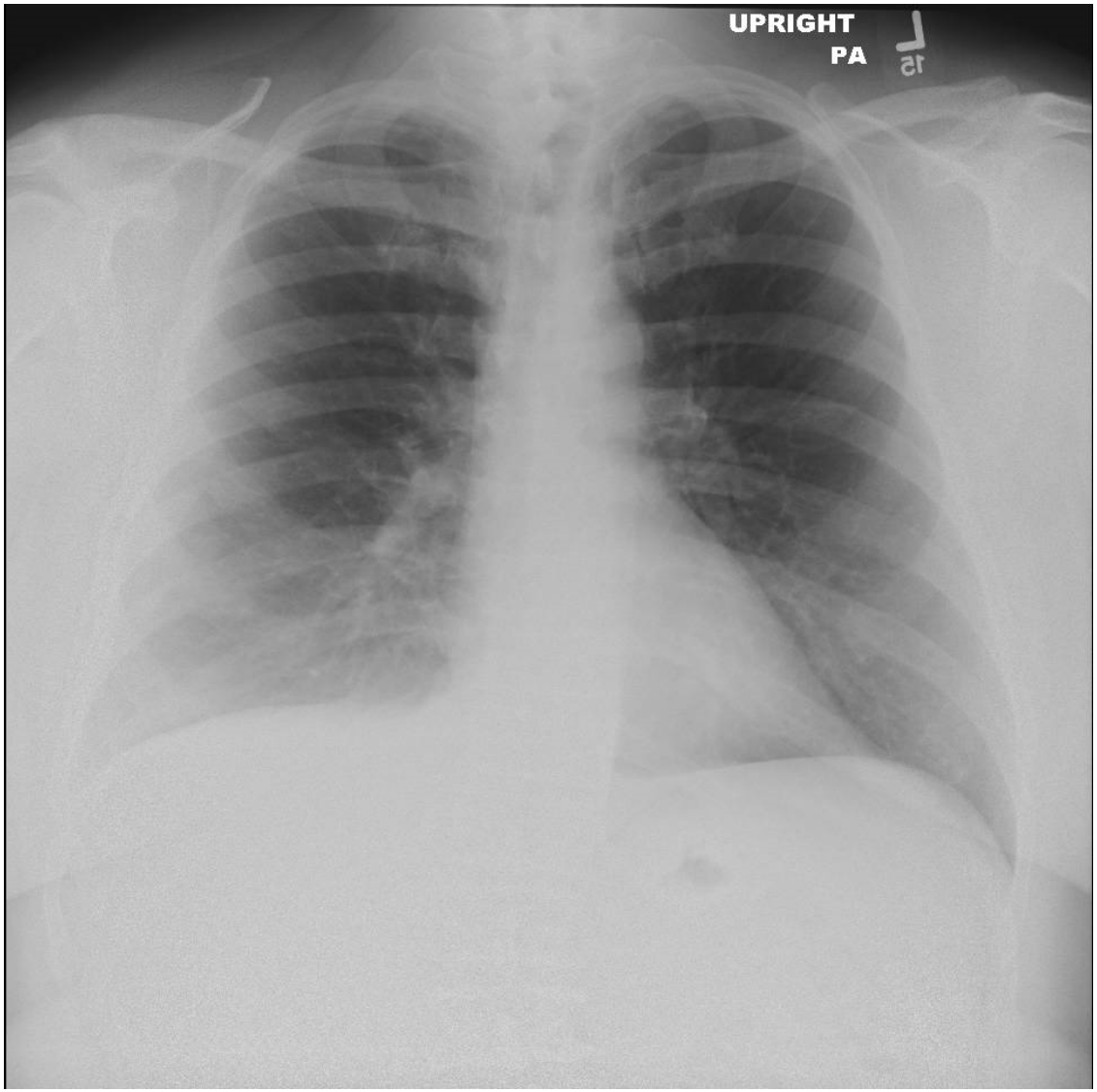
A Case of Aggressive Thyroid Carcinoma

Christopher Lacomis

Initial Presentation – 3/20/2017

- 57 y/o otherwise healthy male presents to UVA ED with 3-4 months of cough with intermittent hemoptysis and right upper abd pain. Previously diagnosed with URI. Hemoptysis significantly worsened 3 days prior and then more so just before arrival, producing enough blood to fill a soda can. No