

# A Case of Diffuse Large B-cell Lymphoma with Cardiac Involvement Incidentally Diagnosed on Cardiac Imaging

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## ABSTRACT

Cardiac lymphomas, either primary or secondary, are mostly of B-cell lineage; among which, diffuse large B-cell lymphoma (DLBCL) is the most common. Secondary involvement of the heart is usually a late manifestation of disseminated lymphoma. Patients may be asymptomatic or may have non-specific symptoms, particularly when cardiac involvement is not extensive. A 22-year male patient presented with four months' history of progressive enlargement of left cervical lymph nodes with intermittent fever along with dysphagia and left ear pain.

Positron-emission tomography (PET)/computed tomography (CT) scan revealed abnormal fluorodeoxyglucose (FDG) uptake in multiple systemic locations including inferior wall of the myocardium. Subsequently, cardiac MRI showed left ventricular posterolateral wall abnormal area of delayed enhancement, corresponding to the FDG uptake on PET CT scan. Patient had remission after completion of standard chemotherapy protocol for the management of DLBCL with acceptable toxicity.

**Key Words:** Diffuse large B-cell lymphoma (DLBCL), Secondary, Heart, Chemotherapy.

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## INTRODUCTION

Cardiac lymphomas, either primary or secondary, are mostly of B-cell lineage; among which diffuse large B-cell lymphoma (DLBCL) is the most common.<sup>1</sup> Despite the potentially lethal nature, most patients remain asymptomatic; hence, according to old reports, cardiac involvement from lymphoma constituted 18% in autopsy studies.<sup>2</sup> Cardiac involvement by lymphoma poses a diagnostic challenge with lesions mimicking many other heart conditions.<sup>3</sup>

Herein, we present a case of a young man with stage IV DLBCL with secondary cardiac involvement, incidentally diagnosed on cardiac imaging.

## CASE REPORT

A 22-year male patient presented with four months' history of progressive enlargement of left cervical lymph node mass, along with progressive dysphagia, left ear pain, and intermittent fever. Initially, patient was being managed as tonsillitis with antibiotics, which resulted in partial improvement of symptoms, but later the nodal mass increased in size and the patient underwent tonsillectomy.

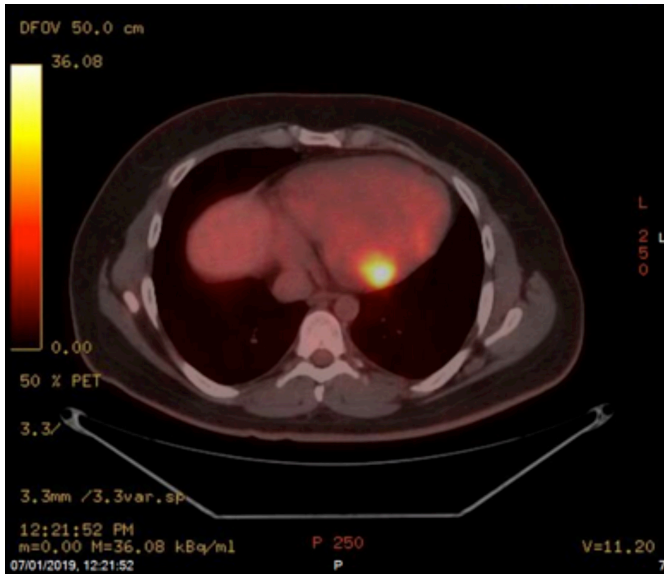
Histopathology of the tonsils revealed DLBCL, germinal centre cell subtype, with BCL-2 focal positive, BCL-6 positive, CD10 positive, CD20 positive, CD3 negative, Ki-67 85%, MUM-1 negative, CYCLIN-D1 negative, C-MYC weakly positive >40%, and EBV positive. He underwent fluorodeoxyglucose (FDG) positron-emission tomography (PET)/computed tomography (CT) for staging purpose. PET CT scan showed abnormal FDG uptake in multiple systemic organs, including nasopharynx, left tonsillar bed and the nodal mass in left neck, jejunum, ileum, incidental intramuscular focal FDG activity that corresponded to a hypodense lesion in the left biceps muscle, and abnormal focal FDG uptake seen in the inferior wall of the myocardium (Figure 1). Later, cardiac MRI revealed normal left ventricular size with preserved systolic function (EF= 62%), along with left ventricular posterolateral wall abnormal area of delayed enhancement, corresponding to the FDG uptake on PET CT scan. The patient was planned for treatment with standard chemotherapy protocol for the management of DLBCL. During the pre-chemotherapy workup, the electrocardiogram (ECG), laboratory investigations, and bone marrow trephine were also normal. He was treated with 1<sup>st</sup> cycle of chemotherapy R-CVP (rituximab, cyclophosphamide, vincristine, prednisone) for cytoreduction with CNS prophylaxis; and later cardiologist opinion was sought to evaluate for any contraindication to add anthracyclines to treatment regimen. The patient received three cycles of R-CHOP protocol under the supervision of cardiologist with addition of doxorubicin. Interim PET CT scan for response evaluation revealed complete metabolic remission (Figure 2). Later, patient completed six cycle of R-CHOP with 4 intra-theal methotrexate to complete the planned treatment with no immediate complications.

