

QUESTION 2

What are the causes of abnormal ^{111}In -octreotide uptake in the lungs in addition to ^{111}In -octreotide-avid tumors?

- A. Infections.
- B. Sarcoidosis.
- C. Inflammatory conditions.
- D. All of the above.

CASE DISCUSSION

The scan of this patient showed a single focus of intense uptake in the right lung and diffuse mild uptake in the rest of the lung tissue bilaterally. The corresponding CT scan showed a tumor in the region of intense uptake and centrilobular emphysema in the rest of the lungs bilaterally. The previously obtained ^{18}F -FDG PET/CT scan showed intense uptake within the tumor but did not demonstrate abnormal diffuse uptake bilaterally within the emphysema.

Somatostatin is a naturally occurring neuropeptide. Somatostatin receptors are found in many tumors, including pituitary adenomas, islet cell tumors, neuroblastomas, pheochromocytomas, small cell carcinoma of the lung, paragangliomas, carcinoid, medullary carcinoma of the thyroid, meningiomas, astrocytomas, lymphoma, Merkel cell tumors, and breast cancer. Also, somatostatin receptors are found in activated leukocytes in granulomatous processes such as sarcoid, tuberculosis, and chronic inflammatory processes (inflammatory bowel disease, rheumatoid arthritis).

A ^{111}In -octreotide scan normally shows activity in the thyroid gland, liver, gallbladder, spleen, bowel, kidneys, and urinary bladder. ^{111}In -octreotide uptake in the lung previously has been reported in infections (lung abscess, pneumonia), sarcoidosis, hypersensitivity pneumonitis from pigeon antigens, and radiation fibrosis, in addition to ^{111}In -octreotide-avid tumors. The uptake is possibly due to activated cells, mainly macrophages within the granulomas and in the alveoli, expressing somatostatin receptors.

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*For the answers, see page 120.

Erratum

In the continuing education test for “Small-Animal PET: What Is It, and Why Do We Need It?” by Yao et al. (*J Nucl Med Technol.* 2013;40:157–165), question 7 contained an error. The corrected question appears below. The authors regret the error.

- 7.** *The total blood volume of a small animal to be imaged is estimated to be 7.5 mL. The volume of the dose of radiopharmaceutical should be less than...*
- A. 0.25 mL.
 - B. 1 mL.
 - C. 0.75 mL.
 - D. 2.5 mL.