numbness, tingling, difficulty urinating, hematuria, hematochezia, melena, nausea, vomiting, weight change, fever, or night sweats. No hx of TB.
- VS WNL, physical exam notable for diminished breath sounds in the right lower lung field, RUQ tenderness
- Basic labs unremarkable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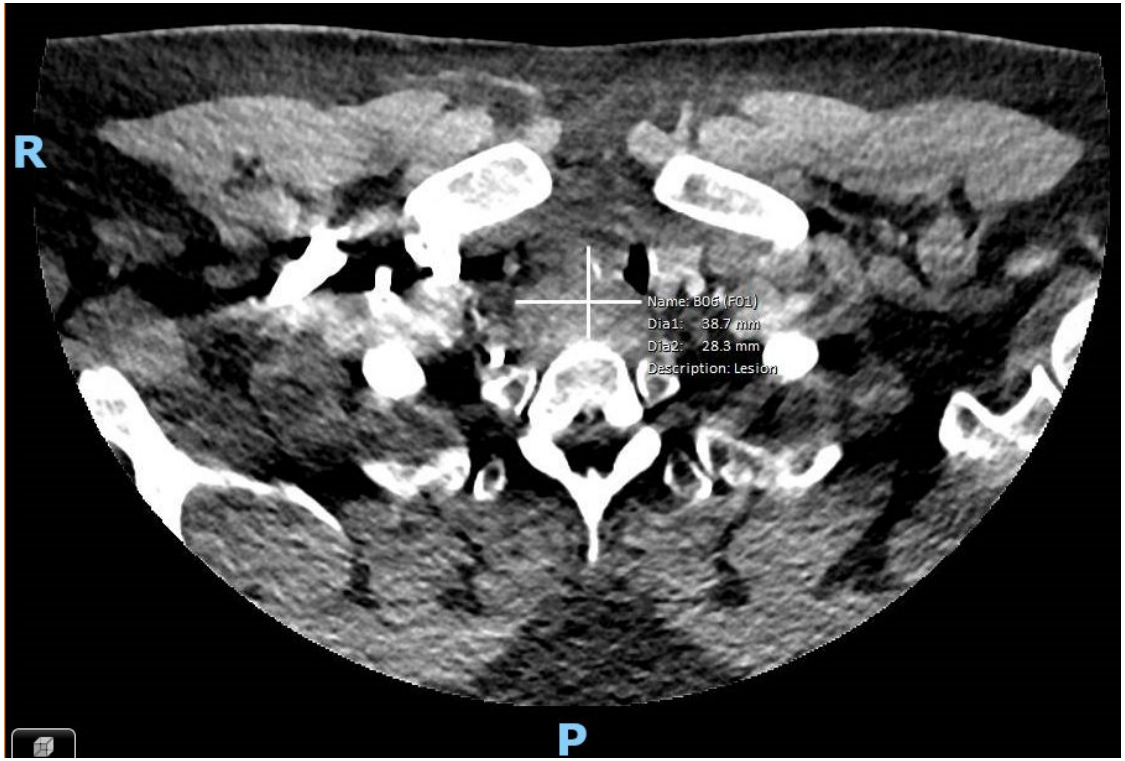
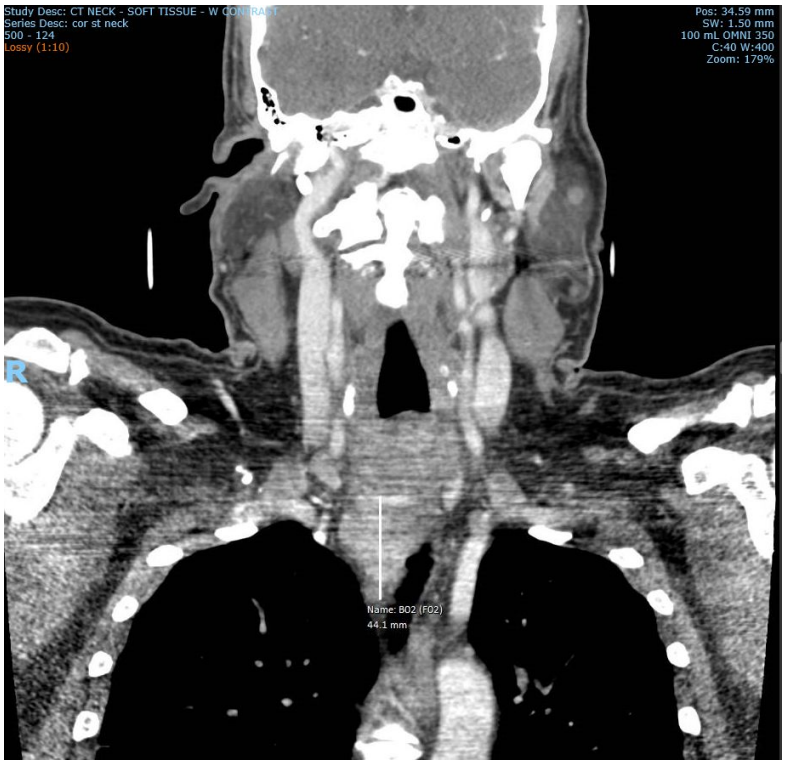
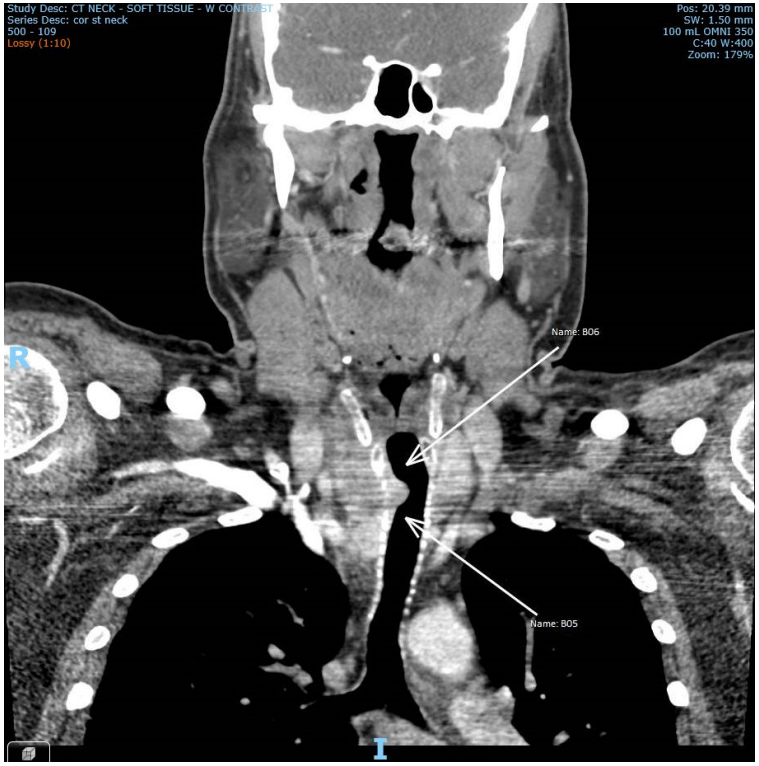


