Breast metastasis from the pancreatic neuroendocrine tumor origin detected by ^{99m}Tc-Octreotate scan

Case Report

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ABSTRACT

A 50 years old woman with history of pancreatic neuroendocrine tumor diagnosed 2 years ago, which has not been surgically removed,was referred to our department for a ^{99m}Tc-Octreotate in order to evaluate the somatostatin receptor status. She was treated with regular sandostatin injections and chemotherapy. Her CT scan which was previously performed confirmed lung, adrenal and hepatic metastases. In her original pancreatic mass biopsy, well-differentiated neuroendocrine tumor of the pancreas with 3% rate of KI-67 positivity was reported. Whole body ^{99m}Tc-Octreotate scan was obtained 4 hours post-intravenous injection of 20 mCi of the radiotracer showed multiple areas of increased tracer uptake in the pancreas, left adrenal, both breasts and left axillary region. Considering the fact that metastasis of the pancreatic NET to the breast is extremely rare, we recommended mammographic correlation and tissue biopsy. Her CT scan images and mammography confirmed breast masses and the biopsy revealed metastatic NET from the pancreatic origin.

Key words: Neuroendocrine tumor; Breast; Metastasis; ^{99m}Tc-Octreotate

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CASE PRESENTATION

A 50-year-old woman, with history of pancreatic neuroendocrine tumor, which have been confirmed by pancreatic biopsy 2 years previously, was referred to our nuclear medicine center for whole body ^{99m}Tc-Octreotate scintigraphy. The histopathology report of pancreatic biopsy stated that the tumor was a well differentiated with 1% Ki-67 rate. Also, synaptophysin and chromogranin were positive in immunohistochemistry evaluation. She showed complaint of a dull abdominal pain and discomfort, with no other significant symptoms. Her previous thoracic and abdominal CT scans showed a large hepatic mass, left adrenal and pancreatic body mass with invasion to the portal vein.

Whole body scan was performed 3 hours after IV injection of 20 mCi of ^{99m}Tc-Octreotate by a dual head gamma camera (Siemens), equipped with low energy high resolution collimator with 1024*128 matrix and photo-peak of 140±5%. The study demonstrated foci of abnormally increased activity in right and left anterior chest, as well as mid and lower abdomen and the liver (Figure 1).

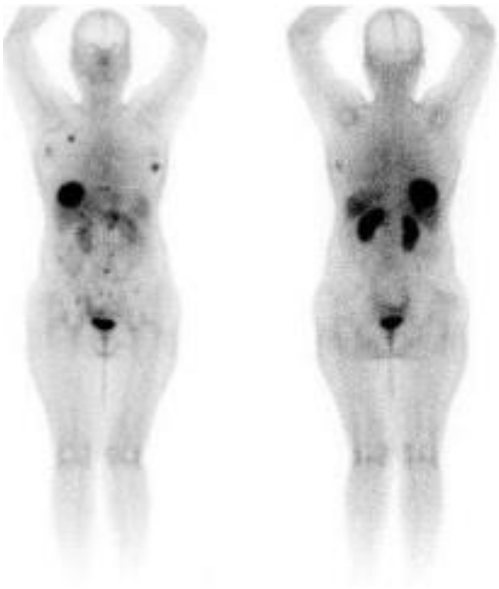

Fig 1. Whole body scan by ^{99m}Tc-Octreotate: Anterior (left) and posterior (right) veiwes.

Single photon emission computed tomography (SPECT) was performed from the thoracic and abdominal regions in step, shoot mode, in 3 degrees intervals, and reconstructed by OSEM protocol, which confirmed foci of tracer uptake in bilateral breast tissues (Figure 2).

SPECT images also localized the large right hepatic lobe and left adrenal metastasis. There was also foci of tracer activity in the lower abdominal area, which were confirmed in SPECT images suspicious for peritoneal seeding.

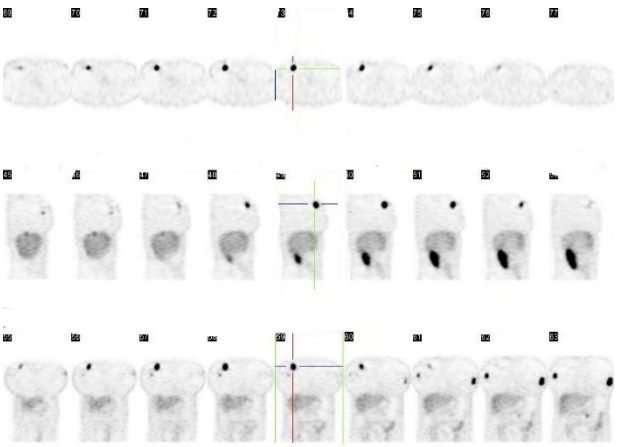

Fig 2. SPECT images of ^{99m}Tc-Octreotate for the thoracic and abdominal regions.

CT scan was also performed to evaluate the new foci of activity in the breasts as well as other findings. The CT slices confirmed that there are two masses in the right and left breasts (21 mm and 27 mm in MTD, respectively), with speculated borders (Figure 3). CT also confirmed the known hepatic, pancreatic and left adrenal masses, with multiple zones of peritoneal seeding. Considering the fact that breast metastasis in neuroendocrine tumor is a quite rare, the patient was planned for breast biopsy. Breast biopsy confirmed high-grade neuroendocrine metastasis with 40% Ki-67 positivity.

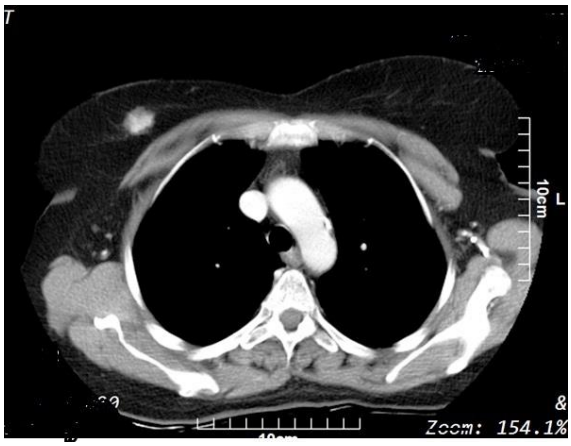

Fig 3. Computed tomography (CT) shows two masses in the right and left breasts.

DISCUSSION

Neuroendocrine tumors (NET) are low-grade malignant neoplasms that occur most commonly in the gastrointestinal (74%) and respiratory tract (25%) [1].

Neuroendocrine breast carcinomas are rare but may represent either as a metastatic or primary lesion. Distinction between primary or metastatic neuroendocrine lesion by mammography or ultrasound is almost impossible [2, 3].

Metastases to the breast are unusual, accounting for about 1 % of all breast neoplasms [4]. The frequency of NET metastases in a large cohort of breast neoplasms was found to be 0.1% [5].

In a review by Kojima et al., the authors report on 59 cases of neuroendocrine tumors of breast. 39 cases were primary neuroendocrine tumors, while only 9 were metastases [6]. Mohanty et al. had described 18 cases of metastatic neuroendocrine neoplasm to the breast [7].

Patients with breast tumors presumed to be mammary carcinoma with neuroendocrine differentiation but showing no expression of progesterone and estrogen receptors should be further investigated for the presence of a primary NET [8].

In conclusion, our case, describes a rare case of breast metastasis from the pancreatic NET origin, which was detected in whole body and SPECT ^{99m}Tc-Octreotate. This case highlights the importance of paying attention and consider the uncommon possibility, while interpreting whole body ^{99m}Tc-Octreotate scintigraphies.

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