A microscopic image of thyroid tissue stained with hematoxylin and eosin (H&E). The image shows a cross-section of thyroid follicles, which are circular structures lined by a single layer of cuboidal epithelial cells. The follicles contain a clear, eosinophilic colloid. In the center of the image, there is a large, irregularly shaped nodule that is densely packed with small, dark-staining cells, representing a metastatic focus of lung adenocarcinoma. The surrounding thyroid tissue appears relatively normal.

An unusual case of the thyroid  
metastases from lung  
adenocarcinoma primary.

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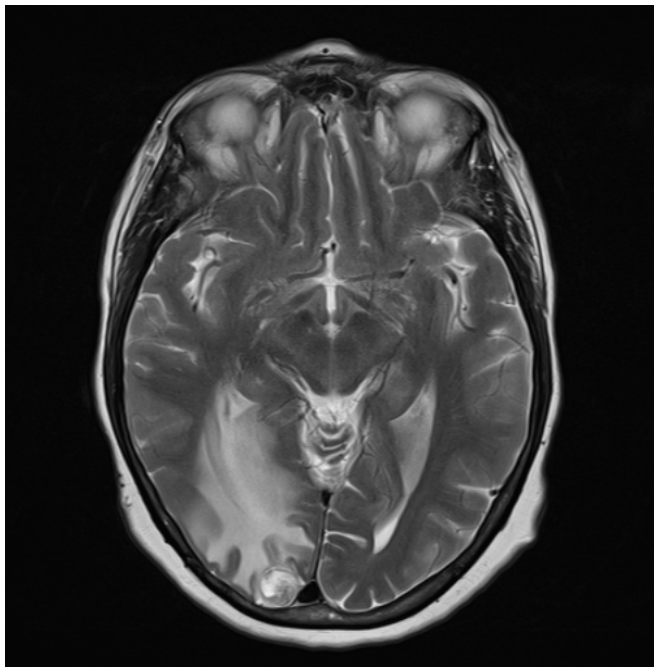
Dr E Robinson, Dr I Sequeiros

# Background

- Thyroid metastasis from primary lung cancer is extremely rare.
- Very few cases reported in the literature, particularly regarding their imaging characteristics and natural history.

# Case presentation

- 62-year-old woman
- Adenocarcinoma of the right upper lobe with cerebral metastases.
  - Initial staging T2a N0 M1b
  - PD-L1, EGFR and ALK negative



