

Case Report

A Giant, Free-Floating Mass in the Left Atrium in a Patient with Atrial Fibrillation

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A large intracardiac mass is a rare condition and one with an extremely high risk of haemodynamic and embolic complications. Urgent surgical excision is the treatment of choice, and the histological examination reveals the exact nature of the mass, usually a myxoma or a thrombus. We present the case of an 80-year-old woman, with a history of atrial fibrillation, who was admitted because of a seriously impaired level of consciousness, and fever. A large cerebral infarct and a urinary tract infarction were diagnosed. On the transthoracic echocardiogram a giant, free-floating mass was detected in the left atrium, transiently obstructing the mitral valve orifice. Based on the features of the mass and patient's history, it was considered more likely to be a thrombus rather than a tumour. Given the patient's extremely unfavourable neurological status, cardiac surgery was considered to be contraindicated and the patient was administered unfractionated heparin intravenously. Unfortunately, after a few hours the patient suffered a cardiac arrest and died.

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A giant, free-floating mass inside a cardiac cavity is a rare finding and one with a great risk of serious complications. The patient may present with symptoms of heart failure, syncope or embolic events, but occasionally can be asymptomatic or with atypical symptoms. A cardiac myxoma and a thrombus are the most common entities in cases of such ball-shaped masses in the left atrium. Mitral valve stenosis and atrial fibrillation are the most common predisposing factors for thrombus development in the left atrial cavity, especially in patients not taking antithrombotic treatment.

Case presentation

A 80-year-old woman was admitted to the emergency department of our hospital because of high fever (up to 39.5°C), a serious decline in her level of conscious-

ness, and refusal to take any food or water during the last few days. The patient was known to suffer from arterial hypertension and atrial fibrillation (AF), diagnosed one year previously. She had been prescribed nifedipine, metoprolol and digoxin, and she had not been receiving any antithrombotic treatment.

During initial physical examination, the patient had a seriously impaired level of consciousness, low systolic blood pressure (≈ 60 mmHg), tachycardia (HR ≈ 110 /min), tachypnoea (≈ 30 breaths/min), hypoxaemia (satO₂ $\approx 80\%$) and fever (39°C). On auscultation, heart sounds were arrhythmic and rales were present in the basal and middle lung fields. There was no jugular venous distension or ankle oedema. Babinski's sign was present on the right side.

The patient was administered O₂, positive cardiac inotropes and fluids in-

travenously, which led to improvement of her haemodynamic and respiratory parameters.

Blood tests revealed an elevated white blood count (16,400 / μ l), impaired renal function (urea 178 mg/dL, creatinine 2.1 mg/dl), hyperkalaemia (6.9 mmol/L), elevated levels of transaminases (alanine transaminase 83 U/l, aspartate transaminase 104 U/l), digoxin (3.99 ng/ml) and troponin-I (8.059 ng/ml). An urinary tract infection was diagnosed by urine test analysis.

The ECG revealed atrial fibrillation with a fast ventricular rate (\approx 120 bpm), left ventricular hypertrophy and mild ST-segment abnormalities consistent with a digitalis effect. The chest radiogram showed an increased cardiothoracic index without signs of pulmonary congestion.

Computed tomography of the brain was performed and a large infarct was found in the bregmatic area of the left hemisphere.

Later the patient underwent transthoracic echocardiography, which revealed left ventricular hypertrophy with normal systolic function (ejection fraction \approx 55%), moderate dilatation of the ascending aorta and a significantly enlarged left atrium (LA) with a giant, ball-shaped mass in its cavity (Figure 1). The mass was non-pedunculated, moving freely within the left atrium like a 'ping-pong ball' and transiently obstructing the mitral valve orifice (Figure 2).

Taking into consideration: 1) the presence of AF and the lack of any antithrombotic treatment; 2) the absence of any reference to such a mass in the patient's previous cardiological examinations; and 3) the free movement of the mass, without any attachment to the interatrial septum, as is usually the case for a myxoma; we concluded that this was probably a thrombus, rather than a cardiac tumour.

Because of the patient's dramatic neurological condition, after consultation with the cardiothoracic surgeons, it was decided not to proceed immediately to surgery, and the patient was administered unfractionated heparin intravenously. The following day, the patient suffered cardiorespiratory arrest and unfortunately died.

