Human Immunodeficiency Virus and the Heart

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Recently, I was presented with the very complex case of a 56-year-old male patient admitted to hospital because of gross peripheral edema, ascites, and breathlessness. In the distant past, this patient had been treated for Hodgkin’s disease with mantle radiation. Two years ago he was human immunodeficiency virus (HIV)-positive and presented with Kaposi’s sarcoma. More recently, he underwent aortic valve replacement for aortic stenosis and coronary artery bypass graft (CABG) surgery for multivessel coronary artery disease. He did well for a short time but then gradually developed signs of heart failure and recurrent angina. Both coronary bypass grafts were occluded, but he had stents placed in the coronary arteries proximal to the occluded grafts. The prosthetic aortic valve functioned normally. Several months later, angina recurred, secondary to restenosis. A second CABG to three vessels was performed. Dense adhesions were noted in the anterior mediastinum, particularly between the right ventricle and sternum. Over the next six weeks, he developed signs of ascites, peripheral edema, pulmonary congestion, and gained a significant amount of weight despite aggressive therapy. Cardiac medications included high-dose intravenous loop diuretics and neseritide. Anti-HIV medications were acyclovir, Tenovir, Bactrim®, and ciprofloxacin.

Physical examination confirmed findings of elevated right atrial pressure, low blood pressure, tachycardia, ascites, marked peripheral edema, and hepatomegaly. Serum albumin was, surprisingly, 3.9 g/dl.

An immediate concern was that this patient’s illness could be explained by postoperative constriction secondary to pericardial restriction. Of course, his radiation therapy for lymphoma could have contributed, and, as I was soon to learn, HIV could also play a pathogenetic role.

The patient underwent right and left heart catheterization and was found to have marked elevation diastolic pressures in all chambers of the heart consistent with restrictive physiology.

In researching the literature on HIV and the heart, I came across an article in Heart by B.D. Prendergast.¹ This is a wonderful piece that summarizes everything a cardiologist would want to know about HIV and the heart. I thought I might share some of the information with you, focusing mainly on things that relate to the patient described.

First, the number of persons world-wide who are affected with HIV is approximately 36 million.

Second, current therapy of HIV is now prolonging life significantly, thus opening the door for other diseases, such as coronary artery disease, valvular heart disease, or even iatrogenic diseases related to medications, to emerge.

The first case of acquired immunodeficiency syndrome (AIDS) involving the heart was reported in 1983.² That patient had Kaposi’s sarcoma involving the anterior cardiac wall and no pericardial effusions were noted.

Iatrogenic effects of treatment related to antiretroviral therapies, especially protease inhibitors, include hyperlipidemia, high blood sugar, high insulin secretion, and inflammatory lesions—for example, vasculitis and perivasculitis—, all of which contribute to the development of coronary artery disease and possibly even aortic valve disease. Both diseases were present in this patient.

The following points focus on HIV-related pericardial disease, which is the diagnosis I thought most likely in this patient. The differential diagnosis related to HIV includes infectious etiologies with bacterial diseases such as tuberculosis, both human and nonhuman; viruses, such as cytomegalovirus and HIV itself; and fungi, including histoplasmosis and cryptococcosis. Renal failure resulting in uremia can also result in pericardial inflammation. Cancers such as Kaposi’s sarcoma and lymphoma are relatively common in this patient population.

Kaposi’s Sarcoma

Pathological findings include visceral and parietal pericardial disease. The adventitia of the coronary arteries and myocardium can also be involved. It is interesting to speculate that if there is inflammation of the coronary artery adventitia, this may influence inflammatory processes in the coronaries, which then may influence the development of atherosclerosis.

Lymphoma

Studies at pathology reveal that the heart can be diffusely involved and the pericardium can be involved by direct extension of mediastinal disease to the pericardium.

Pericardial Disease

One study using echocardiography reported pericardial disease in 21% of 1,139 patients with HIV infection.³ Many
believe that HIV is now the commonest cause of pericardial effusion. Some of these patients have cardiac tamponade and constrictive pericarditis, as well as infiltration of the pericardium by lymphoma or Kaposi’s sarcoma.

Tuberculosis, in one report, was noted in 26% of 66 HIV patients, purulent bacteria were found in 17%, atypical mycobacteria in 8%, and Kaposi’s sarcoma and lymphoma in 10%.

Conclusions

With what I have learned about HIV and the heart, I suspect that the only way we will be able to manage the patient described, who had coronary artery disease, aortic valve replacement, angina, symptomatic right-sided volume overload, and pulmonary congestion with reasonably good left ventricular function, will be to diurese vigorously with loop diuretics and/or ultrafiltration to remove most of the edema fluid. Once that is accomplished, right heart catheterization should be performed to assess diastolic pressures. If diastolic pressures are returned to “normal or near normal,” I would continue with vigorous diuresis. If diastolic pressures remain elevated, I would recommend exploratory thoracotomy to assess the status of the pericardium and remove it if it seems to be the cause of the restrictive physiology. Of course, pericardiectomy may not solve the problem; however, it is the only treatment I can think of that might be effective. Prognosis is obviously poor in patients who advance to this stage of the disease.

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References