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Hemiagenesis of the Left Thyroid Lobe

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Abstract

Thyroid hemiagenesis is a rare abnormality in which one thyroid lobe fails to develop. A careful clinical assessment, including thyroid function tests, thyroid ultrasonography and scintigraphy, plays an important role in diagnosis of thyroid hemiagenesis. We report a case of a 35 year-old man with an incidental finding of a left thyroid lobe hemiagenesis.

Introduction

Thyroid hemiagenesis is a rare congenital abnormality in which one thyroid lobe with or without an isthmus fails to develop. Various thyroid diseases ranging from autoimmune thyroid disorders to thyroid cancer have been reported [1-12]. We report a case of hemiagenesis of the left thyroid lobe in a young man incidentally found during a routine physical examination.

Case Presentation

A 35 year-old man was referred to endocrinology clinic for evaluation of a right thyroid nodule. He reported no hyper or hypothyroid symptoms. He did not take any iodine supplements and had no history of neck irradiation or surgery. There was no family history of thyroid disorders including thyroid cancer. Physical examination: HR 68 bpm, BP 131/77, no orbitopathy. Thyroid examination revealed a diffusely enlarged right thyroid lobe of 30 grams with no palpable nodules or cervical lymph nodes. The left thyroid lobe was not palpable and there was no surgical scar present. Deep tendon reflexes were normal. Laboratory results showed serum TSH 1.61 mcIU/mL (nl 0.55-4.78), free T4 1.24 ng/dL (nl 0.89-1.76), thyroid peroxidase antibodies 0 IU/ml (nl 0-29), thyroglobulin antibodies 0 IU/ml (nl 0-80). Thyroid ultrasound (Figure 1) revealed a normal right thyroid lobe (4.9 x 2.1 x 1.6 cm), a normal isthmus (0.3 cm in thickness), and dense connective tissue in the left thyroid bed with no thyroid tissue. Thyroid scintigraphy revealed a "Hockey Stick sign" (Figure 2). These findings are consistent with hemiagenesis of the left thyroid lobe.