*Feb 2018*

**Initial  
staging**

• T2a N0 M1b

*July 18-*

*Apr19*

**Treatment**

*March 2020*

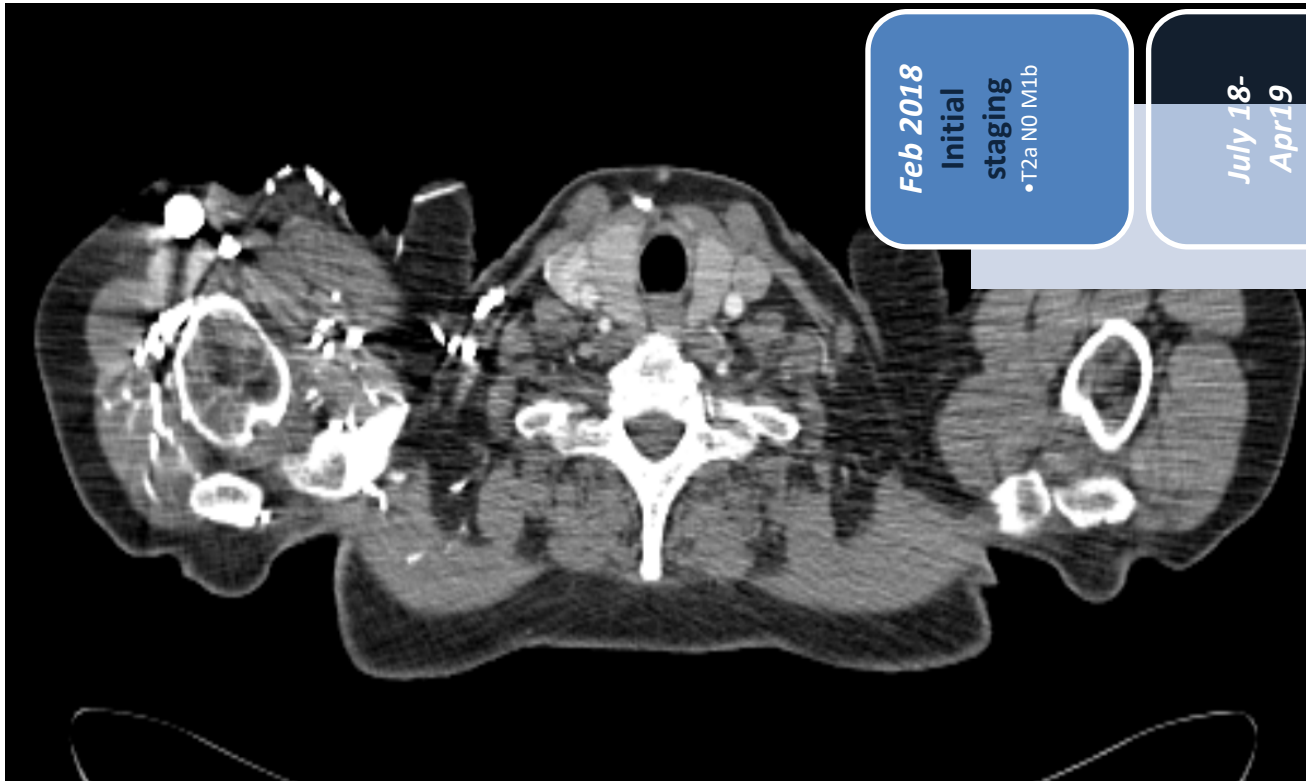
**Restaging**

Right thyroid  
nodule- proven  
metastatic

# Initial staging

February 2018

- No thyroid lesion is present at initial staging



*Feb 2018*  
**Initial staging**  
• T2a N0 M1b

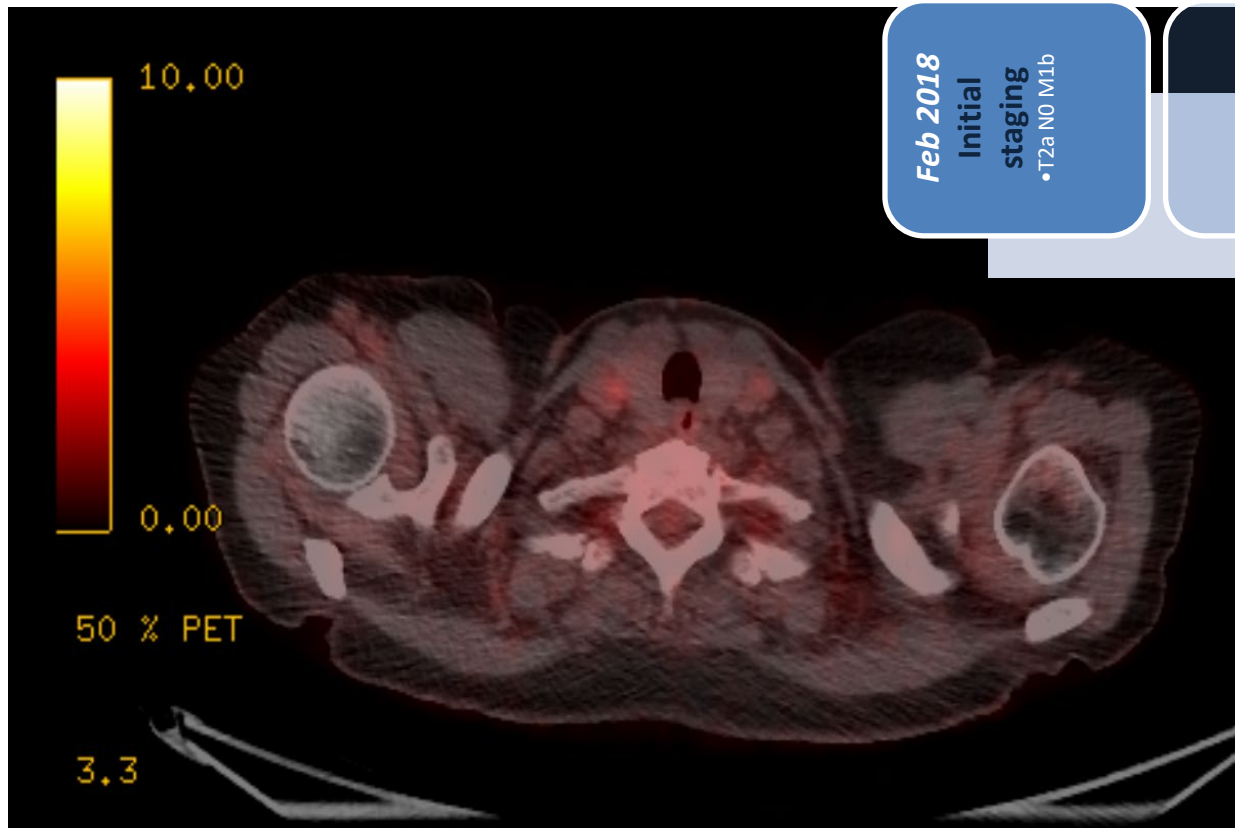
*July 18-  
Apr 19*  
**Treatment**

*March 2020*  
**Restaging**  
Right thyroid nodule- proven metastatic

# Initial PET CT

March 2018

- Confirmed on PET at staging
  - No avid thyroid lesion is demonstrated



*Feb 2018*  
