Valsalva sinus aneurysms often contain intraluminal thrombus and can cause thromboembolic events, including myocardial infarction. Rarely, myocardial ischemia is caused by compression of a coronary artery by a left Valsalva sinus aneurysm. Herein we present a case involving a huge right Valsalva sinus aneurysm causing compression of the right coronary artery (RCA) leading to acute myocardial infarction (AMI) detected on transesophageal echocardiography (TEE), multi-detector row computed tomography angiography (CTA), and intravascular ultrasound (IVUS).

A 69-year-old man presented with severe chest pain progressing to cardiogenic shock. He did not present with any prodromal symptoms before this catastrophic event. Initial 12-lead electrocardiography was consistent with infero-lateral AMI. Urgent coronary angiography, with intra-aortic balloon pump support, indicated total occlusion of the proximal RCA (Figure 1A). Revascularization with coronary artery stenting under IVUS was successful (Figures 1B–D). The thrombus was not aspirated during the intervention. Subsequently, transthoracic echocardiography was performed to evaluate cardiac function. Unexpectedly, a very large mass was found to be protruding into the right ventricle (Figure 1E). TEE then indicated a right Valsalva sinus aneurysm (Figure 1F; Movie S1). CTA (Figures 2A, B) and magnetic resonance imaging (MRI; Figure 2C) clarified that the echolucent mass was a Valsalva sinus aneurysm (63×45 mm) with a mixture of organized and fresh thrombus. To understand the etiology of AMI, we re-evaluated IVUS performed during the coronary intervention, and found a flattened culprit lesion, possibly resulting from external compression (Figure 2D). Based on the IVUS and CTA findings, this patient was diagnosed with external compression of the proximal RCA from an asymptomatic aneurysm, which led to AMI. Valsalva sinus repair and RCA reconstruction were performed successfully.

When transthoracic echocardiography shows a heterogeneous mass near the ascending aorta and the right ventricle (Figure 1A), cardiac tumor and Valsalva sinus aneurysm should be part of the differential diagnosis. TEE is the first-line diagnostic modality for this lesion, because it can clearly visualize the aneurysm walls and the disturbed blood flow within the aneurysm or at the site of perforation. CTA can provide additional 2-D or 3-D anatomical information given its high resolution (Figures 2A,B).
MRI has the advantage of providing better soft-tissue contrast, enabling better delineation of the components of the mass. In addition to understanding the etiology, the advantages of each imaging modality can be used to make a precise diagnosis before surgical repair.

References

Supplementary Files

Supplementary File 1
Movie S1. Transesophageal echocardiography showing a right Valsalva sinus aneurysm.

Please find supplementary file(s):