

Case report

Aortic aneurysm diagnosed in a Mozambican HIV positive and hypertensive man with echocardiography



Edy da Emilia Angelo Nacarapa^{1,2,&}, Artur Francisco Macuacua¹, Ezio Augusto da Costa Massinga³, Jose Manuel Ramos Rincon⁴

¹Chokwe Carmelo Hospital-Daughters of Charity, Saint Vincent of Paul, Gaza Province, Mozambique, ²Tinpswalo Association, Research Unit, Vincentian Association to Fight AIDS and TB, Chókwè, Gaza Province, Mozambique, ³Department of Medical Emergence. Maputo Central Hospital, Mozambique, ⁴Department of Internal Medicine. University General Hospital of Alicante and Miguel Hernandez University of Elche, Spain

[&]Corresponding author: Edy da Emilia Angelo Nacarapa, Chokwe Carmelo Hospital-Daughters of Charity, Saint Vincent of Paul, Tinpswalo Association, Research Unit, Vincentian Association to Fight AIDS and TB, Chókwè, Gaza Province, Mozambique

Received: 20 Apr 2020 - Accepted: 18 May 2020 - Published: 26 May 2020

Domain: Cardiology, Infectious disease

Keywords: HIV, aortic aneurysm, Mozambique

Abstract

Aortic aneurysm might be underdiagnosed on hypertensive HIV infected patients, in settings with limited-resources. Etiological factors include atherosclerosis as well as infections like tuberculosis, syphilis, or HIV-associated vasculitis. HIV/AIDS is a major public health problem in Mozambique and throughout Africa, but there is scant literature from this continent regarding clinical outcomes in people with HIV and aortic dissection. This case report describes a 42-year-old hypertensive man on antiretroviral therapy for HIV, who developed symptoms of deteriorating shortness of breath on exertion. Transthoracic echocardiogram demonstrated an aortic root and ascending aorta dilatation, along with severe aortic valve regurgitation. The final outcome was not favourable.

Case report | Volume 3, Article 27, 26 May 2020 | 10.11604/pamj-cm.2020.3.27.22972

Available online at: <https://www.clinical-medicine.panafrican-med-journal.com/content/article/2/27/full>

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Introduction

HIV/AIDS is among the most important challenges for global public health. Despite the progress in treatment and prevention programs since its emergence in the 1980s, the impact of the pandemic is still widely felt, particularly on the African continent [1]. In Mozambique, HIV prevalence rose from 2% in 1990 to 13.2% in 2015 and has also fueled the TB epidemic [2]. Greater access to highly active antiretroviral therapy (HAART) has prolonged life expectancy for people living with HIV (PLHIV). However, incidence of non-AIDS comorbid conditions has also risen [3] including cardiovascular diseases with aortic involvement, such as aortitis, aneurysms, dissections, and vasculitis [3], which can be directly related with HIV [4]. Secondary infections may include *Mycobacterium avium*, syphilis, salmonella, or tuberculosis-immune reconstitution inflammatory syndrome, among others [5,6]. Degenerative atherosclerotic aneurysm has also been described in an HIV-positive patient treated with HAART [7]. It is estimated that the incidence of aortic aneurysm (AA) thoracic (AAT) is six cases per 100,000 patients/year, while that of AA abdominal (AAA) is 25 per 100,000 patients/year [8,9]. About 10% of patients diagnosed with AA have multiple aneurysms and in different segments of the aorta. Approximately 20 to 25% of individuals who have AAT have a concomitant AAA. The AAA are more frequent than AAT and AA thoracoabdominal (ATA) [10,11]. Recent studies have shown a link between the development of cardiovascular disease and HIV infection with multiple potential mechanisms, including direct vascular inflammation [12,13]. This report describes the case of a hypertensive patient with HIV infection and aortic aneurysm, diagnosed in a rural setting in Africa by transthoracic echocardiography.

