A large eustachian valve, rare to spot

Renu Upadhyay, Jitendra H. Ramteke, Reena Nebu, Sanjeeta Umbarkar

CVTA Department, Seth G S Medical College and KEM Hospital, Mumbai, Maharashtra, India

Correspondence to Renu Upadhyay, MBBS, DNB, DM Resident, Department of Cardiovascular and Thoracic Anesthesia (CVTA), Seth G S Medical College and K.E.M. Hospital, Mumbai, Maharashtra, 400012, India. Mob: 9653164956;
e-mail: rupadhyay46@gmail.com

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Intraoperative use of transesophageal echocardiography (TEE) can detect a structure that is in reality a rare variant. We are reporting a case where we incidentally found large eustachian valve (EV) on transesophageal echocardiography which was missed on transthoracic echocardiography. It was giving right atrium two chamber appearance. We will recommend the importance of obtaining multiple echocardiographic views routinely during TEE to diagnose and differentiate such structures and its implications.

Keywords:
eustachian valve, IVC, right atrium, transesophageal echocardiography

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Introduction

Intraoperative use of transesophageal echocardiography (TEE) can detect a structure that is in reality a rare, yet normal, variant. It may lead to unnecessary surgical intervention [1]. We report a case where we incidentally found a large eustachian valve (EV) on TEE, which was missed in preoperative transthoracic echocardiography. EV was giving the right atrium (RA) a two-chamber appearance.

Case report

A 41-year-old woman, an operated case of mitral valve replacement 20 years back, admitted with complaints of severe respiratory distress, palpitation, and pedal edema since 1 week. On investigation, the patient had atrial fibrillation. On transthoracic echocardiography, normally functioning mitral prosthetic valve *in situ* was noted. Inferior vena cava was dilated (IVC of 28 mm) and congested, dilated RA reached a size of 76 mm and left atrium 62 mm, severe tricuspid regurgitation, tricuspid valve annulus was 54 mm, tricuspid annular plane systolic excursion was 14 mm, and right heart dysfunction was also noted. Coronary angiography was normal.

The patient was planned for tricuspid valve replacement after medical stabilization.

On the day of surgery, after confirming NPO status, the patient was shifted to OT. Standard monitors were attached and left radial artery and right internal jugular vein were secured. General anesthesia was given as per the institutional protocol. As it was a redo surgery, femoral artery and vein were kept ready for peripheral bypass as a standby to aortobicaval cannulation.

Intraoperative TEE showed dilated RA of 8.5 cm, Tricuspid valve annulus of 4.61 cm (Fig. 1), large central TR jet, IVC 2.45 cm, and coronary sinus of 1.25 cm. An unusual structure was noticed in the RA, which appears to be dividing RA into two chambers. It was like a membranous structure, 6.89 cm, extending from IAS and traceable to the IVC–RA junction (Video 1 and Fig. 2).

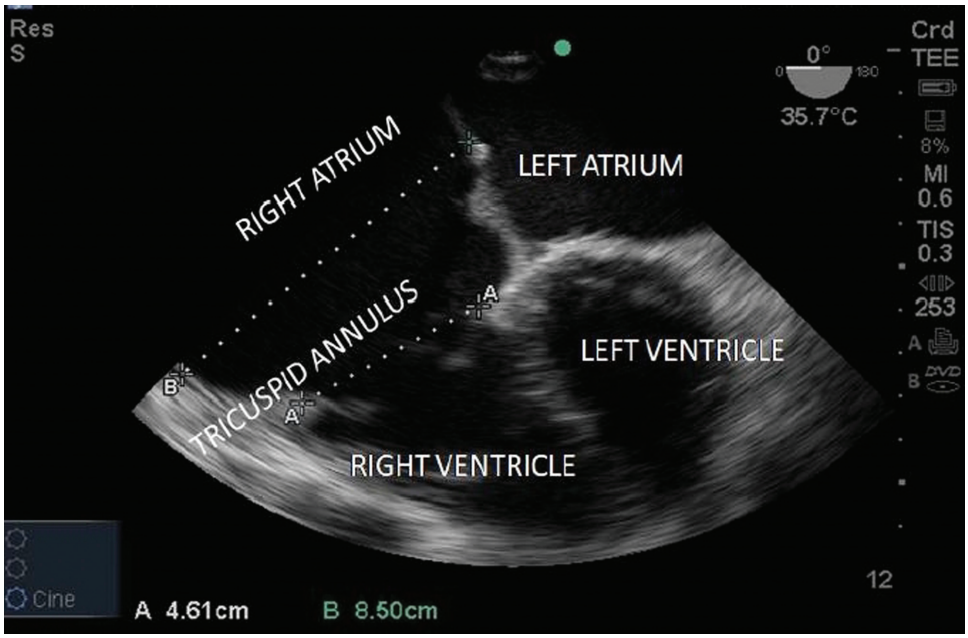
After adequate heparinization, median sternotomy with oscillating saw was done followed by aortobicaval cannulation. The surgeon decided to go for cardiopulmonary bypass and beating heart tricuspid valve replacement.

