

Graves' Disease in Eutopic Thyroid with Ectopic Mediastinal Thyroid Tissue: Role of Single Photon Emission Computed Tomography-Computed Tomography

Abstract

Ectopic thyroid is a rare embryological aberration due to defective migration. Most patients with ectopic thyroid tissue have absent thyroid gland in normal anatomical position and present with hypothyroidism. We present a patient with Graves' disease in the eutopic thyroid with ectopic thyroid tissue in the mediastinum and usefulness of single-photon emission computed tomography-computed tomography.

Keywords: Ectopic, Graves' disease, mediastinum, single-photon emission computed tomography-computed tomography (SPECT-CT)

Introduction

Ectopic thyroid is a rare embryological aberration due to defective migration. It is most commonly found along the tract of descent of the thyroid from foramen cecum till lower pole of thyroid cartilage or along the line of obliterated thyroglossal duct in approximately 90%. Other rare sites are mediastinum, abdomen, and pelvis. Most patients with ectopic thyroid tissue have absent thyroid gland in normal anatomical position and present with hypothyroidism. Patients presenting with toxic goiter or Graves' disease in the eutopic thyroid with ectopic thyroid tissue in the mediastinum is a very rare finding. We report such a case with usefulness of single-photon emission computed tomography-computed tomography (SPECT-CT).

Case Report

A 41-year-old male patient presented with a history of swelling in the neck for 5 years, palpitation, tremor, weight loss, and generalized body ache. On evaluation, the thyroid function test shows raised free triiodothyronine >20 pg/mL (normal range 2.3–4.2 pg/mL), raised free thyroxine >12.0 ng/mL (normal range 0.89–1.76 ng/mL), and suppressed thyroid-stimulating hormone <0.01 mIU/L (normal range 0.34–5.5 mIU/L).

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Ultrasonography neck was suggestive of enlarged thyroid gland with features of thyroiditis. Planar image of the neck and upper chest acquired in anterior view 20 min after intravenous injection with 5 mCi of Tc-99m sodium pertechnetate showed homogeneously increased tracer uptake in the enlarged thyroid gland with suppression of salivary glands tracer uptake [Figure 1]. The tracer uptake at 20 min was 22.3% (normal range 0.4%–4.0%). The overall features were suggestive of diffuse toxic goiter. However, there was an additional focus of tracer uptake in the upper chest on the right side, separate from the thyroid gland [Figure 1 arrow], which persisted on additional planar image acquired after drinking of water.

SPECT-CT images with low-dose, noncontrast CT of the chest were acquired to characterize the abnormal focus of tracer uptake in the chest [Figure 2]. The tracer uptake in the chest was localized to a well-defined, minimally hyperattenuating soft-tissue lesion [Figure 2 arrow] measuring about 1.0 cm × 1.0 cm, in the superior mediastinum posterior to the manubrium on the right side, suggestive of ectopic thyroid tissue. However, due to ethical reasons, the biopsy from this lesion was not obtained. On planar images, the uptake of tracer in the mediastinal

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tissue is not as high as that of eutopic thyroid gland. This may be due to its small size or its presence behind the manubrium. However, SPECT maximum intensity projection image showed increase in intensity of tracer uptake in the mediastinal tissue compared to planar image [Figure 3].

The patient preferred medical management with antithyroid drugs instead of radioiodine ablation.

Discussion

The most common location of ectopic thyroid tissue is base of tongue (lingual thyroid) in about 90% of cases, as reported in the literature.^[1,2] The presence of ectopic thyroid tissue in the mediastinum due to overt descent along thyroglossal duct is a rare entity accounting for approximately 1% of all ectopic locations of the thyroid.^[1] It usually occurs along with normally functioning thyroid gland in the neck.^[2] Coexisting Graves' disease is a further rare entity with only five cases reported till now.^[3-7]

Mediastinal ectopic thyroid tissue if large in size can cause obstructive symptoms such as dysphagia, hoarseness, stridor, dyspnea, rarely with superior vena cava syndrome, and hyperthyroidism.^[4] In this subgroup of patients with obstructive symptoms, surgical excision may be considered. The ectopic thyroid tissue is known to increase in size under increase hormone demand due to stress factors, puberty, and pregnancy.^[7] The differential diagnosis of ectopic mediastinal thyroid is mediastinal tumors or lymphadenopathy, which can be confirmed histologically with CT-guided fine-needle aspiration cytology which is invasive.^[2] Hence, thyroid scintigraphy with SPECT-CT providing functional and anatomical details can accurately characterize such mediastinal ectopic avoiding unnecessary invasive procedures if small in size without obstructive symptoms. The radiotracers used for thyroid scintigraphy are Tc-99m sodium pertechnetate, I-131, and I-123. The present case is unique as it shows Graves' disease in the normal thyroid gland along with an ectopic superior mediastinal thyroid tissue which could be characterized more precisely on SPECT-CT.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given his consent for his images and other clinical information to be reported in the journal. The patient understands that his name and initials will not be published and due efforts will be made to conceal the identity, but anonymity cannot be guaranteed.

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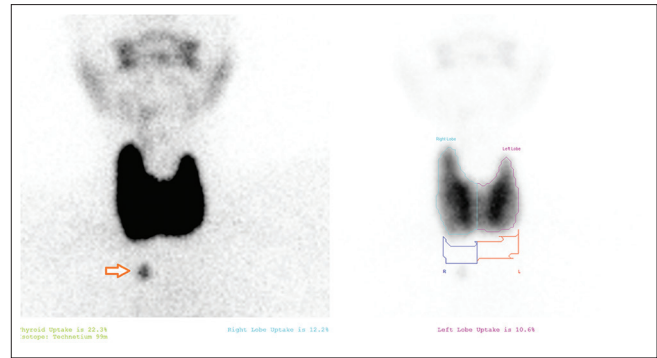


Figure 1: Tc-99m sodium pertechnetate scintigraphy shows homogeneously increased tracer uptake in the enlarged thyroid gland with suppression of salivary glands tracer uptake. The overall features were suggestive of diffuse toxic goiter. There is an additional focus of tracer uptake in the upper chest on the right side, separate from the thyroid gland (arrow), which persisted on additional planar image acquired after drinking of water (not shown here)

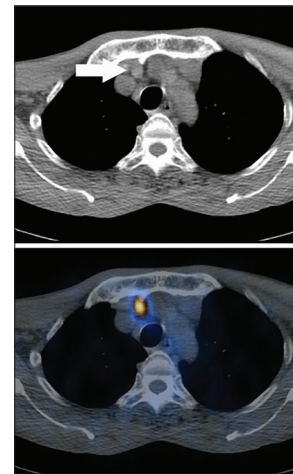


Figure 2: Single-photon emission computed tomography-computed tomography localizes the tracer uptake in the chest to a well-defined, minimally hyperattenuating soft-tissue lesion (arrow) measuring about 1.0 cm × 1.0 cm, in the superior mediastinum posterior to the manubrium on the right side, suggestive of ectopic thyroid tissue



Figure 3: Single-photon emission computed tomography maximum intensity projection image showing increase in intensity of tracer uptake in the mediastinal tissue compared to planar image

Conflicts of interest

There are no conflicts of interest.

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