CT NECK - SOFT TISSUE - W CONTRAST



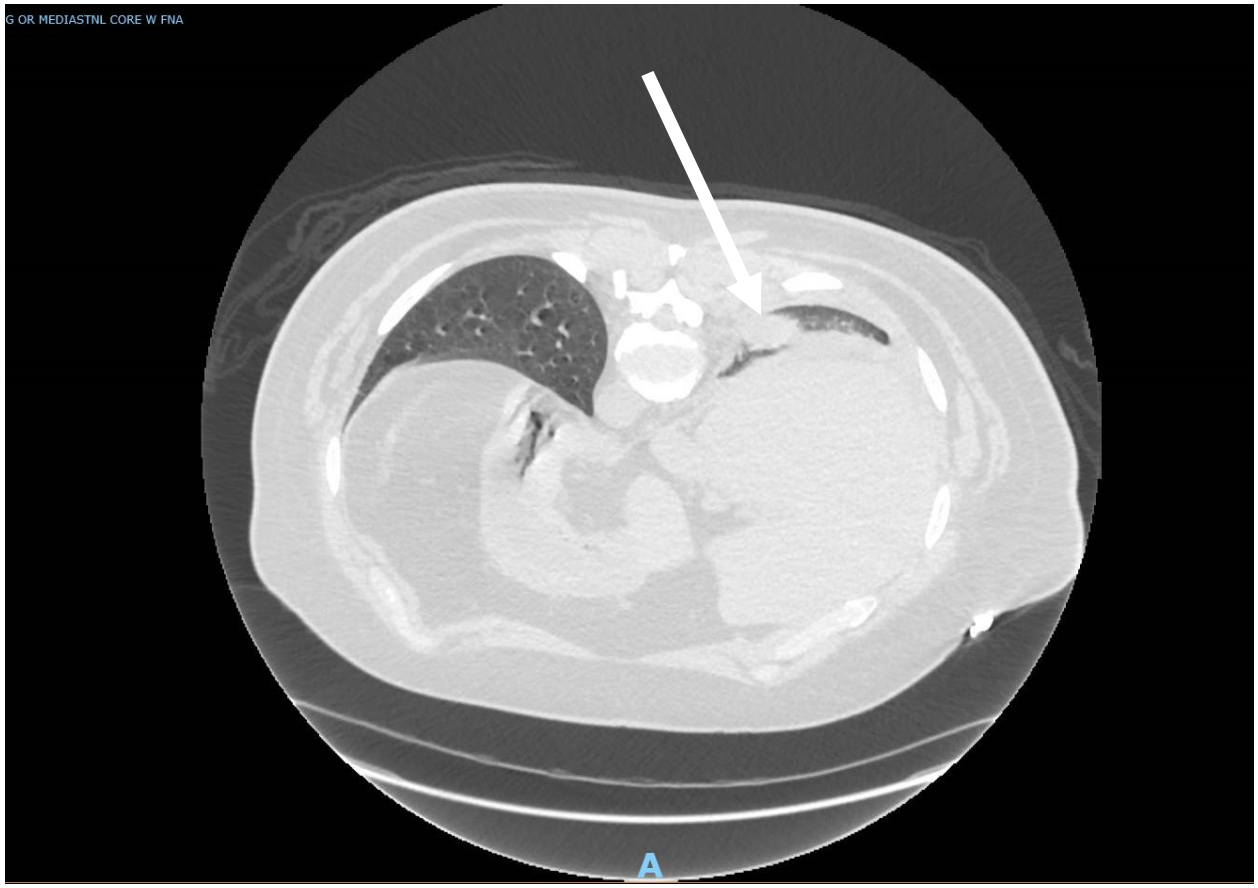


Interim Timeline

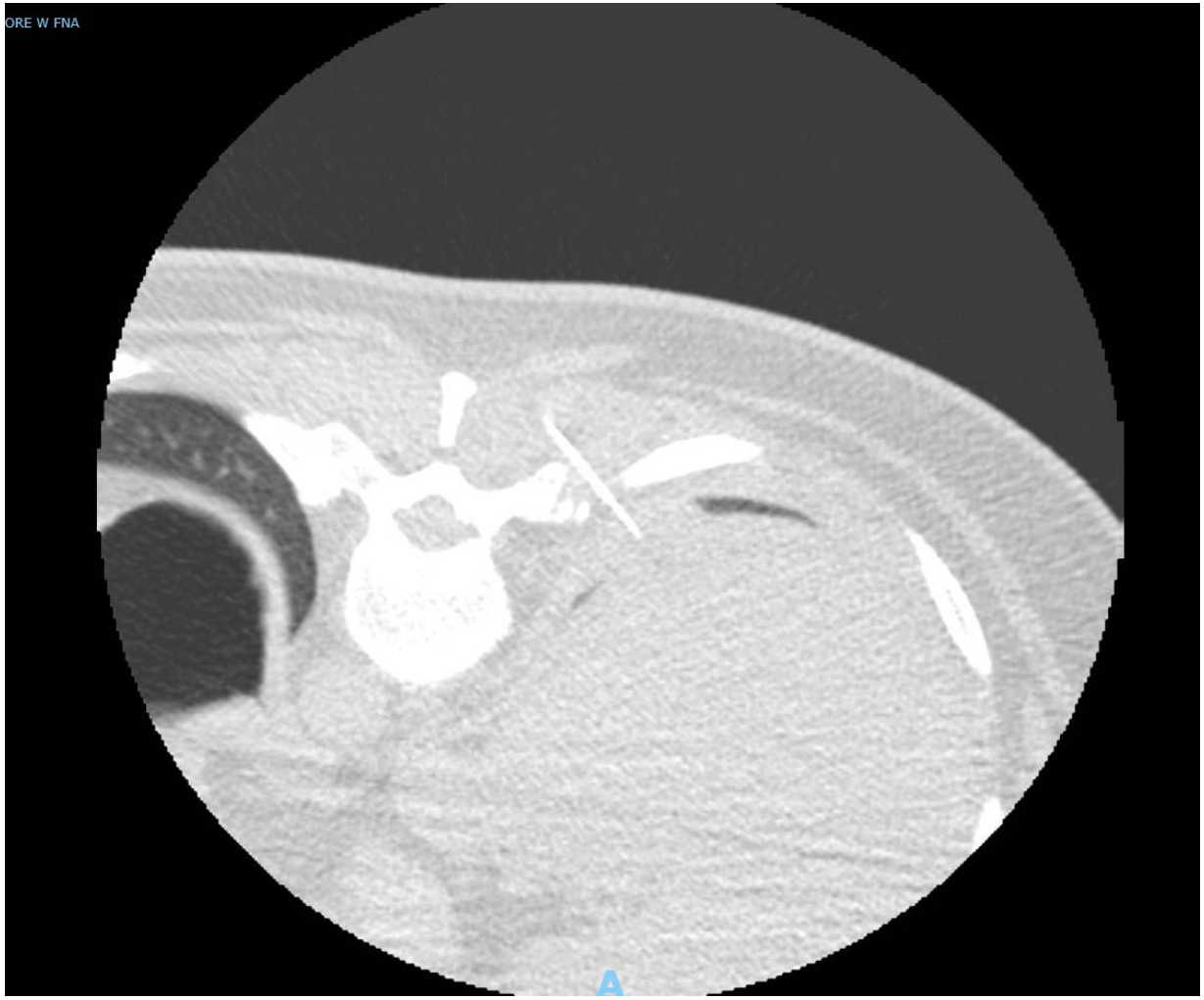
- Thyroglobulin (Tg) measured 2360 ng/mL in the pleural fluid specimen; numerous nodules favored to be lung mets
- Staged as T4aN1bM1 papillary thyroid cancer
- April 2017: Underwent total thyroidectomy with central compartment neck dissection, right lateral neck dissection, tracheal resection, tracheal anastomosis, and tracheostomy
- RAI and EBRT during the winter
- February 2018: procedure performed for right vocal fold paralysis
- February – May 2018: F/u thyroglobulin levels trend down to normal; f/u imaging of neck showed no evidence of disease recurrence