Patient and observation

The patient was a 42-year-old man with hypertension and HIV (diagnosed in February 2018), under treatment with tenofovir (TDF) 300mg plus lamivudine (3TC) 300mg plus efavirenz (EFV) 600mg. He reported experiencing dry cough and dyspnea for the past four months, which had worsened in the previous two weeks, with production of pink sputum on coughing, exertional dyspnea, ascending edema, orthopnea, nocturnal paroxysmal dyspnea, abdominal distension, and early satiety. The patient did not report fever, diarrhea, chest pain, vomiting, or anorexia. He admits a bad adherence to antihypertensive drugs since he was diagnosed 3 years ago. On physical examination, he showed tachycardia and stained mucus but was eupneic and feverless, with a temperature of 36.9°C. Blood pressure was 114/77mmHg, and he had a heart rate of 99 beats per min and respiratory rate of 28 breaths per min. He had a jugular venous distension, and chest auscultation revealed a bilateral creep. Rhythmic and diastolic murmur were audible in the right parasternal space during the cardiac auscultation. Abdominal examination showed hepatomegaly of 3cm and hepatojugular reflux, which was flat with slight wall edema, and a soft liquid wave. Edemas with fovea were present on the extremities. Abnormal biochemical parameters were: alanine transaminase, 140.8U/L; glutamic oxaloacetic transaminase, 71.4U/L; gamma-glutamyl transferase, 358.9U/L; and the other variables were normal creatinine (0.98mg/dL). Chest X-ray revealed an elongated aorta (Figure 1), and transthoracic echocardiography (TTE), dilated aortic root diameter 5.5cm diameter compared with left atrial diameter, a floating membrane compatible of dissection, mitral and tricuspid regurgitation, severe systolic dysfunction with decreasing ejection fraction under 30%, and abnormal contractility, without pericardial effusion (Figure 2). Pharmacological medication (morphine 20mg, atenolol 25mg, lisinopril 10mg) per day was given to stabilize him, while he was waiting surgery. These findings prompted the patient's

transfer to the reference hospital (Maputo Central Hospital) for surgical repair; the final outcome was not favourable, he died before surgery could be arranged.

Discussion

HIV infection could lead to aortic aneurysm in at least three ways: (1) immunodeficiency could allow bacteria that are known to cause mycotic aneurysms to proliferate without immune restraint; (2) one or more of the HIV envelope proteins could sufficiently resemble an artery-specific-antigenic protein (ASAP) to trigger an autoimmune response (molecular mimicry); and (3) the HIV virus itself could infect the arterial-resident cells that maintain the integrity of the load-bearing matrix [14]. Diagnosis of aneurysm is initially made by echocardiography. After that, computed tomography (CT), especially with contrast image enhancement, usually shows the aortic anatomy with great clarity and distinguishes a ruptured aortic aneurysm from an acute aortic syndrome [15]. However, there is limited access to CT in sub-Saharan Africa [9]. Sensitivity in the detection of thoracic aortic dissection was 100% for all techniques. Specificity was 100%, 94%, and 94% for spiral CT, multiplanar transesophageic echocardiography, and MR imaging, respectively. In the assessment of aortic arch vessel involvement, sensitivity was 93%, 60%, and 67%, respectively, and specificity was 97%, 85%, and 88% respectively [16]. In general, patients with a dissected aneurysm are treated surgically. Surgical repair of descending AAT and ATA is feasible in PLHIV, and it needn't lead to remote infectious complications [17]. However, this procedure is rarely available in sub-Saharan Africa.

Conclusion

This incidence of this aortic vascular pathology may be increasing due to the longer survival of PLHIV in the HAART

era. In African countries where the prevalence of hypertension is high, the coexistence of both situations increases the likelihood of this diagnostic entity in rural areas [17]. This case highlights the need to monitor hypertension complications especially in HIV-infected patients, and TTE is an effective tool, especially in low-income countries.

Competing interests

The authors declare no competing interests.

Authors' contributions

All the authors have read and agreed to the final manuscript.

Figures

Figure 1: (A) chest X-ray with thoracic aortic aneurysm and (B) echocardiogram with image of flap, compatible with dissected aortic aneurysm

Figure 2: (A) diameter of the dilated aortic root compared to the atrial diameter and the presence of an anterior intraluminal flap membrane compatible with dissection; (B) severe systolic dysfunction with marked decrease in ejection fraction below 30% as a result of persistent aortic regurgitation, due to the aneurysm that starts right at the aorta root

