



Royal Free London  
NHS Foundation Trust

# REVIEW OF THE 7-SWEEPS OF NECK ULTRASOUND

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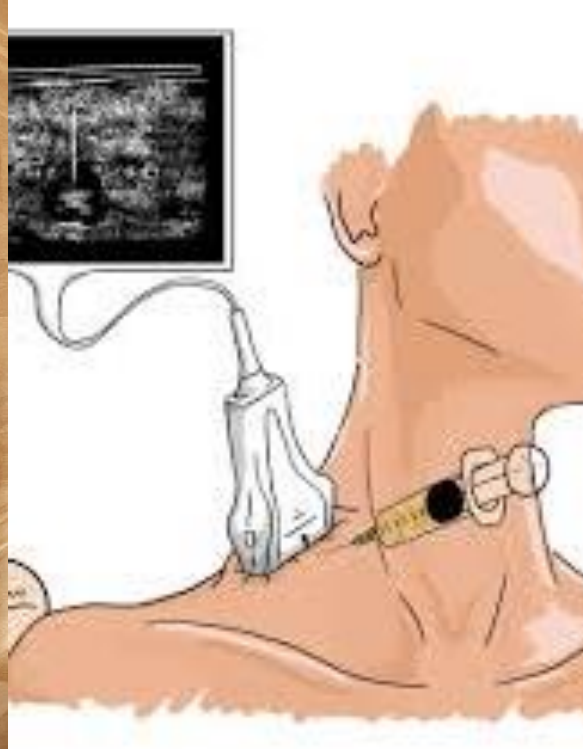
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*Author, UKSONO.*

# OUTLINES

- Introduction
- Objectives
- The 7-Sweeps
- Pros and Cons
- Brief Cross-sectional Imaging reviews and UKSUC
- Conclusion





# INTRODUCTION

- Head and Neck ultrasound has over the years been seen as a specialty of general ultrasound.
- Radiologist and Sonographers alike are seen performing various head and neck ultrasound scans.
- How standardised is the practice of head and neck ultrasound (especially non-medically trained practitioners) and what can be done differently.

# **OBJECTIVE**

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**To evaluate the sonographic anatomical regions in head and neck ultrasound.**

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**Review the sonographic 7-sweeps of the neck.**

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**Pros and cons associated with the 7-sweeps.**

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**Cross-sectional CT image review (Relevant in correlating pathological findings)**



## Head and Neck Ultrasound Practice Standards

It is recommended that only those practitioners who are competent in full neck ultrasound assessment, e.g. the 7 sweep technique, should undertake head and neck/thyroid scanning. A technique such as the 7 sweeps has the advantages of being a reproducible standard and proficient teaching technique, discourages target scanning, follows the path of the surgical neck levels and reduces the possibility of missing additional findings.

Dependent on the service provided in local departments, there may be a role to distinguish levels of practice. Head and Neck scanning competencies could be organised into a tiered system; e.g. Levels I, II & III (based on \*)

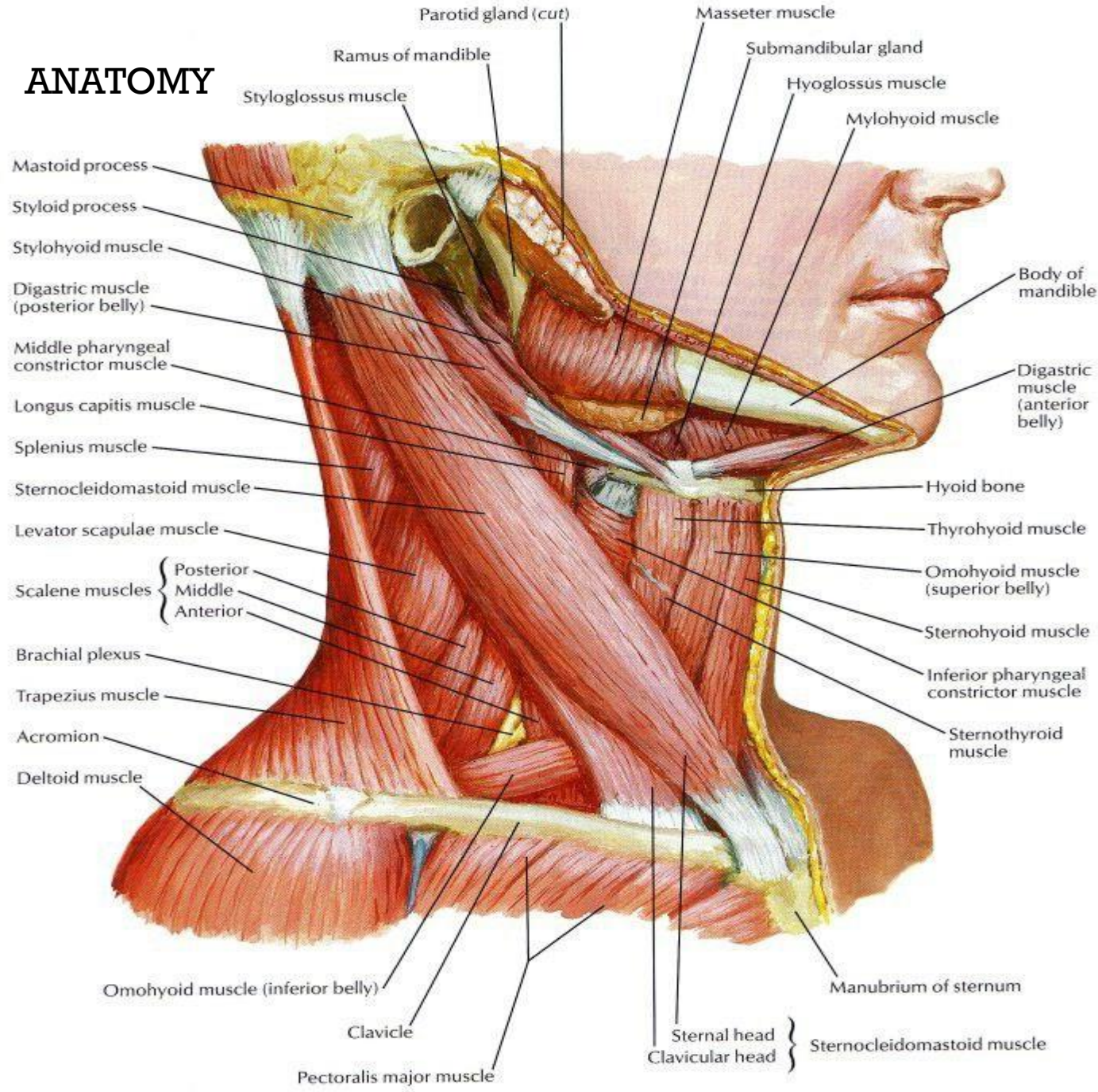
\*[https://www.rcr.ac.uk/system/files/publication/field\\_publication\\_files/bfcr173\\_ultrasound\\_training\\_med\\_surg.pdf](https://www.rcr.ac.uk/system/files/publication/field_publication_files/bfcr173_ultrasound_training_med_surg.pdf)

The table below suggests the levels and standards to be acquired at each stage.

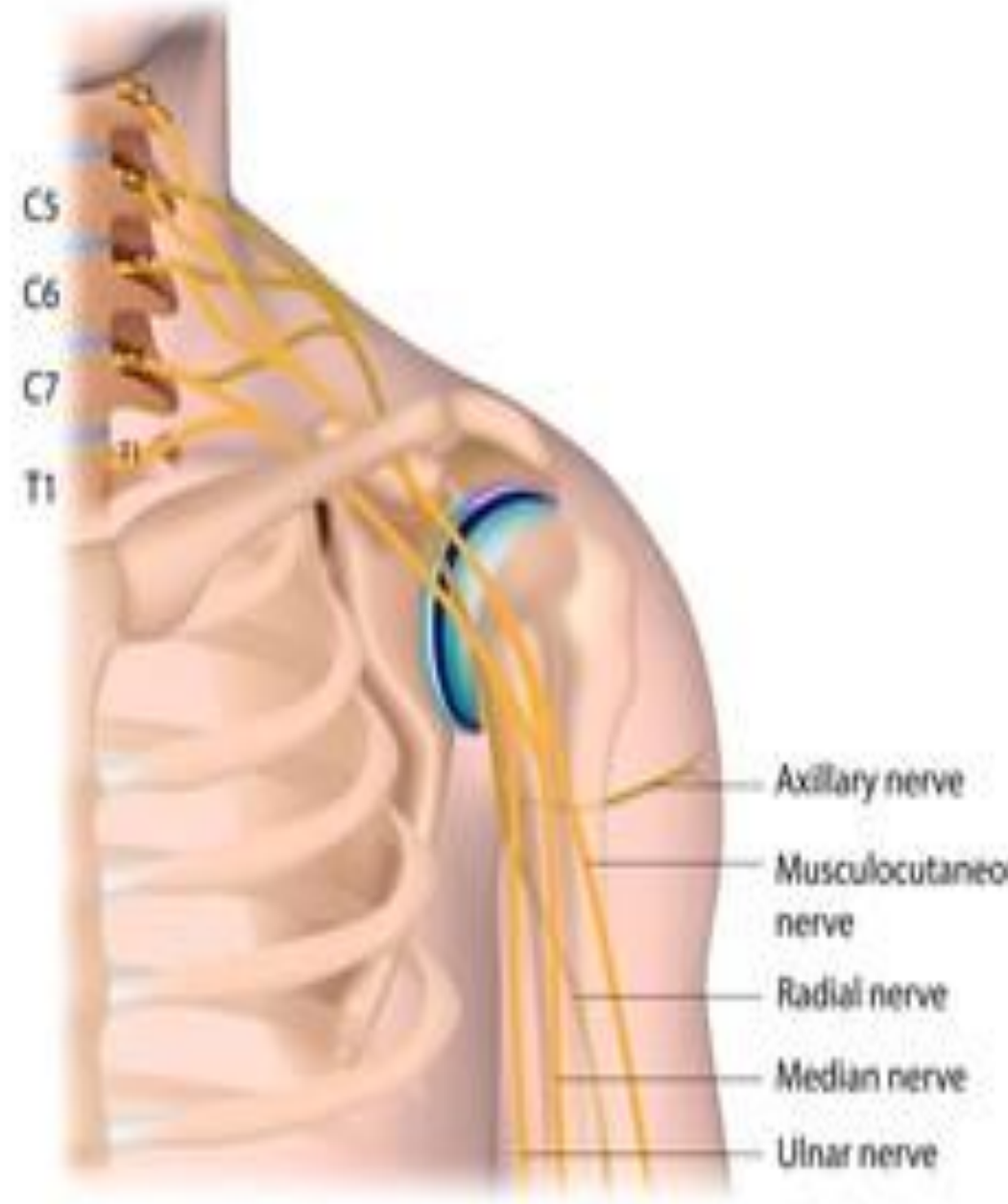
Local agreement for standards of competency is necessary dependant on expertise and pathway provision. This table may be used as a template for protocols and a benchmark of standards.



# ANATOMY



# The Brachial Plexus



- **HEAD AND NECK ULTRASOUND; THE 7-SWEEPS.**

## Head and Neck Ultrasound Step by Step

1. Submental
2. Submandibular
3. Parotid and buccal
4. Deep cervical chain
5. Transverse cervical
6. Posterior triangle
7. Anterior cervical, including thyroid

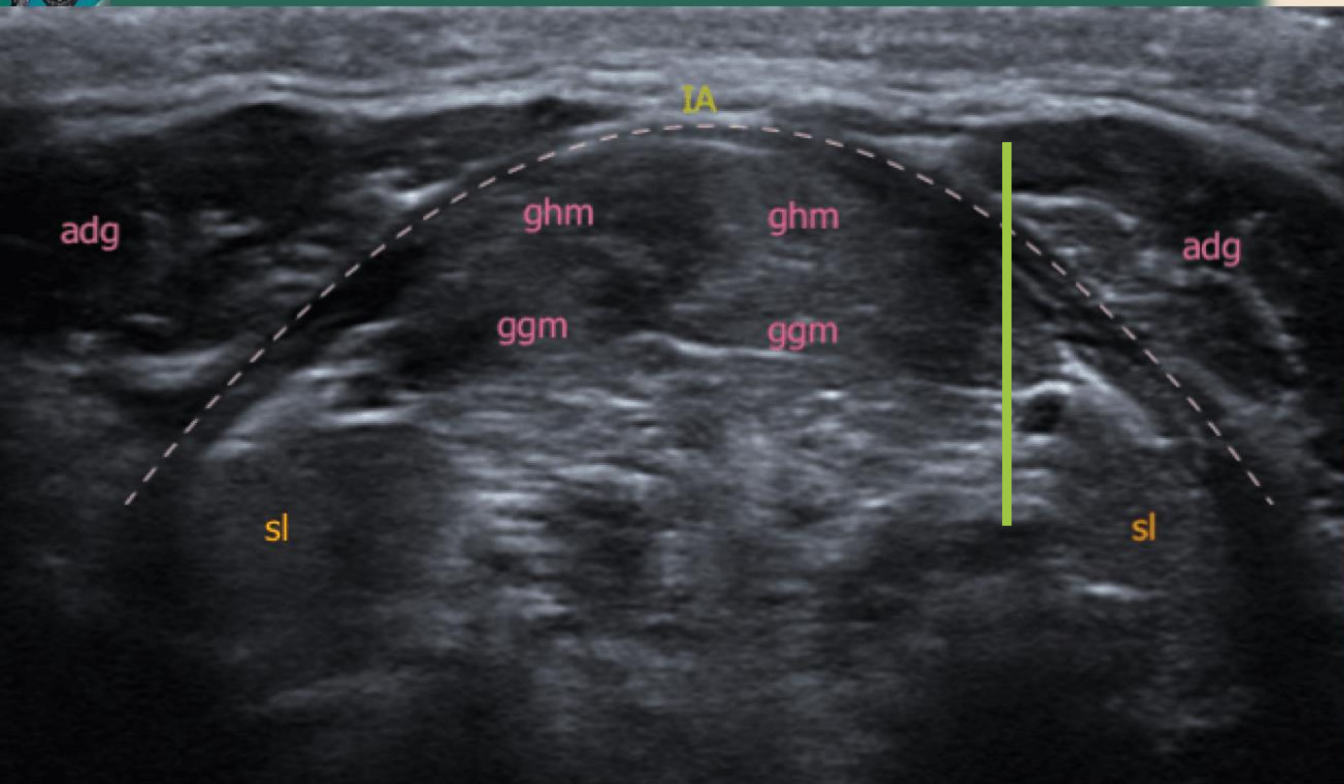
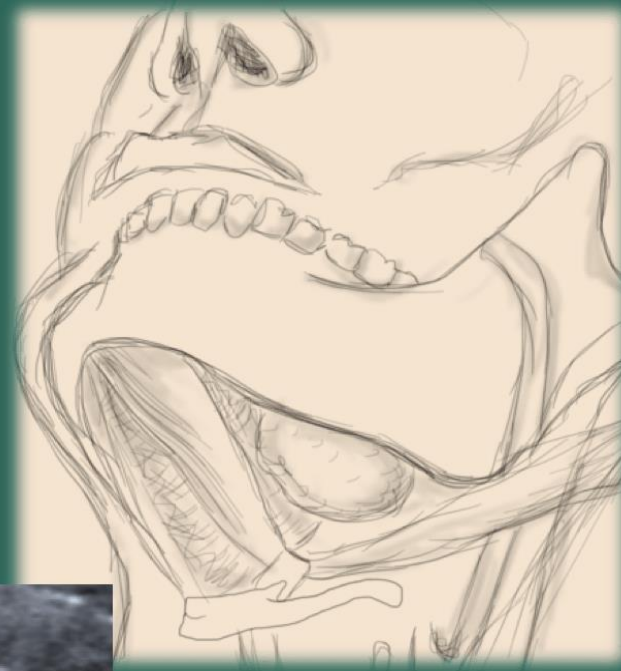




