

Echocardiographic features of free floating thrombus mimicking right ventricular myxoma

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SUMMARY M-mode and cross-sectional echocardiography performed in a patient with acute pulmonary embolism showed a sausage shaped, mobile mass in the right ventricular cavity highly suggestive of a right ventricular myxoma. Emergency thoracotomy 24 hours later showed the right ventricle to be free of tumour but both pulmonary arteries contained embolised venous thrombi, one or more of which were thought to have given rise to the false echocardiographic diagnosis of a right ventricular tumour.

Echocardiography is now the investigation of choice for suspected intracardiac tumours, especially myxomas. False positive diagnosis is unusual, but can occur as a result of faulty recording techniques or misinterpretation. We report here a patient with subacute massive pulmonary embolism in whom echocardiographic findings closely mimicked a right ventricular myxoma.

Case report

The patient, a 51 year old man, was admitted to hospital on 17 September 1982, a few hours after an attack of severe dizziness while getting out of a bath. He noticed numbness in the right arm and leg but denied any symptoms of dyspnoea, chest pain, or haemoptysis. Apart from a history of dizziness on standing over a period of several weeks, there was no relevant previous illness. Examination showed an obese man with no clinical features of a deep vein thrombosis. There were no abnormal neurological signs but he appeared ill, with central cyanosis, tachypnoea, and a tachycardia of 120/min. Arterial pulses were all present but of small volume, and the blood pressure was 135/90 mmHg on admission. Auscultation showed an apical gallop but no heart murmurs, and normal breath sounds. Chest radiograph was normal but the electrocardiogram showed features of right ventricular strain, with an S wave in standard lead I and a small Q wave in III, with T inversion. Arterial blood gases confirmed hypoxaemia with a P_{O_2} of 7.9 kPa. Pulmonary embolism was suspected and the diagnosis confirmed by an isotopic ventilation perfusion lung scan which showed bilat-

eral multiple perfusion defects. He was treated with intravenous heparin 10 000 units six hourly but made no progress over the next three days. As no obvious source for pulmonary embolism was found echocardiography was requested to exclude intracardiac pathology.

ECHOCARDIOGRAPHIC FINDINGS

M-mode echocardiograms showed no abnormalities in the left heart. In the region of the right ventricular cavity there were abnormal bands of echoes showing gross systolic and diastolic movements (Fig. 1a). Real time cross-sectional scanning was performed using a 2.25 MHz, 90° angle mechanical head (Smith Kline). This confirmed the presence of a space occupying lesion inside the right ventricle. The lesion could be visualised in several planes of the right ventricular cavity recorded from both the left sternal edge and the cardiac apex (Fig. 1b). It was sausage shaped and measured approximately 1 cm wide and 3 cm long, and was unrelated to the tricuspid or pulmonary valves. No obvious stalk or point of attachment to the right ventricular wall could be shown. The mass was highly mobile showing similar movements to the tricuspid valve in diastole but moving towards the outflow tract during systole.

The right ventricular lesion was thought to be a tumour, most probably a myxoma, and pulmonary emboli were thought to have originated from this. Twenty-four hours after the echocardiographic examination the patient's condition deteriorated further with hypotension (blood pressure 100/75 mmHg), tachypnoea, and severe cyanosis, and it was decided to carry out an emergency exploration of the

