A rare case of unruptured aneurysm of left coronary sinus of Valsalva accompanied with patent foramen ovale and atrial fibrillation detected after cardiac etiology stroke

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A B S T R A C T
We present a rare case of a 74 year old female with unruptured aneurysm of the left coronary sinus of Valsalva accompanied with patent foramen ovale and atrial fibrillation. This rare combination was detected during diagnostics for a cardiac etiology stroke. The left coronary sinus of Valsalva was reconstructed using an autologous pericardial patch, the left atrial appendage closed, left atrial ablation performed with cooled radiofrequency and the patent foramen ovale sutured directly. The patient was dismissed on the 12th postoperative day after having an uncomplicated postoperative course.

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1. Introduction
Coronary sinus of Valsalva aneurysm (SVA) is a very rare clinical entity. Only 0.15—1.5% of the cardiopulmonary operations in the U.S. [1,2] are done due to SVA. The right coronary SVAs is aneurysmatic in the 94% of cases, the noncoronary sinus in 5% and the left coronary SVA only in 1% of the cases [3,4]. We here present a case of left SVA accompanied with patent foramen ovale and paroxysmal atrial fibrillation.

2. Case report
A 74 year old female presented to our emergency department with a 15 minute onset of dysarthria. No other symptoms were reported. The physical examination also revealed no other clinical findings. ECG showed paroxysmal atrial fibrillation. Patient’s past medical history included hyperlipidaemia, hypothyroidism, hypertension and a low grade dyspnea on exertion. Magnetic
resonance imaging of the brain revealed low diffusion areas of the left temporoparietal lobe. Because of the co-diagnosed paroxysmal atrial fibrillation the stroke was considered of cardioembolic etiology. Further diagnostics with transesophageal echocardiography detected a patent foramen ovale (PFO), a left atrial appendage thrombus and showed good left ventricular function with an ejection fraction (EF) of 60%. Doppler examination of carotid arteries revealed no significant pathology. Coronary angiography excluded coronary artery disease (CAD). The aneurysm topography was further examined via computed tomography angiography showing a large aneurysm (3.5 × 2cm) at the level of the aortic valve and in the area of the left aortic sinus. The ostium of the left main stem (LMS) was identified immediately above the aneurysm. The course of left coronary artery (LCA) was demonstrated directly cranial to the aneurysm. The right coronary (RCA), left anterior descending (LAD) and circumflex (Cx) arteries ran on the aneurysm. There were no signs of thrombosis of the aneurysm (see Fig. 1).

A surgical intervention for correction of the aneurysm was indicated. After median sternotomy, opening of the pericardium and cannulation epicardial left atrial ablation was performed under total cardiopulmonary bypass (CPB) using cooled radiofrequency. Through a right atriotomy subsequently the patent foramen ovale was exposed and closed via double continuous suture. The left atrial appendage was closed with a stapling device.

Beneath the left coronary ostium a large wall defect, which formed the entrance of the large SVA, was detected. Under careful preservation of the left main trunk an autologous pericardial patch – pretreated with glutaraldehyde %) for 5 minutes - was placed and sewn continuously. The aortic valve was intact. Perioperative echocardiography showed complete exclusion of the aneurysm and normal function of the aortic valve. The postoperative course was uncomplicated and the patient was discharged on the 12th postoperative day complaining of no symptoms.

3. Discussion

The first surgical repair of SVA was described in 1956 by Lillehei [2]. This clinical entity appears to be more frequent in Asians [1]. SVA etiology can be congenital or acquired. Secondary infection, trauma or degenerative disorders have been identified as etiologies of the acquired SVA. However, congenital origin is more frequent and may be accompanied with other cardiac defects such as septal defects and aortic regurgitation. The most frequent septal defects are the ventricular septal defects (VSD) [1,2]. In our case, a congenital SVA was considered.

The symptoms of SVA can vary and range from asymptomatic to a cardiac emergency. The late symptomatology can be the result of the compression of the neighboring cardiac structures or aneurysm rupture [2–5]. Conduction abnormalities, angina pectoris symptoms, dyspnea, syncope, coronary infraction, cardiac insufficiency or cardiac ischemia due to SVA may also occur [1–5]. However, due to the rarity of left unruptured SVA and the limited number of literature reports typical symptoms for this special entity cannot be described [5].

For diagnosis of SVA transthoracic (TTE) and transesophageal echocardiography (TEE) should be used [1,2]. The major advantage of TEE is the proximity of the esophagus to the aortic root and it can therefore better portray the anatomy of the SVA [1]. Coronary catheterisation and coronary angiography can also be used for exclusion of synchronous coronary artery disease [1,2].

The treatment of SVA is mainly surgical. However, medical treatment has also been recommended, although by this treatment option the high risk of rupture remains [5]. Due to the rarity of the clinical entity, there are no clear guidelines for SVA surgical treatment. The aim of the surgical treatment is anatomical restoration of the continuity of the aortic wall with closure of SVA opening and correction of any other coexisting defects [5]. However, no closure of small lesions with low risk of rupture has also been proposed and should be considered. The SVA patch repair has shown a low recurrence incidence and is nowadays the treatment of choice [2]. The preferred surgical approach may be aortotomy, atriototomy or ventriculotomy. The reported postoperative results of SVA surgery have been excellent [1,2].

4. Conclusion

The SVA is a rare clinical condition. The unruptured left SVA is an extremely rare case. The clinical symptomatology may vary. The careful preoperative radiological and echocardiographic imaging and the suitable surgical planning are very important for the effective treatment of this disease.

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