# 1. Submental

## Submental Triangle

- Base – Hyoid bone
- Floor – Mylohyoid muscle
- Apex - Symphysis mentis
- Sides – Anterior bellies of digastric muscles
- Content – Submental lymph nodes

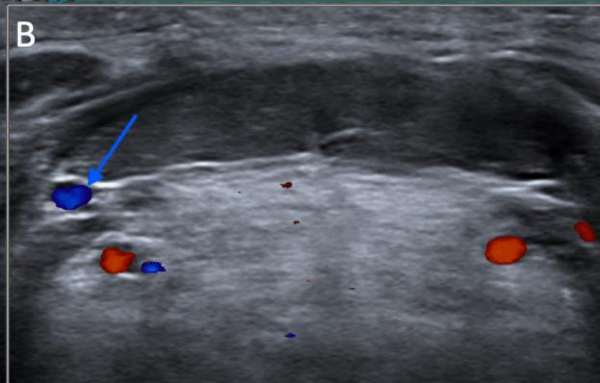




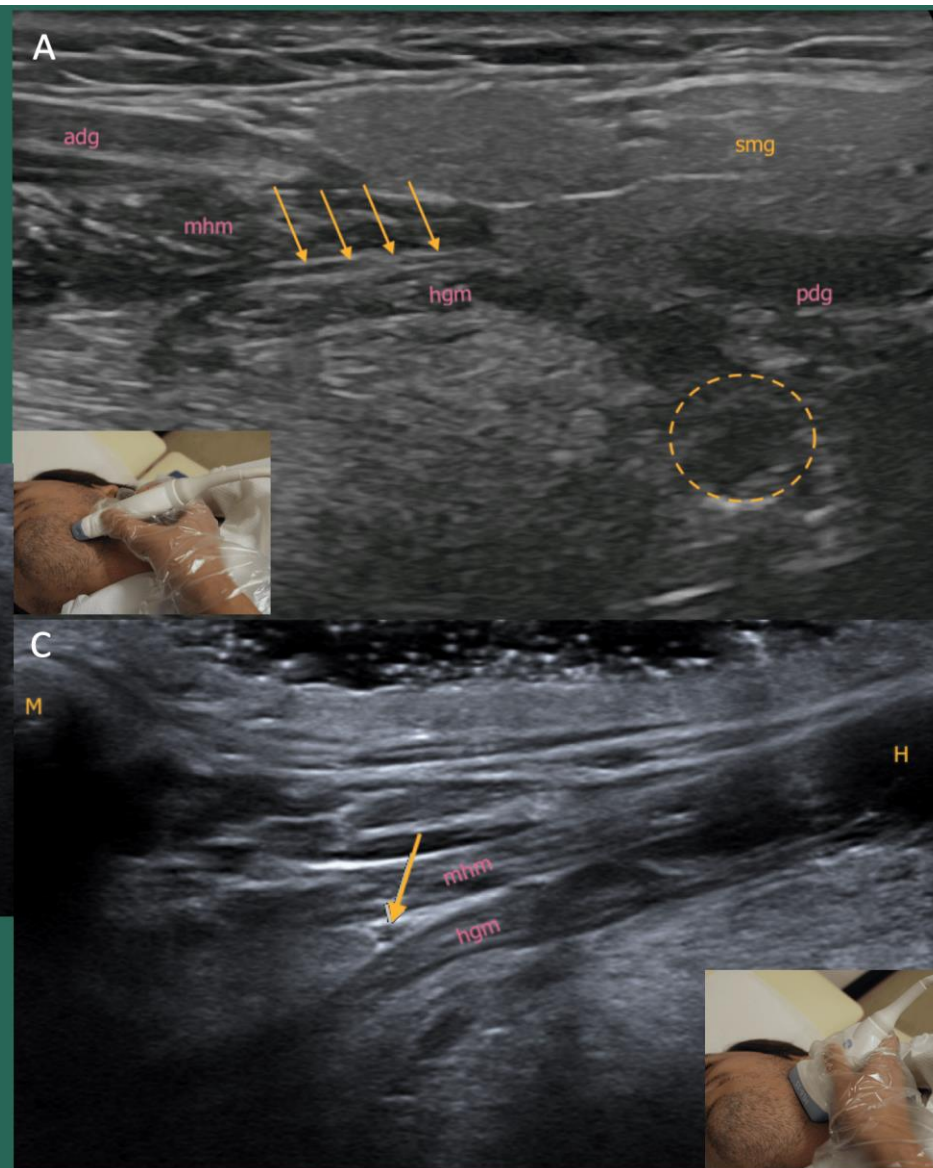
# SUBMANDIBULAR REGION

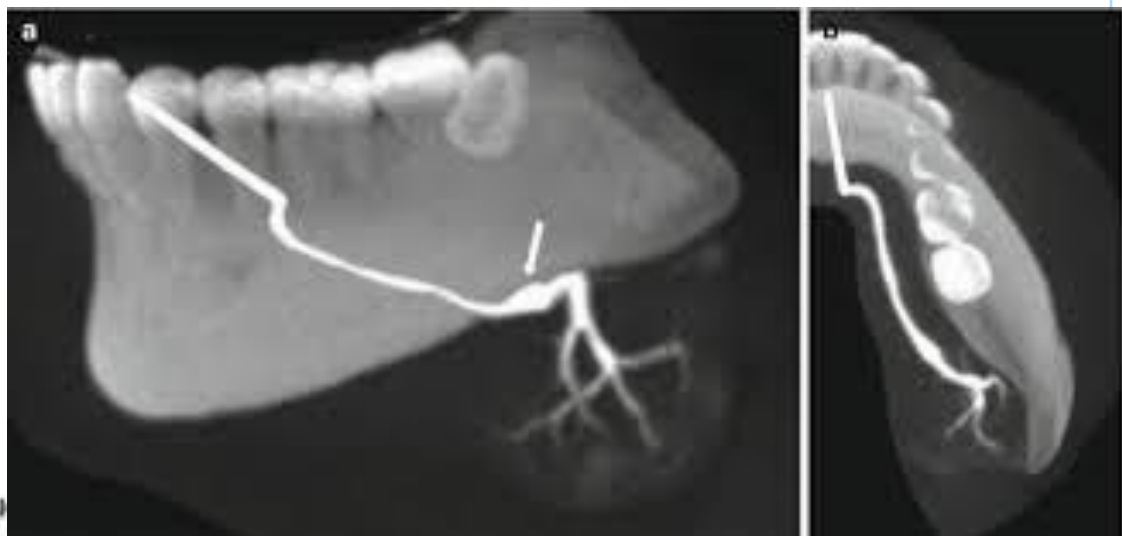
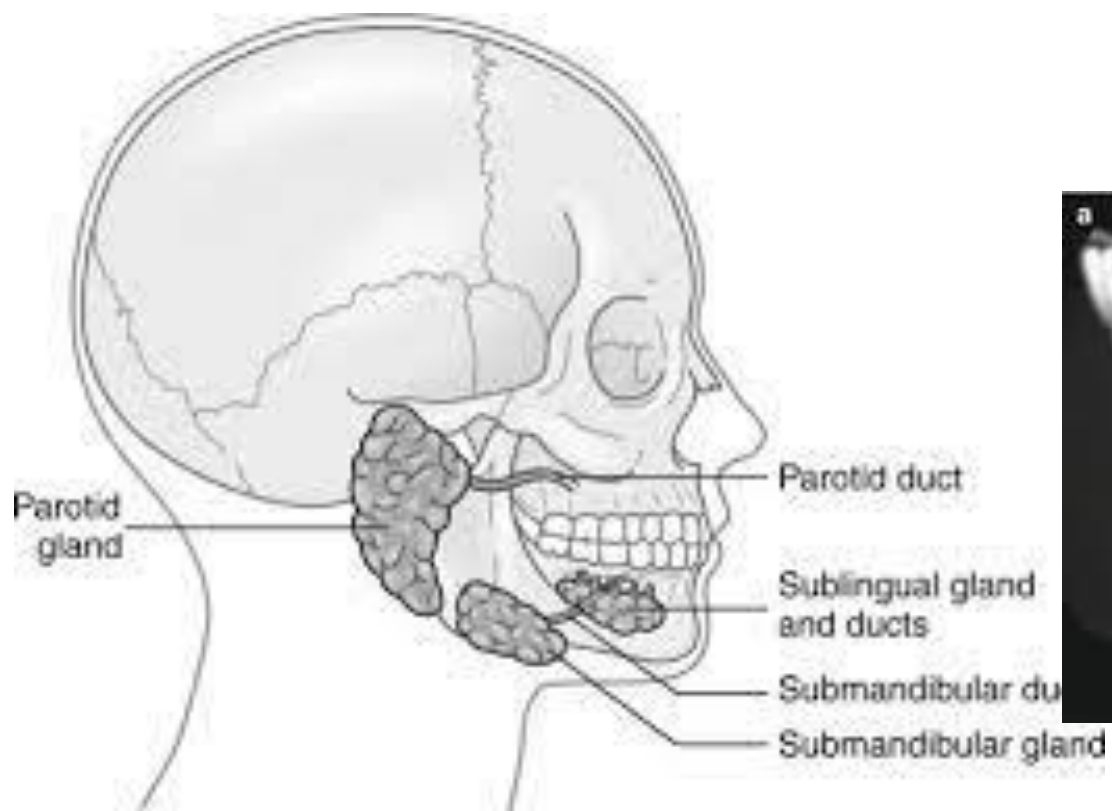
## 2. Submandibular

**TIP:** Submandibular duct runs between the hyoglossus muscle and the mylohyoid muscle



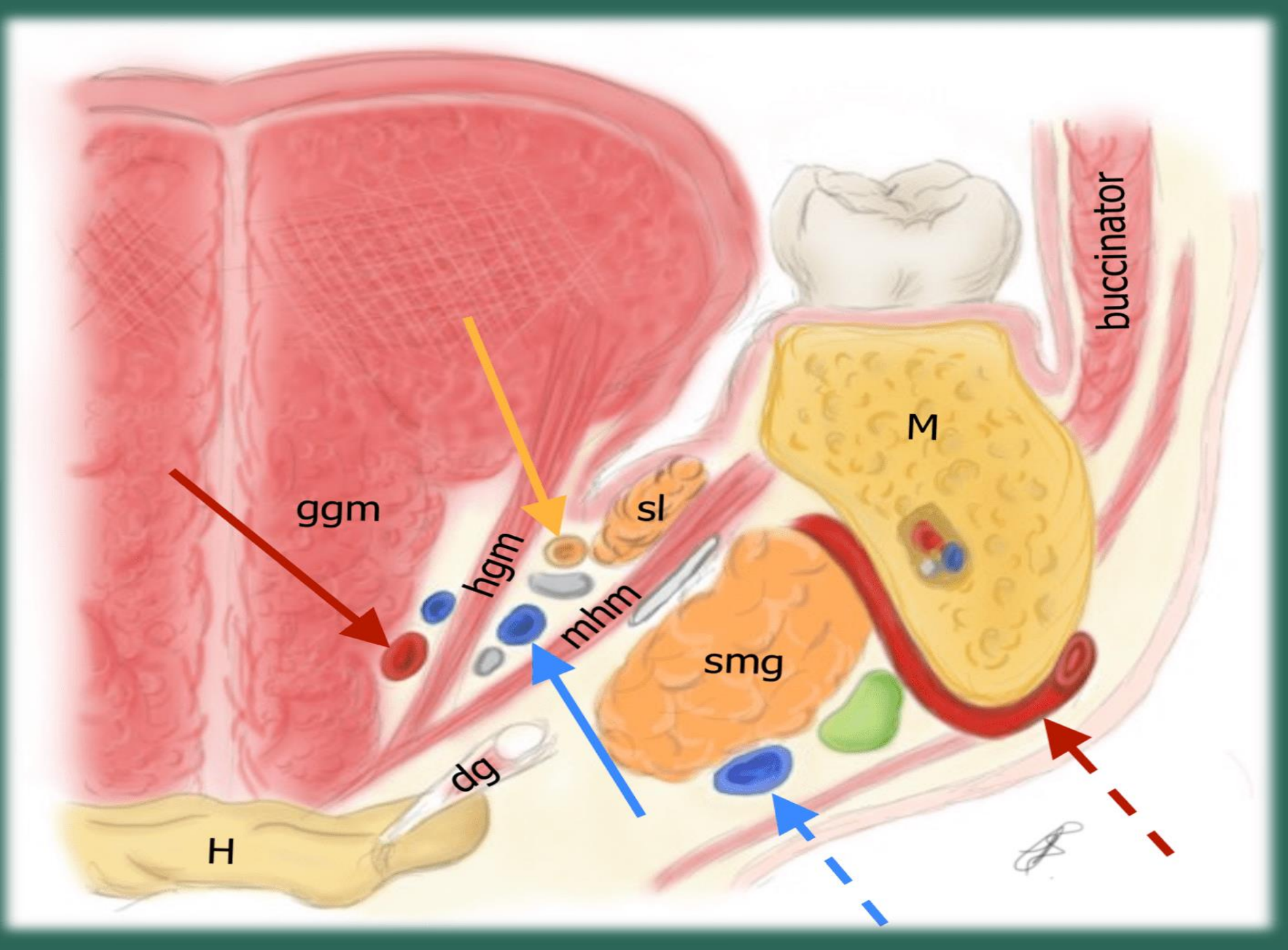
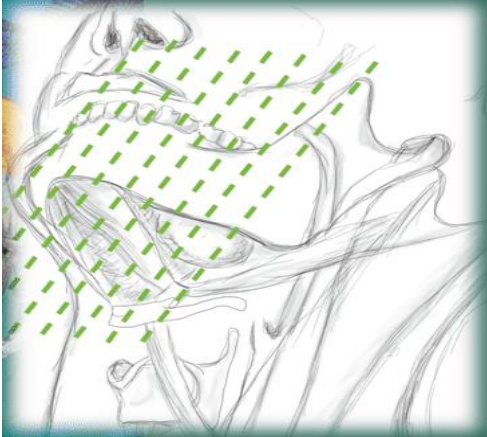
**TRICK:** Color Doppler helps to distinguish the submandibular duct from lingual vein





