

Image Challenge

Rapid Enlargement of the Thyroid Gland

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A 54-year-old woman was admitted to the emergency department with a rapid onset of neck swelling that had developed over the past three weeks. She reported accompanying symptoms of pain, hoarseness, and difficulty in swallowing, as well as noticeable weight loss. However, she denied experiencing palpitations, excessive sweating, or an increase in bowel movements. Her medical history was unremarkable, and there was no family history of thyroid disease or cancer.

Upon physical examination, her thyroid gland was tender, enlarged, and firm to the touch, remaining immobile during swallowing. She was afebrile, and her vital signs were within normal limits. Notably, a pulse of 90 beats per minute was documented, but other signs of thyrotoxicosis or Graves' ophthalmopathy were absent.

Laboratory investigations indicated normal biochemical results, except for an elevated erythrocyte sedimentation rate (ESR) of 40 mm. Thyroid function tests revealed findings consistent with thyrotoxicosis, including a very low TSH level (less than 0.001 mIU/L) and a high free T4 level of 90 pmol/L.

What are the differential diagnoses?

Anaplastic thyroid carcinoma - typically presents as a rapidly growing anterior neck mass and may have compressive symptoms early in the disease. ^[1]

Thyroid abscess - is very rare in a healthy individual due to its anatomy; encapsulation, rich blood and lymphatic supply, and iodine content inside offer the gland protection. Patient may present with tender neck and biochemically normal or thyrotoxicosis. ^[2]

Graves thyrotoxicosis - the goitre size varies from the barely palpable to very large but the consistency is firm but elastic and the borders are easily demarcated by palpation. Patient may have local pressure symptoms.

Primary thyroid lymphoma - it is uncommon and often manifests in individuals with preexisting Hashimoto (chronic autoimmune) thyroiditis. The aggressiveness of clinical presentation depends on histology, with diffuse large B-cell lymphoma displaying a more aggressive behavior. Patients typically have firm to hard, diffusely enlarged, and

immobile thyroid gland, accompanied by lymphadenopathy and obstructive symptoms. Rarely, some patients may exhibit symptoms of hyperthyroidism due to the destruction of the thyroid follicles by the lymphoma. (b)

Other rare differential diagnoses

Primary thyroid sarcoma

Poorly differentiated thyroid carcinoma

Squamous cell thyroid carcinoma

Medullary carcinoma

What are the diagnostic imaging studies?

Ultra sound scan of thyroid showed an irregular shaped, ill-defined, heterogeneous hypoechoic mass with invasion of thyroid capsule and surrounding soft tissues.

Computer tomography (CT) of neck and chest:

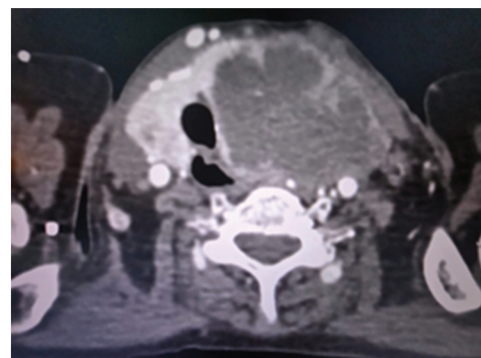


Figure 1: Coronal view

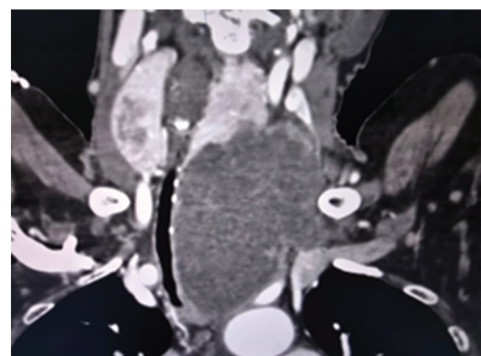


Figure 2: Axial view

The contrast enhanced CT reveals a large, multiloculated mass with central necrosis and peripheral enhancement arising from inferior pole of left hemi-thyroid and extends into the retrosternal, pre-vertebral and carotid spaces. It measures approximately 86mm cranio-caudal, 55mm anteroposterior and 62mm transversely, with inferior extension reaching the level of aortic arch. The left carotid vessel is engulfed by the tumour, demonstrating direct invasion. Additionally, there is lateral displacement of trachea and oesophagus by the mass. Furthermore, multiple subcarinal lymph nodes and several lung nodules are present, with the largest on the right measuring 11 mm, demonstrating lung metastases.

What is the diagnosis?

Advanced anaplastic thyroid carcinoma with lung metastases. The associated biochemical thyrotoxicosis is possibly secondary to destruction of thyroid follicles by tumour cells.

Anaplastic thyroid carcinoma is a rare undifferentiated thyroid cancer. This highly aggressive tumour accounts for 2% to 3% of all thyroid cancers. This malignancy is known for rapid local invasion and early distant metastasis, making anaplastic thyroid carcinoma one of the most fatal malignancies.^[1]

What is the place for biopsy?

Fine needle aspiration cytology is crucial in tissue diagnosis. Core needle biopsy is more sensitive and specific. Microscopic appearance are highly vary and broadly categorised in to sarcomatous, giant cell and epithelial forms. Necrosis, an elevated mitotic rate, and an infiltrative growth pattern are common in all three forms. Vascular invasion is also often present but it is difficult to distinguish anaplastic thyroid cancer from other high-grade tumors, including lymphomas and melanoma. Immunohistochemistry is useful to distinguish anaplastic carcinoma from other undifferentiated thyroid cancers.^[1]

What is the prognosis?

Due to rapid progression, majority of the patients die within one year from local compression or distant metastasis such as pulmonary involvement^[4]. The overall 5-year survival rate is reportedly less than 10%, and most patients do not live longer than a few months after diagnosis.^[5]

What are the available therapeutic options?

Due to high mortality of the disease, all patients with anaplastic thyroid carcinoma are classified as having stage IV disease. Palliative approach will be considered as a suitable therapeutic option in most. Surgical resection can be a choice for localised tumour. Adjuvant radiation therapy or chemoradiotherapy may prolong survival to some degree. External-beam radiotherapy is used for local control.^[1]

What are the new advances in Anaplastic thyroid carcinoma?

Molecular testing for BRAF mutation, and uncommon genetic mutations such as TSC1 mutation and ALK rearrangements are helpful for targeted therapy and may hold promise in future.^[5]

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