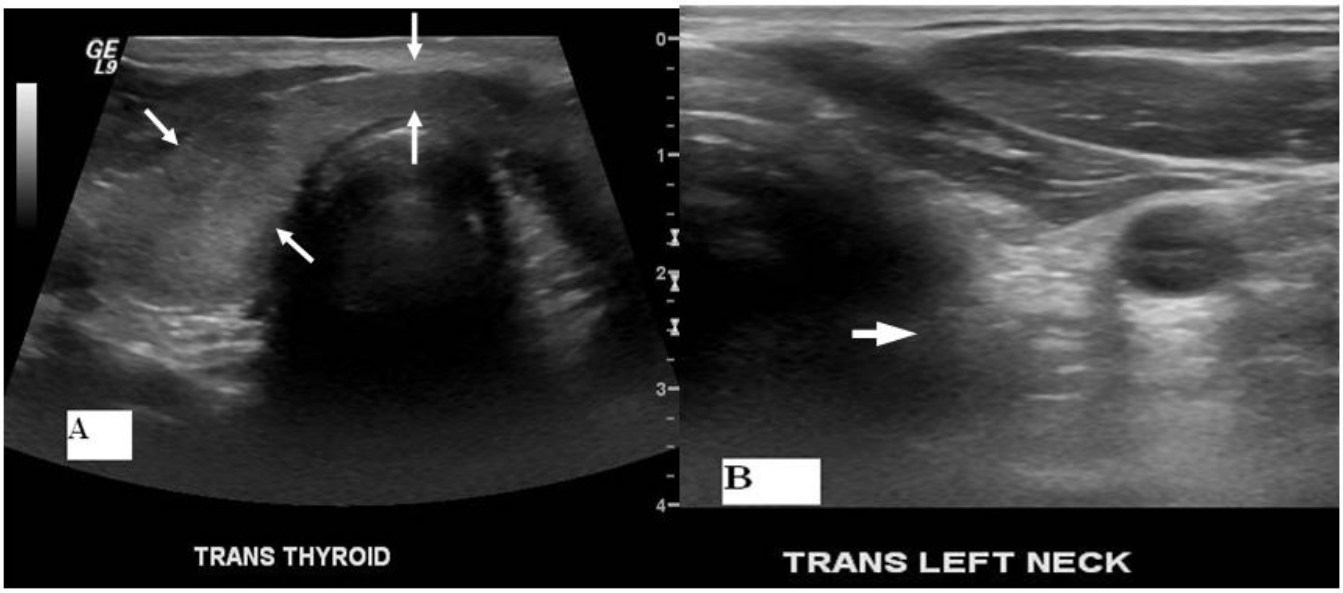

Figure 1: **A)** Thyroid ultrasound, transverse view, shows a normal right thyroid lobe, 4.9 x 2.1 x 1.6 cm. The isthmus is normal in thickness, 0.3 cm (arrows) **B)** There is no thyroid tissue seen in the left thyroid bed. Left thyroid lobe is replaced by dense connective tissue (arrow)