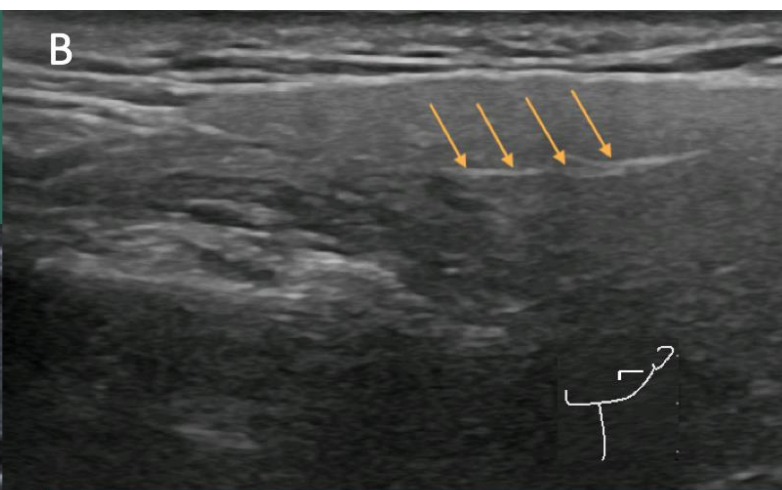
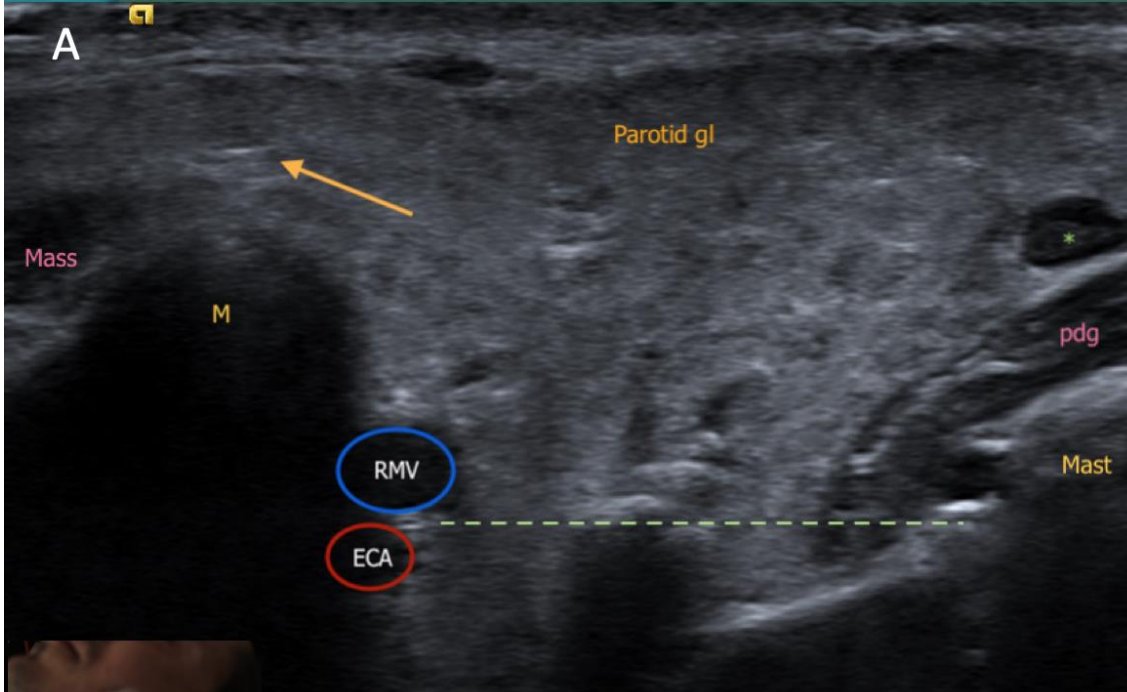


# Coronal section





### 3. Parotid and Buccal

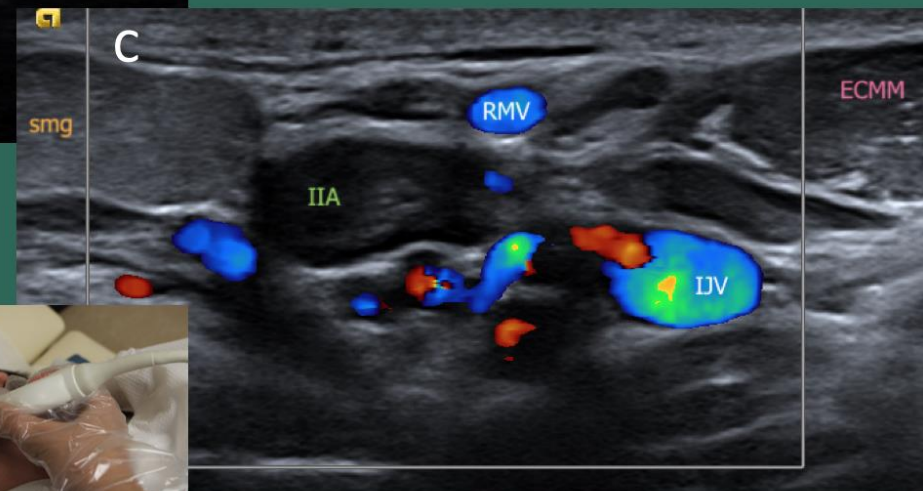


**TRICK:** Parotid duct – echogenic line

**TIP:** Vessels divide superficial and deep parotid lobes



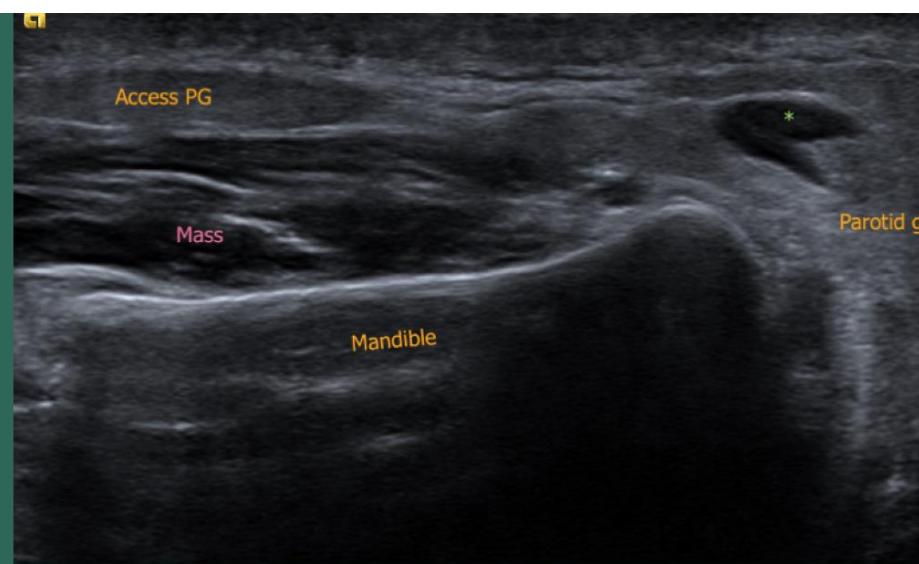
Retromandibular vein (RMV) is a landmark.  
**TIP:** superficial to RMV: facial nerve  
**TRICK:** Displacement of the RMV determines lesion origin:  
- Anteriorly: parotid  
- Posteriorly: submandibular



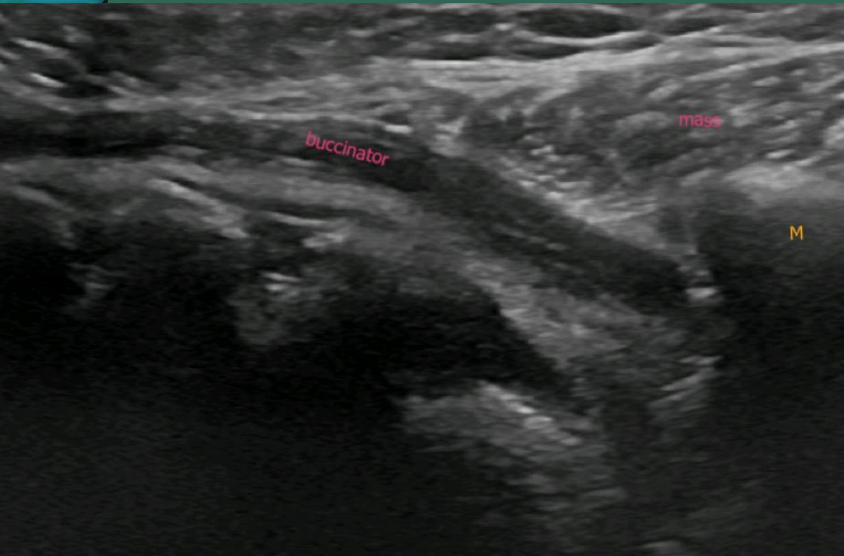
**References:** Department of Radiology, Hospital Pedro Hispano, ULS Matosinhos, Portugal 2018; Department of Radiology, IPO Porto, Porto, 2018

### 3. Parotid and Buccal

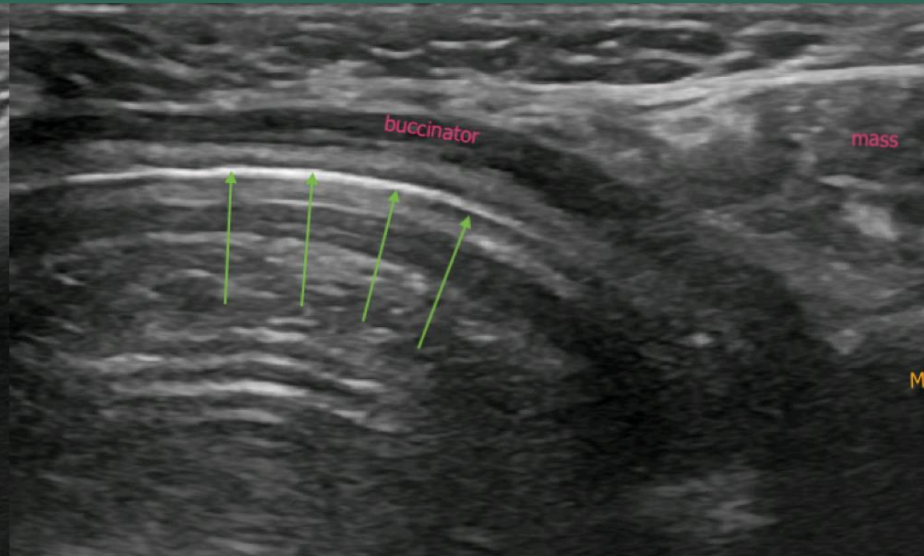
**TIP:** Accessory parotid lobes are usually superficial to masseter muscle



**TRICK:** Buccinator is better identified with cheeks puffed-out



Cheeks relaxed



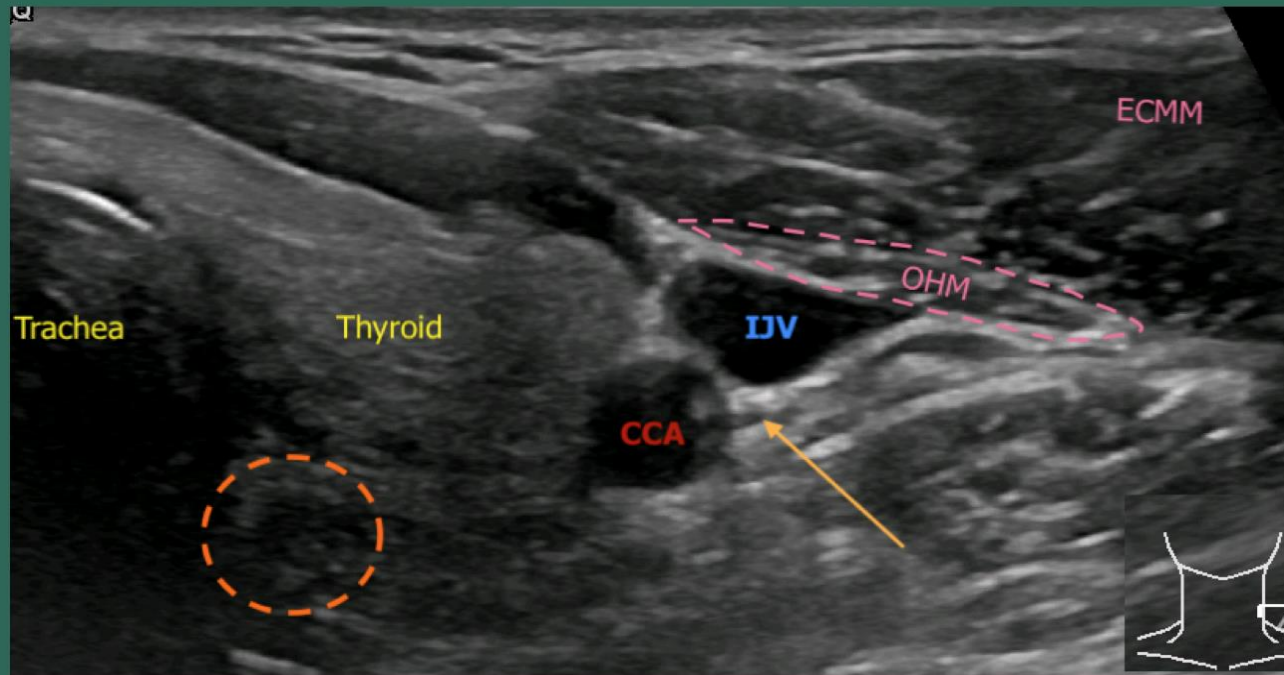
Cheeks puffed-out

References: Department of Radiology, Hospital Pedro Hispano, ULS Matosinhos, Portugal 2018; Department of Radiology, IPO Porto, Porto, 2018



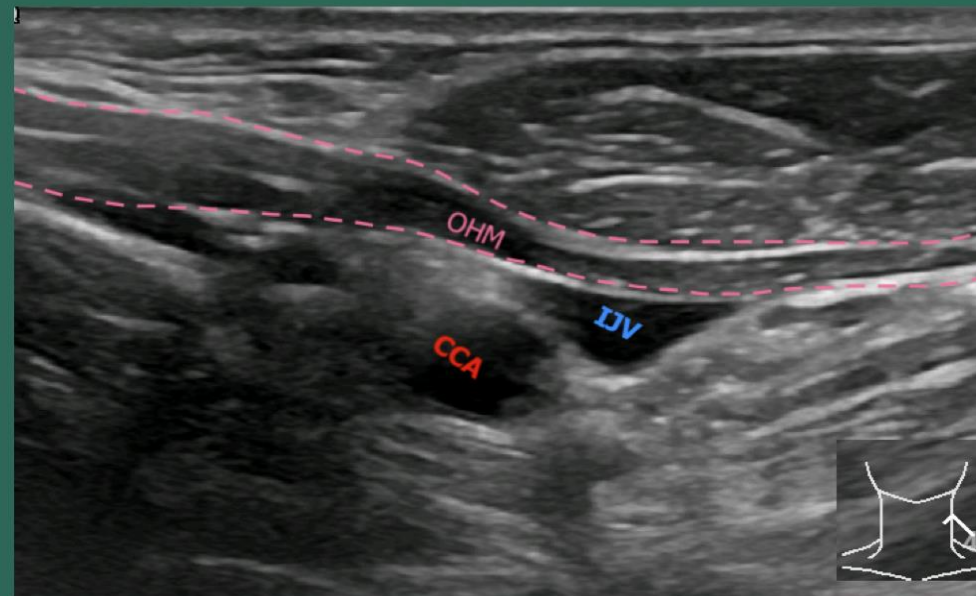
## 4. Deep Cervical Chain

**TRICK:** Internal Jugular Vein should be at the middle of the field of view



**TIP:** Omohyoid muscle is an important surgical landmark

**TRAP:** Omohyoid central tendon can mimic a deep cervical lymph node  
Two ultrasound planes are recommended!



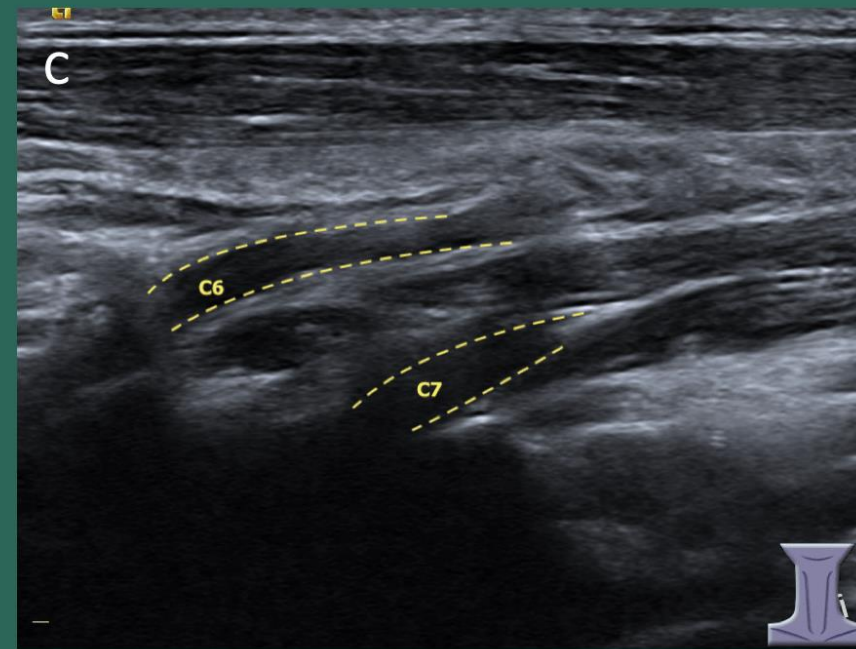
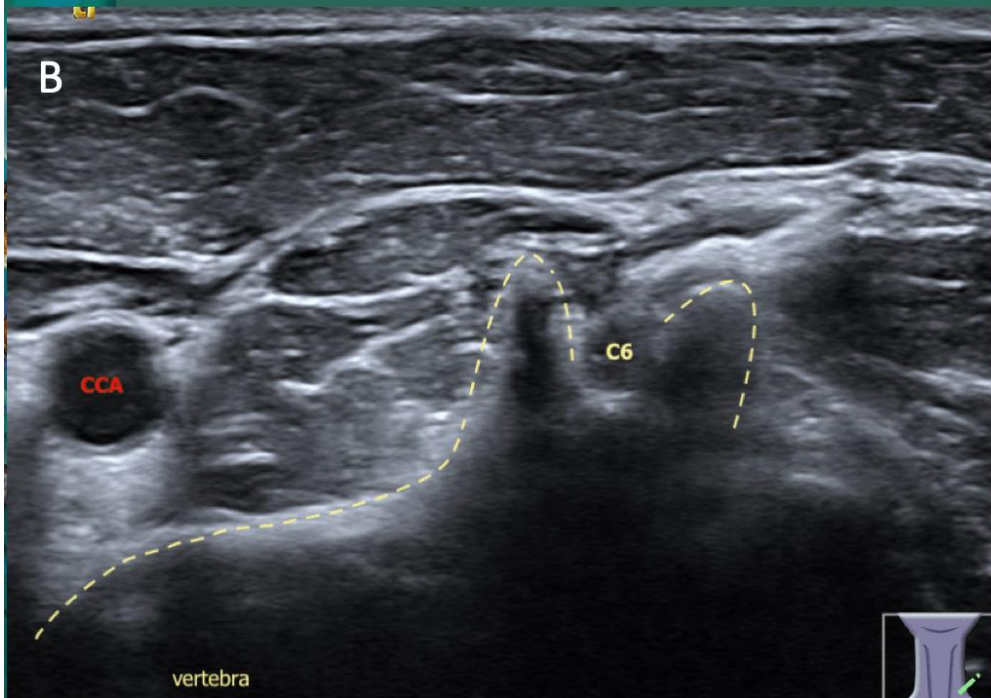
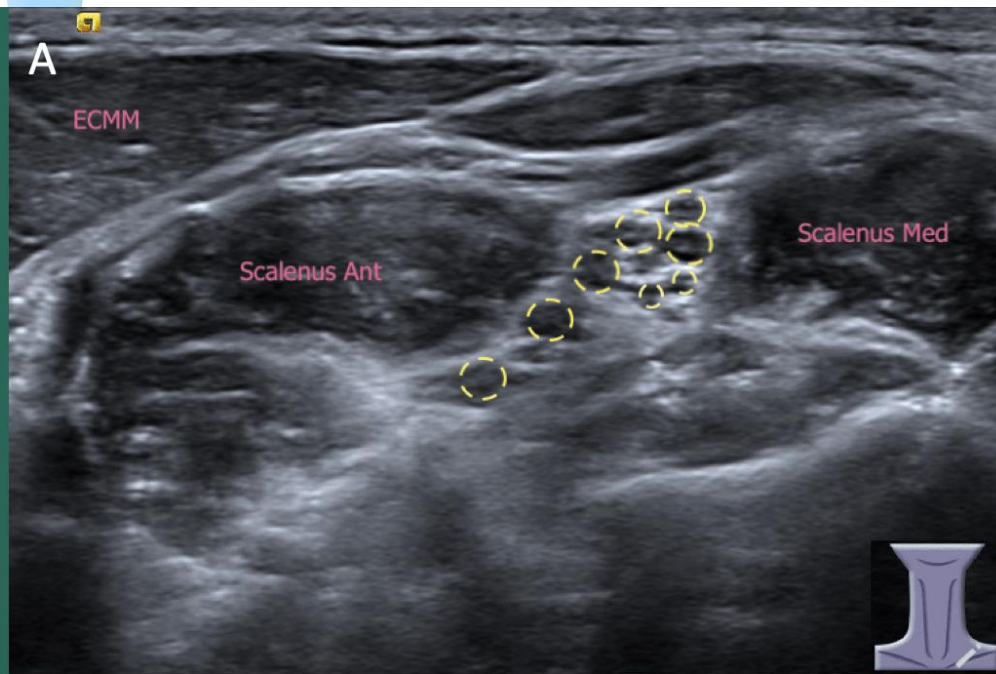
**References:** Department of Radiology, Hospital Pedro Hispano, ULS Matosinhos, Portugal 2018



## 5. Transverse Cervical

**TIP:** Scalenus anterior muscle is an important landmark of the root of the neck.

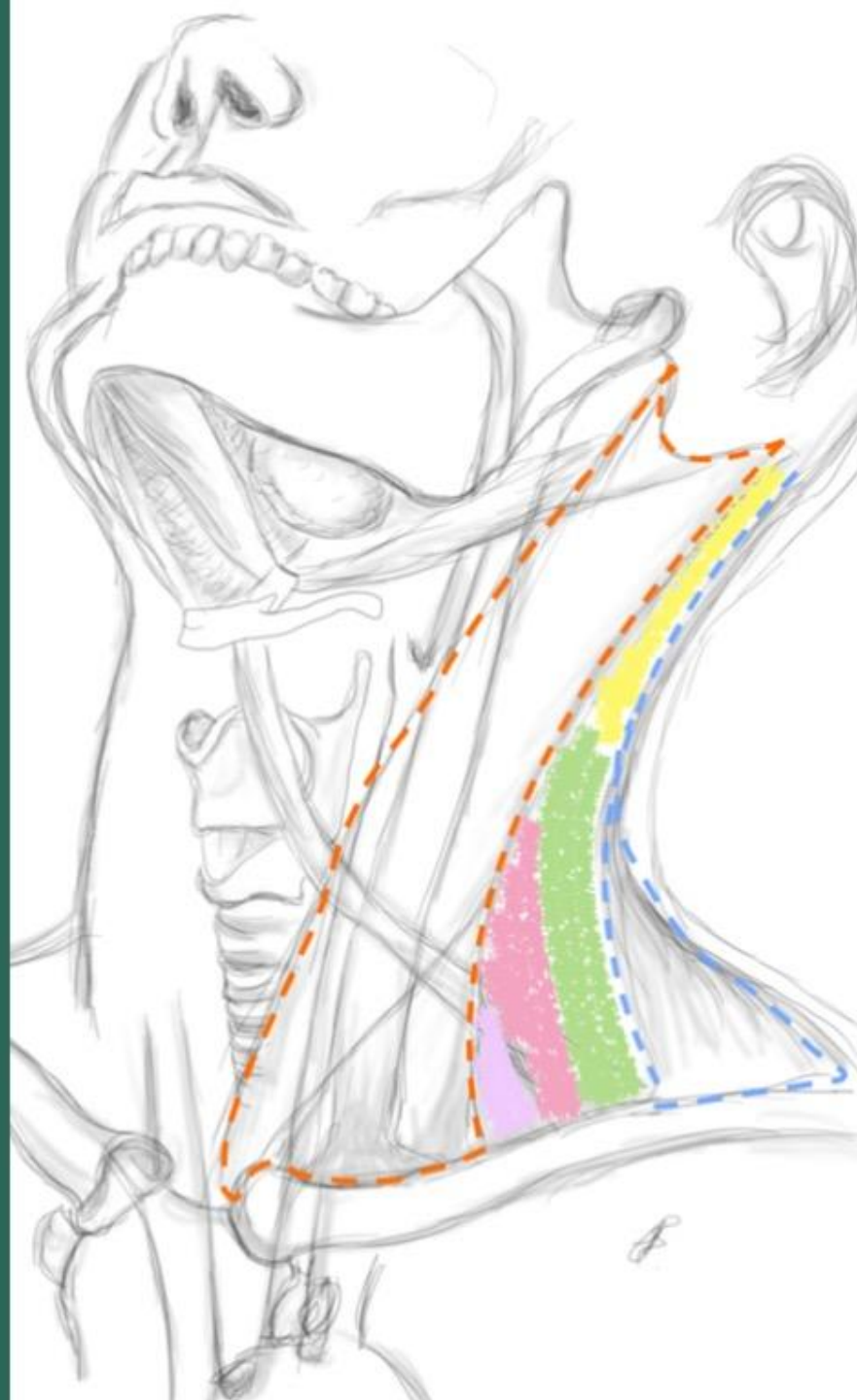
**TRICK:** To find the brachial plexus follow the posterior border of Sternocleidomastoid muscle.



*References:* Department of Radiology, IPO Porto, Porto, 2018

## 6. Posterior Triangle

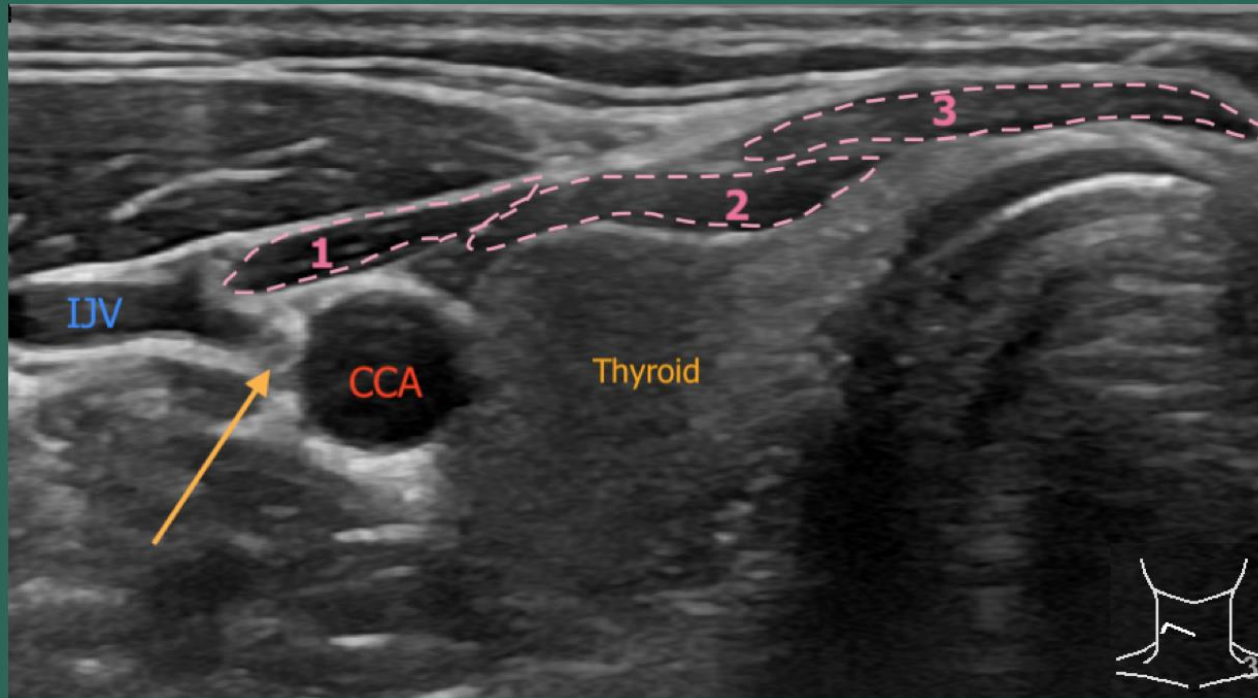
- Anterior border
  - sternocleidomastoid muscle
- Posterior border
  - trapezius muscle
- Floor (ant to post)
  - *Scalene, levator scapulae* and *splenius capitis* muscles
- Content
  - spinal accessory nerve (XI)
  - spinal accessory lymph node chain
  - pre-axillary brachial plexus
  - dorsal scapular nerve
  - fat



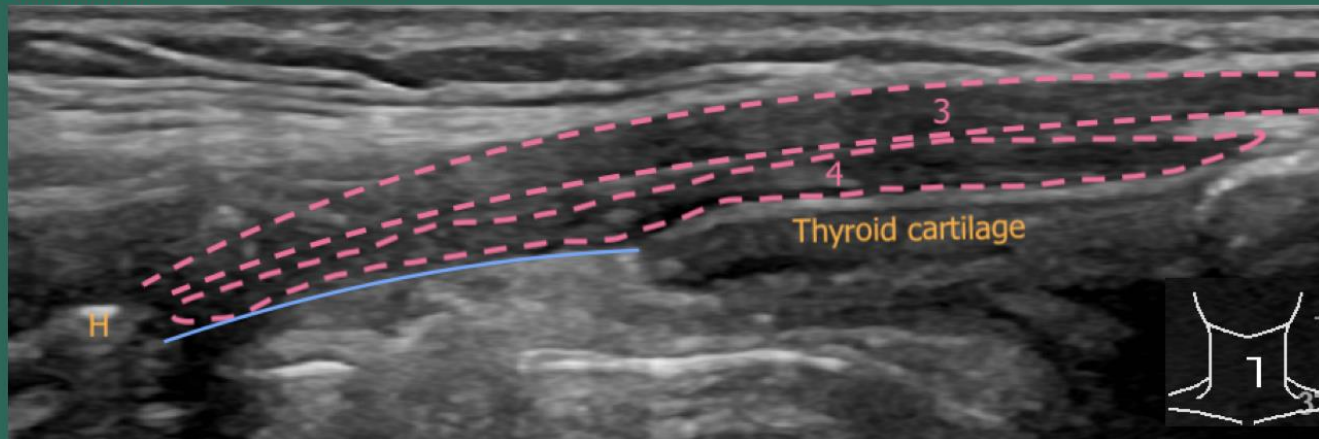
**References:** Catarina Baraças, ULS Matosinhos, PT 2018