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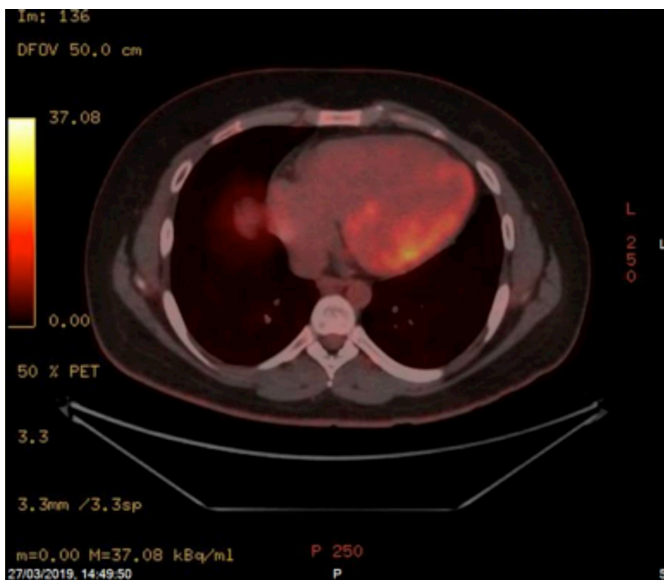
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**Figure 1:** PET scan shows incidental focal intense FDG uptake noted in the inferior wall of the myocardium along with extra nodal disease on other sites.



**Figure 2:** There is complete metabolic remission after treatment.

## DISCUSSION

Secondary involvement of the heart by lymphoma is usually a late manifestation of disseminated disease. It may be asymptomatic or may have non-specific symptoms, particularly when the metastasis is not extensive.<sup>4</sup> Therefore, it is frequently undetected before death. Most common sites of secondary cardiac involvement are left ventricle and right atrium in 55% and 54% of cases.<sup>5</sup> It may occur through direct extension from the mediastinal disease, or hematogenous spread, and by retrograde lymphatic spread. The ECG and X-ray chest are neither sensitive nor specific for detecting the cardiac involvement.<sup>6</sup> However, trans-thoracic ECG is considered as initial screening modality of choice. In a retrospective analysis of 29 patients with disseminated lymphoma, trans-thoracic ECG showed 60% sensitivity for detection of cardiac involvement.<sup>7</sup> PET/CT scan

provides anatomical and functional imaging at the same position.<sup>8</sup> It is often useful in differentiating DLBCL with secondary cardiac involvement from other types of cardiac tumours.<sup>9</sup> Cardiac MRI is preferred imaging modality to evaluate the extent of pericardial and myocardial involvement by lymphoma.<sup>1,10</sup> It has a superior tissue characterisation and; therefore, has higher sensitivity for detection of tumour infiltration.<sup>11</sup> According to literature, the prognosis of lymphoma with secondary cardiac involvement is unfavourable.<sup>12,13</sup> However, improvements in survival have been observed in few reported cases.<sup>12</sup> Generally, chemotherapy is mainstay of treatment for B-cell non-Hodgkin's lymphoma with secondary cardiac involvement, leading to prolonged median survival and durable remissions.<sup>12</sup>

## PATIENT'S CONSENT:

Informed consent was obtained from the patient to publish the case data.

## CONFLICT OF INTEREST:

The authors declared no conflict of interest.

## AUTHORS' CONTRIBUTION:

AHO: Did literature search and drafted the manuscript.

IM: Conceived the idea and overall supervision.

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