

## An Unusual Cause of Stroke from a Left Atrial Mass

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**A 59-year-old woman was admitted to the hospital after having severe headache for 1 day. Her medical history was significant for coronary artery disease, diabetes, atrial fibrillation, and rheumatic heart disease. The patient was in remission from stage II left breast cancer (T2 N0 M0) in 1997, treated with lumpectomy, 6 cycles of chemotherapy (cyclophosphamide, methotrexate, and 5-fluorouracil), and lo-**

**cal radiation therapy (total 6000 cGy). Head magnetic resonance imaging scan showed left occipital hemorrhage. Subsequent angiogram showed a possible mycotic aneurysm of distal parietal occipital branch of the posterior cerebral artery. Cardiology was consulted to evaluate for a cardioembolic source. (J Am Soc Echocardiogr 2007;20:537.e1-e2.)**

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### CASE HISTORY

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Cardiac examination revealed a normal first and second heart sound, a loud 3/6 midsystolic murmur at the right upper sternal border, and a 1/6 middiastolic murmur at the apex. Electrocardiogram showed atrial fibrillation with a heart rate of 80 to 90/min and nonspecific anterolateral T-wave abnormality. A transthoracic echocardiogram (TTE) performed on day 2 of hospitalization showed thickened mitral leaflets with mild stenosis (1.9 cm<sup>2</sup>), thickened aortic valve with moderate stenosis (0.8 cm<sup>2</sup>), and a left atrial (LA) mass. On day 3, a transesophageal echocardiogram (TEE) showed partial obstruction of the mitral orifice from an extensive LA mass with mobile frondlike projections and growth along the LA surface of the mitral leaflet (Figure 1 and Video). Cardiac catheterization showed 80% proximal left anterior descending coronary artery and 50% proximal left circumflex coronary artery stenosis.

The patient was taken to the operating department on day 4. A large (6.4 × 4.2 × 1.4 cm) mass was found in the LA with extension into the LA appendage and atrial surface of the anterior leaflet of mitral valve (Figure 2, A). Resection of LA mass, replacement of the atrial septum with pericardial

patch, and coronary bypass ×2 (left anterior descending coronary artery and obtuse marginal artery) were done. The tumor was a cellular and highly vascular undifferentiated spindle cell neoplasm that infiltrated the myocardium (Figure 2, B). Electron microscopy and immunohistochemistry confirmed high-grade, undifferentiated sarcoma. There was no resemblance to the prior breast cancer that was a moderately differentiated infiltrating ductal carcinoma.

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### DISCUSSION

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Cerebral infarction accounts for 85% of all clinical strokes, with approximately 15% caused by cardioembolism.<sup>1</sup> Of these, the most common causes are atrial fibrillation, valvular heart disease, and left ventricular thrombus from impaired ventricular function, myocardial infarction, or both. Rarely, a neurologic insult may be the first and only clinical manifestation of a cardiac tumor.

Primary cardiac tumors are far less frequent than metastatic cardiac tumors.<sup>2</sup> Signs and symptoms of cardiac tumor may include dyspnea on exertion, fever, weight loss, severe dizziness, diastolic mitral murmur, third heart sound (tumor “plop”), conduction disturbances, pulmonary embolus, atrial fibrillation, elevated sedimentation rate, and peripheral vascular aneurysm.<sup>3</sup> Diagnosis can be confirmed by angiography, computed tomography, magnetic resonance imaging, and TTE or TEE. A comparison of the two ultrasound modalities showed that TEE is superior in visualizing LA appendage thrombi, small thrombi in LA cavity, and tumors of superior vena cava and descending thoracic aorta. Apical thrombi, however, are better detected by TTE.<sup>4</sup>

This case offered several interesting and unexpected clinical findings. The patient's stroke was initially

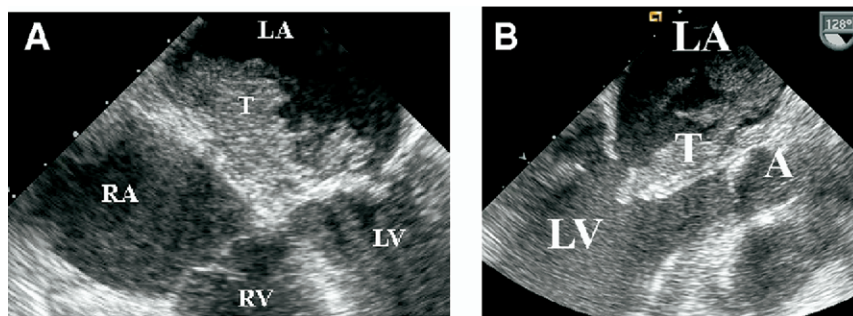
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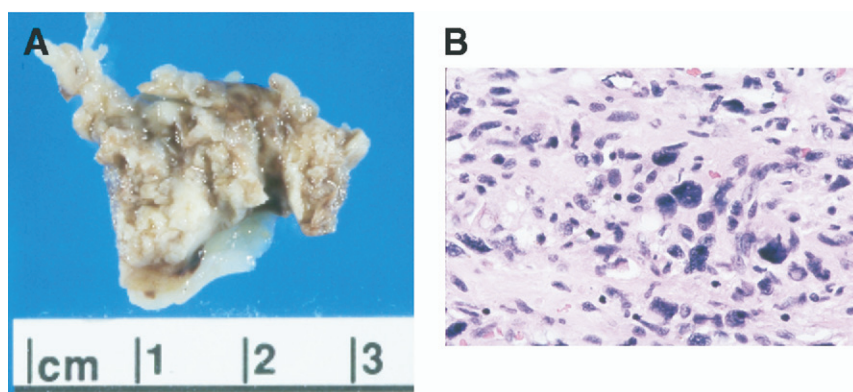
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doi:10.1016/j.echo.2006.10.020



**Figure 1** A, Two-dimensional transesophageal echocardiography revealed large left atrial (LA) tumor (T) with multiple highly mobile papillary projections, infiltrating interatrial septum and LA appendage. B, T extends along entire atrial surface of anterior leaflet of mitral valve, with diastolic prolapse into mitral funnel. There was moderate obstruction of mitral valve orifice and mild valvular regurgitation (not shown). A, Aorta; LV, left ventricle; RV, right ventricle.



**Figure 2** A, Gross appearance of resected left atrial mass that measures  $6.4 \times 4.2 \times 1.4$  cm. B, Histologic section showing high-grade undifferentiated sarcoma. (Hematoxylin-eosin stain, original magnification  $\times 400$ .)

attributed to her atrial fibrillation or rheumatic heart disease. Because the cerebral angiogram showed mycotic aneurysm, endocarditis was also suggested. The TTE was unable to define the LA mass as vegetation versus thrombus or neoplasm. The subsequent TEE findings were interpreted to be most consistent with a neoplastic lesion. Although chemotherapy and radiation treatment can sometimes cause early coronary artery disease, valvular disease, cardiomyopathy, and another primary cancer (especially sarcoma), the interval between treatment and neoplasm formation is usually much longer than in this case.

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#### SUPPLEMENTARY DATA

Supplementary data associated with this article can be found, in the online version, at [10.1016/j.echo.2006.10.020](https://doi.org/10.1016/j.echo.2006.10.020).