

Case Report

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Type I aortic dissection in a patient with human immunodeficiency virus infection

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The use of highly active antiretroviral therapy in patients with HIV infection has significantly reduced HIV-related infectious complications and improved their survival. With effective antiretroviral therapy, cardiovascular disease has gained prominence as a cause of morbidity and mortality in HIV-infected persons. Aortic dissection is an uncommon but potentially fatal disease with catastrophic complications. The spread of AIDS is a major public health problem in China, but there is scant literature regarding the clinical outcome for HIV/AIDS patients with aortic dissection in China. This case report describes a patient with HIV and type I aortic dissection who survived without surgical repair. This report is provided to describe a detailed and successful outcome for a patient with type I aortic dissection and HIV in China.

Keywords: Aortic dissection, acquired immunodeficiency syndrome

1. Introduction

Human immunodeficiency virus (HIV) infection is characterized by a chronic disease process with systemic multiorgan involvement (1). In the early years of the acquired immunodeficiency syndrome (AIDS) epidemic, many patients suffered and died from serious opportunistic infection partly because of their compromised immune system. The use of highly active antiretroviral therapy (HAART) in patients with HIV infection has significantly reduced HIV-related infectious complications and improved their survival. This improvement, combined with the metabolic effects of antiretroviral treatment, has increased the risk of cardiovascular disease (2). HIV patients share many cardiovascular risk factors with the general population, but they also share factors specific to their condition that include the HIV virus itself, HIV replication, chronic inflammation, and exposure to HAART (3,4). Cardiovascular complications occur in a significant

number of such patients and are the immediate cause of death in some. The spectrum of cardiovascular complications of AIDS that may be depicted at imaging includes dilated cardiomyopathy, pericardial effusion, pulmonary hypertension, endocarditis, thrombosis, embolism, vasculitis, coronary artery disease, aneurysm, atherosclerotic cardiovascular disease, and cardiac involvement in AIDS-related tumors (5). With effective antiretroviral therapy, cardiovascular disease has gained prominence as a cause of morbidity and mortality in HIV-infected persons. Aortic dissection is an uncommon but potentially fatal disease with catastrophic complications. It most commonly presents in the elderly population with a history of chronic hypertension. Rapid intervention is necessary as delay leads to higher mortality. Aortic dissection is a very uncommon cardiovascular complication reported in HIV-infected patients. Baciewicz *et al.* (6) reported a case of HIV and type I aortic dissection in which the patient was successfully treated with surgical repair. The spread of AIDS is a major public health problem in China; but there is scant literature regarding the clinical outcome for HIV/AIDS patients with aortic dissection in China. This case report describes a patient with HIV and type I aortic dissection who survived without surgical repair. This report is provided to describe a detailed and successful outcome for a patient with type I aortic dissection and HIV in China.

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2. Case report

A 46-year-old man infected with HIV who had a CD4 count of 150 cells per cubic millimeter was evaluated in November 2009 with complaints of searing pain in the chest, back, and abdomen. The patient denied being short of breath. He was diagnosed with HIV in 1995 and had received HAART (stavudine, lamivudine plus efavirenz) since 1997. The patient developed renal insufficiency and hypertension in 2008 and had been on hemodialysis since then. A physical examination revealed a blood pressure of 211/115 mmHg in both arms. The patient did not smoke or drink and he did not have dyslipidemia or hyperglycemia. He was negative for both HBsAg and HCVAb. On admission, a chest computerized tomography (CT) scan revealed a type I aortic dissection beginning in the ascending aorta and extending to the left iliac artery (Figure 1). Surgical repair was not done because the dissection involved the entire aorta. Medical treatment included aggressive control of the patient's blood pressure and heart rate. He continued to receive antiretroviral therapy (stavudine, lamivudine plus efavirenz) and undergo hemodialysis. A subsequent CT scan performed one month later revealed no change in residual dissection of the aorta. The thoracic and abdominal aorta diameters have remained stable (Figure 2). The patient continued to be followed up regularly, but he died on July 7, 2010 (8 months after the aortic dissection appeared) because of cardiac complications.

3. Discussion

With the further spread of AIDS worldwide and a

dramatic increase in the life expectancy of HIV-infected patients treated with effective antiviral regimens, an increasing number of patients live with the illness but more than 10% experience cardiovascular manifestations (7). Before the advent of HAART, cardiac manifestations in HIV patients mainly included cardiomyopathy, pancarditis, and pulmonary hypertension leading to heart failure, conduction system abnormalities, and neoplastic infiltration (8). In the post-HAART era, acute coronary events by far outnumber all other cardiovascular complications of HIV (7). Cardiovascular prevention is required in more than one-half of HIV-infected/treated patients for HAART to be reliably effective (7). As the prognosis for HIV patients continues to improve, this rate is likely to increase. This increase has been attributed to aging along with a resulting increase in risk factors such as hypertension and diabetes, as well as HAART regimens that include stavudine or protease inhibitors (PIs). All medications in this latter class have a reported association with hyperlipidemia, hyperglycemia, and truncal obesity (9). Atherosclerotic cardiovascular disease has become more frequent with the use of HAART. Studies indicate that new-generation PIs such as darunavir/ritonavir (10) and atazanavir/ritonavir (11) are relatively less likely to lead to dyslipidemia. The integrase inhibitor raltegravir and CCR5 receptor antagonist inhibitor maraviroc have a better lipid and glycemic profile than older PIs and thymidine analogues (12). In addition, HIV has been found to directly affect vascular biology, resulting in an increased risk of cardiovascular disease compared to uninfected persons (13). The current patient had received stavudine-based antiretroviral

