An adult patient with ruptured sinus of Valsalva aneurysm to the right ventricle

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DESCRIPTION

Sinus of Valsalva (SOV) aneurysms are rare cardiac anomalies that may be acquired or congenital. The acquired aneurysm is caused by conditions affecting the aortic wall, such as infections, trauma and connective tissue disorders. The congenital aneurysm is more common and is most often caused by weakness at the juncture of the aortic media and the annulus fibrosus.

A 20-year-old man was admitted to the hospital with dyspnoea on exertion. Physical examination revealed a mesocardiac 3/6 grade continuous cardiac murmur. Electrocardiography was in normal sinus rhythm. Two-dimensional and three-dimensional (3D) transthoracic echocardiography revealed a mean left ventricular ejection fraction of 65%. The pulmonary to systemic flow ratio (Qp/Qs) ratio was 2 : 1 and right heart chambers were in normal size. A giant ruptured SOV aneurysm opening to the right ventricle (RV) was

detected at parasternal long-axis window and short-axis window. Colour-Doppler and colour-flow M-mode echocardiography images showed the blood shunting from the aorta to the right ventricle from aorta during both in diastole and systole (figures 1–6). The three-plane analysis of reconstructed 3D echocardiographic images revealed ruptured SOV aneurysm to the RV. The distance from ruptured SOV orifice was measured as 4.7 mm. (figures 7 and 8). Unfortunately, the patient refused transesophageal echocardiography and cardiac catheterisation which could have given more detailed information about the pathology. Cardiac MRI was also carried out to confirm the diagnosis. The vertical long-axis and short-axis images of MRI accurately delineated the site of rupture into the RV (figures 9 and 10). There was no additional cardiac abnormality. Finally, the patient was referred to cardiovascular surgery.

Figures 1–4 (1) Parasternal long-axis and short-axis window of transthoracic echocardiogram showed a giant, ruptured sinus of Valsalva (arrow). (2) Parasternal long-axis and short-axis window of transthoracic echocardiogram showed a giant, ruptured sinus of Valsalva (arrow). (3) Parasternal long-axis window of colour flow and colour M-mode transthoracic echocardiogram showed a giant ruptured sinus of Valsalva. Blood flow entering the RV from aorta during diastole and systole. S, systole; D, diastole; AV, aortic valve; PV, pulmonary valve; TV, tricuspid valve; RV, right ventricle; LV, left ventricle; LA, left atrium. (4) Parasternal long-axis window of colour flow and colour M-mode transthoracic echocardiogram showed a giant ruptured sinus of Valsalva. Blood flow entering the RV from aorta during diastole and systole. S, systole; D, diastole; AV, aortic valve; PV, pulmonary valve; TV, tricuspid valve; RV, right ventricle; LV, left ventricle; LA, left atrium.

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Figures 5–8 (5) Parasternal short-axis window of three-dimensional transesophageal echocardiogram showed a giant ruptured sinus of Valsalva (arrow). (6) Parasternal short-axis window of three-dimensional transesophageal echocardiogram showed a giant ruptured sinus of Valsalva (arrow). (7) The postprocessing analysis of the reconstructed three-dimensional images. The image with green frame corresponds to parasternal short-axis view, showing a ruptured sinus of Valsalva orifice of 4.7 mm (yellow circle). The image with red frame is orthogonal to the image with green frame, showing similar findings. (8) The postprocessing analysis of the reconstructed colour-flow three-dimensional images. The image with green frame corresponds to parasternal long-axis view, showing ruptured sinus of Valsalva (arrow).

Figures 9 and 10 Vertical long-axis view of cardiac MRI showed ruptured sinus of Valsalva.

Learning points

- ▶ Sinus of Valsalva aneurysms are rare cardiac anomalies that may be acquired or congenital.
- ▶ The acquired aneurysm is caused by conditions affecting the aortic wall, such as infections, trauma and connective tissue disorders.

- ▶ Three-dimensional echocardiography and cardiac MRI help the cardiologists to determine more precise anatomic localisations of the cardiac shunts.

Competing interests None.

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