Received: 14 August 2022 | Revised: 4 September 2022 | Accepted: 12 September 2022

DOI: 10.1111/echo.15459

Echocardiography WILEY

CASE REPORT

A rare cause of dyspnea: Primary large B cell lymphoma causes giant cardiac mass

Uğur Aksu MD[1] | Cem Korucu MD[1] | Kivanç Atilgan MD[2] | Tayfun Aybek MD[2] | Çiğdem Özer Gökaslan MD[3] | Derya Aksu MD[4] | Çiğdem Özdemir MD[5]

[1]Department of Cardiology, Afyonkarahisar Health Sciences University, Faculty of Medicine, Afyon, Turkey

[2]Department of Cardiovascular Surgery, TOBB Economy and Technology University Hospital, Ankara, Turkey

[3]Department of Radiology, Afyonkarahisar Health Sciences University, Faculty of Medicine, Afyon, Turkey

[4]Department of Pathology, Afyonkarahisar City Hospital, Afyon, Turkey

[5]Department of Pathology, Afyonkarahisar Health Sciences University, Faculty of Medicine, Afyon, Turkey

Correspondence
Ugur Aksu, Afyonkarahisar Sağlık Bilimleri Üniversitesi Tıp Fakültesi, Afyon, Turkey.
Email: aksuuu001@msn.com

Abstract

Cardiac lymphoma (CL) is a rare and life-threatening clinical condition. Most cases are diagnosed late period. Although the definitive diagnosis is made by biopsy, a biopsy could not be performed in most cardiac masses due to the high mortality rate and therefore the exact incidence is not known. In this case report, we present a case of giant CL filling both the pericardial area and right heart cavities and treated with surgical resection in a previously healthy male patient who presented with symptoms of heart failure.

KEYWORDS
cardiac tumor, lymphoma, right ventricle

1 | CASE REPORT

A 65-year-old healthy male patient presented with shortness of breath. Physical examination revealed pretibial edema and ascites. The patient's blood pressure was 100/70 mmHg, heart rate was 120/min, and O_2 saturation was 92%. His ECG was consistent with sinus tachycardia. The patient underwent transthoracic echocardiography (TTE). Left ventricular ejection fraction was measured as 60% and a mass filling most of the right atrium and right ventricle and pericardial effusion were observed (Movie S1). Cardiac computed tomography (CT) and cardiac magnetic resistance imaging (MRI) scan were planned for the differential diagnosis of the mass, and anticoagulant treatment was started in case of thrombus and a blood culture was sent. CT and MRI confirmed a giant mass invading right heart cavities and pericardium (Figures 1 and 2).

Surgical treatment was planned for the patient whose blood cultures were negative, since there was no reduction in mass size with anticoagulation. The mass was removed by median sternotomy under general anesthesia. Tumoral mass were excised from the right heart cavities and pericardium (Figure 3). Pathological examination of the mass revealed diffuse large B-cell lymphoma. After the surgery adjuvant chemotherapy was planned. In the whole body scan, multiple metastatic lymph node involvements in the upper lobe of the right lung were detected and bone marrow aspiration revealed no tumoral involvement. Chemotherapy was initiated and 1 month later after the surgery patient underwent a TTE examination and no tumors were observed in the right heart chambers and pericardium (Movie S2). The patient was asymptomatic in the 3-month follow-up after surgery and there was no evidence of recurrence.

2 | DISCUSSION

Cardiac tumors are very rare compared to other cardiac diseases. Although primary heart tumor is most commonly reported as myxoma, cardiac tumors are mostly metastatic.[1–3] In cardiac tumors, the heart cavity where the tumor is located and the relationship of the tumor with the valves are the main determinants of the symptoms or findings in the patient. Left atrial tumors such as myxoma may mimic mitral stenosis and cause systemic embolism, while right atrium or right

