CARDIOLOGIE TUNISIENNE

CASE REPORT

Aortic pseudoaneurysm: an uncommon complication of native infective endocarditis

Le pseudoanévrysme aortique : une complication rare de l'endocardite infectieuse native

Thabet Houssem[1], Kacem Marwen[1], Bader Mouna[1], Mgarrech Imen[2], Ben Farhat Sameh[1], Ghardallou Houda[1], Meddeb Ayoub[1], Abdelhedi Skander[1], Ben Saad Saeb[1], Slim Mehdi[1], Hraiech Aymen[1], Yahya Faten[1], Jerbi Sofien[2], Gribaa Rym[1], Neffati Elyes1[1]

1. *Cardiology department, Sahloul University Hospital, Sousse. Tunisia.*
2. *Cardiovascular Surgery Department, Sahloul University Hospital, Sousse. Tunisia.*

SUMMARY

Aortic pseudoaneurysm is a rare and a catastrophic complication of active infective endocarditis. We describe a case of infective endocarditis complicated pseudoaneurysm of the left coronary sinus of Valsalva extending into pulmonary trunk, diagnosed by Echocardiography and multi-detector computed tomography and surgically treated.

KEYWORDS

Endocarditis; pseudoaneurysm, echocardiography, surgery

RÉSUMÉ

Le pseudo anévrysme aortique est une complication rare mais grave de l'endocardite infectieuse active. Nous rapportons le cas d'un patient ayant eu une endocardite infectieuse compliquée de pseudo anévrysme du sinus de Valsava antéro-gauche s'étendant dans le tronc pulmonaire, diagnostiqué par l'échocardiographie et la tomodensitométrie et traité chirurgicalement.

MOTS-CLÉS

Endocardit, pseudo-anévrysme, échocardiographie, chirurgie

Correspondance

Houssem Thabet

Email: houssem2.thabet@gmail.com

INTRODUCTION

The pseudoaneurysm of the sinus of Valsalva is an uncommon and a serious complication of infective endocarditis of the aortic valve.

We describe a case of a pseudoaneurysm of the left coronary sinus of Valsalva extending into pulmonary trunk, a complication of native aortic endocarditis diagnosed by transthoracic echocardiography, transesophageal echocardiography and multi-detector computed tomography.

CLINICAL PRESENTATION

We report the case of a 61 year-old man with a medical history of diabetes mellitus and no cardiac history presented with dental pain fever and chills. On the initial physical exam, he had no fever although he was on over antibiotics for his dental pain, Heart Rate=98 bpm, blood pressure = 130/70 mm Hg , no signs of shock, prominent high pitched mid-systolic murmur at the right upper sternal area, Respiratory Rate=19 breaths per minute , no adenopathy , skin rash of noted concern.

Three separate sets of blood cultures were collected for suspicion of infective endocarditis. While awaiting culture reports, empiric intravenous antibiotics was initiated, with ampicillin 12g/24H, oxacillin 12g/24h and gentamicin 240 mg/24h, according to 2015 infective endocarditis European society of cardiology guidelines [1] .

Routine blood tests showed: hemoglobin 11.2g/dL, white cell count 19.4 ×109/L (neutrophils: 81%), platelets 260 × 109/L and erythrocyte sedimentation rate: 102 mm/1 h, C-reactive protein were 175 mg/l and procalcitonin were 3.23 microg/l. Renal parameters, liver function tests, blood sugar test, and chest X-ray were normal.

The ECG showed left ventricular hypertrophy with strain pattern. Transthoracic echocardiography revealed an hypertrophied left ventricle, calcified aortic valve with limited opening, mean gradient 63.3 mmHg and Vmax=4.6m/s, doubt on a vegetation on the ventricular side of the anterior right cusp of the aortic valve (figure 1).

