

False positive ^{18}F -FDG-PET/CT findings in a patient with talc pleurodesis

To the Editor: Fluorine-18 fluoro-deoxyglucose positron emission tomography (^{18}F -FDG-PET) can be accumulated and diagnose both malignant [1] and inflammatory lesions [2]. Hybrid imaging by ^{18}F -FDG-PET and computed tomography may be helpful in differentiating malignant from talc-induced granulomatous lesions by providing the exact CT morphologic feature that matches the tracer accumulation.

Malignant pleural effusions are common clinical problem in patients with neoplastic diseases. Lung cancer is the most common cause of malignant effusions with an incidence of 40% and breast cancer is the second cause with an incidence of 25% [3]. Adenocarcinoma of the lung is the most common histological type associated with malignant pleural effusions probably because of its peripheral location [4]. Patients with recurrent, symptomatic malignant pleural effusions require local treatment for relief of breathlessness, chest pain and other symptoms.

Chemical pleurodesis was accepted as a palliative treatment for patients with recurrent, symptomatic malignant pleural effusions. The aim of this procedure is to achieve adhesion of the parietal and visceral pleura by the development of a dense fibrosis in order to prevent accumulation of fluid in the pleural cavity. Talc pleurodesis appears to be most preferred due to its low cost. Serious adverse effects that have rarely been reported with talc include empyema, arrhythmia, and respiratory failure [5].

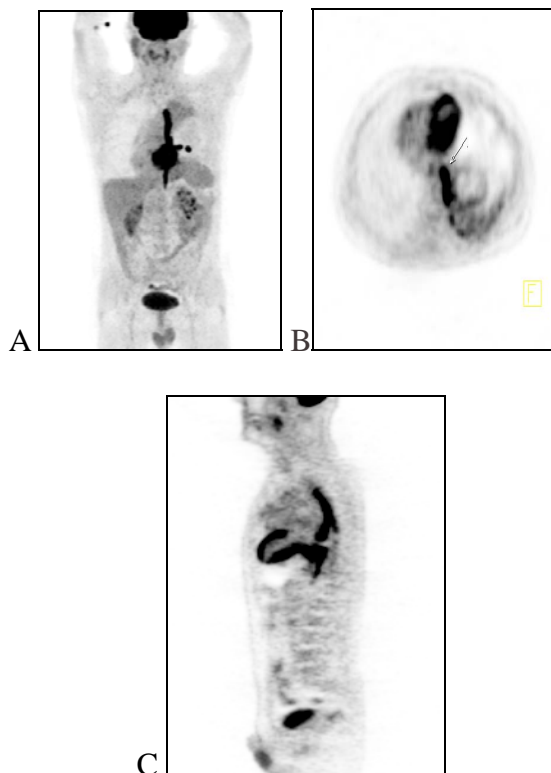


Figure 1. Maximum intensity picture (A), axial PET (B), and sagittal PET (C), images showed intense linear and nodular ^{18}F -FDG uptake in left pleural space with maximum standardized uptake value of 12.4. There was no sign of pathological ^{18}F -FDG accumulation in the pulmonary lobes and other sites of the body

A 54 years old male patient who underwent operation for primary lung cancer and performed talc pleurodesis for pleural effusion was referred to our nuclear medicine department. The ^{18}F -FDG-PET-CT study was performed 12 months after talc pleurodesis to assess the presence of recurrence or metastases with increased ^{18}F -FDG uptake. He had no dyspnea, chest pain, hemoptysis or other clinical symptom. The results of physical examination were normal.

For the PET/CT examination, the patient was intravenously injected with 510MBq of ^{18}F -FDG approximately after 10h of fasting state. After one hour of waiting period in a silent room, the patient was imaged using an integrated PET/CT camera, which consisted of a 6-slices CT gantry integrated on a LSO based full ring PET scanner (Siemens Biograph 6, IL, Chicago, USA). The dose, time of injection, and body weight were used to calculate standardized uptake values (SUV). The study detected intense linear and nodular ^{18}F -FDG uptake in left pleural space with maximum SUV of 12.4 (Fig. 1). Pleural thickening with talc deposits were seen. The areas of increased ^{18}F -FDG uptake corresponded to high-density plaques on CT and were attributed to talc pleurodesis (Fig. 2). There was no sign of pathological ^{18}F -FDG accumulation in the pulmonary lobes and other sites of the body. The areas of pleural thickening from talc remained stable on the follow-up CT scans with no evidence of malignancy.

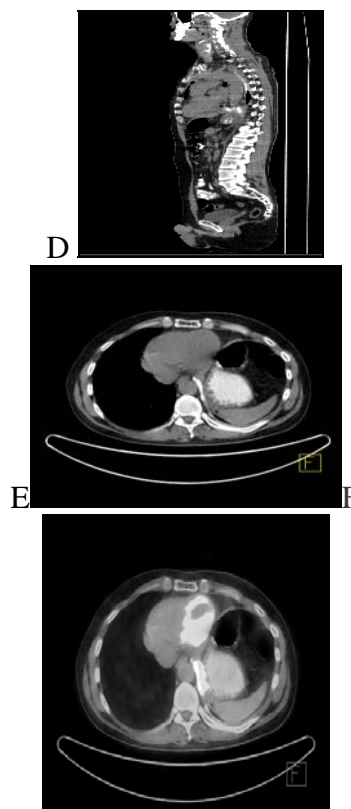


Figure 2. Sagittal CT (D), axial CT (E) and axial fusion (F) images showed pleural thickening with talc deposits. The areas of increased ^{18}F -FDG uptake corresponded to high-density plaques on CT were attributed to talc pleurodesis.

The ^{18}F -FDG PET/CT scan can use metabolic differences to separate benign from malignant lesions [6]. Many studies have shown that pleural malignancy yields increased ^{18}F -FDG-PET uptake in the pleural space [7]. False positive ^{18}F -FDG-PET findings include asbestos reactions, inflammations, recent surgery or radiotherapy [8].

Talc pleurodesis was first described by Chambers (1958) [9]. Since that time, talc pleurodesis has been widely performed for the management of persistent pneumothorax or pleural effusion, particularly for malignant effusions. Talc deposits in the pleura produce areas of increased uptake on ^{18}F -FDG-PET that correspond with areas of high-density pleural thickening on CT. Pleural inflammation due to the talc pleurodesis was presumed to be the cause of increased ^{18}F -FDG activity in our patient because the regions of increased activity correlated with the deposits of talc seen on the CT component of PET/CT. Talc-stimulated macrophages release IL-8, in addition to macrophage chemoattractant protein 1 (MCP-1) and in the presence of adhesion molecule expression on the mesothelial cell may amplify the inflammatory response [10].

In conclusion, it was important in our case to correlate the PET with the CT imaging findings and the clinical history in order to distinguish a benign inflammatory process from malignancy.

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Hell J Nucl Med 2010; 13(2): 179-180