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Unusual Primary Cardiac Neoplasm in a Nonimmunocompromised Patient

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ABSTRACT

Primary cardiac lymphoma is a neoplasm with poor prognosis. It is occasionally seen in patients with AIDS and transplant recipients, and it is exceedingly rare in nonimmunocompromised hosts. Presentation is heterogeneous and nonspecific, making clinical suspicion difficult. Diagnosis is often late. There are different therapeutic options (chemotherapy, radiotherapy, monoclonal antibodies therapy, and surgery), but there is no uniform consent on the best management. Surgical treatment is controversial. We report our experience with a unique patient in 23 years.

INTRODUCTION

Primary cardiac lymphoma (PCL) is classically defined as an extranodal lymphoma involving only the heart and/or pericardium [McAllister 1978], or as a lymphoma which may involve different organs, with the bulk of the tumor located on the heart [Cairns 1987]. Even if the latter represents an extension of the classic definition, and despite since 1987 it has been reported with increasing incidence in immunosuppressed patients (AIDS or transplant recipients), PCL is an extremely rare neoplasm. Only a few cases have been reported with immunocompetent individuals [Ceresoli 1997]. All of them are described in single reports, revealing the rarity of this entity and making a systematic analysis difficult. There are neither international guidelines nor uniform consent on the best therapeutic management, and surgical treatment is controversial. We report our experience with a unique patient in 23 years.

CASE REPORT

A 65-year-old man was admitted to our hospital in January 2003 complaining of severe dyspnea and fatigue, symptoms that he had progressively developed 3 weeks prior to admission. His past history included drainage of a voluminous pericardial effusion (1100 mL) of unexplained origin 5 years earlier. At admission, a picture of right ventricular failure was present. Blood pressure was 100/60 mm Hg, cardiac tones were lowered, and the rhythm was sinus tachycardia. Liver function tests revealed mild elevation of glutamic-oxaloacetic transaminase (55 IU/L) and glutamic-pyruvic transaminase (71 IU/L) serum levels, decrease of the fifth coagulation factor (43%) and prothrombin time (61%), mild anemia (10 g/L), elevated lactate dehydrogenase (671 IU/L), and an inflammatory picture, with erythrocyte sedimentation rate of 54 mm per hour and a C-reactive protein of 74 mg/L. The serologic examination resulted negative for antihuman immunodeficiency virus antibody. Chest roentgenography showed right diaphragm paralysis and mild cardiomegaly. At echocardiography, a lobulated mass was discovered within the right atrium, extending into the ventricle, while the left side of the heart, venae cavae, and pulmonary vascular bed appeared to be normal. At computed tomography, the atrioventricular mass was estimated to be 100×72×80 mm. This filled the atrial cavity up to the junction with the inferior vena cava, which remained patent. The pericardium appeared diffusely thickened, particularly at its right antero-lateral aspect (Figure 1A).

Due to severe hemodynamic instability, the patient was urgently referred to surgery. The femoral vein was exposed before sternotomy. There was an important inflammatory reaction with strong adherences between the heart and pericardium. Tissues were diffusely bleeding. Venous drainage for cardiopulmonary bypass was achieved by the superior vena cava and the right femoral vein, and arterial perfusion through the ascending aorta. After oblique atriotomy, a huge, friable, lobulated tumor was found, filling the cavity entirely. Surprisingly, there was no adhesion to the free atrial wall. The mass largely extended into the ventricle through the tricuspid valve. The pedicle was located in the atrioventricular groove, next to the commissure between the anterior and posterior tricuspid valve leaflets. Resection was performed the more extensive as possible (Figure 1B), but it was limited by the involvement of the right coronary artery within the tumor and by the transmural infiltration of the ventricle. After weaning from cardiopulmonary bypass, diffuse bleeding persisted, and hemostasis was controlled by local BioGlue

