AORTIC DISSECTION IN A PATIENT WITH HUMAN IMMUNODEFICIENCY VIRUS INFECTION THAT WAS DIAGNOSED AT AUTOPSY: A CASE REPORT

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Abstract

A 43-year-old homosexual man was referred to our hospital for chest pain and loss of consciousness. He was hypertensive, and had an uncontrolled viral load. Serum creatinine revealed acute renal failure, and he died 3 days later. On autopsy, aortic dissection (Type B) was found. No obvious inflammatory change, granulation, bacterial or fungal infection, or medionecrosis were seen at the dissection site. To our knowledge, this was the first case with HIV in whom aortic dissection was diagnosed at autopsy. Aortic dissection is a potential differential diagnosis even in young patients presenting with hypertension and chest pain.

Key words : HIV infection, Aortic dissection, Hypertension, Autopsy, Acute renal failure

Introduction

The prognosis of patients with human immunodeficiency virus (HIV) infection has dramatically improved over the past 20 years because of improved antiviral therapy. The causes of death in HIV patients have been changing from AIDS-related causes to non AIDS-related causes such as cardiovascular diseases or non-AIDS related malignancies [1]. We experienced a case with HIV and fatal aortic dissection diagnosed at autopsy. To our knowledge, this is the first case of HIV in whom aortic dissection was diagnosed at autopsy. We report the detailed pathological analysis.

Case report

A 43-year-old man was admitted as an emergency to our hospital due to loss of consciousness. He was diagnosed with HIV infection eight years before the emergency transfer but was lost

to follow-up for three years. He was referred to the previous hospital because of pneumocystis pneumonia, and combination antiretroviral therapy (cART) was started four years before the emergency transfer. He developed various side effects with cART, and only tolerated tenofovir (TDF) + lamivudine(3TC) + raltegravir (RAL), but was poorly compliant because of his fear of side effects. Therefore, he was referred to our hospital, which was located near his residence three years before the emergency transfer to improve his compliance and to receive more familial support. The patient was a known asthmatic since the age of 15 years and had been receiving inhalational steroid therapy. He also had atopic dermatitis since childhood. His medical history was relevant for the following; hepatitis A virus infection at 27 years old, herpes zoster infection at 30 years old, amoebic colitis at 31 years old, gastric ulcer at 33 years old, and candida esophagitis at 40 years old. He had anaphylactic reactions to sulfamethoxazole-trimethoprim, pentamidine, alcohol, and contrast medium. He did not have diabetes mellitus or hyperlipidemia. He had smoked 20 cigarettes per day for 20 years. His BMI was 20 kg/㎡. Family history was negative for Marfan syndrome.

Since referral to our hospital, his compliance did not improve and his HIV status was uncontrolled. His CD4 positive cell count was persistently under 50/mm^3. His asthma and hypertension were also uncontrolled, for which oral antihypertensives and corticosteroids were initiated, but he often stopped taking the antihypertensive because of fear of allergy, and consequently his hypertension was uncontrolled. Moreover, he was diagnosed with ileus and diffuse peritonitis due to perforation and septic shock, necessitating surgical intervention one year before the emergency transfer. Since then, he had to take daily morphine to achieve pain control. He had been hospitalized several times, and was finally discharged against medical advice, and refused to take any further medications one month before the emergency transfer.

Two weeks before the emergency transfer, he complained of chest pain and came to seek our medical advice. On examination, he was fully conscious with a blood pressure of 188/90 mmHg. He refused re-admission and did not take any treatment. After that, he was referred to our hospital by ambulance due to loss of consciousness. On examination, his body temperature was 36.6℃, heart rate was 100 beats/min, blood pressure was 169/96 mmHg, and oxygen saturation was 100% on 5 liter/min oxygen by mask. His Japan coma scale was Ⅱ-10. A systolic murmur (3/6) was auscultated over the left sternal border, and there were coarse crackles over both lung fields.

Laboratory data on admission revealed a white blood cell count of 10600 cells/μL with 94% neutrophils, serum C-reactive protein (CRP) level of 24.6 mg/dL, blood urea nitrogen level of 133 mg/dL, serum creatinine level of 13.76 mg/dL (Table 1). The serum creatinine level was 1.07 mg/dL, and serum CRP level was 1.1 mg/dL two weeks before.

His admission chest radiograph (Fig. 1) revealed bilateral lung infiltrates reaching the pleura with no mediastinal extension. No aortic calcification was seen. No intracranial hemorrhage or infarction was detected on a brain computed tomography (CT) image. Contrast enhanced CT was not performed because of the anaphylactic reaction to contrast medium. He did not wish to receive any treatment before he lost consciousness, and he died 3 days after admission secondary to respiratory failure. The direct cause of death was clinically diagnosed as acute renal failure.

