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Review Article

Asymptomatic Extensive Cardiac Metastasis in Non-Hodgkin's Lymphoma; A Case Report and Literature Review

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Abstract

An 80- year-old male presented to the hospital with abdominal pain, nausea, and vomiting. The hospital workup demonstrated a grade IV diffuse large B cell lymphoma (DLBCL). A moderate pericardial effusion was found incidentally. Transthoracic echocardiography (TTE) revealed a mass adherent to the lateral wall of the left ventricle with possible extension to the apex and right ventricular free wall, consistent with cardiac metastasis. The patient was started on a reduced dose regimen of etoposide, prednisone, vincristine, cyclophosphamide, and doxorubicin (EPOCH regimen) with consideration of possible cardiac rupture. Cardiac metastasis is often underdiagnosed. Patients can be asymptomatic despite the high burden of cardiac involvement. Severe early post-chemotherapy complications including ventricular fibrillation, pulmonary emboli, and cardiac rupture can occur. Several strategies appear effective in reducing the risk of complications. However, further research is needed to enhance our knowledge regarding the best treatment options.

Keywords: Non-Hodgkin's Lymphoma, Cardiac metastasis, Diffuse Large B Cell Lymphoma, EPOCH

Introduction

Non-Hodgkin's lymphoma comprises a broad spectrum of lymphoid neoplasms. Extranodal involvement is usually seen in 20-40 % of patients [1]. Diffuse large B cell lymphoma is the most common subtype with cardiac metastasis. It is more common in men and immunocompromised patients [2]. Although cardiac involvement was reported in 20 % of patients with non-Hodgkin's lymphoma at autopsy, it is usually underdiagnosed in these patients [3] Manifestation varies depending on the grade of invasion and location of the tumor. Limited data is available about the prognosis of cardiac lymphomas. However, several studies report an unfavorable prognosis if left untreated [2,4]. We are presenting an interesting case of grade IVA DLBCL with asymptomatic extensive cardiac involvement.

Case Presentation

An 80-year-old man with a past medical history of hypertension and hyperlipidemia presented to the emergency room with abdominal pain, nausea, and vomiting for 7 days. Upon arrival at the ER, his vital signs were stable. The physical exam and lab findings were unremarkable. Abdominal computer tomography (CT) was performed which revealed a new large subhepatic mass and a confluent periportal lymphadenopathy measuring approximately 8 x 9 x 7 cm that appeared to obstruct the gastroduodenal junction. Moreover, a moderate pericardial

effusion was noted on CT. Fine needle aspiration (FNA) of the abdominal lymph node demonstrated a grade IVA diffuse large B cell non-Hodgkin's lymphoma. Flow Cytometry was positive for CD5, CD20, and CD23. Transthoracic echocardiography demonstrated an ejection fraction (EF) of 50-55% with a mass adherent to the lateral wall of the left ventricle with extension to the apex and right ventricular free wall, concerning a neoplastic process (Figure 1). Of note, the patient denied any chest pain, or shortness of breath and used to run 3 miles every day.

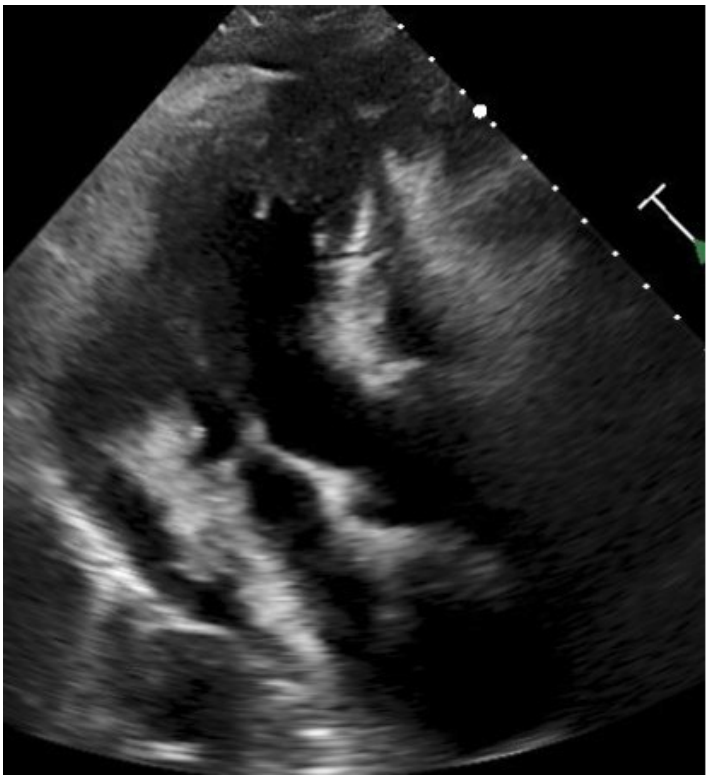

Figure 1: The lateral wall of the left ventricle metastasis with extension to the apex and right ventricular free wall.