**Initial  
staging**  
• T2a N0 M1b

*July 18-  
Apr19*  
**Treatment**

*March 2020*  
**Restaging**  
Right thyroid  
nodule- proven  
metastatic

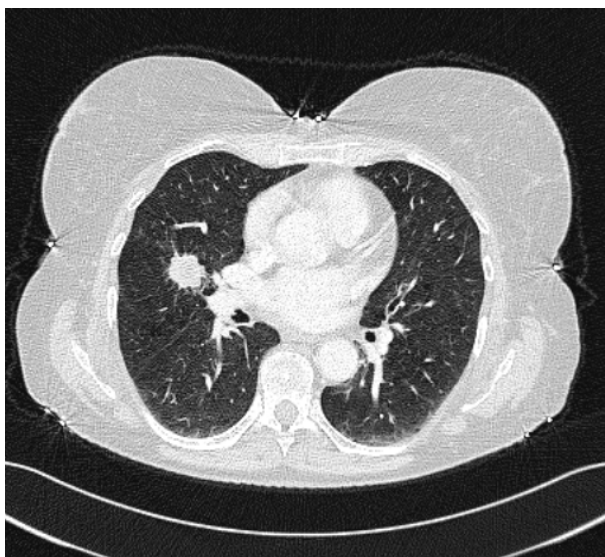
# Treatment

- The patient underwent several treatment regimens following diagnosis
  - Apr 2018- Cerebral gamma knife
  - Jun-July 2018- Radical radiotherapy (RT) to the right lung
    - Partial response
  - Oct 2018- Further Gamma knife –October
  - Feb 2019- Further Gamma knife to new (
  - April 2019- Whole Brain RT (WBRT)

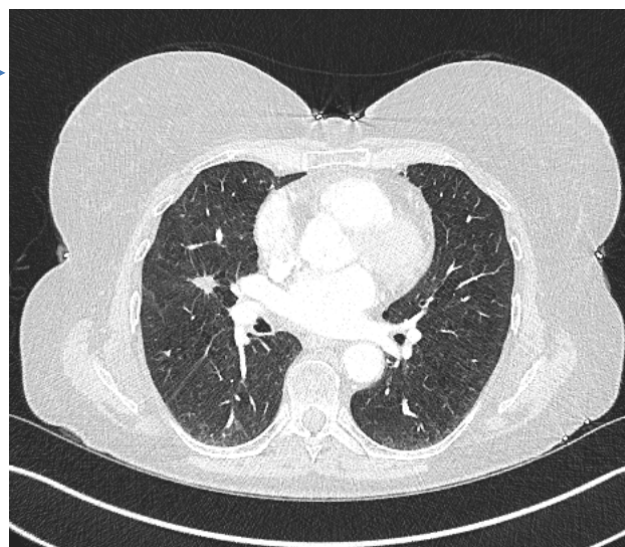
**Feb 2018**  
Initial staging  
•T2a N0 M1b