Right atriotomy was done, and a huge EV was noticed. Tricuspid valve was replaced with bioprosthetic valve. Patient came out of cardiopulmonary bypass on Milrinone infusion (0.5 μg/kg/min) and protamine was given. The rest of the course was uneventful.

Discussion

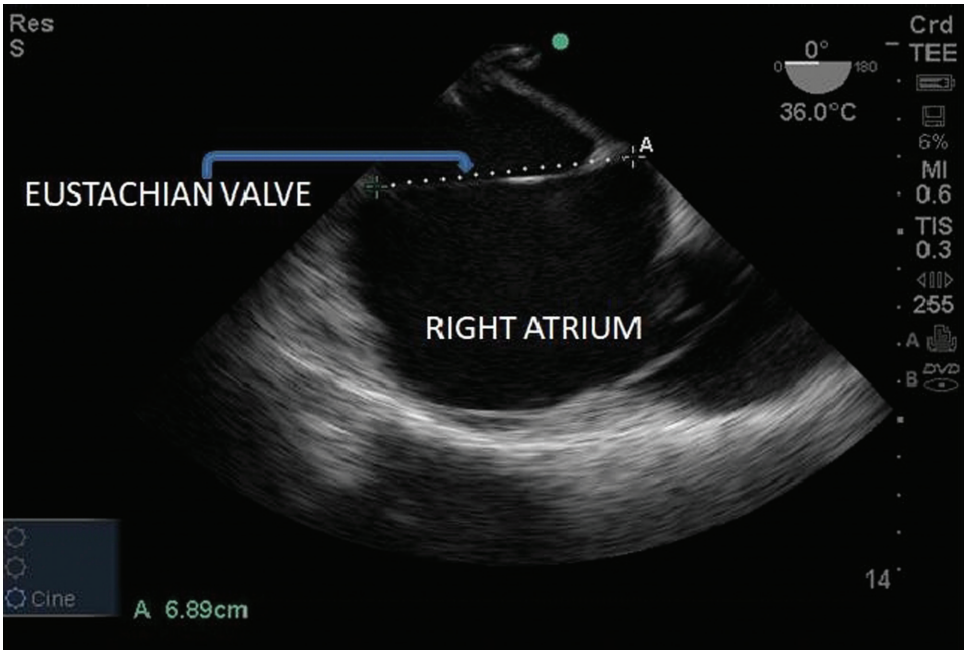
EV is due to the persistence of the right sinus venosus valve. It can present as a thin fibrous or membranous structure or as a fold of the endocardium. It usually arises from the anterior rim of the IVC orifice [2]. A persistent EV is seen in only 0.20% of adults during echocardiographic examination. Their presentations vary in size, shape, thickness, and extension. The approximate length of the EV noted is 3.6 mm with a range of 1.5–23 mm [3]. It may give divided RA look on echocardiography [4]. It can be mistaken with clot/thrombus, tumors, or vegetations or for 'cor triatriatum dexter' [5]. Cor triatriatum dexter results from

Figure 1



TEE mid-esophageal 4-chamber view showing tricuspid annulus (46 mm) and dilated right atrium (85 mm). TEE, transesophageal echocardiography.

Figure 2



TEE view (mid-esophageal four-chamber, probe turned to right) showing large eustachian valve (6.89 cm) (divided right atrium look). TEE, transesophageal echocardiography.

persistence of the entire right sinus venosus valve, which forms a large, obstructive flap across the RA and divides it into two chambers. This cardiac malformation can be differentiated from the giant EV dividing the RA, by echocardiographic demonstration of the atrial septal defect and by the presence of cyanosis in cor triatriatum [6].

Occasionally, a large EV can obstruct the flow, causing a dilated IVC. Sometimes a prominent EV was mistaken for the atrial septum and surgically closed for instead of ASD. It can cause lower inflow obstruction [7]. A persisting EV can prevent spontaneous closure of PFO after birth and directs the blood from the inferior cava to the interatrial septum,

which may predispose to paradoxical embolism and stroke [8,9]. Its other reported complications are hindrance in cannulation especially dual-stage single-venous RA cannulation, endocarditis (specially in intravenous drug abusers), and very rarely myoma or fibroelastoma can arise from EV [10].

In our case, it was an accidental finding during intraoperative TEE. EV was huge in size, making the RA to look like two chambered. IVC and hepatic artery were dilated but mostly due to tricuspid regurgitation and not due to obstruction to IVC. In various TEE views, its course was traced to be arising from the anterior rim of the IVC orifice and end at the orifice of the coronary sinus. Although peripheral bypass was not done in our case, in case it had been needed, EV would have proved difficult for cannulation.

We will recommend the importance of obtaining multiple echocardiographic views routinely during TEE to diagnose and differentiate such structures and its implications.

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Conflicts of interest
There are no conflicts of interest.

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