Ruptured Sinus of Valsalva: An Unusual Cause of Heart Failure

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Abstract

A 35-year-old male patient presented with heart failure. On examination, there was a continuous murmur over the left sternum. Transthoracic echocardiography revealed a ruptured aneurysm arising from the noncoronary sinus of Valsalva and draining into the right atrium.

Keywords: Echocardiography, heart failure, rupture, sinus of Valsalva aneurysm

Introduction

Sinus of Valsalva aneurysm is a rare cardiac anomaly usually detected in the third or fourth decade of life. This lesion is more frequent in males and more commonly arises from the right coronary (77%) followed by noncoronary (23%) and, sometimes, the left coronary sinus of Valsalva. Congenital defect of the aortic media is the main etiology of these aneurysms. Less common etiologies include thoracic trauma, infective endocarditis, and syphilis. Unruptured sinus of Valsalva aneurysms often remain asymptomatic, but once ruptured, mortality is very high unless repaired.

Case Report

A 35-year-old male patient with no cardiovascular risk factors was referred for cardiac evaluation. He presented with worsening shortness of breath and palpitation for 2 weeks duration. On examination, the patient was dyspneic and had a regular pulse of 110 beats/min and a blood pressure of 120/80 mmHg. He had mild pitting ankle edema and an elevated jugular venous pulse. Lungs were clear on auscultation; however, there was a grade III continuous murmur best heard in the left lower sternal border.

Electrocardiography showed sinus tachycardia. A transthoracic echocardiogram was performed, which revealed a ruptured sinus of Valsalva (RSOV) aneurysm [Figures 1 and 2] arising from the noncoronary sinus (NCC) and communicating with the right atrium with classical windsock deformity. He was referred for surgical correction of the defect to another center where he underwent successful surgical repair. During 3-month follow-up visit, the patient remained asymptomatic.

Discussion

Sinus of Valsalva aneurysm can be congenital or acquired which often presents as an incidental finding during cardiac imaging. The prevalence of this defect is approximately 0.09% of the general population. In addition, RSOV aneurysm is rare, comprising only 0.3%–3.56% of all congenital heart diseases and usually occurs in men in the third or fourth decade of life.

The right sinus of Valsalva is commonly involved followed by the NCC, and least commonly, the left coronary sinus. The right sinus of Valsalva usually ruptures into the right heart chambers while rupture into the left heart is extremely rare. Transthoracic echocardiogram is the standard imaging technique for diagnosis of RSOV aneurysm, but sometimes, transoesophageal imaging or cardiac catheterization is required if transthoracic echocardiogram is inadequate. Differential diagnosis of a continuous murmur includes patent ductus arteriosus, arteriovenous fistula, ventricular septal defect combined with aortic regurgitation, and aortopulmonary window and such cases can be recognized early with transthoracic echocardiography. Recent reports have suggested a potential role of cardiac computed tomography in identifying the defect

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in establishing the diagnosis as some cases may be initially missed by echocardiography. Magnetic resonance imaging might be useful in diagnosing the coexisting cardiac lesions more precisely. The anomaly usually occurs in isolation but may coexist with ventricular septal defect or aortic valve regurgitation in about 30%–40% of patients.

Often, unruptured sinus of Valsalva aneurysms is asymptomatic. Once these aneurysms rupture, the patient develops acute symptoms of heart failure. Left untreated it carries a dire prognosis with the median survival reduced to 1–2 years. Early surgical intervention is the treatment of choice. Correction of the defect, either by direct closure, or patch repair, is generally associated with a good outcome. Successful percutaneous closure of suitable lesions has also been reported.

**CONCLUSION**

RSOV aneurysm is a rare cardiac deformity that carries a severe prognosis. Patients with such condition may present with heart failure. Transthoracic echocardiogram is sufficient to accurately diagnose this condition. Early surgical repair is the treatment of choice.

**Declaration of patient consent**

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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**Conflicts of interest**

There are no conflicts of interest.

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