

Transthoracic Echocardiography versus Transesophageal Echocardiography for Rupture Sinus of Valsalva Aneurysm

Abstract

We report a rare case of sinus of Valsalva aneurysm of both right and left coronary sinus (LCS), with perforation of the LCS opening into the left ventricle. The LCS aneurysm with its perforation was undiagnosed on transthoracic echocardiography emphasizing the role of transesophageal echocardiography in delineating the anatomy.

Keywords: *Left coronary sinus aneurysm, left ventricle, rupture sinus of Valsalva, sinus of Valsalva aneurysm*

Introduction

Sinus of Valsalva aneurysm (SOVA), a rare disease with an incidence of 0.09%,^[1] involves commonly the right coronary sinus (RCS) ~70% followed by noncoronary sinus ~25% and rarely the left coronary sinus (LCS) ~5%.^[2] Only a few cases of SOVA of LCS rupturing into left ventricle (LV) are reported.^[3,4] Occurrence of multiple SOVA is still rare.^[5] We hereby report a case of multiple SOVA with LCS perforation opening into LV, which was diagnosed on transesophageal echocardiography (TEE).

Case Report

A 35-year-old male patient was scheduled for surgery with a preoperative diagnosis of ruptured RCS into LV. Two-dimensional transthoracic echocardiography (TTE) showed tricuspid aortic valve with outpouching of right sinus coursing posteriorly and opening into LV. Computerized tomographic angiography showed a lobulated aneurysm arising from the right coronary sinus (RCS) and coursing posteriorly to lie between aortic root and left atrium (LA) with rupture into the left ventricular outflow tract (LVOT). Right coronary artery was arising normally from RCS ~4.5 mm away from aneurysm. LA, right atrium (RA), and right ventricle were

dilated. Aortic annulus measured 24 mm, aortic root sinus 32 mm, sinotubular junction 24 mm, and ascending aorta 26 mm.

Intraoperative precardiopulmonary bypass (CPB) TEE showed aneurysmal RCS and LCS [Figures 1, 2 and Videos 1, 2]. LCS was perforated and seen opening into LV [Figures 1, 2 and Videos 1, 2]. Moderate mitral regurgitation was present with a vena contracta of 0.56 cm. Severe aortic regurgitation (AR) was present. Mild LV dysfunction was present with ejection fraction of 44%. No clot or vegetation or pericardial effusion was present.

Intraoperatively, aneurysmal sac was identified and repaired with Dacron patch after filling with gelfoam [Figure 3]. Postrepair, the patient had persistent ventricular fibrillation due to severe AR with LV distension. CPB was resumed and aortic valve was replaced with #21 On-X aortic valve prosthesis [Figure 3]. Post-aortic valve replacement, there was no gradient across the valve and no paravalvular leak.

Discussion

SOVA can be congenital (Marfan syndrome, Ehlers–Danlos syndrome, or other connective tissue disorders) or acquired (syphilis, bacterial endocarditis, tuberculosis, chest trauma, vasculitic

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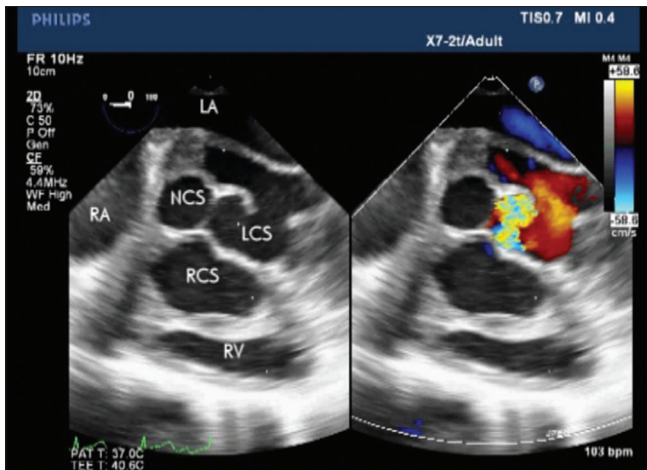