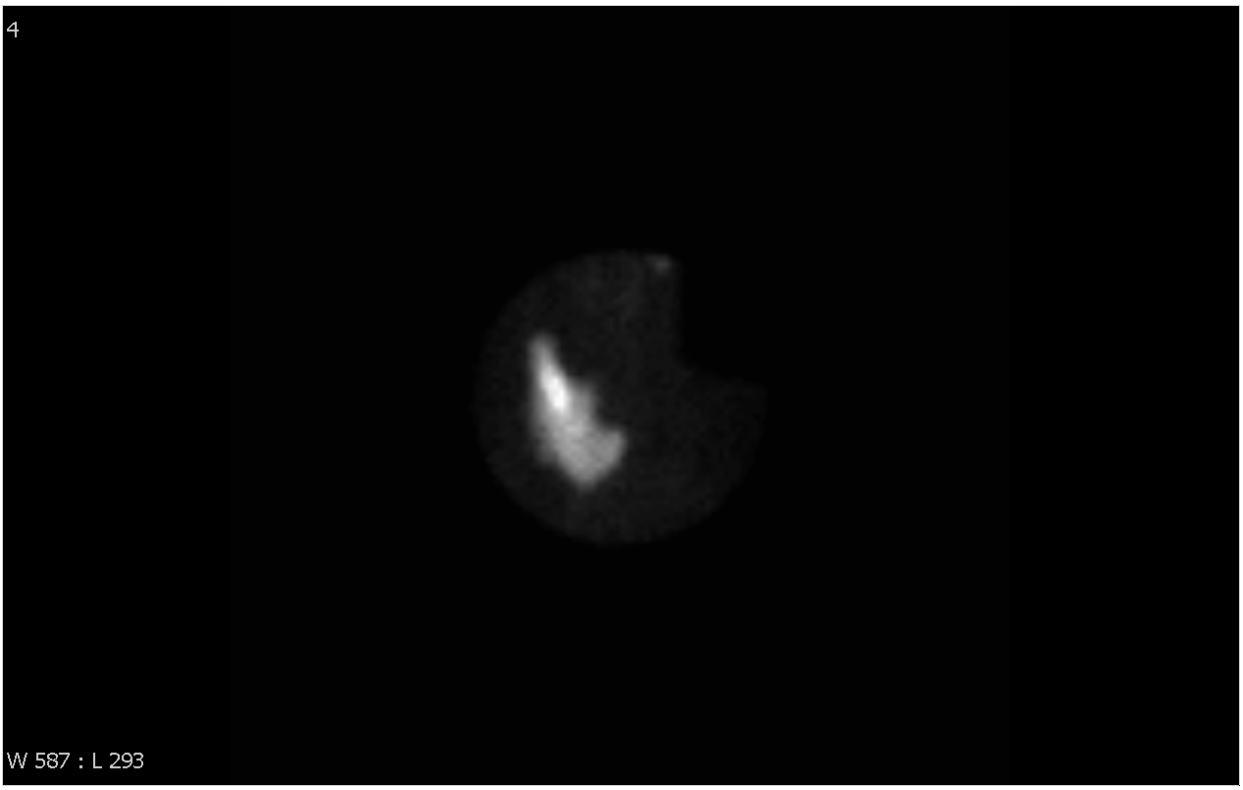

Figure 2: Thyroid scintigraphy with Tc-99m pertechnetate shows the right thyroid lobe and isthmus in normal shape and position. There is an absence of radiotracer in the expected location of the left lobe (Hockey stick sign)

Discussion

Hemiagenesis of the thyroid gland is a rare congenital abnormality in which one of the thyroid lobes, usually the left, with or without isthmus, fails to develop [1-3]. The prevalence of this disorder is approximately 0.05 – 0.16 %, more frequently found in women than in men, with hemiagenesis involving the left lobe in most of the patients [1-3,13-16]. Nearly 300 case reports have been described in the literature [1]. The exact pathogenesis of the agenesis is not known, although it is thought to result from failure of cells to migrate laterally during embryonic development. A genetic basis has been suggested because of the high occurrence rate of hemiagenesis among monozygotic twins, among sisters, or together with other thyroid malformations within one family [3,17]. Thyroid hemiagenesis usually does not cause clinical symptoms unless there is a thyroid hormone imbalance or possible thyroid disease. Compensatory hypertrophy of the remaining lobe occurs in most patients due to thyroid tissue overstimulation by TSH [3] and this was observed in our patient. Thyroid hemiagenesis can be associated with various thyroidal diseases, including benign adenoma, multinodular goiter, chronic thyroiditis, Grave's disease, thyroid carcinoma, or toxic adenoma [1-12]. Extrathyroidal lesions, such as parathyroid adenoma or hyperplasia, cervical thymic cysts, ectopic sublingual thyroid gland and thyroglossal duct cyst have also been reported [3,18-21]. On physical examination, thyroid hemiagenesis can be suspected in any patient with absence of palpable thyroid tissue and confirmed with thyroid scintigraphy or ultrasound. Thyroid scintigraphy can demonstrate absent thyroid tissue and also ectopic thyroid tissue. The characteristic "Hockey Stick sign" is usually observed in patients with thyroid hemiagenesis, as described in our case. Other conditions may mimic thyroid hemiagenesis (for nonvisualization of one thyroid lobe) such as a contralateral autonomous solitary thyroid nodule suppressing normal extranodular tissue; focal or unilateral subacute thyroiditis; primary or metastatic carcinoma; post-inflammatory atrophy of thyroid tissue in Hashimoto's disease, or infiltrative disorders [3]. Therefore, a proper clinical assessment, including thyroid function studies, thyroid ultrasound and scintigraphy are essential to establish the diagnosis. Computed tomography and magnetic resonance imaging can be used to confirm unilateral thyroid disease and true hemiagenesis, however, these techniques are expensive and time-consuming. It has been suggested that levothyroxine therapy can be used for subclinical hypothyroidism in patients with hemiagenesis [1,22].

In summary, we described a case of hemiagenesis of the left thyroid lobe in a young, biochemically euthyroid man. Ultrasonography and thyroid scintigraphy confirmed the diagnosis.

In conclusion, patients with thyroid hemiagenesis should have careful, long-term follow-up because of higher risk of developing thyroid pathologies.

Disclaimer

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We certify that all individuals who qualify as authors have been listed; that each has participated in the conception and design of this work, the analysis of date, the writing of the document, and the approval of the submission of this version; that the document represents valid work; that if we used information derived from another source, we obtained all necessary approvals to use it and made appropriate acknowledgements in the document; and that each takes public responsibility for it.

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