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DIFFUSE LIPOMATOSIS OF THE THYROID GLAND WITH HYPERTHYROIDISM

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ABSTRACT
Diffuse lipomatosis of the thyroid gland (DLT) with hyperthyroidism is an extremely uncommon lesion with a couple of reports in literature. Infiltration of adipose tissue in the thyroid gland may be seen in benign to malignant conditions of the thyroid and have to be differentiated on histopathology. We present a case of a 65 year old female who presented with a large bulky multinodular goiter with hyperthyroidism and showed diffuse lipomatosis on histopathology.

INTRODUCTION

Diffuse thyroid lipomatosis is an uncommon entity and was initially reported by Dhayagude in 1942 [1]. It is characterized by diffuse proliferation of adipose tissue in the thyroid gland, sometimes associated with amyloid deposition. Infiltration of the thyroid gland with adipose tissue is seen in various conditions like heterotopic adipocyte nest, adenolipoma, amyloid goiter, intrathyroidal thymic and parathyroid lipoma, lipomatosis or adenolipomatosis, encapsulated papillary carcinoma and liposarcoma and is a differential diagnosis of diffuse lipomatosis of the thyroid gland [2]. Diffuse lipomatosis of the thyroid gland can rarely be associated with hyperthyroidism. The diagnosis is based purely on histopathology.

Case Report

Clinical Findings

A 65 year old female presented to a tertiary care hospital with anterior neck swelling which progressively increased in size since 3 years. She had tremors and difficulty in swallowing. There was no history of sweating, change in voice and heat or cold intolerance. Her thyroid function tests were abnormal. She was diagnosed with hyperthyroidism and was put on Neomercazole. She was also a known case of chronic obstructive pulmonary disease and end stage renal disease on dialysis and oral medications. On investigations, her hemoglobin was 9.1gm%, total WBC count- 7400/mm^3, BUN- 45mg/dl, creatinine-4.7mg/dl. Ultrasonography of thyroid showed diffusely enlarged right and left lobes. Right lobe showed a 32x28mm heterogenous nodule with peripheral hypoechoic halo and lateral cystic changes with peripheral vascularity. The right lobe also showed few small echogenic lesions measuring 12x0.8mm and 9x5mm.The left lobe of thyroid showed a well defined cystic lesion measuring 38x24mm with retrosternal extension and mild vascularity. Isthmus showed a 17x8mm well defined hetergenous nodule. CT scan showed a large fat containing lesion in retropharyngeal space with enchancing nodules within it, ranging from 1-3cm, extending from arch of atlas to clavicle and a diagnosis of liposarcoma was favoured [Image 1]. Total thyroidectomy was done and the specimen was sent for histopathology.

Pathological Findings

A large bilobed encapsulated greasy yellow total

thyroidectomy specimen was received. The right lobe measured 9x9x4cm, left lobe measured 9x7x4cm and isthmus measured 2x2cm [Image 2]. Cut surface showed mainly adipose tissue among which was seen characteristic reddish brown thyroid tissue [Image 3]. Microscopic examination showed a thinly encapsulated mass composed of an intimate mixture of predominantly mature adipose tissue and few areas of thyroid tissue [Image 4]. The thyroid tissue was composed of colloid filled follicles of varying sizes with bland cytological features [Image 5]. Some eosinophilic material was seen between the follicles which were thought of as amyloid. Congo Red staining and polarization done twice did not show any apple green birefringent deposits, diagnostic of amyloid. There was no systemic amyloidosis. The tissue was entirely benign and there were no malignant features. The main differential diagnosis considered was thyroid adenolipoma, amyloid goiter, and liposarcoma. Histopathology ruled out other differential diagnosis and hence a diagnosis of DLT was made. Thyroid epithelium lining the colloid filled follicles was confirmed by immunohistochemistry with Thyroid transcription factor 1(TTF-1) [Image 6]. The patient expired 2 months after diagnosis due to respiratory distress following chronic obstructive pulmonary disease.

Fig 1. CT scan showing fat containing lesion in neck and nodule in the isthmus

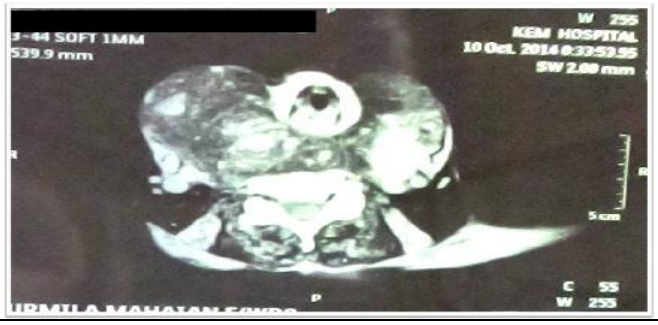


Fig 2. Gross examination- Large bilobed encapsulated greasy yellow specimen of thyroid gland. Right lobe measures 9x9x4cm, left lobe measures 9x7x4cm, isthmus measures 2x2 cm

Fig 3. Cut section- adipose tissue with reddish brown areas of thyroid tissue

Fig 4. Microscopic examination-On 10X -Thyroid composed of an intimate mixture of mature adipose tissue and colloid containing thyroid tissue. No amyloid was seen in our case (congo red and polarization was negative)