## 7. Anterior Cervical (including thyroid)



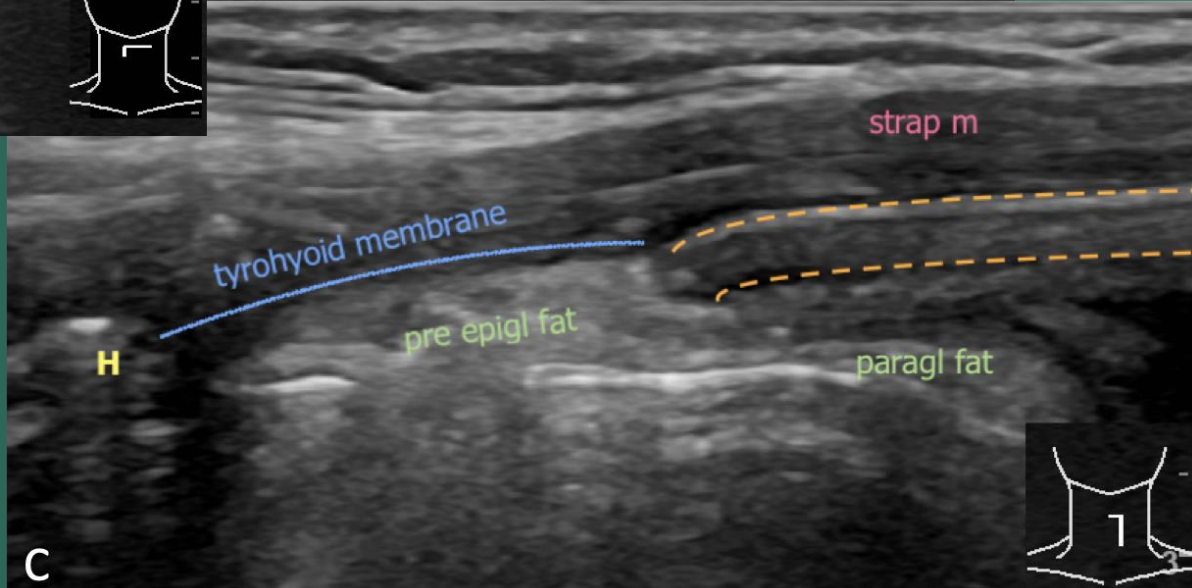
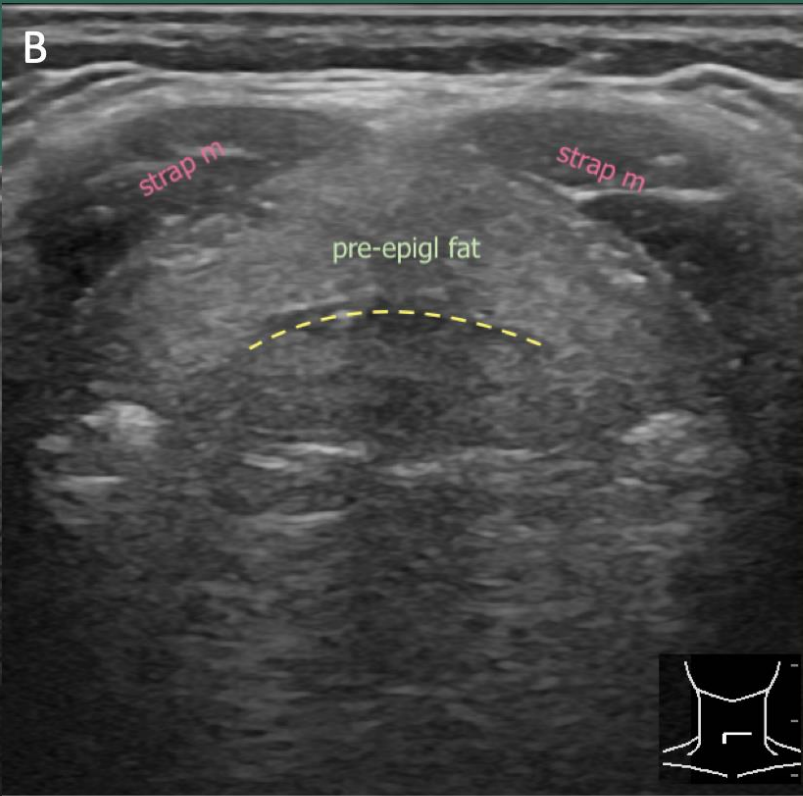
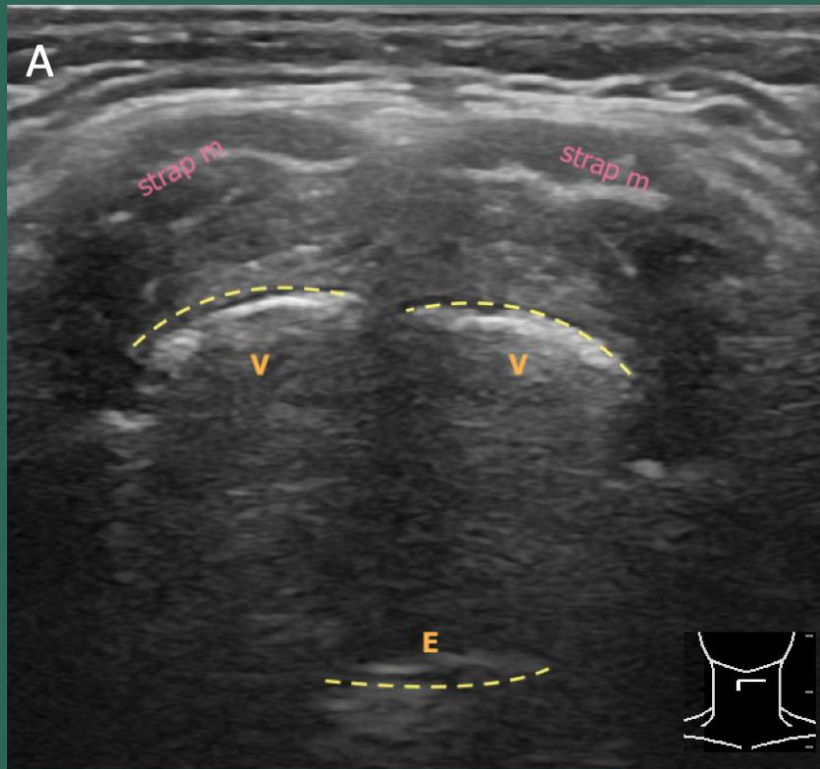
**TIP:** Strap muscles are important to localize thyroglossal duct cysts and anterior cervical lymph nodes



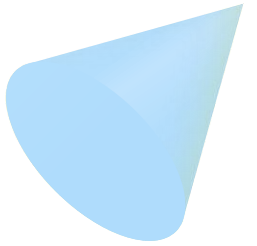
*References:* Department of Radiology,  
Hospital Pedro Hispano, ULS  
Matosinhos, Portugal 2018



# 7. Anterior Cervical

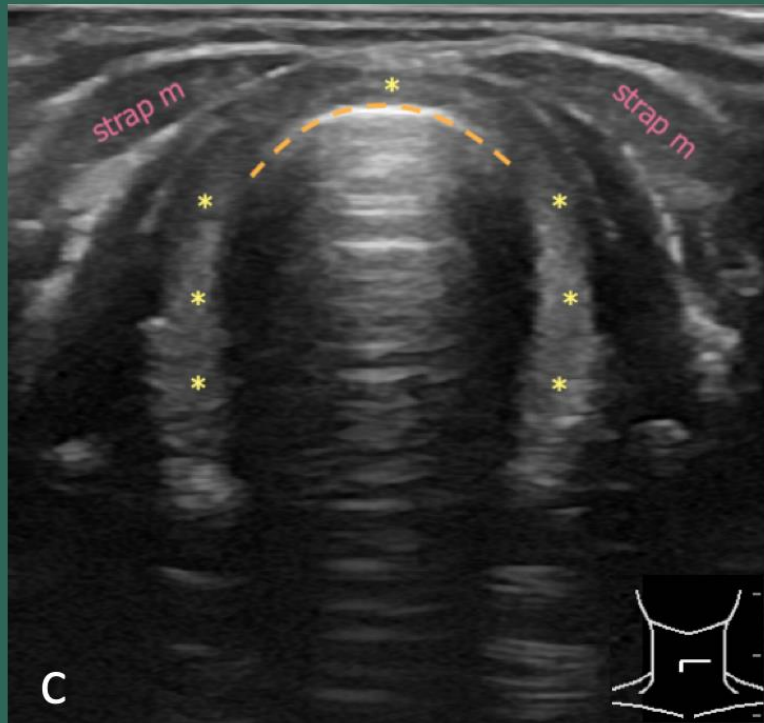


**TIP:** epiglottis and pre-epiglottic space are important laryngeal landmarks

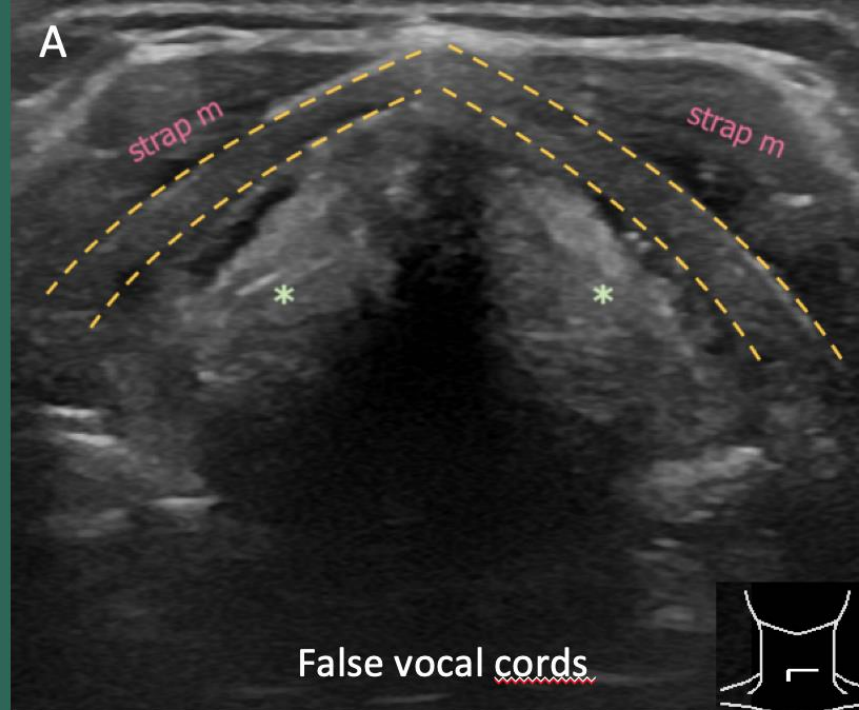


# 7. Anterior Cervical

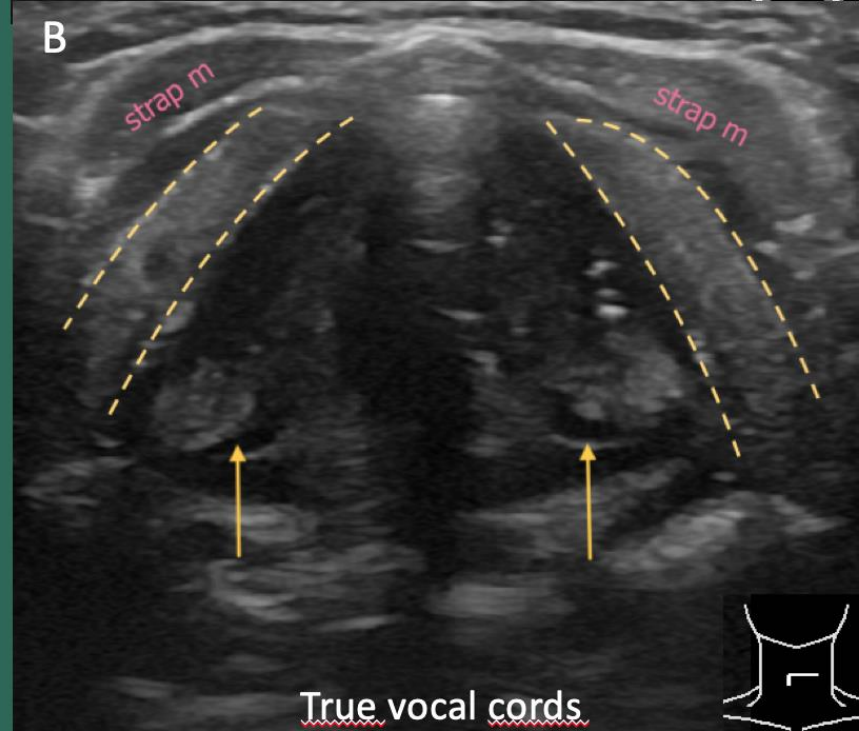
**TIP:** Cricoid cartilage differs from tracheal rings in thickness



