# Tuberculosis mimicking malignancy

**To the Editor:** Distinguishing benign inflammatory from malignant processes is a diagnostic dilemma especially true in a country like India, where there is a high incidence of tuberculosis [1]. For example, in patients with a known malignancy, tubercular lymphadenopathy may mimic metastases and in cases of tubercular lymph node involvement at unusual sites, the diagnosis may be initially unsuspected. Incorporation of contrast enhanced CT (CECT) into the PET/CT protocol may improve the diagnostic confidence owing to superior morphological delineation. Two such cases from India, wherein PET/CT findings pointed towards disseminated malignancy indicate the above. Based on CECT findings, tubercular involvement was entertained as a possibility, though not a certainty. This was subsequently confirmed by excisional biopsy.

A 17 years old boy presented with generalized lymphadenopathy. He had a past history of non Hodgkin's lymphoma, treated with chemotherapy and now in remission. Since two years, he developed malaise, low-grade fever, cough and weight loss. Blood tests revealed lymphocytosis; total leukocytes (TLC) 5500: differential leukocytes (DLC): N45, L54, E1), mild anemia and raised ESR: 55mm/h. Chest X-rays revealed mediastinal and hilar lymphadenopathy, parenchymal infiltrates in the right lung and right pleural effusion (Fig. 1C). Sputum examination was negative for tuberculosis. Mantoux test was weakly positive (9 mm). Fine needle aspiration cytology from cervical lymph-nodes was inconclusive. Bone marrow biopsy was normal. The patient underwent a $^{18}$F-FDG PET/CT scan which showed increased uptake at multiple lymph nodes, namely cervical, axillary, mediastinal, hilar, retrocrural, portal, perigastric and retro-peritoneal, with increased pleural uptake (Fig. 1A, 1B). The CECT scan, showed multiple necrotizing lymph nodes with peripheral enhancement in the same areas (Fig. 2). Lymph node biopsy revealed the presence of caseating granulomas. Acid fast bacillus (AFB) stain was positive for mycobacterium tuberculosis. (Fig. 3). The patient started anti-tubercular treatment and showed dramatic response.

Another case, a 45 years old female patient presented with lassitude and weight loss. Systemic examination revealed bilateral axillary and right cervical lymphadenopathy. The patient had a family history of breast carcinoma but no history of tuberculosis. Local breast examination and sonomammography were normal. Blood tests revealed raised ESR: 51mm/h with lymphocytosis TLC: 8600, DLC: N40, L58, E2. Chest X-rays and sputum examination were negative. Mantoux test was inconclusive (6mm). CECT performed in the PET/CECT protocol, showed increased uptake in bilateral axillary and right cervical lymph nodes which appeared necrotic, with hypodense centres and peripheral enhancement (Fig. 4A). Axillary lymph node biopsy revealed epithelioid granulomas with Langhans giant cells (Fig. 4B). Acid fast basilli stain was positive for mycobacterium tuberculosis. Antitubercular treatment was instituted, followed by significant amelioration of symptoms.

Acute or chronic inflammation, abscesses, inflammatory lymphadenopathy and non-specific reactions following radiotherapy may mimic tumor tissue in PET scans [2-4]. Traditionally, a threshold SUV of 2.5 to 3.8 has been proposed to distinguish benign from malignant lesions [5]. However, tubercular pathology is one of the most well-known diseases that causes intense $^{18}$F-FDG uptake [6]. Peak SUVs as high as 21.0 have been reported in tuberculous lesions [7]. Studies have documented the value of additional delayed images obtained 90-120min after $^{18}$F-FDG injection to differentiate benign from malignant lesions [8]. However, certain studies have found equivocal results, with a majority of tuberculous lesions showing no reduction in SUV at dual time point imag-

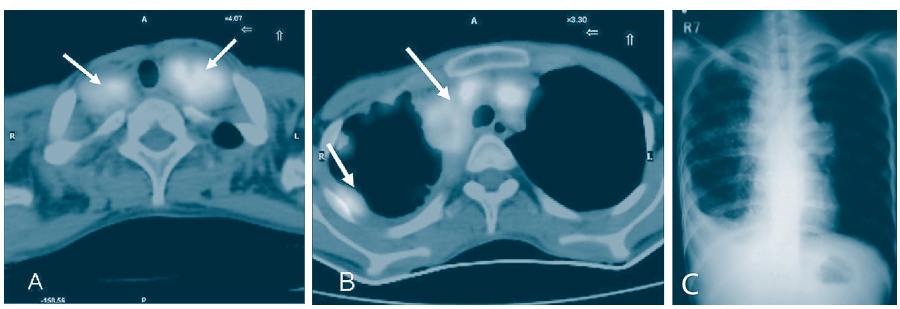



**Figure 1.** PET/CT showing increased uptake in cervical (A) and mediastinal lymph nodes (B) and at pleura (arrows), with volume loss of the right hemithorax. (C) Chest X-rays film showing mediastinal and hilar lymphadenopathy, pulmonary infiltrates in the right lung and right pleural effusion.

