

Bi-Atrial Primary Cardiac Lymphoma: A Rare Entity

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Abstract

Primary cardiac lymphoma is a rare disease which mainly found in elderly men. It is usually a B-Cell non-Hodgkin's lymphoma which primarily located in the heart and may involve the pericardium. The common presentations include massive pericardial effusion and heart failure. Clinical diagnosis is often delayed in these patients and prognosis is dismal. We report a case of a 70-year-old man presented with congestive cardiac failure and constitutional symptoms. A computed tomography of the chest showed two large right and left atrial masses. Echocardiographic study demonstrated that the tumour was in both atria with infiltration into the left ventricle. The diagnosis was confirmed by lymph node excision. The patient was started on chemotherapeutic agents but unfortunately succumbed to the disease 18 days later. Although, the prognosis of primary cardiac lymphoma remains poor, early diagnosis may alter the clinical course.

Keywords: Primary Cardiac Lymphoma, Tumour, B-Cell, Echocardiography, Histopathology

Introduction

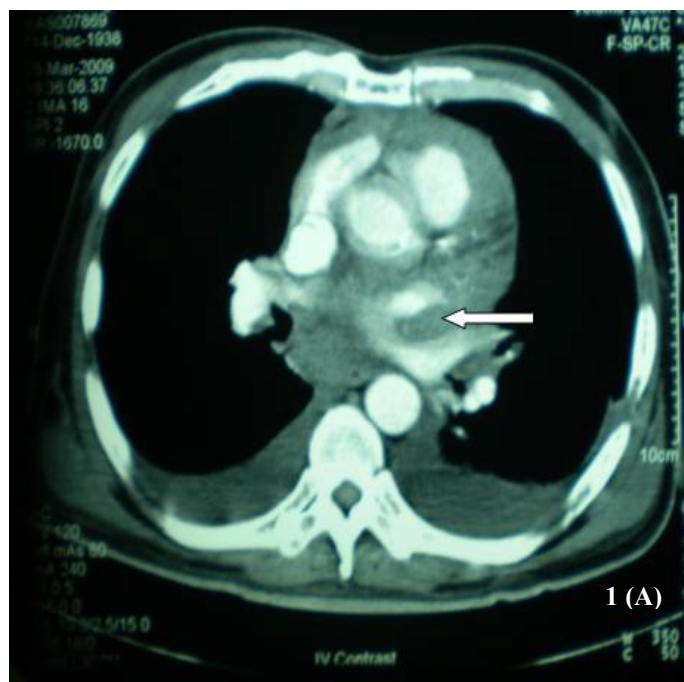
Primary cardiac lymphoma is defined as lymphoma involving only the heart or the pericardium, or when the main bulk of disease is localized to the heart. Primary cardiac lymphoma is extremely rare with only 77 cases reported up to 2007. (1) The reported incidence is about 0.5% of all lymphomas and about 1-2% of all cardiac tumours. (2-6) Clinical diagnosis is very difficult and often become apparent when the disease is advanced, with the majority of cases identified at postmortem. (5) Patients may present with signs of heart failure, arrhythmias, or massive pericardial effusion depending on the location of the tumour. The usual sites of involvement are right atrium, right ventricle, pericardium, left ventricle, interventricular septum and left atrium in the descending order of frequency. (7) In the present

case, both right and left atria were affected by primary lymphoma. Similar findings have only been reported in three patients. (7)

Case Report

A 70-year-old immunocompetent man was admitted to the hospital and was found to be suffering from congestive cardiac failure. He also suffered from anorexia, weight loss and nocturnal sweating prior to admission. There had not been any further manifestation of the disease until two months before presentation. The patient who was an ex-smoker had a history of diabetes mellitus and hypertension for the past 10 years which were controlled with oral hypoglycemic agents and anti-hypertensive. The patient had an unremarkable family history.

Physical examination revealed a cachexic man with tachypnea and jugular vein distention. On physical examination the patient was pale but not jaundice. The blood pressure and pulse rate were normal. A soft systolic murmur grade 2/6 was heard at the lower left sternal edge with an audible third heart sound. The breath sounds were reduced at the lung bases and fine crackles with occasional rhonchi were audible.

