

# Part 1

## Aortic Diseases

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# 1 Spontaneous Ruptured Aneurysm of the Sinus of Valsalva

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## History

**Case 1:** A 30-year-old female had no symptom. Cardiology examination revealed a grade 4/6 diastolic heart murmur at the left sternal edge.

Transthoracic echocardiography (TTE): An aneurysm of the right sinus of Valsalva was well seen in the parasternal short-axis (PSA) view. The aneurysm was ruptured into right ventricle (RV) as demonstrated by color Doppler (Figure 1.1 and Videoclip 1.1).



**Case 2:** A 40-year-old male had the onset of a new heart murmur. Auscultation revealed grades 3/6 systolic and 3/6 diastolic murmurs best heard at the right sternal border.

Echocardiogram revealed that left ventricle (LV) and RV were normal in size and systolic function. A PSA view with color Doppler shows a ruptured aneurysm of the noncoronary sinus of Valsalva and the high-velocity flow through the ruptured noncoronary sinus aneurysm into right atrium (RA; Figure 1.2 and Videoclip 1.2).



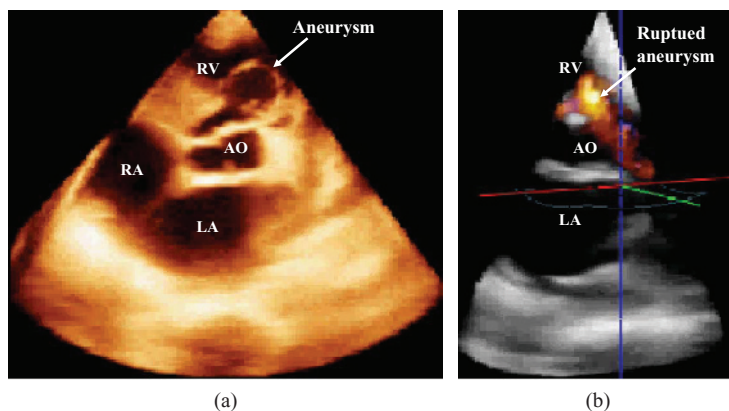
## Discussion

A ruptured aneurysm of aortic sinus is a major cardiovascular event that demands prompt diagnosis and treatment. Most aortic sinuses of Valsalva aneurysms are congenital or are associated with an infectious process such as endocarditis or syphilis. In our two cases, the patient presented at 30 and 40 years of age. The anatomical positions of the coronary sinus and the aortic valve are normal, and predisposing infection is absent, which suggests a possible spontaneous rupture of congenital coronary sinus aneurysms.

The right sinus of Valsalva is the most common site of aortic sinus aneurysmal dilatation, followed by the noncoronary sinus. After rupture, a fistulous tract is formed, frequently with the RV in the former instance and with the RA in the latter [1]. Uncommonly, rupture into the pulmonary artery may occur [2]. Our patients had a ruptured right and noncoronary

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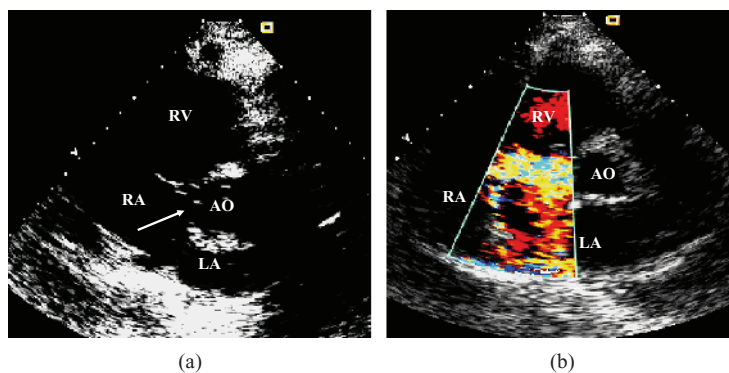
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**Figure 1.1.** (a) Parasternal short-axis view shows the right sinus of Valsalva (arrow). (b) Parasternal short-axis view with color Doppler shows the high-velocity flow through the ruptured sinus aneurysm into right ventricle in case 1. AO, aorta; LA, left atrium; RA, right atrium; RV, right ventricle.

sinus of Valsalva and a fistula to the RV in case 1 and to the RA in case 2. At presentation, they had the onset of a new murmur and had no symptoms, which suggests that these events happened recently.

TTE can lead to an accurate diagnosis in most of these patients and transesophageal echocardiography may be useful when TTE is inconclusive. The natural history of asymptomatic aneurysm of an aortic sinus is unclear, and variant cases—with rapid clinical deterioration or many years of stabilization—have been described [1]. However, once symptoms develop or rupture occurs, urgent intervention is recommended. Open-heart correction of the aneurysm and fistula, with or



**Figure 1.2.** (a) Parasternal short-axis view shows ruptured aneurysm (arrow) of the noncoronary sinus of Valsalva. (b) Parasternal short-axis view with color Doppler illustrates the high-velocity flow through the ruptured noncoronary sinus aneurysm into right atrium in case 2. AO, aorta; LA, left atrium; RA, right atrium; RV, right ventricle.

without aortic valve replacement, carries a low operative risk and traditionally has been the choice of treatment [1]. A novel percutaneous closure technique has brought hope of a less invasive method to correct such condition [3]. Our patient underwent a traditional operation and recovered completely.

### References

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