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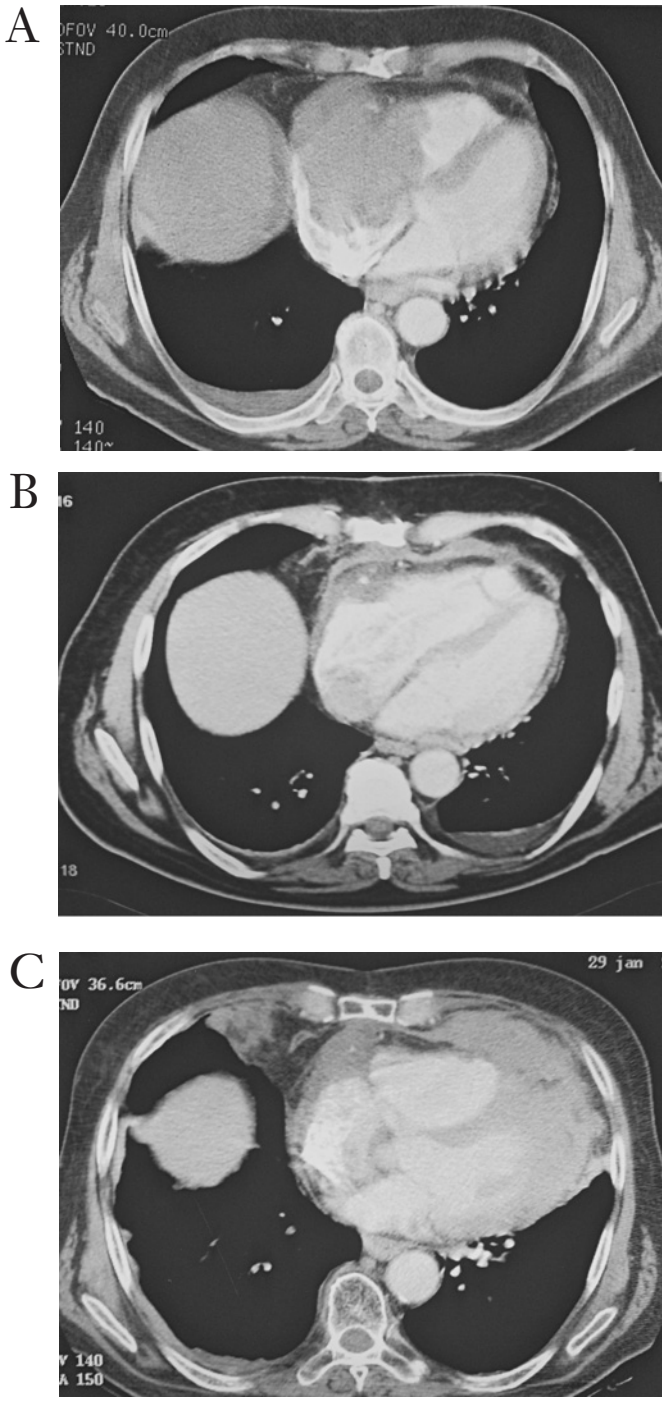

Figure 1. Chest Computed Tomography. A, A voluminous endocavitary mass involves the right cardiac chambers. The pericardium is thickened, especially at its right antero-lateral aspect. B, Aspect of the lumen of the right cardiac chambers after surgical resection of the mass. C, Tumoral invasion of the left ventricle 10 months postoperatively.

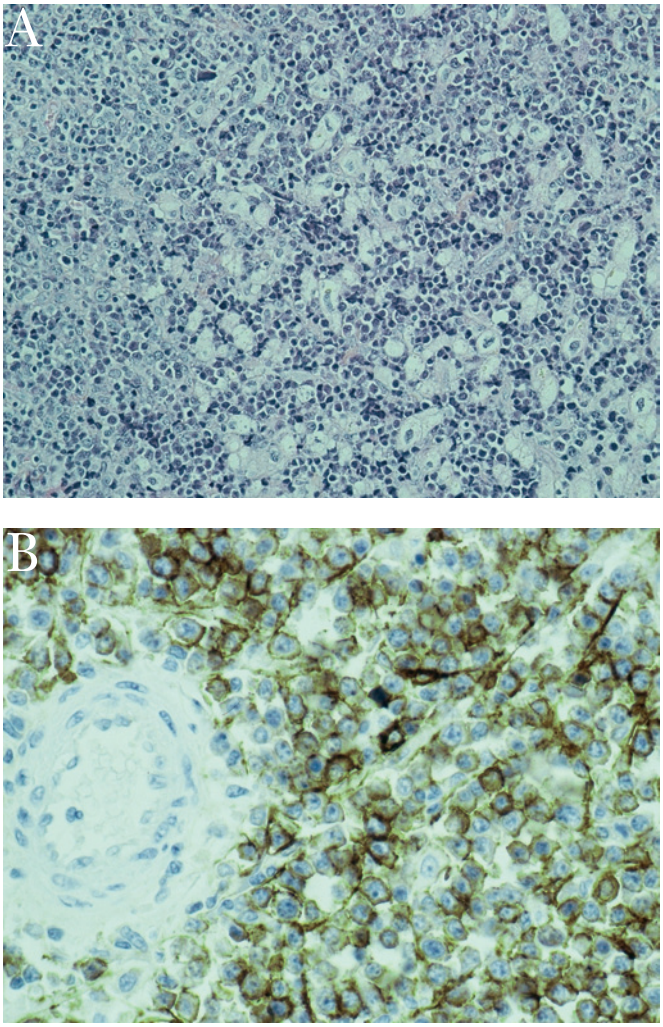

Figure 2. A, Microscopic examination showing diffuse proliferation of large-sized atypical lymphocytes infiltrating the myocardium (original magnification ×20). B, Immunohistochemical studies revealing B-lymphocytes based on the positive staining for CD20, next to an intramyocardial vessel (original magnification ×40).

