VANDERBILT UNIVERSITY
MEDICAL CENTER

ANAPLASTIC THYROID CANCER

IMAGING FINDINGS

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SENRS 2026 | Interesting Case

CLINICAL PRESENTATION

64-year-old man with history of HTN and type 2 diabetes

SETTING

- Emergency department

CHIEF COMPLAINT

- 1 day of noisy breathing and voice changes

HPI

- 2–3 months of worsening neck swelling, dysphagia, globus sensation
- 20-lb weight loss over past year

EXAM

- Raspy voice, thyroid-region mass, right cervical lymphadenopathy

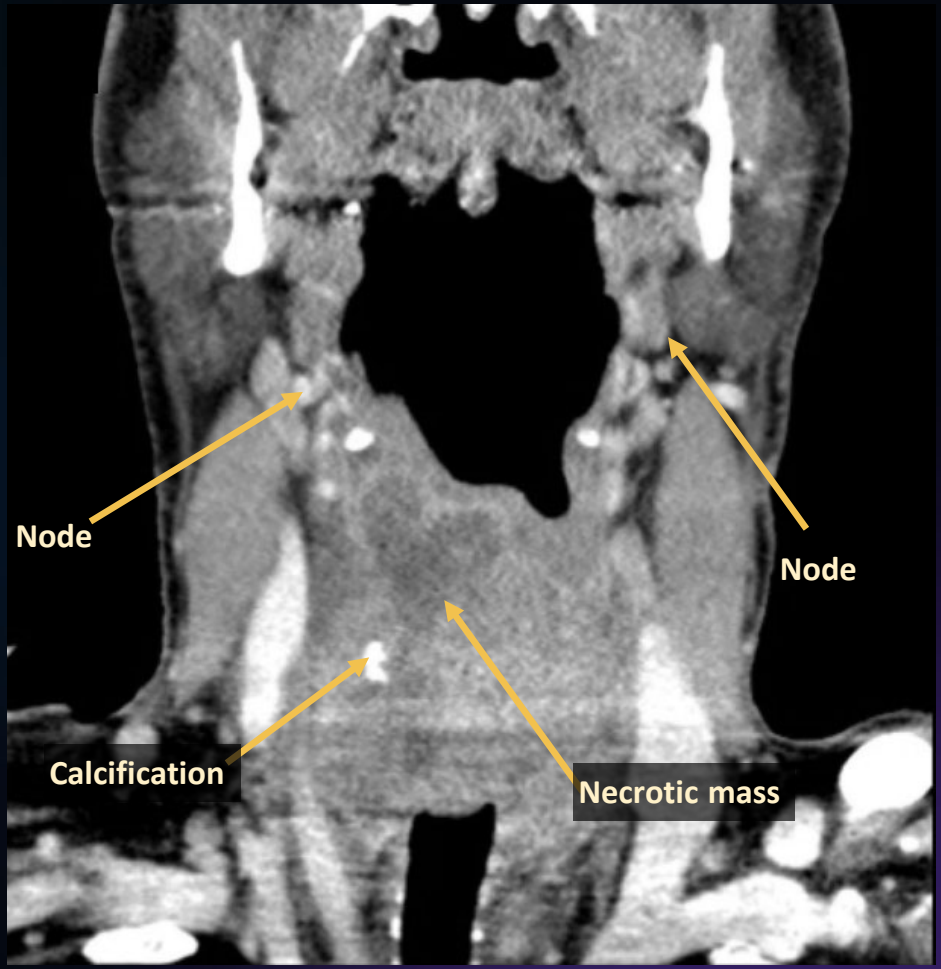
LABS

- TSH elevated at 24

IMAGING: CT

Soft tissue neck, coronal, with contrast

Enlarged heterogeneous mass with calcification at the level of the lower neck extending to the thoracic inlet



