Unruptured aneurysms of the non-coronary and left sinuses of Valsalva accompanied by severe aortic valve regurgitation

Aneurysms of the sinuses of Valsalva usually come to the surgeon’s attention when they rupture into cardiac cavities and the patients are hemodynamically compromised by the acute shunts [7]. Unruptured aneurysms of the sinuses of Valsalva, which may cause a wide spectrum of cardiac signs and symptoms, or even without any symptoms, are extremely rare among cardiac surgical patients [3, 4, 8, 9, 12].

Case report

A 58-year-old female patient with a 3-year history of dyspnea and NYHA class II-III congestive heart failure was referred for cardiologic evaluation. There was no history of bacterial or rheumatic endocarditis in the anamnesis. At echocardiography, left heart catheterization and angiocardiology, severe aortic valve regurgitation was documented; the blood pressure at rest was 120/40 mm Hg; the most impressive morphologic findings, however, were giant unruptured aneurysms of the left and non-coronary sinuses of Valsalva; the ascending aorta was of normal size and configuration (Fig. 1). The coronary arteries showed no stenotic lesions. The left ventricular function was slightly compromised.

At surgery the heart was exposed through a median sternotomy incision. The enormously enlarged non-coronary and left sinuses of Valsalva were easily identified. The left sinus of Valsalva aneurysm appeared to be extracardial, reached far to the left and was in close relationship to the left atrial appendage. As a result, the left main coronary artery was enormously stretched and elongated. The aneurysmal non-coronary sinus of Valsalva was in intracardiac position and in close morphologic relationship with the right atrium. The right sinus was of more or less normal size. The diameter and wall tissue quality of the ascending aorta were normal. The operation was performed using cardiopulmonary bypass with moderate hypothermia and cardioplegic arrest (Bretschneider HTK solution). The ascending aorta and the aortic root were incised longitudinally. The aortic valve ring was slightly enlarged. There were two small defects in the non-coronary and right aortic valve leaflets which apparently accounted for the valve regurgitation. There were no macroscopic signs of active endocarditis. At microscopic examination these leaflets showed chronic tissue degenerations and marked postinflammatory fibrosis. The pathology of the non-coronary and left aneurysmatic sinuses of Valsalva was confirmed. The left coronary artery was displaced distally and originated from the area of the sinus-vascular junction.

For repair the aortic valve and the aortic root with the proximal ascending aorta were excised and replaced with a 25 mm St. Jude composite graft. The coronary ostia were excised from the aortic wall with adequate button cuffs measuring about 1.5 cm in diameter and implanted into the graft using 6-0 polypropylene interrupted mattress sutures. The patho-histologic examination of the aortic wall showed discrete degenerative alterations of the intima and media. Regrettably no particular aneurysmal tissue was sent for microscopic evaluation.

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Key words

Sinuses of Valsalva • Aneurysm

Abstract

This report describes a case of giant unruptured aneurysms of the left and non-coronary sinuses of Valsalva associated with severe aortic regurgitation. Repair was accomplished by replacement of the aortic valve and the aortic root with a 25 mm St. Jude composite graft utilizing a modified Bentall technique. [Eur J Cardio-thorac Surg (1996) 10:1030–1032]
Fig. 1 Angiographic appearance of the enormously abnormal morphology of the aortic root and the sinuses of Valsalva. The aortic valve regurgitation is not adequately demonstrated because almost all of the contrast dye disappears in the massively enlarged sinuses of Valsalva.

The postoperative course was uneventful. The echocardiography early after surgery demonstrated excellent results. The patient was discharged from the hospital on postoperative day 7 for rehabilitation. Follow-up studies by clinical assessment and echocardiography were carried out 4 and 10 months after operation; they demonstrated good results and regular conditions of the aortic root and aortic valve.

Discussion

Congenital aneurysms of the sinuses of Valsalva are thin-walled outpouchings of the aortic root, that may rupture into the right (or rarely left) heart chambers to form an aortocardiac fistula [7]. Edwards et al. have documented that aneurysms of the sinuses of Valsalva may be caused by disconnection (= separation) of the normal aortic wall media and the fibrous aortic valve annulus. This may be due to the absence of normal elastic tissue and media in this region [5, 6].

In 1957 Sawyers et al. reviewed a total of 45 patients with 49 ruptured aneurysms of the sinuses of Valsalva who had undergone surgery; among these cases, 34 aneurysms were situated in the right, 13 the non-coronary (posterior), and only 2 in the left, sinus [10]. The distribution of the various sites and directions of rupture in a large number of cases was described by Shu-Hsun et al. in 1990 [11]. Rupture of sinus aneurysms causes acute shunts between the aorta and a cardiac cavity, mostly associated with congestive heart failure, which usually requires urgent surgical repair with closure of the abnormal communication [7].

The natural history of ruptured aneurysms of the aortic sinuses of Valsalva has not been clearly defined [7]. This is due to the rarity of the condition. Particularly the time course and probability, due to gradual enlargement, of the aneurysm’s rupturing into an adjacent low-pressure cardiac chamber are not known [7]. Because of this, in asymptomatic patients it is controversial whether to advise for or against an operation [7]. Mostly these aneurysms do not cause any cardiac symptoms and are diagnosed by change. Depending on their size, however, they may initiate dis-tension of the aortic annulus with consecutive aortic valve regurgitation, protrusion into the right atrium and tricuspid valve incompetence or protrusion into the right ventricle with right ventricular outflow tract obstruction. Moreover these aneurysms may cause stretching and narrowing of the left main and/or right coronary artery with marked myocardial ischemia or even sudden cardiac death [1, 3, 4, 7–9].

In isolated unruptured aneurysms of a sinus of Valsalva without compromise of the aortic valve and/or the coronary ostia, repair may be accomplished by simple plication of the aneurysm or excision of the aneurysm(s) and patch closure of the defect(s) between the aortic annulus and the sinu-vascular ridge [1, 9]. In cases with additional aortic valve defects and/or if the right or left coronary ostium originates from the aneurysmal area, a more complex repair seems advisable in order to avoid subsequent complications. Because of the particular conditions in our case, the repair was performed with replacement of the aortic valve and root using a composite graft employing a modified Bentall technique [2].
References


