

# Aneurysm of the left aortic sinus causing acute myocardial infarction

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## ABSTRACT

This report describes the findings and management of a young male who presented with an acute ST-segment elevation myocardial infarction due to compression of the circumflex coronary artery by a large aneurysm of left sinus of Valsalva.

**Keywords:** Aneurysm, computed tomography, echocardiography, imaging, magnetic resonance, myocardial infarct

## CASE REPORT

A 14-year-old male presented with an acute inferoposterolateral ST-segment elevation myocardial infarct. A week before he had developed exercise-induced angina, which progressed to recurrent episodes of chest discomfort at rest during the days before presentation. He had no previous medical history nor used illicit drugs. Diagnostic coronary angiography revealed extensive thrombus in the mid-segment of the left circumflex, which could not be aspirated with an export catheter [Figure 1a]. A bare metal stent was inserted, and TIMI 3 flow with a normal blush index was established [Figure 1b]. Transthoracic echocardiographic assessment revealed a large structure bulging in the left ventricle, displacing the anterior mitral valve leaflet into the left atrium, and resulting in mild mitral valve obstruction and regurgitation [Figures 2a-c]. Additional transesophageal evaluation confirmed the presence of a large left-side sinus of Valsalva aneurysm (SVA), without evidence of intracardiac or intracavitary thrombus [Figures 2a and b]. Additional evaluation with 64-slice multidetector computed tomography [Figure 3] and gadolinium cardiovascular magnetic resonance

was helpful in delineating the size and position of the aneurysm as well as the extent of his myocardial necrosis [Figure 2d]. Elective repair was scheduled, but 3 weeks later he however presented in congestive heart failure after rupture of a smaller second aneurysm, originating from the primary sac [Figure 2c]. During emergency repair, the orifice of the aneurysm was closed with pericardial patch. Obliteration of the aneurysm, which had gradually displaced the anterior mitral leaflet, resulted in severe mitral valve regurgitation requiring replacement with a prosthetic valve. Six months after his surgery he remains well, and has engaged in noncompetitive, noncontact sports.

## DISCUSSION

Left-side SVA is rare, representing 1% of SVA's, and are most commonly congenital in nature, resulting from the absence of muscular and elastic layers.<sup>[1]</sup>

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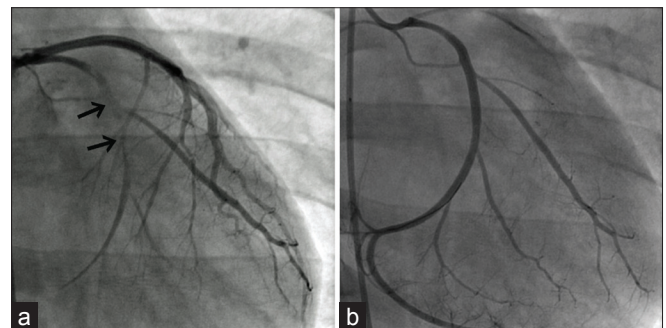


Figure 1a-b: Diagnostic coronary angiogram (AP view) which demonstrates extensive thrombus in the mid-left circumflex (left-side panel). The right-side panel shows restored flow after insertion of a bare metal stent

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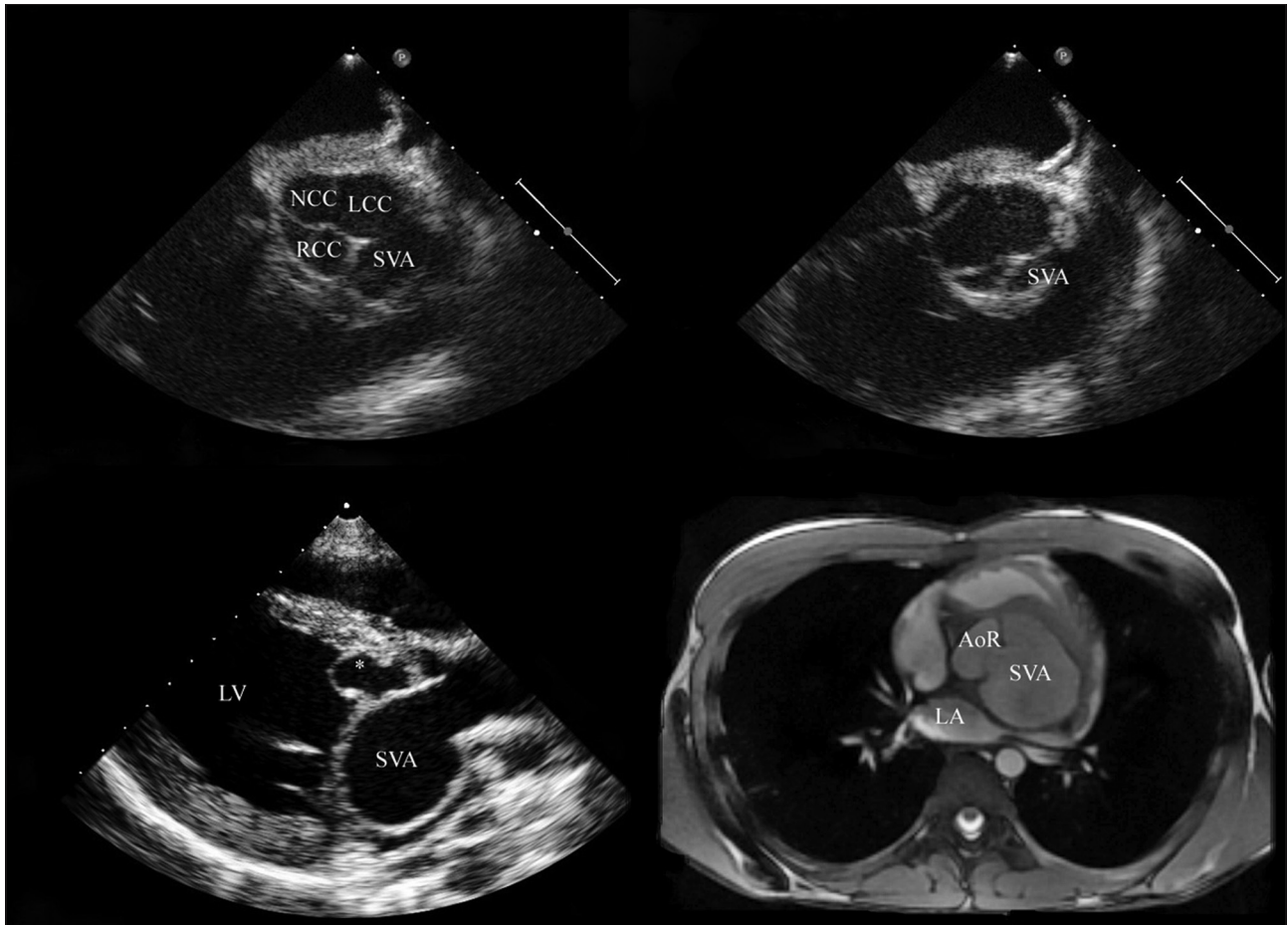


