Diffuse Lipomatosis of the thyroid gland: A cyto-histopathologic curiosity
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ABSTRACT:
We report a case of 31 year old man who presented with 2 year history of midline neck swelling associated with recent onset of respiratory distress. FNAC of thyroid swelling revealed a colloid goiter with cystic change. A total thyroidectomy was performed. On histopathological examination diagnosis of diffuse lipomatosis of the thyroid gland was rendered. Retrospective review of FNAC revealed follicular epithelial cells with clusters of mature adipocytes. Lipomatosis or adenolipomatosis of the thyroid gland is an extremely rare entity which requires adequate clinical details and thorough histopathological examination for diagnosis.

KEY WORDS:
Lipomatosis, Adenolipoma, Thyroid.

1. INTRODUCTION:
Infiltration of adipose tissue in the thyroid gland is uncommon. Such a phenomenon has been reported in heterotopic adipocyte nests, adeno lipoma, amyloid goiter, lymphocytic thyroiditis, intrathyroid thymic or parathyroid lipoma, lipomatosis or adenolipomatosis, encapsulated papillary carcinoma, and liposarcoma[1]. A close correlation between clinical features, FNAC and histopathological findings is required to make the correct diagnosis, which is essential because the differential diagnosis also includes malignant tumors.

We report a rare case of diffuse lipomatosis of the thyroid gland in a 31-year old man presenting with respiratory distress. A brief discussion on the varying differential diagnosis is included.

2. CASE REPORT:
A 31-year old man presented with a history of glandular enlarging midline neck swelling for the past 2 years. He had noticed a rapid increase in the swelling associated with respiratory difficulty for the past 2 months. In our case, the patient presented with a swelling in the neck with normal levels of T3, T4 and TSH. However, there was no history of difficulty in swallowing or change in voice. On examination, a large lobulated thyroid enlargement involving both right and left lobes was noted. The lower end of the swelling was palpable. There were no signs of hypothyroidism or hyperthyroidism. Thyroid function tests were within reference ranges. Ultrasonography scan showed right lobe measuring 6.3X4X3.2cms with heterogenous echotexure, left lobe measuring 6.4X3.1X2.7cms. No retrosternal extension of the thyroid was noted. FNAC of thyroid swelling was performed and reported as a colloid goiter with cystic change (Fig 1). A total thyroidectomy was performed and the specimen was submitted for histopathological examination. We received the right lobe, left lobe and isthmus separately. The right lobe measured 7X3X2cms and weighed 210 gms, the left lobe measured 6X3X2cms and weighed 155gms and the isthmus was 2X1.5X1cms in size. A cut section of all the specimens was similar and showed soft pinkish and grey areas with scattered yellow foci (Fig 2). No focal lesion was identified in any of the specimens.
Multiple histological sections from all the specimens revealed similar morphology consisting of colloid-filled thyroid follicles lined by cuboidal cells and showing minimal variation in size. The interfollicular stroma showed infiltration by mature adipose tissue (Fig 3). No lymphocytic infiltrate, follicular destruction or amyloid deposition was noted. There was no focus of papillary carcinoma in the sections examined. Retrospective review of FNAC of thyroid swelling revealed as a colloid goiter with clusters of mature adipose tissue (Fig 4). A diagnosis of diffuse lipomatosis of the thyroid gland was rendered.

3. DISCUSSION:

Presence of adipose tissue in the thyroid gland is an infrequent 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\(^2\). The various differential diagnosis of the presence of mature adipose tissue in the thyroid, like in the present case, include heterotopic nests of adipocytes, diffuse lipomatosis or adenolipomatosis, adenolipoma (thyroliipoma), amyloid goiter, lymphocytic thyroiditis, intra thyroid thymic or parathyroid lipoma, encapsulated papillary carcinoma and liposarcoma\(^1\). Heterotopic nests occur due to inclusion of fat cells in the thyroid before the formation of capsule. This is manifested by the presence of occasional small islands of adipose tissue, which are often detected incidentally\(^3\). The present case, in contrast, showed diffuse infiltration of the adipose tissue throughout the thyroid. Adenolipoma of the thyroid has also been named thyrolipoma or thyroid hamartoma and is an encapsulated tumor composed of a variable proportion of thyroid glandular tissue and fat\(^1\). The gross composition of fat may vary from 10 to 20% and hence the detection of adipose tissue on imaging also varies\(^4\). Our case did not show any mass lesion on gross inspection and, hence this diagnosis was not considered. Lipomatosis, also called “choristomatous adiposities”, demonstrated diffuse fatty infiltration rather than a single nodule\(^5\). Lipomatosis or adenolipomatosis may also manifest as a congenital swelling, as described by Simard and cited by Chesky\(^3\). Aspiration cytology of such lesions may yield a mixture of follicular cells and adipocytes and lead to a pre-operative diagnosis of fat containing lesion of the thyroid\(^6\). The present case was not associated with lipoma at any other site and was not congenital in nature.

Adipose tissue infiltration has been reported in the thyroid gland with amyloid deposition in association with systemic amyloidosis\(^1,4\). No amyloid deposition was detected in the present case. Lymphocytic thyroiditis, a diffuse inflammatory process, may also be associated with fat infiltration. Liposarcoma of the thyroid gland is rare and presents with a rapidly growing mass with an aggressive clinical course. The long clinical course in the present case rule out the diagnosis of liposarcoma. However, the recent increase in size and respiratory difficulty was worrisome for the clinician and prompted surgery. Because of the diffuse nature of fat infiltration and admixture of thyroid follicles, the possibility of intra thyroid thymic or parathyroid lipoma was not considered. Retrospective review FNAC of thyroid swelling revealed as a colloid goiter with clusters of mature adipocytes. Hence, the clinical, FNAC and histological features suggested a diagnosis of lipomatosis of the thyroid gland.
Fig. 1: Photomicrograph of FNAC shows thyroid follicular epithelial cells admixed with mature adipocytes (H&E X100).

Fig. 2: Gross photograph of the total thyroidectomy specimen showing pinkish and grey areas with scattered yellow foci.

Fig. 3: Microphotograph showing thyroid follicles lined by cuboidal cells with interfollicular stromal infiltration by mature adipose tissue (H&E X100).

Fig. 4: Microphotograph of FNAC showing thyroid follicular epithelial cells admixed with mature adipocytes (H&E X400).
The pathophysiology of adipose tissue infiltration in the thyroid gland is not clear and several theories have been proposed. Some authors consider this a developmental anomaly, which can explain the heterotopic nests\(^4\). Others regard the presence of adipose tissue as a metaplastic process resulting from vascular changes with local hypoxia\(^7\). This explains the occurrence of fat in thyroid tumor is an integral neoplastic component of the tumor\(^8\).

4. CONCLUSION:
The presence of macroscopic fat within thyroid gland is rare, with few diagnostic possibilities. Most of these lesions are benign with the exception of liposarcoma and encapsulated liposarcoma and encapsulated papillary carcinoma. Because the differential diagnosis includes malignant entities, an accurate diagnosis is essential.

5. REFERENCE: