

CT of the Neck: Pharynx and Larynx

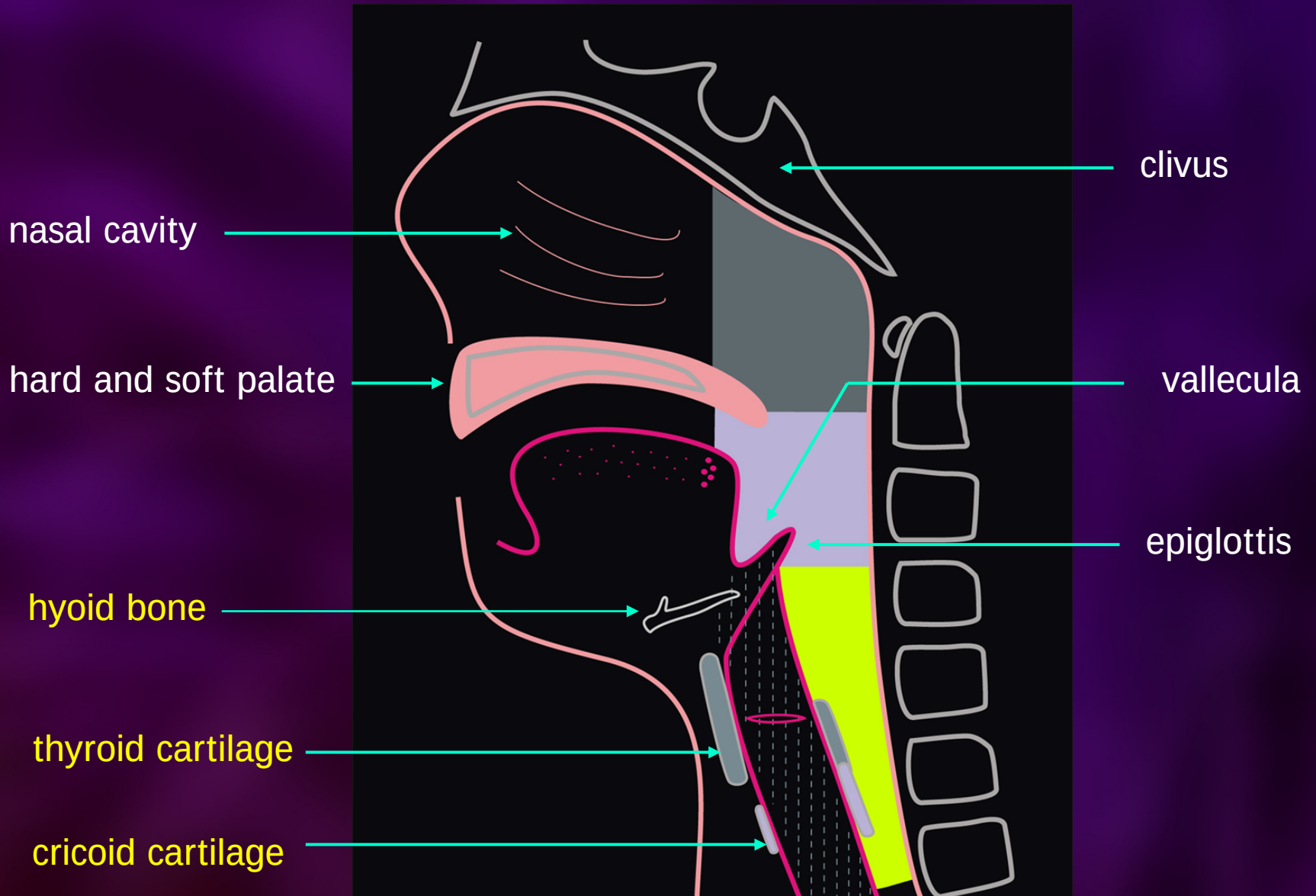
Cross-Sectional Anatomy made Easy!

