Case Report

Differential Diagnosis of a Left Atrial Mass: Role of Three-Dimensional Transoesophageal Echocardiography

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We describe an 81-year-old woman with an episode of loss of consciousness and a mass inside the left atrium. We demonstrate the added value of three-dimensional transoesophageal echocardiography in the differential diagnosis of the cardiac masses.

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We present a case of left atrial thrombus on the upper anterior side of the left atrial wall.

Case presentation

An 81-year-old woman was admitted to our clinic because of an episode of loss of consciousness. The patient had a history of type 2 diabetes mellitus, permanent atrial fibrillation and peripheral vascular disease. Her medication included antidiabetic treatment, digitalis and propafenone. On admission, the clinical examination revealed bradycardia, complete arrhythmia with normal heart sounds, a soft systolic apical murmur consistent with mild mitral regurgitation and no signs of pulmonary congestion. The ECG showed atrial fibrillation with periods of bradycardia on 24-hour ECG monitoring. An increased cardiothoracic index was noted by chest X-ray. Laboratory investigation revealed impaired renal function, hyperkalaemia, normal thyroid function tests and normal prothrombin time.

A transthoracic echocardiographic examination showed a left ventricle of normal dimensions with preserved systolic function (EF 50%) and an echogenic mass inside the left atrium. The differential diagnosis of this mass included a tumour or a thrombus formed on the atrial wall. Intravenous administration of contrast agent did not reveal perfusion in the mass, suggesting that this mass was an organised thrombus.

Three-dimensional transoesophageal echocardiography provided additional information about the origin, nature and mobility of the mass. The mass was immobile and was attached to the upper anterior wall of the left atrium (Figures 1-3). Using the image-rendering process and cropping the volume image appropriately revealed an echo-lucent area of central necrosis inside the mass (Figure 4). Finally, spontaneous contrast was noted inside the left atrium, suggesting stasis of blood.

The above echocardiographic findings, along with the patient's history of atrial fibrillation, were consistent with a thrombus formation in the left atrium. Digitalis and propafenone were discontinued and the patient was treated with anticoagulants and was discharged a week later. After 20 days the mass in the left atrium had been reduced in size (20 × 11 mm).

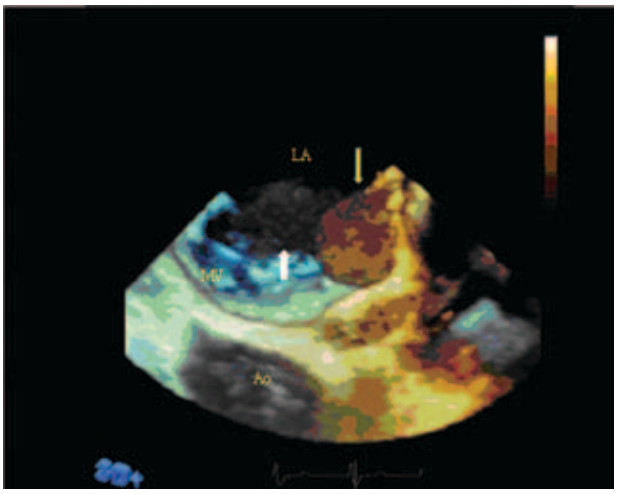

Figure 1. Live 3D. Large, immobile, echogenic mass (22 × 30 × 15 mm) (yellow arrow) inside the left atrial cavity, originating from the upper anterior wall of the left atrium. Spontaneous contrast was noted inside the left atrium (white arrow). Ao – aorta; LA – left atrium; MV – mitral valve.

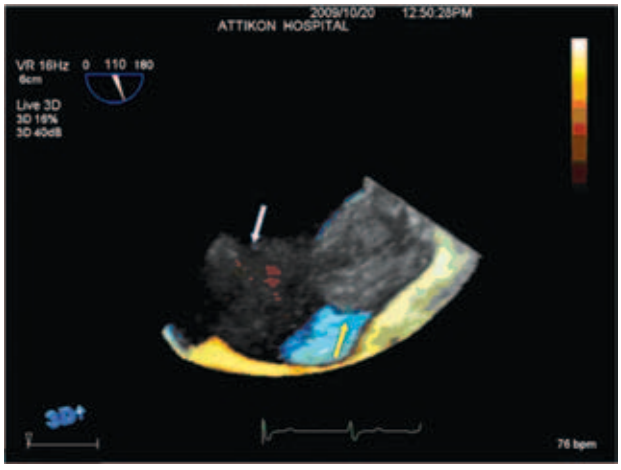

Figure 2. Live 3D: zoom. Large immobile echogenic mass (yellow arrow) and spontaneous contrast (white arrow) inside the left atrial cavity.

