

Unexpected Appearance of Ectopic Mediastinal Toxic Nodular Thyroid Hyperplasia in a Case of Recurrent Hyperthyroidism

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Abstract: Ectopic mediastinal thyroid is a rare entity. Patients are usually euthyroid and symptoms due to mediastinal compression are cautionary to investigate intrathoracic mass. We represent a female patient who had undergone subtotal thyroidectomy 12 years ago and had recurrent hyperthyroidism following an euthyroid period. Antithyroid antibodies were negative. Thyroid ultrasonography showed residual thyroid tissue in both sides and multiple nodules on the right side. Thyroid scintigraphy showed a nonhomogeneously increased tracer uptake on the right thyroid lobe and left lobe was rather suppressed. Additionally, a large mass of nonhomogeneously increased activity located in the mediastinum which was totally separate from the thyroid gland was detected. MRI images supported that the thoracic mass was an ectopic thyroid tissue and surgical excision confirmed benign nodular hyperplasia.

The case is interesting in the way that the patient had a recurrent hyperthyroidism due to toxic nodular hyperplasia of the mediastinal ectopic thyroid gland and the pathology was first realised by Technetium-99m (Tc-99m) pertechnetate thyroid scan.

Keywords: Radionuclide imaging, Thyroid gland, Recurrence, Intrathoracic goiter, Tc99m-pertechnetate.

INTRODUCTION

Ectopic thyroid is defined as existence of normal thyroid tissue anywhere in the body other than normal thyroid bed [1]. The prevalence of ectopic thyroid tissue has been reported as 7%-10%. Ectopic mediastinal thyroid is very rare, constituting <1% of all cases [2-4]. Patients with ectopic thyroid tissue are usually euthyroid [5]. Hyperthyroidism is a rare condition in ectopic mediastinal thyroid tissue and reported hyperthyroidism in mediastinal ectopic thyroid cases mostly had a diagnosis of Graves disease. This situation was probably due to thyroid stimulant antibodies. Ectopic thyroid tissue diagnosis in recurrent cases is a very rare condition [6].

The role of thyroid scintigraphy in diagnosis of intrathoracic thyroid has been reported before. Radioiodine thyroid scintigraphy is the preferred agent for thyroid scintigraphy in order to decrease the percentage of attenuation by sternum [7]. In this case report, we represent demonstration of benign toxic nodular hyperplasia of ectopic mediastinal thyroid by Tc-99m pertechnetate thyroid scintigraphy in a patient with recurrent hyperthyroidism following subtotal thyroidectomy.

CASE PRESENTATION

A 43 years old female patient, who had undergone right total, left subtotal thyroidectomy 12 years ago (benign nodular hyperplasia). The patient was euthyroid in the following years until she came up with shortness of breath, palpitations and fatigue. In blood

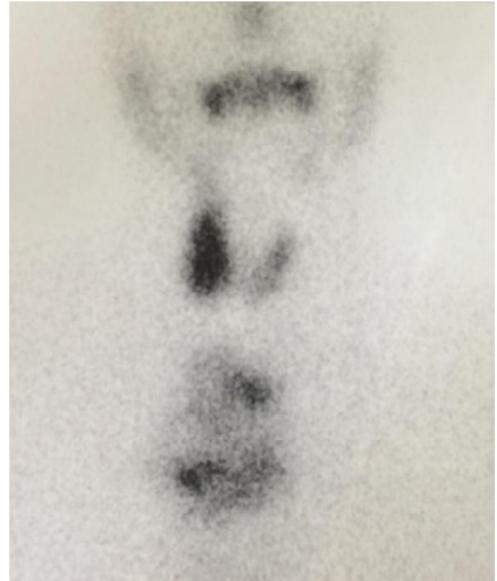


Figure 1: Tc-99m pertechnetate thyroid scintigraphy by a parallel hole collimator. Increased nonhomogeneous radiotracer uptake on the right thyroid lobe (due to nodular hyperplasia) and the mass lesion located in the mediastinum. Note that the mediastinal activity uptake is not in continuity with the thyroid gland.

