

Isolated Splenic Tuberculosis Masquerading as Disease Progression of Hodgkin's Lymphoma on Interim ¹⁸F-Fluorodeoxyglucose Positron Emission Tomography/Computed Tomography Scan

Abstract

¹⁸F-fluorodeoxyglucose (¹⁸F-FDG) positron emission tomography/computed tomography (PET/CT) scan is the imaging modality of choice in the management of lymphoma. However, ¹⁸F-FDG is a nonspecific tracer for tumoral metabolic activity and infective pathology, thus posing a challenge in accurate response assessment. Here, we present a case of Hodgkin's lymphoma, referred for staging PET/CT scan which showed FDG-avid disease in the mediastinum, and on interim ¹⁸F-FDG PET/CT in addition to the mediastinal mass lesion, a FDG-avid lesion was also noted in the spleen suggestive of disease progression. The biopsy report of the lesion was tuberculosis, which was masquerading as disease progression on interim ¹⁸F-FDG PET/CT.

Keywords: ¹⁸F-fluorodeoxyglucose positron emission tomography/computed tomography, Hodgkin's lymphoma, spleen, tuberculosis

A 28-year-old female patient presented with a painless, firm lump on the left side of the upper chest. The ultrasonography-guided mediastinal mass biopsy revealed features compatible with Hodgkin's lymphoma. The patient was referred for staging ¹⁸F-fluorodeoxyglucose (¹⁸F-FDG) positron emission tomography/computed tomography (PET/CT) scan. Maximum intensity projection (MIP) image [Figure 1a] showed FDG-avid mediastinal mass with involvement of multiple groups of lymph nodes. The axial and coronal fused PET/CT images [Figures 1b-d] showed FDG-avid mediastinal mass lesion encasing the great vessels and its branches, trachea, and esophagus. The patient subsequently underwent two cycles of doxorubicin, bleomycin, vinblastine, and dacarbazine-based chemotherapy and was then referred for an interim ¹⁸F-FDG PET/CT scan which revealed a good response to therapy. MIP image [Figure 1e] showed a significant reduction in FDG avidity and extent of mediastinal mass and lymph nodes; however, transaxial and coronal fused PET/CT images [Figures 1f-h] showed focal FDG uptake in the inferior pole of the spleen. Suspecting disease progression, the patient underwent a USG-guided splenic

lesion linear core biopsy, which revealed fibrocollagenous tissue with lymphoid cells, epithelioid granuloma, and central necrosis [Figure 2]. No atypical (Hodgkin) cells were seen, suggestive of necrotizing granulomatous inflammation compatible with tuberculosis (TB).

Hodgkin's disease is a type of monoclonal lymphoid neoplasm.^[1] Functional imaging using ¹⁸F-FDG PET/CT is considered as the gold standard imaging modality in staging and response assessment of Hodgkin's lymphoma.^[2] Staging ¹⁸F-FDG-PET/CT accurately detects the extent of lymphoma and extralymphatic involvement.^[3] Bone marrow involvement is accurately diagnosed by ¹⁸F-FDG-PET/CT, which demonstrates higher rate of involvement than bone marrow biopsy procedure.^[4] Interim ¹⁸F-FDG PET/CT has a high prognostic value in evaluation of the chemosensitivity of the tumor and identifies patients with different outcomes, with patients showing residual tumor uptake after two cycles of chemotherapy related to poor prognosis.^[5] ¹⁸F-FDG is a nonspecific tracer that accumulates within the tumor cells and also in granulation and inflammatory tissues;^[6] both Hodgkin's lymphoma and TB show intense FDG uptake in PET/CT imaging with no differentiation in PET

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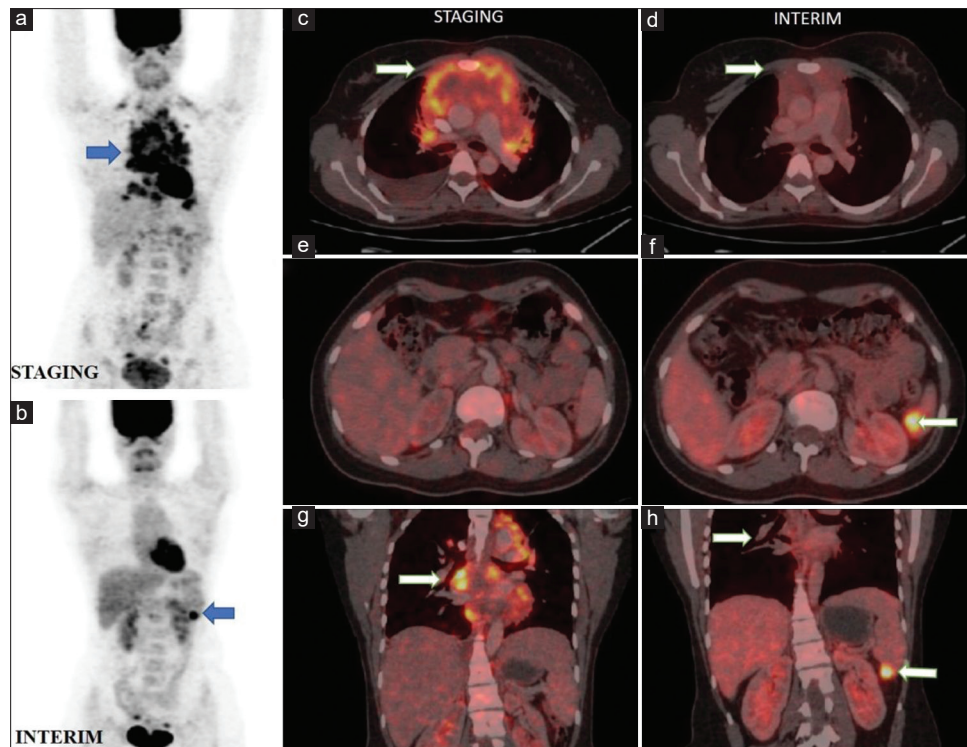


