



Society of Radiologists in Ultrasound  
2012 Toshiba Residents Program

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**Clinical history:** 52 y/o euthyroid female with long standing enlargement of the thyroid gland and multiple medical problems. Ultrasound is performed to evaluate the thyroid enlargement. The patient progresses to have difficulty breathing 3 years later.

**Figures:**

Figure

1:

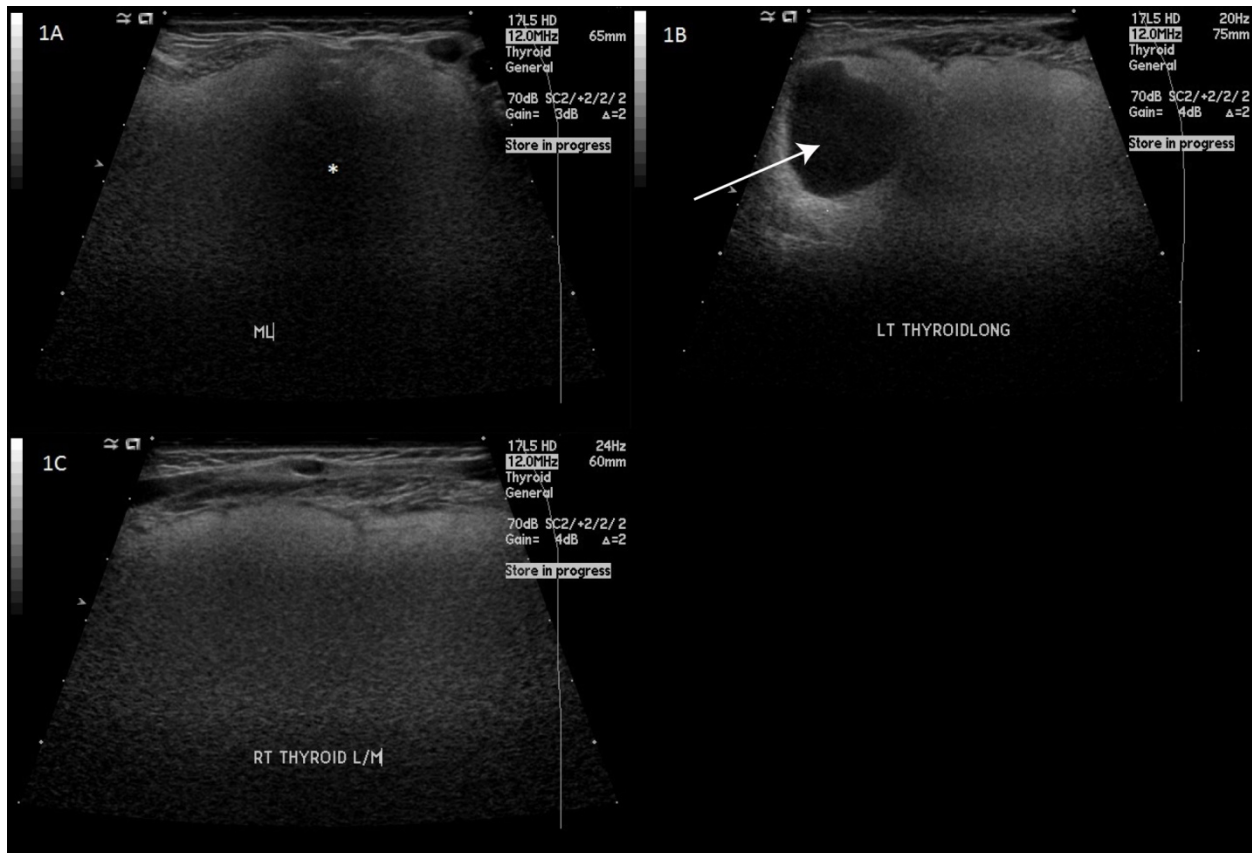
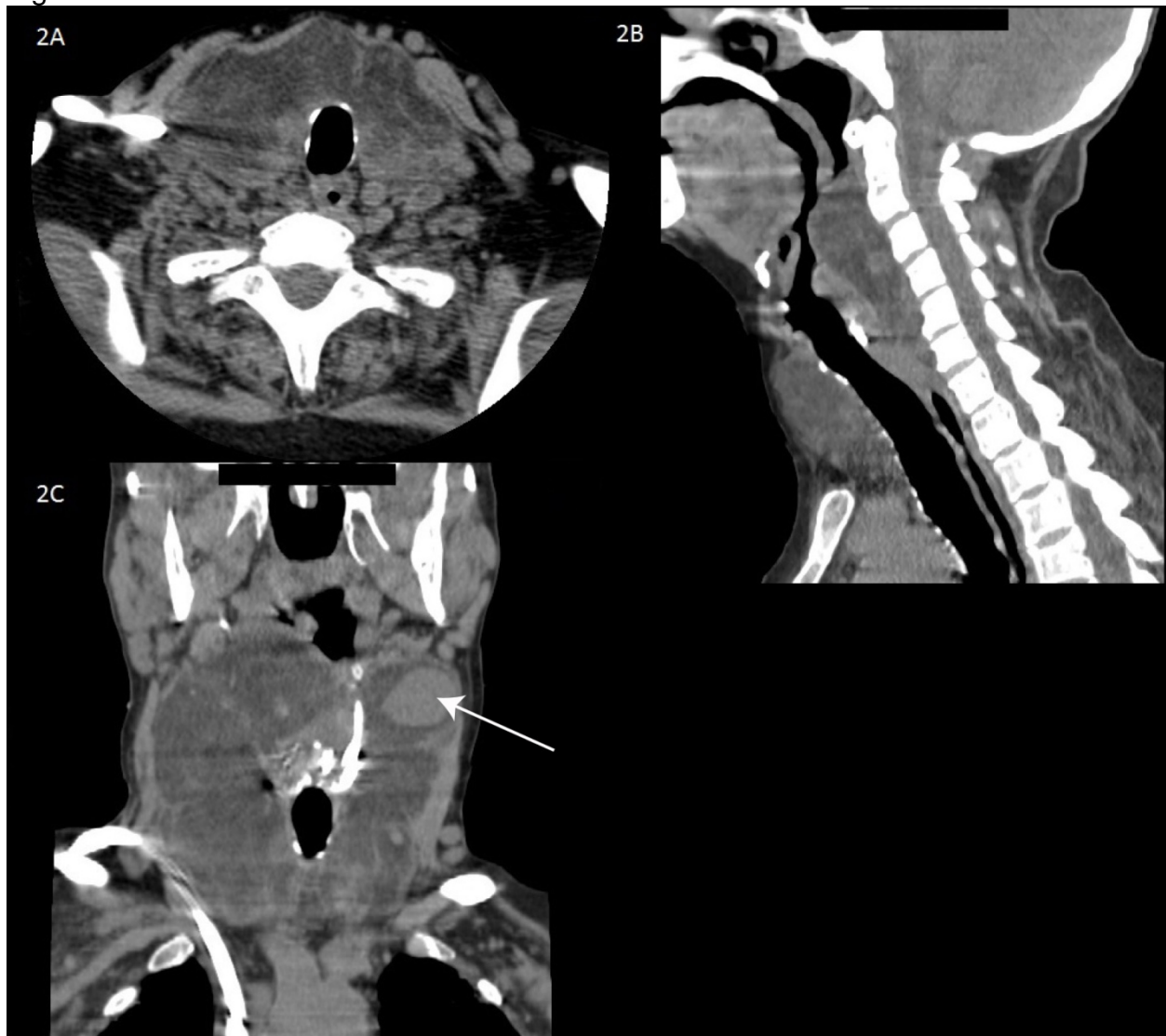