Figure 2: Transesophageal echocardiography of the aortic root (short axis view) demonstrates the orifice of the left-side sinus of Vasalva aneurysm (SVA) during diastole and systole (upper-left and upper-right panels). Transthoracic echocardiography (parasternal long axis, diastole) shows the large SVA bulging into the left atrium, displacing the anterior mitral valve leaflet toward the apex of the ventricle (lower-left panel). A smaller secondary aneurysm bulges toward the left ventricular outflow tract. (\*) Cine cardiovascular magnetic resonance (transverse slice, 8 mm slice thickness, 3 T) reveals the SVA, originating from the left coronary sinus, bulging into the left atrium. AoR = aortic root; LA = left atrium; LV = left ventricle; LCC = left coronary cusp; NCC = noncoronary cusp; RCC = right coronary cusp

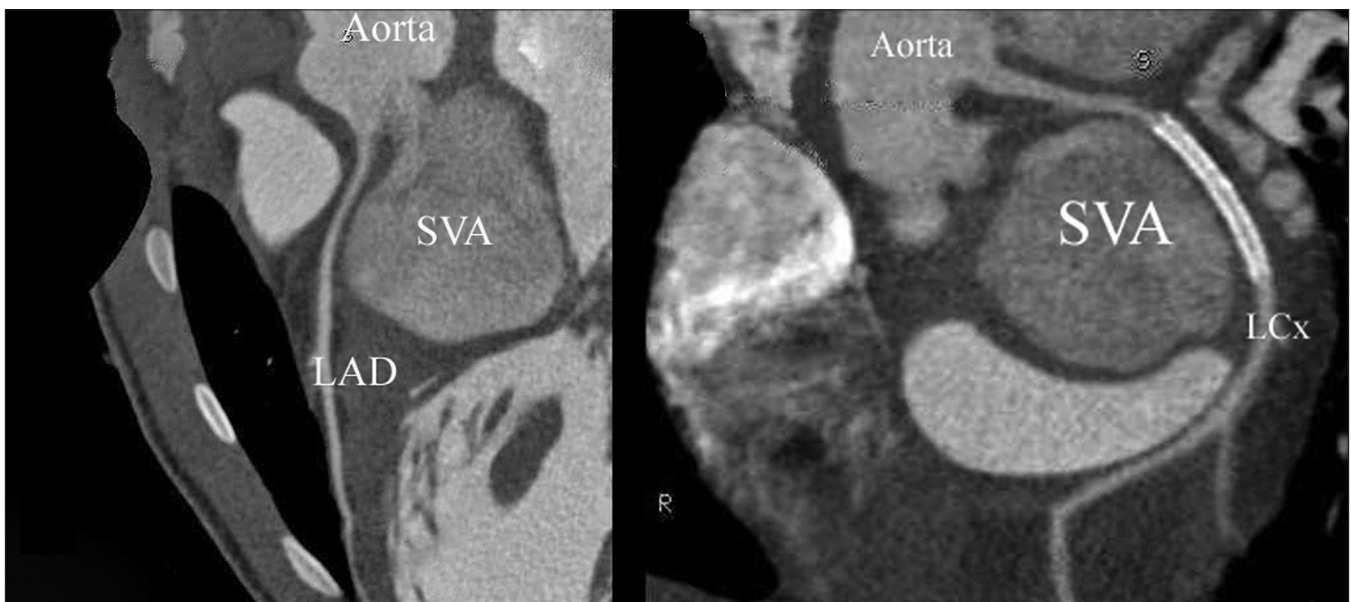


Figure 3: Multidetector coronary angiography demonstrates the origin, size, and position of the SVA, which extends just below the left anterior descending artery (LAD, left-side panel), and displaces and compresses the left circumflex (LCx, right-side panel)

Clinical presentation is usually due to rupture and resulting heart failure, but several cases of effort-related angina, myocardial infarction, and cardiac death secondary to compression of the left main stem, the left anterior descending, and/or left circumflex have been reported.<sup>[1-4]</sup> Successful repair of the aneurysm, in some instances with coronary bypass grafting or aortic valve replacement because of aortic valve regurgitation, has been performed.<sup>[1-3]</sup> Our patient is the youngest reported to be managed for myocardial infarction due to left-side SVA, the first reported to be managed with coronary stenting, and the first to require additional mitral valve replacement. Six months after his surgery he remains well, and has engaged in non-competitive, non-contact sports.

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