

¹³¹I Uptake in Bronchiectasis Detected by Single Photon Emission Computed Tomography/Computed Tomography during Follow-up of Thyroid Cancer

Abstract

During follow-up of thyroid cancer, ¹³¹I whole-body scan showed intense tracer uptake in the right hemithorax of a patient previously submitted to thyroidectomy and radioiodine therapy for differentiated thyroid cancer. Thyroglobulin was undetectable at the time of the scan. Single-photon emission computed tomography/computed tomography (SPECT/CT) of the thorax correctly identified widespread bronchiectasis ¹³¹I-avid in the middle lobe of the right lung. After bronchoalveolar lavage, a bronchial specimen was positive for *Mycobacterium avium* infection. Hybrid imaging with SPECT/CT allowed to correctly identify a false-positive case of ¹³¹I uptake due to inflammation in a single diagnostic session, minimizing patient discomfort or misdiagnoses.

Keywords: ¹³¹I, bronchiectasis, pitfalls, single-photon emission computed tomography/computed tomography, uptake

A 46-year-old female underwent thyroidectomy for differentiated thyroid cancer [Figure 1]. Postoperative ¹³¹I whole-body scan showed tracer uptake, higher than surrounding background, in the neck (a) and

in the right hemithorax (a, arrow). The patient underwent radioiodine therapy (1850 MBq). Nine months after, the patient underwent ¹³¹I whole-body scan (b): diffuse ¹³¹I uptake was observed in the right hemithorax;

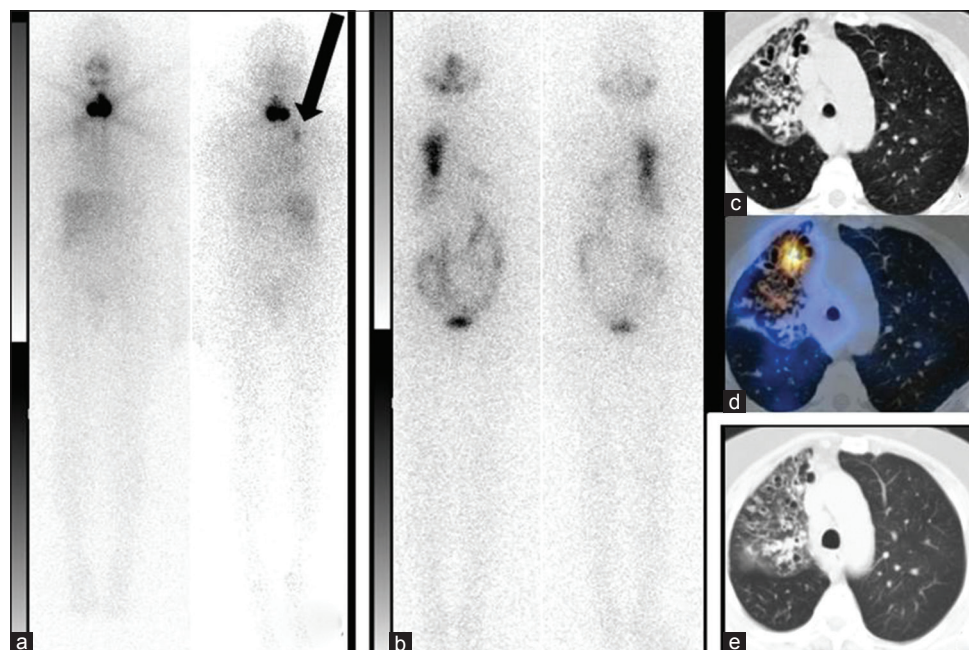


Figure 1: Postoperative ¹³¹I whole-body scan shows tracer uptake in the neck (a) and in the right hemithorax (a, arrow). A following further ¹³¹I whole-body scan confirms diffuse ¹³¹I uptake in the right hemithorax (b); CT (c) and SPECT/CT (d) showed ¹³¹I uptake in association with bronchiectasis in the middle lobe of the right lung. A CT of the thorax (e) performed at follow-up, showed partial resolution of bronchiectasis

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thyroglobulin serum level was 0.1 ng/ml at the time of the second ¹³¹I scan, but the patient's anamnesis was positive for chronic dyspnea and cough. Single-photon emission computed tomography/computed tomography (SPECT/CT) was performed. CT (c) and SPECT/CT (d) showed ¹³¹I uptake in widespread bronchiectasis in the middle lobe of the right lung.

A bronchial specimen was positive for *Mycobacterium avium* infection. CT of the thorax (e), performed at 3-month follow-up, showed partial resolution of bronchiectasis.

¹³¹I is a useful radiopharmaceutical in imaging thyroid cancer;^[1] it is well known the possibility to detect ¹³¹I uptake in inflammatory lesions.^[2] Moreover, other malignant tumors show ¹³¹I-avid uptake that can be managed by SPECT/CT.^[3]

Hybrid scanners allowed nuclear medicine physicians to identify diagnostic pitfalls occurring in clinical practice.^[4] Similarly, to other reports on this topic,^[5,6] the use of CT with "lung window" allowed to identify diffuse ¹³¹I-avid bronchiectasis in a single diagnostic session, minimizing patient discomfort. The ¹³¹I uptake in bronchiectasis is due to expression of sodium-iodide symporter in secretions.^[7] Nuclear medicine physicians should be aware of tracer physiological distribution and pitfalls, to avoid misdiagnosis. Laboratory data, expertise on CT,^[8] and hybrid imaging are of the utmost importance.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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