Table 1. Laboratory Findings at admission

【Peripheral Blood】		
WBC	10600	/μL
Stab	9.0	%
Seg	85.0	%
Lym	2.0	%
Mono	2.0	%
Eos	0.0	%
Hb	6.1	g/dL
Plt	13.6×104	/μL

【Coagulation test】		
PT-INR	1.30	
APTT	35.4	sec

【Biochemistry】		
CRP	24.6	mg/dL
TP	5.2	g/dL
Alb	2.7	g/dL
AMY	256	U/L
AST	66	U/L
ALT	24	U/L
CK	237	U/L
ALP	426	U/L
Γ−GTP	61	U/L
ChE	92	U/L
Glu	78	mg/dL
UA	17.3	mg/dL
BUN	133	mg/dL
Cre	13.76	mg/dL
NH3	28.8	μg/dL

【Electrolyte】		
Na	130	mEq/L
K	6.1	mEq/L
Cl	86	mEq/L
Ca	7.4	mEq/dL

【Infection】		
C7-HRP		negative
Aspergillus antigen		negative
Toxoplasma IgG		negative
Cryptococcus Antigen		negative
RPR	negative	
TPHA	17.7	COI

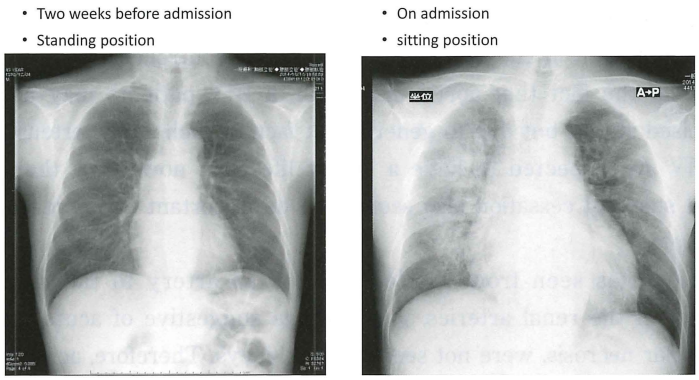

Fig. 1. Chest radiographs at two weeks before admission and at admission

An autopsy was performed on the day after death. Aortic dissection (Type B) was seen from the left subclavian artery to the right arteria iliaca communis. On hematoxylin-eosin (HE) staining, no obvious inflammatory changes, granulation tissue, bacterial infection, fungal infection or medionecrosis were seen at the dissection area (Fig. 2). Cytomegalovirus (CMV), human herpesvirus 6 (HHV-6), and human herpesvirus 8 (HHV-8) special stains were negative.

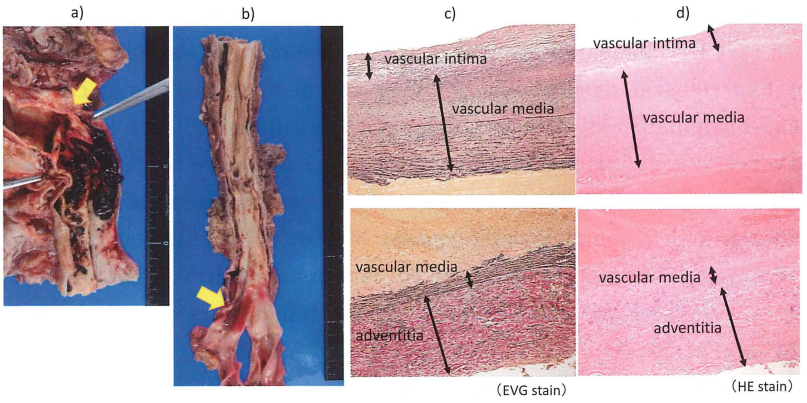

Fig. 2. Autopsy examination of the aorta

Aortic dissection was absent in both renal arteries. Mild focal sclerosing glomerulonephritis was detected, which did not cause acute renal failure. Other findings that may have caused the acute renal dysfunction, such as acute tubular necrosis, were not detected. Hyaline membrane formation was seen in both lungs, suggesting diffuse alveolar damage.

The direct cause of death was likely circulatory failure secondary to aortic dissection, and respiratory failure secondary to diffuse alveolar damage.

