An unusual case of right-sided heart failure caused by giant sinus of Valsalva aneurysm obstructing right ventricular outflow tract

Dan D. Le, Carlos M. Orrego, Dimitrios Maragiannis, and Su Min Chang*

Cardiology Department, Houston Methodist Hospital, Houston, TX, USA
*Corresponding author. Tel: +1 7134413625, Fax: +1 7137931641, Email: SMChang@houstonmethodist.org

A 63-year-old male with a previous history of leg swelling for many decades and dyspnoea on exertion for few months, presented to the local emergency department complaining of unexpected fall. He was found to have a systolic murmur and abnormal ECG for which he was referred to our clinic for further evaluation. His physical examination was significant for a loud ejection systolic murmur at the left upper sternal border, an elevated jugular venous pressure and bilateral lower extremity oedema with significant venous stasis changes. An ECG showed normal sinus rhythm with incomplete RBBB. Transthoracic echocardiography (TTE) showed a large aneurysmal vascular structure protruding into the right ventricle (RV) (Panels A and B. Supplementary material online, Videos S1 and S2) compressing the right ventricular outflow tract (RVOT) with systolic gradients across RVOT of >50 mmHg (Panel C). The left ventricular systolic function was mildly depressed and RV systolic function was severely depressed. Cardiac magnetic resonance (CMR) confirmed the presence of a giant unruptured sinus of Valsalva aneurysm (SVA) arising from the right coronary cusp causing significant RVOT obstruction (Panels D and E, arrow; Supplementary material online, Videos S3 and S4). The patient was further evaluated for the coronary arterial anatomy preoperatively by coronary computed tomography angiography (CTA), which showed normal coronary arteries (Panel F, Supplementary material online, Video S5). Patient underwent an uneventful surgery with repair of right coronary SVA. The patient was discharged from the hospital in good condition on the eleventh day of treatment.

(Panel A) Two-dimensional TTE apical four-chamber view showed a large aneurysmal vascular structure protruding into the RV. AN, aneurysm; LA, left atrium; LV, left ventricle; RA, right atrium; RV, right ventricle. (Panel B) Colour Doppler of aortic root (parasternal long-axis view) demonstrated flow from the aortic root into the aneurysm. AN, aneurysm; Ao, aorta; LA, left atrium; LV, left ventricle; RA, right atrium; RV, right ventricle. (Panel C). Continuous wave (CW) Doppler of RVOT (parasternal short-axis view) showed the RVOT obstruction with systolic gradients across RVOT of >50 mmHg. (Panel D) Cine-CMR (three-chamber long axis) confirmed a giant unruptured sinus of Valsalva aneurysm measuring \(~\times 55 \times 57 \text{ mm}\). AN, aneurysm; Ao, aorta; LA, left atrium; LV, left ventricle; RA, right atrium; RV, right ventricle. (Panel E) Cine-CMR of RVOT showed a giant SVA causing significant RVOT obstruction (arrow) with the interventricular septum bowing to the left during systole suggestive of RV pressure overload. AN, aneurysm; LV, left ventricle; PA, pulmonary artery; RV, right ventricle. (Panel F). Three-dimensional reconstruction of coronary CTA (posterior view) showed normal coronary arteries and a giant unruptured aneurysm of sinus of Valsalva. AN, aneurysm; Ao, aorta; LAD, left anterior-descending coronary artery; LC, left coronary cusp; NC, non-coronary cusp; RC, right coronary cusp; RCA, right coronary artery.

Supplementary material is available at European Heart Journal online.