**July 18-  
Apr19**  
Treatment

**March 2020**  
Restaging  
Right thyroid nodule- proven metastatic



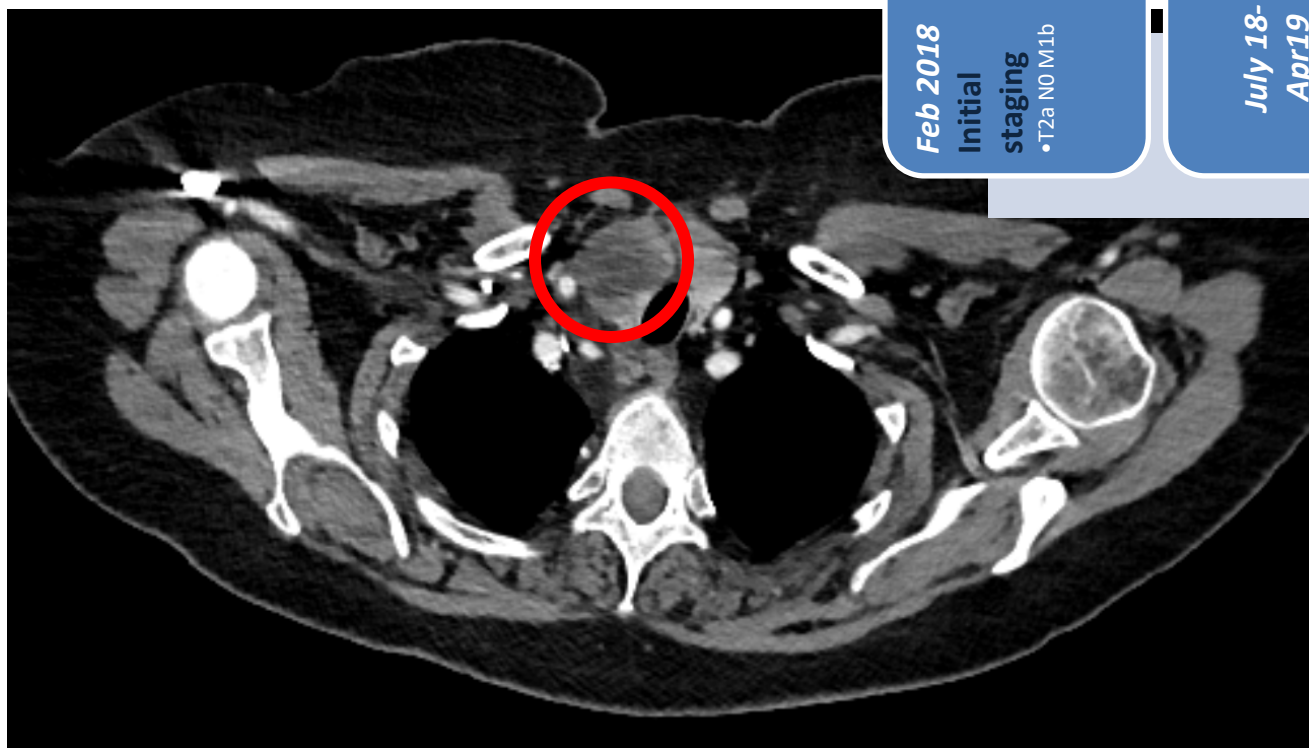
Partial response to radical RT



# Restaging scan

March 2020

- On a routine restaging scan an ill-defined low-density nodule in the right lobe of the thyroid was noted