Figure 1: Maximum intensity projection image (a) of staging ^{18}F -fluorodeoxyglucose positron emission tomography/computed tomography showing fluorodeoxyglucose-avid mediastinal mass and lymph nodes. Axial and coronal fused positron emission tomography/computed tomography images (b and d) showing fluorodeoxyglucose-avid mediastinal mass lesion and lymph nodes. Maximum intensity projection image (e) of interim ^{18}F -fluorodeoxyglucose positron emission tomography/computed tomography scan. Axial and coronal fused positron emission tomography/computed tomography images (f and h) showing mildly fluorodeoxyglucose-avid mediastinal mass. Axial and coronal fused positron emission tomography/computed tomography images (g and h) showing new focal fluorodeoxyglucose-avid lesion in the inferior pole of spleen which was not seen on previous scan (c)

quantitative parameters.^[6] Thus, TB lesions can mimic Hodgkin's lymphoma. If there is any new ^{18}F -FDG-avid focal lesion in interim PET/CT scan with uncertain etiology, then biopsy merits consideration before labeling as disease progression and considering a change of chemotherapy regimen.^[7] Thus, in ambiguous situations, ^{18}F -FDG PET/CT helps in guiding biopsy site and makes a definitive diagnosis; as in our case, the splenic lesion masquerading as lymphoma was subsequently found to be a splenic tubercular lesion on biopsy. TB accounts for a major health burden globally, with 15% cases being extrapulmonary TB;^[8] hepatosplenic involvement is noted in mostly disseminated TB, whereas isolated splenic TB is an extremely rare entity, commonly misdiagnosed as lymphoma, abscess, or primary splenic carcinoma.^[9] ^{18}F -FDG PET/CT can determine the metabolic activity of tuberculous lesion, assess the extent of disease, detect site for biopsy, and evaluate therapeutic response.^[10] Development of TB-specific radiotracers with positron-emitting isotopes labeled with antitubercular drugs such as isoniazid and rifampicin may pave the way for specific diagnosis of TB.^[11] The usefulness of ^{18}F -FDG PET/CT in determining treatment response in Hodgkin's lymphoma and assessing disease progression is unequivocal, but any new lesion should always be histopathologically examined before any change of treatment is considered due to the nonspecific nature of ^{18}F -FDG PET/CT. In a

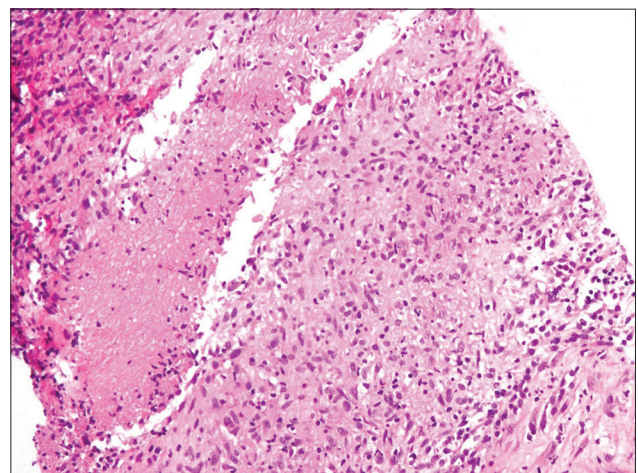


Figure 2: Biopsy of splenic lesions showing fibrocollagenous tissue with lymphoid cells, epithelioid granuloma, and central necrosis. No atypical (Hodgkin) cells are seen, suggestive of necrotizing granulomatous inflammation compatible with tuberculosis

tubercular endemic region like India, the diagnosis of TB in any suspected lesion merits consideration.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given her consent for her images and other clinical information

to be reported in the journal. The patient understands that name and initials will not be published and due efforts will be made to conceal identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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