Discussion

A giant intracardiac mass is a rare finding and, as the patient may present without serious or specific symptoms and signs,¹ it may be diagnosed incidentally during an echocardiographic examination. Such a mass can be a tumour^{2,3} (most likely a myxoma), a thrombus,⁴ a vegetation,⁵ or other more uncommon entities (i.e. cysts).

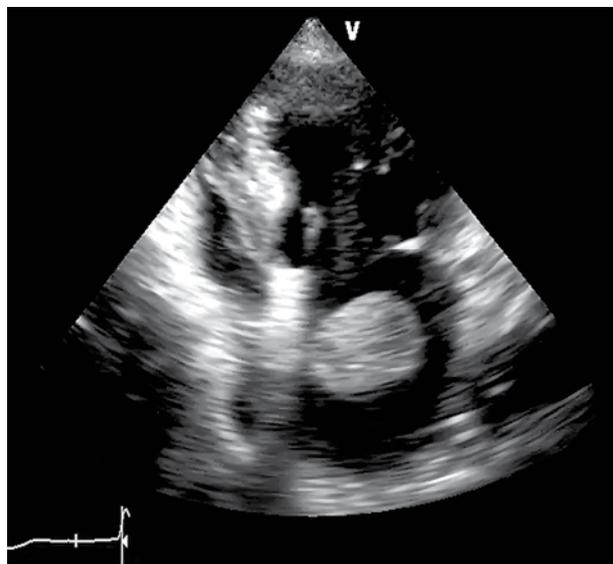


Figure 1. Transthoracic echocardiogram, 4-chamber apical view. A large mass free-floating in the left atrium.

Transthoracic echocardiography is usually the first imaging technique applied to the patient, but transoesophageal echocardiography is extremely useful in the assessment of intracardiac structures. Cardiac computed tomography (CT) and magnetic resonance imaging (MRI) are additional important tools in the diagnosis and tissue characterisation of intracardiac masses. Recently, three-dimensional transthoracic and transoesophageal echocardiography⁶ has emerged as a novel and useful tool for the detection and differential diagnosis of cardiac masses. Nevertheless, the differential diagnosis may be difficult until surgical excision and histological examination are performed.⁷ Moreover, a thrombus may be formed and superimposed on a tumour or vegetation. A ball-shaped, free-floating intracardiac mass carries substantial risks for the patient, because of:

- possible cerebral or peripheral embolic events;
- symptoms of heart failure, due to impaired left ventricle filling or mitral regurgitation, if the mass impedes the coaptation of the mitral valve leaflets;
- or syncope due to obstruction of the mitral valve orifice.

Cardiac myxomas are by far the most common primary cardiac tumours, with the majority of them being solitary and located in the left atrium. Usually there is an attachment to the interatrial septum, in the area of the *fossa ovalis*. Atypical locations and multiple myxomas occur more frequently in the case of familial myxomas and in such cases underlying malignancy should

