

Resolution of right atrial thrombus shown by serial cross sectional echocardiography

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SUMMARY A 78 year old woman with congestive cardiac failure developed pulmonary embolism. Cross sectional echocardiography detected an undulating fusiform mass attached to the lateral wall of the right atrium and protruding through the tricuspid valve. Serial cross sectional echocardiograms showed a reduction in the size of the mass, and by three months the mass was immobile and attached by a broad base to the lateral atrial wall. The mass was assumed to be a thrombus, and treatment with heparin and oral anticoagulants appeared to prevent the development of further pulmonary emboli.

Right atrial thromboemboli are rarely diagnosed clinically, but reports of their recognition by cross sectional echocardiography have appeared recently.¹⁻⁷ As no series of patients is available it is necessary to build up a picture of the value of the technique from case reports. The information needed is: whether cross sectional echocardiography can differentiate between thrombus and tumour; whether abnormal echoes originate in situ or migrate from peripheral veins; and whether the appearance and character of the echoes can help in deciding optimum treatment. Here we describe a patient who presented with pulmonary embolism and cross sectional echocardiographic evidence suggesting a right atrial thrombus protruding through the tricuspid valve.

Case report

A 78 year old woman was admitted in congestive cardiac failure. She gave a 10 year history of atrial fibrillation, hypertension, and thyrotoxicosis. Auscultation showed a pansystolic murmur at the apex. One week later she developed pleuritic pain with haemoptysis, which was thought to be caused by a pulmonary embolus. Cross sectional echocardiography before the probable embolus had shown a considerable amount of pericardial fluid and mitral annular calcification. A week later the pericardial effusion had resolved, but the right atrium contained a large mobile mass pro-

truding through the tricuspid valve (Fig. 1). This fusiform mass undulated, had a distinct acoustic margin, and was attached to the lateral wall of the right atrium.

A week later the cross sectional appearance of the mass showed that it had reduced in length and was no longer protruding through the tricuspid valve. She was treated with oral anticoagulants after an initial course of heparin, and no clinical or radiographic signs of recurrent embolism developed subsequently. Three months after the initial demonstration of the mass the echocardiogram showed a broad based, ses-

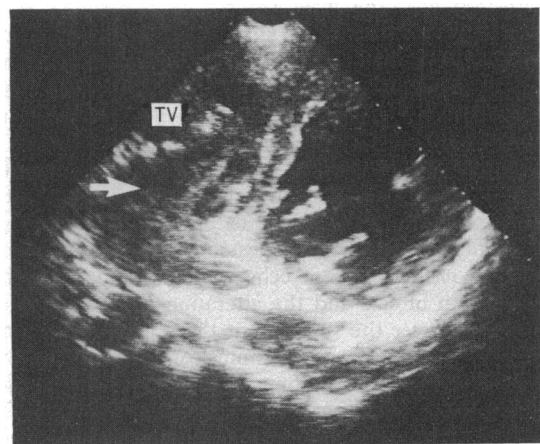


Fig. 1 Cross sectional echocardiogram in the short axis view at left sternal border showing clot (arrow) attached to right atrial wall and protruding through tricuspid valve (TV).

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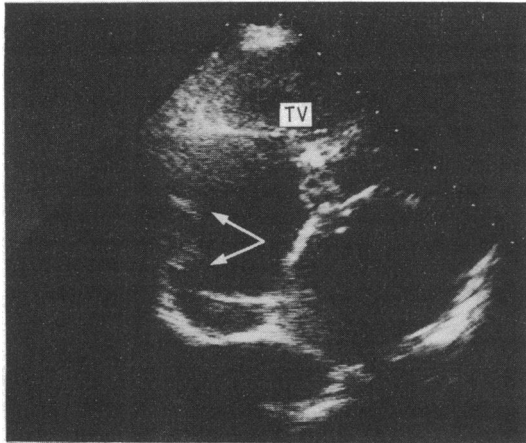


Fig. 2 Cross sectional echocardiogram in the short axis parasternal view showing sessile clot (arrows) on the lateral wall of the right atrium.

sile mass on the lateral wall of the atrium at the site of the original attachment (Fig. 2).

Discussion

Using cross sectional echocardiography, right atrial thrombi have been shown to be free floating,^{2,3,6} sessile with a broad attachment to the atrial wall,⁴ or pedunculated,^{5,7} as in the present case. Deduction from individual case reports may be misleading. Thus Redish and Anderson described the mass in their patient as homogenous and regarded the lack of a discrete attachment point as favouring a diagnosis of clot,⁶ whereas Manno *et al* stated that the typical appearance of an atrial thrombus was a non-homogeneous, immobile mass with a broad based attachment to the atrial wall.⁴

The main problem in diagnosis is to differentiate between thrombi and tumours. Myxoma is likely if an attachment to the interatrial septum is shown, but right atrial thrombus fixed to the interatrial septum has been described in one patient.⁷ Attachment of a pedunculated mass to the lateral wall of the right atrium in our patient and that of Come⁵ favoured thrombus or embolus. The nature of the mass in our patient was further suggested by the undulating motion of the elongated echoes and particularly by the reduction in size and the alteration in movement of the mass over the subsequent three months. During that period there was no clinical or radiographic evidence of further pulmonary emboli, which suggests that the echo findings resulted from resolution of the thrombus by retraction against the atrial wall rather than by breaking off of pieces of thrombus. Myxoma could have reduced in size only if myxomatous tissue had broken off to cause pulmonary embolism.

It is impossible to be certain echocardiographically whether the right atrial mass in this case was a thrombus developing in situ or whether it represented an embolus from deep veins. We have referred to the mass as a thrombus because of the absence of any clinical evidence of peripheral venous thrombosis, the low cardiac output state, and the attachment to the atrial wall. Local thrombosis is certain only in patients with foreign bodies such as catheters⁸ or a Le Veen shunt¹ in the right atrium.

On detection of a right atrial thrombus or embolus by cross sectional echocardiography the choice is between medical treatment with anticoagulants, streptokinase, or antiplatelet aggregation treatment and surgical management. Patients with these right atrial masses are at risk of sudden death from obstruction of the tricuspid orifice or right ventricular outflow tract and from pulmonary embolism. One patient treated with streptokinase died,³ as did one receiving aspirin and dipyridamole,⁷ and necropsy showed right ventricular outflow tract obstruction by thrombus⁶ in a further patient who had died before planned arteriography and surgery.

The use of streptokinase has been questioned: Starkey and de Bono thought that partial dissolution of the thrombus could have led to death from pulmonary emboli in their patient,³ and Come speculated that streptokinase could deplete plasminogen and promote thrombus growth.^{5,9} Operation was ruled out in our patient because of her general frailty, but heparin followed by oral anticoagulants appeared to be successful in permitting resolution of the right atrial thrombus. The general clinical condition of a patient may dictate whether surgery is advisable, and patients such as ours with longstanding, irreversible heart disease are unlikely to obtain prolonged benefit from operation.

Cross sectional echocardiographic investigation should be performed in all patients with pulmonary emboli, as van Kuyk *et al* suggested,⁷ but would entail a major increase in workload in many laboratories, and, until the prevalence of cross sectional echocardiographically detectable right sided thrombi in such patients is known, this advice seems premature. At present severely ill patients with pulmonary emboli, and particularly those considered for pulmonary embolectomy, should undergo cross sectional echocardiography.

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