Landmarks:

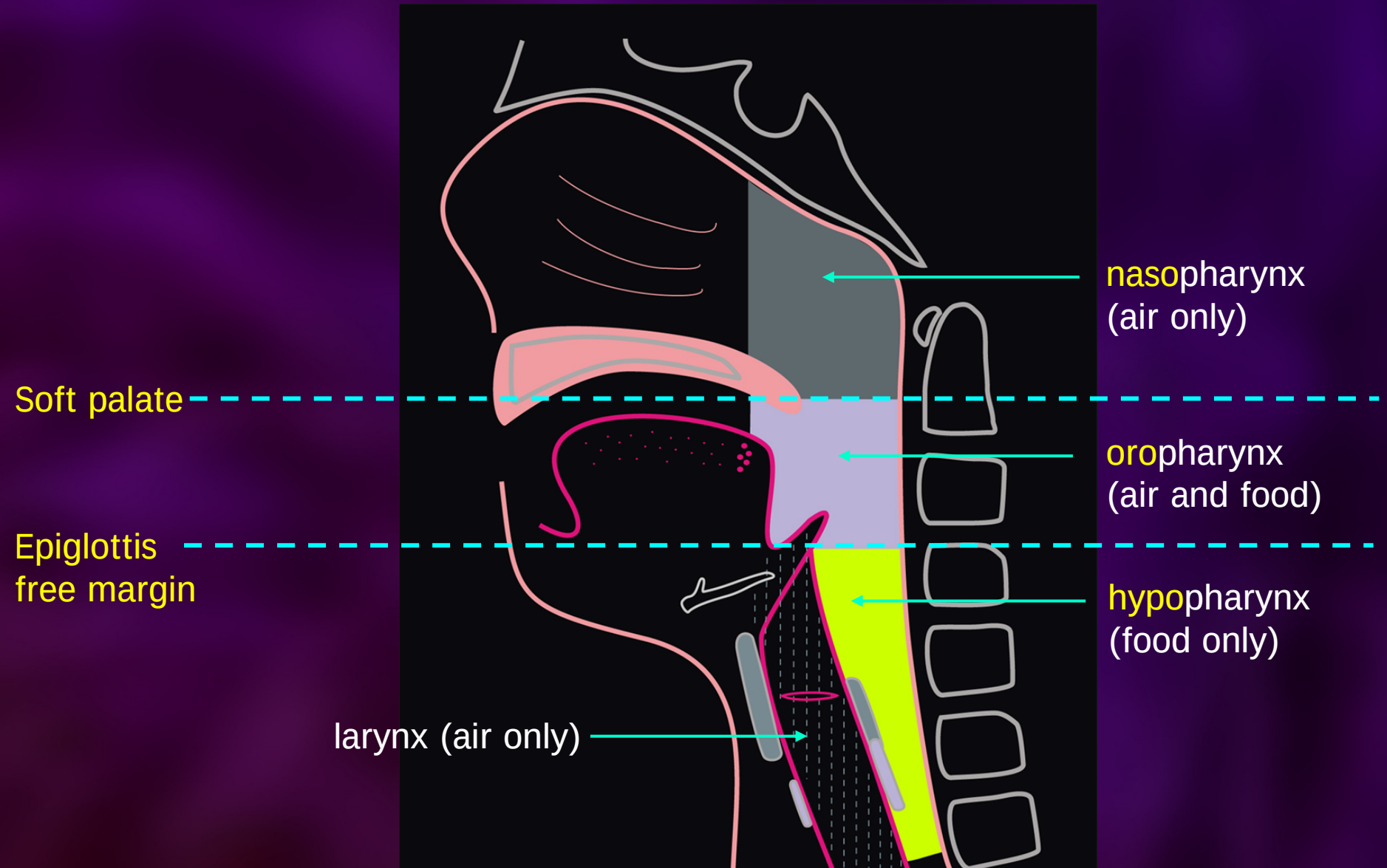
Everything happens in threes!