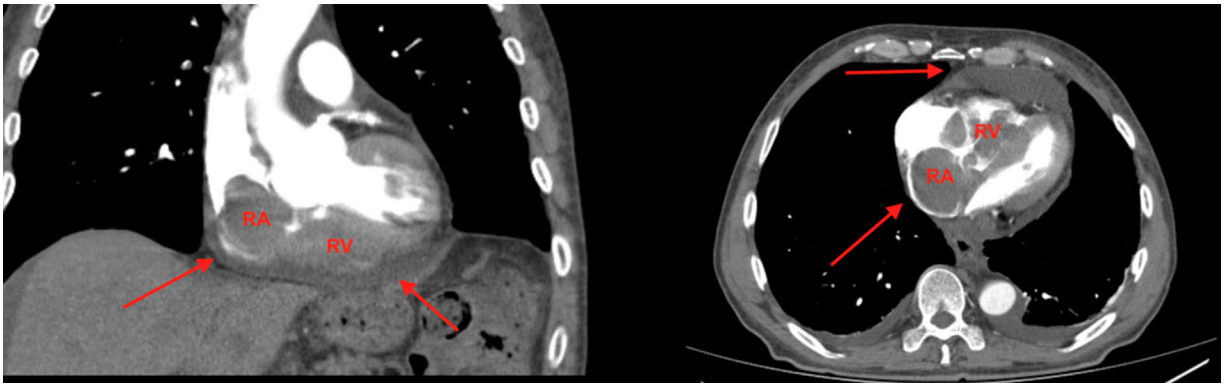

FIGURE 1 CT shows giant mass filling the atrium and ventricle (Coronal and axial plane)

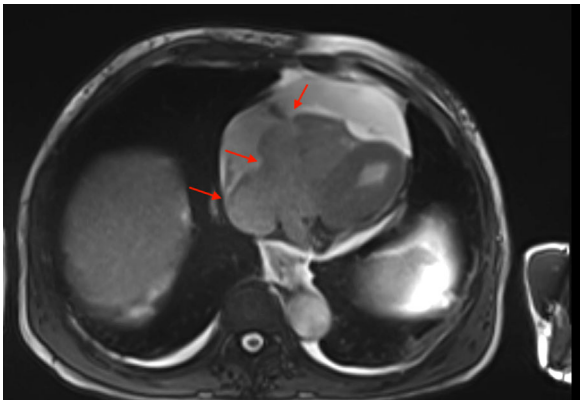

FIGURE 2 MRI demonstrates giant mass invading myocardium and pericardium (Coronal plane)

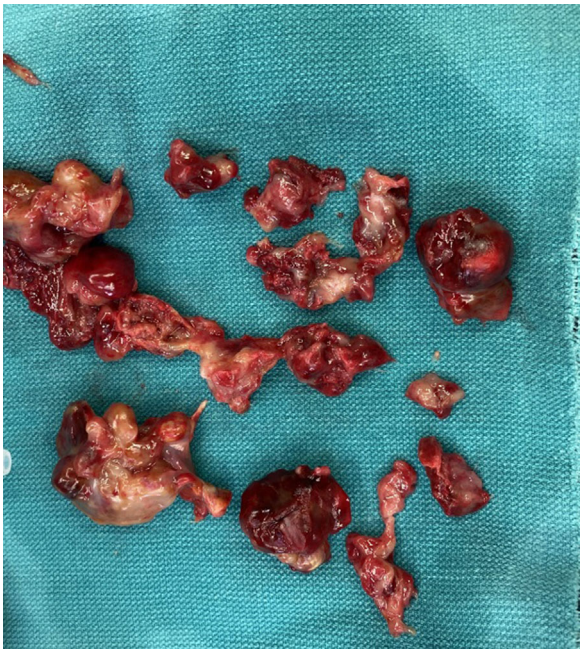

FIGURE 3 Mass excised from right atrium and ventricle

ventricular tumors may cause pulmonary embolism and right heart failure. In patients with pericardial involvement, it may present with pericarditis, pericardial effusion or tamponade. Finally, the tumor affecting the conduction pathways can cause various heart blocks.[4–6]

There is no specific finding in the differential diagnosis of cardiac tumors, and therefore advanced imaging methods are often required.[3] TTE is the first diagnostic method to be applied. TTE can provide useful information about all heart chambers and pericardium.[1] The localization of the tumor, its relation to the valves, its size, and pericardial involvement are well detected. However, TEE is often insufficient to differentiate between tumor or vegetation or thrombus. In the differential diagnosis of cardiac tumors, multi-slice cardiac CT and cardiac MRI offer better image quality than TTE and are preferred because they better demonstrate the continuity of the anatomical structure and its relationship with other organs. Especially since cardiac MRI has high soft tissue resolution, it is the most useful method in the differentiation of tumors or thrombus.[1,3,7]

