

Case report

Pseudoaneurysm of the thoracic aorta in patients with human immunodeficiency virus infection

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Received 18 January 2002; received in revised form 21 May 2002; accepted 27 May 2002

Abstract

Arterial pseudoaneurysm has been reported as a possible complication of immunodeficiency virus infection. We report two cases of HIV-positive patients with a pseudoaneurysm at the level of the descending thoracic aorta. The first patient refused surgery and has been followed up to 14 months, whereas the second patient underwent successful surgical repair. The importance of magnetic resonance imaging in the diagnosis of thoracic aorta pseudoaneurysm is also discussed. © 2002 Elsevier Science B.V. All rights reserved.

Keywords: Aorta; Pseudoaneurysm; Human immunodeficiency virus

1. Introduction

As a consequence of the increasing diffusion of infection with the human immunodeficiency virus (HIV) a new spectrum of associated pathologies is becoming evident. Vasculitis and arterial aneurysms have recently been described as a complication of HIV infection [1–3].

2. Case report

2.1. Patient 1

A 34-year-old HIV-positive homosexual man presented with recurrent episodes of thoracic pain. The patient's clinical history was negative for opportunistic infections or for traumatic injury. Chest X-ray films showed a solitary group of calcified lymph nodes and an aortic aneurysm, which appeared as a regularly bordered mass located in the upper left chest. A body magnetic resonance imaging (MRI) was performed and a saccular aneurysm (3.9 × 4.5 cm) with a wide communication with the aortic lumen (Fig. 1) was detected at the level of the descending thoracic aorta. Elective aneurysmectomy was suggested, but the patient refused surgery. Controls by MRI evidenced a progressive dilatation (4 × 5.1 cm) during the following 14 months.

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2.2. Patient 2

A 38-year-old man who was a drug-abuser was admitted for the evaluation of a recurrent, non-specific thoracic pain. He had been HIV-seropositive for 4 years. Laboratory tests showed an accelerated erythrocyte sedimentation rate and increased C-reactive protein. The patient's HIV infection has been well controlled on anti-retroviral therapy and no opportunistic infections or tumour have developed since the initial diagnosis. Careful questioning revealed no history of trauma. An admission chest roentgenogram revealed a dilatation of the thoracic aorta, thought to be consistent with a chronic aneurysm. The diagnosis was confirmed by a chest MRI that revealed the presence of a saccular aneurysm measuring 4.6 × 3.8 cm in correspondence to the aortic hystmus (Fig. 2). The patient underwent elective surgery. A left thoracotomy was performed, entering the fourth intercostals space, and partial cardiopulmonary bypass was instituted between the left atrium and left femoral artery following a low dose of heparin (100 units/kg). The false aneurysm was resected and a 22 mm Dacron tube was then anastomosed. The cross-clamp time was 22 min. Universal precaution protocol (i.e. impermeable gowns, two pairs of surgical gloves, protective glasses, and reinforced masks) was followed throughout. Routine antibiotic prophylaxis was implemented before the operation and during the first and the second postoperative days. There were no needle stick or sharp object injuries during the operation. Acute and chronic inflammatory changes were revealed by means of

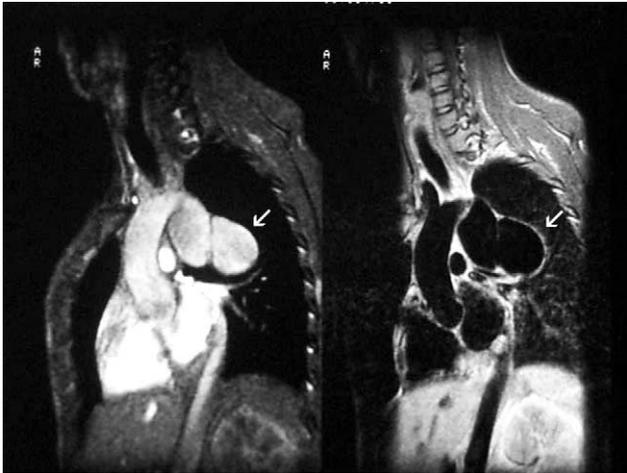


Fig. 1. MRI parasagittal gated images showing a saccular aneurysm (white arrow) at the aortic isthmus just distal to the left subclavian artery. (Left) In the cine-gradient echo (repetition time/echo time = 50/14) the image signal intensity in the aneurysm is homogeneous. (Right) SET1 (repetition time/echo time = 923/14) of the aorta.

histological examination of the aneurysm walls, with occlusion of the vasa vasorum by inflammatory infiltrate, destruction of the internal elastic lamina and edema. Ziehl-Neelsen and GMS (gomori methenamine silver) staining did not reveal the presence of fungi. The postoperative course was uneventful and the patient went home on the ninth postoperative day.