**Feb 2018**  
**Initial staging**  
•T2a N0 M1b

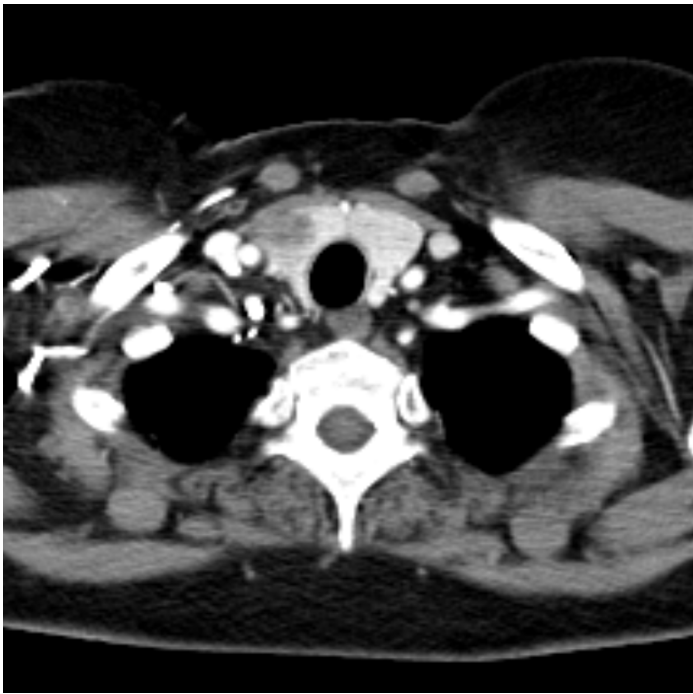
**July 18-  
Apr19**  
**Treatment**

**March 2020**  
**Restaging**  
Ill defined right thyroid nodule-  
proven metastatic

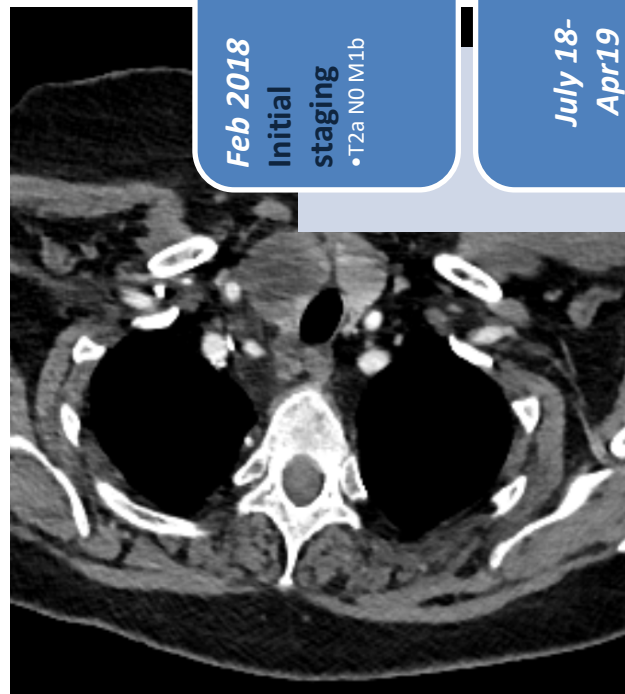
In retrospect this lesion was present on a previous restaging scan