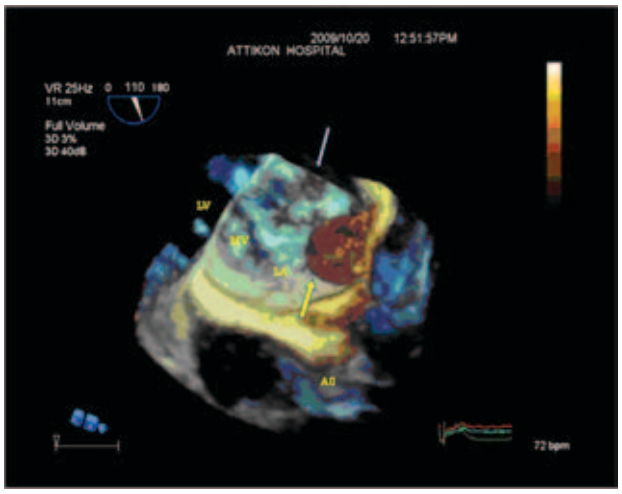

Figure 3. 3D: full volume. View from the upper wall of the left atrium. Echogenic mass (yellow arrow) inside the left atrial cavity, originating from the upper anterior wall of the left atrium. Spontaneous contrast was noted inside the left atrium (white arrow). Ao – aorta; LV – left ventricle; LA – left atrium; MV – mitral valve.

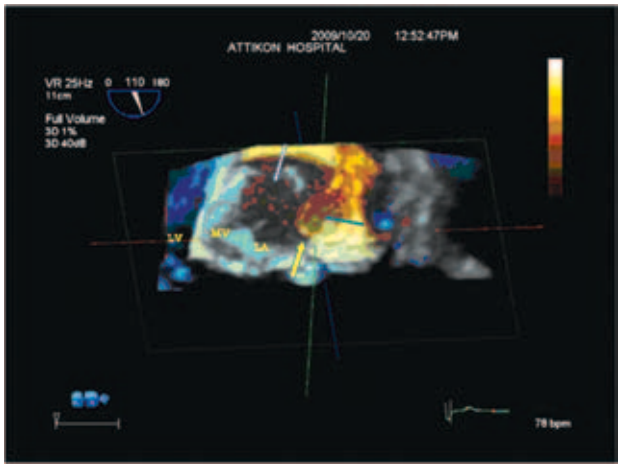

Figure 4. 3D: full volume. View from the upper wall of the left atrium after cropping in order to see inside the mass. The presence of an echo-lucent area (blue arrow) in the centre of the mass (yellow arrow) indicates clot lysis. Spontaneous contrast was noted inside the left atrium (white arrow). Ao – aorta; LV – left ventricle; LA – left atrium; MV – mitral valve.

Discussion

Left atrial thrombus is an important source of systemic embolisation. It is found most often within the left atrial appendage and is usually presented in association with atrial fibrillation.[1,2] Rarely, it can be attached to the *fossa ovalis* or to other sites of the left atrial wall, when it may be hard to differentiate from a tumour. Cardiac masses often present a clinical challenge in their differential diagnosis, and in many cases only biopsy can produce the final diagnosis.

Three-dimensional echocardiography is a novel technique for the evaluation of cardiac chambers and their function, which is currently used mainly for a more detailed assessment of left ventricular mass and volume.[3] Three-dimensional transoesophageal echocardiography has recently been used successfully in the evaluation of cardiac masses, and provides accurate information regarding the location, composition and size of cardiac tumours,[4] sometimes even comparable to histopathological findings.[5]

In our case, three-dimensional transoesophageal echocardiography expanded the diagnostic capabilities of cardiac ultrasound in the differential diagnosis between left atrial thrombus and cardiac tumour by providing additional information about the precise location, origin, nature, size and mobility of the mass. During the image-rendering process, three-dimensional transoesophageal echocardiography also allowed the visualisation of the thrombus from multiple angles, giving us a more comprehensive assessment. By using the cropping technique we were able to section the volume image and look inside the mass. The echo-lucent area in the centre of the mass was indicative of clot lysis. Additionally, the spontaneous contrast inside the left atrium was another finding suggesting the existence of a thrombus.

In conclusion, three-dimensional transoesophageal echocardiography represents a useful, novel tool for the discrimination and differential diagnosis of cardiac masses.

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