

FIRST REPORT OF TRANSCATHETER CLOSURE OF RUPTURED SINUS OF VALSALVA ANEURYSM USING THE NIT-OCCLUD LE VSD OCCLUDER

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HISTORY AND PHYSICAL

A 46-year old male with a history of arterial hypertension and obesity, was referred to our hospital due to symptoms of congestive heart failure (New York Heart Association class III). Physical examination revealed diastolic heart murmur.

IMAGING

Transthoracic echocardiogram showed a fistula from the right coronary sinus to the right ventricle. Invasive angiography visualized a ruptured sinus of Valsalva aneurysm (SVA) **[Fig. 1]**.

INDICATION FOR INTERVENTION

The defect measured 6 mm in diameter at the aorta and deemed to be suitable for transcatheter closure.

INTERVENTION

Occlusion of the SVA was attempted using a 12 x 16 mm Nit-Occlud Lê VSD Occluder (Pfm Medical) under local anesthesia. The procedure was performed under transesophageal echocardiography guidance. The device was delivered from the venous side after formation of an arteriovenous loop **[Fig. 2]**. The procedure and further hospitalization was uneventful. The patient experienced gradual symptoms reduction and echocardiography after three months revealed no residual shunt.

LEARNING POINTS OF THE PROCEDURE

SVA constitute a rare cardiac anomaly, which is of congenital origin or acquired. Commonly, it involves the right coronary sinus (70%) and the noncoronary sinus (29%). The congenital SVA is caused by weakness at the junction of the aortic media and the annulus fibrosus. Acquired aneurysms are caused by conditions affecting the aortic wall, such as endocarditis, trauma or connective tissue disease. Unruptured SVAs usually remain asymptomatic. In most cases rupture occurs at the age of 20 to 40 years. SVAs rupture mostly into the right ventricle and the right atrium, or less frequently to the pulmonary artery, left ventricle, left atrium or pericardial cavity. This manifests as exercise intolerance, dyspnea or chest pain most commonly.

Surgery is considered the gold standard treatment for SVA. However, percutaneous closure appears to be a feasible alternative to surgical repair. The first transcatheter closure of SVA was reported in 1994. Since then, a significant number of such procedures have been performed using various devices, most commonly patent ductus arteriosus occluders or atrial septal defect occluders.

We chose the Nit-Occlud L  VSD Occluder, which was originally designed for ventricular septal defect (VSD) closure. The device is constructed of a single coil. The coil is made of nitinol, an alloy with shape memory characteristics. In its relaxed state it adopts to the form of a pair of cones nested in each other. This implant is distinguished by a gentle and refined structure, which minimize its interference with neighboring tissues. This is documented by the lower rate of atrio-ventricular conduction disturbances after VSD closure with Nit-Occlud L  VSD Occluder in comparison with other devices (0% vs. 5-7%, respectively). We believe that the abovementioned occluder should be considered for transcatheter SVA closure. Noteworthy, to our best knowledge this is the first closure of SVA with the PFM L  VSD device.

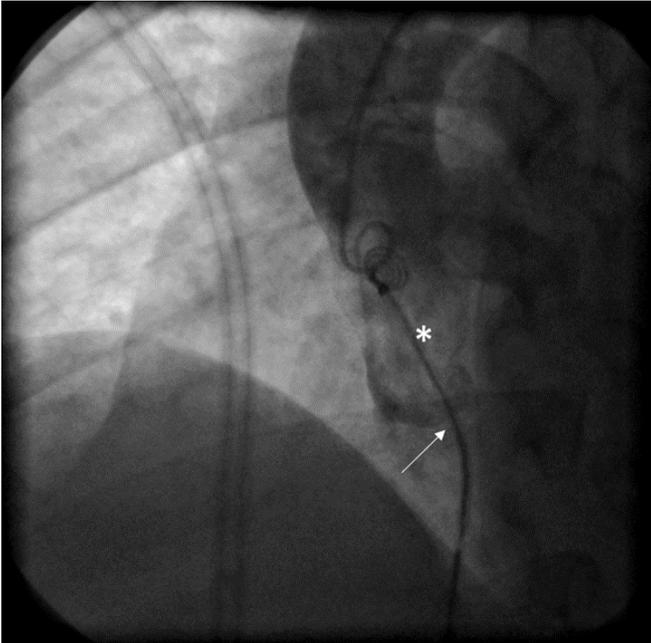


Figure 1. Aortography during positioning of the device. SVA (asterisk) and catheter introduced through the site of rupture (arrow)

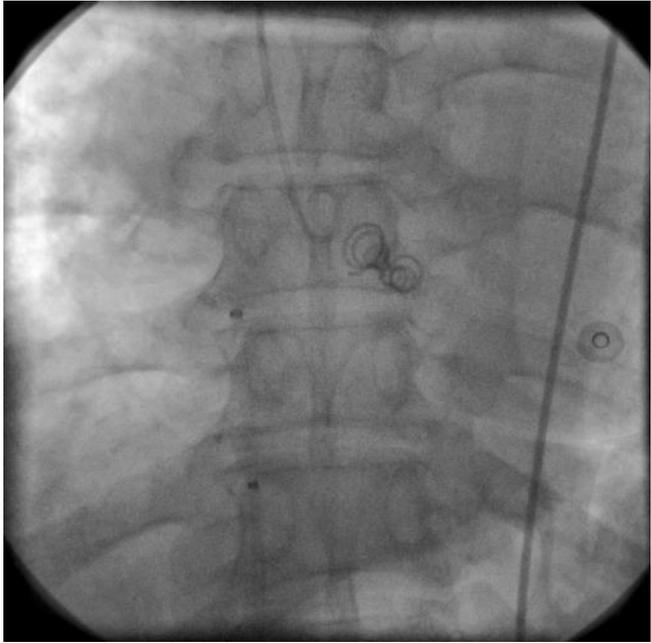


Figure 2. Released Occluder