Interim Timeline

- June 2018: Dermatology orders CT abd/pelvis (lymphedema) and find new basilar pulmonary nodules concerning for metastasis
- August 2018: PET CT – Neck disease-free. Multiple hypermetabolic lung nodules and significant mediastinal lymphadenopathy. Thyroglobulin increasing again. Lesions not iodine avid, making RAI unlikely to have benefit and c/f anaplastic dedifferentiation.
- September 2018 – CT-guided biopsy



RLL pleural-based nodule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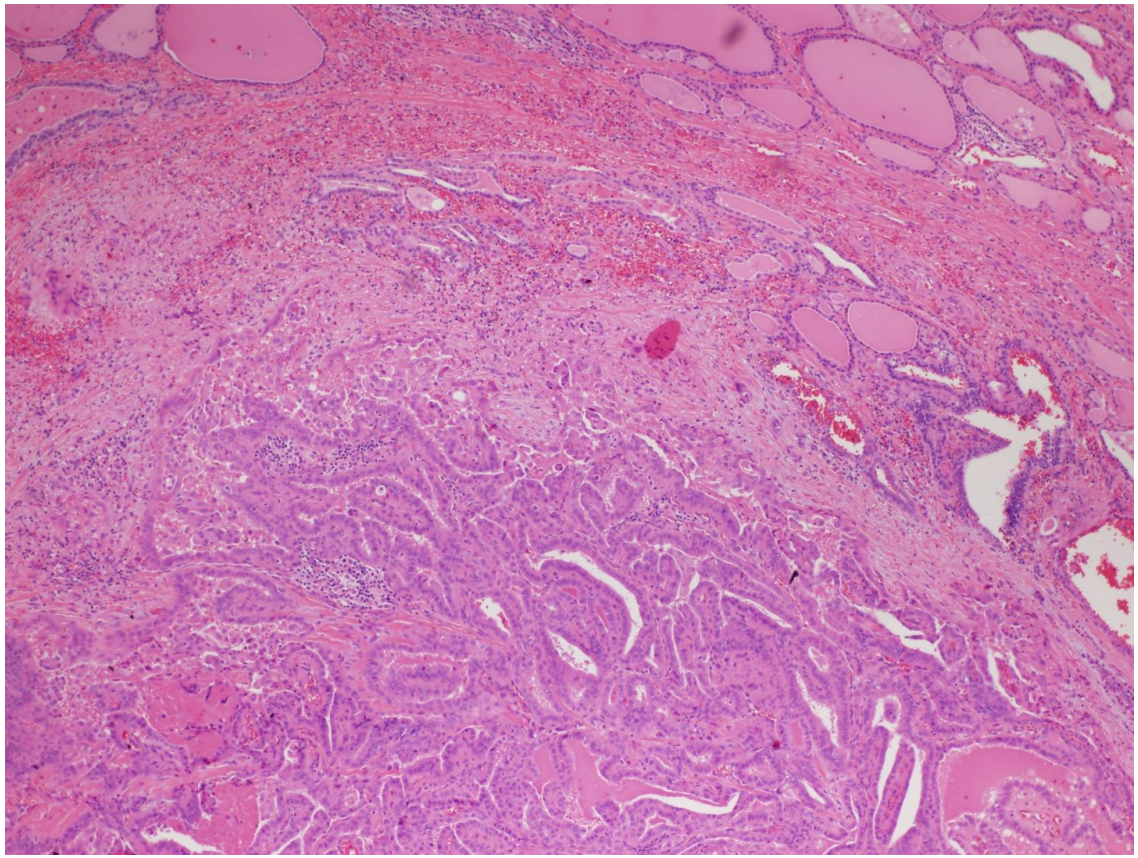
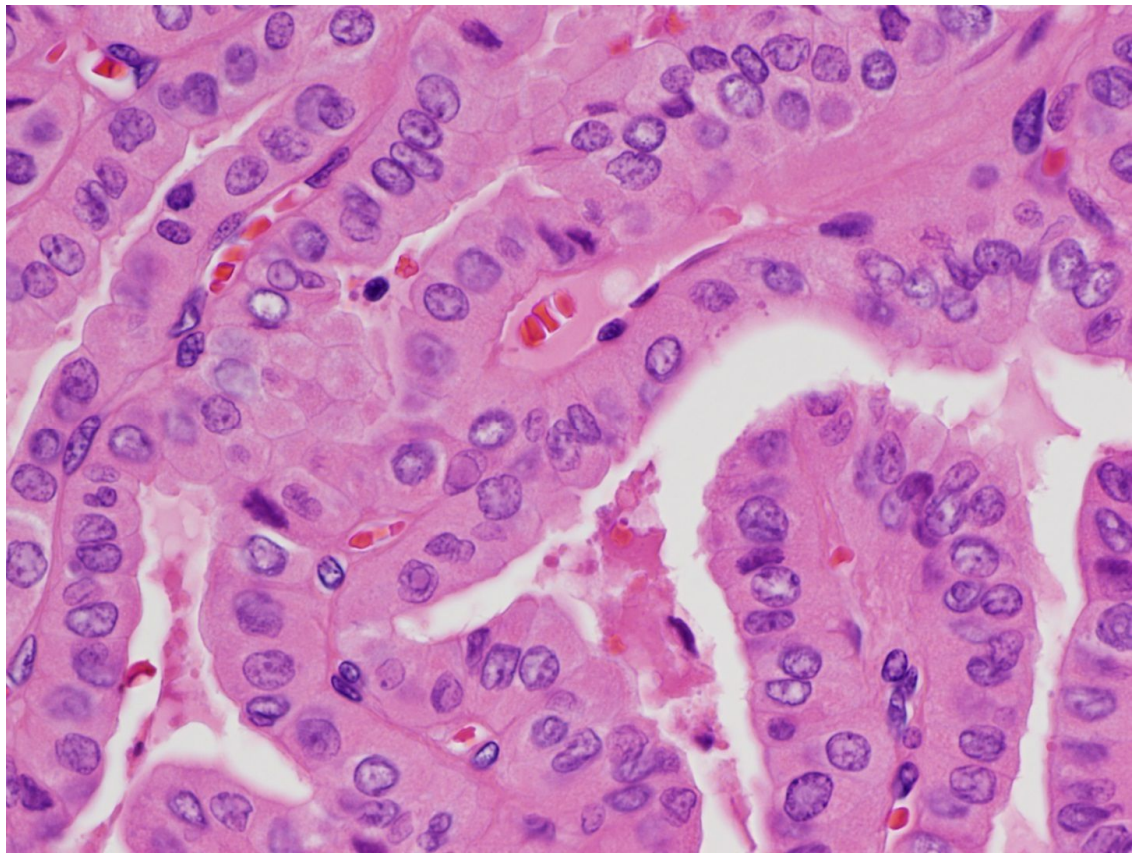
Thyroid



