



# GIANT ATRIAL SEPTAL ANEURYSM WITH THROMBI IN A PATIENT WITH ATRIAL SEPTAL DEFECT AND CEREBRAL ISCHEMIC EVENTS: A CASE REPORT

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**SUMMARY** – Atrial septal aneurysm is a congenital abnormality that may occur as an isolated malformation or in combination with other cardiac abnormalities. More than half of the cases of atrial septal aneurysm are associated with an atrial shunt. We present a case with a thrombus at a giant atrial septal aneurysm associated with atrial septal defect and thrombus in the left atrial appendage, detected by transesophageal echocardiography after cerebral ischemic events. To the best of our knowledge, this combination has not been described in the literature so far.

**Keywords:** *Atrial septal aneurysm; Thrombus; Spontaneous contrast; Cerebrovascular incident; Echocardiography*

## Introduction

Atrial septal aneurysm (ASA) as a sole malformation or in combination with atrial septal defect (ASD) or patent foramen ovale (PFO) is a congenital heart defect that is sometimes diagnosed in adults. Until recently, ASA was a rare clinical entity. However, new echocardiographic methods, especially transesophageal echocardiography (TEE) and three-dimensional (3D) TEE, have considerably increased its recorded prevalence in adults. According to several studies using TEE, the prevalence of ASA ranges between 2% and 10%<sup>1,2</sup>. Studies show that ASA is a risk factor

for thromboembolic events, so its early detection is essential<sup>3,4</sup>.

## Case Report

A 48-year-old man was referred to our hospital for transesophageal echocardiographic evaluation of ASA. Physical examination and electrocardiography were normal. However, his past medical history included a stroke two years and a transient ischemic attack one year before, as well as paroxysmal atrial fibrillation, arterial hypertension, hypercholesterolemia, and depression. His medication included an angiotensin-converting enzyme inhibitor, beta blocker, statin, warfarin, and sedative. Echocardiography was performed with GE Medical Systems Ultrasound, Vivid 9 (General Electric, USA). Transthoracic echocardiography (TTE) showed an ASA, normal ejection fraction of

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the left ventricle, dilated left atrium (4.6 cm), and trivial mitral regurgitation (MR).

Two-dimensional TEE revealed severe spontaneous echo contrast (SEC) at the giant ASA and a forming thrombus. Color Doppler imaging detected ASD (Fig. 1), whereas 3D TEE confirmed giant ASA

measuring 3.3x1.7 cm, bowing convexly into the right atrium with a thrombus measuring 1.5x1.3 cm (Fig. 2). In the left atrial appendage (LAA), severe SEC and another thrombus measuring 2.0x2.5 cm (Fig. 3) was visualized. 3D TEE showed an ASD encompassing an area of 0.2-0.3 cm<sup>2</sup> (Fig. 4). Contrast TEE

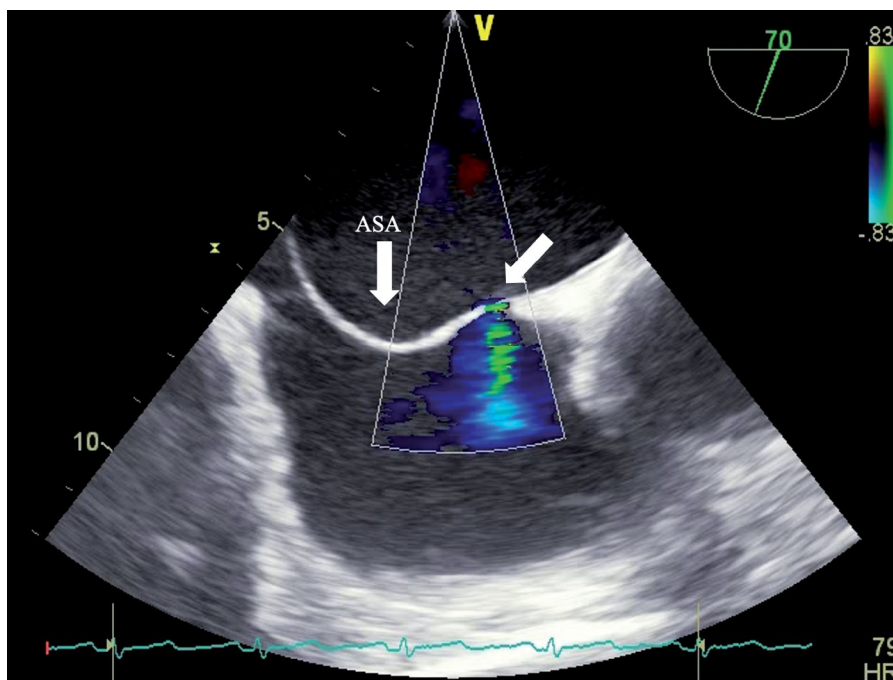


Fig. 1. Transesophageal echocardiogram showing giant atrial septal aneurysm (ASA) and atrial septal defect (ASD).