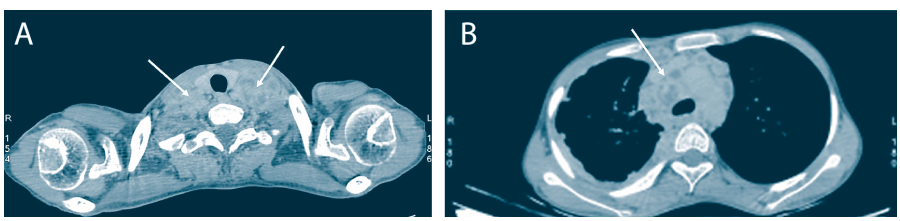
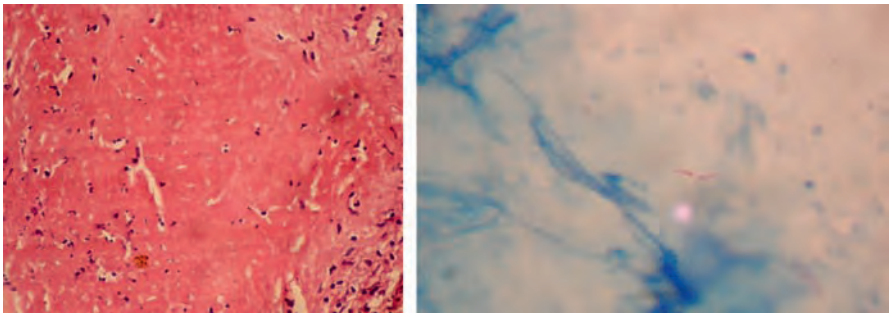
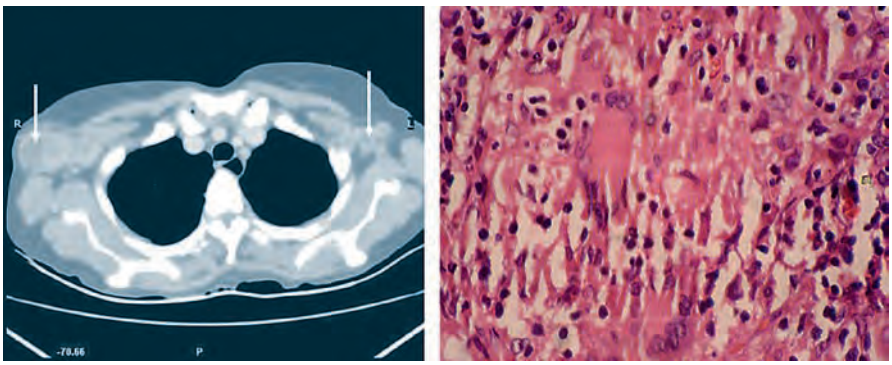



**Figure 2**. Contrast enhanced CT showing peripherally enhancing necrotic cervical (A) and mediastinal (B) lymph nodes (arrows) with evidence of volume loss of the right hemithorax.



A B

**Figure 3.** High power view of a cervical lymph node showing (A) caseating necrosis (H & E, 200x) and (B) acid fast bacilli with caseating necrosis (ZN, 1000x).



A B

**Figure 4.** Second case: CECT in PET/CECT showing increased uptake in centrally necrotic, peripherally enhancing, axillary lymphadenopathy (A). High power view of axillary lymphnode (H&E stained, 400 x) showing epithelioid granuloma with Langhan's giant cells (B).

ing [7]. Addition of CECT to the PET/CT protocols may help to show necrotic lymphnodes and calcification with increased radionuclide uptake at the periphery [9]. Of course PET/CT is an expensive diagnostic procedure. Necrotizing metastatic lymphadenopathy is rare in lymphomas but much more common in tuberculosis. The pulmonary lesions in the first case further strengthened the possibility of tuberculosis. Although tubercular axillary lymphadenopathy has been reported in 41% of the cases of mammary tuberculosis, the incidence of isolated axillary tubercular lymphadenopathy is low [10]. Owing to the immunosuppression associated with chemotherapeutic regimes as in our first case, occurrence of reactivation tuberculosis in a known case of malignancy is not uncommon. Awareness of this phenomenon and the possibility of occurrence of tuberculosis at unusual sites is paramount to arriving at an early diagnosis.

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**Maria M. D'Souza, Madhavi Tripathi, Madhur Shrivastav, Rajnish Sharma, Anupam Mondal**

*Department of PET Imaging Institute of Nuclear Medicine and Allied Sciences Brig. SK Majumdar Marg , Delhi-India*

**Dr. Maria M D'Souza**

EC-285 Maya Enclave, New Delhi – 110064, India
Phone: 91-1125495047, Fax: 91-1123919509
e-mail: maria.md@rediffmail.com

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