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tests, TSH levels were suppressed (0.12mIU/mL reference values: 0,34-5,6) while fT4: 1.44ng/dL (reference values: 0,61-1,12) and fT3: 3,3 (reference values: 2,5-3,9). Antithyroid antibodies (AntiTg, AntiTPO and TRAB) were negative. On thyroid ultrasonography (USG), right and left lobes and isthmus were measured 25X21X59mm, 16X21X45mm, and 4.9mm respectively. No nodules were noted on the left lobe but there were multiple nodules on the right lobe. There were no signs of retrosternal extension. A second surgery to the neck was not a preferred option due to risk of complications so the patient was referred to our clinic as a candidate for radioiodine therapy. On thyroid scintigraphy performed before radioiodine therapy, nonhomogenously increased tracer uptake was observed on the right thyroid lobe whereas there was relatively lower activity uptake on the left lobe of the thyroid. Unexpectedly, on parallel hole image, a large mass of nonhomogenously increased activity located in the mediastinum was also detected. This mass lesion was totally separate from the thyroid gland (Figure 1). Because the nature of this incidental activity retention was obscure, magnetic resonance imaging (MRI) of thorax was performed to evaluate etiology. MRI also showed nodular hyperplasia on the right lobe of the thyroid. There was a mass lesion in 46X83X89mm size located in the anterior mediastinum including hyperintense regions on T1 and T2 weighed images. The mass had solid and cystic components (Figures 2a, 2b) and demonstrated minimal contrast enhancement following intravenous injection of Gadolinium (Figure 3). Trachea was deviated to right and subcutaneous vascular structures were dilated due

to compression of great vessels in the mediastinum (Figure 4). The mass was totally separate from the thyroid (Figure 5) Preoperatively, the differential diagnosis of the mass lesion was not possible as retrosternal goiter and other mediastinal pathologies like thymoma could both show Tc-99m pertechnetate uptake [8]. Surgical removal of the lesion enlightened the diagnosis. Histopathological examination of the encapsulated lesion which was 235gr in weight and 11X8,5X45mm in size revealed benign nodular hyperplasia (Figure 6). No surgery was planned for the recurrent thyroid tissue due to high risk of complications. Hyperthyroidism is now under control with Methymasole 10mg/day.

DISCUSSION

Intrathoracic thyroid tissue is mostly nonfunctional and thyrotoxicosis caused by intrathoracic goiter has been reported in a few cases [9]. These case reports involve Graves disease diagnosed in mediastinal thyroid [10]. It is interesting in this case that recurrent hyperthyroidism due to ectopic mediastinal toxic nodular hyperplasia was detected in a previously thyroidectomised patient. On thyroid scintigraphy, mediastinal mass which showed no continuity with the overlying thyroid, was Tc-99m pertechnetate avid. However mediastinal pathologies other than ectopic thyroid tissue have been previously reported to be positive on thyroid scan [8, 11, 12]. So we performed other confirmatory examinations before surgery. MRI results were also equivocal because no connection between the lesion and thyroid could be demonstrated. In surgery the lesion was observed to be encapsulated