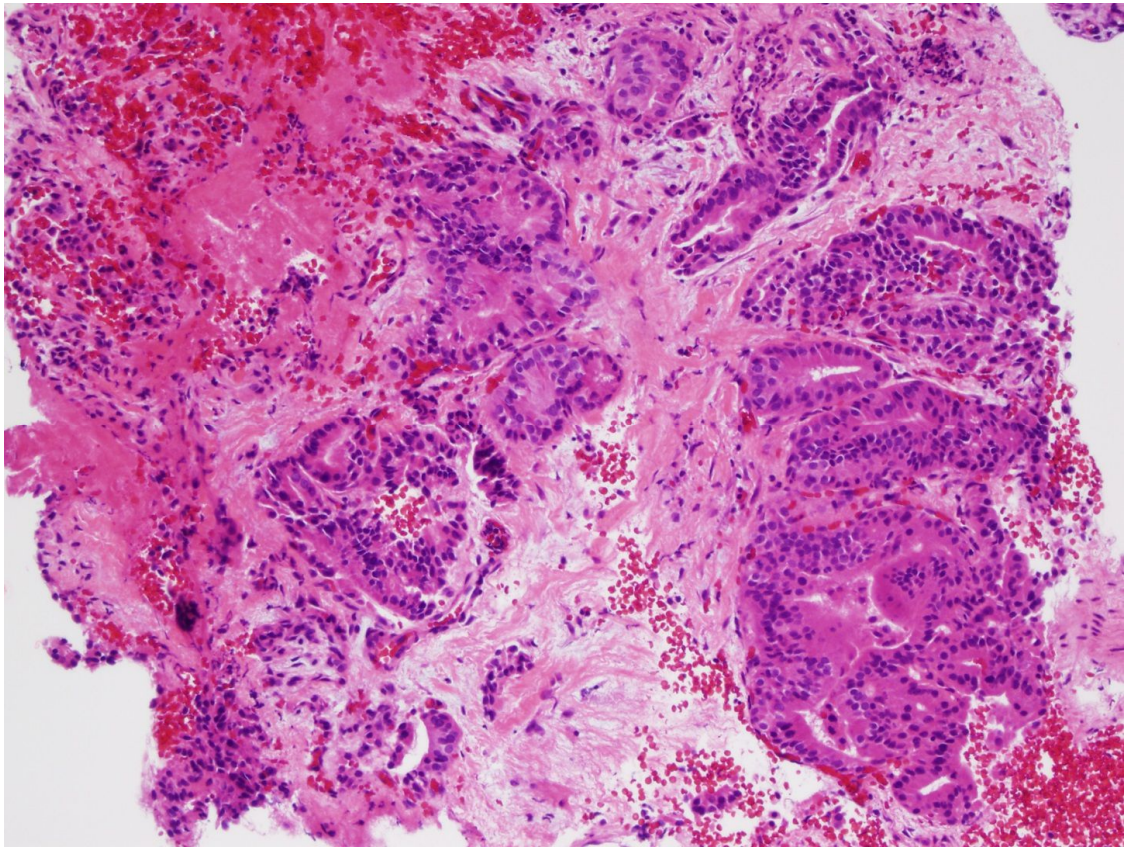
This is his original thyroid resection. A low power view comparing his PTC to the background normal thyroid

