

## Aneurysm of Coronary Sinus of Valsalva Can Rupture Anytime!

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### ABSTRACT

An aneurysm of the sinus of Valsalva ruptures in about 35% of all cases and only leads to acute symptoms in 25% of all patients. This paper illustrates a case of a patient who was scheduled for an elective operation due to an aneurysm of the right coronary sinus of Valsalva, which ruptured and led to the necessity of an emergency surgery.

### CASE REPORT

A 53-year-old asymptomatic male patient was diagnosed with a large aneurysm of the right coronary sinus of Valsalva on transthoracic echocardiography (TTE) with a diameter of 61 mm (Figure 1A). After conducting a cardiac catheterization, the sinus of Valsalva aneurysm was confirmed, and the patient was scheduled for an elective operation. Two weeks later, before the scheduled operation, he was admitted to the emergency unit due to retrosternal pain and dyspnea. On TTE, a rupture of the right sinus of Valsalva aneurysm was detected with a left to right shunt into the right ventricle. Although the right ventricle was already overloaded and dilated, the ejection fraction remained normal (Figure 2A). The computed tomography (CT) scan confirmed the ruptured aneurysm with a size of 3 × 2.5 cm, but excluded an aortic dissection or hematoma (Figure 2B).

The patient was immediately scheduled for an emergency surgery. After initiation of standard cardiopulmonary bypass, an aortic root replacement with a 23-mm Conduit and ATS Aortic Valve Graft (ATS Medical, Inc., Minneapolis, MN, USA) was conducted. Thereafter, the root defect was closed with a mattress suture (Figure 2C). The operation was carried out without complications, and the patient made a swift recovery.

Postoperatively, the echocardiography displayed a normal ejection fraction and a sufficient aortic valve function with a maximum transvalvular gradient of 21 mmHg (mean, 10 mmHg) as well as the excluded aneurysm (Figure 1B).

Received October 1, 2010; accepted November 5, 2010.

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Three-month TTE follow-up demonstrated a regular aortic valve function with a mean transvalvular gradient of 11 mmHg and a slightly dilated right ventricular outflow tract.

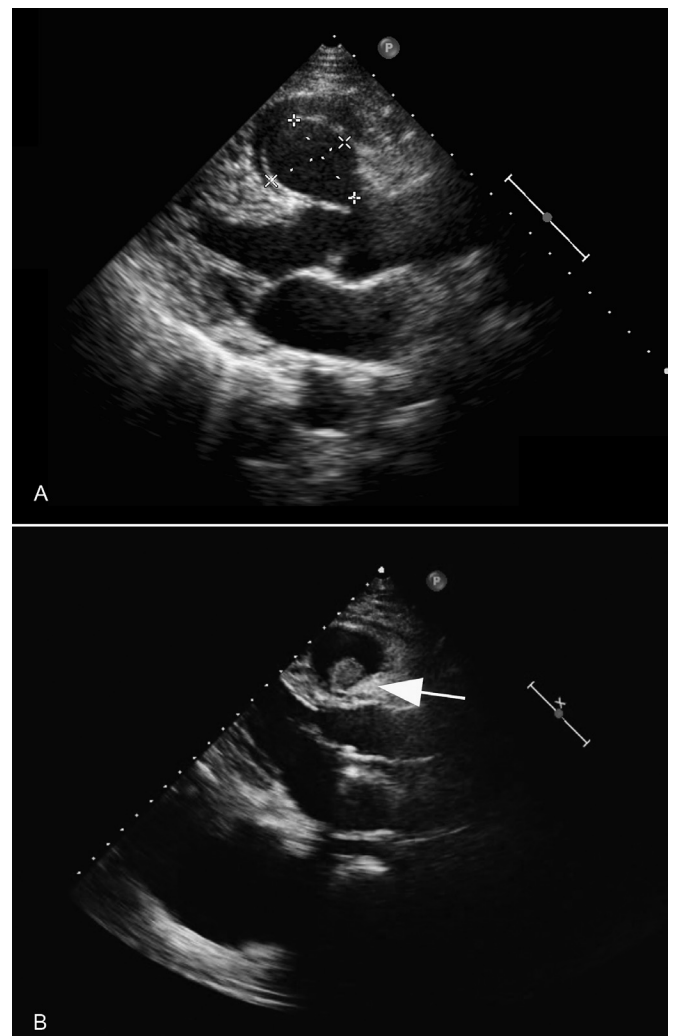


Figure 1. A, Preoperative detection of a sinus of Valsalva aneurysm 3 × 2.5 cm on transthoracic echocardiography. B, Postoperative transthoracic echocardiography with the excluded aneurysm and aortic valve graft (white arrow).

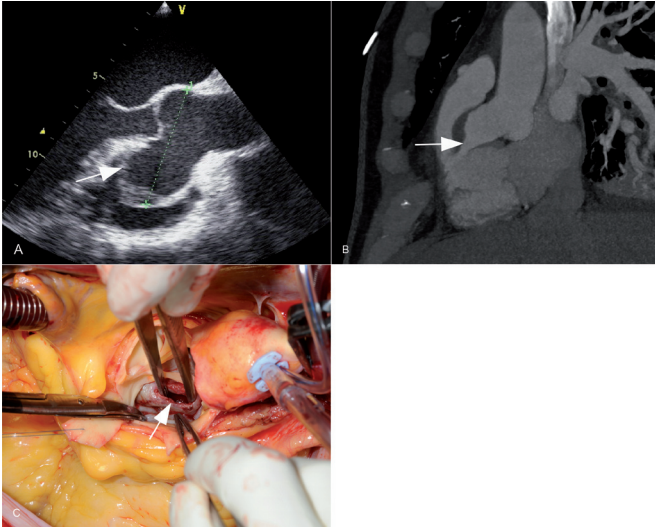


Figure 2. A, Ruptured sinus of Valsalva aneurysm on transesophageal echocardiography. B, Computed tomography scan of the sinus of Valsalva aneurysm. C, Intraoperative view of the ruptured right coronary sinus of Valsalva aneurysm (white arrows).

## DISCUSSION

Sinus of Valsalva aneurysms are rare cardiac anomalies that occur in between 0.09% and 0.15% of all cases [Jung 2008]. The right coronary sinus is most frequently affected, and in 20% of all cases it ruptures into the right ventricle [Moustafa 2007]. An acute rupture of a sinus of Valsalva aneurysm occurs with a probability of 35%, but only 25% of the patients present with acute symptoms [Yan 2008]. Major symptoms in case of an acute rupture include shortness of breath, chest pain,

and fatigue [Jung 2008]. When an unruptured aneurysm is detected, an operation is highly recommended to prevent further complications [Raffa 1991].

Clear guidelines are only available for the treatment of aortic aneurysms, and there are no specific guidelines specifically defined for the therapy of sinus of Valsalva aneurysms. Particularly, the time period from the first diagnosis to the moment of the surgery and the grading of aneurysm size are not defined and have to be elucidated. Because no exact estimation of risk for rupture is possible, however, a good prognosis requires an early diagnosis followed by a prompt surgical intervention without a certain delay. Otherwise, it can increase the risk for an acute rupture as seen in our case. Consequently, a CT scan at the time of diagnosis should have been made, because it is known that the asymmetry of the aneurysm increases the risk of a rupture and that the size of 61 mm is a further indication for urgent surgery.

With this case report, we want to alert all involved clinicians that a sinus of Valsalva aneurysm is an indication for urgent surgery because it may rupture at any time!

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