Medical Image of the Month: Bilateral Atrial Enlargement

Figure 1. Portable chest radiograph showing elevation of the left mainstem bronchus (red arrow).

Figure 2. Thoracic CT scan showing right atrial enlargement (blue circle) and left atrium (red circle).

Figure 3. Echocardiogram showing right atrial enlargement (white circle).
A 97-year-old woman was repeatedly admitted for dyspnea, hypoxemia and treated with antibiotics for presumed left lower lobe pneumonia. She has a past medical history of atrial fibrillation, congestive heart failure and sick sinus syndrome with placement of a cardiac pacemaker. Notably on physical examination, she had heart rate of 110 beats/minute, temperature of 98.8°F, blood pressure of 122/72 mm Hg, and a respiratory rate of 27 breaths/minute. She had a sternal heave, a grade 4/6 "blowing" holosystolic murmur, a loud S2, jugular venous distension and an enlarged liver. Chest x-ray showed obscuration of the left lower lobe - the left heart border cannot be seen, and the L mainstem bronchus is straightened and lifted superiorly (Figure 1). An image of the heart is shown from a CT abdomen obtained 6 months previously, showing cardiomegaly, particularly massive atrial enlargement (Figure 2). An ultrasound showed bilateral atrial enlargement with moderate mitral regurgitation and severe tricuspid regurgitation (Figure 3). The left ventricular ejection fraction was 55%, but with abnormal septal motion. She was treated with gentle diuresis to help relieve volume overload, and isosorbide dinitrate for preload and afterload reduction. Pulmonary hypertension was attributed to chronic mitral regurgitation. The cause was unclear - the patient remembered that her brother had rheumatic fever as a young recruit in WWII, but didn't know whether she had ever experienced it.

Atrial enlargement can be of prognostic significance. Left atrium size has been found to be a predictor of mortality due to both cardiovascular issues as well as all-cause mortality (1). Larger right atrium than left atrium has been associated with all-cause mortality in elderly patients with heart failure (2).

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References