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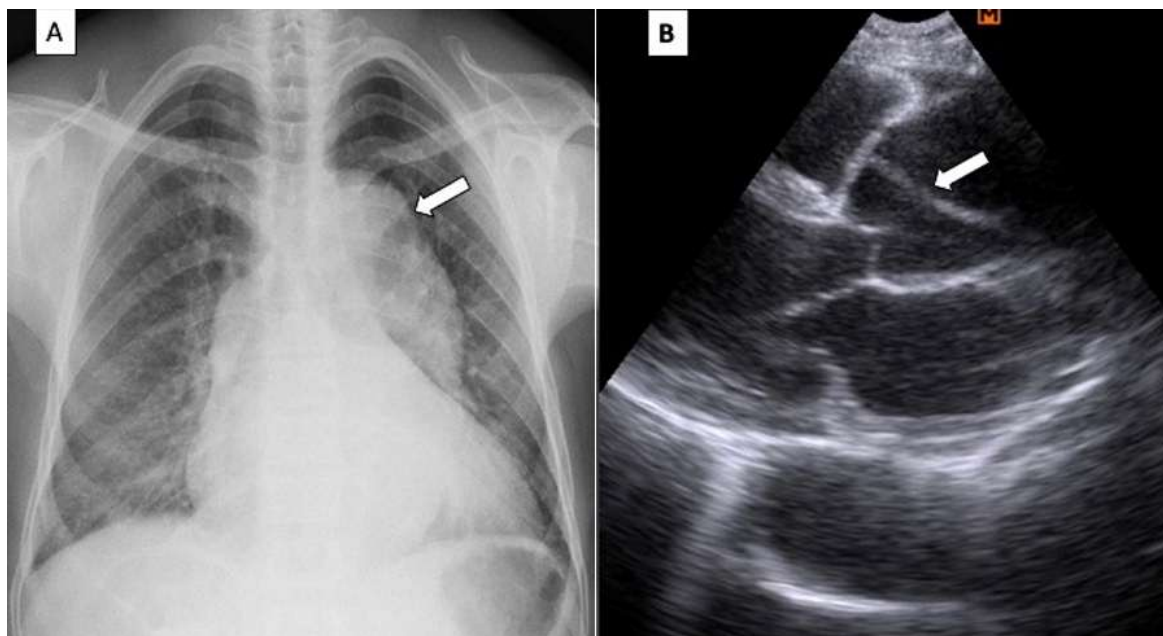


Figure 1: (A) chest X-ray with thoracic aortic aneurysm and (B) echocardiogram with image of flap, compatible with dissected aortic aneurysm

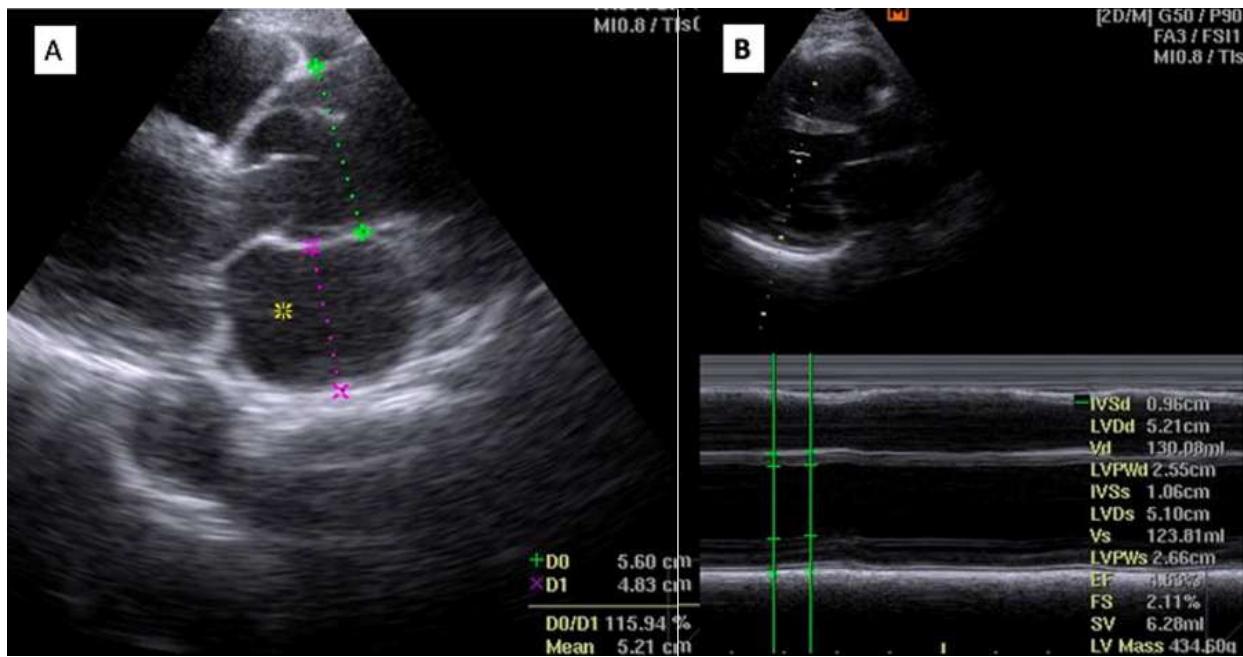


Figure 2: (A) diameter of the dilated aortic root compared to the atrial diameter and the presence of an anterior intraluminal flap membrane compatible with dissection. (B) severe systolic dysfunction with marked decrease in ejection fraction below 30% as a result of persistent aortic regurgitation, due to the aneurysm that starts right at the aorta root