(CryozLife Inc, Kennesaw, GA). The patient was stable with a low dose of Norepinephrine.

Microscopic examination showed diffuse proliferation of large-sized atypical lymphocytes (Figure 2A), with plasmacytoid differentiation in some sections. Immunohistochemical studies revealed B-lymphochytes (World Health Organization classification) based on the positive staining for CD20 (Figure 2B), CD79a, DBB42, and intra-cytoplasmatic K light chains. Eight well-tolerated cycles of CHOP chemotherapy (cyclophosphamide, doxorubicin, vincristine, prednisone) combined with MABTHERA (monoclonal CD20 antibody rituximab) were administrated. Six months postoperatively a cardiac CT scan showed the progression of the tumor size, although the patient's clinical conditions had been satisfying since the operation. Three cycles of ESHAP chemotherapy (etoposide, methylprednisolone, high-dose cytarabine, cisplatine) were added. Ten months postoperatively he started to worsen clinically. A new CT scan showed massive involvement of the left ventricle (Figure 1C). Radiation therapy (2 cycles of 20 Gy) was associated to chemotherapy. He continued to deteriorate, with fever, confu-

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sion, anorexia, and eventually died in February 2004, 13 months after diagnosis.

DISCUSSION

Primary cardiac tumors (PCTs) are rare, with an incidence between .0017% and .19% in unselected patients at autopsy [Reynen 1996]. PCL represents 1.3% of PCT and .5% of extranodal lymphomas [McAllister 1978]. It is particularly rare in nonimmunocompromised individuals [Ceresoli 1997]. It has high predilection for the right side of the heart, where it may arise from a single or multiple foci and extend from one chamber to another. The right atrium is most commonly affected [Ceresoli 1997, Chim 1997, Ikeda 2004, Nagakawa 2004, Sommers 1996]. This distribution represents a difference from sarcoma, which uniformly originates in any area of the heart, and from myxoma, which usually affects the left atrium [Reynen 1996]. The reason of that is unknown. At immunohistological studies, it is mostly of B-cell lineage and diffuse large cell subtype [Ceresoli 1997, Chim 1997, Nagakawa 2004, Sommers 1996].

Clinical suspicion is difficult due to rarity of the event and to the heterogeneous, nonspecific presentation: congestive heart failure, pericardial effusion, cardiac tamponade, arrhythmia, or superior vena cava syndrome. Dyspnea and edema are the most common symptoms. Echocardiography is commonly associated with computed tomography and/or magnetic resonance imaging. In the literature, histological diagnosis was achieved by cytology of pericardial effusion in 67% of cases, and on pleural samples in two patients [Ceresoli 1997]. Cardiac biopsy was performed in case of unavailable cytology, through either transvenous catheterism (under fluoroscopic or transesophageal echocardiographic guidance), mediastinoscopy, or thoracoscopic pericardial window. In some cases an open biopsy was performed due to the high false negative rates of less-invasive biopsy [Nagakawa 2004].

Reported therapies are heterogeneous. Chemotherapy with CHOP or similar regimen, combined or not with monoclonal antibodies therapy, is the most accepted treatment. Association with radiotherapy, as in our patient, seems to allow a moderate improvement of the outcome [Ceresoli 1997]. Recently, monoclonal CD20 antibody rituximab has been used as a unique therapy in a single patient, surviving at 6 months follow-up [Nagakawa 2004]. Surgical treatment is controversial. Sommers and associates [1996] suggest aggressive resection, while others did not observe improvement of survival after surgery [Ikeda 2004]. Whatever the treatment, prognosis is still generally poor. Most cases have been diagnosed postmortem or a few weeks antemortem. Despite recent literature showing that an earlier recognition may improve the mean life expectancy to 7 months approximately, and that remission was even possible in a few cases [Nagakawa 2004], the reported follow-up of surviving patients was rarely over 1 year, making a systematic analysis of best therapy and of long-term outcome difficult.

PCL should be suspected in case of cardiac mass, picture of right ventricular failure, and history of unexplained pericardial effusion. The interval between the onset of effusion and growth of a visible cardiac mass was surprisingly long in our patient. Although this aspect clashes with the usually rapid progression of PCL, a correlation between the two events may be neither demonstrated nor absolutely excluded.

In our unique experience, surgical treatment was mandatory due to critical hemodynamic conditions, and even if combined with other therapies it did not improve the outcome of PCL. We deem that when histological diagnosis is preoperatively achieved, operation is justified only by instability and/or by the risk of embolism related to a bulky intracavitary growth. Nevertheless, exploratory thoracotomy should be required for nondefeated patients when diagnosis is doubtful.

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