**TRAP:** Level VI lymph nodes can mimic parathyroid adenomas



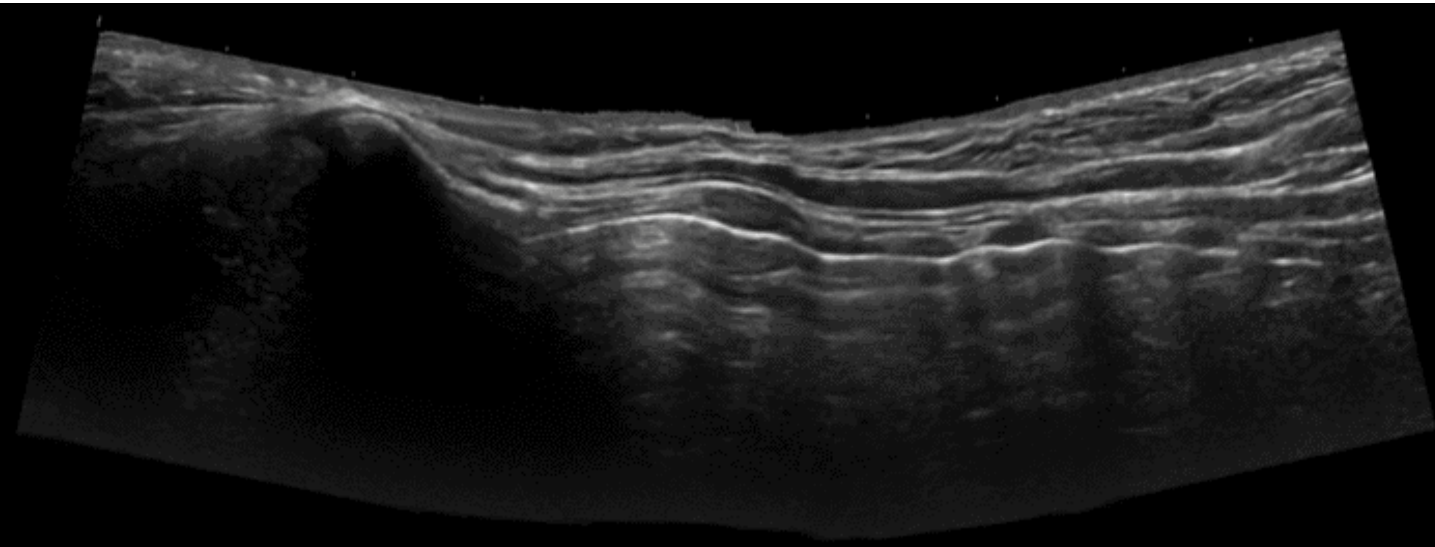
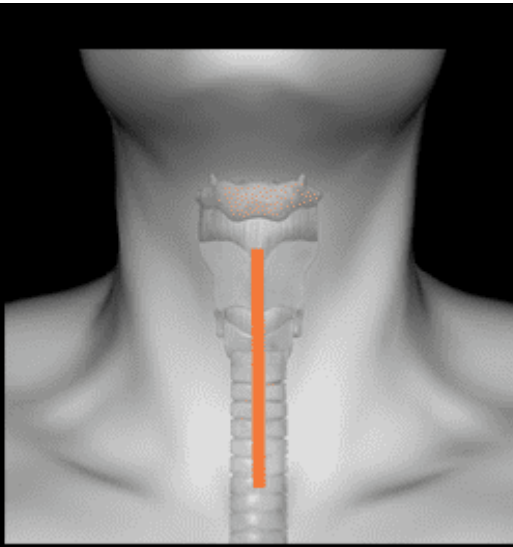
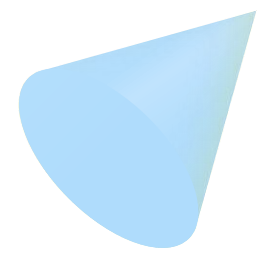
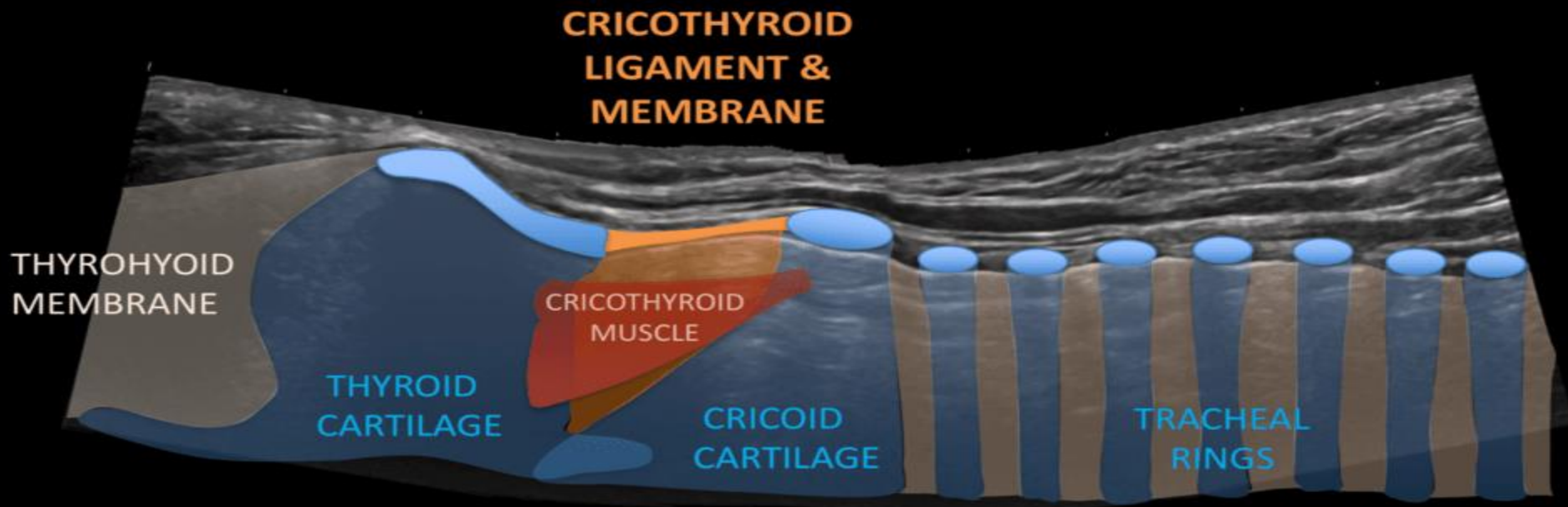
False vocal cords



True vocal cords

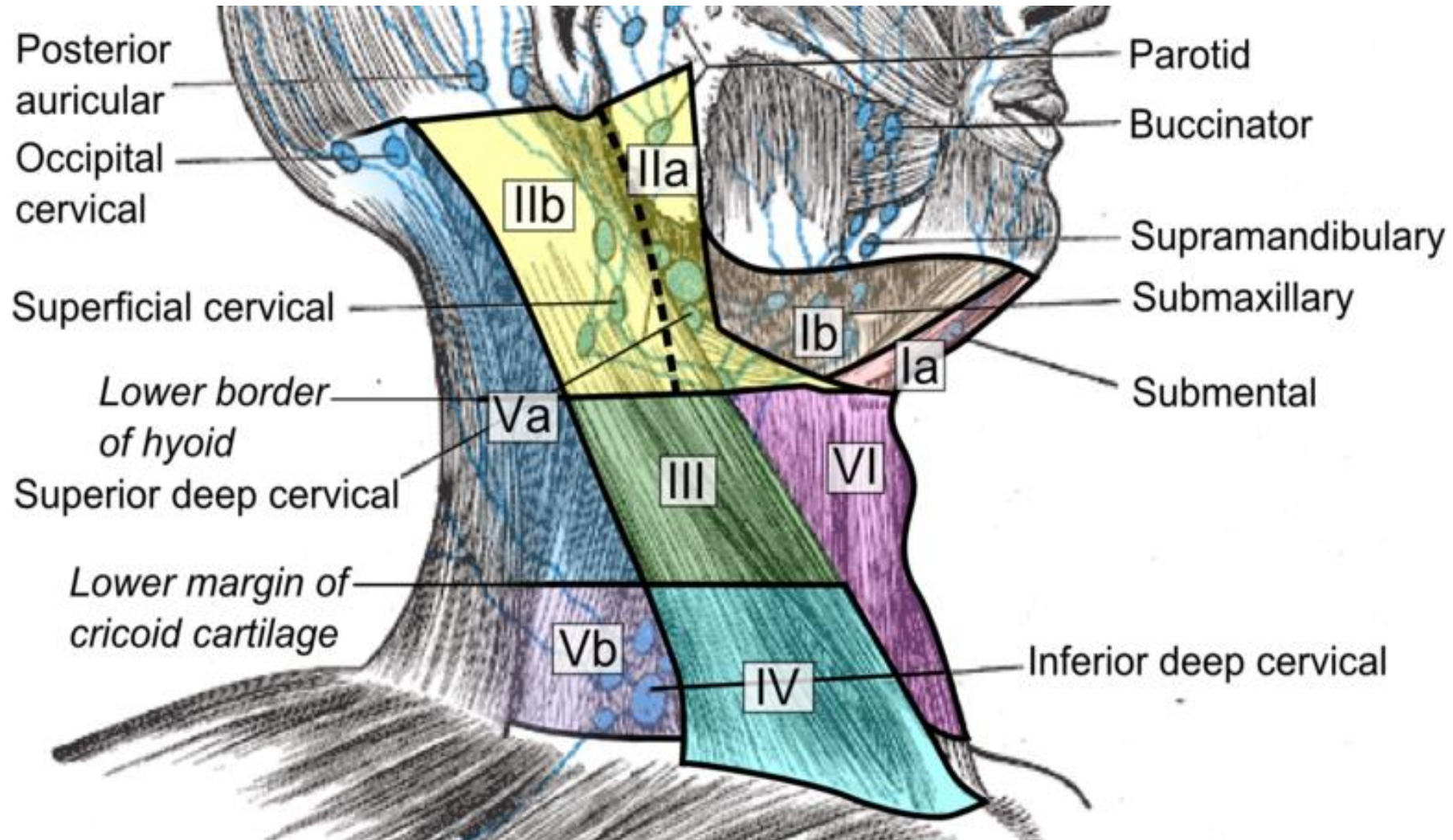








# LYMPH NODES DISTRIBUTION



**Reference:** [File:Cervical lymph nodes and levels.png - Wikipedia](#)

## PROS

- Discourages Target scanning of the neck (exceptions exist)
- Allows a reproducible Standard and Teaching Method
- Less likely to be surprised
- The anatomy and location of pathology will reduce possible differential diagnosis
- If you can't identify the pathology, the anatomical location might help the surgeons

## CONS

- Time consuming (subjective)
- National/General Adoption- (Regulation limitation).

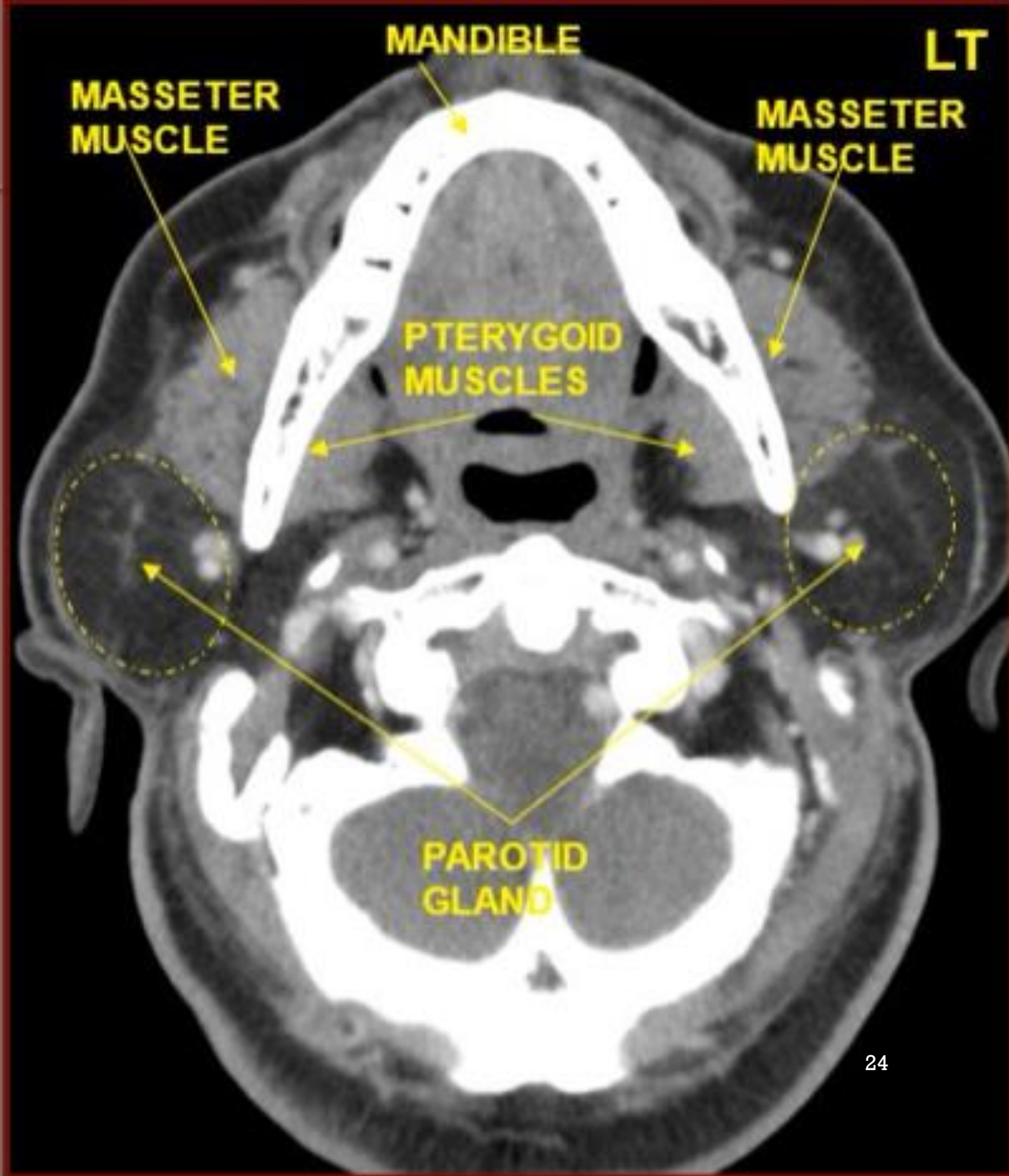
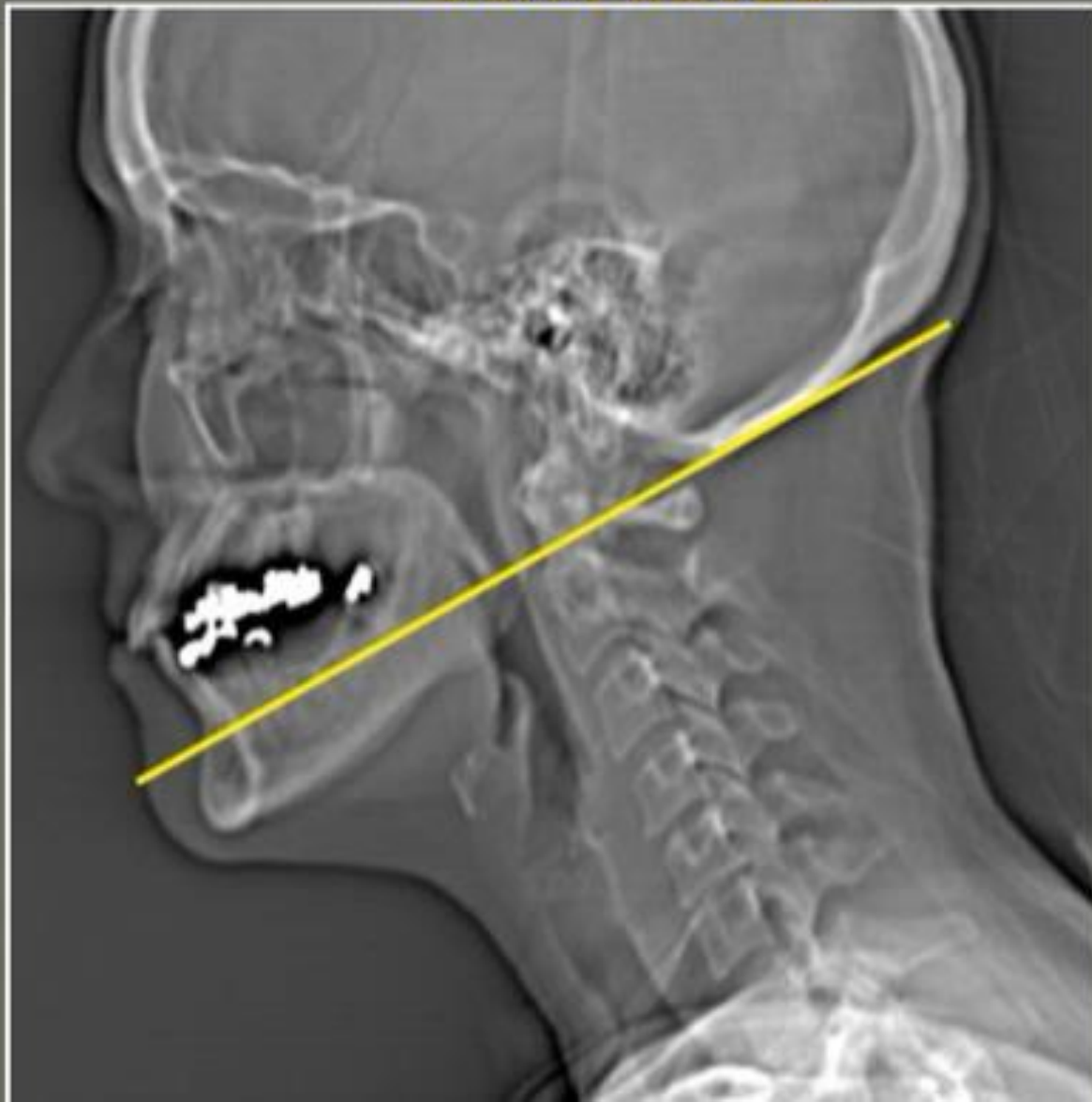