Transesophageal echocardiography confirmed the aortic stenosis and the presence of the vegetation on the aortic valve without any additional image of complication. All the three blood cultures yielded growth within 24 hours of incubation. The isolated germ was Streptococcus spp. The antibiotherapy was adjusted to ampicillin + gentamycin according to 2015 infective endocarditis European Society of Cardiology Guidelines [1]. Specialized stomatological examination revealed a chronic periodontitis treated by dental decalcification.

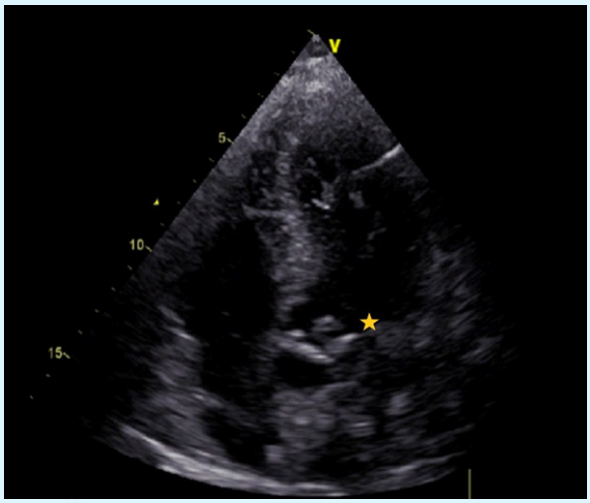

Figure 1. 2D transthoracic echocardiography 4 chamber apical view. Asterix showing a vegetation in ventricular side of a calcified aortic valve

Initial evolution was favorable. The patient presented stable apyrexia, inflammation markers showed improvement.

After 10 days of antibiotics, the patient developed pericardial effusion detected on echocardiography follow up. The initial strategy was the follow up but 3 days after, transthoracic echocardiography showed the persistence of the pericardial effusion and revealed an extended saccular lesion to the septum at the expense of the left coronary sinus passing behind the left main coronary artery without evidence of rupture (figure 2).

Transesophageal echocardiography (TEE) confirmed these findings. The multi-detector computed tomography (MDSCT) showed pseudoaneurysm of the left coronary sinus 26*30 mm developed under the left main and the pulmonary trunk (figure 3). It showed also calcified and infiltrated coronary arteries without significant stenosis. The patient was addressed immediately to surgery. Operative findings were vegetation on the aortic valve and aneurysm of the left sinus of Valsalva fistulized but not communicated to pulmonary trunk. Surgical Aortic valve replacement with a Liva Nova pericardial bioprosthesis was performed; however, the aortic aneurysm was respected.

The evolution was favorable and the patient was discharged 10 days later without complication in transthoracic echocardiography.

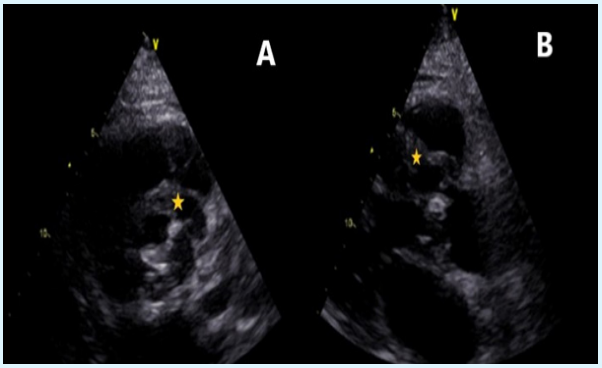

Figure 2. (A) 2D echocardiography parasternal short axis view showing an additional cavity in the aortic annular forward the left main coronary non communicated with adjacent structure. (B) parasternal long axis view showing the pseudoaneurysm (asterixis).

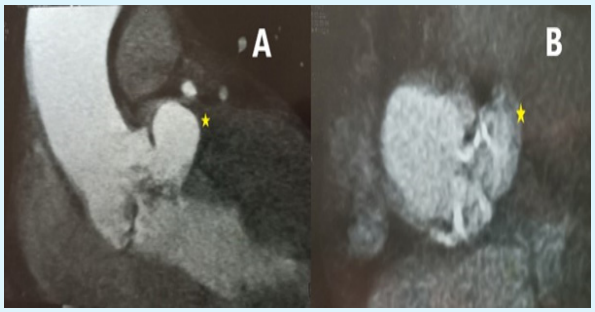

Figure 3. cardiac CT showing the pseudoaneurysm (Asterix) of the left coronary artery sinus of Valsalva in contact with the main left coronary artery.