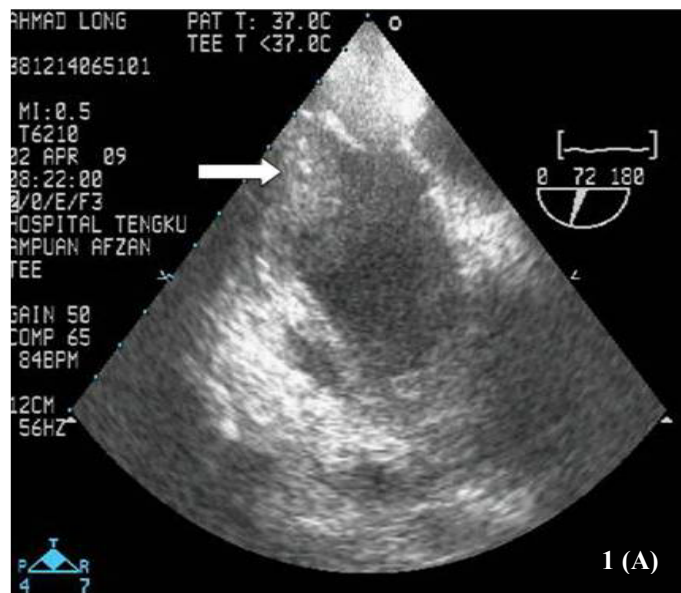


1 (A)

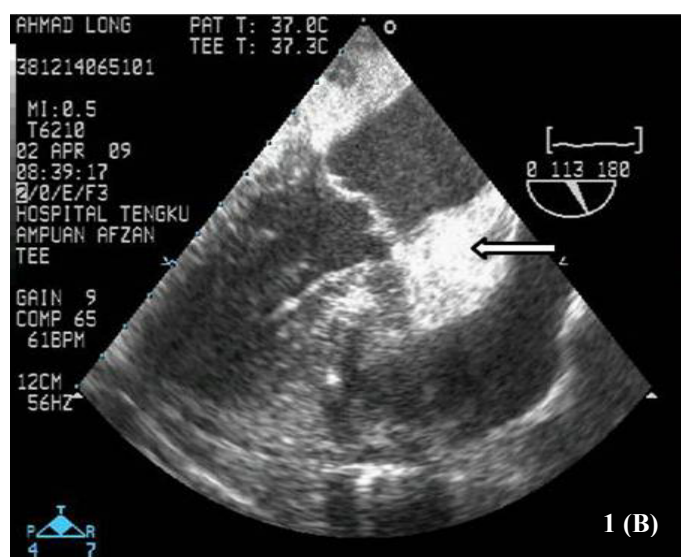


1 (B)

Figure- 1 (A and B): These figures were the thorax computed tomography showed the filling defect in the left and right atrium which was the lymphomatous mass.



1 (A)



1 (B)

Figure 2 (A and B): The transesophageal echocardiography (TEE) shows the right atrial lymphomatous mass in figure 2 (A) and left atrial lymphoma with infiltration into the left ventricle in figure 2 (B).

The liver was just palpable 3 cm below the costal margin and the spleen was not enlarged. The ECG showed sinus rhythm with non specific ST-T changes.

The chest radiograph showed cardiomegaly, pulmonary congestion and bilateral mild pleural effusion. The hematological examinations showed normochromic normocytic anemia with mild thrombocytosis. Serum albumin and serum lactate dehydrogenase were 29.5g/L. and 641 U/L, respectively. Serologic screening test for human immunodeficiency virus was negative. Arterial blood gases showed respiratory alkalosis with mild hypoxia. 2-D echocardiography showed a left atrial mass infiltrating into the left ventricle with strikingly bright myocardium.

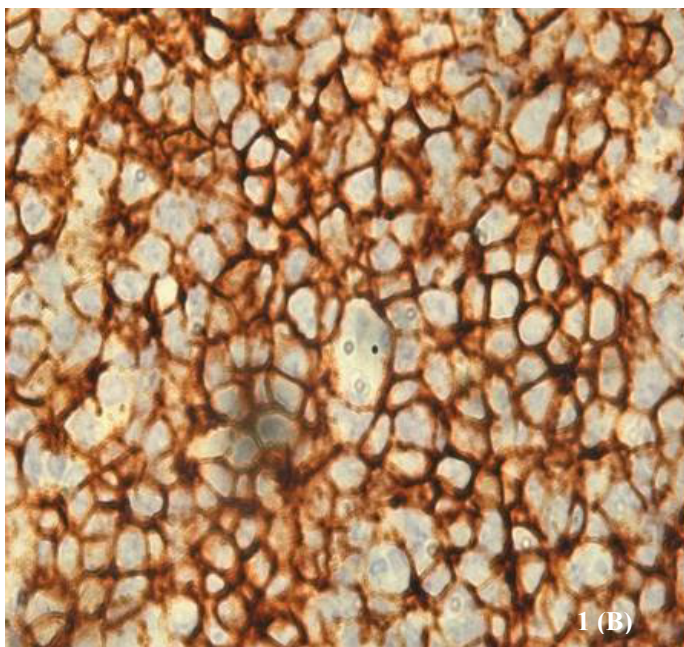
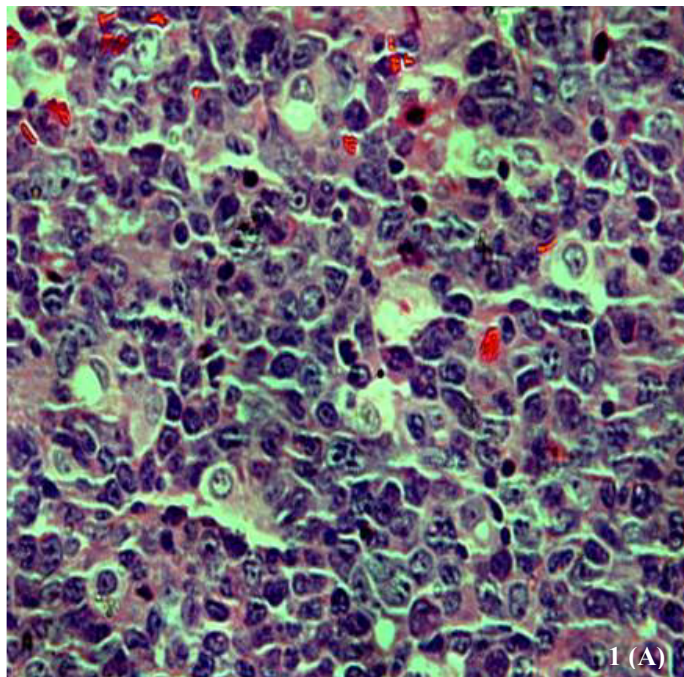


