



Case Report

Diffuse Lipomatosis of the Thyroid Gland. Case Report and Review of Literature.

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Abstract

Fat tissue is usually not present in normal thyroid glands, or can only be noted directly under the capsule and along the vessels. Only a few thyroid lesions containing fat tissue have been reported until today.

Lipomatosis of thyroid gland is very rare and characterized by infiltration of fat cells into the thyroid tissue. The pathophysiology of thyroid lipomatosis remains unclear.

We report the case of a 69-year-old female who was admitted to the Emergency Room of our hospital. She complained of dysphagia, dyspnea, swelling of the neck and loss of weight.

Her thyroid panel tests were in normal range. Ultrasound examination displayed with typical appearance of a multinodular goiter. A computed tomography revealed a rightward deviation and compression of the trachea with narrowing the tracheal lumen to more than 50%.

The patient underwent total thyroidectomy. The histopathological examination revealed fat tissue which was diffusely distributed throughout the whole thyroid gland. There was no evidence of atypia or mitotic activity.

Capsular infiltration or amyloid deposits were not noted as well as no nuclear grooves or intranuclear cytoplasmic inclusions. Therefore, diffuse lipomatosis of the thyroid gland was diagnosed.

Keywords

[Diffuse lipomatosis](#), [adipose tissue](#), [atypia](#), [thyroid](#).



Introduction

Thyroid lipomatosis, also called thyrolipomatosis is a rare disease, which is characterized by diffuse infiltration of mature fat tissue in the thyroid gland (1).

Despite the fact that there are several theories which try to explain the pathophysiology of this abnormality – which include the embryological origin of the adipose tissue, adipose metaplasia induced by hypoxia, or senile involution of thyroid cells – the exact etiology of thyroid lipomatosis still remains unknown.

The final diagnosis was confirmed by extensive gross and microscopic examination of the surgical specimen. In other specific cases, the diagnosis might be suggested by fine-needle aspiration (FNA) interpretation.

To our knowledge, only few cases of thyrolipomatosis have been reported in the literature until today (2).

Herein, we describe an additional case of diffuse lipomatosis of thyroid gland and review the reports of fat-containing thyroid lesions.

Case history and clinical findings:

The 69-year-old Albanian woman was admitted to the Emergency Room of our hospital in November 2021. She complained of a 2 month history of compressive conducting airway symptoms like dyspnea, dysphagia, dysphonia, swelling of the neck and loss of weight.

A non - toxic goiter with a 2 years history and an arterial hypertension controlled by application of three antihypertensive drugs for the last 8 years were noted in her medical history.

Thyroid ultrasound examination revealed a multinodular goiter with iso-hyperechoic nodules less than 10 mm in size, and increased intra-nodular blood flow in the right lobe, and a 30 mm solid nodule with small heterogeneous cystic areas in the left lobe. No lymph nodes were detected. Computed tomography of the chest and neck revealed a rightward deviation and compression of the trachea narrowing the tracheal lumen to more than 50%.

Routine laboratory checks and thyroid macro-molecule analysis were normal.



Parameters (normal lab range)	Results
TSH (0.35-4.94 mU/L)	1.5 mU/L
fT3 (1.88-3.18 pg/ml)	2.37 pg/ml
fT4 (0.7-1.48 ng/dl)	1.06 ng/dl
TPO antibody(<5.5 IU/mL)	0.33 IU/mL
Anti-Tg (<150 IU/mL)	10.7 IU/mL
Thyroglobulin(<77ng/ml)	32ng/ml
Thyrocalcitonin(<10pg/ml)	1.4pg/ml
Hematocrit (37–47%)	37.5%
Hemoglobin (11.5–16 g/dl)	12.8 g/dl
White blood cells (5000–10 000/mm ³)	7230/mm ³
Glycemia (70–110 mg/dl)	89 mg/dl
BUN(10-50mg/dl)	46mg/dl
Creatinine (0.5–1.2 ng/dl)	0.88 ng/dl
ALT(10–40 UI/l)	19 UI/l
AST , 10–42 UI/l)	22 UI/l
Total bilirubin (0.1–1.4 ng/dl)	0.6 ng/dl
Albumin (3.2–5 g/dl)	4.1 g/dl
Sodium (135–145 mmol/l)	141 mmol/l
Potassium (3.5–5 mmol/l)	4.6 mmol/l
Calcium (8.5–10.5 mg/dl)	9.1 mg/dl



Treatment- A total thyroidectomy was performed.

Tissue – based diagnosis and follow-up

Pathology findings:

The gross examination of the specimen revealed a right lobe with colloidal and fleshy appearance measuring 6.5 x 5 x 3 cm. The left lobe measured 5 x 3 x 2.5 cm, and the isthmus measured 1.5 x 1 x 1 cm, all without remarkable macroscopic changes (Figure 1).



Figure 1 –Gross appearance of the thyroid gland.

The formalin-fixed, paraffin-embedded tissue blocks of the resected thyroid specimens were cut into 5- μ m sections. Each section was stained with hematoxylin and eosin.