- **Bone and Cartilage:** 3 key structures
 - hyoid bone
 - thyroid cartilage
 - cricoid cartilage
- **Pharynx:** 3 subdivisions
 - nasopharynx
 - oropharynx
 - hypopharynx
- **Larynx:** 3 subdivisions
 - supraglottis
 - glottis
 - infraglottis

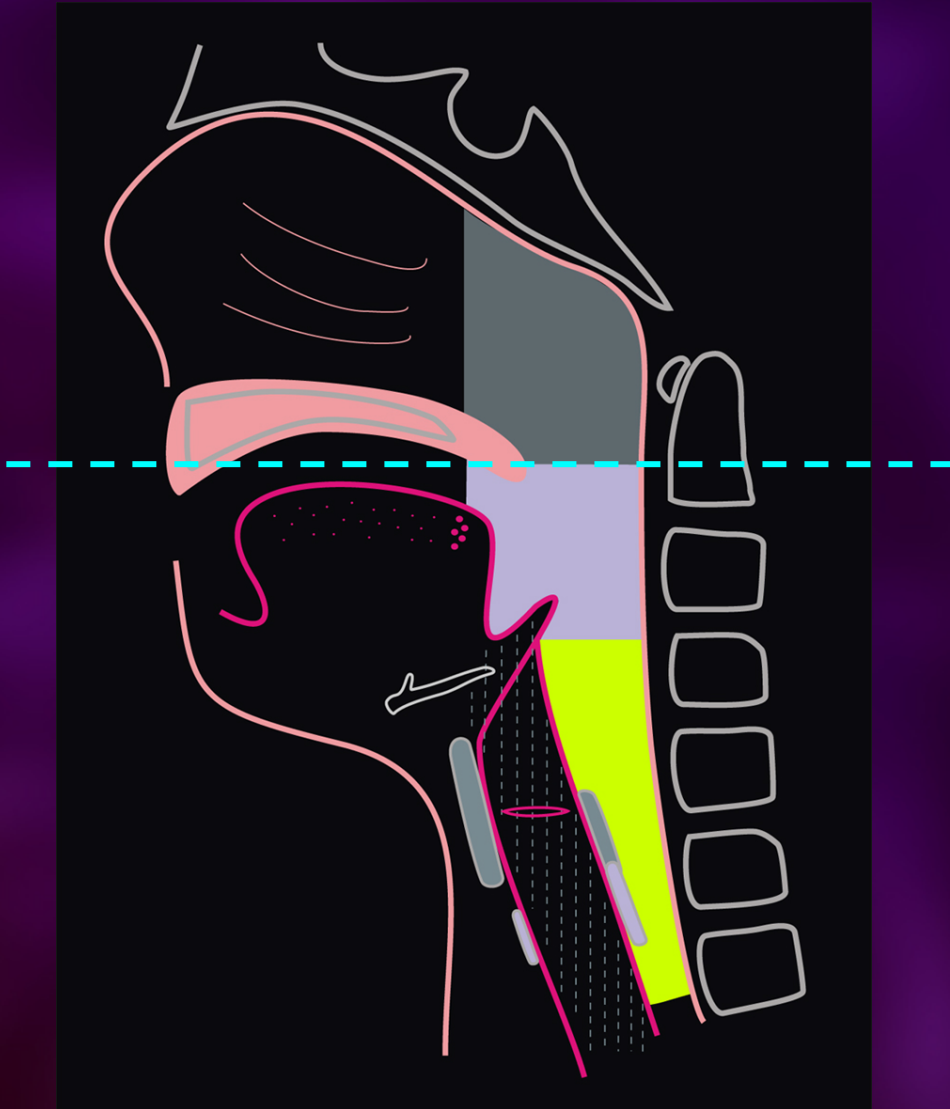
Landmarks



Pharynx - Subdivisions

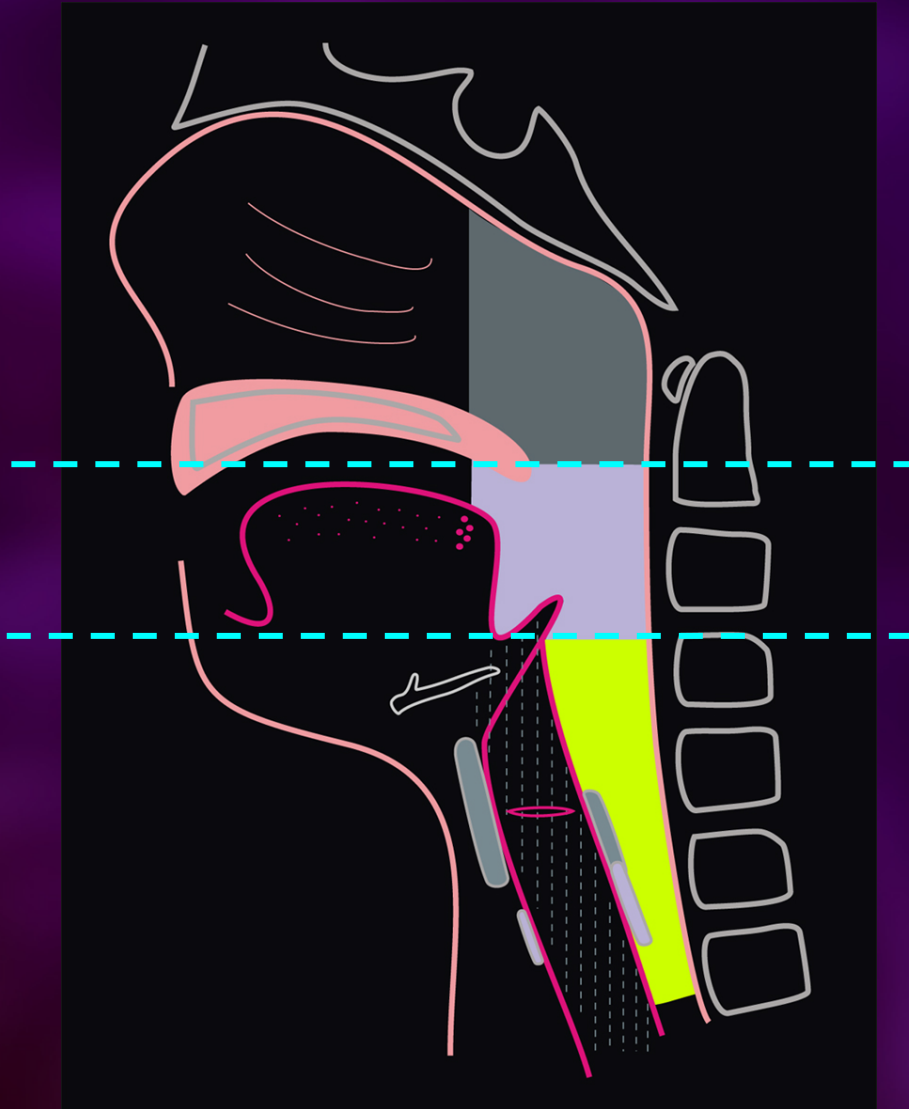


Nasopharynx



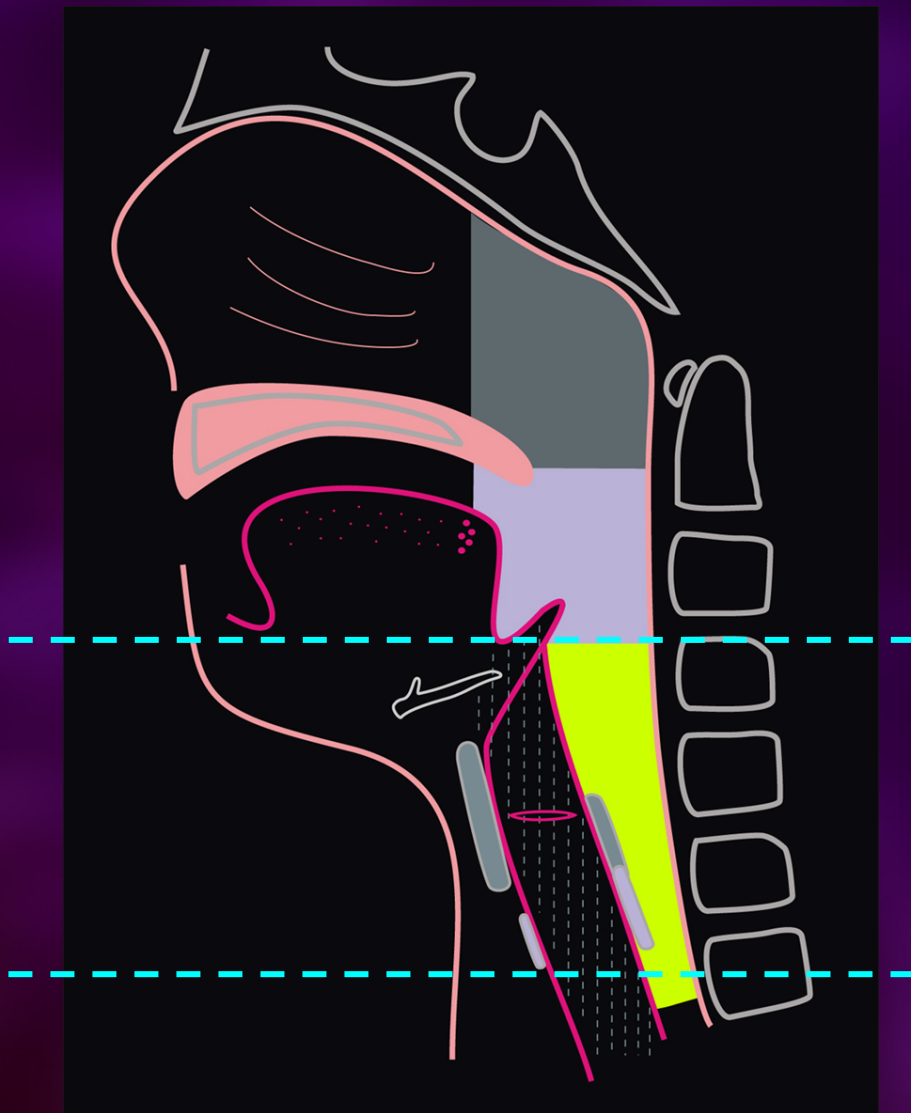
- Highest pharyngeal subdivision
- Extends from skull base to soft palate

Oropharynx



- Continues inferiorly from nasopharynx
- Extends from level of soft palate down to epiglottis (just below free margin)
- Includes tongue base and valleculae

