

Non-Hodgkin Lymphoma as an Uncommon Cause of Acute Heart Failure

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Introduction

Adequate management of acute heart failure (HF) requires the identification of the underlying cause and the triggering factor.

Cardiac involvement by lymphomas is uncommon and antemortem diagnosis is difficult¹; however, therapeutic advances have improved the prognosis of this entity, thus reinforcing the need for an early diagnosis¹⁻³.

Case Report

The authors present the clinical case of a 62-year-old male patient who sought the emergency department with complaints of progressively worsening dyspnea (NYHA class IV) for three weeks, accompanied by orthopnea, paroxysmal nocturnal dyspnea, peripheral edema and postprandial fullness. He had a history of arterial hypertension and atrial fibrillation (AF), and was on enalapril and amiodarone.

On admission, he was hypotensive (85/55 mmHg) and tachypneic (40 bpm); cardiac auscultation revealed arrhythmia, with no murmurs; pulmonary auscultation revealed decreased breath sounds in both bases, and fine crackles in both bases; peripheral edema was also present. ECG showed AF with controlled ventricular response, alterations suggestive of ST-segment elevation in DI and aVL, T-wave inversion in inferior wall, straight ST-T segment in V3 - V6, with no dynamic changes in serial electrocardiograms. Chest radiography revealed increased cardiothoracic ratio and effacement of the left costophrenic angle. Blood gas showed hypoxemia with metabolic alkalosis. Laboratory tests showed renal failure (BUN 14.8 mmol/L; creatinine 155 μ mol/L); hypokalemia (K 2.9 mmol/L); troponin I 0.66 ng/mL; NT-pro-BNP 4,060 pg/mL; and C-reactive protein 7.6 mg/dL.

He was admitted to the intensive care unit with the diagnosis of acute HF. Treatment was started with intravenous diuretics and antibiotics. Bedside transthoracic echocardiography (TT-echo) was performed and showed non-dilated left ventricle

with global impairment of the systolic function (ejection fraction of 20%), and diastolic dysfunction with increased filling pressures (lateral E' 0.07 m/s; E/E' 12).

On hospital day (D) 4, due to failure to achieve clinical improvement, perfusion with levosimendan was performed unsuccessfully. Coronary angiography ruled out coronary disease.

On D7 he remained tachypneic, hypotensive, with AF with fast ventricular response, negative cumulative fluid balance, and deterioration of liver and renal function tests. Repeat TT-echo showed a large heterogeneous mass (maximum thickness of 22 mm) with intermediate echogenicity in the basal portion of the posterior and inferior walls of both ventricles, apparently adherent to the myocardium and limiting its motion, and mild circumferential pericardial effusion (Figure 1). In view of this finding, and due to the patient's clinical and hemodynamic instability, thoracic CT-scan was performed in an attempt to elucidate the cause of the mass. CT-scan revealed mediastinal lymph node enlargement forming a conglomerate (7.7 cm; 6.7 cm); at the heart level, an heterogeneous and nodular mass (12-cm long and 3-cm thick) involving the atrioventricular grooves and no cleavage plane with the myocardium could be observed (Figure 2).

The etiologic investigation also showed normal serum tests and autoimmunity; normal thyroid function; tumor markers with increased serial PSA (57.6 ng/mL).

Since the differential diagnosis was mediastinal lymphoproliferative disease with cardiac involvement versus cancer of unknown primary site, with cardiac and mediastinal metastases, the hematologist chose to start an empirical chemotherapy cycle (D8 – cyclophosphamide, prednisolone and tropisetron), thus meeting the cure potential. The patient showed marked clinical improvement (NYHA II).

In collaboration with the urologist, the clinical diagnosis of prostate carcinoma was made; the hypothesis of mediastinal and cardiac metastases could not be ruled out, and LH-RH agonist was started.

Supraclavicular lymphadenopathy was later identified; its pathological anatomy permitted the diagnosis of diffuse stage IV large B-cell non-Hodgkin lymphoma, according to the REAL classification (Ann-Arbor staging system). Bone marrow biopsy and aspirate were normal.

On D30, the second targeted chemotherapy cycle was performed (rituximab, cyclophosphamide, adriamycin, vincristine and prednisolone – R-CHOP) uneventfully. Pre-discharge TT-echo showed significant decrease of the mass, and only a hyperechogenic 8-mm-thick mass could be seen in the basal portion of the left ventricular posterior wall.

Keywords

Heart Failure; Lymphoma, Non-Hodgkin; Neoplasm Metastasis.