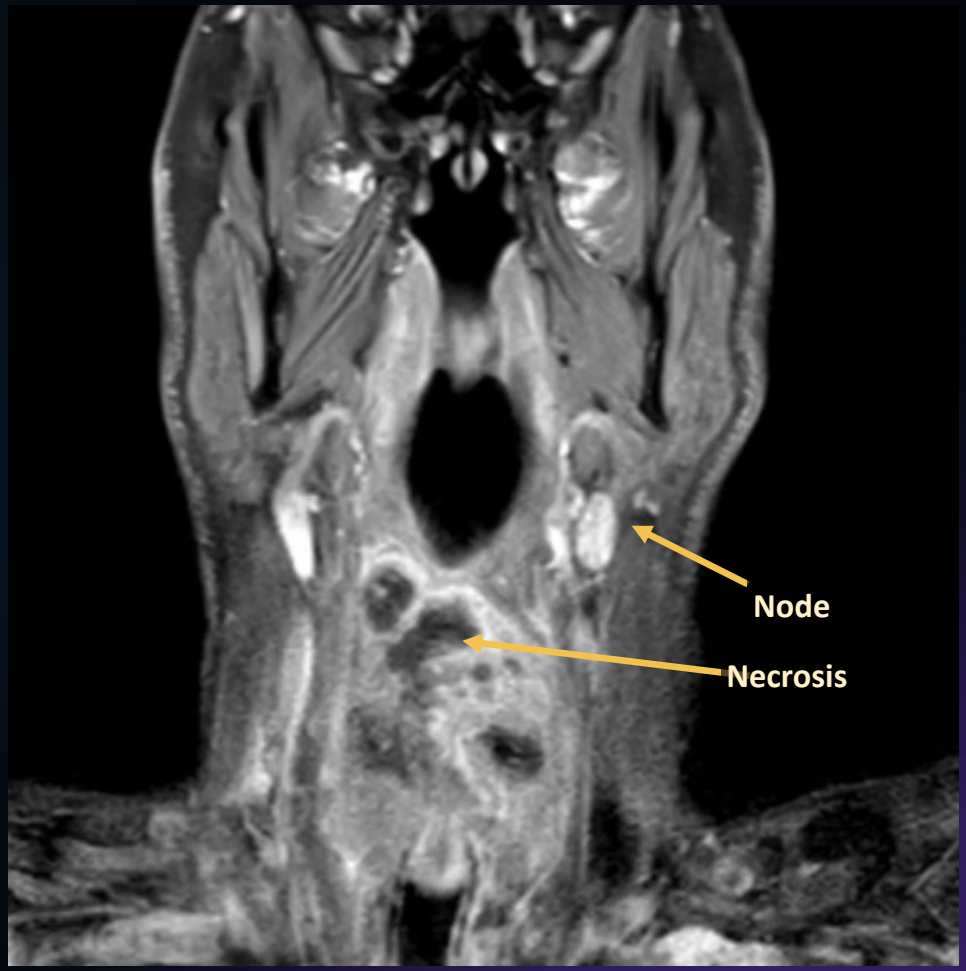
IMAGING: MRI

Soft tissue neck, coronal, T1, with contrast

Heterogenous mass with areas of central necrosis and enhancement centered in the thyroid

Parts of this mass appear to extend outside the thyroid capsule

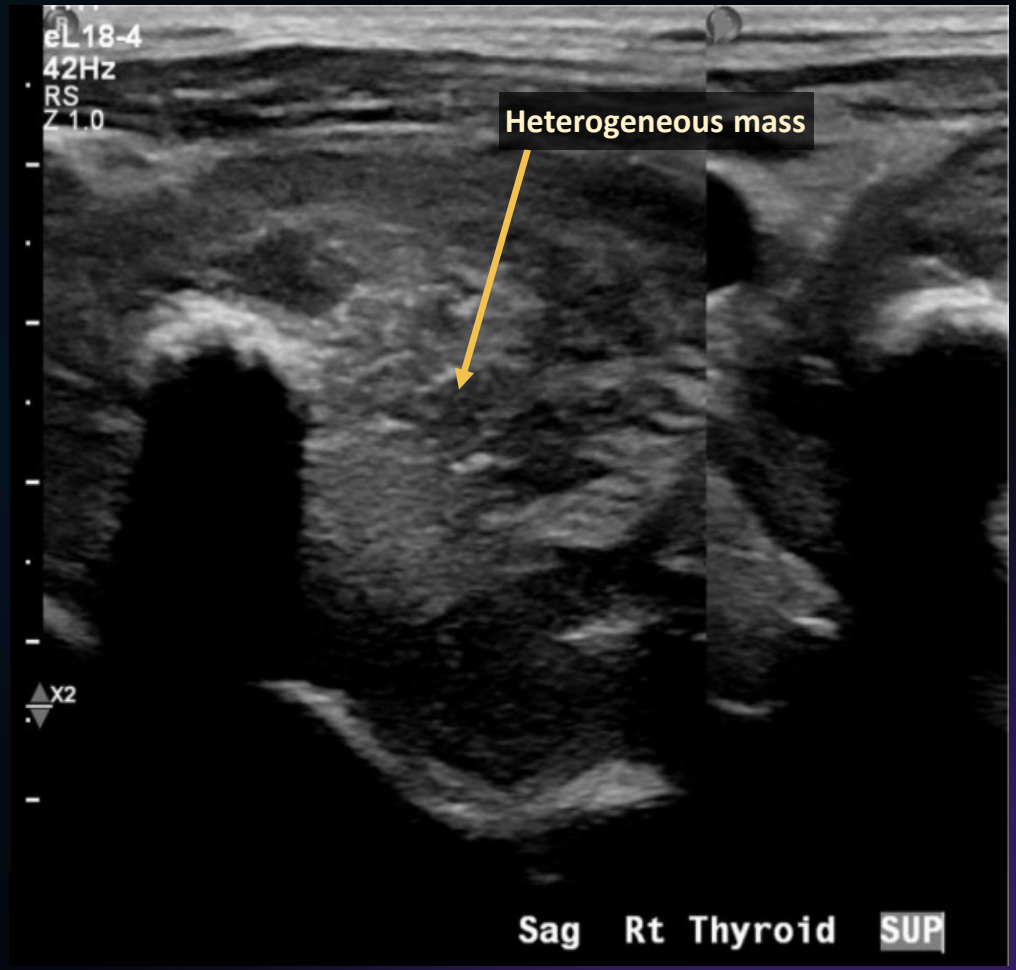
Numerous surrounding enlarged lymph nodes