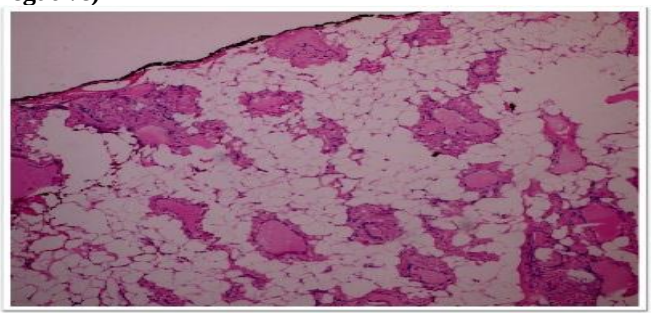


Fig 5. Microscopic examination-On 40X -Thyroid composed of an intimate mixture of mature adipose tissue and colloid containing thyroid tissue.

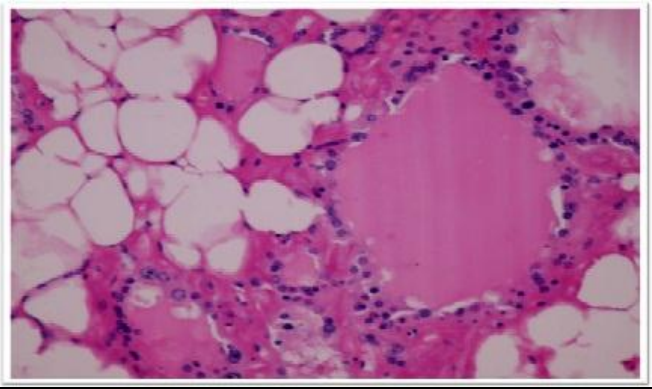
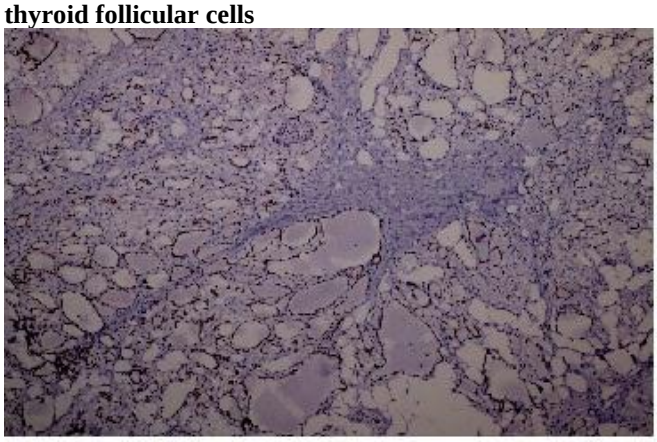


Fig 6. On immunohistochemistry TTF- 1 positive in thyroid follicular cells



DISCUSSION

The presence of adipose tissue in the thyroid gland is an uncommon phenomenon, unlike parathyroid, thymus, salivary gland or pancreas. In the normal thyroid gland, few adipocytes may be found near the capsule and in the perivascular location [3]. The pathophysiology of adipose tissue infiltration in the thyroid gland is not clear and several theories have been proposed. Breek *et al* noted that thyroid arises from primitive foregut and hence the presence of these lesions suggest a disturbance in the development of primitive foregut [4]. Schroder and Bocker believe in the origin of fat cells from stromal fibroblasts due to chronic tissue hypoxia is presumed responsible for the presence of fatty tissue in amyloid goiter [5]. Some authors favour neoplastic origin for adipose tissue [6].

DLT of the thyroid gland is an entity characterized by diffuse proliferation of adipose tissue in the gland and is sometimes associated with amyloid deposition. DLT has to be differentiated from other benign and malignant lesions of the thyroid and the major differential diagnosis includes adenolipoma, amyloid goiter, intrathyroidal thymus and parathyroid lipoma and liposarcoma. Histopathology clinches the diagnosis. Adenolipoma and other intrathyroid fat containing masses were ruled out because these are usually well circumscribed, focal nodules within an otherwise normal gland [2]. The possibility of intrathyroid thymus and parathyroid lipoma was excluded because of the diffuse nature of fat infiltration and admixture of thyroid follicles [7]. Adipose tissue with amyloid deposition has been reported in the thyroid gland [2,8]. Amyloid goiter was ruled out on Congo Red stain and polarization microscopy. Liposarcoma is an aggressive lesion with local invasion and would show histopathology of a malignant neoplasm. Our case showed bland nuclear features and all malignant lesions were excluded [9-11].

Most cases of DLT present with euthyroid status but a couple of case reports showed DLT associated with hyperthyroidism. In our case the thyroid gland was massively enlarged and the net volume of thyroid tissue was more than an average size thyroid gland and hence could be the probable cause for hyperthyroidism. However, other authors feel that hyperthyroidism was not causally related to DLT.

DLT with hyperthyroidism is a rare medical curiosity. DLT coexists with other lesions and the differential diagnosis varies from benign to malignant. Histopathology clinches the diagnosis and hence a good histopathological diagnosis is warranted.

Surgery is the treatment of choice and care should be taken to avoid excessive bleeding due to the friability of the gland.

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None

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

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