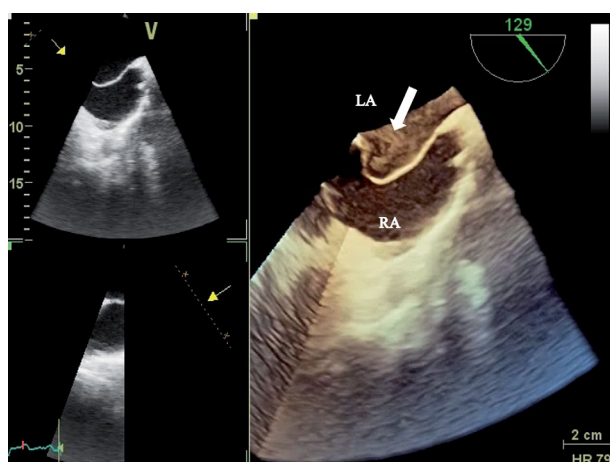


Fig. 2. 3D transesophageal echocardiogram showing giant atrial septal aneurysm with thrombus (arrow).

RA = right atrium; LA = left atrium

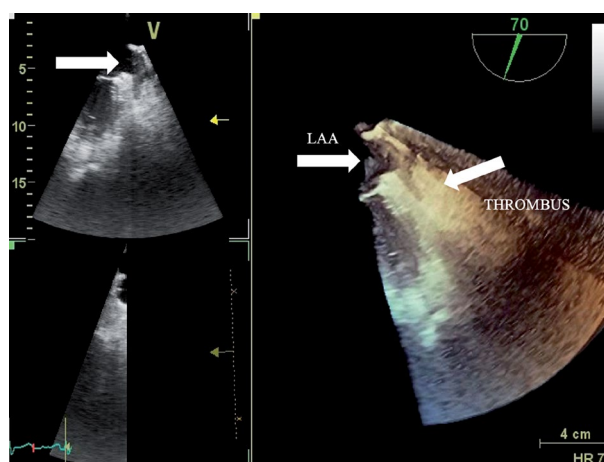
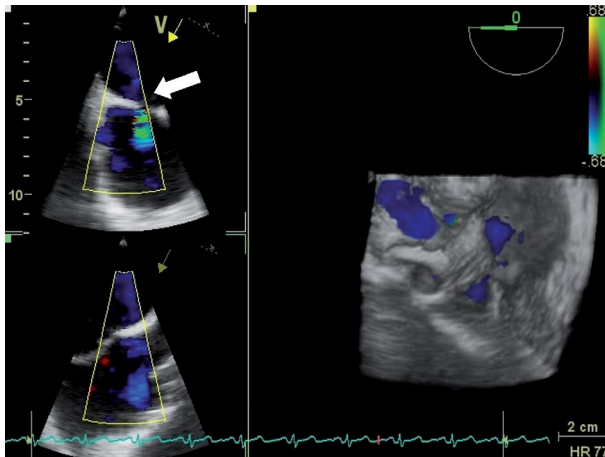
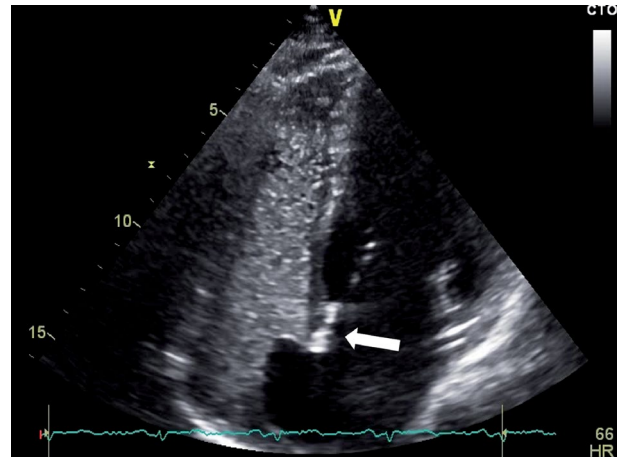


Fig. 3. 3D transesophageal echocardiogram showing severe spontaneous echo contrast and thrombus in left atrial appendage (LAA).



