A 27-year-old man emergently presented with shortness of breath and hemoptysis. He had hypoxia, tachypnea, and tachycardia, as well as a continuous murmur across the precordium with maximum intensity over the left sternal border. Chest radiographs revealed moderate congestion. Computed tomograms of the chest showed multiple bilateral pulmonary emboli. Transesophageal echocardiograms revealed severe tricuspid insufficiency with vegetation on the tricuspid valve and a shunt between the noncoronary sinus of Valsalva and the right atrium (Fig. 1).

Diagnostic cardiac catheterization, including thoracic aortography, yielded a large sinus of Valsalva aneurysm (SVA) with signs of shunting into the right atrium (Fig. 2). The patient underwent surgical repair of the ruptured noncoronary cusp with use of a CorMatrix ECM® tissue patch (CorMatrix Cardiovascular, Inc.; Roswell, Ga), augmentation of the septal leaflet of the tricuspid valve with a CorMatrix patch, and annuloplasty ring placement. Postoperative images showed well-functioning aortic and tricuspid valves. The ruptured SVA with shunt flow directed toward the septal leaflet of the tricuspid valve might have predisposed the patient to endocarditis of the tricuspid valve.1

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Fig. 1 Transesophageal echocardiograms show A the sinus of Valsalva aneurysm preoperatively (3-dimensional view), B the shunted flow (arrow) from the aorta into the right atrium and then into the right ventricle preoperatively (color-flow Doppler mode), C the aneurysm intraoperatively (short-axis basal view), and D a complete Mercedes-Benz sign of the aortic valve postoperatively.

Ao = aorta; AV = aortic valve; LA = left atrium; RA = right atrium; RV = right ventricle; SVA = sinus of Valsalva aneurysm; TV = tricuspid valve

Click here for real-time motion image: Fig. 1B. Click here for real-time motion image: Fig. 1C.
Sinus of Valsalva Aneurysm Rupture

Comment

The prevalence of ruptured SVA is less than 1%. Most SVAs arise from the right coronary sinus, and they most often rupture into the right atrium or ventricle. In young and middle-aged patients with symptoms of acute heart failure and new heart murmurs, SVA should be considered in the differential diagnosis. Transthoracic (and, in some cases, transesophageal) echocardiography is the chief diagnostic method. Additional imaging tools include cardiac catheterization, multidetector computed tomography, and cardiovascular magnetic resonance. Surgical repair is the usual treatment of choice for ruptured SVA, and percutaneous catheter-based closure is a less invasive alternative.

References