

Three Cases of Thyroid Gland Left Lobe Hemiagenesis: The Ultrasonographic and Scintigraphic Findings of Thyroid Hemiagenesis

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ABSTRACT

Thyroid hemiagenesis is a quite rare thyroid pathology caused by a defect occurring during the embryonic development of thyroid tissue. We report here three cases of thyroid gland left lobe hemiagenesis with ultrasonographic and scintigraphic findings. All three of our cases were thyroid gland hemiagenesis of the left lobe, which have been described as the most frequently reported in literature

Key words: thyroid hemiagenesis, ultrasonography, scintigraphy

TİROİD SOL LOB HEMİAGENEZİ OLAN 3 OLGU: TİROİD HEMİAGENEZİ ULTRASONOGRAFİ VE SİNTİGRAFİ BULGULARI

ÖZET

Tiroid hemiagenezisi, tiroid dokusunun embriyonik gelişimi sırasında oluşan defect sonucu görülen ve oldukça nadir rastlanan bir tiroid patolojisidir. Biz bu yazda, yetişkin 3 olguda saptanan tiroid sol lob hemiagenezisinin ultrasonografi ve sintigrafi bulgularını sunduk. Üç olgumuz da literatürde en sık şekilde olan sol lob hemiagenezisi idi.

Anahtar sözcükler: tiroïd hemiagenezi, ultrasonografi, sintigrafi

Thyroid hemiagenesis is a quite rare thyroid pathology caused by a defect occurring during the embryonic development of thyroid tissue (1). The first case report was published by Handfield –Jones in 1866 (2). Thyroid ultrasonographic examinations performed in healthy children report the prevalence of this morphologic anomaly to be 0.02-0.05%(3,4). It is more frequent among females than males (3:1) and is usually seen as agenesis of the left lobe (5). We report here about three cases of thyroid gland left lobe hemiagenesis with ultrasonographic and scintigraphic findings.

Case 1

A twenty-nine year-old female patient was admitted with the complaint of dysphagia. She did not have a history of any previous surgery. On her physical examination, the

right lobe of the thyroid was palpable and thyroid function tests and thyroid ultrasonography were planned.

Free T3 was found to be 3.79 pg/ml, free T4 was 1.16 ng/dl, TSH was 2.82 uIU/ml, antiTG Ab was 10 IU/ml and antiTPO was 7 IU/ml.

Ultrasonography was performed using the Logic 5 expert ultrasound unit, which has a linear 7.5 MHz probe. The right lobe of the thyroid was measured as 18 x 18 x 39 mm and displayed homogenous parenchyma echogenicity and no nodular lesions were detected. The left thyroid lobe was not observed. Left thyroid lobe hemiagenesis was considered in the euthyroid patient who had no history of thyroid surgery (Figure 1A). Scintigraphy was recommended. Thyroid scintigraphy was taken after iv administration of 5 mCi^{99m}Tc-pertechnetate and anterior planar images were recorded with the Siemens ECAM double