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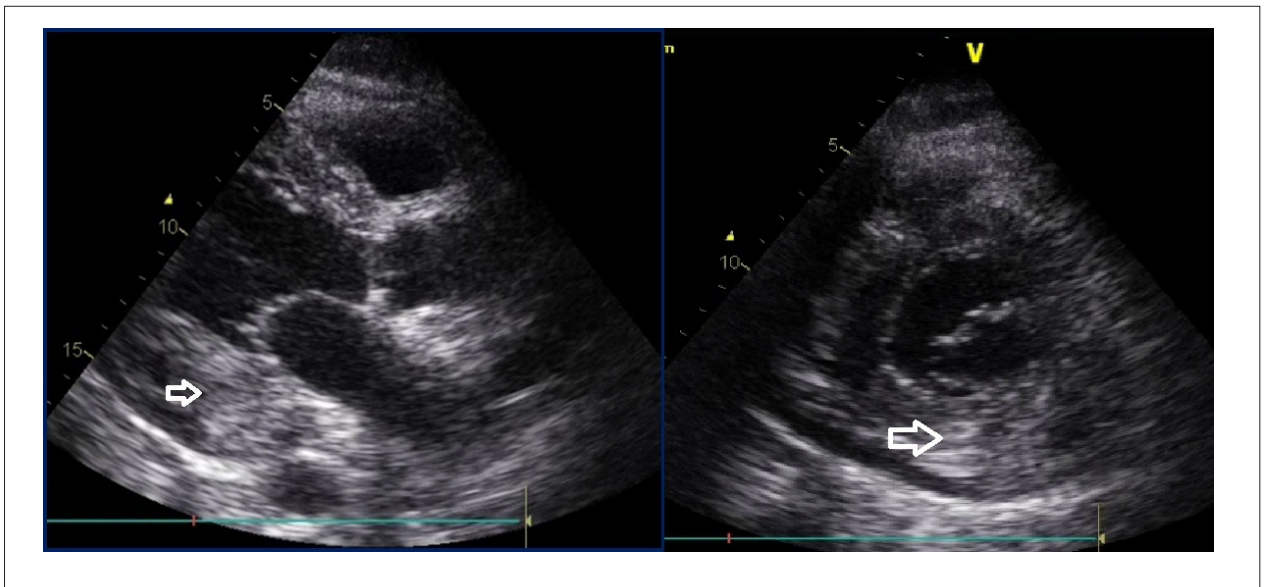


Figure 1 – Large, heterogeneous mass with intermediate echogenicity observed in the left ventricular posterior and inferior walls.



Figure 2 – Heterogeneous mass involving the atrioventricular grooves, with no cleavage plane with the myocardium.

Case Report

Control thoracic CT-scan showed marked decrease of the mediastinal lymphadenopathies no longer characterizing lymphadenomegaly, and regression of the cardiac mass. The patient was discharged on D35 with NYHA functional class II, and normal renal and hepatic function.

Discussion

Cardiac masses are potentially lethal, regardless of being benign or malignant. Almost 75% are benign; metastasis is the most common malignant form (10-12%) and is associated with a poor prognosis⁴.

Lymphomas are the third cause of cardiac metastases, in absolute terms, after lung and breast cancer. In relative terms, they rank second, after melanomas¹. Cardiac involvement by lymphoma, as documented in autopsy, accounts for 13.6% of metastatic tumors of the heart¹.

Modern imaging techniques have provided a more frequent diagnosis of heart lesions.

Diffuse large B-cell lymphoma (DLBCL) is the most common of non-Hodgkin lymphomas (31%), and is rapidly fatal if left untreated³.

Cardiac involvement may occur in three manners: by contiguity from intrathoracic lesions involving the parietal pericardium and then the heart; by retrograde lymphatic dissemination; or by hematogenous dissemination⁴.

Its clinical presentation is determined by several factors: site, size, growth rate, degree of invasiveness, and tumor friability. DLBCL is characterized by high growth rate, presenting as a mass that causes symptoms when infiltrating tissues or organs.

The spectrum of cardiac manifestations is broad, going from the absence of symptoms to HF, pericardial effusion or arrhythmias^{3,5,6}. Cardiac involvement is rarely the initial presentation of lymphomas⁷; in average⁴ it starts 20 months after the initial diagnosis.

Chest radiography shows low sensitivity and specificity as a diagnostic tool; however, it may reveal tracheal deviation; cardiac enlargement; signs of HF; and abnormal cardiac silhouette.

TT-echo is a sensitive method for the identification of cardiac involvement by lymphomas, which more commonly present as nodular or polypoid masses in right chambers, with variable myocardial infiltration⁶. There are few cases in the literature^{7,8} reporting the restrictive/constrictive action of the neoplasm, thus conditioning diastolic HF as the underlying pathophysiological mechanism.

Thoracic CT-scan was the imaging test that permitted the diagnosis by showing the morphology, site and extension of the cardiac mass, as well as the multiple mediastinal lymphadenopathies. Cardiac metastases by lymphoma appear on the thoracic CT-scan as focal nodules in the cardiac walls and pericardium⁴.

Magnetic resonance imaging is the gold standard, permitting the differentiation between tumor and myocardium. However, it requires the patient's hemodynamic stability.

The pathological diagnosis of cardiac masses is essential. Traditionally, it required thoracotomy, but less invasive procedures such as fluoroscopy-guided endomyocardial biopsy and percutaneous intracardiac biopsy are currently available. These techniques had been considered, but were not performed due to the patient's hemodynamic status.

Treatment advances including combination of rituximab (anti-CD20 monoclonal antibody) with the standard CHOP regimen have provided higher survival rates (61% of full remission).

This case represents an uncommon presentation of cardiac involvement by DLBCL. It was characterized by a significant difficulty in the diagnosis related to the patient's hemodynamic instability, requiring empiric cytotoxic therapy.

Author contributions

Conception and design of the research and Writing of the manuscript: Caetano F; Acquisition of data: Trigo J, Basso S, Araújo LF; Analysis and interpretation of the data: Caetano F, Mota P, Trigo J, Basso S; Critical revision of the manuscript for intellectual content: Mota P, Leitão-Marques A; Echocardiography: Trigo J; Performing chest CT: Basso S; Hematologist cooperating in the clinical case: Araújo LF.

Potential Conflict of Interest

No potential conflict of interest relevant to this article was reported.

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Study Association

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