# **BRIEF CROSS-SECTIONAL (CT) IMAGING REVIEWS**

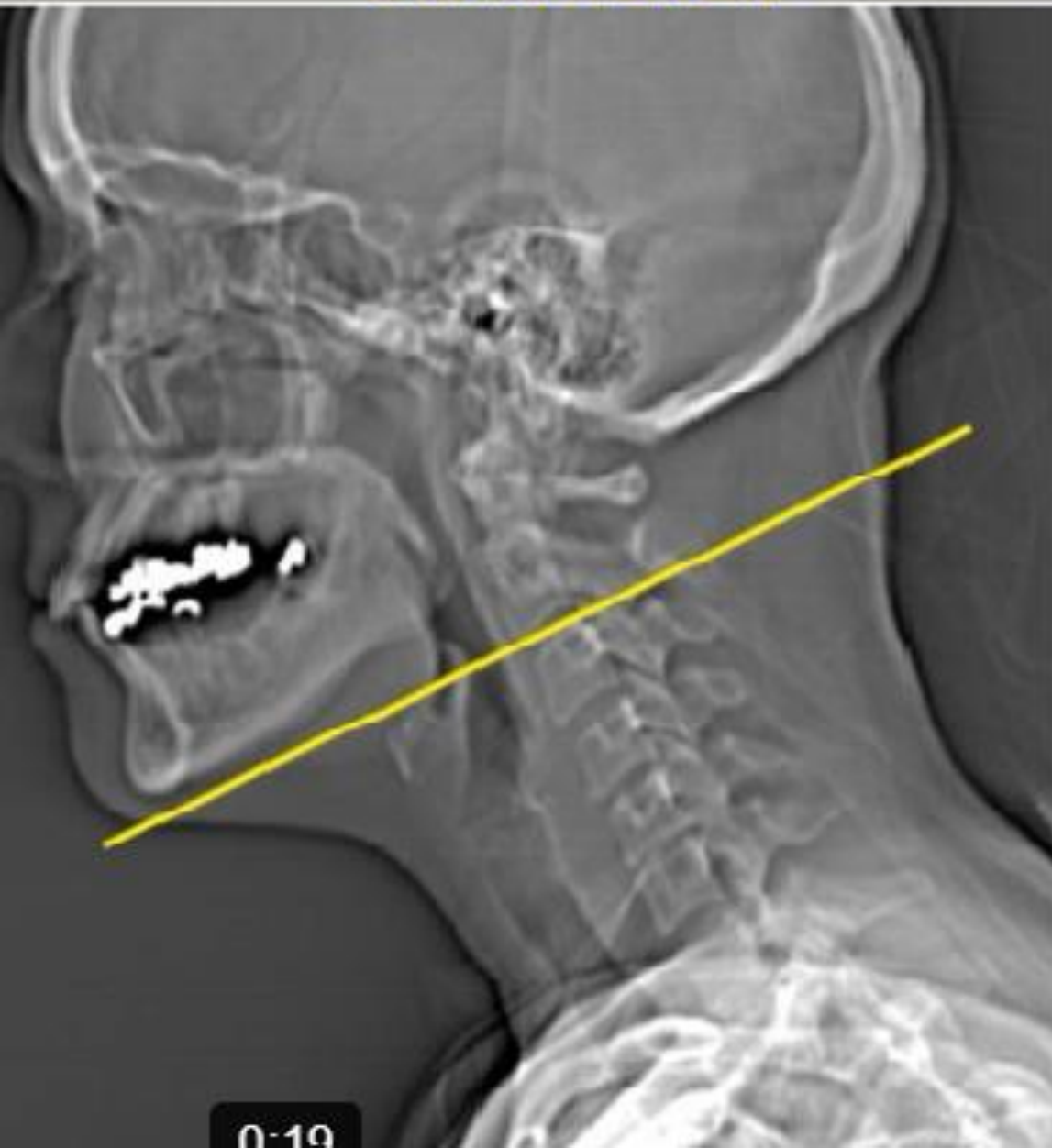


**SCAN LEVEL**

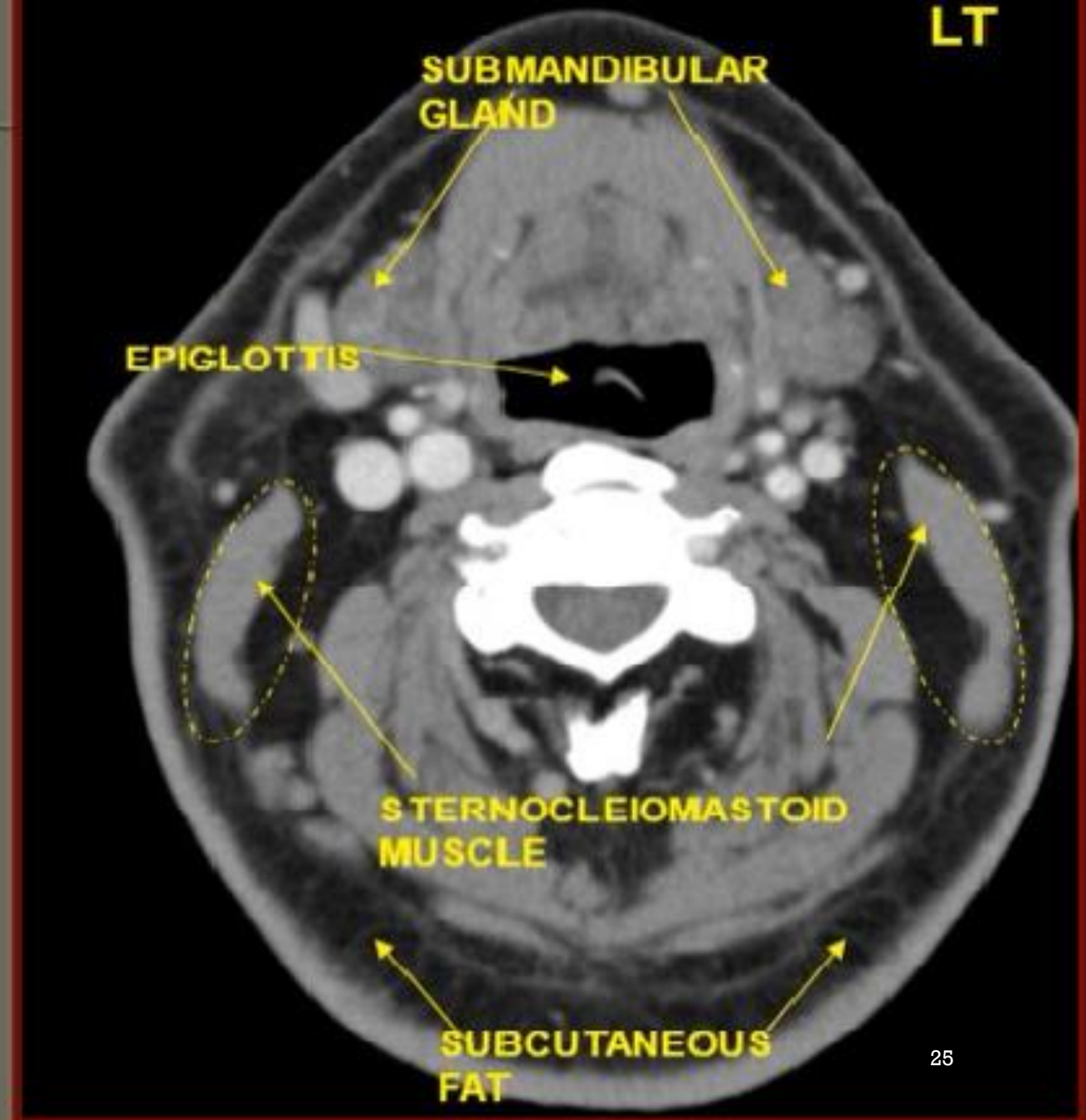




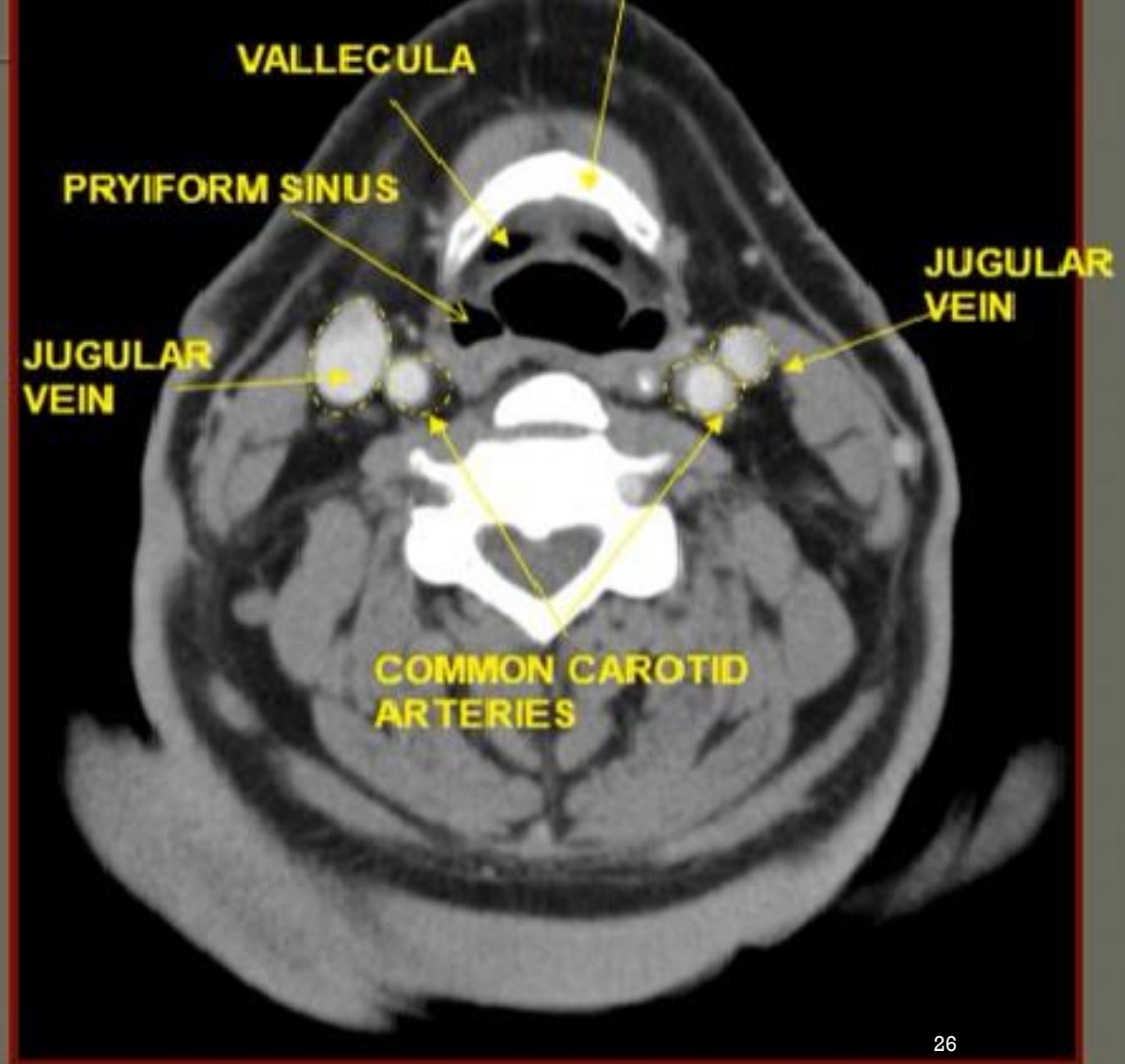
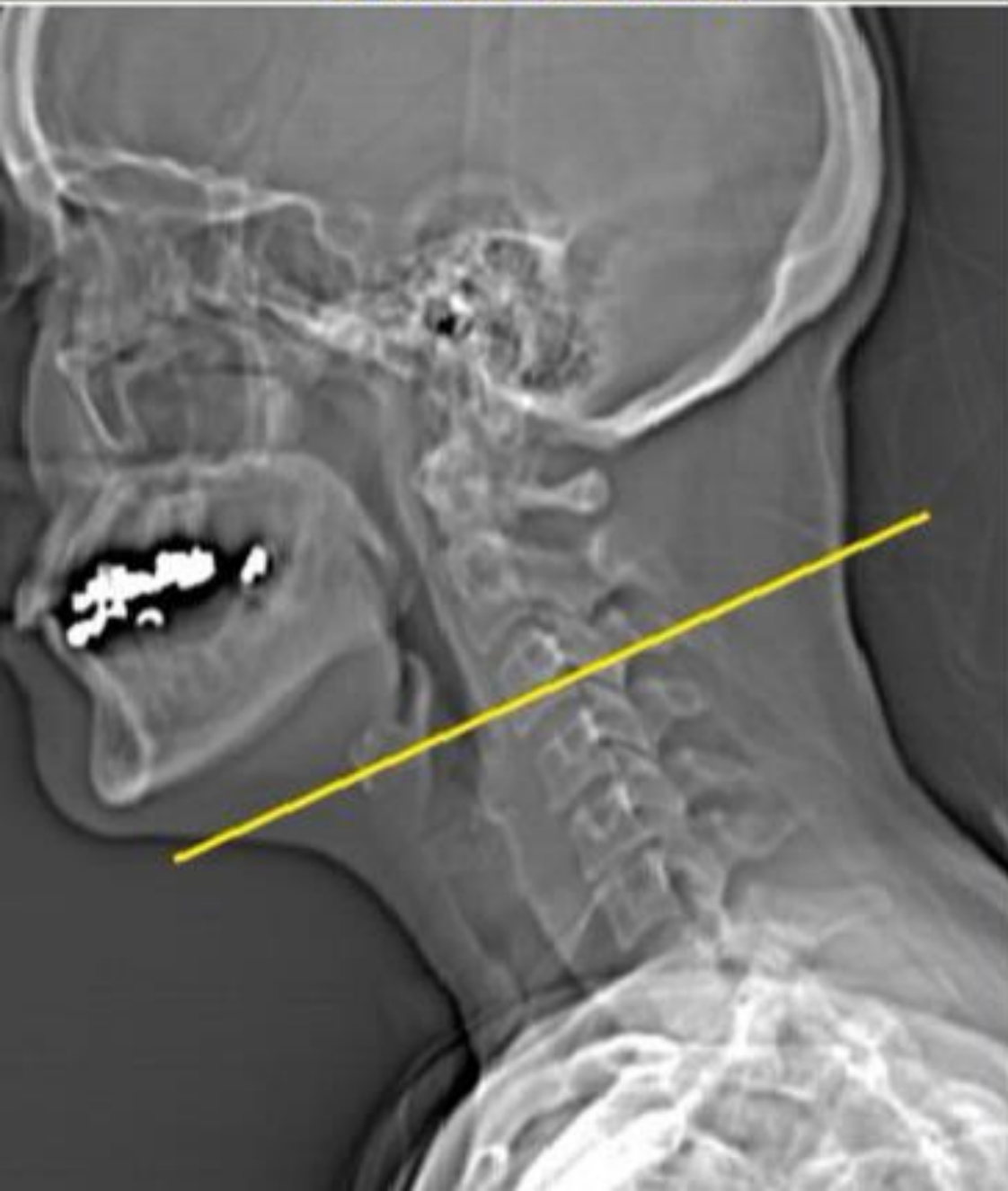
**SCAN LEVEL**



