# Primary cardiac lymphoma mimicking myxoma presenting with intermittent bradyarrhythmia

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**Abstract**

Cardiac malignant tumours are extremely seldom in clinic, especially primary cardiac lymphomas. Due to the complexity of tumor, cardiac malignant tumours are characterized by multiple clinical and imaging manifestations. Consequently, cardiac malignant tumours may be easily misdiagnosed or neglected before histopathologic examinations. In this case, we reported a patient presented with intermittent bradyarrhythmia and was diagnosed as myxoma by imaging examinations, but he was eventually confirmed as primary cardiac lymphoma. This case highlights that diagnosis for cardiac myxoma should be caution even with sufficient imaging data.

## Introduction

Clinically, cardiac malignant tumours are extremely rare and primary cardiac lymphomas (PCL) account for 1-2% of cardiac malignant tumours therein [1, 2]. Cardiac lymphomas can provoke a wide spectrum of symptoms, including symptoms of arrhythmia, heart failure, embolism, dyspnea and fatigue [2-4]. These multiple clinical manifestations of cardiac lymphomas may depend on the tumor location, pattern of growth, histologic type, and invasive features, which also lead to misdiagnosis. Like other malignancies, most cardiac malignant tumours are associated with a poor outcome, but patients with cardiac lymphoma have a better prognosis if they are treated timely and appropriately [3].

## Case description

An 85-year-old man presented to the emergency department due to acute onset of fatigue and weakness. His emergent electrocardiogram (ECG) showed serious atrioventricular block with a heart rate of 43 bpm (Figure 1A). After hospitalization, atrioventricular block of different degree was recorded, and intermittent bradycardia occurred frequently. Intriguingly, his transthoracic echocardiogram (TTE) revealed a pedunculated mass of about 34 × 34 mm in the right ventricle (Figure 1B, arrow) attached to the right atrial wall, and the mass oscillated between the right ventricle and right atrium with the cardiac cycle, which could block the tricuspid orifice during the diastolic phase and was suggestive of atrial myxoma. Enhanced computed tomography (CT) scan of the whole body did not reveal lymphadenectasis or other suspicious masses, except a mass with clear boundaries in the right ventricle (Figure 1C, arrow). However,because of previous history of hip arthroplasty, he cannot receive the cardiac MRI which could indicate more characterisation of this cardiac mass.

The patient underwent open heart surgery because of the clinical suspicion of myxoma. After surgical

removal of the tumor, serious atrioventricular block was diminished, but ECG recorded first-degree atrioventricular block on rare occasions (Figure 1D). To our surprise, we found the cardiac tumor mimicking myxoma had a complete fibrous capsule without myocardial infiltration and futher histological examination revealed primary cardiac large B-cell lymphoma (Figure 1E). The immunohistochemical markers showed strong positive staining for CD20, CD79a, Ki-67 (Figure 1E), and Bcl-2 in the malignant cells, and weak positive staining for CD3, CD31, Bcl-6, MUM-1, and c-Myc. The patient was discharged a few days later without chemotherapy treatment and was well after 6 months' postoperative follow-up.

## Discussion

Cardiac lymphoma is an extremely rare disorder and the tumor presents with various clinical manifestations [1]. Our patient mainly presented with fatigue and weakness, and these symptoms might be resulted by the pendulous mass affecting normal hemodynamics. Serious atrioventricular block was diminished after removal of the tumor, which might be caused by the changed hemodynamics and thereby lead to ischemia of atrioventricular node. Besides, whether clinical manifestations of the patient are affected by secretory feature of lymphoma has not been identified.

There are still lack of unified diagnostic criteria for primary cardiac lymphomas. At present, PCL mainly refers to non-Hodgkin's lymphoma involving only the heart and/or pericardium, as well as non-Hodgkin's lymphoma with cardiac manifestations [5]. PCL is highly aggressive and could involve in the cardiac chamber (especially the right atrium), and even extracardiac sites, which is often multifocal [5]. The pathological subtypes of PCL cases reported include diffuse large B-cell lymphoma, Burkitt lymphoma, T-cell lymphoma and small lymphocytic lymphoma, among which diffuse large B-cell lymphoma is the most common subtype [6]. Intriguingly, it has reported that the B-cell lymphoma cells can embed fibrin thrombus and futher lead to formation of the Fibrin-associated large B-cell lymphoma, which may be associated with Epsteine-Barr virus. Fibrin-associated large B-cell lymphoma is thought to hardly invade myocardium , and seems has a better prognosis[7].

Well-documented evidence have reported that imaging modalities of cardiac lymphoma are various [1, 8]. Although Image modalities, including echocardiography, enhanced computed tomography (CT), and magnetic resonance image (MRI), are helpful in the detecte characterisation, for diagnosis prior to histological examination is difficult[5, 6]. Herein, the definite diagnosis of cardiac tumor requires histological examination. Seldom cases have reported that cardiac lymphoma coexist with myxoma and the mechanisms are obscure [9]. We have first reported a malignant tumor that had a complete fibrous capsule similar to myxomawith ECG revealing intermittent bradyarrhythmia. Accordingly, this case reminds us that diagnosis for cardiac myxoma should be caution.

At present, the definite standard treatment for PCL patients still remains absent. Therefore, an aggressive therapeutic approach to isolated cardiac lymphoma remains disputed [3, 9]. Considering the patient's condition and that the whole-body enhanced CT scan did not find lymphadenectasis or other suspicious masses, there is no symptomatic lymphomatous cardiac infiltration at diagnosis and we did not administer further treatment for this 85-year-old man.

In conclusion, cardiac lymphomas are extremely rare with various clinical manifestations which could easily lead to misdiagnosis, subsequently, causing a poor outcome. Herein, we should be caution for the possibility of cardiac malignant tumours which need histological examination for diagnosis .

## Conflict of Interest

None declared.

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