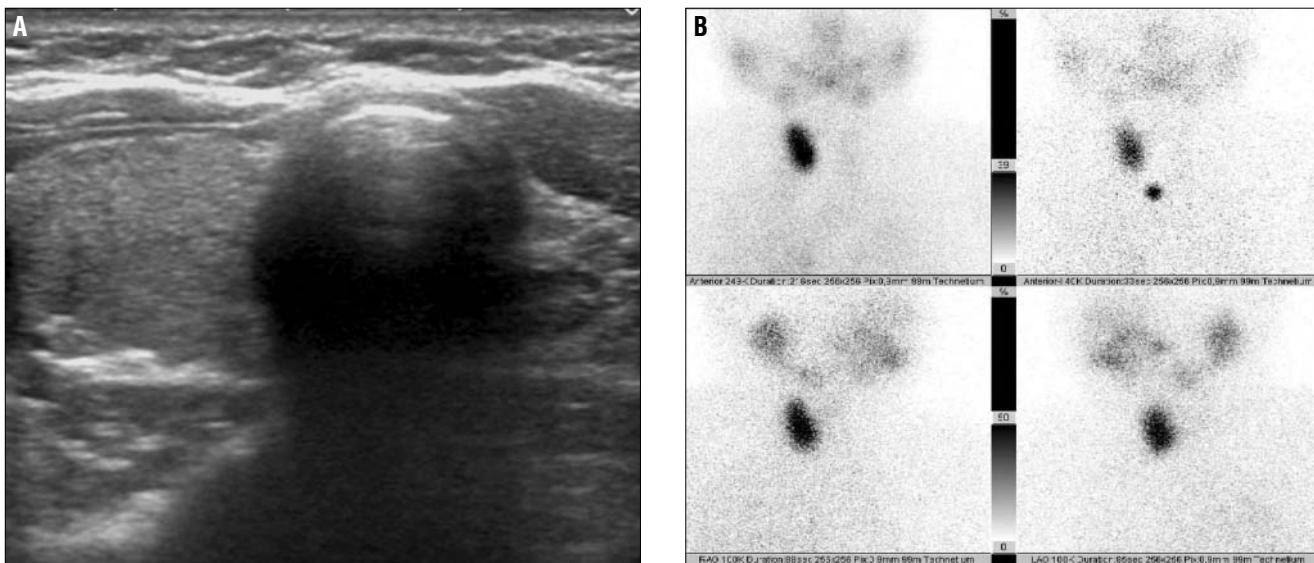


Figure 1. While the right thyroid lobe is observed both on USG (**A**) and scintigraphy (**B**), the left lobe is not observed in the 29-year-old female patient who did not have a history of thyroid surgery.

detector gamma camera. The right thyroid lobe was in normal shape, size and localization. Activity distribution within the gland was homogenous in the right lobe and irregular borders or activity reuptake suggesting nodular formation was not seen. The left thyroid lobe was not observed (Figure 1B). The patient was diagnosed with left thyroid lobe hemiagenesis.

Case 2

A 64-year-old male patient was admitted with complaints of nervousness and excessive sweating. He did not have a history of thyroid surgery. The right thyroid lobe was larger than normal on physical examination and thyroid function tests and thyroid ultrasonography were performed. Free T3 was found to be 4,46 pg/ml, free T4 was 1.39 ng/dl, TSH was 0,01 uIU/ml, Anti TG Ab was 12IU/ml and Anti TPO Ab was 8 IU/ml.

Ultrasonography was performed using the Logic 5 expert ultrasound unit with a linear probe of 7.5 Mhz. The right thyriod lobe was measured as 38 x 38 x 51 mm and heterogenous iso-hypoechoic clustered nodules with distinctive borders including anechoic cystic necrotic components of which the largest being 34 x 34 x 30 mm in size were detected. The left thyroid lobe was not observed. He was diagnosed with multinodular goiter and left thyroid lobe hemiagenesis (Figure 2A). Scintigraphy was recommended. Thyroid scintigraphy was taken after iv administration of 5 mCi^{99m}Tc-pertechnetate and anterior planar images were recorded with the Siemens ECAM double detector gamma camera. When images were examined,

a hyperactive nodule with irregular borders and increased uptake with areas of necrosis was observed in the field of a large nodule which involved almost all the right lobe which was interpreted as a toxic adenoma. Due to this nodule, the other sites of the thyroid lobe were observed to be suppressed. The left thyroid lobe could not be visualized (Figure 2B). The patients findings were consistent with multinodular goiter in the right lobe and left lobe thyroid agenesis.

Case 3

A 35-year-old female patient was referred to our clinic with the diagnosis of a thyroid nodule. She did not have a history of a thyroid surgery. On physical examination, a formation that could represent a palpable nodule was detected in the right lobe of the thyroid and thyroid function tests and thyroid USG were performed.