Figure 1: Mid-esophageal aortic valve short-axis view. Right coronary sinus and left coronary sinus aneurysmal with perforation of left coronary sinus seen

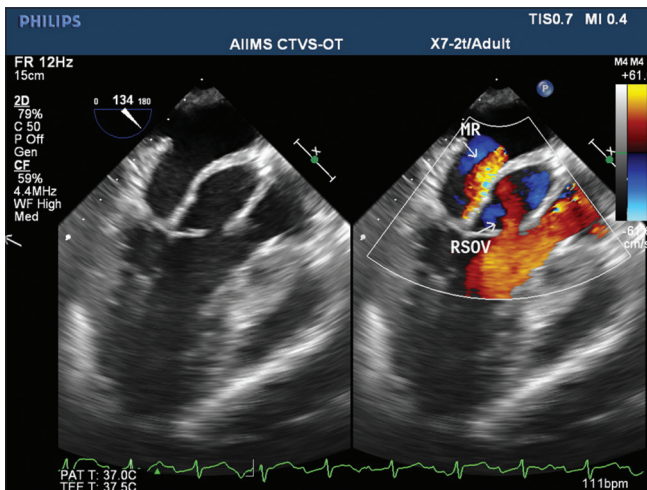


Figure 2: Mid-esophageal aortic valve long-axis view. Left coronary sinus perforation opening into left ventricle seen

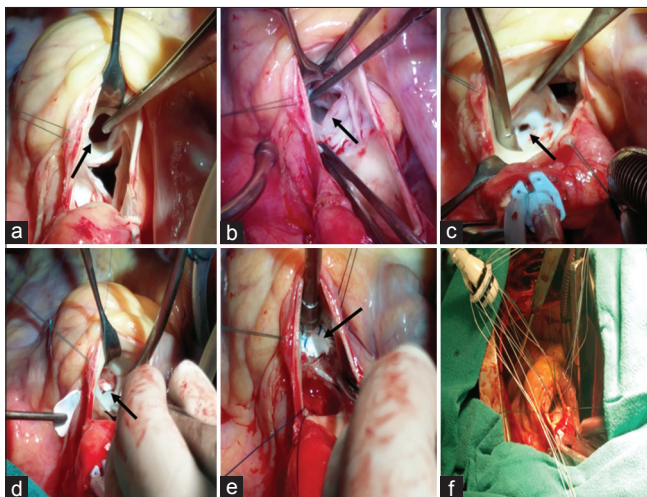


Figure 3: (a) Right coronary sinus aneurysm blind sac. (b) Left coronary sinus aneurysm blind sac. (c) Perforation in the left coronary sinus. (d) Gelfoam used to fill the aneurysmal blind sac. (e) Dacron patch closure of the blind sac. (f) Aortic valve replacement being performed

diseases, and iatrogenic injury during aortic valve replacement).^[1] It occurs more commonly in men than in women. Rupture of the right and noncoronary sinuses typically occurs into the right ventricular outflow tract being the most common site followed by the RA while left SOVA ruptures into LA and LVOT.^[1] Very rarely, left sinus of Valsalva ruptures into the pulmonary artery or pericardial cavity.

TTE helps in diagnosing most of the cases of SOVA. In the present case, TTE diagnosed RCS aneurysm rupturing into LV. On TTE, most probably RCS and LCS aneurysm were seen in continuity in one plane which appeared to be RCS aneurysm alone. TEE showed clearly on mid-esophageal aortic valve short-axis [Figure 1 and Video 1] and long-axis view [Figure 2 and Video 2] aneurysm of both RCS and LCS. In addition, a perforation was seen in LCS and not in RCS that opened into the LVOT. TEE was thus beneficial in guiding the surgeon about both RCS and LCS aneurysm with rupture of the LCS aneurysm into the LVOT. This emphasizes the role of intraoperative TEE for ruptured sinus of Valsalva. It also guides about the origin and size of the aneurysm, associated conditions such as ventricular septal defect, AR, presence or absence of thrombus in the sinuses, and assessment of the aortic valve postrepair or replacement.

Conclusion

Intraoperative TEE has an incremental value over TTE in the management of patients with SOVA.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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