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Case Report

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Cardiac Involvement as the Initial Manifestation of Diffuse Large B-Cell Lymphoma: A Case Report

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Abstract

Diffuse Large B-Cell Lymphoma (DLBCL) is the most common subtype of non-Hodgkin lymphoma. Cardiac involvement is uncommon and is usually secondary to disseminated disease.

Because cardiac manifestations are often nonspecific, diagnosis may be delayed despite the potentially life-threatening nature of this condition.

An 85-year-old woman presented to the Emergency Department with a 10-day history of progressive dyspnea, asthenia, and brief episodes of interscapular pain associated with presyncope. Physical examination revealed a systolic murmur and reduced breath sounds over the right lower lung field. Laboratory investigations showed elevated inflammatory and tumor-related biomarkers, including lactate dehydrogenase and β2-microglobulin. Initial imaging excluded pulmonary embolism but identified suspicious cardiac and mediastinal lesions. Further multimodality imaging, including cardiac CT, whole-body CT, and 18F-FDG PET/CT, demonstrated extensive metabolically active disease involving the heart, mediastinum, adrenal glands, lungs, and pelvis. CT-guided biopsy of a pelvic lesion confirmed diffuse large B-cell lymphoma.

This case highlights the importance of considering secondary cardiac involvement in patients with suspected lymphoproliferative disorders and unexplained cardiac symptoms. Early recognition and prompt multidisciplinary evaluation are essential to establish the diagnosis and initiate appropriate treatment.

Keywords: Diffuse Large B-cell Lymphoma, Cardiac Involvement, Cardiac Metastasis, Internal Medicine

1. Learning Points

- Cardiac involvement should be considered in the differential diagnosis of patients with suspected lymphoproliferative disorders presenting with unexplained cardiovascular symptoms.
- Although uncommon, secondary cardiac involvement by diffuse large B-cell lymphoma may represent the first manifestation of systemic disease and requires prompt diagnosis to improve clinical outcomes.

2. Introduction

Diffuse Large B-Cell Lymphoma (DLBCL) is the most common subtype of non-Hodgkin lymphoma, accounting for approximately 30–40% of newly diagnosed cases worldwide [1]. Despite its aggressive biological behavior, DLBCL is potentially curable with prompt diagnosis and appropriate treatment.

Cardiac involvement by lymphoma is uncommon and is considerably more often secondary than primary. Cardiac metastases are identified in up to 9% of patients with disseminated malignancies at autopsy, whereas clinically evident cardiac involvement remains rare [2-3]. Secondary cardiac lymphoma most frequently occurs in the setting of advanced systemic disease,

with DLBCL representing the predominant histopathological subtype [4].

The clinical presentation of cardiac lymphoma is highly variable and often nonspecific, ranging from constitutional symptoms and dyspnea to arrhythmias, heart failure, pericardial effusion, cardiac tamponade, myocardial infarction due to coronary artery involvement, and sudden cardiac death [4]. Because of its rarity and heterogeneous presentation, the diagnosis is frequently delayed. Multimodality imaging, including cardiac computed tomography (CT), cardiac magnetic resonance imaging (CMR), and 18F-fluorodeoxyglucose positron emission tomography/computed tomography (18F-FDG PET-CT), plays a pivotal role in the early detection, characterization, and staging of cardiac involvement. Early recognition is essential, as timely initiation of systemic therapy may substantially improve patient outcomes.

3. Case Description

An 85-year-old woman presented to the Emergency Department with a 10-day history of progressive asthenia and worsening dyspnea; she also reported brief episodes of interscapular pain, occasionally associated with presyncope.

Her medical history was significant for paroxysmal atrial fibrillation, autoimmune hypothyroidism, and a previous episode of deep vein thrombosis involving the left lower limb.

Her regular medications included rivaroxaban 20 mg once daily, amlodipine 10 mg once daily, irbesartan 300 mg once daily, flecainide 100 mg twice daily, and bisoprolol 5 mg once daily.

On admission, her vital signs were as follows: blood pressure 150/80 mmHg, heart rate 90 beats/min, and peripheral oxygen saturation (SpO_2) 98% on room air. The patient was hemodynamically stable and in fair general condition. Physical examination revealed reduced breath sounds at the right lung base and a grade 3/6 systolic murmur best heard over the mitral and aortic areas (Levine classification). The abdomen was soft, non-tender, and non-distended, with normal bowel sounds. Costovertebral angle tenderness was absent bilaterally, and no focal neurological deficits or peripheral edema were detected.