Thyroid



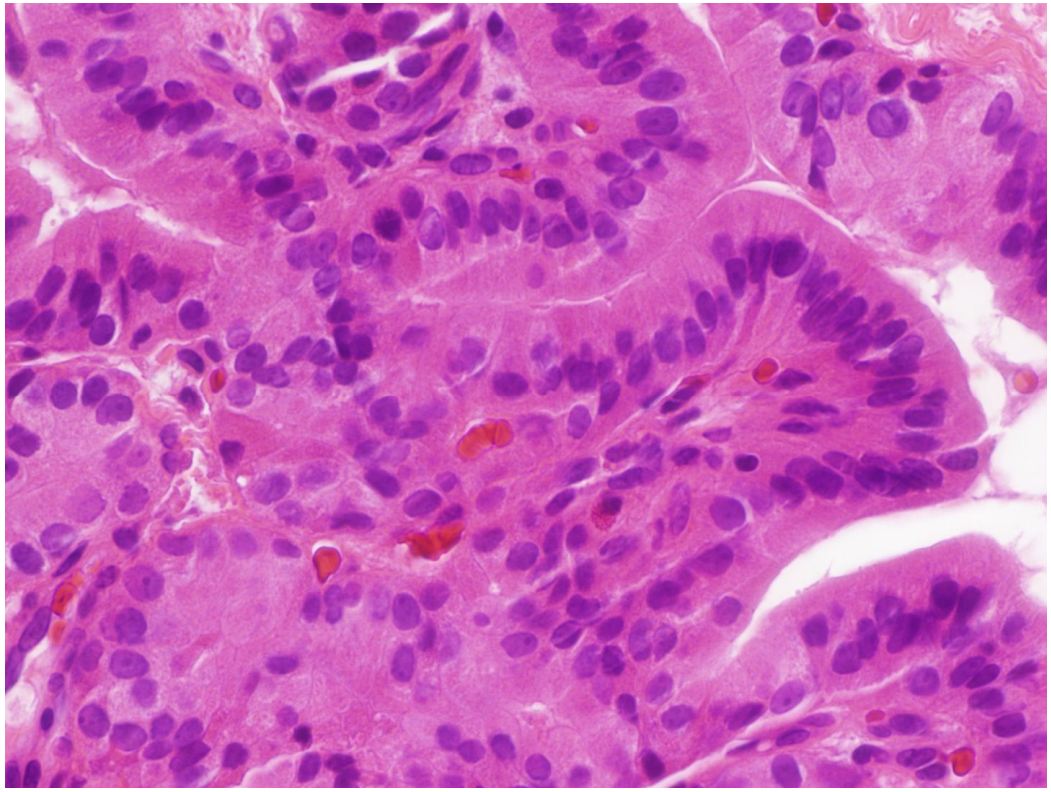
This is from his original thyroid resection. A high power view of the nuclear features of PTC (nuclear pseudoinclusions, nuclear grooves, nuclear overlapping, ovoid nuclei, optical clearing of chromatin (formalin-fixation artifact).