- Evidence of interval growth

August 2019



March 2020



**Feb 2018**  
**Initial staging**  
•T2a N0 M1b

**July 18-  
Apr19**  
**Treatment**

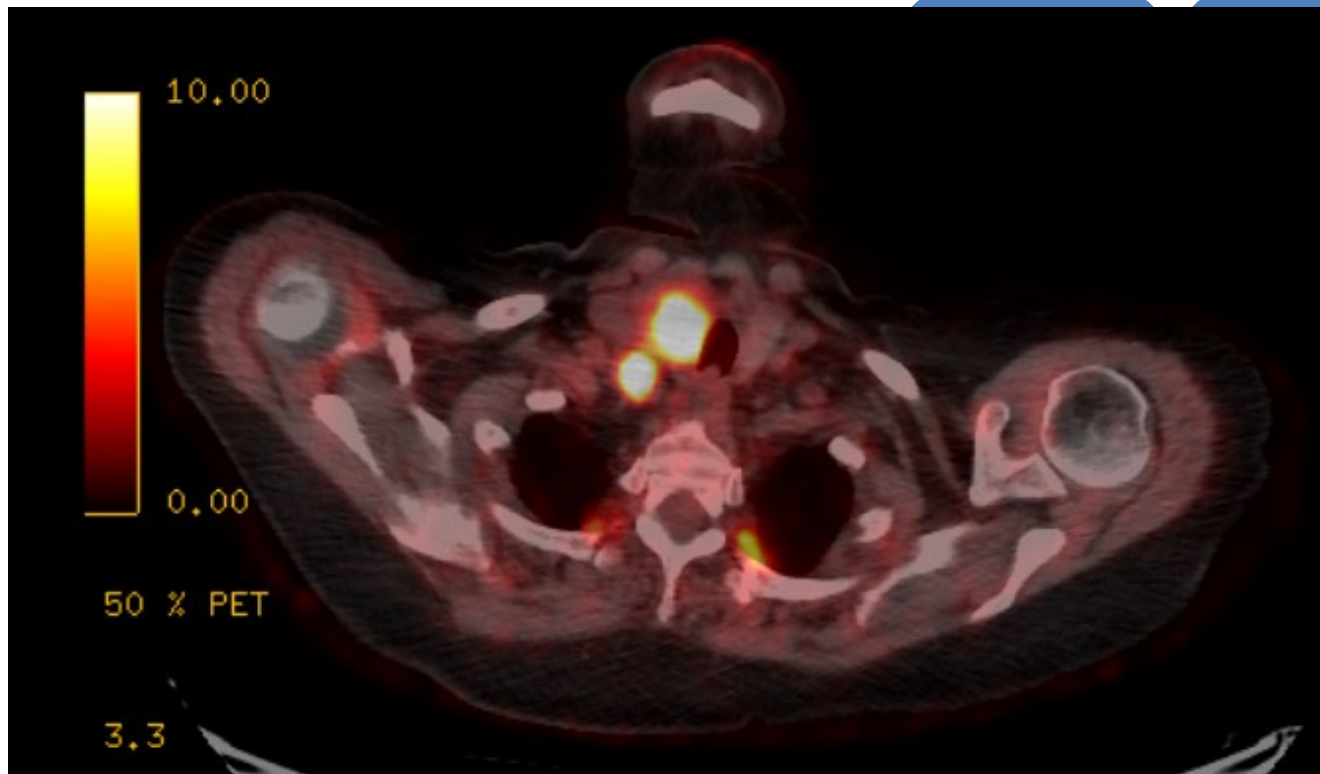
**March 2020**  
**Restaging**  
III defined right thyroid nodule-proven metastatic