CL is rare among cardiac tumors. The right atrium was found to be the most common site of invasion in lymphomas. It has been suggested that the drainage of the lymphatic system into the inferior vena cava and right atrium may be a factor that facilitates the invasion of lymphatic cells into the right atrium and ventricle.[2,5,8]

Chen et al. diagnosed primary B-cell lymphoma in a patient who presented with paroxysmal ventricular tachycardia and AV block and suggested that lymphoma should be suspected in cases of masses in more than one cardiac cavity.[9] In our study, there was both a tumor in the right heart cavities and an effusion in the pericardial area. However, in our case, the immune deficiency was not present as in their case. In the case report of Alimi et al., the diagnosis of pulmonary stenosis and cardiac lymphoma causing pericardial effusion was made by pericardiocentesis at the age of 18.[8] Similar to our case, the patient presented with shortness of breath. Unlike both case reports, in our case, the patient's mass was surgically resected, and the patient's dyspnea improved significantly as a result of the procedure.

Surgical resection is recommended as the first treatment because complications such as embolism or obstruction are common in cardiac tumors.[1] However, surgical resection is often not possible due to increased comorbidity or diagnosis at an advanced stage. Adjuvant

chemotherapy is often started after resection. However, its effect on mortality is not clear.[10]

In conclusion, CL is a very rare clinical condition and clinicians should be aware of this entity when multiple chamber involvement was detected. Surgery is a key treatment protocol because it allows pathological diagnosis and provides relief in symptoms.

INFORMED CONSENT

Written informed consent was obtained from the patient for the publication of the case report and the accompanying images.

REFERENCES

1. Griffin BP. *Manual of Cardiovascular Medicine*. 5th ed. Wolters Kluwer Health; 2019.
2. Bussani R, Castrichini M, Restivo L, et al. Cardiac tumors: diagnosis, prognosis, and treatment. *Curr Cardiol Rep*. 2020;22(12):169. doi:10.1007/s11886-020-01420-z
3. Poterucha TJ, Kochav J, O'Connor DS, Rosner GF. Cardiac tumors: clinical presentation, diagnosis, and management. *Curr Treat Options Oncol*. 2019;20(8):66. doi:10.1007/s11864-019-0662-1
4. Hu B, Zhao J, Liang X, Ren C, Li N, Liang C. A case of complete atrioventricular block associated with primary cardiac lymphoma reversed without cardiac pacemaker implantation. *J Int Med Res*. 2022;50(4):3000605221089780. doi:10.1177/03000605221089780
5. Rubalcava Lara LF, Aviles-Salas A, Candelaria M. Primary myocardial diffuse large B cell lymphoma. Report of one case. *Rev Med Chil*. 2021;149(8):1231-1235. doi:10.4067/s0034-98872021000801231
6. Tanaka Y, Yamabe H, Yamasaki H, et al. A case of reversible ventricular tachycardia and complete atrioventricular block associated with primary cardiac B-cell lymphoma. *Pacing Clin Electrophysiol*. 2009;32(6):816-819. doi:10.1111/j.1540-8159.2009.02372.x
7. D'Angelo T, Booz C, Bucolo GM, et al. Cardiac involvement of metastatic clear cell sarcoma: a multimodality imaging report. *Circ Cardiovasc Imaging*. 2022;15(5):e013902. doi:10.1161/CIRCIMAGING.121.013902. Epub 2022 Apr 28. PMID: 35481360; PMCID: PMC9112960.
8. Alimi H, Poorzand H, Jafarian AH. Malignant lymphoma with diffuse cardiac involvement and pulmonary stenosis. *J Cardiol Cases*. 2021;23(5):198-201. doi:10.1016/j.jccase.2020.10.021
9. Chen KW, Chang JH, Yeh SP, Lu CR. Primary cardiac B-cell lymphoma with atrioventricular block and paroxysmal ventricular tachycardia. *J Cardiothorac Surg*. 2012;7:70. doi:10.1186/1749-8090-7-70
10. Yanagawa B, Chan EY, Cusimano RJ, Reardon MJ. Approach to surgery for cardiac tumors: primary simple, primary complex, and secondary. *Cardiol Clin*. 2019;37(4):525-531. doi:10.1016/j.ccl.2019.07.001

SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

How to cite this article: Aksu U, Korucu C, Atilgan K, et al. A rare cause of dyspnea: Primary large B cell lymphoma causes giant cardiac mass. *Echocardiography*. 2022;1-3. https://doi.org/10.1111/echo.15459