Figure 2:



**Figure legends:**

Figure 1: Ultrasound images: (A) midline transverse view in the area of the thyroid shows diffusely echogenic tissue with attenuation of sound typical of fat. The central hypoechoic area represents the trachea (asterisk). (B,C) Additional longitudinal views to the left and right of the midline show similar findings of diffusely echogenic tissue with posterior attenuation. A cyst is noted on the left (arrow).

Figure 2: CT images: (A) Axial image demonstrates an enlarged diffusely fatty infiltrated thyroid gland. (B) Sagittal midline image shows extension posteriorly to the retropharyngeal space with mass effect on the hypopharynx. (C) Coronal image shows extension inferiorly to the thoracic inlet. The left sided thyroid cyst is again seen in the superior left thyroid (arrow)

**Diagnosis:** Diffuse lipomatosis of the thyroid gland.

**Discussion:**

Fat containing lesions of the thyroid are extremely rare as there are only a limited number of adipocytes in the normal thyroid gland. The differential for adipose tissue in the thyroid includes diffuse lipomatosis (also known as thyrolipomatosis), thyrolipoma, heterotopic fat rest, amyloid goiter, lymphocytic thyroiditis, or liposarcoma. (Gupta et al, 2009) Of these diagnoses, diffuse lipomatosis of the thyroid gland is the most rare condition with only 11 reported cases in the literature (Dombale et al, 2011). The pathogenesis of this condition is unknown, but it has been suggested that the fatty infiltration is secondary to metaplasia of stromal fibroblasts from hypoxia or senile involution as noted in other organs (Schroder et al, 1985).

Ultrasound demonstrates enlargement of the thyroid with diffuse increase in the echogenicity and attenuation of sound typical of fat. Due to the posterior attenuation, it was difficult to discern the borders of the thyroid. A cyst is noted in the left thyroid. No other focal lesions are seen. Evaluation for focal lesions was compromised by the attenuation of sound. Computed tomography of the neck demonstrates a markedly enlarged diffusely fatty infiltrated thyroid gland with density (Hounsfield unit of -30 to -40). The thyroid gland extended inferiorly to the thoracic inlet and involved the retropharyngeal space with some mass effect on the hypopharynx. The cyst seen on ultrasound was again noted in the left superior thyroid.

In our case, the thyroid was diffusely infiltrated with fat, making diagnoses such as heterotopic fat rests or thyrolipoma less likely as these conditions are focal processes (Ge et al, 2009). The patient has also had her enlarged thyroid for some time, and there were no solid enhance elements on imaging to suggest liposarcoma. Since the patient was euthyroid and did not have any neck pain, lymphocytic thyroiditis was also considered unlikely.

The patient did not have a history of amyloidosis, however, if the patient did have amyloidosis, the thyroid findings could be explained by amyloid goiter, or the deposition of amyloid into the thyroid causing enlargement. Amyloid goiter is extremely rare and is only seen in 0.04% of patients with primary amyloidosis. While amyloid goiter is frequently accompanied by fat deposition to a varying extent, diffuse involvement as seen in this case is also rare (Aksu et al, 2010). In addition, the patient's goiter preceded her renal issues. While amyloid goiter can rarely be the presenting symptom of amyloidosis (D'Antonio et al, 2000), the extent of the thyroid involvement without evidence of amyloidosis affecting other organs made the diagnosis of amyloid goiter less likely.

Given the patient's presentation and findings on imaging, diffuse lipomatosis of the thyroid gland was felt to be the most likely diagnosis. Patients with this condition are also often euthyroid as seen in our patient (Ge et al, 2009) and are usually asymptomatic until the thyroid causes mass effect in the neck. Most patients with this condition elect for a thyroidectomy and therefore the natural history of this rare entity is unknown.

**References:**

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