

Isolated sinus of Valsalva aneurysm presenting with dyspnea revealed by multimodality imaging

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Isolated sinus of Valsalva aneurysm (SOVA) is a very rare anomaly. Separation between the media and annulus fibrosus causes weakness in the wall, leading to dilatation in one of the aortic sinuses, typically the right one [1]. Symptoms can vary depending on the compression of immediate structures. When undetected and ruptured, this anomaly can be associated with high mortality [2, 3]. Surgery is the recommended treatment, but this can also be associated with complications [4].

After complaining of exertional dyspnea during a routine gynecological examination, a 59-year-old woman was referred to a cardiologist. An ambulatory out-of-hospital transthoracic echocardiogram was suggestive of a large pericardial cyst and the patient was referred to our tertiary care center. In hospital, a transthoracic echocardiogram in parasternal long axis view revealed a circular thin-walled structure located above the aorta in the projection of the right ventricle (Figure 1A). The 4-chamber view showed a similar structure between the right atrium and ventricle, but its connection with neighboring structures remained unclear.

Upon administering agitated saline, the microbubbles remained confined solely to the right atrium and ventricle. Notably, the thin-walled structure displayed no observable changes (Figure 1B). To obtain left heart chamber opacifications, intravenous transpulmonary echocardiographic contrast agent was administered. Supplementary material, *Video S1*, shows how contrast agent filled the left atrium, ventricle, and ascending aorta, revealing a huge dilation of the sinus of Valsalva. Transesophageal echocardiogram

on the mid-esophageal short axis view revealed an abnormal dilatation of the sinus of Valsalva aneurysm of the right coronary cusp (Figure 1C). Cardiac computed tomography confirmed a giant (66 × 47 × 42 mm) dilatation of the sinus of Valsalva (Figure 1D), and computed tomography coronary angiography showed normal coronary arteries. Cardiac surgery was performed using the Bentall procedure (Figure 1E). The aortic root and ascending aorta were reconstructed, and a prosthetic valve was implanted. Histopathology of the resected part of the aorta showed thinned media with mucoid degeneration and disrupted elastic tissue (Figure 1F). The postoperative course was uneventful. At one month follow-up, she was asymptomatic and feeling well.

In our presented case, multimodality imaging including contrast agents aided prompt diagnosis of SOVA, and elective cardiac surgery using the Bentall procedure resulted in a favorable outcome. Raising awareness of SOVA, a very rare anomaly and an unusual cause of dyspnea, could mitigate the risk of rupture and prevent adverse outcomes.

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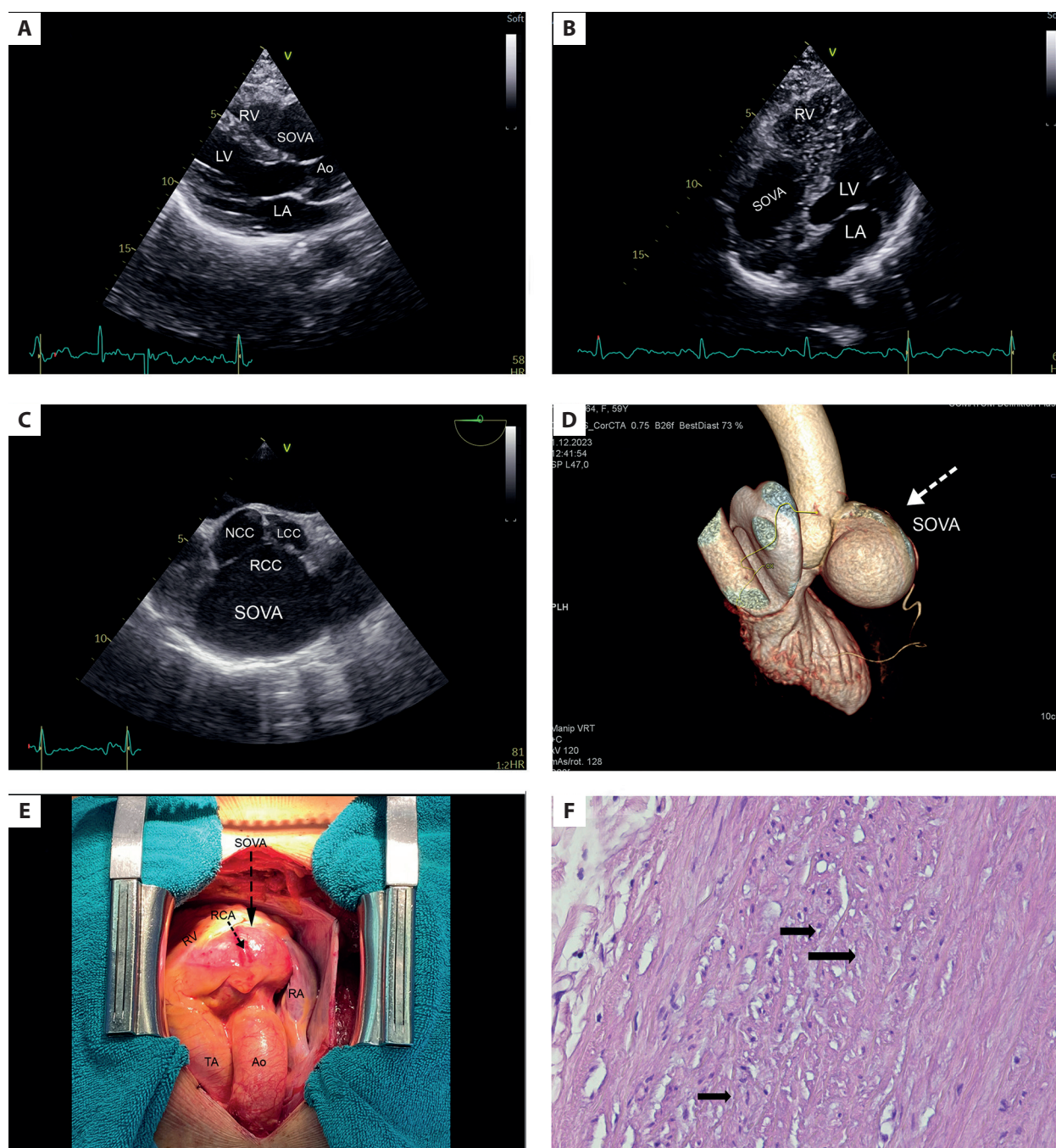


Figure 1. Images of SOVA. **A.** Transthoracic echocardiography (TTE), parasternal long axis (PLAX) view. **B.** TTE 4-chamber view with agitated saline opacification of right heart chambers. **C.** Transesophageal echocardiography midesophageal short axis view (ME SAX). **D.** Computed tomography arrow depicting SOVA. **E.** Cardiac surgery: large arrow depicting SOVA, small arrow depicting RCA. **F.** Histopathology: arrows depicting mucoid degeneration

Abbreviations: Ao, ascending aorta; LCC, left coronary cusp; LV, left ventricle; NCC, non-coronary cusp; RA, right atrium; RCA, right coronary artery; RCC, right coronary cusp; RV, right ventricle; SOVA, sinus of Valsalva aneurysm; TA, truncus pulmonalis

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