Successful device closure of a ruptured sinus of Valsalva presenting with acute heart failure

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DESCRIPTION

A sinus of Valsalva aneurysm (SVA) is an uncommon cardiac anomaly that can be congenital or acquired. SVAs were present in 0.09% of cadavers in a large autopsy series and ranged between 0.14–0.23% in a Western surgical series.¹ A congenital SVA is usually clinically silent but may vary from a mild, asymptomatic dilation detected in routine two-dimensional echocardiography, to symptomatic presentations related to the compression of adjacent structures or intracardiac shunting caused by rupture of the SVA into the right side of the heart. Approximately 65–85% of SVAs originate from the right sinus of Valsalva, while SVAs originating from non-coronary (10–30%) and left sinuses (<5%) are exceedingly rare.

The most common complication is rupture into the atrium or ventricle, and, very rarely, towards the left chambers, causing left-to-right shunting or aortic valve insufficiency with congestive heart failure and the need for urgent surgical resolution. Although open-heart surgery with or without aortic valve replacement remains the treatment of choice, trans-catheter device closure of a ruptured SVA has been successfully performed.² So far, around 136 cases of device closure of ruptured SVAs have been reported in the literature.³ For an asymptomatic unruptured SVA, there is no consensus regarding management. Most large surgical series have advocated early surgical repair even if the patient is asymptomatic, while Vural *et al*³ proposed that patients with unruptured, stable

Figure 2 Aortic root angiogram showing a ruptured sinus of Valsalva aneurysm forming a windsock deformity (arrow) into the right side chambers.

aneurysms should be anticoagulated, followed at 6-month intervals, and then repaired if symptoms develop or the size of the sinus is >50% of the average size of the other two normal Valsalva

Figure 1 Transthoracic echocardiogram, parasternal short-axis view, displaying an RSOV (arrow), with colour Doppler demonstrating shunting into the right atrium (RA) near the tricuspid valve (LA, left atrium; RSOV, ruptured sinus of Valsalva; RA, right atrium; RV, right ventricle).

Video 1 Aortic root angiogram showing opacification of the right ventricle on aortic root injection through the ruptured sinus of Valsalva.

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Figure 3 Aortic root angiogram showing the device (arrow) positioned across the ruptured sinus of Valsalva just before its deployment.

Video 2 Aortic root angiogram showing no residual shunt across the ruptured sinus of Valsalva after device deployment.

into the right ventricle (figure 1). Angiogram revealed a classical windsock deformity (figure 2 and video 1). Successful device closure was achieved using a 10/12 mm LIFETECH CERA PDA occlusion device. Subsequent angiogram and echocardiogram revealed no residual shunt (figures 3 and 4, and video 2). The patient was on regular follow-up for 6 months and did not have any recurrence of symptoms.

Figure 4 Transthoracic echocardiogram, apical four-chamber view, showing the device in situ (arrow) across the RSOV (LA, left atrium; LV, left ventricle; RSOV, ruptured sinus of Valsalva; RA, right atrium; RV, right ventricle).

sinuses, compresses or distorts surrounding chambers or tissues, or increases in consecutive echocardiographic examinations.

We present a case of a 34-year-old man with acute heart failure symptoms of 1 week duration. Transthoracic echocardiogram revealed a ruptured sinus of Valsalva aneurysm entering

Learning points

- ▶ Ruptured sinus of Valsalva aneurysm is a rare cardiac anomaly.
- ▶ Presentation varies from asymptomatic findings to acute heart failure, which can rapidly worsen to cause death.
- ▶ Although surgery is the gold standard treatment, percutaneous transcatheter closure has now become equally efficacious with fewer complications.

Competing interests None declared.

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REFERENCES

- 1 Prian GW, Diethrich EB. Sinus of Valsalva abnormalities. A specific differentiation between aneurysms of an aneurysms involving the sinuses of Valsalva. *Vasc Surg* 1973;7:155–64.
- 2 Zhong L, Tong SF, Zhang Q, *et al*. Clinical efficacy and safety of transcatheter closure of ruptured sinus of Valsalva aneurysm. *Catheter Cardiovasc Interv* 2014;84:1184–9.
- 3 Kuriakose EM, Bhatla P, McElhinney DB. Comparison of reported outcomes with percutaneous versus surgical closure of ruptured sinus of Valsalva aneurysm. *Am J Cardiol* 2015;115:392–8.

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