

SSTR Expressing Mediastinal Ectopic Thyroid: A Rarity Unveiled

Abstract

Rarely, ectopic thyroid tissue can coexist with an eutopic thyroid. Technetium pertechnetate scan is peculiar for thyroid tissue uptake. However, DOTANOC uptake in mediastinal ectopic thyroid has been rarely reported. We present a unique case of an ectopic mediastinal thyroid mass that did not show any uptake on a pertechnetate scan and showed significantly increased uptake on ^{68}Ga -DOTANOC positron emission tomography-computed tomography with an eutopic cervical thyroid with normal pertechnetate and physiological mild DOTANOC uptake.

Keywords: ^{68}Ga -DOTANOC positron emission tomography-computed tomography, $^{99\text{mTc}}$ Technetium-pertechnetate scan, ectopic mediastinal thyroid

Case and Discussion

A 31-year-old female presented with exertional dyspnea and retrosternal chest pain for 3 months. Contrast-enhanced computed tomography (CECT) thorax showed a mass measuring $\sim 8\text{ cm} \times 5.5\text{ cm}$ in the anterior and superior mediastinum abutting the left lobe of thyroid, a possible differential of lymphoma, neurogenic tumor, germ cell tumors, ectopic thyroid tissue, thymoma, or neuroendocrine tumor (NET) were considered by the clinician. Her thyroid profile was within normal limits (thyroid-stimulating hormone – 2.07 uIU/mL, T3 – 137 ng/dl, and T4 – 6.8 ug/dl). Serum chromogranin was normal (45.4 ng/mL). Other tumor markers including Beta-human chorionic gonadotropin (beta-hCG), Cancer antigen-125 (CA-125), Alpha-fetoprotein (AFP), Carcino-embryogenic antigen (CEA), and Carbohydrate antigen 19.9 (CA19.9) were also within normal limits. $^{99\text{mTc}}$ Technetium-pertechnetate scan with single-photon emission CT/CT [Figure 1a and d] showed tracer uptake in the normal cervical thyroid gland with no significant uptake in mediastinal mass. On ^{68}Ga -DOTANOC positron emission tomography-CT (PET/CT) [Figure 1b and e], a well-defined, heterogeneous density tracer-avid mass measuring $\sim 8\text{ cm} \times 5.6\text{ cm}$ was noted in the superior and anterior mediastinum on the left side extending from D1–D6 vertebrae

level abutting the left lobe of the thyroid with low fluorodeoxyglucose (FDG) avidity on ^{18}F -FDG PET/CT [Figure 1c and f]. Both lobes of the thyroid gland in the cervical region appeared normal. In view of increased somatostatin (SSTR) expression and low FDG avidity, a high possibility of a neuroendocrine tumor was considered. She underwent an *en bloc* resection of the mass with excision of adherent adjacent thymic tissue. On histopathology [Figure 2], gross images showed a well-circumscribed nonencapsulated mass with cut sections showing areas of hemorrhage, scarring, and brown colloid-filled nodular areas [Figure 2a]. Microscopy showed thyroid follicles of varying sizes with evidence of old hemorrhage and scarring [Figure 2b and c]. The left lobe of the thymus attached with the specimen showed thymic parenchyma within normal histological limits for age [Figure 2d]. Thus, a final impression of the ectopic thyroid gland with adenomatous changes was made. Ectopic thyroid tissue can be described as functional thyroid tissue that is located anywhere other than its anatomic position including the mediastinum, heart, diaphragm, and esophagus.^[1] Intrathoracic ectopic thyroid tissue is very rare and is usually located in the anterosuperior aspect of the mediastinum.^[2–4] Intrathoracic thyroid is often secondary to the extension of the cervical portion of the thyroid gland; however, in the present case, the mass was separate from the thyroid gland in the neck.^[4] In symptomatic cases, surgery is