Lung - Core

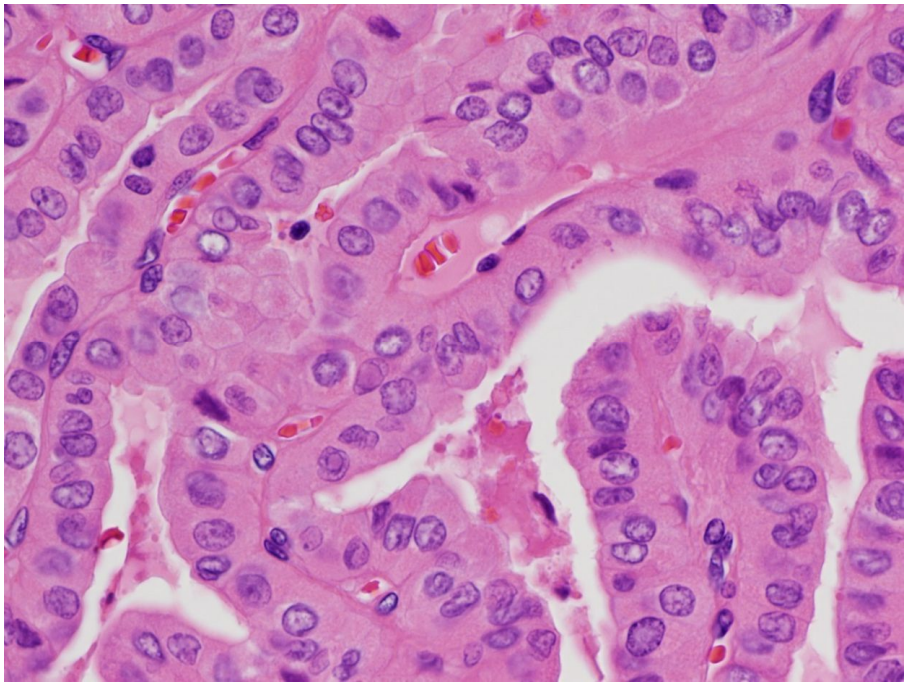


This is a 10x view of his lung lesion

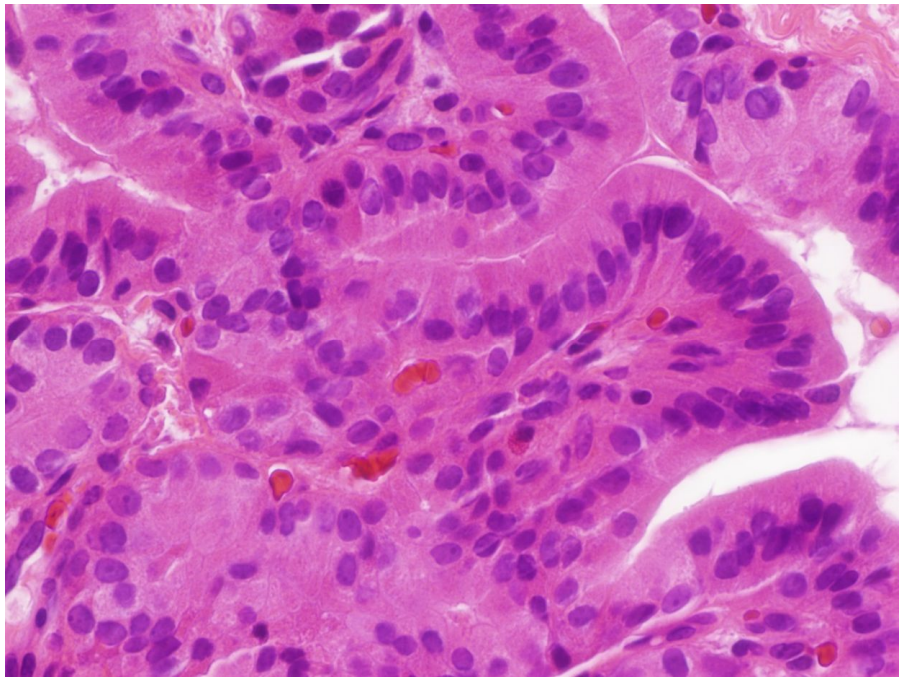
Lung - Core



This is a 40x view of the metastatic lung lesion showing cytomorphology that is quite distinct from his primary thyroid PTC