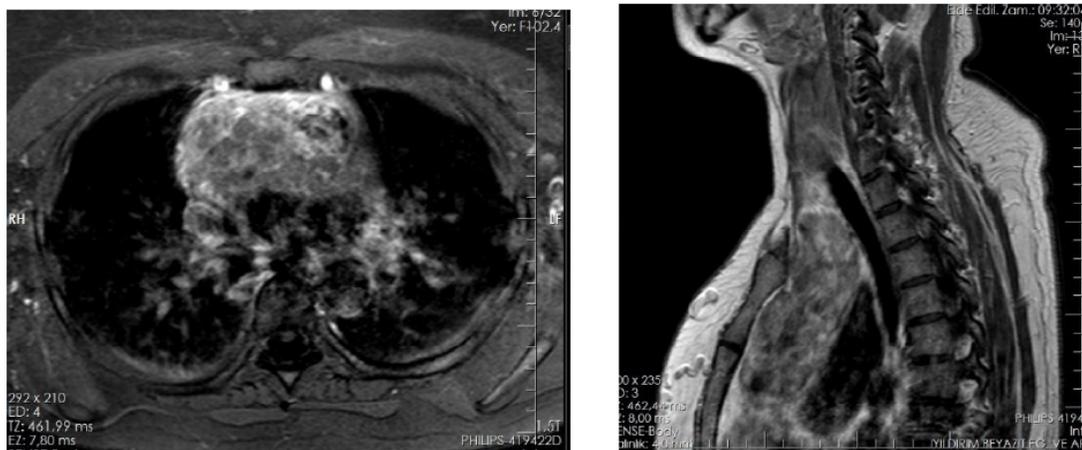


Figure 2a and 2b: T1W images on axial and sagittal plane. The lesion was located in the anterior mediastinum starting from the region anterior to the ascending aorta in pulmonary truncus level and extending to the superior anteriorly to the trachea. The lesion had cystic and solid components.

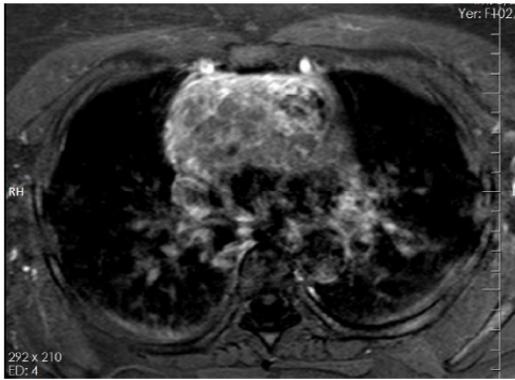


Figure 3: Axial images of T1W postcontrast images showing minimal contrast enhancement.

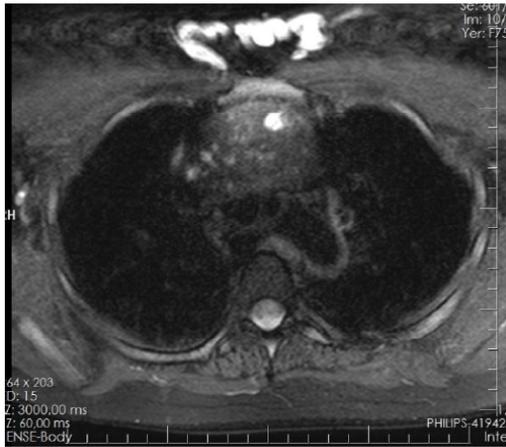


Figure 4: T2 fat suppressed sequences on axial plane. Vascularity increase in the subcutaneous tissues of the mediastinum.



Figure 5: Coronal T1W images demonstrating that there was no connection between the mediastinal mass and the adjacent thyroid.

and existed in the anterior mediastinum separately from the overlying thyroid tissue. Histopathology

confirmed nodular hyperplasia. This tissue was an ectopic thyroid which became apparent slowly in the years following subtotal thyroidectomy. The patient was euthyroid in the postoperative period probably due to this hidden thyroid.



Figure 6: Macroscopic appearance of the surgically excised anterior mediastinal mass.

In the literature, there are a few case reports demonstrating radioiodine (I-131) uptake in incidental mediastinal thyroid tissue and thyroid scintigraphy with I-131 has been reported to be of diagnostic value in intrathoracic goiter [13]. I-131 can be a better agent to evaluate retrosternal pathologies with higher energy and less amount of photons attenuated by sternum, but in this case, we were able to demonstrate the function of the mediastinal mass by Tc-99m pertechnetate probably because the patient was hyperthyroid and the activity uptake was very high in the ectopic thyroid gland.

