

Bilateral Renal Lymphoma Detected by ^{18}F -FDG PET/CT scan: A Case Report

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ABSTRACT

Diffuse large B-cell lymphoma (DLBCL) is the commonest subtype of non-Hodgkin's lymphoma (NHL) and constitutes 25% of all NHL cases. Extranodal involvement includes the gastrointestinal, head and neck, orbital, central and peripheral nerve systems, thorax, bone, skin, breast, testis, thyroid, and genitourinary systems in 25-40% of HL patients, particularly NHL patients. Renal involvement in lymphoma is commonly seen in cases of widespread nodal or extranodal lymphoma, which is known as secondary renal lymphoma (SRL). This reported case of SRL was a known DLBCL patient. A young woman of 19 years diagnosed with DLBCL visited the PET-CT division of National Institute of Nuclear Medicine & Allied Sciences (NINMAS) for a ^{18}F -FDG PET-CT study to assess therapeutic response, metabolic characterization and staging. Post-chemotherapy abdominal CT and ultrasound were normal. However, ^{18}F -FDG PET-CT revealed metabolically active lymphoma involving cervical, mediastinal, and abdominal lymph nodes, but unusual bilateral renal involvement modified the therapeutic management eventually.

Keywords: Renal lymphoma, ^{18}F -FDG PET-CT, therapeutic response

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INTRODUCTION

Lymphoma is a broad term for cancer that involves the lymphatic system which includes the lymph nodes (lymph glands), spleen, thymus gland and bone marrow (1). The two main types of lymphoma are: 1) Hodgkin lymphoma and 2) Non-Hodgkin lymphoma. Hodgkin Lymphomas are subdivided into a) Nodular lymphocyte predominant Hodgkin lymphoma and b) Classical Hodgkin lymphoma. Classical Hodgkin lymphoma are again classified into a) Nodular sclerosing, b) Mixed Cellularity, c) Lymphocyte-rich, d) Lymphocyte-depleted. Non Hodgkin lymphomas are of various types. Of them Diffuse large B cell lymphoma are most common. Others are follicular lymphoma, Burkitt

lymphoma, mantle cell lymphoma, T-cell lymphoma etc (1). Positron Emission Tomography with Computed Tomography (PET-CT) scan utilizing fluorine-18 fluorodeoxyglucose (^{18}F -FDG) as a tracer plays an important role in staging, re-staging, prognosis, planning appropriate treatment regimens, and detecting recurrence. CT scan is more commonly used as an imaging modality for staging lymphoma because of its availability and relatively lower cost. But CT scan lacks functional information, which impedes identification of disease in normal-sized organs. In PET-CT scan the degree of FDG uptake is expressed quantitatively by means of the Standardized Uptake Value (SUV). It represents the activity in the lesion in $\mu\text{Ci/ml}$ corrected for the weight of the patient and the dose of FDG administered (2).

Non-Hodgkin Lymphoma is often widely disseminated at extranodal sites, which include gastrointestinal, head and neck, orbit, central and peripheral nervous system, thorax, bone, skin, breast, testis, thyroid and genitourinary system. Renal involvement in lymphoma is commonly seen in case of widespread nodal or extranodal lymphoma which is known as secondary renal lymphoma. Only renal involvement of lymphoma without evidence of elsewhere disease is rare and is known as primary renal lymphoma (PRL) (2). Here, a case of secondary renal lymphoma in a patient of Diffuse Large B Cell Lymphoma (DLBCL) is reported, which was missed in conventional CT scan. In this case report, presentation, in addition to nodal and mediastinal involvement areas in a patient diagnosed as DLBCL, rare bilateral renal extra nodal simultaneous involvement was detected on ^{18}F -FDG PET-CT imaging were presented.

CASE REPORT

A 19-year-old female with DLBCL came to PET-CT division of NINMAS for ^{18}F -FDG PET-CT scan to see therapy response following 12 cycles of chemotherapy. She was diagnosed as NHL by Ultrasound guided biopsy from cervical lymph node. Immunohistochemistry report revealed: CD20, Bcl-2, Mum1- positive; CD3, CD5, Bcl-6: negative which was compatible with DLBCL, nongerminal type. Her post chemotherapy CT scan of abdomen and ultrasound showed no abnormality. Whole-body PET with low-dose

non-diagnostic CT was performed after 6 hours of fasting while maintaining a blood glucose level of 10.4 mmol/L. Injection dose for PET was 5.7 mCi ^{18}F -FDG and acquisition was done 45 minutes after the injection. Scan revealed metabolically active lymphoma involving cervical, mediastinal and abdominal lymph nodes. Multiple intense FDG avid pulmonary nodules in both lungs suggesting pulmonary infiltration. Skeletal and peritoneal involvement was also noted. Multiple intense FDG avid soft tissue density lesions involving both kidneys were evident (Figure-1).