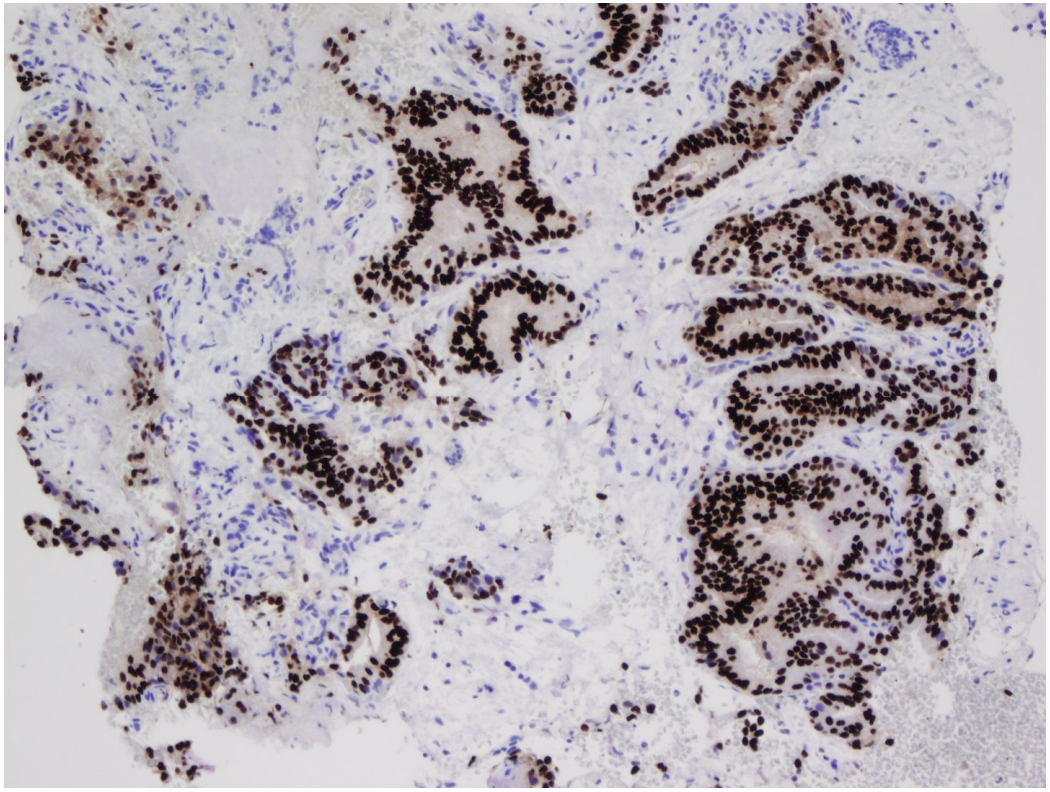


Thyroid



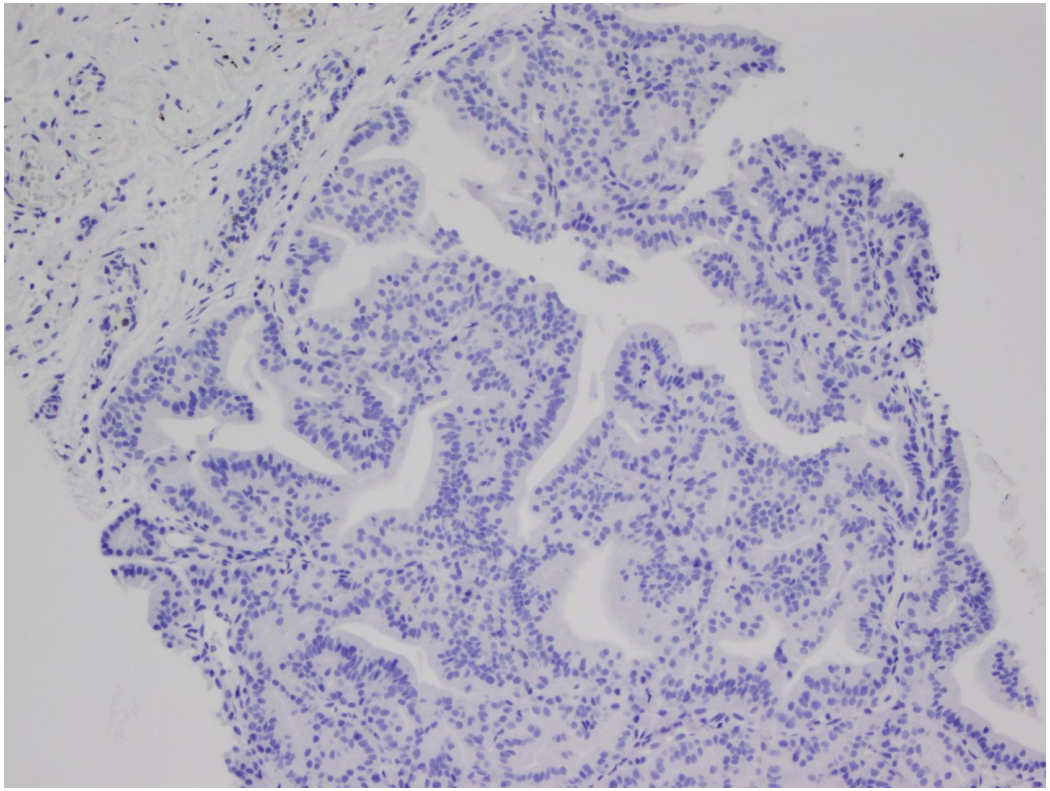
Lung

Lung: TTF - 1



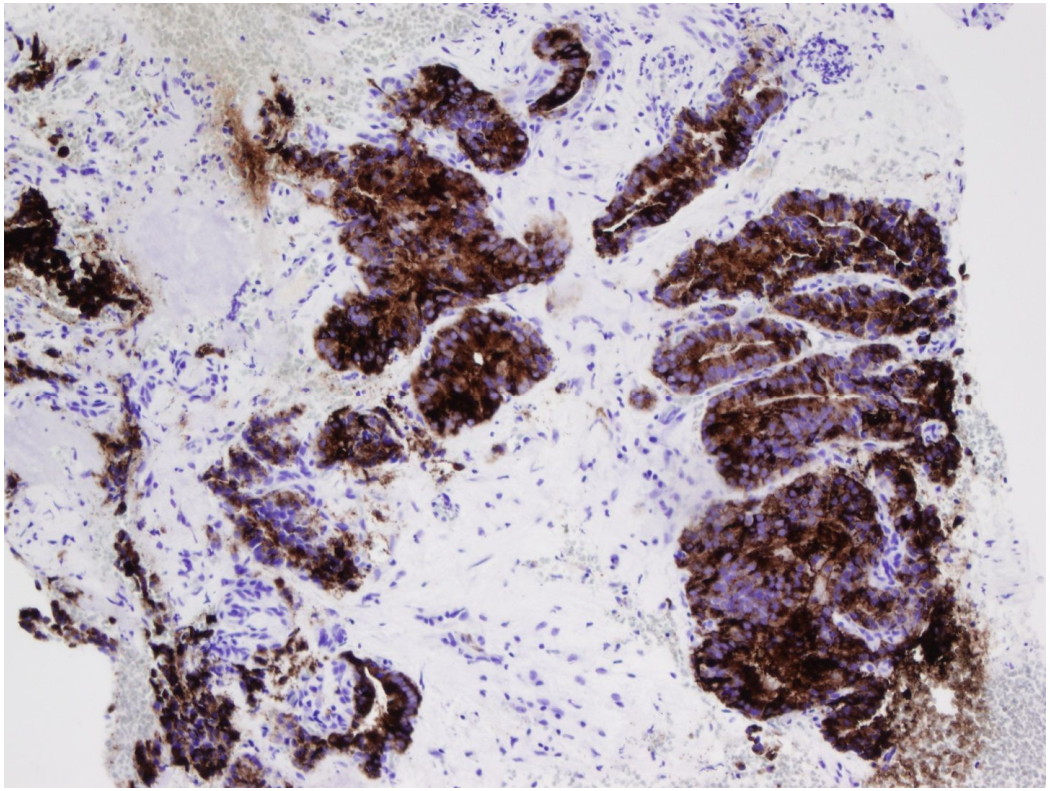
TTF-1 (positive, nuclear) in patient's lung met. TTF = thyroid transcription factor. Positive in primary lung adenocarcinomas and thyroid neoplasms

Lung: Napsin - A



This is Napsin-A (negative) in his lung tumor. Positive in primary lung adenocarcinomas

Lung: Thyroglobulin



Thyroglobulin (positive, cytoplasmic). Positive in thyroid neoplasms and mets. Negative in lung adenocarcinomas

Papillary Thyroid Cancer (PTC)

- 2.5:1 female to male ratio; median age of diagnosis is 51
- From 1975 to 2012, the incidence increased from 4.8 to 14.9 per 100,000.
  - ? Better screening – US more widespread
  - Generally indolent; Mortality remains low (5y survival ~98% in 2007)
- Typically presents as a nodule or incidental finding on imaging
- Poor prognostic factors include advanced age (no specific cutoff), large tumor size, macroscopic invasion, distant mets, certain histologic subtypes

Tall Cell Variant PTC

- 1% of all PTC; most common of the aggressive variants
- Associated with BRAF gene mutation – potential for targeted therapies
- 30-70% of the cells need to be twice as tall as they are wide
- Primary tumors tend to be large and locally invasive
- Often with distant metastases at time of diagnosis
- Tend to overexpress Muc1 cell surface glycoprotein (compared to classic PTC), which interferes with cell-cell adhesion and may help explain aggressive behavior
- Accounts for 20% of thyroid cancers which are refractory to RAI

References

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