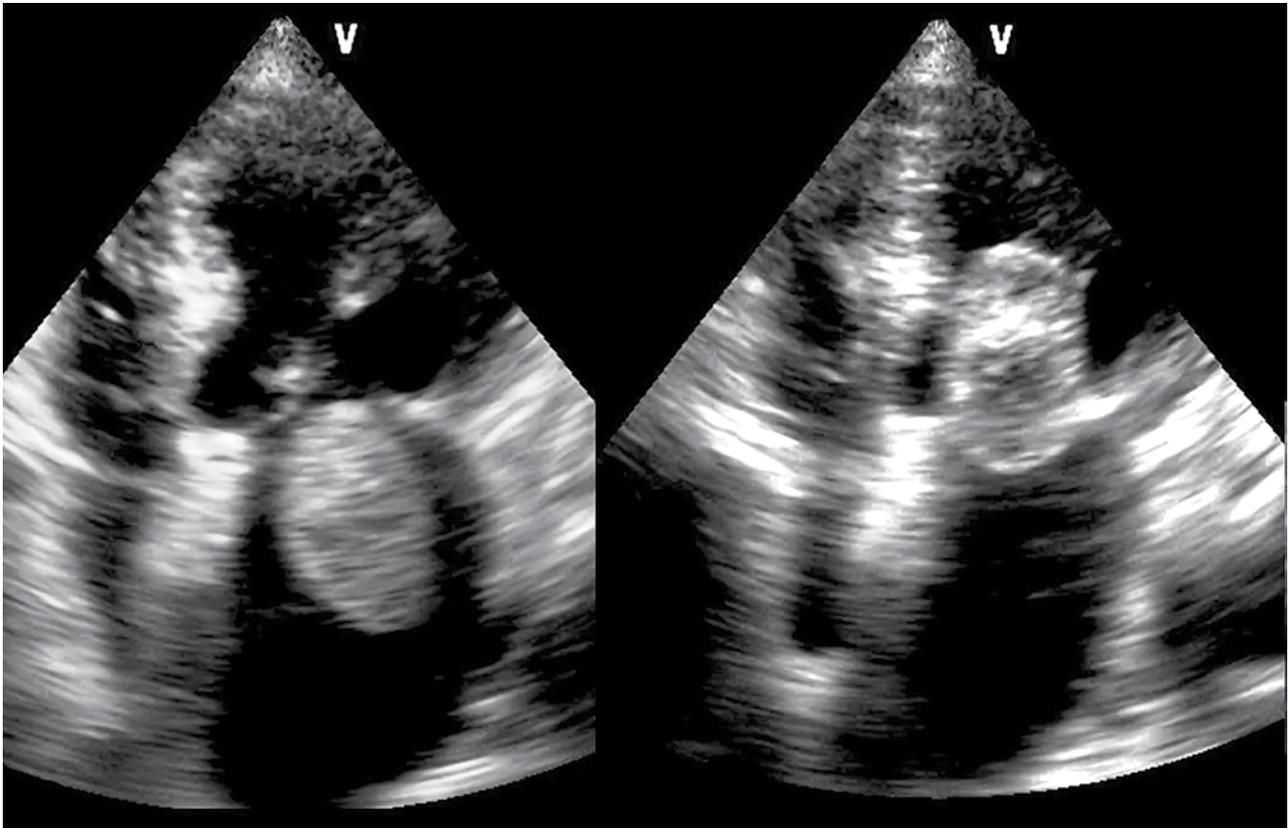


Figure 2. Transthoracic echocardiogram, 4-chamber apical view. The giant-sized mass transiently obstructs the mitral valve orifice.

be considered. Both hypoechoic and hyperechoic foci may be seen in the echocardiogram, representing areas of haemorrhage and calcification, respectively. The appropriate therapy is surgical excision, with the usual approach being through the right atrium and across the interatrial septum, but lately less invasive techniques via a mini-thoracotomy have been employed.

Vegetations can be detected in a patient with symptoms, signs and laboratory findings suggestive of infective endocarditis. In the transthoracic or transoesophageal echocardiogram they appear as echogenic, mobile masses attached to the valve, the endocardial surface, or prosthetic materials in the heart. They can be linear, round, irregular, or shaggy, and frequently show high-frequency flutter or oscillation. The intracardiac mass of our patient did not have the characteristics of a vegetation. Moreover, there were no clinical signs or laboratory findings (i.e. positive blood cultures) suggestive of infective endocarditis.

Left atrial thrombi are usually small or medium sized, formed inside the left atrial appendage, but there are rare cases of giant, ball-shaped thrombi, free-floating in the left atrium. They are thought to

originate as mural thrombi, usually on the interatrial septum, and gradually grow until they become detached under their own weight. Most of these case reports have been described in patients with severe mitral valve stenosis,⁸ atrial fibrillation,⁹ or both, most often in the absence of any antithrombotic treatment.

Most of these patients are referred for urgent surgery, with excision of the mass, and valve replacement in the case of coexistent mitral valve stenosis. Thrombolytic¹⁰ and anticoagulation¹¹ treatment has been administered in a few patients, but due to the uncertain effectiveness and the high risk of embolisation, it should be considered only in patients with recent, non-organised thrombi and serious contraindications for cardiothoracic surgery, as was the case in our patient, due to her dramatic neurological condition.

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