

Recurrent ^{99m}Tc Sestamibi Emboli in the Lungs Revealed on Consecutive Rest and Stress Single-Photon Emission Computed Tomography/Computed Tomography Myocardial Perfusion Images

Abstract

Many causes of incidental focal uptake on raw data images using myocardial perfusion imaging, including malignant diseases, metastatic processes, benign pathologies, and physiological conditions, have been reported in the literature. However, iatrogenic ^{99m}Tc sestamibi emboli have not yet been reported. Herein, we demonstrated iatrogenic ^{99m}Tc sestamibi embolization on consecutive rest and stressed myocardial perfusion images at different locations.

Keywords: ^{99m}Tc sestamibi, iatrogenic emboli, myocardial perfusion imaging, single-photon emission computed tomography/computed tomography

A 53-year-old male patient with hypertension and diabetes had a 15-day history of chest pain and was referred for myocardial perfusion scintigraphy. According to our department protocol, 1-day rest and stress myocardial integrated single-photon emission computed tomography/computed tomography (SPECT/CT) images were acquired. Rest SPECT/CT images obtained 60 min after injection of 10.7 mCi (395.9 MBq) of ^{99m}Tc sestamibi revealed a normal myocardial perfusion with a focal uptake at the left hemithorax [Figure 1a]. This uptake was paired with focal ^{99m}Tc-sestamibi accumulation in the anterior segment of the left upper lobe on SPECT/CT images with no pathologic pulmonary findings in the corresponding low-dose CT images [Figure 1b]. After rest imaging, the patient underwent a standard adenosine stress test. Subsequently, 140 µg/kg/min of adenosine infusion was administered over 6 min, and 31.1 mCi (1150.7 MBq) of ^{99m}Tc-sestamibi was injected at the 3rd min. Stress SPECT/CT myocardial perfusion images acquired 30 min after the pharmacological stress test revealed no sign of hypoperfusion or perfusion defects similar to those in the rest images. However, a focal ^{99m}Tc-sestamibi uptake was observed at the right hemithorax on stress raw data

images, and the focal activity accumulation in the left lung, which was detected on the rest images, disappeared [Figure 1c]. Stress SPECT/CT images demonstrated focal increased uptake of ^{99m}Tc-sestamibi in the lateral segment of the right middle lobe without any pulmonary pathology on the reciprocal low-dose CT images [Figure 1d]. These aforementioned incidental focal ^{99m}Tc-sestamibi accumulations in both lungs were evaluated as iatrogenic ^{99m}Tc-sestamibi embolism due to the absence of accompanying pulmonary anomalies in the corresponding low-dose CT images and the disappearance and appearance of focal ^{99m}Tc-sestamibi uptake on the consecutive rest and stress images. Information collected from raw data images is very important for detecting extracardiac findings using myocardial perfusion scintigraphy. Although many causes of incidental focal uptake on raw data images in myocardial perfusion imaging, including malignant diseases, metastatic processes, benign pathologies, and physiological conditions, have been reported in the literature,^[1-12] to the best of our knowledge, this report is the first to demonstrate iatrogenic ^{99m}Tc-sestamibi embolization on rest and stress myocardial perfusion images at different locations. In our case, SPECT/CT helped to avoid additional diagnostic tests and radiation exposure

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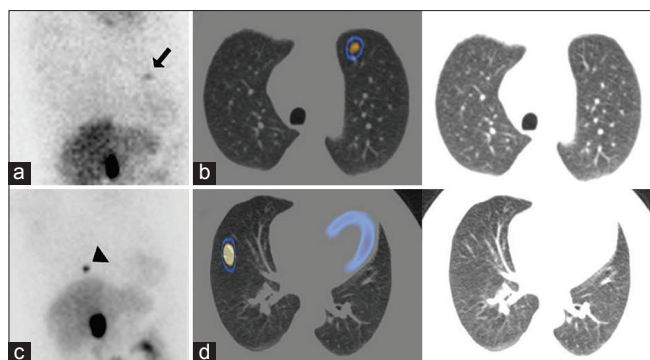


Figure 1: Rest single-photon emission computed tomography/computed tomography myocardial perfusion scintigraphy images showed a focal ^{99m}Tc-sestamibi accumulation in the anterior segment of the left upper lobe without any pulmonary pathology (arrow in [a] rest raw data image; [b] corresponding fusion lung window rest single-photon emission computed tomography/computed tomography and lung window computed tomography images). Stress single-photon emission computed tomography/computed tomography myocardial perfusion scintigraphy images revealed disappearance of the focal activity accumulation in the left lung and a focal uptake in the lateral segment of the right middle lobe with no pulmonary pathology (arrowhead in [c], stress raw data image; [d] fusion lung window single-photon emission computed tomography/computed tomography and corresponding lung window computed tomography)

and provided psychological comfort to the patient by identifying the false-positive result. For this reason, apart from its significant role in reducing attenuation artifacts and improving image quality, SPECT/CT may alter the approach for patients with extracardiac findings detected using myocardial perfusion imaging.

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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