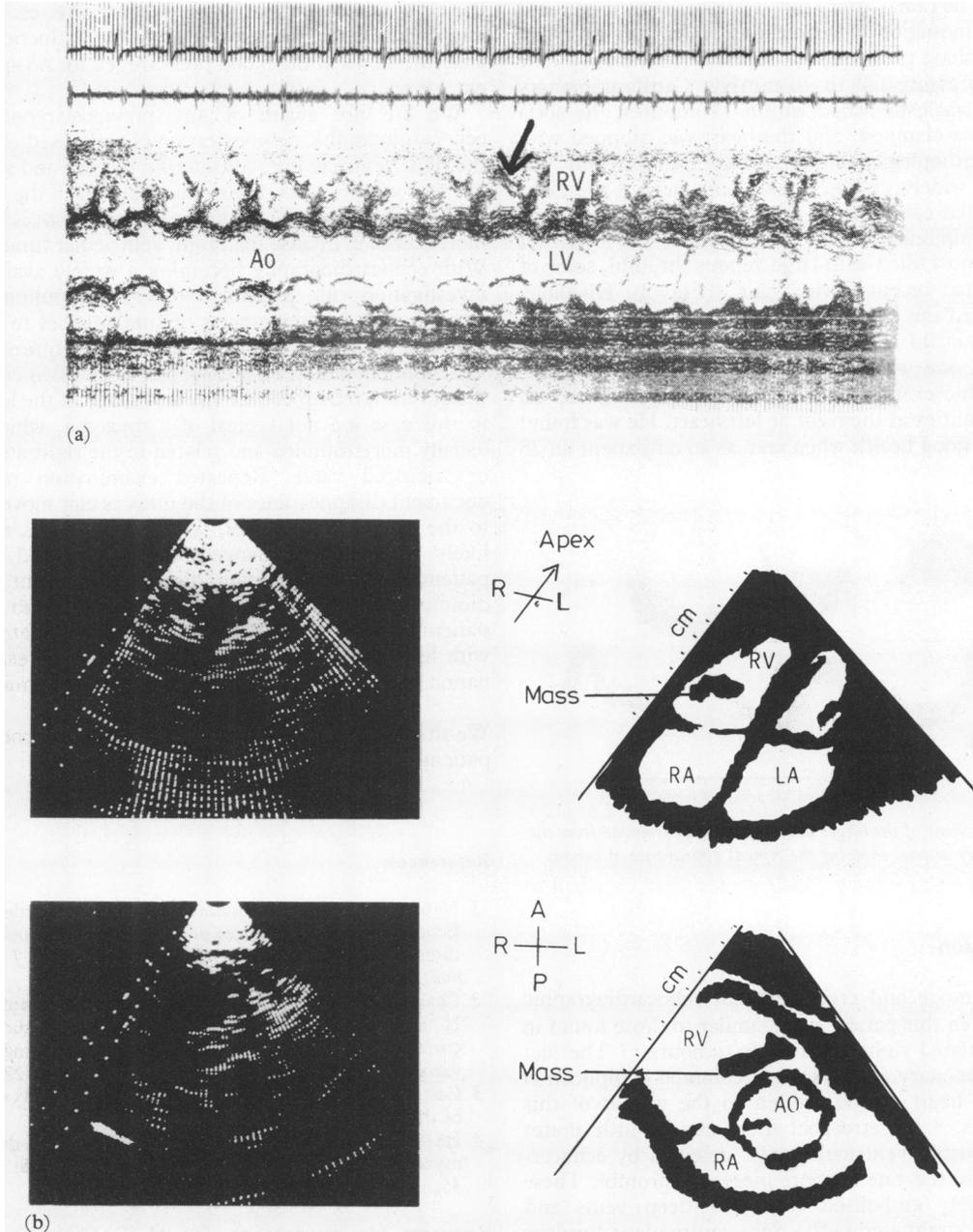


Fig. 1(a) *M-mode* echocardiographic recording from the left sternal edge showing abnormal echoes in the right ventricular cavity (arrow). The lesion appeared to occupy a large area of the ventricular cavity and showed both systolic and diastolic movements. **(b)** Apical four chamber and left sternal minor axis views of the right ventricular cavity. The mass is unrelated to the tricuspid valve and extends from the body of the right ventricle towards the ventricular outflow.

heart. The radial artery blood pressure was monitored during induction of anaesthesia which had no effect on the blood pressure, but shortly afterwards systolic blood pressure fell to 70 mmHg. Cardiopulmonary bypass was established within 15 minutes, the aorta was cross clamped, and the heart was stopped with cold cardioplegic solution. The right atrium was opened widely giving an excellent view of the right ventricular cavity which was normal and empty. The main pulmonary artery was opened; the branches were almost filled with large venous thrombi, some of which had recent fibrin "tails" (Fig. 2). Histology confirmed the absence of tumour. The patient made an uneventful recovery and left hospital on 29 September, one week after operation. Repeat echocardiographic examination before discharge showed no abnormalities in the right or left heart. He was found to be in good health when seen as an outpatient on 25 October.



Fig. 2 Some of the larger pieces of thrombi removed from the pulmonary arteries showing the typical appearance of venous casts.

Discussion

The M-mode and cross-sectional echocardiographic findings in this patient were similar to those found in pedunculated right ventricular tumours.^{1,2} The fact that pulmonary embolism is a common complication of right heart tumour added to the weight of this diagnosis.^{3,4} In retrospect there can be little doubt that the right ventricular mass detected by echocardiography was one or more pieces of thrombi. These presumably embolised from the deep veins and became caught among the right ventricular subvalvar apparatus. Some time between the echocardiographic examination and the open examination of the heart

the clots moved on to the pulmonary arteries. This might have occurred shortly after the induction of anaesthesia when the blood pressure fell for no apparent cause.

We are not aware of any previous report of echocardiographic demonstration of embolised clot in the right ventricle but, considering the size and shape of these venous casts, their entanglement in the right heart is not surprising. Pulmonary embolism is a far more common disease than right ventricular tumours. With echocardiography becoming a widely available investigation in patients with cardiopulmonary emergencies, further reports of similar cases to ours may be anticipated. More experience is required for the confident differential diagnosis of the two conditions, but in retrospect the site and shape of the lesion in this case are not typical of a myxoma, which is usually more rounded and related to the right atrium or tricuspid valve. Repeated examination might document disappearance of the mass as clot moves on to the pulmonary arteries, while a tumour is more likely to remain unchanged. As it happened, our patient's clinical condition dictated an urgent cardiectomy, with a satisfactory outcome. Had the patient's condition been stable, continued treatment with heparin and repeated echocardiographic examination would have been the management of choice.

We thank Dr E Elias for permission to report on his patient.

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