Echocardiography diagnosis of ruptured congenital right coronary sinus of Valsalva aneurysm into right ventricle

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Received 13 February 2005; received in revised form 28 June 2005; accepted 7 July 2005
Available online 12 September 2005

Abstract We describe a case of ruptured aneurysm of the right coronary sinus of Valsalva (ASV) diagnosed by transthoracic two-dimensional echocardiography which allowed to quickly establish a correct diagnosis in a patient with a recent onset of continuous murmur and acute right congestive heart failure.

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Case report

A 45-year-old woman presented with a history of acute dyspnoea, right congestive heart failure and tachycardia. Examination revealed a wide pulse pressure and a continuous murmur across the precordium.

Transthoracic two-dimensional echocardiography (TTE) demonstrated an aorta-to-right ventricle fistula through a ruptured right coronary sinus of Valsalva. The echocardiogram revealed enlargement of the right chambers and right coronary sinus of Valsalva. Both contrast and color-Doppler techniques showed shunting from the sinus of Valsalva with the typical “wind sock” appearance into the right ventricle and, passing through the tricuspidal leaflets, into the right atrium (Fig. 1A,B).

Aortography showed a non-dilated aortic root and the direction of the shunt from the right coronary sinus towards the right ventricle without any sign of aortic regurgitation. Coronary arteries and the aortic valve were normal.

The suspicion of infective endocarditis was excluded on the basis of patient’s history and laboratory analysis. The configuration of the aneurysm was consistent with the contrast medium-filled sinus demonstrated by aortography, with a normal coronary sinus and a mobile “wind sock” aneurysm protruding into the right ventricle (Fig. 2).

The surgical approach was from the aortic root. The aortic ostium of the Valsalva aneurysm was

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successfully repaired with a Dacron patch. A second surgical approach, through right atriotomy, allowed evaluation of the right side of the aneurysm and excluded the presence of tricuspid valve apparatus lesions. After closure of the aneurysm, two-dimensional echocardiography no longer showed an abnormal configuration (Fig. 1C,D). At 6-month, the patient remained well and asymptomatic and there was no residual tricuspid regurgitation.

Discussion

Before the introduction of echocardiography the diagnosis of a ruptured sinus of Valsalva aneurysm in the living patient was rare, with most of the reports coming from autopsy or surgery.\(^1\)

Nowadays, the diagnosis is possible with both TTE and transoesophageal echocardiography (TEE). In the patient presented, TTE provided very detailed information to the surgeon. We obviously would have performed a TEE had we not reached a precise anatomical description with TTE.\(^8\) Angiography in this case was not necessary for the diagnosis but only for excluding coronary stenosis.

Aneurysms of the sinus of Valsalva account for less than 1% of congenital cardiac anomalies.\(^4\) Ninety to 95% of these congenital aneurysms originate in the right or non-coronary sinus and project into the right ventricle or into the right

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**Figure 1** Transthoracic two-dimensional echocardiography. (A) Short axis view shows normal coronary sinus and a mobile “wind sock” aneurysm protruding into right ventricle; (B) short axis view with color-Doppler technique shows the shunting blood flow from the sinus of Valsalva through the “wind sock” into the right ventricle; (C) short axis view after surgical repair with Dacron patch; (D) short axis view with color-Doppler technique shows the absence of shunt after surgical repair. Ao, aorta; RA, right atrium; LA, left atrium; RV, right ventricle; TV, tricuspid valve.

**Figure 2** Right anterior oblique aortogram (Ao) shows sinus of Valsalva aneurysm projecting into the right ventricle across the tricuspid valve. The aneurysm appears as a finger-like or nipple-like projection with a perforation at its tip (black arrow). ao, aorta; ra, right atrium; rv, right ventricle.
atrium. Aneurysm arising in the non-coronary sinus almost all rupture into the right atrium, and those arising in the right coronary sinus generally communicate with the right ventricle and occasionally with the right atrium.

Complications of sinus of Valsalva aneurysms include aortic regurgitation, coronary artery flow compromise, arrhythmias, and rupture.6

Most commonly, rupture occurs from the right coronary sinus into the right ventricle or into right atrium. However, rupture may also occur into the pericardium, the pleural space, or the left heart chambers.9

References