A “Teapot” Atrial Septal Aneurysm with Spontaneous Thrombus in an Asymptomatic Patient

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An 84-year-old woman with a history of hypertension, mild aortic stenosis, coronary artery bypass grafting, and a known atrial septal aneurysm (ASA) came to the cardiac clinic for a routine follow-up. She had no history of stroke or systemic embolism. Cardiovascular examination was notable for a grade 2/6 holosystolic murmur at the cardiac apex and a grade 3/6 mid-peaking crescendo/decrescendo murmur at right upper sternal border with radiation to bilateral carotids. The rest of the systemic examination was normal. She was noted to be in sinus rhythm. A follow-up transthoracic echocardiogram for her valvular heart disease revealed normal left ventricular (LV) chamber size with low normal LV systolic function. LV ejection fraction by biplane Simpson’s method was calculated to be 53%. LV wall thickness was increased with the presence of moderate concentric LV hypertrophy. There was the presence of moderate aortic stenosis and mild mitral regurgitation. The left atrium was severely enlarged with an indexed left atrial volume of 84 mL/m². A large ASA was noted with fixed deviation of the ASA toward the right atrium with a bright echodensity, suggestive of thrombus within the ASA (Figure 1). Right-sided chamber sizes were normal with normal estimated right atrial pressure. An elevated mitral peak velocity of early filling/early diastolic mitral annular velocity ratio suggested elevated LV diastolic pressure. She was admitted to the hospital for a transesophageal echocardiogram (TEE) for better characterization of the ASA and for intravenous anticoagulation. TEE revealed a large ASA with fixed deviation of the ASA toward the right atrium throughout the cardiac cycle. The maximum excursion of the ASA was 2.4 cm, with anteroposterior dimension of 2.0 cm and superoinferior dimension of 2.3 cm. A laminated thrombus measuring 2.0 × 1.0 cm was noted within the concavity of the ASA (Figure 2A and 2B; see Movies I–V in the online-only Data Supplement). Dense spontaneous echo contrast was seen emanating from the ASA, giving it a steaming teapot appearance (see Movie II in the online-only Data Supplement). Color flow Doppler and agitated saline injection at rest and with the valsala maneuver failed to reveal evidence of interatrial shunt (see Movies III–V in the online-only Data Supplement). There was no spontaneous echo contrast seen in the left atrium or the left atrial appendage. Laboratory values were all within normal ranges. She had no history of atrial fibrillation. She was anticoagulated with intravenous heparin and warfarin and was discharged home on warfarin with a therapeutic international normalized ratio. The patient remained asymptomatic without any embolic complications at 1-year follow-up on therapeutic anticoagulation with warfarin.

ASA is most commonly defined as redundant and mobile interatrial septal tissue in the region of the fossa ovalis with bulging of ≥15 mm beyond the plane of the atrial septum or phasic excursion of ≥15 mm during the cardiorespiratory cycle. TEE is more sensitive in diagnosing ASA, and the prevalence in TEE studies range from 2% to 10%. ASAs are associated with atrial arrhythmias and systemic embolism. TEE is more sensitive than transthoracic echocardiogram to diagnose ASA because the interatrial septum is visualized more consistently with TEE. In a review of 195 cases, 47% of ASA were missed with transthoracic echocardiogram.

There have been several case reports of fibrinous thrombus adherent to an ASA in specimens obtained at surgery or postmortem. However, thrombus superimposed on an aneurysm of the interatrial septum has never been demonstrated by conventional transthoracic echocardiogram. Schneider et al reported 2 cases of patients with cerebral emboli in whom a TEE revealed thrombus superimposed on an ASA that had not been detected on transthoracic echocardiography.

The unique aspect of the present report lies in the demonstration of the thrombus adherent to the ASA in an asymptomatic patient. Although there are few case reports of thrombus in the ASA causing embolic events, our patient was asymptomatic. The fixed out pouching of the ASA toward the right atrium was likely secondary to increased left atrial pressure compared with the right atrium. The persistent out pouching then led to stagnation of blood in the ASA, as evidenced by the spontaneous echo contrast, and to thrombus formation. Also, the lack of oscillations of the ASA probably prevented the dislodgement of the thrombus and systemic embolism. She was successfully treated with anticoagulation without any embolic events.

Disclosures

None.

References


**Figure 1.** Transthoracic echocardiogram (subcostal view) showing the atrial septal aneurysm (red arrows). Note the hyper-echoic area within the atrial septal aneurysm suggestive of thrombus.

**Figure 2.** Transesophageal echocardiogram showing the atrial septal aneurysm with thrombus. **A,** Mid-esophageal 0° view. **B,** Mid-esophageal 111° view. Red arrows point to the atrial septal aneurysm. Green arrowheads point to the thrombus. Blue arrow points to the spontaneous echo contrast emanating from the atrial septal aneurysm.
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Movie Legend:

Movies 1-2: Transesophageal echocardiogram showing the atrial septal aneurysm with thrombus and spontaneous echo contrast. Best viewed with Windows Media Player.

Movies 3-5: Transesophageal echocardiogram showing the atrial septal aneurysm with thrombus. Agitated saline injection fails to demonstrate a right to left shunting. Best viewed with Windows Media Player.