Free T3 was found to be 2,81 pg/ml, free T4 was 1.09 ng/dl, TSH was 2,62 uIU/ml, Anti TG Ab was 11 IU/ml and Anti TPO Ab was 7 IU/ml .

Ultrasonography was performed using Logic 5 expert ultrasound unit with a linear probe of 7.5 Mhz. The right thyroid lobe was measured as 19 x20 x40 mm and a heterogenous isoechoic nodule measuring 7,5 x 6 x 6 mm, which displayed a regular hypoechoic halo was detected in the inferior aspect of the right lobe. The parenchymal echogenicity of remaining part of right thyroid lobe was homogenous. The left thyroid lobe was not observed. The patient was considered to have left thyroid lobe

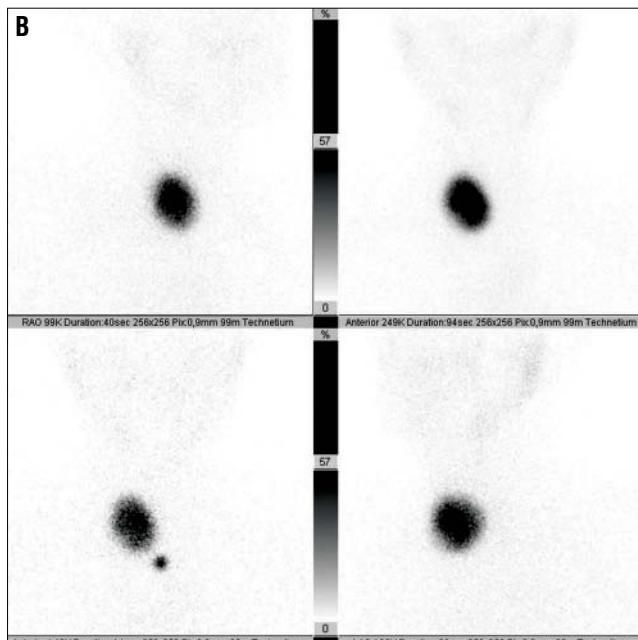
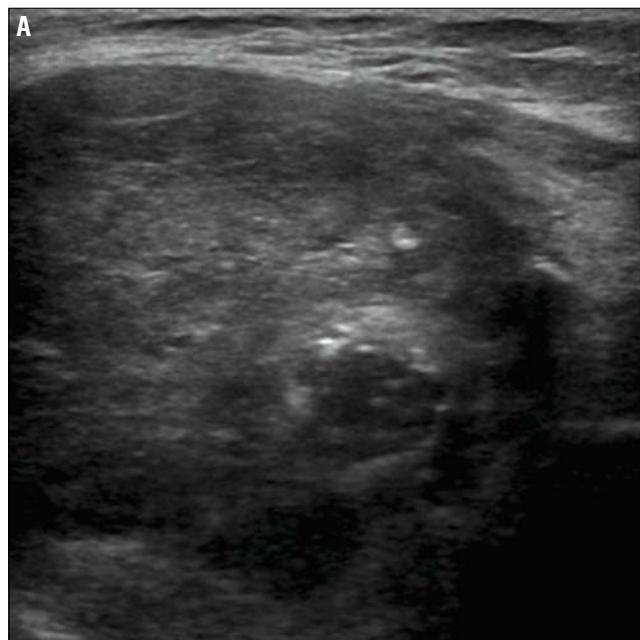


Figure 2. While the right thyroid lobe is observed both on USG (**A**) and scintigraphy (**B**), the left lobe is not observed in the 64-year-old male patient who did not have a history of thyroid surgery. Nodules involving almost all the right thyroid lobe, with borders that cannot be clearly discriminated on USG were interpreted as a toxic adenoma on scintigraphy.

hemiagenesis with a solid nodule and thyroid scintigraphy was recommended. Thyroid scintigraphy was taken after iv administration of 5 mCi^{99m}Tc-pertechnetate and anterior planar images were recorded with the Siemens ECAM double detector gamma camera. When the images were analysed, the right thyroid lobe was found to be of normal localization, shape and size. Activity distribution of the gland was normal and no margin irregularity or activity reuptake suggestive of nodular formation were observed. The left thyroid lobe was not observed (Figure 3). The patient was considered to have a normo-active solitary nodule in the right lobe and left lobe hemiagenesis.

