

Mediastinal ectopic benign colloid goitre detected using iodine-131 whole body scintigraphy and single-photon emission computed tomography-computed tomography

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ABSTRACT

Ectopic thyroid tissue primarily occurs along the course of the embryologic migration of the thyroid gland. Mediastinal thyroid may be differentiated into primary and secondary form. Primary mediastinal goiters are quite rare, occurring in <1% of all goiters. We present findings of 29-year-old female, case of papillary carcinoma of the thyroid who underwent iodine-131 whole body scintigraphy after total thyroidectomy showed a primary mediastinal mass lesion along with residual thyroid. She underwent mediastinal mass excision through sternotomy and biopsy confirmed as ectopic nodular colloid goiter with no malignancy.

Keywords: Iodine-131 single-photon emission computed tomography/computed tomography, mediastinal ectopic benign goiter, papillary carcinoma, surgical excision

INTRODUCTION

Ectopic thyroid gland can be found in the region of the neck, the mediastinum, the pharynx, the larynx, the esophagus, the trachea, and around the aorta.^[1,2] Patients with ectopic mediastinal goiter are usually asymptomatic and reported as incidental finding on chest radiograph.^[3] We present image findings of iodine-131 (I-131) uptake in a mediastinal ectopic benign colloid goiter in I-131 whole body scan (WBS) and hybrid single-photon emission computed tomography/computed tomography (SPECT/CT) in the case of papillary carcinoma.

CASE REPORT

A 29-year-old female presented with palpable thyroid nodule which was confirmed as papillary carcinoma, and she

underwent total thyroidectomy. She was referred for I-131 WBS, which showed residual thyroid in the anterior neck along with an intense uptake in the mediastinum [Figure 1]. SPECT/CT of the chest [Figure 2] revealed an anterior mediastinal mass measuring 7 × 6 × 4 cm with calcification. Total excision of the mass with thymectomy was done, and histopathology revealed primary ectopic nodular colloid goiter with adenomatous hyperplasia with no malignancy. Thymus was separate from the lesion and had no pathological change. She underwent radioiodine ablation therapy with the dose of 100 mCi (3.7 Gbq) and post therapy I-131 WBS showed good residual thyroid uptake with no residual in mediastinum [Figure 3]. After 6 months, her thyroglobulin was <0.2 ng/ml, and I-131 WBS showed complete ablation of the residual thyroid [Figure 4].

DISCUSSION

Mediastinal ectopic thyroids with no connection to normal thyroid gland are very rare, accounting for <1% of all cases,^[1] but rare mediastinal ectopic thyroid is also important to consider in the differential diagnosis of mediastinal masses. Mediastinal tumors include primary thymic carcinomas, neuroendocrine carcinomas, germ-cell tumors, and lymphomas, as well as neurogenic, endocrine, and mesenchymal tumors. Endocrine tumors include

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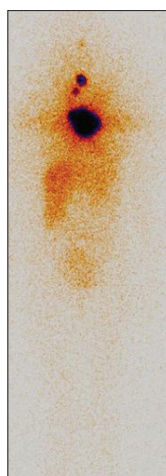


Figure 1: Whole body iodine-131 scintigraphy shows uptake in thyroid remnant and in mediastinum

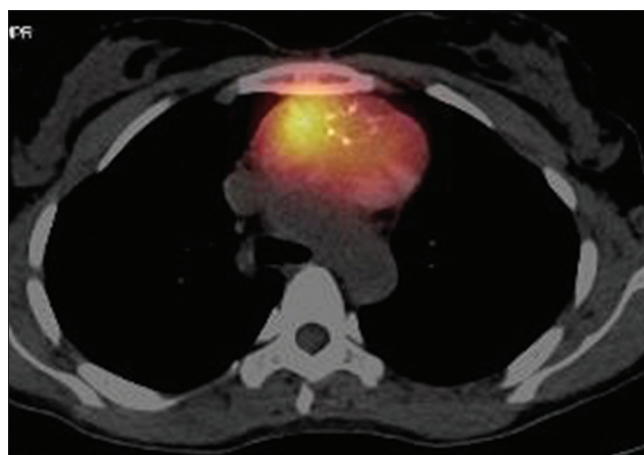


Figure 2: Single-photon emission computed tomography/computed tomography of chest showing increased uptake localized to anterior mediastinal mass lesion

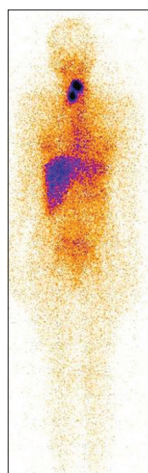


Figure 3: Posttherapy whole body iodine-131 scintigraphy after mediastinal mass excision showing only remnant thyroid uptake with no residual disease in mediastinum

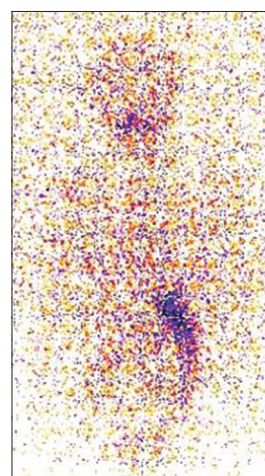


Figure 4: Iodine-131 scintigraphy after 6 months showed complete ablation of the remnant thyroid

ectopic thyroids, intramediastinal goiters, and parathyroid tumors.^[2] More rarely, primary thyroid tumors (adenomas or carcinomas) may occur in the mediastinum without cervical disease.^[3] Biallelic mutations in *FOXE1* have been shown to result in thyroid ectopy in mice; however, till date, no mutations in known genes have been associated with human ectopic thyroid tissues.^[4]

Thyroid scintigraphy with I-131 or technetium-99m is highly sensitive and specific for detecting normal and ectopic thyroid tissues.^[5] Integrated I-131 SPECT-CT imaging has an additional value in patients with thyroid cancer, for characterization of tracer uptake seen on planar imaging as well as for precise localization of malignant lesions in the neck, chest, and skeleton.^[6] This localization of I-131 uptake may have a clinical impact on patient management by influencing referral for I-131 treatment, tailoring of the administered radioiodine dose, and/or the addition of surgery or external radiation therapy when indicated.^[7]

Mediastinal goiter can remain asymptomatic until the structures located in the thoracic inlet are compressed. The chief complaints in reported mediastinal ectopic thyroid cases are painful or pulsating retrosternal mass, dyspnea, and cough.^[2,8] Histological findings are the most important for accurate diagnosis. Most mediastinal ectopic thyroid cases showed normal thyroid follicles.^[8] Surgery for mediastinal goiters should always be considered, even in elderly patients because they can be malignant and can have mass effects on the surrounding structures.^[9] This interesting case illustrates the use of I-131 WBS and SPECT/CT in an ectopic mediastinal nodular benign colloid goiter.

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