsequently performed (figure 2). The principle findings were:

- ▶ Severely dilated RV
- ▶ Severe RV impairment
- ▶ PASP 50 mm Hg (in setting of poor RV function)
- ▶ Large mobile friable clots seen extending from the IVC and prolapsing into the tricuspid valve occasionally.
- ▶ RA dilated

TREATMENT

After a multidisciplinary team discussion involving cardiologists, physicians, surgeons, radiologists and haematologists a decision was made not to operate or thrombolise the patient, which is the usual

Figure 1 CT pulmonary angiography images showing (a) large pulmonary emboli in both branches of the pulmonary trunk. The second slice (b) suggests the presence of a clot extending from the inferior vena cava to the right atrium.

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Figure 2 Echocardiographic views of the large thrombus extending from the inferior vena cava (IVC) and prolapsing into the tricuspid valve.

treatment for large pulmonary emboli causing respiratory or haemodynamic compromise. It was felt further embolisation was a distinct possibility with both aggressive management options. This would likely lead to irreversible deterioration and probable death of the patient owing the friable nature of the clots present in the RA.

Thus intravenous heparin and warfarin was used to gradually lyse the clot while the patient was observed on a high-dependency cardiac unit.

OUTCOME AND FOLLOW-UP

Following treatment, a repeat echo 5 days later demonstrated significantly smaller clots in the RA. The patient was discharged with long-term warfarin.

DISCUSSION

This is a case report describing a patient presenting with massive pulmonary emboli and a large IVC thrombus prolapsing into the heart. Right heart embolism is a rare and dangerous entity with likelihood of subsequent pulmonary embolus of 97%, and mortality of 44%.² Moreover, the presence of a large IVC thrombus prolapsing into the tricuspid valve is exceedingly rare. The diagnosis may be achieved with CT, angiography or during surgery.²⁻³ Treatment is usually by heparin, thrombolysis or by surgical embolectomy. The probability of survival with none of the aforementioned therapies is 0.19.⁴

This case demonstrates the immense value of transthoracic echocardiography in the detection and formulation of management plans in acute massive PE and in particular right heart thrombi. Furthermore, this case highlights the essential need to create bespoke management plans for individual patients. In this protocol-driven era of medicine, it is essential to use clinical judgement in conjunction with protocols to treat patients.

Learning points

- ▶ The use of echocardiography in pulmonary embolism
- ▶ The necessity for multidisciplinary teams in the management of complex and critical patients
- ▶ The need to treat each patient on an individual basis and create bespoke management plans.

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