Discussion

Thyroid hemiagenesis is a rare congenital anomaly characterized by the absence of one lobe or one lobe and isthmus. Congenitally, the thyroid gland develops from the medial part of the base of the pharynx at foramen caecum localization. Afterwards, the thyroid gland displaces inferiorly at fetal week 7 and reaches its normal localization in the anterior of the trachea. The cause of hemiagenesis has not been determined. Insufficient migration of thyroid cells is considered to be a cause of agenesis (6).

Thyroid diseases seen in thyroid agenesis cases have been reported to include multinodular goiter, hyperthyroidism,

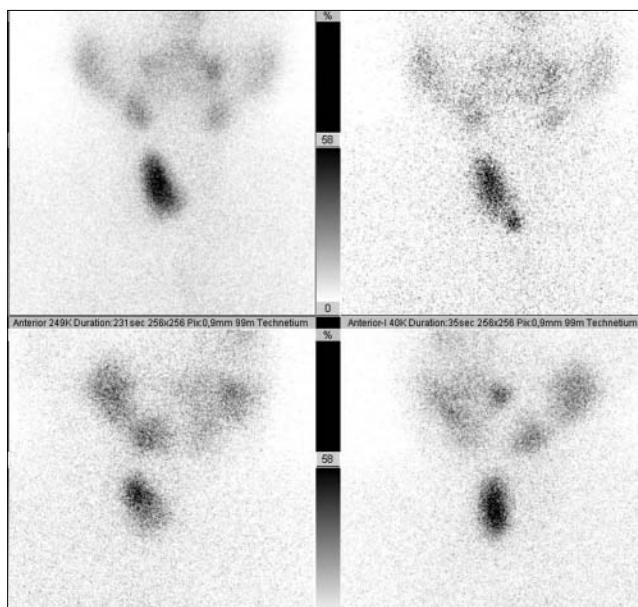


Figure 3. While the right thyroid lobe is observed both on USG and scintigraphy (**B**), the left lobe is not observed in the 35-year-old female patient who did not have a history of thyroid surgery. An isoechoic nodule with a regular halo was detected on USG and the nodule was found to be normoactive on scintigraphy.

hypothyroidism, adenoma, adenocarcinoma, chronic thyroiditis and subacute thyroiditis. Hyperthyroidism is the most commonly seen disease. No thyroid diseases are seen in some cases (6). The most frequent associate thyroid disorders are thyroid nodules and autoimmune

thyroid diseases. Simple goiter and nonautoimmune sub-clinical hypothyroidism are less often observed. Patients are usually euthyroid (7). Thyroid dysgenesis is a rare and potentially confusing anomaly, especially in the setting of double parathyroid adenomas and primary hyperparathyroidism (8).

Diagnosis of thyroid lobe hemiagenesis should be verified with USG, the most inexpensive modality, along with scintigraphy. It should be remembered that scintigraphy cannot discriminate between functional and true hemiagenesis cases (5).

Two of our cases were euthyroid and a nodule was detected on ultrasonography in one case, while a nodule was not detected in the right thyroid lobe of one. In the one case with hyperthyroidism, multinodular goiter was observed and it was decided to reevaluate this patient with post treatment US and laboratory testing. Left thyroid lobe agenesis was verified scintigraphically in all three cases and an ectopic thyroid gland was not detected. The female/male ratio of thyroid agenesis is reported as being 3/1 in literature. This ratio was 2/1 in our cases. All three of our cases were thyroid gland hemiagenesis of the left lobe, as are most reported cases in literature.

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