IMAGING: ULTRASOUND

Right thyroid, sagittal

Enlarged right thyroid lobe

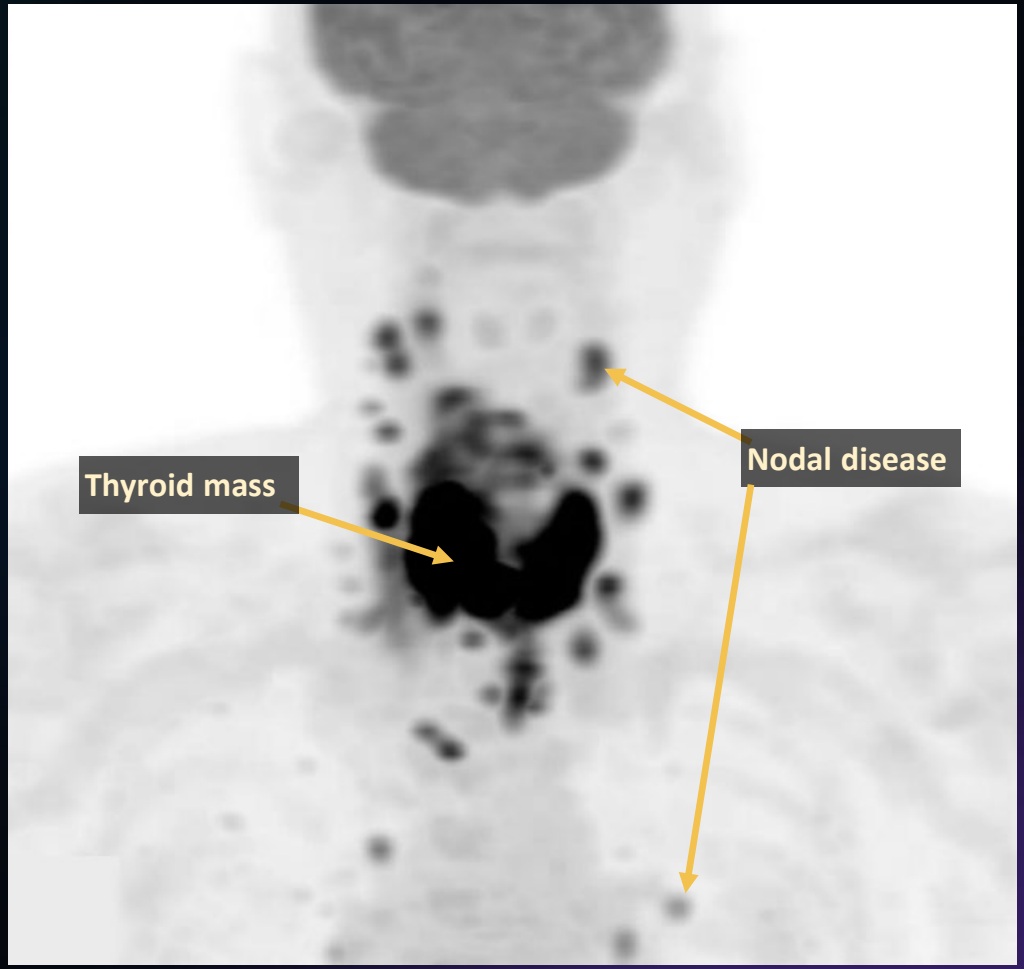


IMAGING: PET/CT

FDG, coronal MIP

Intense FDG uptake in the region of the thyroid with numerous surrounding lymph nodes, some of which are in the mediastinum

These findings are consistent with biopsy-proven stage IV anaplastic thyroid cancer.



DIAGNOSIS & TEACHING POINTS

Metastatic BRAF V600E-positive anaplastic thyroid carcinoma (ATC)

- ATC arises from follicular epithelium
- Exceptionally aggressive; all cases stage IV
- CT: infiltrative necrotic mass, calcification, organ invasion, enlarged nodes
- US: local invasion
- PET: intense FDG avidity favors ATC over differentiated thyroid cancer
- Diagnosis: FNA biopsy plus BRAF V600E testing

MANAGEMENT & OUTCOME

Management

- Thyroidectomy, if resectable (not possible for this patient)
- Systemic BRAF inhibitors, if BRAF V600E-positive
- Radiation to reduce tumor burden and mass symptoms
- This patient also required tracheostomy and PEG tube soon after diagnosis because of compression of the trachea and esophagus

Outcome

- Necrotic tracheostomy pressure wound that could not heal
- Recurrent pneumonia and sepsis
- Hospice at 7 months after diagnosis; he died shortly after

Rapid progression and poor prognosis: early goals-of-care discussions are essential

REFERENCES

Bible, K. C., et al. (2021). 2021 American Thyroid Association Guidelines for Management of Patients with Anaplastic Thyroid Cancer. *Thyroid®*, *31*(3), 337–386. https://doi.org/10.1089/thy.2020.0944

Ahmed, S., et al. (2018). Imaging of Anaplastic Thyroid Carcinoma. *American Journal of Neuroradiology*, *39*(3), 547. https://doi.org/10.3174/ajnr.A5487

THANK YOU