

## Successfully Surgical Repair of Giant Unruptured Aneurysm of the Sinus of Valsalva

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### Abstract

Aneurysmal dilatation and progressive enlargement of one of the sinuses of Valsalva, most often occurs on the site of right coronary sinus and normally goes undetected during life until its rupture. Rarely, the aneurysm presents with evidence of obstruction of the right ventricular outflow tract, aortic insufficiency, conduction abnormalities, or coronary artery compression in the absence of rupture. The biggest size in the literature of aneurysm was reported as 8 cm. In this case report, we present successful surgical repair of 10 cm large sinus of Valsalva aneurysm with Bentall procedure.

**Keywords:** Aneurysmal dilatation; Sinuses; Aortic; Dyspnea

### Introduction

Since its first description in 1840 by Thurman, varying terminologies and classifications have been used. In 1962, Sakakibara and Konno [1] documented four types of aneurysm but did not account for a description of the penetration of ruptured aneurysms. The classic congenital sinus of Valsalva aneurysm is defined as the dilation or enlargement of one of the aortic sinuses between the aortic valve annulus and the Sino tubular ridge. Multiple sinus dilation should be considered as a separate entity, namely, as aneurysmal dilation of the aortic root. By definition, the true sinus of Valsalva aneurysm arises from above the aortic annulus, in contrast to the prolapsing aortic cusp below the annulus. The sinus of Valsalva aneurysm, like many other congenital cardiac lesions, has to be defined carefully before its devastating results occur.

There have been a few reported cases of unruptured sinus of Valsalva aneurysms [2] but not in this size of aneurysm (10 cm). We describe a patient with an unruptured 10 cm aneurysm of the sinus of Valsalva.

In our case a 50-year-old man presented with intermittent dizziness and electrocardiographic evidence of a severe conduction disturbance, echocardiographic LVEF with 25%. During surgical transesophageal echocardiography showed an enlarging aneurysm of the right sinus of Valsalva. Successful surgical repair was carried out with Bentall procedure.

### Case Report

A 50-year-old Turkish man was admitted with a history of weakness, and mild dyspnea with a 2-year diagnosis history as an aneurysm of the ascending aorta. There was no history of recent chest pain or injury. On examination, his pulse was normal with a regular rhythm at a rate of 70 beats/min.

The transthoracic echocardiography was reported as aneurysm of aortic root and ascending aorta with global hypokinesia and hypertrophy of left ventricle (Figure 1). On Cardiac CT, a large aneurysm of the right coronary sinus of Valsalva was found. Aneurysm size was measured between 84.30 mm to 97.83 mm (Figure 2). During a surgical procedure, the ascending aorta was normal, aneurysm of sinus Valsalva was giant with size of 10 cm (Figure 3). After the axillar cannulation and sternotomy, bicaval cannulation was performed. Aortotomy was from top of the aneurysm on thinnest place, the right coronary cusp of the aortic valve was abnormally left side distorted. The other two cusps and sinuses was slightly distorted. The aneurysm was bulging into the right ventricle and to a lesser extent into the left ventricular outflow tract (Figure 4).



**Figure 1:** The transthoracic echocardiography was reported as aneurysm of aortic root and ascending aorta with global hypokinesia and hypertrophy of left ventricle.



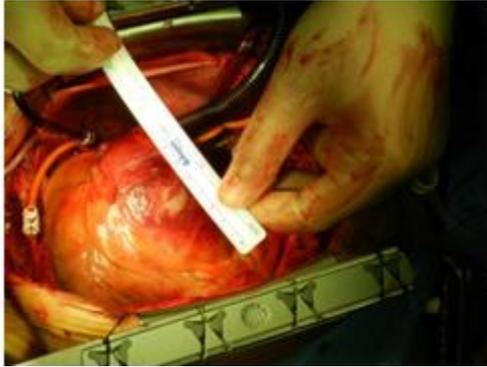
**Figure 2:** On Cardiac CT, a large aneurysm of the right coronary sinus of Valsalva was found. Aneurysm size was measured between 84.30 mm to 97.83 mm.

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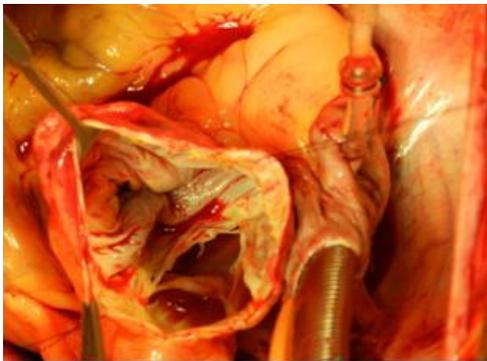
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**Figure 3:** During a surgical procedure, the ascending aorta was normal, aneurysm of sinus Valsalva was giant with size of 10 cm.



**Figure 4:** The aneurysm was bulging into the right ventricle and to a lesser extent into the left ventricular outflow tract.

The aneurysm was left opened and the aortic valve was replaced with a No:25 St. Jude Medical bileaflet mechanical valved graft with sinus Valsalva (Gelweave Valsalva Technology). Postoperatively, the patient had an uneventful recovery.

## Discussion

Sinus of Valsalva aneurysms are usually remained asymptomatic and undetected, unless rupture occurs. As symptoms, patients may present acute right heart failure, exertional dyspnea, palpitations, and angina like chest pain [3]. In our patient, symptoms were presented as insufficiency of right ventricle. These aneurysms may be congenital, due to a deficiency in the muscular and elastic tissues at the base of the aorta, or acquired after infective endocarditis, atherosclerosis, or aortic dissection [4]. In our case etiology was genetic, because brother of our patient has died with similar history.

The surgical approach depends on some various factors, such as whether the aneurysm is ruptured, the necessity to repair or replace the aortic valve or aortic valve with aortic root (Bentall procedure). Like we have shown in our Figure 4, the aneurysm is contiguous to sternum.

We think that surgical approach to the aneurysm needed to be very careful from beginning with sternotomy, because of deviation is mostly versus right coronary sinus, which was like in our patient. Especially in these cases with giant aneurysm of ascending aorta, the choice of aortic cannulation must be from axillary or femoral artery.

In ascendant aortic surgery, the surgical choice of procedure in pathological sinotubular junction is known very well. Involvement in this predicted area sinus of Valsalva aneurysm is interesting.

Successful results of Valve sparing reimplantation technics has been reported if there was no any pathology on leaflets structure. Neo sinus Valsalva procedure with Dacron graft is rarely applied technic if only one sinus Valsalva affected especially in noncoronary sinus Valsalva affected cases. But in our case, we preferred modified Bentall de bono procedure with button technic, due to sinus Valsalva was pathologically dilated especially the right coronary sinus and also because of the impaired sinus Valsalva and fibrotic leaflets leads valve coaptation competence was impossible. We used bileaflet mechanical valved greft with sinus Valsalva because of it effects the flow dynamics in positive way and also increases the coronary diastolic reserve [5].

## Conclusion

Cases of unruptured giant sinus of Valsalva aneurysm are extremely rare. Only this case has been reported in our department. As we know, any case in this size of aneurysm (10 cm) has not been reported yet. Our patient presented with symptoms of insufficiency of right ventricle. A good prognosis depends on early diagnosis and prompt surgical intervention. However, we think the best surgical procedure is modified Button Bentall procedure, as we did in our case.

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