

## ATRIAL SEPTAL ANEURYSM

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A 67-year-old lady was admitted with a history of chest pain typical of angina, with her ECG showing T wave inversion in her lateral leads (aVL, I). Her cardiac enzymes were elevated, with a total creatinine kinase of 591iU/L and aspartate transaminase of 186iU/L, confirming that she had sustained a myocardial infarction.

Her past medical history included hypertension and a cerebrovascular accident in 1975 (when she was 40 years old). During the latter event, she had suffered a left-sided hemiparesis with sensory symptoms in the left arm and face, which was followed by a full recovery. At that presentation, it was felt that the stroke was secondary to her hypertension, although she was also taking the oral contraceptive pill, which was stopped. No echocardiography or Computer Tomography (CT) brain scan was performed.

Following her admission with her myocardial infarction, she continued to have chest pain. Cardiac catheterisation

demonstrated good left ventricular function with an occluded distal (dominant) circumflex branch of the left coronary artery and a 70% distal stenosis in left anterior descending artery. A percutaneous transluminal coronary angioplasty was performed to the occluded distal circumflex artery with a good angiographic result.

Eight months following her discharge from hospital, she complained of breathlessness, and transthoracic echocardiography was organised. This showed a large atrial aneurysm involving the whole of the septum, bulging into right atrium with no oscillation seen with respiration (Figure 1). There was no thickening of the atrial septum to suggest the presence of thrombus. Her left ventricular function was good. Transoesophageal echocardiography confirmed the findings (Figures 2 and 3).