Histopathological examination of the thyroid gland revealed mature fat tissue that was diffusely distributed throughout the whole gland and replaced the normal macro-follicular thyroid tissue. There was no evidence of atypia or increased mitotic activity (Figure 2).

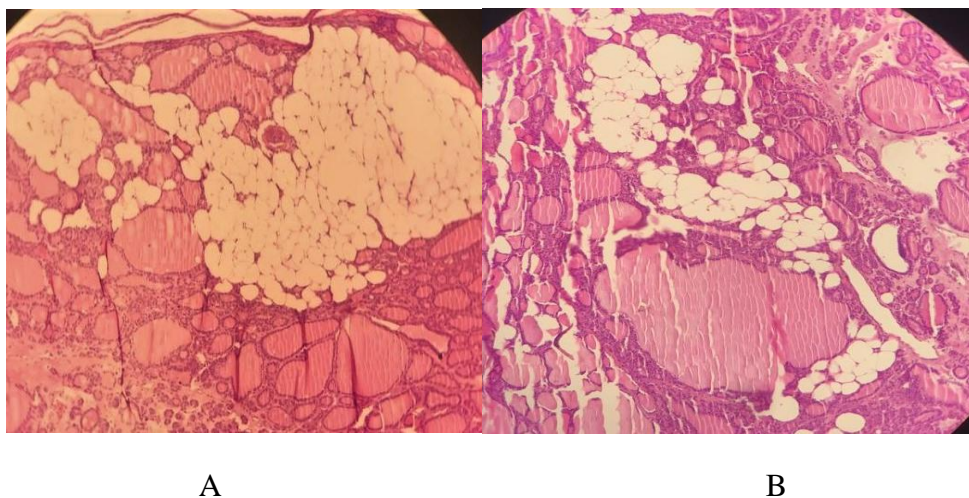


Figure 2(A,B) Histopathological findings of the thyroid gland. Diffuse infiltration of otherwise normal macro-follicular goiter by mature fat cells (H-E x20).



Based on these histopathological data, the diagnosis of thyroid lipomatosis was stated, and a common thyroid hormone substitution therapy was started.

Any complains or indications of recurrence were not noted in the postoperative follow up.

Discussion:

Diffuse lipomatosis of the thyroid gland is a rare entity which is characterized by a general enlargement of the thyroid gland and diffuse infiltration of stroma by mature fat tissue.

To our knowledge, only 20 cases have been reported in the literature (2), 18 of which were confirmed by surgical tissue examination.

The first case of thyroid gland lipomatosis of was reported by Dhayagude in 1942 (3).

Ge et al, estimated the median age of the patients to 42 years (range, 11-76 years). An almost equal gender distribution was noted in their 10 cases of thyrolipomatosis, who mainly complained of diffuse or nodular goiter, with or without tracheal compression (4).

Most patients were found to be euthyroid and asymptomatic as long as – in accordance with our patient - the thyroid mass did not involve the neck.

However, both hyperthyroidism and hypothyroidism have also been described in a few patients with diffuse lipomatosis of thyroid gland.

The presence of fat tissue in the thyroid can be observed in certain different disorders too, such as Hashimoto's thyroiditis, intra-thyroidal thymus and heterotopic adipocytes.

Increased quantity of intra-thyroid fat tissue can also be attributed to the occurrence of benign lesions of thyroid gland, like thyroid lipoma, which are composed of mature fat cells, separated by a fibrous capsule(5), or even in thyroid neoplasia, such as thyroid papillary carcinoma and thyroid liposarcoma (5)

The lesions of thyroid gland lesions presenting with fat cells are briefly summarized in Table I.

Table I. Summary of fat-containing lesions of the thyroid gland.

Neoplastic	Non-neoplastic
Thyrolipoma	Amyloid goiter
Papillary carcinoma	Adenomatous nodule
Follicular carcinoma	Thyrolipomatosis
	Dyshormonogenetic goiter
	Lymphocytic thyroiditis



The pathophysiology of proliferation of adipose tissue in the thyroid gland remains still unclear.

One hypothesis assumes that heterotopic groups of fat cells origin in the thyroid gland during embryogenesis. Other studies state a metaplastic process of stromal fibroblasts, which is generated in response to hypoxia or senile involution (6,7).

Another study published by Lau et al. discusses the possible relationship between the abnormal differentiation of fat tissue in thyroid lipomatosis and the mutation of the mitochondrial protein succinate dehydrogenase-subunit (8).

Cytology or analysis of fine needle aspiration material may suggest the diagnosis of thyroid lipomatosis based on the presence fat cells in the smear. However, histopathological (surgical) material is usually mandatory to confirm the diagnosis (9).

Conclusion

In our knowledge, this is the first time of presenting an Albanian patient with thyroid lipomatosis.

Lipomatosis of the thyroid gland is very rare benign entity. It should, however, kept in mind and included in the diagnoses of fatty benign or malignant thyroid lesions.

Declaration of interest

The authors declare that there is no conflict of interest that could be perceived as prejudicing the impartiality of the research reported.

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