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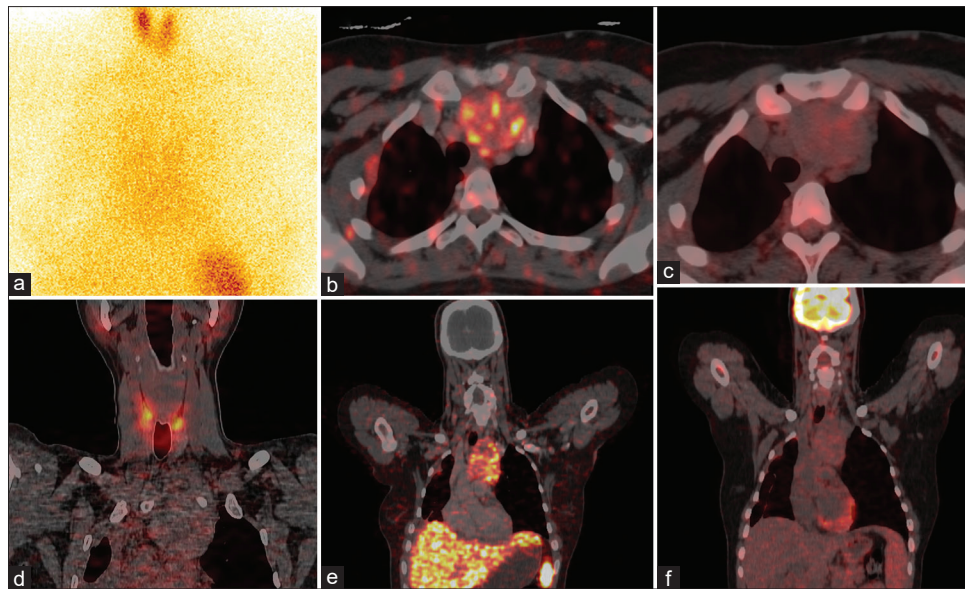


Figure 1: (a,d) ^{99m}Tc -pertechnetate scan with SPECT/CT shows tracer uptake in normal cervical thyroid gland with no significant uptake in mediastinal mass. (b,e) On ^{68}Ga -DOTANOC PET/CT a well-defined, heterogenous density tracer avid mass was noted in the superior and anterior mediastinum on the left side extending with low FDG avidity on ^{18}F -FDG PET/CT (c,f)

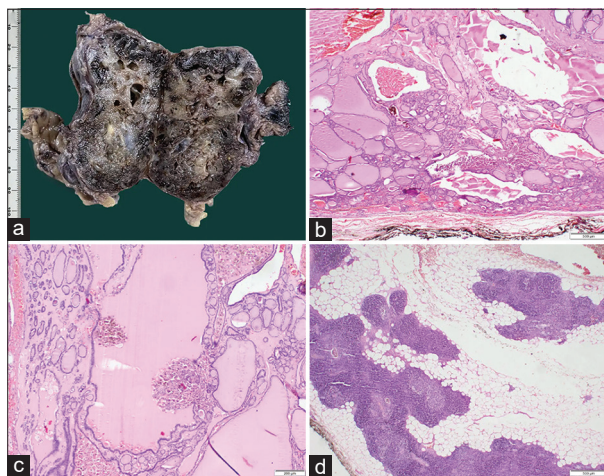


Figure 2: On histopathology, gross images show a well circumscribed non-encapsulated mass with cut sections showing areas of hemorrhage, scarring and brown colloid-filled nodular areas (a). Microscopy showed thyroid follicles of varying sizes with evidence of old hemorrhage and scarring (b, c). Left lobe of the thymus attached with the specimen (d) showed thymic parenchyma within normal histological limits for age

the treatment of choice.^[5,6] Ectopic thyroid tissue presents as intensely enhancing mass on CECT scan; however in our case, it showed heterogeneous density mass with mild enhancement, while noncontrast CT showed attenuation less than normal cervical thyroid gland likely due to necrosis.^[7] Technetium-99m or I-123 thyroid scintigraphy is the most useful diagnostic tool in localizing ectopic thyroid tissue; however, absent iodine content can be due to necrosis or underlying malignancy.^[3] Our patient did not have uptake in thyroid scintigraphy attributable to necrosis (after ruling out contrast interference). It is well known that normal thyroid expresses SSTRs, as seen in ^{68}Ga -DOTANOC scan.^[8] To our knowledge, no published literature could

be found where SSTR expression in the ectopic thyroid gland is documented. Thus, patients with SSTR expressing mediastinal masses may also have ectopic thyroid tissue as a possible differential.^[9]

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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