Bilateral breast uptake of radioiodine in a male patient with gynecomastia: A case report

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ABSTRACT

A 56-year-old male patient with papillary thyroid carcinoma was given radioiodine for the treatment of persistent disease. Post radioiodine whole body scan revealed uptake at the thyroid region and bilateral uptake at the upper thoracic region. Single photon emission computed tomography/computed tomography (SPECT/CT) confirmed uptake at the left thyroid lobe, and additional symmetrical mammary gland uptake was observed at both breasts. The patient had obesity-related gynecomastia, but he did not have any history of breast cancer, mastitis, hyperprolactinemia, or galactorrhea. Although breast uptake of radioiodine is a common finding in postpartum or lactating women, it is uncommon in male patients. To our knowledge, this is the first case of a male patient with breast uptake of radioiodine documented with SPECT/CT. SPECT/CT is useful in male patients in the differentiation of benign breast uptake with lung metastases or axillary metastases of thyroid cancer.

Keywords: Breast uptake, gynecomastia, radioiodine, single photon emission computed tomography/computed tomography, thyroid cancer

INTRODUCTION

Following radioiodine therapy, a whole body posttreatment radioiodine scintigraphy is performed to localize the tumor extent and possible metastases in patients with differentiated thyroid carcinoma. False positive uptake of radioiodine could be misinterpreted as metastases. Radioiodine uptake of the breast tissue is a common false positive finding in lactating or postpartum women. It can also be seen in the presence of mastitis, hyperprolactinemia, or breast tumor. However, it is very rare in male patients. Here we report a case of a male patient with gynecomastia, who had bilateral symmetrical breast uptake on whole body radioiodine scintigraphy.

CASE REPORT

A 56-year-old male patient diagnosed for papillary thyroid carcinoma was referred to the nuclear medicine department for radioiodine ablation. He had undergone total thyroidectomy operation 1-year ago, and the postoperative pathological examination revealed multicentric papillary thyroid carcinoma with extra thyroidal invasion and positive surgical margins (stage PT3N0M0). The patient had received 1.85 GBq (50 mCi) radioiodine for remnant ablation 7 months ago. Whole body imaging following radioiodine treatment administration showed focal radioiodine uptake at the thyroid region without any metastatic foci. Six months later serum thyroglobulin level was <0.2 ng/ml and anti-thyroglobulin level was 10.58 IU/ml under thyroid stimulating hormone (TSH) stimulation (TSH level: 60.82 µIU/ml). Diagnostic radioiodine whole body scan with 5 mCi I-131 revealed uptake at the thyroid region as expected and also atypical focal radioiodine accumulation at both sides of the upper thoracic region as well [Figure 1a].

Additional single photon emission computed tomography/computed tomography (SPECT/CT) acquisition was performed to identify the source of uptake. SPECT/CT confirmed uptake at the left thyroid lobe, and additional symmetrical mammary gland uptake was observed at both breasts. The patient had obesity-related gynecomastia, but he did not have any history of breast cancer, mastitis, hyperprolactinemia, or galactorrhea. Although breast uptake of radioiodine is a common finding in postpartum or lactating women, it is uncommon in male patients. To our knowledge, this is the first case of a male patient with breast uptake of radioiodine documented with SPECT/CT. SPECT/CT is useful in male patients in the differentiation of benign breast uptake with lung metastases or axillary metastases of thyroid cancer.

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Radioiodine uptake in the breast is a common finding in postpartum or lactating women. It has also been reported in women with a history of hyperprolactinemia or breast diseases. The exact mechanism of I-131 accumulation by breast tissue is unclear, however, enhanced NIS expression in the breast tissue in lactating women and in the presence of hyperprolactinemia have been proposed. However, idiopathic breast I-131 uptake has also been reported, in a nulliparous woman without endocrine abnormality or breast disease. Breast uptake of radioiodine is an uncommon finding in male patients without hyperprolactinemia or breast pathology.

Sodium/iodide symporter (NIS) is the route of access for iodine to the thyroidal follicular cells for normal thyroid hormone synthesis. In the presence of thyroid cancer, radioiodine is transported into the cancer cells via NIS. Radioiodine ablation is usually inefficient in undifferentiated thyroid cancers, as those cells have lost their ability to express NIS. Although the majority of NIS in the body is localized in the thyroid gland, it is also present in nonthyroidal tissues, such as breast, thymus, salivary gland, gastrointestinal tract, and various tumors. Therefore, a false positive uptake of radioiodine, at least hypothetically, could be seen in those tissues with NIS expression.

It is important to identify correctly the breast radioiodine uptake and differentiate it from other possible metastatic foci. Breast uptake on planar whole body I-131 scan could be misinterpreted as lung or axillary metastases of the thyroid cancer. As the case in this report, SPECT/CT is extremely useful to localize such ambiguous uptake due to its cross-sectional nature with the coexistence of strong morphological data provided by CT part of the examination. We administered a higher dose (150 mCi) of radioiodine to avoid a possible third radioiodine therapy as the first radioiodine dose was unsuccessful, and the postoperative pathology revealed extracapsular invasion and positive surgical margins.

To the best of our knowledge, this is the first case in the literature showing benign breast uptake of radioiodine in a male patient with gynecomastia. The presence of bilateral symmetrical breast uptake was helpful for this particular patient to identify correctly the breast accumulation. However, nuclear medicine physician should be more cautious, particularly in the presence of asymmetrical upper chest uptake in a male patient and conventional planar scintigraphy should be supported by additional SPECT or SPECT/CT scanning in such situations when available.

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**Conflicts of interest**
There are no conflicts of interest.

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