*Fig. 4. Color Doppler echocardiogram showing atrial septal defect.*



*Fig. 5. Transthoracic contrast echocardiogram showing giant atrial septal aneurysm.*

did not show a right-to-left shunt, only left-to-right shunting (Fig. 5). At first, we decided to continue oral anticoagulation therapy with warfarin keeping the INR within the therapeutic range of 2.0-3.0. Since the thrombi were still present in ASA and LAA, at a scheduled TEE control three months later, despite good anticoagulation therapy, we recommended surgical therapy. The patient remained in sinus rhythm throughout the procedure. He was then referred to a cardiac surgeon and underwent a successful operation consisting of surgical LAA closure and repair of ASA. One year later, the patient remained clinically asymptomatic and stroke-free.

## Discussion

Literature data show that there is a direct correlation between ASA and stroke, particularly in the presence of a PFO or ASD. TEE is a more sensitive method for detecting the presence of ASA than TTE. More ASA have been detected after thromboembolic events of unknown etiology<sup>5,6</sup>. ASA is a congenital cardiac abnormality which is characterized by localized bulging of atrial septum into either or both atria during the cardiac cycle. The majority of ASA can be clinically dormant for a long time but they are strongly

associated with thromboembolic events and atrial fibrillation. 2D and 3D TEE have made detection of this abnormality easier and more frequent, and TEE is the diagnostic method of choice for ASA, whereas 3D TEE has an even bigger diagnostic potential<sup>7</sup>. In case of suboptimal echocardiographic (ECG) evaluation, ECG gated MRI and ECG gated multislice computed tomography represent useful alternative diagnostic methods.

In our case, we identified ASA with a thrombus and another thrombus in LAA as the sources of thromboembolic incidents. Such patients pose a therapeutic dilemma. Beside standard anticoagulation therapy, the treatment option could be surgical resection of the aneurysm and extraction of the thrombus with surgical ASD closure and LAA occlusion, or percutaneous ASD closure and LAA occlusion as an alternative<sup>8</sup>. In our opinion, the latter course was at that moment contraindicated due to the presence of thrombi in both ASA and LAA.

Instead, our primary intention was first to prevent future thromboembolic events in this particular setting. We decided to continue oral anticoagulation therapy with warfarin maintaining the INR within the therapeutic range for three months. As follow-up TEE three months later revealed persistence of thrombi despite proper anticoagulation, we reconsidered the

approach and recommended surgical intervention, as we were convinced that the giant ASA was the reason for slow blood flow and spontaneous echo contrast, causing therefore development of thrombi in the aneurysm and LAA.

In conclusion, this is a case report on a unique combination of giant ASA with thrombus, ASD and another thrombus in LAA in a patient with a history of cerebrovascular incidents, which to the best of our knowledge, has not been described in the literature so far.

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## Sažetak

### DIVOVSKA ANEURIZMA LIJEVOG ATRIJA S TROMBIMA U BOLESNIKA S ATRIJSKIM SEPTALIM DEFJEKTOM I CEREBROVASKULARNIM INCIDENTIMA: PRIKAZ SLUČAJA

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Atrijska septalna aneurizma prirodna je abnormalnost koja se može pojaviti kao izolirana malformacija ili u kombinaciji s drugim malformacijama srca. Više od polovine slučajeva atrijskih septalnih aneurizma udruženo je s atrijskim septalnim defektom. Ovdje prikazujemo slučaj bolesnika s trombom u divovskoj atrijskoj septalnoj aneurizmi udruženoj s atrijskim septalnim defektom i trombom u lijevoj aurikuli, koji su otkriveni transezofagijskim ultrazvukom srca nakon cerebrovaskularnog inzulta. Ovakva kombinacija dosad nije bila opisana u literaturi.

**Ključne riječi:** *Atrijska septalna aneurizma; Tromb; Spontani kontrast; Cerebrovaskularni incident; Ehokardiografija*