Introduction

Clinical heart involvement secondary to metastasis of malignant tumors is relatively unusual. Autopsy studies have shown up to 12% of cardiac involvement in all patients with malignancy, and most of them are asymptomatic. Systemic non-Hodgkin’s lymphoma is one disease that can affect the myocardium, particularly in immunocompromised patients. The clinical presentation is usually nonspecific. The diagnosis of cardiac involvement can be difficult and requires high clinical suspicion. Ventricular arrhythmias are extremely unusual and only few cases have been described so far. These arrhythmias usually are symptomatic and associated with significant hemodynamic instability.

Case report

A 27-year-old female patient presented to the emergency department with sudden-onset palpitations and chest discomfort. Blood pressure was 68 x 40 mmHg and heart rate was 184 bpm. Physical examination also revealed an increased volume in the left breast and a diffuse abdominal mass. The 12-lead electrocardiogram (ECG) performed on the admission revealed a wide-complex tachycardia with left-bundle branch block pattern and negative concordance in precordial leads (Figure 1A).

Based on the initial presentation, the diagnosis of monomorphic ventricular tachycardia was established and patient underwent electrical cardioversion to normal sinus rhythm. The ECG was repeated, showing normal sinus rhythm and no ST changes (Figure 1B). She was started on intravenous amiodarone infusion and then admitted to the intensive care unit. Investigation was negative for myocardial ischemia or pulmonary embolism. A transthoracic echocardiography (TTE) revealed normal left and right ventricular functions, moderate posterior pericardial effusion and thickening of the basal-interventricular septum, which was not present in previous examination performed one year before for investigation of shortness of breath during physical activities (Figure 2A).

Clinical investigation revealed a medical history of acquired immunodeficiency syndrome (AIDS) due to HIV infection in the previous 12 months and initial CD4 count of 39 cells/mm$^3$. Immediately after this diagnosis she was started on highly active antiretroviral therapy (HAART), which increased and stabilized CD4 cell counts to 89 cells/mm$^3$ after three months of treatment. She also received the diagnosis of diffuse large B-cell lymphoma (DLCL), a non-Hodgkin’s lymphoma which was initially treated with a combination of Cyclophosphamide, Adriamycin, Vincristine and Prednisone (CHOP). Due to severe neutropenia treatment was changed to Etoposide, Vincristine, Doxorubicin, Cyclophosphamide and Prednisone (EPOCH). Despite a complete course of treatment, lymphoma remission failed (breast and retroperitoneal mass tissue biopsy were positive for DLCL). In the week after the emergency admission, she was started on Ifosfamide, Carboplatin and Etoposide (ICE), a second-line chemotherapy protocol.

After an Oncology consultation, chemotherapy with ICE regimen for DLCL was continued. Cardiac biopsy was considered, which the patient refused. A new TTE after 30 days of chemotherapy revealed marked improvement, with a decrease in the pericardial effusion, as well as complete reduction in the myocardial septal thickening (Figure 2B). No further arrhythmias were documented in the subsequent eight months. No chronic antiarrhythmic medications were prescribed.

Discussion

Metastatic involvement of the heart is discovered at the autopsy in 10 to 12% of patients with malignancies, most frequently of lung carcinoma. The majority of these cases involve the pericardium and epicardium, suggesting a regional lymphatic invasion. Myocardial involvement is less frequent and usually associated with melanoma or lymphoma, suggesting hematogenous invasion. Diffuse large B-cell lymphoma is a NHL with an incidence in HIV-
infected individuals over 100 times the incidence in the general population.\(^1\)

In patients with NHL, clinical signs of cardiac involvement are nonspecific and frequently undetected before death. Chest pain, congestive heart failure and pericardial effusion were previously reported, the latter being the most common presentation.\(^2\) Although several cases of arrhythmias have been documented, most include atrioventricular block, probably related to secondary lesion to the conduction system.\(^3\) Ventricular arrhythmias are rarely diagnosed in this population. For unknown reasons, most cases were reported in patients with primary cardiac lymphoma.\(^4,5\)

We describe a case of heart involvement in NHL presenting with monomorphic ventricular tachycardia, which is a rare manifestation. The diagnosis was performed based on images obtained from the transthoracic echocardiogram, which is an inexpensive and easily available method. It is important to emphasize that in such cases cardiac involvement can be better determined with more sensitive imaging modalities, such as magnetic resonance or computed tomography. However, these techniques are expensive and not always available in cardiac centers.

The mechanism associated with ventricular tachycardia could be secondary to ventricular conduction delay caused by localized myocardial invasion of lymphoma cells, although triggered activity cannot be excluded. In this setting, the electrophysiological study can be a valuable tool in selected cases to understand the arrhythmia mechanisms and response to pharmacological treatment. However, no prospective studies testing the role of this modality are available in such population.

One could hypothesize that the recent chemotherapy treatment caused myocardial toxicity and triggered VT, since two cases of ventricular arrhythmias were previously
In conclusion, we report an unusual case of cardiac involvement of NHL presenting with VT. The occurrence of arrhythmias in this population should always alert for the possibility of metastatic involvement of the myocardium.

Potential Conflict of Interest

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Study Association

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References