

## Surgery of the Sinus Aneurysm of Valsalva

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### Abstract

Valsalva sinus aneurysms are an infrequent pathology. They are produced by dilation in the area of junction of the aortic middle layer with the fibrous annulus of the aortic valve; eventually they evolve to rupture or infection. In order to analyze its prevalence and evaluate the risks of its surgical resolution without the presence of complications, 344 cardiac surgeries were analyzed, of which only 3 (0.87%) corresponded to aneurysms of the sinus of Valsalva, two of them of origin congenital fistulized to the right ventricle and the rest a non-active aortic valve endocarditis with a recess at the level of the left sinus of Valsalva. Two patients underwent simple closure of the fistulas and the remaining closure with dacron patch, without postoperative complications or mortality.

**Conclusion:** The prevalence of the sinus aneurysm of Valsalva is low, the surgical treatment is simple, without surgical complications and, in this small series, without mortality. The sinus aneurysm of Valsalva (ASV) was described by John Thurman in 1840.

**Keywords:** *Sinus Aneurysm of Valsalva (ASV); Pathology*

### Introduction

It is an infrequent pathology that occurs by dilation in the area of junction of the aortic middle layer with the fibrous annulus of the aortic valve, and eventually evolves to rupture or infection. It is usually congenital, but occasionally it is secondary to infective endocarditis. Perforation into the right cardiac cavities is frequent and its complication with infectious endocarditis is possible.

### Objective of the Study

The objective of the present work was to analyze the prevalence of this pathology in a Cardiovascular Surgery service and the safety of its surgical treatment.

### Case Series

344 cardiac surgeries were analyzed. Only three of the patients (0.87%), all male, had a sinus aneurysm of Valsalva. The average age of the patients was 30 years, with a range of 18 to 38 years.

Case 1 Patient 38 years of age, with a history of smoking. Consultation for precordialgia, dyspnea CF IV and palpitations. The transesophageal echocardiogram (TEE) showed a continuity solution of 7 mm from the sinus of right Valsalva (SVD) to the right ventricle (RV) with overload of it. Moderate aortic insufficiency. Ejection fraction (EF) of the left ventricle: 62%. Surgery: simple closure of right aorto-ventricular fistula and aortic valve plastic.

Case 2 Patient of 18 years of age, asymptomatic, with a diagnosis of ventricular septal defect. The TEE showed aortic fistula at VD of 6 mm in diameter. Good left ventricular function. Surgery: simple closure of communication between SVD and RV below the septal valve of the tricuspid valve.

Case 3 A 34-year-old patient with a diagnosis of congenital aortic valve stenosis due to bicuspid valve with surgical commissurotomy at 13 years of age and several hospitalizations for heart failure. The TEE showed aneurysmal dilatation of the left and right sinus of Valsalva. Calcified bicuspid aortic valve, with a peak gradient of 100 mmHg. Surgery: infective endocarditis not active bicuspid aortic valve with recess at the level of the left sinus of Valsalva. Aortic valve replacement was performed by mechanical prosthesis No. 21 and closure of the recess with dacron patch.

### Results

Etiology Two patients presented sinus aneurysm of Valsalva of fistulized congenital origin to the right ventricle; the remaining, a non-active aortic valve endocarditis with a recess at the level of the left sinus of Valsalva.

Precordialgia clinic, dyspnea and palpitations, in one case; heart failure in another; the rest, asymptomatic. Surgical technique Two patients underwent simple closure of the fistulas with separate points of polyester 2-0 with Teflon patch; to the rest, close with dacron patch. Average time of extracorporeal circulation (CEC): 64 minutes. Average clamping time: 46 minutes. Average of hospitalization: 7 days. No postoperative complications or mortality.



## Discussion

The perforation of a congenital aneurysm of the sinus of Valsalva can be spontaneous, secondary to infectious endocarditis or thoracic trauma or after aortic valve surgery. Fistulized ASVs are classified as: Type I: connects the SVD and the right ventricular outflow tract (RVOT) below the pulmonary valve. Type II: connects the SVD with the VD. Type IIIa: connects the SVD with the right atrium (AD). Type IIIb: connects the posterior area of the SVD with the RV. Type IIIa + b: connects the SVD with the AD and the VD. Type IV: connects a non-coronary sinus with the AD. The right coronary sinus is the most frequently affected. It can be associated with aortic coarctation, bicuspid aortic valve, atrial septal defect and ventricular septal defect. The consequences of ASV rupture depend on the volume of flow through the communication, the speed of establishment of the rupture and the cardiac chamber with which communication is established. Only one of the three cases that we have presented was really asymptomatic and the clinical diagnosis corresponded to interventricular communication. The diagnosis was made with the echocardiographic study, and in spite of the absence of symptoms, it was decided to intervene to resolve the fistula between the aorta and the right ventricle.

In the remaining two cases, the patients were symptomatic for heart failure, although with preserved left ventricular function. Although the cause of heart failure cannot be determined, undoubtedly the concomitant valvular failure had a hemodynamic influence on the impairment of functional capacity. The resolution of the valvulopathy resulted in the main surgical behavior and the resolution of the aneurysm secondary behavior. Case 3 was a non-active aortic endocarditis with right and left ASV, which presented a recess at the level of the latter, without fistulization, for which reason it did not correspond to the previous classification. In conclusion, sinus aneurysm of Valsalva is a pathology of low prevalence, whose presence may be associated with concomitant pathology and whose surgical treatment is safe, without significant complications and, in this small series, without mortality.

## Summary

Surgical treatment of sinus of Valsalva aneurysm: The sinus of Valsalva aneurysm is a dilatation in the union of the aortic media with fibrous aortic annulus. From January 1 - December 31/2004, 344 patients underwent cardiac surgery: three of them (0.87%) had sinus of Valsalva aneurysm. Two patients had congenital aneurysm communicated to the right ventricle. The other was healed endocarditis with a recess in the left sinus. The defect was corrected with simple closure in two cases and dacron patch in one of them. There was no mortality and no postoperative problems. Although the small sample, the surgery was an effective and safe procedure.

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