Initial investigations included laboratory testing, a 12-lead electrocardiogram (ECG), and chest radiography. The ECG showed no significant abnormalities. Laboratory investigations demonstrated elevated levels of D-dimer, C-reactive protein (CRP), ferritin, lactate dehydrogenase (LDH), and β2-microglobulin, as summarized in Table 1. Chest radiography revealed a well-defined opacity in the right upper paramediastinal region, enlargement of the right hilar profile, and an ill-defined elongated opacity in the right lower lung field.

Given the clinical suspicion of pulmonary embolism, a contrast-enhanced computed tomography pulmonary angiography (CTPA) was performed. The examination excluded pulmonary embolism, as no intraluminal filling defects were identified within the pulmonary arterial tree. However, it revealed an ill-defined hypodense soft-tissue lesion within the adipose tissue of the right atrioventricular groove, surrounding the mid-portion of the right coronary artery and demonstrating mild contrast enhancement. In addition, two contiguous fluid-attenuation lesions measuring 5.5 cm and 1.5 cm were identified in the right paracardiac region.

The patient was subsequently admitted to the Internal Medicine Department for further diagnostic evaluation and management.

4. Discussion

During hospitalization in the Internal Medicine Department, the patient's symptoms persisted, and the trend of the main laboratory parameters is summarized in Table 1. Given the persistence of symptoms and the findings on the initial imaging studies, cardiac computed tomography (cardiac CT) was performed.

Cardiac CT demonstrated an ill-defined soft-tissue mass with mild contrast enhancement located between the ascending aorta and the main pulmonary artery, extending to the right coronary ostium and along the proximal-to-mid right atrioventricular groove. The lesion measured up to 30 × 26 mm and was inseparable from the adjacent right atrial wall, raising suspicion of cardiac infiltration. Additional findings included biatrial enlargement, more pronounced in the left atrium, circumferential pericardial effusion, and multiple enlarged hilar and mediastinal lymph nodes. Two rounded fluid-attenuation lesions with hyperattenuating walls, measuring 48 mm and 13 mm, were identified at the right cardiophrenic angle. A contrast-enhancing pleural nodule measuring 10 × 15 mm was also detected along the right paravertebral pleura of the lower lobe.

A contrast-enhanced whole-body CT scan was subsequently performed for oncologic staging. The examination confirmed the previously described findings and additionally revealed two solid adrenal masses with heterogeneous contrast enhancement, as well as a 41×58 mm pelvic adnexal mass adjacent to the uterus.

Subsequent 18F-fluorodeoxyglucose positron emission tomography/computed tomography (18F-FDG PET-CT) demonstrated intense hypermetabolic activity in all previously identified lesions, with a maximum standardized uptake value (SUV max) of 17.25 in the pulmonary lesion, 27.0 in the cardiac lesion (Figure 1), 28.8 in the adrenal lesions, and 29.8 in the pelvic mass.

Based on these imaging findings, a CT-guided core needle biopsy of the right parauterine pelvic mass was performed to establish the histopathological diagnosis.

Hematochemical Examination	Result				Unit of Measurement	Normal Values
	Entry	Day 2	Day 6	Day 10		
White Blood Cells	4.8	5.8	4.8	4.4	103/µL	4.0 – 11.0
Red Blood Cells	3.26	3.1	3.01	2.84	10^6/µL	4.0 – 5.20
Haemoglobin	11.5	11.7	10.4	10.3	g/dL	12.0 – 15.5
Platelets	135.0	145.0	127.0	121.0	103/µL	150 - 450
C-Reactive Protein	0.94	0.89	1.06	1.33	mg/dL	0.0 – 0.5
D-dimer	1780.0	-	-	-	mg/L (FEU)	0 - 500
Ferritin	579.0	-	-	-	ng/mL	15 - 150
Lactate DeHydrogenase	1126.0	-	-	978.0	U/L	135 - 214
Beta-2-Microglobulin	4.91	-	-	-	mg/L	< 3.0

Table 1: Blood chemistry tests during the hospitalization.