Figure- 3 (A and B): Tumor cells are composed of malignant, large, lymphoid cells arranged in diffuse manner as shown in figure 3A. The tumor cells are stained positive for CD20 in figure 3B.

A computed tomography (CT) scan of the chest demonstrated two filling defects in the right and left atria (Figure- 1A and 1B). Multiple lymphadenopathies were seen in the cervical, mediastinal, para-aortic and para-caval regions. The liver and spleen were of normal size.

Trans-esophageal echocardiography confirmed the location of the lymphoma mass in the bi-atrium with lymphomatous infiltration into the left ventricle (Figure 2A and 2B). The right atrial mass measured 3.9×2.9 cm and the left atrial mass measured 3.4×1.3 cm. The bone marrow and other organs did not show any evidence of tumour

invasion. The histological examination revealed diffuse proliferation of lymphoid cells with high mitotic index and positivity for CD20. The histology confirmed a B-Cell non-Hodgkin's lymphoma of the heart. (Figure- 3 (A and B))

The patient received the CHOP regime chemotherapy (cyclophosphamide, doxorubicin, vincristine and prednisolone). He unfortunately succumbed to his illness on the 18th day of chemotherapy.

Discussion

Primary cardiac lymphoma is defined as a lymphoma exclusively involving the myocardium and/or pericardium. The majority of reported cases consist of B-Cell non-Hodgkin's lymphoma.(4, 8, 9) This tumour is an extremely rare malignancy which constitutes about 1.3% of primary cardiac tumour and 0.5% of extranodal lymphoma.(10) This condition is a disease exclusively found in the elderly men. The median age at presentation was 64 years old. Male to female ratio was 3:1.(5, 7) Patients with small secondary lesions in other parts of the body are also classified as primary cardiac lymphoma. Extensive extra cardiac involvement with the bulk of tumour within the pericardium or cardiac symptoms from lymphomatous cardiac infiltration at the time of diagnosis, have also been accepted as primary cardiac lymphoma.(4, 5, 7) Though some authors have strictly declared that the tumour is primarily localized in the heart structures, Carins et al, have reported that massive cardiac involvement with minimal infiltration into other sites is indicative of primary cardiac lymphoma.(11) Moreover, when cardiac lymphoma is bulky, it tends to metastasis. Our case merits to be considered as exclusively cardiac because the bulk of the tumour was mainly in the heart.

Cardiac lymphoma is usually located in the right atrium and less often in the left atrium or the left ventricle. In our present case, the tumour involved both the right and left atria with visible infiltration into the left ventricle. The tumour can also involve the inferior vena cava, superior vena cava, jugular vein and pulmonary artery. Intracardiac tumour can infiltrate all three layers of the heart.(4) In general, there are three possible mechanisms by which lymphoma can spread to other organs: direct infiltration, lymphatic or hematogenous spread.(2) It may seem difficult for primary cardiac lymphoma to directly extend into other structures due to cardiac movement. Up to now, only one case of direct extracardiac invasion has been reported.(12)

The involvement of sites like mediastinal and pleural most likely represent direct tumour spread.