Hypopharynx

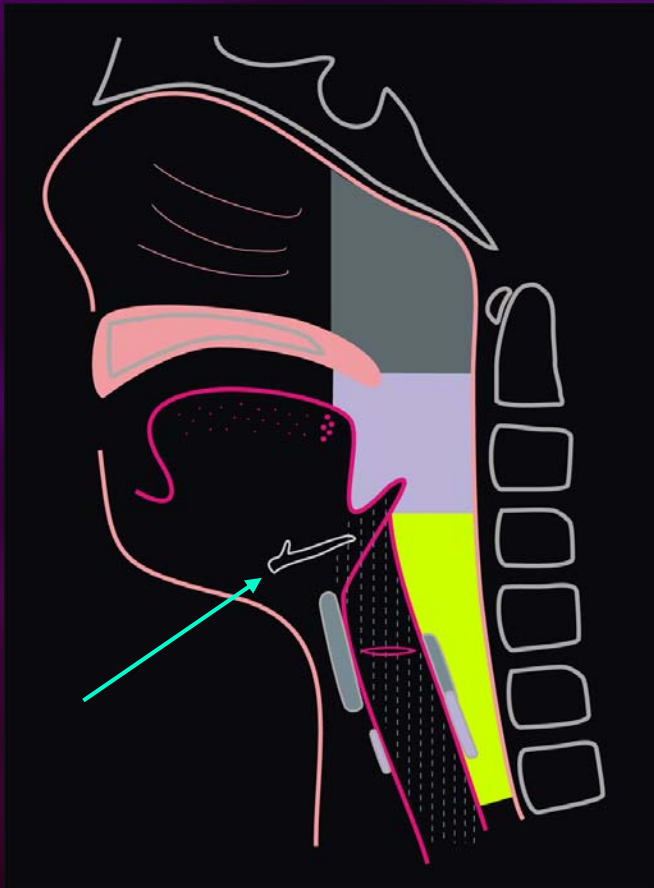
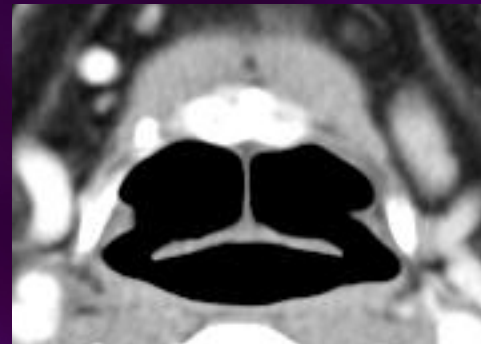
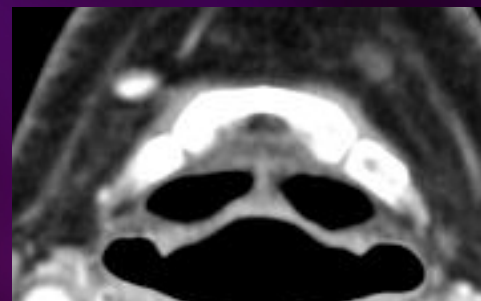
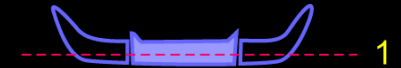
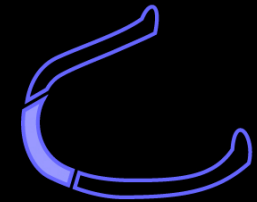
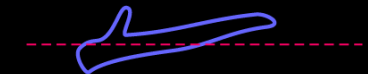


- Continues inferiorly from oropharynx
- Extends from epiglottis down to thoracic inlet
- Situated BEHIND the larynx!
- 3 subdivisions
 - Piriform Recesses
 - Posterior Pharyngeal Wall
 - Postcricoid Space

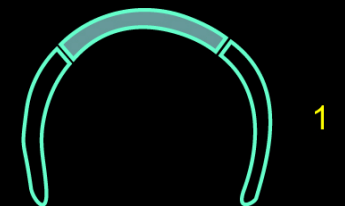
Bone and Cartilage Landmarks

1. Hyoid bone

Curved bone consisting of body and paired “horns”



