CASE REPORT

An interpreting physician is essential to avoid inaccurate diagnosis of PET-CT: A case report

Mohamed Awad Tag Eldin *, Tamer Ibraheem

Pulmonary Medicine Department, Ain Shams University, Egypt

Received 10 October 2013; accepted 21 October 2013
Available online 25 November 2013

KEYWORDS
PET-CT; Chest; Diagnosis; Pulmonary lesions

Abstract The presence of a pulmonologist in the process of interpreting chest PET-CT is quite crucial, as the clinical findings will prevent any misdiagnosis. 

© 2013 Production and hosting by Elsevier B.V. on behalf of The Egyptian Society of Chest Diseases and Tuberculosis. Open access under CC BY-NC-ND license.

Case presentation

A 41 years old male who is a nonsmoker, with no co-morbidities, presented with cough and low grade fever of one month duration for which he sought medical advice and radiological examination was done (Fig. 1) along with receiving cough syrup and oral Amoxicillin/clavulanic acid 1 g/12 h for 2 weeks with no improvement of either cough nor fever.

Laboratory results showed a sedimentation rate of 22 mm/h, C-reactive protein of 2.69 mg/L (slightly high), other routine laboratory tests; complete blood count and differential leukocyte counts were within normal limits and urinalysis was all within normal limits. Sputum for Ziehl–Neelsen stain was negative for acid fast bacilli repetitively.

Fiberoptic bronchoscopy (FOB) was advised, but the patient refused, then CT guided biopsy was advised but the patient refused, so [18F] 2-fluoro-2deoxy-D-glucose (18F-FDG) Positron emission tomography – computed tomography (PET-CT) was done 3 days later (Fig. 2).

According to radiological evaluation patient was fit for surgical intervention along with functional evaluation and general condition, but our clinical impression was not consistent with radiological impression, there is no chest pain or hemoptysis or affection of general condition, patient received oral clarithromycin and injectable third generation cephalosporin and CT chest was repeated 5 weeks later (Fig. 3).

Follow up radiological, clinical and FOB should be done every 3–6 months.

Discussion

Advances in CT scanning have revolutionized pulmonary medicine, allowing for the noninvasive diagnosis of multiple conditions of the lung and mediastinum that previously required biopsy. No technology, however, is without limits; widespread acceptance of CT scanning has been complicated by the frequent findings of pulmonary
lesions that are either too small for diagnostic biopsy, near vasculature or do not possess attributes specific to any single diagnosis [1].

18F-FDG PET-CT imaging has dramatically changed cancer staging, and findings of restaging studies commonly affect changes in treatment protocols [1].
\(^{18}\text{F-FDG}\) however is not tumor specific. As interpreting physicians we need to be aware of these false positives and false negatives [2].

Inflammatory cells such as neutrophil and activated macrophages at the site of inflammation or infection show increased FDG accumulation [3]. Active granulomatous processes (tuberculoma and tuberculous lymphadenopathy, sarcoidosis, cryptococcosis, and paragonimiasis), other infectious conditions and active fibrotic lesions have also been reported to show increased FDG accumulation and cause false-positive PET-CT scans for malignancy [3].

As many lesions may have an infectious cause, some advocate the use of empiric antibiotics, hoping that successful treatment may obviate the need for further testing. Macrolide antibiotics are known to have anti-inflammatory and immunomodulatory properties independent of their antimicrobial effects and have been used to treat such inflammatory disorders as panbronchiolitis, asthma, bronchiectasis, and cryptogenic organizing pneumonia [4,5].

It is found that macrolides may contribute to lung regeneration through their actions on several components of the remodeling process and the effects of macrolides on the regenerative response of alveolar epithelium to injury, and in the alveolar surfactant homeostasis [6].

In conclusion, in light of the increased reliance of \(^{18}\text{F-FDG}\) PET-CT for cancer staging, it is vital that radiologists and pulmonary physicians be aware of pitfalls in \(^{18}\text{F-FDG}\) PET-CT imaging and correlate PET and CT components with clinical data to avoid misdiagnosis, overstating of disease, surgical interventions and unnecessary biopsies.

References