Remodeling operation for unruptured aneurysms of three sinuses of Valsalva

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Congenital unruptured aneurysms affecting all three sinuses of Valsalva are extremely uncommon. Congenital aneurysms of the noncoronary or the right coronary sinus have been described more often in the literature. The distribution of aneurysmal sites has been stated to be approximately 70% for the right coronary sinus, 29% for the noncoronary sinus, and 1% for the left coronary sinus. We report here the approximately 70% for the right coronary sinus, 29% for the noncoronary sinus, and 1% for the left coronary sinus. We report here the approximately 70% for the right coronary sinus, 29% for the noncoronary sinus, and 1% for the left coronary sinus.1 We report here the approximately 70% for the right coronary sinus, 29% for the noncoronary sinus, and 1% for the left coronary sinus.1 We report here the approximately 70% for the right coronary sinus, 29% for the noncoronary sinus, and 1% for the left coronary sinus.1 We report here the approximately 70% for the right coronary sinus, 29% for the noncoronary sinus, and 1% for the left coronary sinus.1 We report here the approximately 70% for the right coronary sinus, 29% for the noncoronary sinus, and 1% for the left coronary sinus.1 We report here the approximately 70% for the right coronary sinus, 29% for the noncoronary sinus, and 1% for the left coronary sinus.1 We report here the approximately 70% for the right coronary sinus, 29% for the noncoronary sinus, and 1% for the left coronary sinus.1 We report here the approximately 70% for the right coronary sinus, 29% for the noncoronary sinus, and 1% for the left coronary sinus.1

Clinical Summary

A symptom-free 62-year-old woman was admitted to the cardiovascular department of our hospital for cardiac examination. An electrocardiogram showed no ischemic changes and first-degree heart block. A transthoracic echocardiography was performed, and she was found to have two large aneurysms of the left coronary and noncoronary sinuses of Valsalva, with oppression of both atria, trivial aortic and mitral regurgitation, and moderate tricuspid regurgitation. Further, transesophageal echocardiography showed three aneurysms of 60 × 60 mm, 42 × 40 mm, and 16 × 20 mm in size that had extracardiac protrusions from the noncoronary, left coronary, and right coronary sinuses of Valsalva, respectively. Aortography confirmed three saccular aneurysms of the sinuses of Valsalva, and the right and left coronary arteries originating from the aneurysm were also found (Figure 1).

The aim of surgical management was resection of the three aneurysms of the sinuses of Valsalva and preservation of the aortic valve function. After a longitudinal incision of the pericardium, the aneurysms could not be observed at the cardiac surface but rather were located behind the atrial chambers. Under cardiopulmonary bypass, the aortic root was inspected with particular care, and the aneurysms were circularly incised around the mouth of the aneurysms (left coronary and noncoronary sinuses) from the outside. The communications of the aneurysms and the aortic root were ovoid shaped and 2.5 × 3 cm wide, 2.5 × 3.5 cm wide, and 2.5 × 2 cm wide, corresponding to the left coronary, noncoronary, and right coronary sinuses, respectively. The aortic annulus was not dilated, but all Valsalva walls were aneurysmal, except for the aortic annulus and three commissures. A gel-impregnated Dacron polyester fabric graft (24 mm) was selected, and then the graft was cut into the three crown shapes. After the three commissural points were fixed, a remodeling procedure was performed.

The patient was easily weaned from cardiopulmonary bypass and recovered uneventfully. No aortic regurgitation at all was seen on postoperative aortography (Figure 2).

Discussion

Aneurysms of the left coronary sinus of Valsalva are extremely uncommon and typically protrude and rupture into the pulmonary artery, the left ventricle, or even the epicardium. In this case, the patient had had three aneurysms of the sinuses of Valsalva, including an aneurysm of the left coronary sinus. No similar case involving three congenital unruptured aneurysms of the sinuses of Valsalva has been reported previously.

An unruptured congenital aneurysm of the sinus of Valsalva does not usually cause symptoms, but if it remains untreated it carries some risks, such as right ventricular outflow tract obstruction, coronary artery occlusion, aortic regurgitation, complete heart block, and resistant ventricular tachycardia. We found 22 previously reported cases of extracardiac, isolated, unruptured aneurysms of the left sinus of Valsalva. These were congenital in 12 patients and acquired in 10. The left sinus alone was affected in 21 patients; there was aneurysmal involvement of all three sinuses in the other patient, but that case was acquired by inflammatory change. Twelve of these 22 patients underwent surgery, and the chosen operative procedure was closure of the mouth of the aneurysm in all cases. This patient was the first to be treated by a remodeling procedure for unruptured congenital aneurysms of all three sinuses of Valsalva. Sarsam and Yacoub suggested that remodeling procedure was potentially applicable to aneurysm of the sinus of Valsalva.8 We applied the remodeling procedure because all Valsalva walls were aneurysmal except for the aortic annulus and three commissures, and patch grafting would have been complicated. In addition to these reasons, aortic regurgitation was mild and the aortic annulus had not been dilated.

In conclusion, extracardiac, unruptured Valsalva aneurysms should be surgically repaired, even if asymptomatic, because of the possibility of severe complications. A valve-sparing aortic root remodeling with the Yacoub procedure is potentially applicable to multiple aneurysms of the sinuses of Valsalva, particularly in...
patients with mild aortic regurgitation or mild or no dilatation of the aortic annulus.

References