# Repeat PET scan

March 2020

- This lesion in the right lobe of the thyroid was confirmed as PET avid



Treatment

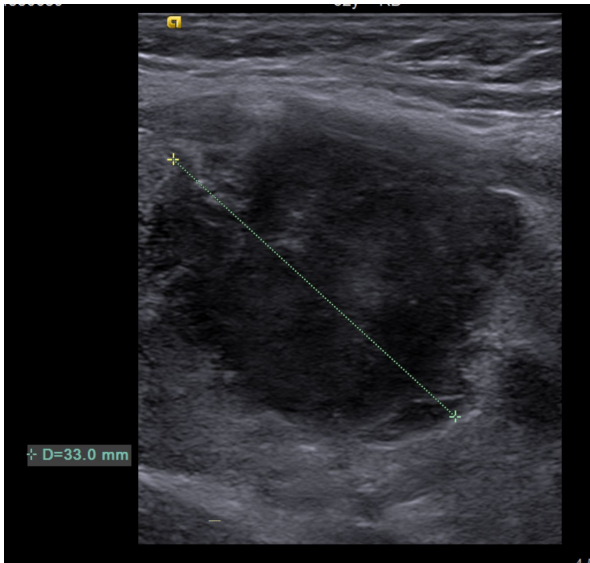
March 2020

Restaging

III defined right  
thyroid nodule-  
proven metastatic

# Ultrasound guided biopsy.

March 2020



*Feb 2018*  
**Initial staging**  
•T2a N0 M1b

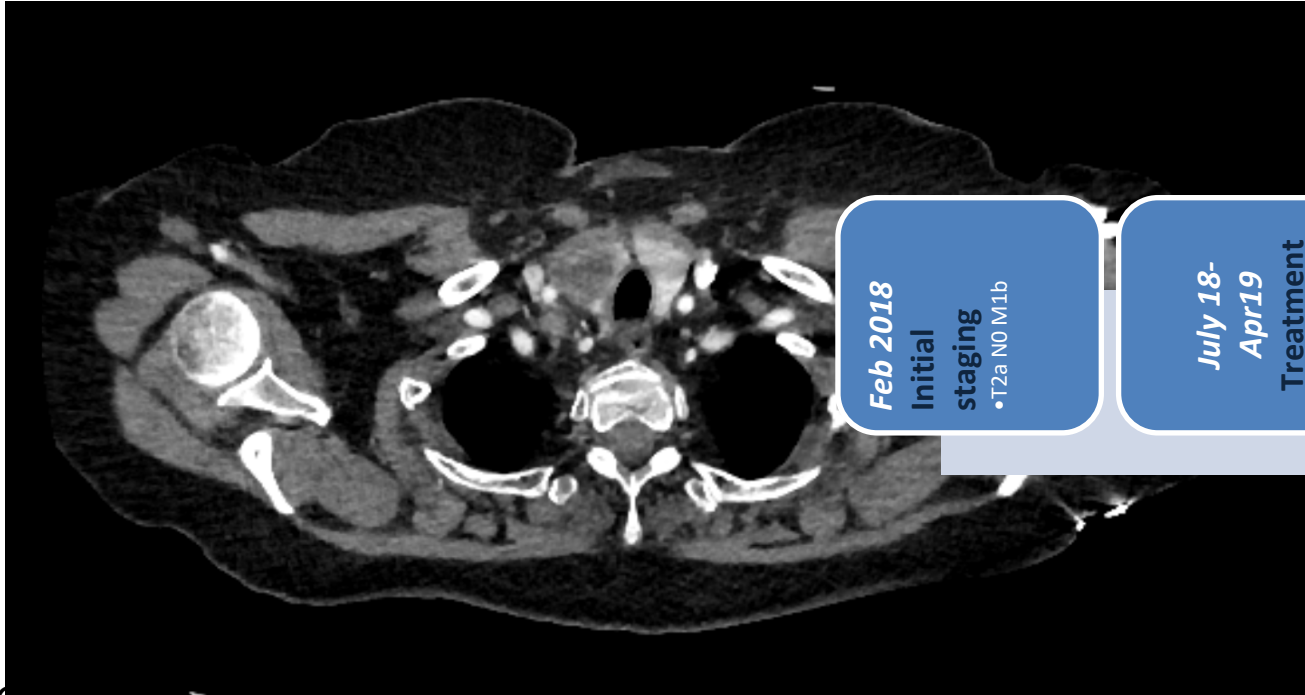
*July 18-  
Apr19*  
**Treatment**

*March 2020*  
**Restaging**  
Ill defined right thyroid nodule-  
proven metastatic

- Ultrasound (US) guided biopsy was taken due to the PET avidity.
- On US the mass was ill defined with heterogenous echotexture and mild internal vascularity.
- Histopathology revealed it was **moderately differentiated adenocarcinoma** with micro-acinar, mucin-producing pattern consistent with **lung primary origin** (TTF1 positive).
- The patient subsequently underwent palliative RT to mediastinal and thyroid disease

# Restaging scan

June 2020



**Feb 2018**  
**Initial staging**  
• T2a N0 M1b

**July 18-  
Apr19**  
**Treatment**

**March 2020**  
**Restaging**  
III defined right thyroid nodule-proven metastatic

- Good response
- Right lobe thyroid nodule reduced in size to 21 mm, (previously 35 mm at equivalent site of marking).

# Stable disease

September 2020

- On the latest restaging imaging the patient was found to have stable disease



Treatment

March 2020

Restaging

III defined right  
thyroid nodule-  
proven metastatic

# Learning Points

- Emphasizes the importance of a comprehensive interrogation of review areas on restaging imaging.
- Added challenge due to streak artefact from contrast injection.
- A multimodality approach contributes to an accurate diagnosis and helps ensure rare incidences of thyroid metastases are not missed or dismissed as benign thyroid disease.

Thank you