### DISCUSSION

An atrial septal aneurysm is a localised deformity of the

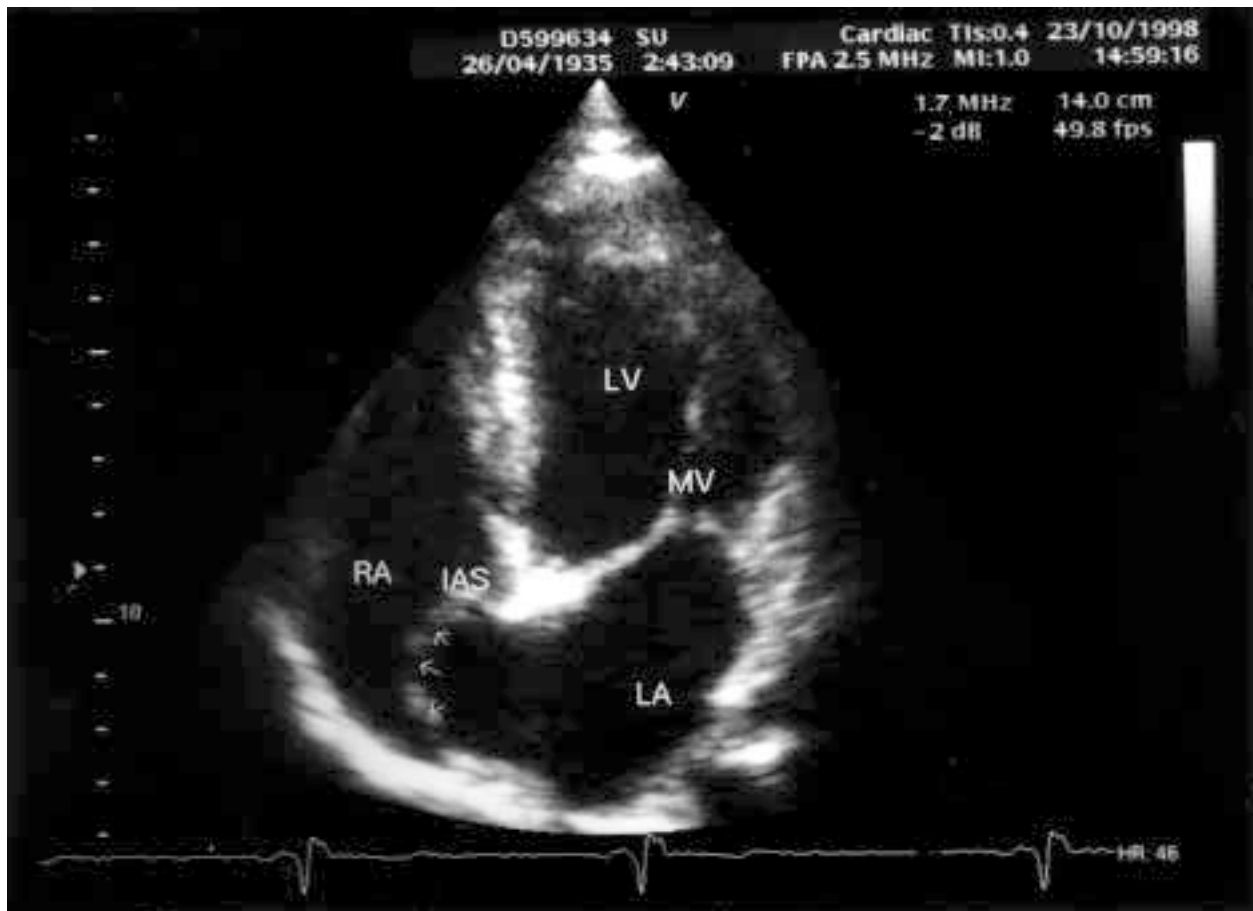


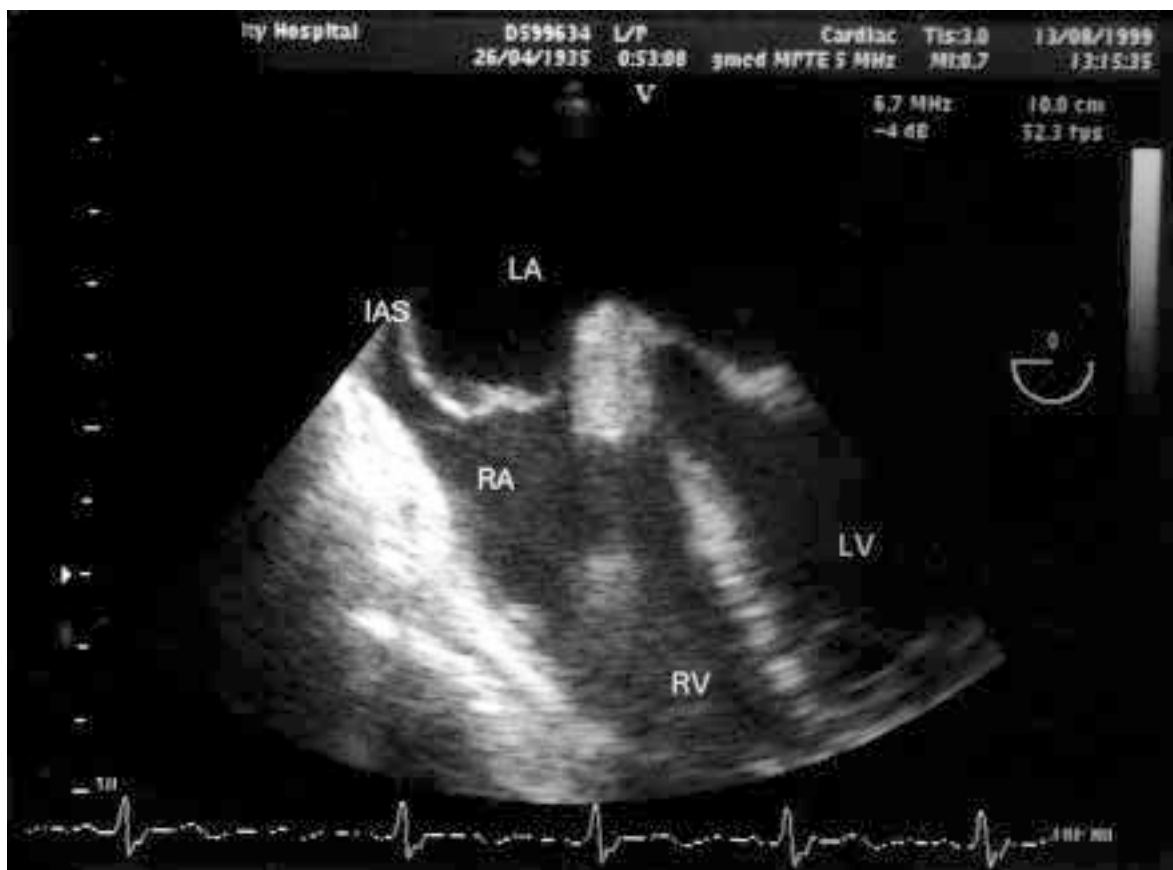
FIGURE 1

Transthoracic echocardiogram showing atrial septal aneurysm (arrows).

