Septic rupture of an atherosclerotic plaque of the ascending aorta

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INTRODUCTION

Infectious aortitis has become a rare disease thanks to the widespread use of antibiotics. We report the case of a patient who, 15 days after initiation of antibiotics for bacteraemia due to methicillin-resistant Staphylococcus aureus (MRSA), developed acute chest pain followed by haemodynamic instability. A tamponade due to a rupture into the pericardium of the ascending aorta at the site of an atherosclerotic plaque was diagnosed by an emergent chest contrasted computed tomography (CT). Intraoperatively, the septic nature of the rupture was suspected. All aortic atherosclerotic plaque samples grew MRSA. Postoperatively, the patient had an uneventful recovery after 12 weeks of antibiotic therapy. Transoesophageal echocardiography and chest CT were normal at 3 months after cessation of antibiotics. This case report permits the review of some characteristics of this disease, its physiopathology as well as the therapeutic implications.

Keywords: Aortitis · Methicillin-resistant Staphylococcus aureus · Bacteraemia · Aortic surgery

CASE REPORT

A 62-year old man, with a history of repeated peripheral vascular surgery, was admitted for an acute limb ischaemia with fever. Bacteraemia due to methicillin-resistant Staphylococcus aureus (MRSA) was diagnosed and related to an infection of the prosthetic graft performed 1 month before on the left leg. Vancomycin and gentamicin were begun. Ablation of the infected vascular graft and amputation were required. On day 7, gentamicin was stopped. At this time haemocultures were sterile. The patient was afebrile, and the healing of the leg was favourable. The day before the acute event, clinical and biological examinations were normal except for the persistence of an inflammatory syndrome. C-reactive protein levels were at 393 mg/l (nl < 3 mg/l). On the 15th day of hospitalization, the patient suddenly developed shortness of breath with chest pain. Electrocardiogram only showed tachycardia. Secondly, haemodynamic instability appeared. Chest radiography (Fig. 1a) evoked a voluminous pericardial effusion that was confirmed by chest computed tomography (CT) with the administration of intravenous contrast media (Fig. 1b) performed during emergency in a patient with a severe haemodynamic instability. This pericardial effusion was bloody, as a result of a rupture of an atherosclerotic plaque of the ascending aorta into the pericardium (Fig. 2). The ascending aorta was neither dilated nor dissected. There were many atherosclerotic lesions of ascending and descending thoracic aortae (Fig. 2). Emergent median sternotomy with extrapericardial ascending aorto cannulation was performed. Pericardiotomy permitted the drainage of 700 ml of blood with fresh clots. Classical extracorporeal circulation was performed. The ascending aorta was clamped and transversal aortotomy permitted the identification of: a normal aortic valve without endocarditic lesions, no dilatation of the sinuses of Valsalva and a false aneurysm at the anterior face of the ascending aorta at the site of an ulcerated atherosclerotic plaque. A fresh clot sealed the 10-mm diameter ovoid rupture from which a purulent secretion issued. There were no infectious signs around the ascending aorta. In this context, the septic origin of the rupture was macroscopically suspected and confirmed by microbiological cultures of the purulent secretion and aortic samples that grew MRSA. Resection of the ascending aorta was performed with an in situ prosthetic graft insertion from the ostium of right coronary artery to 5-mm upstream the aortic clamp. Postoperative course was uneventful; the patient was separated from mechanical ventilation after 24 h and stayed 4 days in the intensive care unit without any complications. Vancomycin, rifampicin and gentamicin were intravenously infused. Gentamycin was stopped 14 days postoperatively. Vancomycin and rifampicin were intravenously given during 6 weeks followed by pristinamycin orally during 6 weeks. At 1 year, the patient was well with a normal transoesophageal echocardiography and chest CT.

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DISCUSSION

This current case report is of interest for many reasons. First, infectious aortitis has become very rare since the development of antibiotics [1]. The aortic intima is highly resistant to infection but the disruption of this barrier, as a result of an atherosclerotic lesion in this case, reduces its resistance. Secondly, we describe a very rare complication of bacteraemia. Two mechanisms may be evoked: the bacteria could have seeded in the existing atherosclerotic plaque on the ascending portion of the aorta resulting in a weakness of the aortic wall. In the current case, another mechanism could be septic emboli of the aortic vasa vasorum. Localization on the ascending aorta was frequent in the specific context of syphilitic or luetic aortitis [1]. Localizations on descending (related to coarctation) or abdominal (related to aneurysm) aorta are more ‘frequent’ [2]. A new mechanism of aortitis is related to the increase aortic stent implantation with a potential direct contamination of the aorta [1]. Infection by contiguity has almost completely disappeared. Lastly, the acute evolution of this infectious aortitis is also particular because clinical manifestations are often non-specific depending on the site of infection and aneurysm formation. ‘Classically’, a mycotic aneurysm appears and is clinically revealed by the complications related to its localization: cough, dysphagia, hoarseness, dyspnoea and superior vena cava syndrome [3]. Patients with no aneurysm formation are likely to be less symptomatic [3].

Emergent CT scan with contrast enhancement is the initial imaging technique of choice. In the current case, it permitted to show that cardiomegaly was the result of a voluminous pericardial effusion, to identify its nature and to diagnose the aetiology and the mechanism of this pericardial effusion [2].

The limitation of the current case report is the absence of pathological confirmation, but, in our opinion, the association of clinical finding, CT images, intraoperative findings and MRSA presence in the resected aortic wall samples are the body of evidence that make the diagnosis highly likely.

The medical treatment of aortitis, alone, is associated with a poor outcome. The treatment of choice is a combination of a prolonged adapted antibiotic treatment (6–12 weeks) and surgery that permits to confirm the diagnosis, to treat the complication, to control the infection and to restore the vascular continuity. Resection of the infected aortic segment with in situ prosthetic graft reconstruction is the preferred method of revascularization [3, 4]. After antibiotic cessation, follow-up with chest CT and echocardiography is mandatory to confirm the absence of infectious recurrence.

Conflict of interest: none declared.

REFERENCES