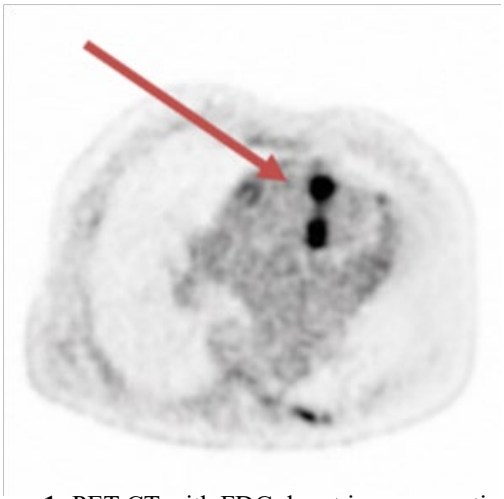


Figure 1: PET-CT with FDG, heart in cross-section.
The image shows uptake on PET-CT with FDG at the level of the atrioventricular sulcus.

4. Conclusion

Histopathological examination of the CT-guided biopsy specimen (Figure 2) revealed diffuse proliferation of atypical large B lymphoid cells expressing CD20. Immunohistochemistry demonstrated positivity for PAX5, MYC, BCL2, and MUM1, with negativity for CD10 and BCL6, together with a high proliferative index, establishing the diagnosis of DLBCL.

The patient's clinical presentation was ultimately attributed to advanced systemic DLBCL with secondary cardiac involvement. This case highlights the diagnostic challenges posed by cardiac lymphoma, whose clinical manifestations are frequently nonspecific and may mimic more common cardiovascular diseases. Although uncommon, cardiac involvement should always be considered in patients with suspected or confirmed lymphoma presenting with unexplained cardiac symptoms or atypical imaging findings. Multimodality imaging, particularly cardiac CT and 18F-FDG PET-CT, is crucial for detecting cardiac infiltration, defining disease extent, identifying the most appropriate biopsy site, and guiding therapeutic planning.

Early diagnosis is of paramount importance because cardiac lymphoma may lead to life-threatening complications, including malignant arrhythmias, conduction disturbances, heart failure, cardiac tamponade, myocardial ischemia, and sudden cardiac death [5,6]. Prompt recognition and timely referral for hematologic treatment may significantly improve clinical outcomes despite the aggressive nature of the disease.

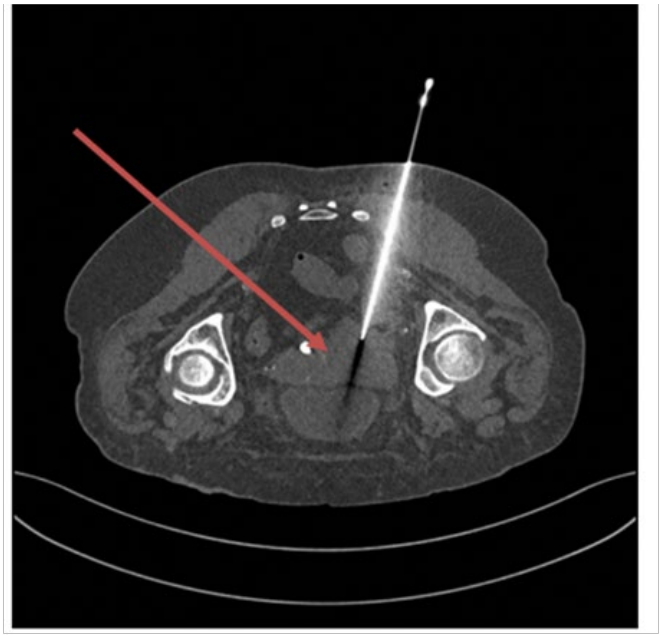


Figure 2: Pelvic mass biopsy, cross-sectional CT view.
The pelvic mass and biopsy of the same are indicated on the CT image.

Declaration

Contribution

All authors participated in the patient's clinical management. Dr. Saturnino performed the crucial biopsy for the diagnosis. All cited authors performed the collection of the tests performed, and the writing of the clinical case. Drs. Tirelli, De Sena, and Nuzzo also provided supervision and post-writing corrections.

Conflict of Interest

There are no conflicts of interest.

Ethical Approval

Ethical approval is not required, as this involves the description of a clinical case and its medical management.

Patient Consent for Pubblication

Consent for publication has been obtained.

Availability of Data

Since this is a case report, the data is not accessible to the public as it is contained in a medical record.

Funding

There was no funding.

Declaration of AI use

The case study was not written with AI; a tool was used solely for post-writing English organization

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