3. Discussion

The association between infection with HIV and the development of vascular pseudoaneurysm has been recently described. Marks and Kuskov [1] in a review of 16 HIV-positive patients with focal areas of vascular disease identi-

fied some special clinical features: (1) young age; (2) no signs of atherosclerosis; (3) rapid development of focal necrotizing vasculitis with aneurysm formation and rupture; or (4) slow progressive development of granulomatous vasculitis. The clinical and pathological features of ten HIV-positive patients with arterial aneurysms were retrospectively evaluated by Nair et al. [2], who found an unusual major incidence in young black patients, the occurrence in atypical sites, and the tendency toward multiplicity. In a review of 14 cases of arteritis in AIDS patients, Calabrese et al. [4] described two different pathological features of the arterial wall: (i) angiogenic immunoproliferative, probably a consequence of autoimmune mechanisms; and (ii) intense necrotizing vasculitis with the formation of aneurysms, which the authors attributed to local infection of the vessel wall or to thrombosis. To the best of our knowledge, these are the first two reports of pseudoaneurysms of the thoracic aorta in patients with AIDS. Both patients in this report were young, with no signs of atherosclerosis and mainly no episodes of trauma; moreover, the histopathological changes in the aortic wall of the second patient were typical of a necrotizing arteritis. On the other hand, a careful clinical and laboratory examination excluded any opportunistic infection in both patients, and therefore we can rule out the possibility of an infective vasculitis, which has been described as a possible complication in HIV-infected patients by direct bacterial infection resulting from immunosuppression [5]. Finally, the patients had no known risk factors for aneurysm formation.

Recently, a vigorous perioperative treatment with anti-retroviral agents immediately before cardiac surgery using cardiopulmonary bypass has been recommended in patients with advanced HIV infection [6]. In the author's opinion, this strategy could become the standard for patients with cardiovascular disease and advanced HIV infection. However, as the author pointed out, the following aspects of his report need to be considered: (1) lack of a reactive increase in the neutrophil count; (2) transient extreme reduction of lymphocytes; and (3) a relative decrease in the CD8 + cell ratio.

During the last decade, different risk groups within patients with AIDS have been identified, in whom the prognosis has been shown to be strongly influenced by the patient's baseline conditions. Patients with clinical evidence of AIDS and bacterial endocarditis and patients who were IV drug abusers have a much worse outcome after cardiac surgery than patients who are simply HIV-positive [7].

In our patient, a partial cardiopulmonary bypass was used for a brief period of time (less than 30 min). Moreover, the patient was in good general conditions, and the postoperative course has been uneventful.

Finally, it is our belief that MRI represents a useful tool for the assessment of aortic disease, providing clear demonstration of the morphological changes of the vessel wall. The oldest but still a very valuable technique is the spin echo (SE), which is an MRI sequence whose signal is an



Fig. 2. MRI parasagittal gated image showing a saccular aneurysm of the aortic isthmus just distal to the left subclavian artery (white arrow). The cine-gradient echo image signal intensity in the aneurysm is inhomogeneous because of the intraluminal turbulence.

echo resulting from the refocusing of magnetization after the application of 90° and 180° radio frequency pulses. In recent years an innovative pulse sequence termed fast spin echo (FSE) has become widely used. FSE uses a large number of 180° radio frequency pulses to collect the image data. With the advent of segmented acquisition techniques the sequences can be performed in breath-hold, and the acquisition of sequences allows the accurate measurement of the aortic pseudoaneurysm. More recently, the advent of fast gradient systems with ultrafast repetition and echo times up to 1 ms has provided an important breakthrough for three dimensional (3D) MR angiography of the thoracic aorta [8].

MRI also furnishes an easily reproducible and reliable method of follow-up with decreased morbidity and at approximately one-third of the cost of catheter angiography.

Although elective surgery represents the most adequate treatment for aortic pseudoaneurysms [9], the few data available about the natural course of this pathology support the need for further studies.

In conclusion, as we are now facing a serious problematic worldwide spreading of AIDS, we need to pay attention to aortic pseudoaneurysms as a possible manifestation of HIV infection.

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