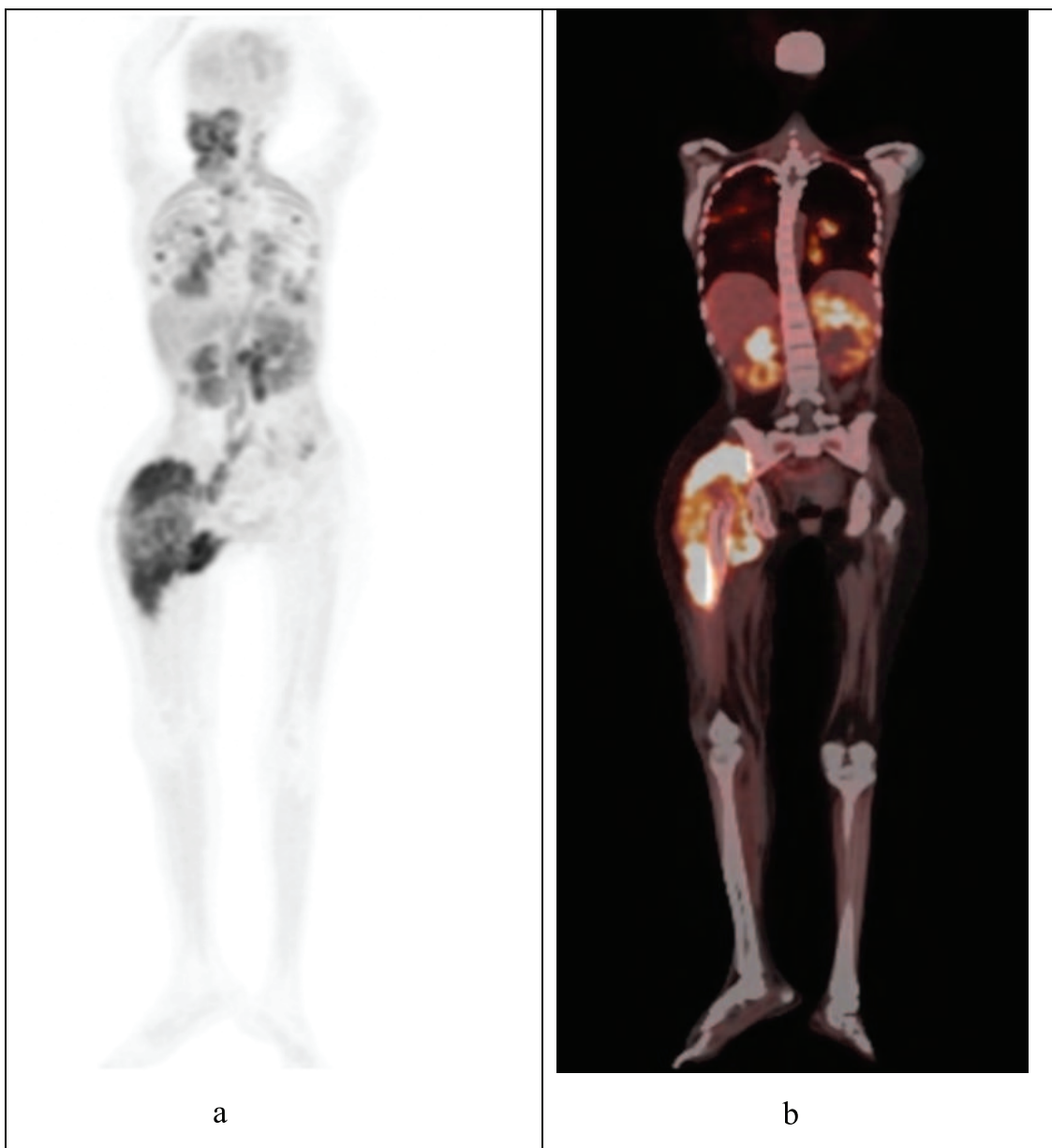


Figure 1: ^{18}F FDG PET-CT done in a 19-year-old female with DLBCL showing (a) Maximum Intensity Projection (MIP) images and (b) coronal section of bilateral enlarged kidneys with multiple FDG avid soft tissue density masses

