Transesophageal Echocardiography Reveals a Missed Right Atrial Aneurysm in a Patient with Atrial Septal Defect and Mitral Valve Prolapse

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Abstract

Right atrial (RA) aneurysms are rare entities reported in the literature. Affected patients are usually asymptomatic, but sometimes, they tend to present with arrhythmias or even heart failure if big. They may form a nidus for thrombus formation and subsequent thromboembolic complications. We report a coincidental finding of a RA aneurysm in a 22-year-old female with the atrial septal defect and mitral valve prolapse, causing moderate mitral regurgitation. The aneurysm was detected incidentally on transesophageal echo after anesthetic induction for elective surgery of the primary pathology. The mitral valve was repaired, and the atrial septal defect was closed. The aneurysm was excised in toto and RA wall repaired.

Keywords: Aneurysm, arrhythmia, atrial septal defect, mitral valve prolapse, right atrium

Introduction

Right atrial (RA) aneurysms are infrequently encountered in clinical practice. They are mostly diagnosed coincidentally during the workup of associated defects. They are so far described to be idiopathic in origin. If large, they can present with atrial fibrillation or right heart failure, which usually sets in with the onset of supraventricular arrhythmias. They also form a nidus for thrombus formation and subsequent thromboembolic complications. For these reasons, RA aneurysms need to be addressed when encountered and must be completely excised, and RA free wall repaired. We report a coincidentally detected RA aneurysm on transesophageal echocardiography (TEE) after anesthetic induction in a 22-year-old female taken up for atrial septal defect closure and surgical repair of the mitral valve in a patient with mitral regurgitation (MR).

Case Report

A 22-year-old female presented with the New York Heart Association Class II dyspnea on exertion for the last 3–4 years gradually worsened over the last 1 year. On detailed evaluation, transthoracic echocardiography findings of a large ostium secundum atrial septal defect with deficient aortic and inferior rims and a prolapsing A2 segment of the anterior leaflet of mitral valve causing severe MR was recorded preoperatively. The posterior mitral leaflet was restricted. The right atrium and right ventricle were dilated with mild tricuspid valve regurgitation with a normal left ventricular function. Elective surgery was planned.

After anesthetic induction, routine TEE revealed an outpouching of RA free wall with a mouth 1.9 cm long [Figures 1 and 2]. TEE midesophageal view at zero degrees with probe turned to right reveals the right atrial aneurysm [Video 1].

The outpouching appeared to be thin-walled on echo with no spontaneous echo contrast or thrombus within. It measured...
The aneurysm was saccular in nature. The atrial septal defect was an ostium secundum defect measuring 32 mm, and the A2 segment of the anterior mitral leaflet was prolapsing, causing severe eccentric MR. Other transthoracic echo findings were confirmed.

Following sternotomy and pericardial opening, stay sutures were taken. A striking reddish raised bleb was seen on the surface of the free wall of right atrium around 3 cm in diameter, which appeared to be clearly demarcated from the rest of the atrial wall.

Further confirming the possibility of an aneurysm of the right wall, the aneurysmal segment completely collapsed on cardiopulmonary bypass with the right atrium becoming empty. The affected segment was papery thin and translucent, invaginating into the atrial cavity [Figure 4].

Under cardioplegic arrest, the aneurysmal segment of RA free wall was incised, it was excised completely and RA stay sutures taken on apparently healthy RA wall, and through the atrial septal defect, the mitral valve was repaired. Chordal transfer from the P2 segment of the mitral valve to the A2 segment with a posterior compression annuloplasty was done.

Atrial septal defect was closed with autologous pericardial patch and RA free wall was sutured edge to edge.

The patient was successfully weaned off cardiopulmonary bypass. Postbypass TEE revealed a satisfactory mitral valve repair and no residual shunt across atrial septal defect (ASD) patch. The outpouching of right atrium seen on pre bypass examination was no longer seen postbypass.

**Discussion**

RA aneurysm is an outpouching of a thinned out segment of RA free wall. It is idiopathic in origin. It was first described by Bailey in 1955.[1] A true aneurysm would be thin-walled, papery in consistency, and translucent in appearance clearly demarcated from the normal atrial wall.[2] The blood circulating in the right atrium underneath the aneurysm makes it apparently prominent. Histopathologically, its wall is composed of fibrous tissue and thinned out muscle fibers.[2]

It is mostly reported as an incidental finding unless it is huge in size.[3,4] Reports of giant atrium leading to right heart failure as presenting picture have been noted in the literature.[5,6] Association of ASD in a child with RA aneurysm was reported by Chatrath et al.[7]

We report a young adult female, diagnosed case of ASD and mitral valve prolapse, incidentally detected by TEE to have an aneurysm of the right atrium, probably not reported yet in literature. This combination of ASD and mitral valve regurgitation is a common occurrence in a pediatric cardiology practice, but so far, an RA aneurysm associated with them has not been reported.
Aneurysms of right atrium can lead to supraventricular arrhythmias and, in fact, could be the presenting symptoms in patients. Sluggish flow within can generate thrombus and subsequently can result in thromboembolic complications. Hence, RA aneurysms incidentally detected also should be addressed as they can be life-threatening. They are to be subjected to aneurysmectomy, which includes excision of aneurysm in toto and repair of RA free wall. We successfully repaired the mitral valve, closed the ASD, and resected the aneurysm in our patient. TEE is clearly useful in picking up a missed small aneurysm of the right atrium on transthoracic echocardiography.

Declaration of patient consent
The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given her consent for her images and other clinical information to be reported in the journal. The patient understands that her name and initials will not be published and due efforts will be made to conceal identity, but anonymity cannot be guaranteed.

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Conflicts of interest
There are no conflicts of interest.

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