Dual Tracer PET Imaging with FDG and FLT Differentiates Tuberculous Lymphadenopathy from Metastases in a Case of Carcinoma Cervix

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A forty-year-old woman with a known case of carcinoma cervix underwent 18-fluorodeoxyglucose positron emission tomography–computed tomography (18-FDG PET/CT) for evaluation of abdominal lymphadenopathy. Her treatment history included radical hysterectomy and radiotherapy 6 months ago. She complained of weight loss of 7 kg over last 5 months.

The maximum intensity projection (MIP) image (Fig. 1a, arrows) revealed multiple areas of intense FDG uptake, which on CT and fused PET/CT images were localized to multiple lymph nodes in bilateral cervical region, right axilla, mediastinum and abdomen. The SUVmax of right axillary lymph nodes (most FDG avid of all lymph node groups) was 15.3. There was no evidence of metabolically active disease or CT demonstrable abnormality in rest of the body.

Presence of metabolically active disease in extensive supradiaphragmatic lymphadenopathy was unusual for a case of carcinoma cervix. This finding, along with history of significant weight loss and absence of extranodal disease, was suspicious for unrelated pathology like lymphoproliferative disorder or granulomatous disease. Mixed malignant and benign lymphadenopathy was also considered a possibility. To solve the conundrum, 18-fluoro-L-thymidine (FLT) PET/CT was performed on the next day. This scan was performed to assess the proliferation rate in various above-mentioned lymph nodes, and to plan the optimum site of biopsy. The FLT PET scan

(Fig. 1b) showed physiological distribution of the tracer in bone marrow, liver, gall bladder and urinary bladder. There was minimal FLT uptake in the enlarged, FDG avid lymph nodes (Fig. 1c & d). SUVmax of FLT uptake in right axillary lymph nodes was 1.4 (SUVmax of FDG uptake = 15.8). The SUVmax of FLT uptake in cervical, mediastinal and abdominal lymph nodes were 1.3, 1.4 and 1.0 respectively. (SUVmax of FDG uptake 12.1, 12.7 and 11.9, respectively). Considering avidity for FDG and non-avidity of proliferation marker tracer (FLT), possibility of infective/inflammatory pathology was raised in the final report. Considering maximum metabolic activity on FDG PET and feasibility, open biopsy of right axillary lymph node was performed; which revealed tuberculosis. Patient was started on anti-tuberculosis therapy and she reported gradual weight gain with no new symptoms over last 3 months.

Though extensively used for evaluation of malignancies, FDG is not a cancer-specific tracer.

Non-specific uptake is often seen in active macrophages in infective and inflammatory pathologies [1, 2]. Hence, a tracer that is more specific marker for malignancy can help to identify false-positive FDG PET findings. Use of dual tracer imaging with FDG and FLT to differentiate between benign and malignant lesions has been described in the literature for characterization of pulmonary lesions [3]. FLT is thought to be relatively more specific compared to 18F-FDG, in that it is a cell proliferation tracer; FLT usually does not concentrate in benign lesions [4]. Our case demonstrates the usefulness of a dual tracer imaging approach to identify benign cause of FDG avid lymphadenopathy in a known case of malignancy. This approach may play a vital role

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Fig. 1 (a) FDG PET of a forty-year-old woman with known carcinoma cervix, maximum intensity projection (MIP) image showing metabolically active extensive lymphadenopathy; (b) FLT PET scan of same patient, showing no appreciable uptake in lymphadenopathy;

physiological distribution of the tracer in bone marrow, liver, gall bladder and urinary bladder is seen; (c) intense FDG uptake in lymph nodes; (d) minimal FLT uptake in the same lymph nodes. Biopsy of the nodes revealed tuberculosis

when clinical and/or FDG PET findings point toward unrelated benign disease in patients with malignancy.

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