CASE REPORT

Positron emission tomography/computed tomography data of a tuberculosis mimicking lung cancer: A Case report

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Abstract PET/CT is a modern and very valuable tool for detecting primary or secondary lung cancers. However, in countries where tuberculosis is endemic, data must be interpreted with caution because of the frequent tuberculomas. We report here a case of a cancer-like tuberculoma of the lung with paralysis of the left vocal cord, and discuss the PET/CT contribution in tuberculomas as well as the noncancer etiologies of this damage.

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Introduction
Fluorodeoxyglucose positron emission tomography/computed tomography (PET/CT) is a powerful tool in cancer imaging. The principle is to pinpoint abnormal accumulation of the radiopharmaceutical in areas of increased glucose metabolism. However, glucose is also an important substrate for inflammatory cells. Recent studies suggested that PET/CT findings should be interpreted with caution in tuberculosis-endemic regions [1,2]. We report here the case of a pulmonary tuberculosis mimicking lung cancer.

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Observation

We present a case of a 52-year-old, heavy smoker male who was admitted with a history of cough and vocal cord paralysis for the last 3 months.

After general and clinical examinations, we performed a laryngoscopy that found a paralysis of the left vocal cord, with no hypopharynx or larynx visible lesion.

Computed tomography of the thorax revealed a 6 cm × 4.5 cm mass of the left upper lobe with no evident mediastinal nodes (Fig. 1).

The maximum standardized uptake value (SUVmax) of the mass lesion was 12.3 on the PET/CT examination, with no uptake on the hypopharynx or larynx (Fig. 2).

Flexible fiberoptic bronchoscopy was then performed and no visible endobronchial lesion was noticed. Results of smear and cytology of the bronchial lavage fluid were negative for acid-fast organisms (AFB) and malignant cells. The culture
of bronchial lavage fluid was also negative for tuberculosis. Transthoracic needle biopsy guided by computed tomography showed no abnormal cells.

A left thoracotomy was performed, and a frozen section of the mass revealed a giant-cell granulomatous inflammation with caseous necrosis. Given the extent of the lesion, we also performed a biopsy of the lung for confirmation. The postoperative course was uneventful. The patient received antituberculous therapy for 6 months, with an excellent long-term radio clinical evolution.

Discussion

Differentiating lung cancers from tuberculomas is very important, because in Morocco, lung granulomas arise mostly from tuberculosis. However, diagnosis of the tuberculoma is usually difficult, because of its nonspecific radiographic appearances and the difficulty of bacteriological confirmation unlike the common tuberculosis. Vocal cord paralysis is sometimes the only sign of an underlying disease [3]. Thus, it is clinically important to diagnose the primary disease in cases of vocal cord paralysis (VCP) because many of its potential causes, such as symptom-free malignant tumors, can be fatal or cause serious morbidity if detected late [3,4].

In the thorax, the left recurrent laryngeal nerve is more vulnerable than the right because of its longer intrathoracic course, coming in contact with the mediastinal surface of the left lung, continuing along the mediastinal lymph nodes, and finally looping around the aortic arch [5]. VCP has been reported to be about 1.4–2.5 times more frequent on the left side than on the right [4].

Left VCP associated with a mass in the lung usually signifies a diseased condition, implying a lung carcinoma with subaortic lymph node metastasis [6]. In our case, despite the left vocal cord paralysis, neither subaortic lymph nodes, nor tumor invasion of the aortopulmonary window was noticed on the CT scan.

Radiologic evaluation is often useful for determining the etiology of VCP, especially in intrathoracic etiologies. However, chest radiographs can sometimes miss small lesions in the mediastinum [3]. In these cases, computed tomography (CT) can be a very sensitive and valuable diagnostic tool [3], especially for the neck and upper chest lesions.

18F-FDG PET contributes significantly to the diagnosis of lung cancer, but FDG is not a cancer-specific agent, inflammatory lesion- like tuberculomas in this case- can also accumulate glucose. Recently, 18F-FDG PET has been used to evaluate activity response to antituberculous chemotherapy in patients with tuberculomas [7].

Left recurrent laryngeal nerve palsy in patients with mediastinal lymphadenopathy caused by tuberculosis, pneumoconiosis, or sarcoidosis has rarely been reported [8]. In chronic pulmonary disease, paralysis may be caused by three possible conditions: (1) when the nerve is passing through or is adjacent to caseous nodes, (2) when the nerve is trapped in fibrous pleural thickening or in chronic fibrosing mediastinitis, and (3) when the nerve is stretched by retraction of the left upper lobe bronchus pulled toward the apex [9]. The latter is probably the one involved in our case.

We found five cases of 4 to 30 year-old (average 14) patients with tuberculosis-destroyed lungs or tuberculous pleurisy scars including the upper mediastinal pleura who had a history of VCP. The second and the third mechanisms are more likely to be involved in these cases. We also found a patient with active tuberculosis in the apex. The mechanism in this case was uncertain, but other factors are possible, such as the direct spread of infection, damaging the nerve [5].

A negative chest and neck CT usually reassures clinicians and suggests that the VCP is idiopathic, thus obviating the need for aggressive therapeutic regimens or further invasive diagnostic testing [10].

Multi-tracer PET, a novel promising technology utilizing differences in tracer kinetics and decay, has been providing additional and complementary information to improve pulmonary nodule characterization [11].

Conclusion

The exact role of PET/CT in tuberculosis is not yet clearly defined. With the development of more specific radiotracers in the future, PET/CT may play a significant role in the diag-

![Figure 1](image1.png)

Figure 1  Chest CT scan: excavated mass of the left upper lobe.

![Figure 2](image2.png)

Figure 2  PET/CT: isolated hyperfixation of the mass.
nosis of tuberculosis. Till then, positive FDG PET/CT findings should be interpreted with caution in tuberculosis-endemic regions.

The authors confirm that the patient described in this case report has given his informed consent for publication.

The authors confirm that they all contributed to this work.

Conflict of interest

The authors declare having no conflict of interest.

References


