

## **DIFFUSE LIPOMATOSIS OF THE THYROID GLAND: REPORT OF TWO CASES AND REVIEW OF THE LITERATURE OF A CURIOUS ENTITY**

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### **ABSTRACT**

**Aim:** Study of the incidence of diffuse lipomatous infiltration of the thyroid gland.

**Patients and methods:** 320 cases of thyroid pathology, representing one year of activity of the pathology department, were reviewed by the authors.

**Results:** We observed 2 cases of lipomatous infiltration of the thyroid gland, the first case showed mature adipose tissue scattered between the thyroid follicles, occupying approximately 40% of the thyroid gland, and one other case upon review of the 320 thyroid glands registered in our pathology department this year, with about 5 to 10% of adipose tissue.

We found randomly distributed adipocytes in subcapsular location in 59 cases (18.5%), with 24 cases (7.5 %) with more than 1% and 35 cases (11%) with less than 1% of adipocytes. We also noticed the presence of one adenolipoma.

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### **INTRODUCTION**

Diffuse lipomatous infiltration of the thyroid gland is uncommon [1-5]. We encountered recently a rare case of diffuse lipomatosis of the thyroid gland in the setting of a nodular hyperplasia and a 9 mm papillary carcinoma. Because this is a rather seldom entity, we reviewed the relevant literature about this topic and found nothing or very few in the standard books of endocrine and thyroid pathology.

### **MATERIAL AND METHODS**

Diffuse lipomatosis of the thyroid gland, also called adipose metaplasia of the interfollicular stroma or thyrolipomatosis, is only cursorily described in standard books, with very few case reports about this topic. So, we decided to review all the thyroid pathology occurring last year in our pathology department (320 cases), to get glimpse of the incidence of adipose tissue in the thyroid gland.

### **RESULTS**

After review of the 320 thyroids, the great majority of considered cases was nodular hyperplasia or goiters or single / multiple adenoma(s). There were also 61 malignant tumors, with 47 papillary carcinomas with more of the half being occult (less than 10 mm), 4 medullary carcinomas, 3 anaplastic carcinomas, one diffuse sclerosing papillary carcinoma, one poorly differentiated vesicular carcinoma and one occucarcinoma with oncocytic features. We also noticed 4 vesicular carcinomas (3 of them minimally invasive with one for which the diagnosis was made because of visceral metastases of vesicular thyroid carcinoma) and one case of extension to the thyroid by a near-by head and neck squamous carcinoma.

During this review, we encountered, with the exception of the first case, which showed that approximately a half of the thyroid gland was occupied by adipose tissue, only one case demonstrating a slight adipose involution of the

thyroid with about 5 to 10 % of adipocytes mingled with the thyroid follicles. We also found randomly distributed adipocytes in sub-capsular location in 59 cases (18.5%), with 24 cases (7.5 %) with more than 1% and 35 cases (11%) with less than 1% of adipocytes. We also noticed the presence of only one adenolipoma.

Of the 61 malignant tumors, only 4 (all are papillary carcinomas) showed adipose tissue in the thyroid.

## DISCUSSION

Intra-thyroid adipose tissue is rare in normal thyroid glands [1-6]. Standard books dedicated to endocrine / thyroid pathology very briefly address this topic. The most extensive citation was in a 22 years-old book (LiVolsiVA: Surgical pathology of the thyroid, vol.22 in the series Major Problems In Pathology: 331), “the presence of adipose tissue in the thyroid gland is unusual, and in most cases is found in a sub-capsular location; most authors attribute this finding to inclusion of mesenchymal fat and sometimes muscles during embryologic development. Much rarer are tumors, or at least mass lesions, containing fat and thyroid gland mixed together, sometimes surrounded by a fibrous capsule.

Our review of the 320 thyroid cases showed that, indeed, very few adipocytes are rather frequently found in sub-capsular position. They are rather difficult to identify, when they occur singly, because they are difficult to differentiate from artifacts/ resorption of the colloid, or empty vessels. Even when easily recognizable, they very often go unnoticed because attention is focused on the pathology of the thyroid [1, 2, 5]. As an example, in the first case which had a 9 mm papillary carcinoma, the adipose involution was only noticed on the opposite lobe with nodular hyperplasia, but the intensity of adipose involution was the same on both lobes.

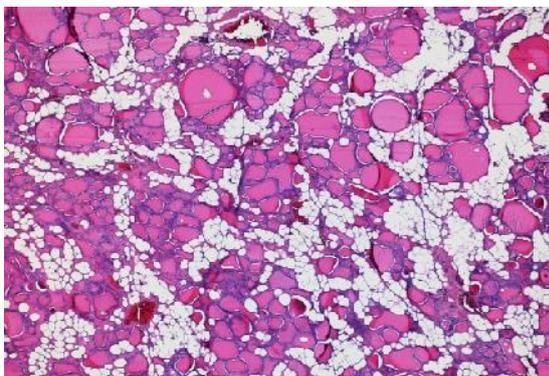


Figure 1: Diffuse replacement of thyroid tissue by mature adipocytes with entrapped follicles containing colloid.

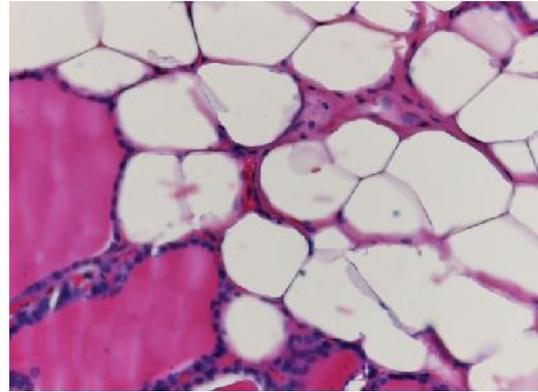


Figure 2 : few preserved thyroid follicles in an extensively lipomatous area.

It is also very subjective to decide between some adipocytes in the thyroid parenchyma in sub-capsular location, and an irregular outline of the thyroid gland, with adipocytes stemming from the adipose tissue of the mediastinum adhering to the thyroid.

As, in our review, we did not notice other types of inclusions like muscular or cartilaginous tissue (with the exception of parathyroid tissue which is frequently found), we do not share the opinion that they represent inclusion of mesenchymal fat and sometimes muscle during embryologic development [2, 7]. We did not notice any relationship between adipose involution and malignancy either, because with the exception of the first case (9 mm papillary carcinoma), there was a trend of fewer cases with adipocytes in the context of malignancy (6.5% vs. 18.5 %) compared to benign pathology.

Concerning the metaplastic or involutive nature of intra-parenchymal adipocytes, it is, in our opinion, difficult to have a definitive opinion; we prefer to consider it as involutive in comparison with the parathyroid glands which very often show adipose involution. Lipomatosis of the thyroid is, in our opinion, a misnomer. Our case, which was the only one with enough adipocytes to get noticed, showed no significant enlargement of the thyroid gland, and the adipose component was not macroscopically seen.

## CONCLUSION

Diffuse lipomatosis of thyroid gland (presence of adipocytes between follicles in significant number to be noticed, even at the midst of the thyroid gland) occurs rarely; in less than 1% of thyroid gland. But, finding few adipocytes on the superficial aspect of the thyroid gland is quite common. This phenomenon has no pathological or therapeutic implications.

### CONFLICT OF INTEREST

The authors and author institutions have no conflicts of interest.

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