Clinical presentation can vary from conduction defects to obstructive symptoms and death. The two most common clinical presentations are massive pericardial effusion and heart failure. Usual symptoms include heart failure unresponsive to diuretics, shortness of breath, palpitation, arrhythmias, cardiac tamponade, constitutional symptoms, syncopal attack and sudden death. The tumour may predispose to thromboembolic phenomenon. Other presentations include superior vena cava syndrome and acute myocardial infarction. Occasionally, aortic and tricuspid valvular involvement may cause hemodynamic decompensation and pulmonary hypertension.

The clinical progression is extremely rapid. Diagnosis is usually made late and most often made at postmortem examination. The prognosis is poor as antemortem diagnosis is extremely difficult. Appropriate diagnosis is of paramount importance prior to proper chemotherapy. Once the suspicion of cardiac mass has been made, a 2-D echocardiography is a good non-invasive diagnostic tool to detect the presence of tumour mass and pericardial effusion. Other investigative tools include computed tomography (CT) as well as cardiac magnetic resonance imaging (MRI). Cardiac MRI has been reported to have the diagnostic edge in the diagnosis of primary cardiac lymphoma. An isointense signal of the tumour to normal myocardium on T1- and T2- weighted images with heterogeneous signal enhancement have been described in primary cardiac lymphoma but have not been reported in other cardiac tumours.(5) The definitive diagnosis relies on tissue histopathological sample. Most reported cases are of diffuse B-Cell non-Hodgkin's lymphoma with majority large cell type. Occasionally, T cell lymphoma may be found. Cytogenetic staining of B cell lymphoma should be positive for CD20 as illustrated in this case.(4-5)

Treatment options in such patients include radiation and chemotherapy though the result is usually disappointing. This may be due to either late diagnosis or aggressive nature of the tumour. There is no evidence to indicate that surgery improves the patient survival. It is often difficult to completely resect the tumour. Combinations of Rituximab and conventional chemotherapeutic agents have shown promising result in some patients who have achieved complete remission.(4, 5, 13) The median survival would be only 1 month for patient without treatment. The median survival time of the patients

who tolerate chemotherapy or radiotherapy is estimated to be one year. Rapid regression of intramural tumour may lead to rapid deterioration as a result of heart failure, arrhythmia or cardiac rupture. Early chemotherapy initiation resulted in meaningful clinical remission and delay disease progression at the same time. However, our patient unfortunately died on 18th day of chemotherapy. The exact cause of death is still unknown as his family refused to give their consent for the postmortem examination.

In conclusion, primary cardiac lymphoma is a rare entity and carries a poor prognosis. This tumour primarily affects elderly men and typically involves the right heart chambers. Prompt diagnosis and early initiation of treatment may result in clinically meaningful remission and prolong the survival time. The present case was unusual because both atria were involved which had rarely been reported in the literature.

References

1. Larsen PR, Kronenberg HM & Melmed SZ Williams. Textbook of Endocrinology. 10th ed. Philadelphia, Pa: Saunders; 2003.
2. Blizzard RM, Kyle M. Studies of the Adrenal Antigens and Antibodies in Addison's Disease. *J clin Invest.* 1963; 42: 1653-1660.
3. Irvine WJ, Davies SH, Delamore IW, Williams A Wynn. Immunological Relationship Between Pernicious Anaemia and Thyroid Disease. *Br Med J.* 1962 Aug 18;2(5302):454-456.
4. Kra SJ, Barile AW. Addison's Disease and Addisonian Anemia; A Case Report. *Arch Intern Med.* 1964 Aug;114:258-262.
5. Feyrter F, Klima R. Uber die Magenveränderungen bei der Addisonschen Krankheit. *Dtsch Med Wochenschr.* 1952 Sep 26; 77 (39): 1173- 1175.
6. Smith AWM, Delamore IW, Williams A Wynn. Gastric Acid Secretion and Mucosal Appearances in Addison's Disease and Hypopituitarism. *Gut.* 1961 Jun;2(2):163-167.
7. Williamson J, Paterson RWW, McGavin DDM, Greig WR, Whaley K. Sjogren Syndrome in Relation to Pernicious Anemia and Idiopathic Addison Disease. *Brit. J. Ophthal.* 1970. 54: 31- 36.
8. Duda- Krol WB, Kusz- Rynkun A, Pietrzak J, Soszka A. Family Incidence of Addison-Biermer Anemia. *Wiad Lek.* 2005; 58 (11- 12): 685- 7.
9. Kazimierska E, Lubinska M, Lewczuk A, Blaut K, Sworzak K. Multi-reasons, Severe Megaloblastic Anemia- Description of Two Cases. *Pol Merkur Lekarski.* 2006; 20 (118): 437- 9.

10. Kuliszkiewicz- Janus M, Bednarek-Tupikowska G, Rozycka B, Deren I. Coexistence of Addison-

bbBiermer Anemia with Endocrine Glands Dysfunctions. *Pol Arch Med Wewn.* 2004; 112 (5): 1311- 9.