**LT**

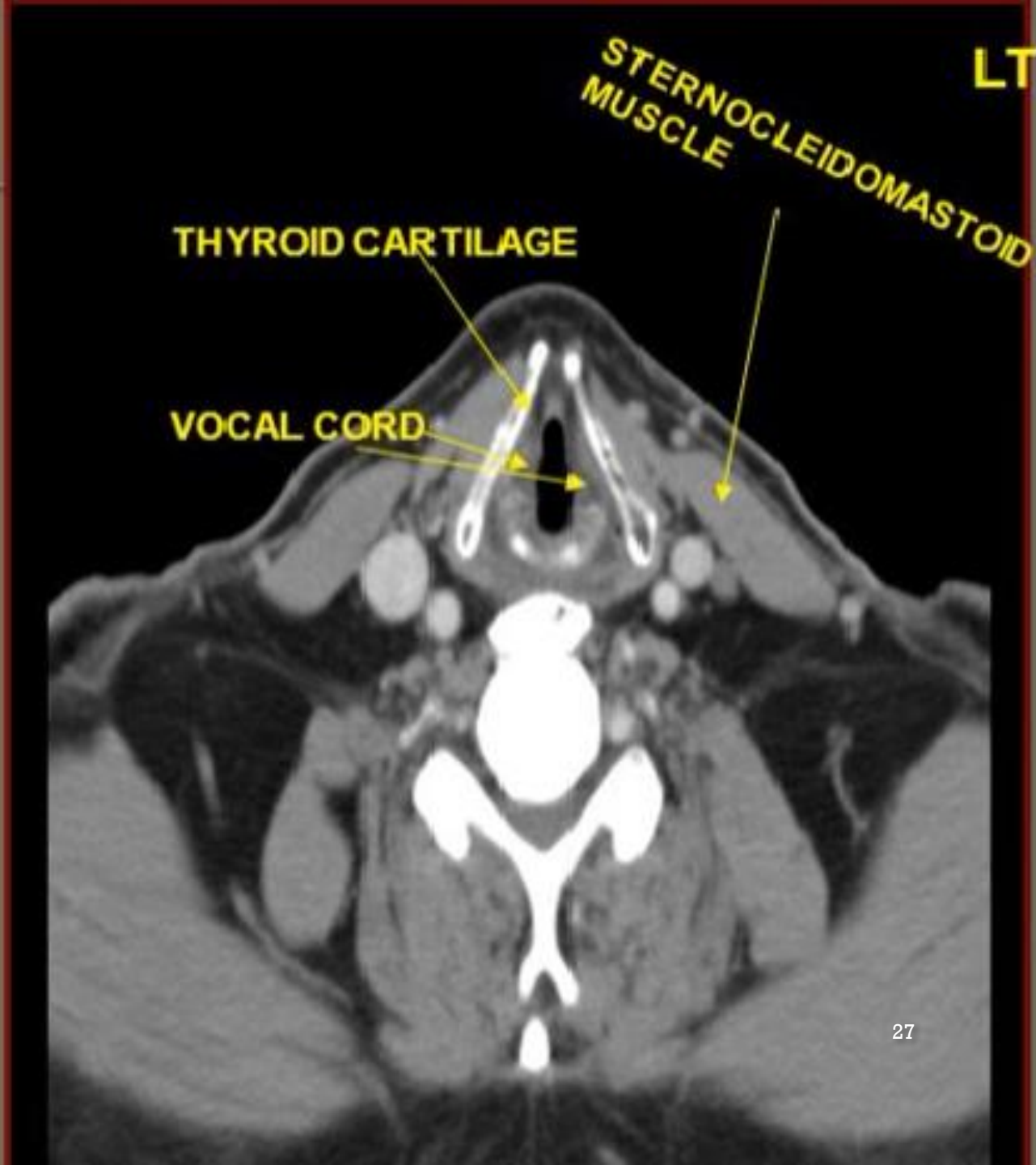
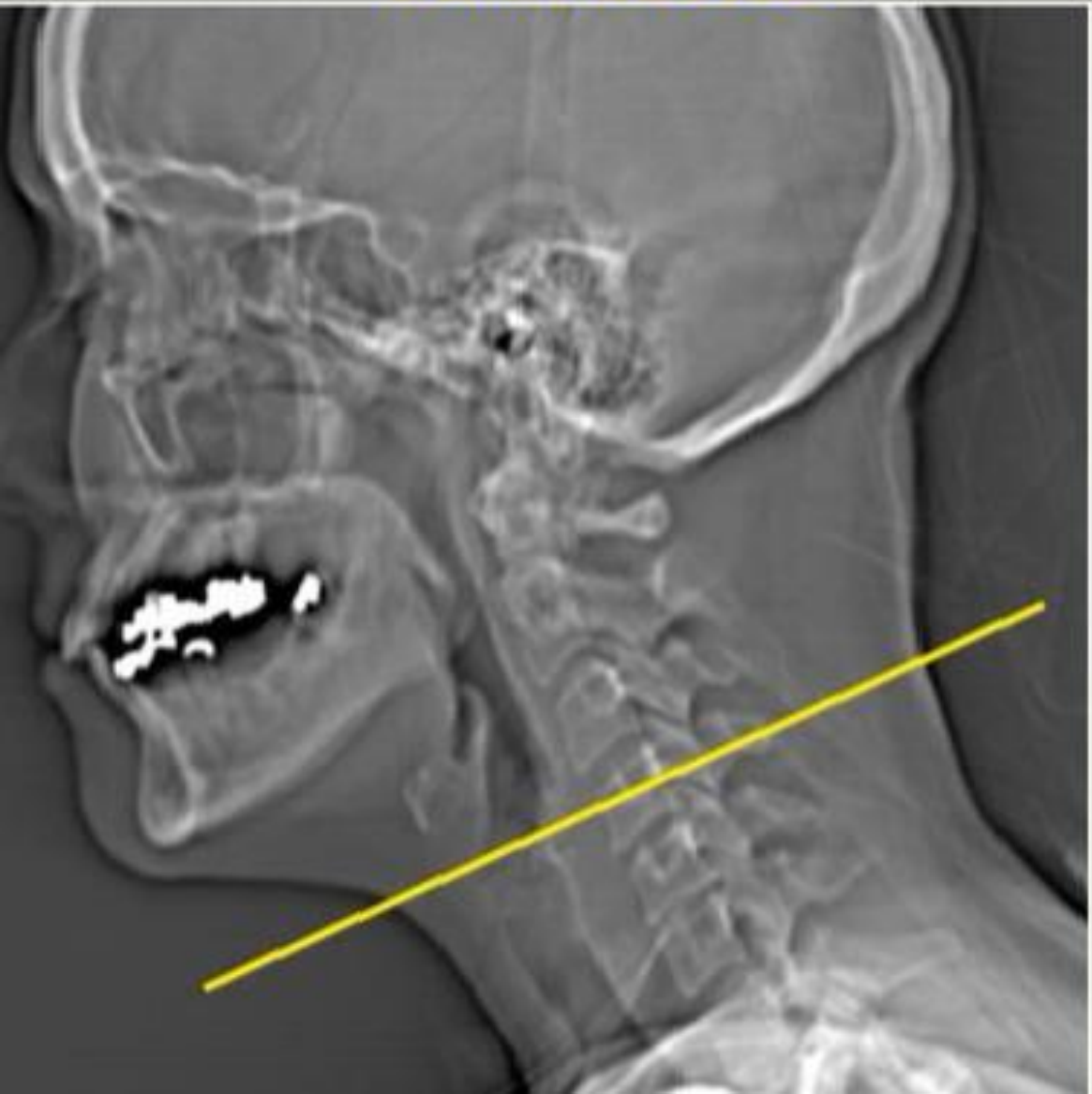


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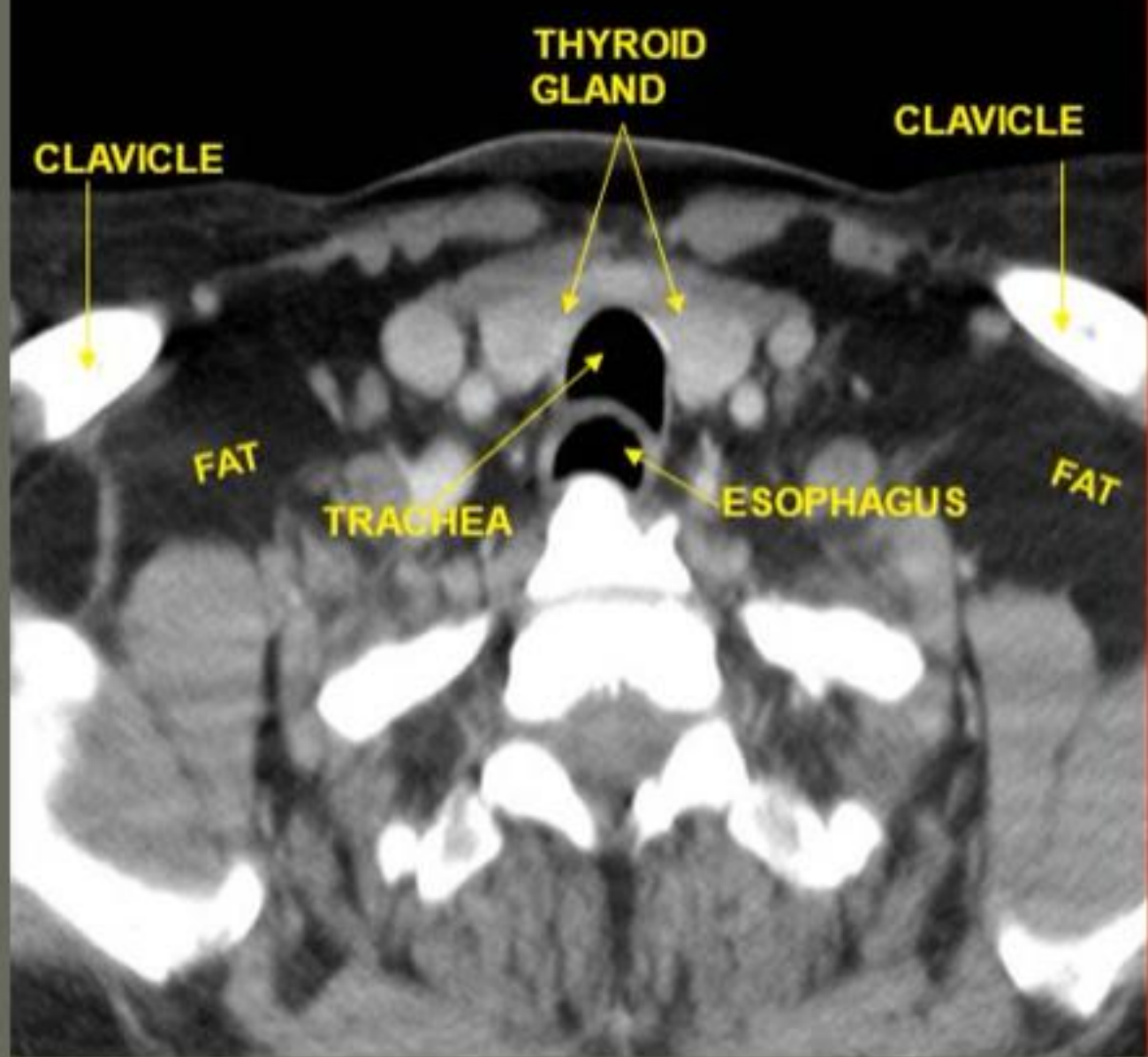




**SCAN LEVEL**



SCAN LEVEL



Ref: CT neck by [Rodger Hector Russell](#)



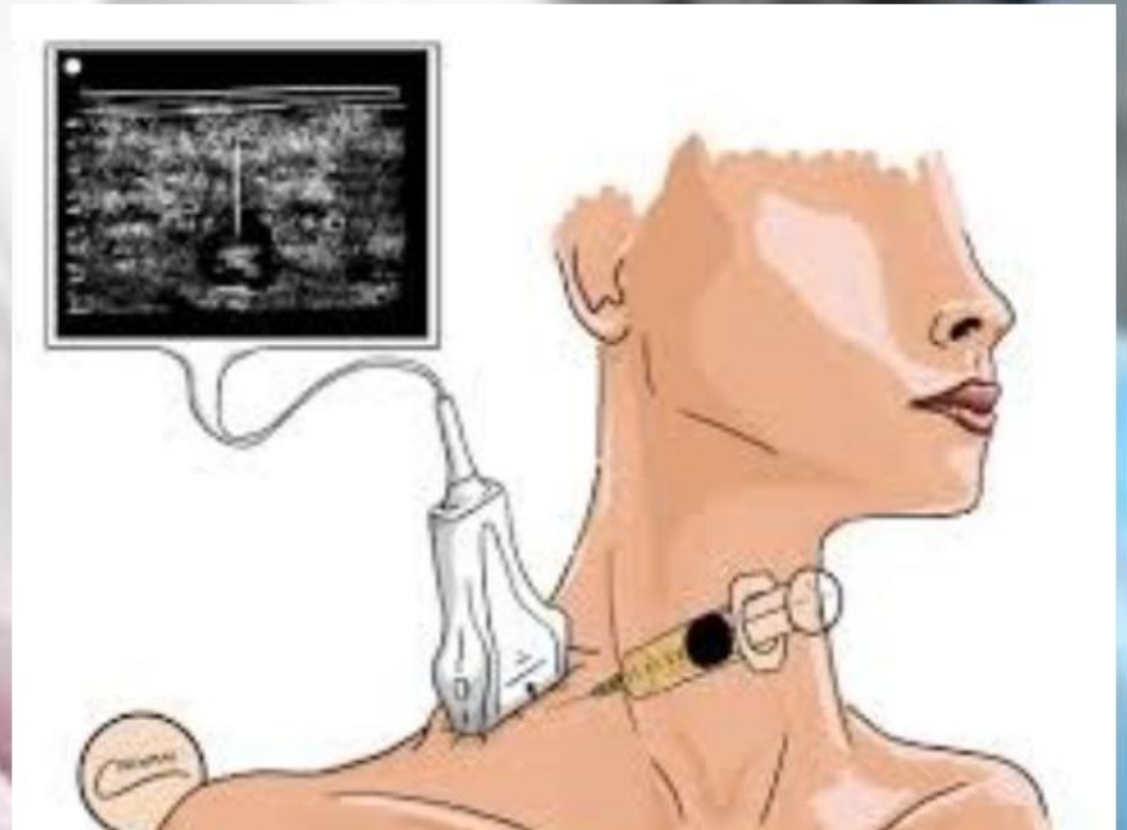


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Pioneer's H & N Presentation NIRAD2022

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- Head and Neck ultrasound is an interesting subspecialty of general ultrasound with practitioners seen performing highly specialized exams in cases of thyroid nodule characterizations, cervical lymph node assessment, neck lumps evaluation, salivary gland pathologies etc.



## **CONCLUSION**

- 7-sweeps neck scan is highly recommended for all head and neck ultrasound practitioners due to its wholistic concept in practice.





**THANK YOU**