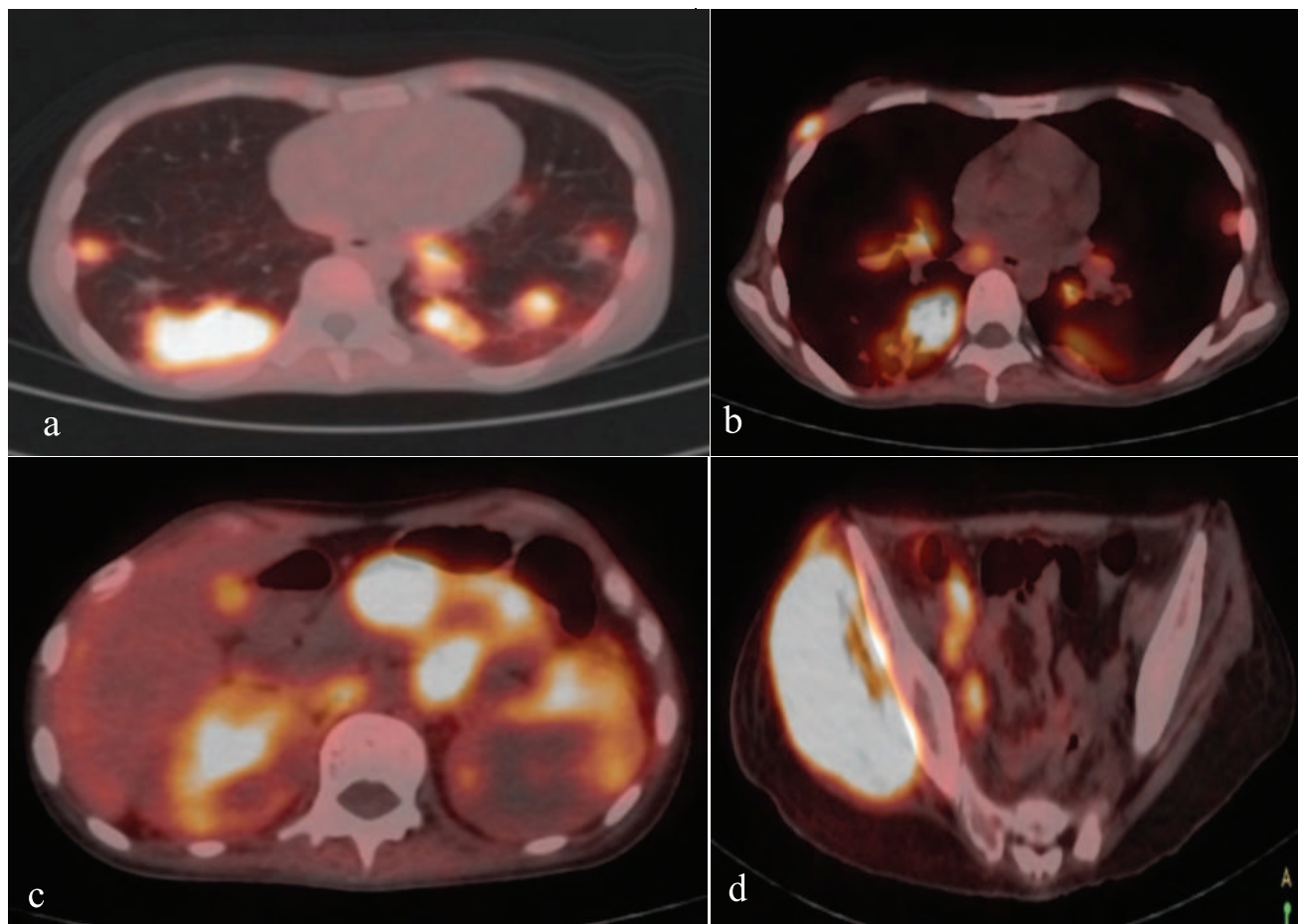


Figure 2: Transaxial fused ^{18}F FDG PET-CT images of the same patient showing (a) multiple FDG avid pulmonary nodules (b) mediastinal lymph nodes (c) multiple FDG avid soft tissue mass in both kidneys and peritoneal seeding and (d) FDG uptake in right gluteal muscle and right iliac bone involvement

DISCUSSION

Diffuse Large B Cell Lymphoma (DLBCL) is the most common aggressive lymphoma (3). The presentation of DLBCL is symptomatic enlarged lymph nodes; around 40% of patients have extranodal involvement, most commonly in the gastrointestinal tract (36%), ear, nose, and throat (20%), and bone marrow (14%). The kidney is not a lymphoid organ. So, renal parenchymal involvement appears to be a secondary process, either by direct extension from a retroperitoneal mass or through hematogenous spread in the case of disseminated disease (4). The diagnosis, therefore, depends on the findings of renal enlargement and declining renal function. Primary renal non-Hodgkin's lymphoma is an extremely rare disease, and only a few cases have been reported, accounting for <1% of all lymphomas (5).

The clinical presentations may include flank pain, hematuria, abdominal mass, fever, and weight loss. Acute renal failure is

also described as a clinical presentation in different literature. In this reported case, the patient had no complaints related to the kidney. Imaging plays a crucial role in the diagnosis of renal lymphoma. The most common findings on a CT scan are multiple soft tissue masses, ranging from 1-3 cm, with minimal enhancement after contrast compared to the surrounding renal parenchyma (6).

^{18}F -FDG PET/CT is considered the gold standard for response assessment (7). As in the reported case, renal involvement in lymphoma was not identified by a conventional CT scan, but it was diagnosed with the help of a PET/CT scan. As with lymphomatous involvement in other organs, renal lymphomas are usually FDG-abundant, but in renal cell carcinoma, FDG uptake is variable (8). The detection of asymptomatic renal masses in the general population is also increasing due to the widespread use of cross-sectional imaging (9).

Renal masses are also detected by an ¹⁸F-FDG PET/CT scan done for the evaluation of lymphoma. Thus, the aim of the present study is to analyse the FDG PET/CT features of solid renal masses detected in patients with lymphoma and to evaluate the ability of PET/CT to differentiate RCC from renal lymphomatous involvement.

CONCLUSION

Renal lymphoma may remain asymptomatic. A meticulous search for renal involvement is important while reporting PET/CT to diagnose SRL or PRL. This is more important in disseminated lymphoma.

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