Infective endocarditis complicated by large aortic pseudoaneurysm after cardiac surgery

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Abstract A 66-year-old female with Streptococcus viridians aortic and tricuspid infective endocarditis develops, during the course of antibiotic therapy, rupture of a right coronary sinus of Valsalva aneurysm to the right ventricle. An urgent cardiac surgery is preformed with implantation of a mechanical aortic prosthesis and a right coronary sinus plasty. Six months later a huge aortic pseudoaneurysm is diagnosed and she is submitted to a second uneventful surgery. A review is done for the significant features with discussion of diagnosis and therapy.

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Introduction

Native valve infective endocarditis (IE) has well documented predisposing factors, with high rates of morbidity and mortality. A case is reported in which there was an infrequent complication of IE — the rupture of a sinus of Valsalva aneurysm (SVA) to the right ventricle (RV) — which needed a prompt diagnosis and surgical therapy. A very rare complication of cardiac surgery — an aortic pseudoaneurysm (PA) — was later on detected and surgery had to be once again performed. A description of the clinical case and discussion of the relevant features are performed.
Clinical case

A 66-year-old female patient, with a history of rheumatic fever in childhood, complained in mid July 2000 of high fever (38–39 °C), chills and mental confusion. A cranioencephalic CT scan showed multiple cerebral ischemic lacunar hypodensities. On 25th July 2000 she was admitted to the Hospital. A systolic cardiac murmur was heard in the second right intercostal space. A transthoracic echocardiogram (TTE) showed calcification of the aortic cusps, with restricted opening, moderate aortic regurgitation and mild mitral regurgitation. There was left ventricular hypertrophy. No vegetations were identified. Normochromic, normocytic anemia and leucocytosis with neutrophilia were detected and blood was drawn for blood cultures. She was started on ciprofloxacin for 5 days due to an initial suspicion of urinary tract infection. She was readmitted later on due to the maintenance of the febrile syndrome. Another TTE and a tranesophageal echocardiogram (TEE), performed in the Cardiology Department of Santa Marta Hospital, showed tricuspid valve vegetations and significant aortic valve stenosis. (Figs. 1 and 2). Because of the great distortion of the aortic valve no vegetations and/or peri-valvular abscess were identified at that time. A later review of the tape showed an anterior periaortic cavity that should correspond to an abscess. There was no clear evidence of an SVA. Blood cultures were positive for Streptococcus viridans. Tricuspid and aortic valve IE were diagnosed. The patient was started on Gentamicin and Penicillin G iv and became afebrile on the 6th day. Subsequent blood cultures were negative. On day 11, the patient complained of fatigue and significant inferior limbs edema.

There was hepatomegaly and the cardiac murmur became continuous. A new TTE identified a right SVA rupture to the RV (Fig. 3). On 9th September 2000 she was submitted to cardiac surgery. Right SVA rupture to the RV was confirmed. A mechanical prosthesis (St.Jude n’19 HP) was placed in aortic position and a right coronary sinus plasty was performed. There were no immediate postoperative complications. Seven further weeks of penicillin treatment were done.

During early follow-up she remained asymptomatic. In a routine TTE, on March 2001, a cystic image that compressed the lateral wall of the right atrium (RA) was detected (Fig. 4), which on TEE showed that it is connected to the aortic wall above the prosthesis (Fig. 5), which had a leak. A thoracic CT scan confirmed the presence of a 9-cm saccular aneurysm of the aortic root, which compressed the lateral wall of the RA.

Figure 1 Transesophageal echocardiography which shows a stenotic, very calcified aortic valve with no obvious vegetations, but with a image (A) that could be a periaortic valve abscess. (RA: Right atrium; LA: left atrium; RV: right ventricle; LV: left ventricle; AOV: aortic valve; AB: abscess).

Figure 2 Transesophageal echocardiography which shows a tricuspid valve vegetation (arrow).
Although initially reluctant, she was readmitted to the Hospital and was re-operated on 17th April 2001. The presence of an aortic rupture just above the aortic valve plane was confirmed, communicating with a very large PA, with migration of the right coronary artery ostium. A conduit for reimplantation of the right coronary artery had to be used. Aneurysmectomy, aortoplasty and suture of the periprosthetic leak were also performed. Surgery and the immediate recovery were uneventful and the patient was discharged asymptomatic. After 40 months of follow-up she remains in NYHA class I, with no further complications.

Discussion

The rupture of an SVA after IE is rare. In the review done by Anguera et al. from the Aorto-Cavitary Fistula in Endocarditis Multicenter Study, 76 (1.6%) cases of aortocavitary fistula (ACF) formation were detected in 4681 IE. TTE is usually first performed, but often TEE is needed. In the study by Anguera et al. these techniques had a sensitivity of 53% and 97%, respectively, for diagnosis.

The periaortic complications described here were not always immediately obvious: a previous diagnosis of tricuspid (and eventually aortic) valve IE was made in a patient with no known risk factors for right-sided IE and with concomitant severe
aortic valve stenosis. Later on, as we referred, a new review of the TEE, demonstrated a cavity image that corresponded to a probable abscess anterior to the aortic ring. The sudden deterioration of the clinical parameters, with right cardiac failure and development of a new continuous heart murmur, was compatible with fistula formation. In this case, TTE immediately diagnosed this complication and the site of rupture of an SVA into the right ventricle. The patient initially refused to be submitted to a new TEE or to surgery and TEE was only performed at the time of surgery. It did not increase the accuracy of TTE.

Even more rare is the formation of a very large PA of the thoracic aorta as a complication of aortic valve IE, which in this case appeared after surgery. At first the correct diagnosis of this complication was not clear and the relationship between the huge cystic cavity near the lateral wall of the right atrium and the ascending aorta was not evident. Thoracic CT scan was very useful to better analyze and diagnose the abnormalities in the proximal ascending aorta, although TEE was also helpful. We believe that these two techniques should be performed in conjunction in cases of suspicion of thoracic aortic complications after aortic valve endocarditis. MRI may also give a good contribution to this diagnosis.

Surgical intervention in these cases is justified by the high risk of rupture even in the absence of symptoms.

References