Discussion

To our knowledge, this was the first case with HIV in whom aortic dissection was diagnosed at autopsy. We could not find any articles in the published literature reporting aortic dissection in patients with HIV before the era of highly active antiviral therapy (HAART), even when there were many opportunistic complications. In our case, contrary to our expectations, aortic inflammation was not seen in the autopsy despite the uncontrolled HIV status. This finding might shed light on the fact that aortic dissection in HIV patients may not be due to the immunocompromised status, but due to general risk factors such as hypertension and smoking. Patients with HIV are expected to have a longer life span nowadays; therefore, control of hypertension and smoking cessation also seemed to be important to prevent aortic dissection even in HIV patients.

Aortic dissection was seen from the left subclavian artery to the right arteria iliaca communis, but not in the renal arteries, and findings suggestive of acute renal dysfunction, such as acute tubular necrosis, were not seen in the kidneys. Therefore, acute renal failure was thought to be triggered by decreased renal blood flow due to bilateral obstruction of the renal arteries, and loss of consciousness might be explained by uremia.

Aortic dissection is caused by a tear in the aortic vascular media. In Japan, the prevalence of aortic dissection at autopsies was 1.5% from 2003 to 2008, and the peak incidence of aortic dissection occurred at 70 years of age among the general population [2]. Predisposing factors for aortic dissection are hypertension, disorders of collagen such as Marfan's syndrome, preexisting aortic aneurysm, bicuspid aortic valve, aortic instrumentation and surgery, aortic coarctation, Turner syndrome, pregnancy and delivery, and inflammatory diseases that cause vasculitis such as Takayasu's arthritis, rheumatoid arthritis, and infective aortitis [3].

It is known that HIV patients have a high prevalence of cardiovascular diseases [4,5], which is caused by hypertension, dyslipidemia, smoking, and diabetes mellitus as clinical factors [6,7]; and persistent inflammation [8], protease inhibitor administration [9], and low CD 4 positive cell count as HIV related conditions [10]. Nevertheless, the incidence of vasculitides remains low (1%) in the HIV population [11]. The mechanism of HIV-associated vasculitides is heterogeneous and multifactorial with a complex pathogenesis. Nair et al. [12] studied the histopathological features of the aneurysm wall in detail in 10 patients with HIV. The common theme was inflammation of the vessel walls with the vasa vasora being the epicenter of this inflammatory process, and adventitia demonstrated evolving inflammatory changes, characterized by macrophage infiltration with haemosiderin deposits. Giant cell arteritis (GCA), Takayasu's arthritis, and Behcet's syndrome were also reported as the cause of large-vessel vasculitides

in patients with HIV [13, 14]. In our case, autopsy revealed no cellular infiltration around the aorta; hence, aortic dissection was not due to GCA or vasculitis. We could not find a relationship between the chronic inflammation seen in patients with HIV and aortic dissection.

Two cases of HIV infection and aortic dissection were previously reported (Table 2) [15, 16]. The age at presentation was between 40 and 50 years including our case, and all the reported cases were hypertensive. On the other hand, the other 2 cases were receiving cART and HIV was under control. Aortic dissection in our case was diagnosed on autopsy, while the other cases were diagnosed while alive as having DeBakey I, and one of them underwent surgery.

Table 2. Record of HIV and Aortic Dissection

	Baciewicz 2003	Shen 2012	Our case
Age, gender	57, male	46, male	43, male
signs	Weakness of right leg	Chest pain, back pain	Unconsciousness, chest pain
Hypertension history	Yes	Yes	Yes
Smoke habitant	No record	No	Yes
Family history	No	No record	No
Diagnosis method	CT	CT	Autopsy
Debekey	I	I	IIIb
Stanford	A	A	B
cART	3TC+RTV	d4T+3TC+EFV	Not received
CD4(/μL) at diagnosis	390	150	16
Viral load(copies/mL)	<40	<40	7000
Therapy	operation	conservative	No therapy
prognosis	Aliive	Dead 8months after diagnosis	death(found at autopsy)

Acute respiratory distress syndrome (ARDS) was diagnosed clinically, and was considered one of the direct causes of death, which was confirmed by the pathological findings on autopsy. Septic shock and trauma were reported as causes of ARDS [17]. Sugano et al. reported that serum CRP level >15 mg/dL in patients with aortic dissection was an independent factor for respiratory failure at $PaO_2/FIO_2 \leqq 200$ mmHg [18]. In our case, hence, respiratory failure seems to have followed the aortic dissection despite the fact that we could rule out septic shock.

In conclusion, aortic dissection should be considered as a differential diagnosis in hypertensive HIV patients presenting with symptoms such as chest pain, even in the young.

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Conflict of interest

There were no conflicts of interest to declare.

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