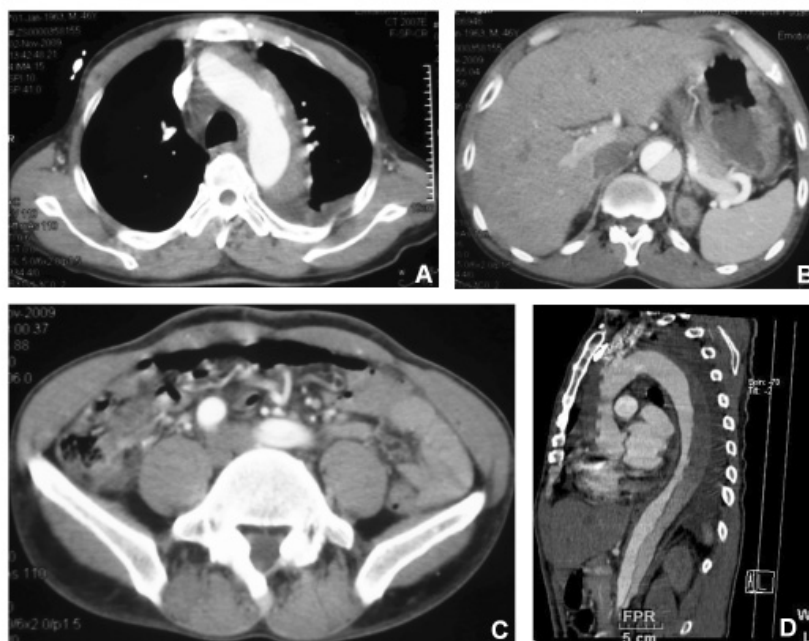


Figure 1. CT scan performed on November 2nd 2009 showing a type I aortic dissection beginning in the ascending aorta and extending to the left iliac artery (A, B, C, and D).



Figure 2. CT scan performed on December 4th 2009 showing no change in the dissection of the aorta. The thoracic and abdominal aorta diameters have remained stable (A, B, and C).

therapy for nearly 13 years, he had developed renal insufficiency and hypertension, and he had been on hemodialysis since 2008. The exact cause of renal failure in this patient is unknown, though it may be associated with HIV infection. Kidney function is abnormal in up to 30% of HIV patients; AIDS-related kidney disease has become a relatively common cause of end-stage renal disease requiring dialysis (14). The origins of aortic dissection in the current patient appear to be multifactorial and related to high blood pressure, hemodialysis treatment, HIV infection, as well as to the adverse reactions to antiretroviral drugs. The prevalence of hypertension in HIV disease was estimated to be 20% to 25% before HAART but is now up to 74% in patients with HAART-related metabolic syndrome (15). Recent reports indicate that elevated blood pressure may be related to PI-induced lipodystrophy and metabolic disorders and especially to elevated fasting triglycerides (8). Acute or chronic renal failure also contributes to hypertension (8). In the current patient, hypertension may have been associated with renal failure and adverse reactions to antiretroviral therapy and may have been the most significant cause of aortic dissection.

Acute aortic dissection is a medical emergency with high morbidity and mortality requiring prompt diagnosis and treatment. A high degree of caution is required for its successful diagnosis as presenting symptoms are so variable that dissection may be overlooked in up to 39% of cases (16). Rapid advances in noninvasive imaging technology have facilitated the early diagnosis of this condition and should be considered in the differential diagnosis of any patient with chest, back, or abdominal pain. Dissections may involve the ascending aorta alone, the descending thoracic and abdominal aorta alone, or the entire aorta. An aortic dissection is serious because it may rupture, causing life-threatening internal bleeding. The risk of death depends on the extent of the dissection. The risk is highest for those dissections involving the ascending aorta. Emergency surgery is the treatment for patients with a type A dissection while optimal medical therapy is appropriate for patients with an uncomplicated type B dissection. The medical treatment of an aortic dissection includes aggressive control of blood pressure

and heart rate while the aorta heals. An adequate beta-blockade is the cornerstone of medical therapy. The literature mentions one HIV-infected patient who underwent surgical repair of a type I aortic dissection (6). Select patients with a type I aortic dissection and HIV infection are candidates for surgical repair (6). One study indicates that perioperative morbidity and mortality rates are high in HIV patients undergoing abdominal aortic surgery (17). HIV infection itself does not seem to increase perioperative morbidity and mortality in cardiac surgery and major cardiac surgery does not negatively affect the course of HIV infection (18). Once the acute dissection has healed, adequate control of blood pressure may eliminate the need for surgery. Patients who survive acute aortic dissection need long-term medical therapy with beta-blockers and appropriate serial imaging follow-up. Lifelong monitoring of the diameter of the aorta is required because a previously dissected aorta may enlarge and rupture.

Because of the nature of the viral infection and the possible mode of viral transmission, many surgeons remain reluctant to perform invasive procedures on patients with HIV infection in China. Presently, there are no definitive or specific treatment guidelines from different surgical societies regarding surgical management of patients with HIV infection. The current patient with type I aortic dissection did not undergo emergency surgical repair but he did survive acute aortic dissection and he received long-term medical therapy with beta-blockers and appropriate serial imaging follow-up.

As the epidemic progresses and new treatments help increase the long-term survival of AIDS patients, cardiovascular complications will become more common. Although HIV infection can now be treated effectively with a combination of antiretroviral medications, cardiovascular diseases present new challenges for the management of persons infected with HIV in China. Patients with aortic dissection have a high risk of an adverse outcome and need to be managed aggressively in hospital and over the long-term with frequent follow-ups (19). Future advances in this vein include the early diagnosis and optimal treatment of aortic dissection in HIV-infected patients.

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