LA = left atrium  
LV = left ventricle

IAS = intra-atrial septum  
RV = right ventricle

RA = right atrium  
AOV = aortic valve



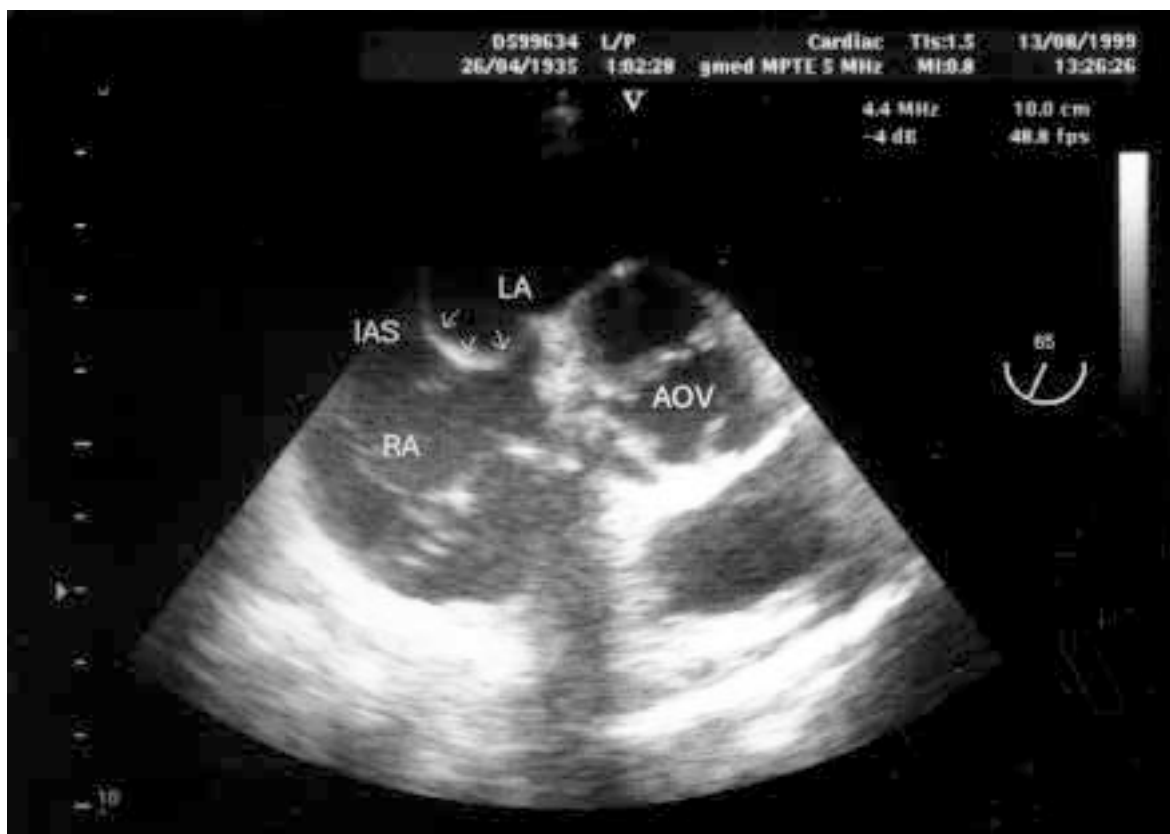
FIGURES 2 AND 3

Multiplane transoesophageal echocardiography showing aneurysmal bulging of intra-atrial septum into right atrium.

LA = left atrium  
LV = left ventricle

IAS = intra-atrial septum  
RV = right ventricle

RA = right atrium  
AOV = aortic valve



inter-atrial septum, which is commonly associated with congenital cardiac anomalies, such as atrial septal defect and mitral valve prolapse. The clinical relevance of its finding is still uncertain although atrial septal aneurysm has long been implicated in cases of stroke and arterial thromboembolism.<sup>1,2</sup>

The prevalence of atrial septal aneurysm varies from 0.5% (using transthoracic echocardiography) to 1% (from autopsy studies) and to 3% (using transoesophageal echocardiography).<sup>3</sup> It has been postulated that an atrial septal aneurysm is a site of thrombus formation and thrombi have been seen within the aneurysmal sac in such patients at autopsy or during the course of cardiac surgery, and also on transoesophageal echocardiography.

However, it is difficult to prove a causal relationship between cardiac abnormalities and an ischaemic stroke, even in the presence of obvious sources of embolism within the heart. Nevertheless, the incidence of clinical events compatible with cardiogenic embolism appears to be remarkably high in patients with atrial septal aneurysm, ranging from 20% to 52%.<sup>4</sup>

In this patient, it was unclear whether the atrial septal aneurysm was an incidental finding or whether it was due to the occluded circumflex coronary artery, particularly given that ventricular aneurysm is a well-recognised complication of myocardial infarction. The blood supply to the interatrial septum is usually derived from both the right and left coronary arteries, including the conus branches, septal and atrial rami, and occasionally by Kugel's anastomotic artery which is derived from the circumflex artery, and traverses the interatrial septum.<sup>5</sup> However, it is difficult to delineate such small vessels in coronary angiography; the small vessels supplying atria have also been found to be difficult to preserve and to study in corrosion casts produced from postmortem specimens. It is therefore possible that the formation of the atrial septal

aneurysm was caused by the occlusion of the distal left dominant circumflex artery and its smaller branches supplying the atrial septum.

When investigating a young patient with stroke, it is important to rule out sources of thromboembolism (cardiac or carotid), even if they suffer from hypertension as illustrated in the above lady. The aetiology of this lady's stroke 23 years prior to the presentation is unclear and may well be related to the atrial septal aneurysm or even the hypertension. Echocardiography (especially transoesophageal studies) is increasingly used to rule out underlying cardiac abnormalities (such as atrial septal aneurysm) and other sources of emboli such as aortic atheromatous plaques in young patients with unexplained stroke, although in general the 'pick-up' rate of such abnormalities is low.<sup>6</sup>

#### REFERENCES

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