He underwent chemotherapy and was started on etoposide phosphate, Oncovin, cyclophosphamide, and hydroxydaubomycin (EPOCH) regimen. The dose of cyclophosphamide was reduced to 75% and vincristine was held on the first day of chemotherapy to decrease the risk of bowel perforation and cardiac rupture. He was started on Bactrim as well as daily allopurinol. He was discharged in stable condition after his first dose of a 5-day chemotherapy. On his further admissions, he was found to have multiple episodes of non-symptomatic non-sustained ventricular tachycardia on telemonitoring. TTE was performed which revealed EF of 40-45% and improved infiltration of the anterolateral and right free wall after the fifth chemotherapy. He was discharged on amiodarone to prevent ventricular tachycardia.

Discussion

Approximately 20% of patients dying from lymphoma have cardiac involvement, which is usually diagnosed by autopsy [3]. It can involve different layers of the heart; however, the pericardium is involved more frequently (41.1%) followed by the right heart chambers [5]. Three major routes of metastasis to the heart were discussed: Direct extension of a mediastinal tumor to the heart usually involves pericardium, while retrograde lymphatic spread and diffuse interstitial-perivascular spread can lead to an epicardial and myocardial metastasis, respectively [2]. Cardiac lymphoma should be considered when more than one chamber is involved [6]. The presentation may vary, which may include chest pain, dyspnoea, acute heart failure, superior vena cava (SVC) syndrome, embolic phenomenon, and arrhythmia. Pericardial effusion is a common complication and can be seen in up to 58% of patients [3]. Despite massive cardiac involvement, patients can be asymptomatic similar to our patient.

Electrocardiogram (ECG) is not sensitive, however, echocardiography can detect cardiac tumors with a specificity of 95% and sensitivity of 90%, though a lower specificity and sensitivity have been reported in other studies. Echocardiography can characterize tumor features including size, shape, mobility, location, and burden of involvement. Transesophageal echocardiography has higher sensitivity compared to TTE [7,8] Cardiac CT is an excellent modality to observe a cardiac lymphoma in addition to the extracardiac structures, and it usually manifests as an iso- to hypo-attenuating mass. A positron emission tomography/ computed tomography (PET/CT) is superior to either modality alone as it provides more accurate information about the overall staging of lymphoma compared to CT alone and has higher anatomy resolution compared to PET alone [8].

Chemotherapy is the cornerstone of the treatment. It is associated with increased median survival from 1 month to 18 months and can lead to durable remission in these patients [1]. Although most cases are responsive to the regimen of rituximab, cyclophosphamide, doxorubicin, vincristine, and prednisone (R-CHOP), it can lead to notorious complications such as ventricular fibrillation, cardiac perforation, and massive pulmonary emboli early after chemotherapy [9]. Reduced- dose chemotherapy seemed to be a successful strategy in several case reports to decrease the risk of complications. However, concerns regarding the therapeutic effect exist. In the study of Al-mehisen et al, chemotherapy was started at half dose and was increased to full dose once cardiac magnetic resonance imaging (CMRI) revealed fibrosis of the tumor [8]. Moreover, placing a bovine patch on the affected part was tried in previous studies [9] In our case, the patient was started on an EPOCH regimen as it is more incremental compared to bolus therapy to decrease the risk of cardiac and bowel perforation. Moreover, the cyclophosphamide dose was reduced to 75% and vincristine was held on the first day of chemotherapy. Further treatments including radiation therapy,

autologous transplant, and chimeric antigen receptor T cell have been associated with favorable outcomes in several studies [10,11].

Conclusion

Prompt diagnosis and treatment of diffuse large B cell lymphoma with cardiac metastasis can improve survival. Currently, our knowledge regarding the best treatment with the least complications is scarce. Further studies are required to improve our insight regarding the best treatment strategies for these patients.

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