CONCLUSION

Hyperthyroid patients with possible symptoms of a mediastinal mass should be evaluated carefully in the preoperative period in order not to miss this rare pathology.

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REFERENCES

- [1] Massine RE, Durning SJ, Koroscil TM. Lingual thyroid carcinoma: a case report and review of the literature *Thyroid* 2001; 11(12): 1191-6. <http://dx.doi.org/10.1089/10507250152741055>

- [2] Gamblin TC, Jennings GR, Christie DB III, Thompson WM Jr, Dalton ML: Ectopic thyroid. *Ann Thorac Surg* 2003; 75(6): 1952-3.
[http://dx.doi.org/10.1016/S0003-4975\(03\)00007-9](http://dx.doi.org/10.1016/S0003-4975(03)00007-9)
- [3] Bremerich J, Pippert H: Ectopic thyroid tissue: an unusual differential diagnosis of space-occupying mediastinal lesions. *Schweiz Med Wochenschr* 1997; 127: 266-70.
- [4] Wang J, Fang J: Ectopic thyroid mass in the left lateral neck and anterior mediastinum: a case report. *J Med Case Rep* 2014; 21(8): 351-6.
<http://dx.doi.org/10.1186/1752-1947-8-351>
- [5] Ibrahim NA, Fadeyibi IO: Ectopic thyroid: etiology, pathology and management. *Hormones (Athens)* 2011; 10(4): 261-9.
<http://dx.doi.org/10.14310/horm.2002.1317>
- [6] Basili G, Andreini R, Romano N, Lorenzetti L, Monzani F, Naccarato G, *et al.* Recurrence of Graves' disease in thyroglossal duct remnants: relapse after total thyroidectomy *Thyroid* 2009; 19(12): 1427-30.
<http://dx.doi.org/10.1089/thy.2009.0143>
- [7] Park HM, Tarver RD, Siddiqui AR, Schauwecker DS, Wellman HN: Efficacy of thyroid scintigraphy in the diagnosis of intrathoracic goiter. *AJR Am J Roentgenol* 1987; 148(3): 527-9.
<http://dx.doi.org/10.2214/ajr.148.3.527>
- [8] Squires RS, Smith M, Rohatgi PK: Uptake of Tc-99m pertechnetate in thymoma. *Clin Nucl Med* 2002; 27(1): 47-8.
<http://dx.doi.org/10.1097/00003072-200201000-00011>
- [9] Guimarães MJ, Valente CM, Santos L, Baganha MF: Ectopic thyroid in the anterior mediastinum. *J Bras Pneumol* 2009; 35(4): 383-7.
<http://dx.doi.org/10.1590/S1806-37132009000400013>
- [10] Basaria S, Cooper DS: Graves' disease and recurrent ectopic thyroid tissue. *Thyroid* 1999; 9(12): 1261-4.
<http://dx.doi.org/10.1089/thy.1999.9.1261>
- [11] Lebo NL, Raymond F, Odell MJ: Selectively false-positive radionuclide scan in a patient with sarcoidosis and papillary thyroid cancer: a case report and review of the literature. *J Otolaryngol Head Neck Surg* 2015; 44(1): 18.
<http://dx.doi.org/10.1186/s40463-015-0069-3>
- [12] Kiratti PO, Peksoy I, Erbaş B, Gedikoğlu G, Karabulut N: Technetium-99m pertechnetate uptake in ectopic parathyroid adenoma. *Ann Nucl Med* 1999; 13(2): 113-5.
<http://dx.doi.org/10.1007/BF03164887>
- [13] Kamaleshwaran KK, Rajan F, Asokumar P, Mohanan V, Shinto AS: Mediastinal ectopic benign colloid goitre detected using iodine-131 whole body scintigraphy and single-photon emission computed tomography-computed tomography. *Indian J Nucl Med* 2015; 30(2): 180-2.
<http://dx.doi.org/10.4103/0972-3919.152989>

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