

## Coexisting Tuberculosis and Non-Hodgkin's Lymphoma on $^{18}\text{F}$ -Fluorodeoxyglucose PET-CT

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### ABSTRACT

Non-Hodgkin's lymphoma (NHL) has been related to immune deficiency and may be preceded by chronic inflammatory diseases. Tuberculosis (TB), on the other hand, is a chronic infectious disease whose presentation and reactivation is known to be promoted by cell mediated immunodeficiency. The coexistence of NHL and TB in the same patient is not uncommon, and PET/CT using F-18 fluorodeoxyglucose (FDG) may show tracer-avid lymph nodes in both conditions. This case illustrates the importance of FDG PET/CT guided biopsy in confirming a diagnosis of concurrent NHL and TB.

**Keywords:** NHL, TB, FDG, PET-CT, Coexistence.

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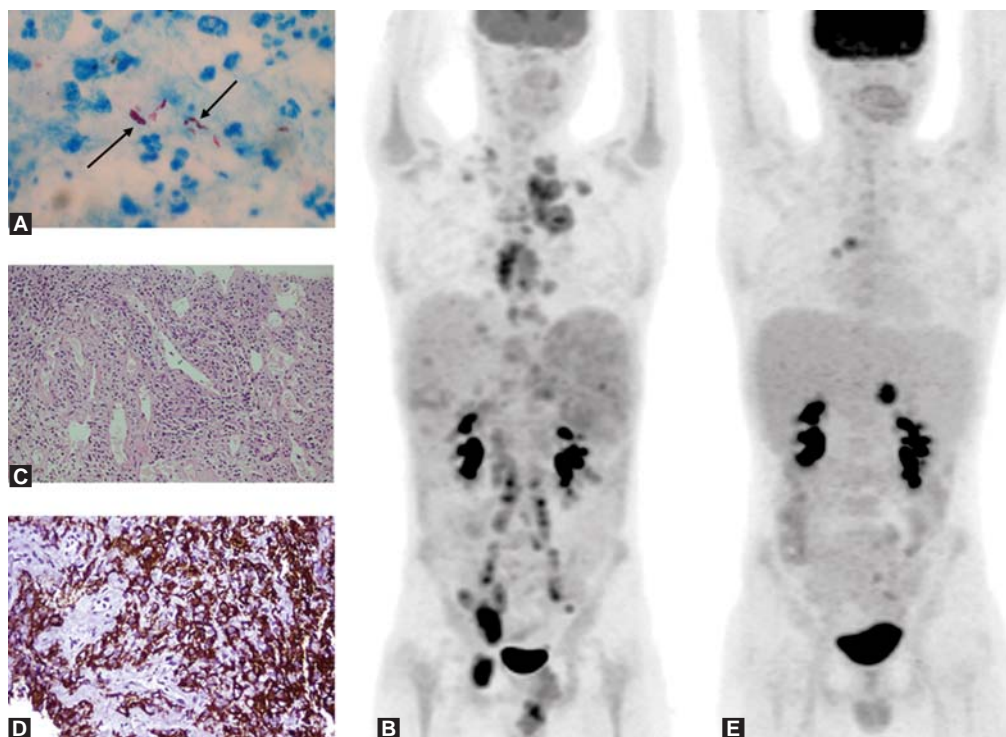
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### INTRODUCTION

A 20-year-old male on irregular empirical antitubercular therapy (ATT) presented with swelling of abdomen and feet

(3 days), loss of appetite and weight (3 months) and intermittent fever and dry cough (6 months). Physical examination revealed pallor and hepatosplenomegaly. The leukocyte count was  $19.5 \times 10^9$  gm/l, hemoglobin 8.7 gm/dl, platelet count  $334 \times 10^9$  gm/l, erythrocyte sedimentation rate 98 mm/h, lactate dehydrogenase 1324 IU/ml, total bilirubin 5.49 mg/dl, negative Mantoux and blood/urine cultures and hepatosplenomegaly and abdominal lymphadenopathy on ultrasonography. While fine-needle aspiration from retroperitoneal and celiac lymph nodes were inconclusive, mediastinal lymph nodes showed acid fast bacilli on Ziehl-Neelsen stain (arrows) (Fig. 1A), confirming tuberculosis (TB). Since, fever did not subside after 1 month of regular ATT, positron emission tomography-computerized tomography (PET-CT) using  $^{18}\text{F}$ -Fluorodeoxyglucose (FDG) was performed and showed increased uptake of the tracer in cervical, mediastinal, abdominal and pelvic lymph nodes with hypermetabolic foci in the liver and spleen (Fig. 1B). Standardized uptake values (SUVmax) in the mediastinal and external iliac lymph nodal were 7.3 and 14.1 respectively. Biopsy from the right iliac lymph node showed nodal architecture distorted by atypical



**Figs 1A to E:** (A) Acid fast bacilli seen on Ziehl-Neelsen stain, (B) whole body PET scan showing FDG uptake in multiple lymph node groups, (C) atypical large lymphoid cells with prominent nucleoli and moderate cytoplasm in iliac lymph node, (D) CD-20 positivity in the cells, (E) follow-up PET scan showing reduced FDG uptake in most of the lymph nodes

large lymphoid cells with prominent nucleoli and moderate cytoplasm positive for CD-20, a B-cell marker (Figs 1C and D), confirming diffuse large B-cell lymphoma. After 4 cycles of chemotherapy, fever subsided and a follow-up FDG PET-CT showed significant metabolic response (Fig. 1E).

FDG uptake in a patient with tuberculosis (TB) and Hodgkin's lymphoma has been reported earlier.<sup>1</sup> The use of FDG whole-body PET scanning has also been described for monitoring disseminated TB.<sup>2,3</sup> Immune deficiency in Non-Hodgkin's lymphoma (NHL) may result in infections<sup>4,5</sup> and coexistence of NHL and TB has been reported earlier.<sup>6-8</sup> Since symptoms and signs may be shared, initial therapeutic failure during the treatment of either NHL or TB should raise the possibility of simultaneous occurrence of both diseases. Further, the introduction of immunosuppressive chemotherapy with immunologic changes already present in patients with NHL may worsen the clinical course of TB. FDG PET-CT has been widely used for inflammatory or infectious diseases, because increased FDG concentration representing increased cell glycolysis is demonstrated in activated macrophages, lymphocytes and granulocytes as well as neoplastic cells.<sup>9</sup> Increased FDG uptake might, therefore, be expected in tubercular infections.<sup>10</sup> Biopsy, though invasive, remains the most sensitive and specific diagnostic procedure. However, caseating or necrotizing granulomatous lesions typical for TB may also be found in NHL.<sup>11</sup> However, the certain proof of TB is the presence of acid-fast bacilli in biopsy and/or culture.<sup>12</sup> While FDG PET-CT is not specific for the diagnosis of either NHL or TB it may help in choosing a biopsy site based on the SUVmax.

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