DISCUSSION

Bacterial endocarditis involving the aortic valve may give rise to a number of complications such as aortic regurgitation, sub valvular abscesses, aortic annulus erosion, bacterial pericarditis and more uncommonly mycotic aneurysms of sinuses of Valsalva. Chu et al reported origins of aneurysm of sinus Valsalva as 76.8%, 20.2%, and 3% for right , non-and left coronary sinus, respectively [2] Our case presented an aortic infective endocarditis with methicillin sensible Streptococcus complicated with pseudoaneurysm of Valsalva sinus despite efficacious therapy.

On physical exam during the follow up, no signs suggested the development of complications. However, lab tests and imaging techniques showed subtle signs of uncontrolled infection (i.e. elevation of C-reactive protein, occurrence of pericardial effusion on echocardiography), thus high risk of complication occurrence.

This shows that presence of pericardial effusion in the course of infective endocarditis should prompt the search of complication [3].

Echocardiography is the modality of choice for the diagnosis of the aneurysm of the sinus of Valsalva. In case of technical difficulties (poor acoustic window poor echogenicity), TEE is strongly recommended. It can improve the diagnostic accuracy due of its better image quality especially in the display of fine structures, or in the case of complex anatomy [4, 5]. The sensitivity of transthoracic echocardiography (TTE) ranges from 40 to 63 % and that of TEE from 90 to 100 %. Sensitivity and specificity for the detection of abscesses associated with endocarditis were 28.3 and 98.6 %, respectively, for TTE, 87.0, and 94.6 % for TEE [6].

Contrast-enhanced ECG-gated multidetector cardiac CT angiogram is a commonly used noninvasive modality for evaluation of Sinus of Valsalva aneurysms, cardiac chambers and its relations with the coronary arteries, due to its high spatial and temporal resolution, and rapid scan acquisition [7].

Staphylococci were the most common cause (46 %). Streptococci were the second leading cause of aorto-cavity fistulation (33 %).

The notion that less virulent microorganisms, such as Streptococcus viridians, always respond to antibiotics alone is erroneous, because these bacteria can cause extensive damage to the heart valve and surrounding tissues if inadequately treated [8].

According to the ESC guidelines infective endocarditis [1] there was no initial indication for emergent surgery but the development of a life threatening complication made surgical intervention mandatory immediately. Delayed timing of surgical intervention, sometimes causes more extensive destruction of aortic periannular abscess, or pseudoaneurysm. That incites the question: wasn't an elective surgery a better-suited choice.

Contemporary modes of surgery for peri annular abscess/pseudoaneurysm involves drainage of the cavity, radical debridement of necrotic tissue, annular reconstruction of the destroyed annulus, and root replacement using an optimal conduit.

Conventional aortic valve replacement using a mechanical or stented biological valve, aortic valve replacement with translocation, aortic root replacement using an allograft, pulmonary autograft (Ross procedure), stentless biological

valve, or a composite graft are conduits of choice. Yankah et al. demonstrated the superiority of the antibiotic-permeable cryopreserved allograft over aortic valve replacement in 161 patients with periannular abscess [9].

Eighty-three patients were found to have left ventricle-aorta discontinuity. The actuarial freedom from residual/recurrent infection and paravalvular leaks was 92 %. Actuarial freedom from reoperation at 17 years was 75 % (83 % for allograft vs. 64 % for aortic valve replacement) [9].

CONCLUSION

Whilst echocardiography remains the technique of choice for the initial management of infective endocarditis, multi-modality cardiac imaging is useful for non-invasive characterization of the infection and its complications. The presence of pericardial effusion in the course of infective endocarditis should prompt the search of complication.

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