Axial CT appearance



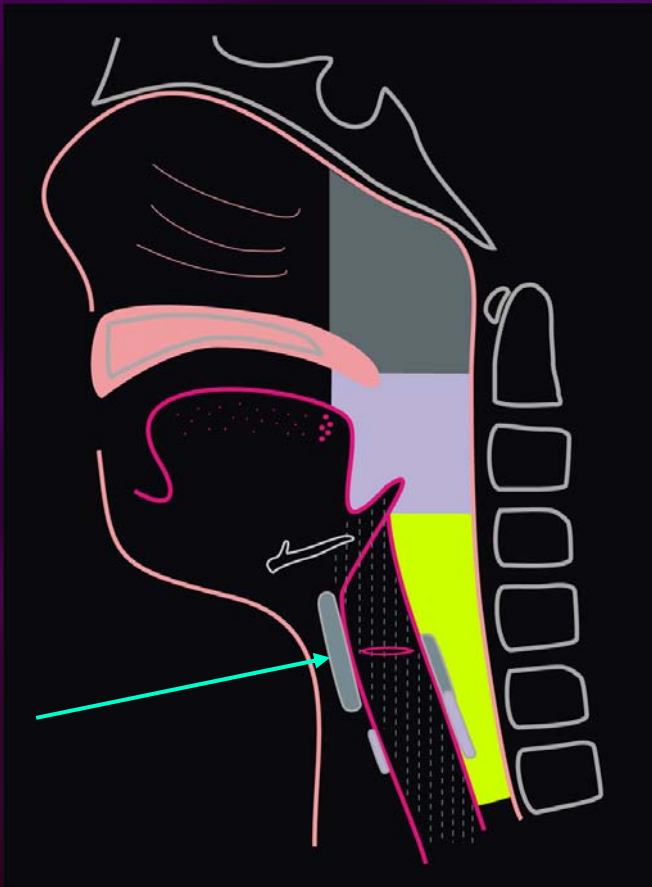
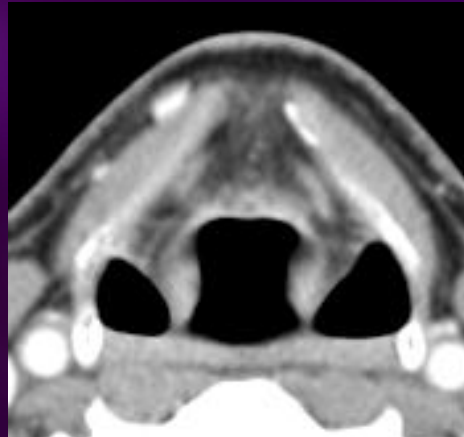
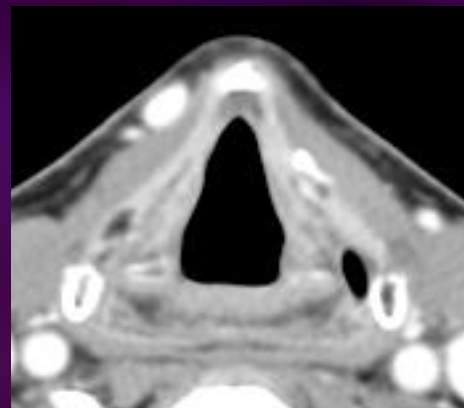
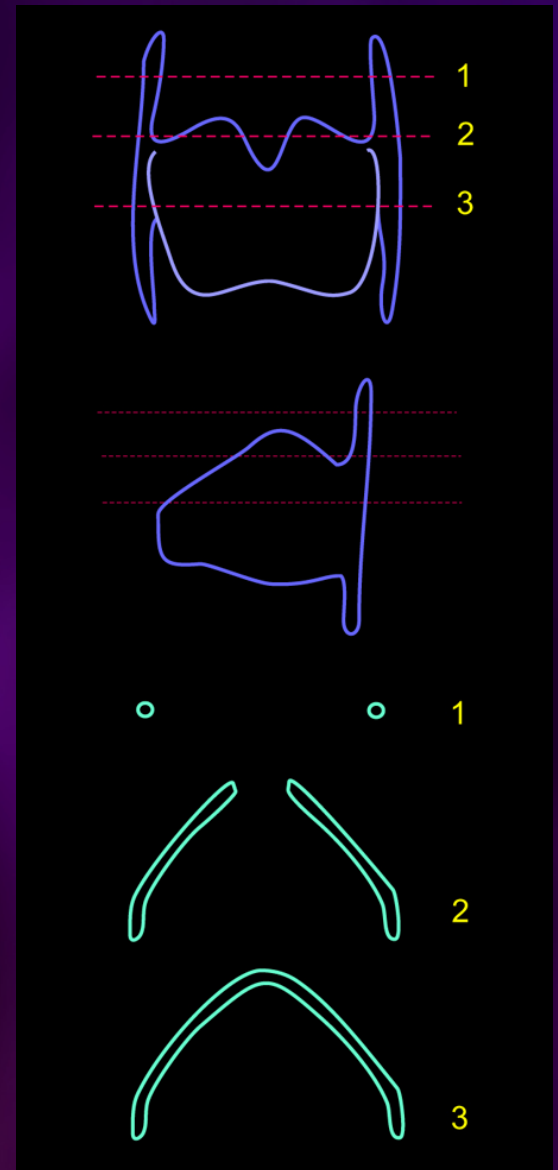
1

2. Thyroid cartilage

“Adam’s apple”

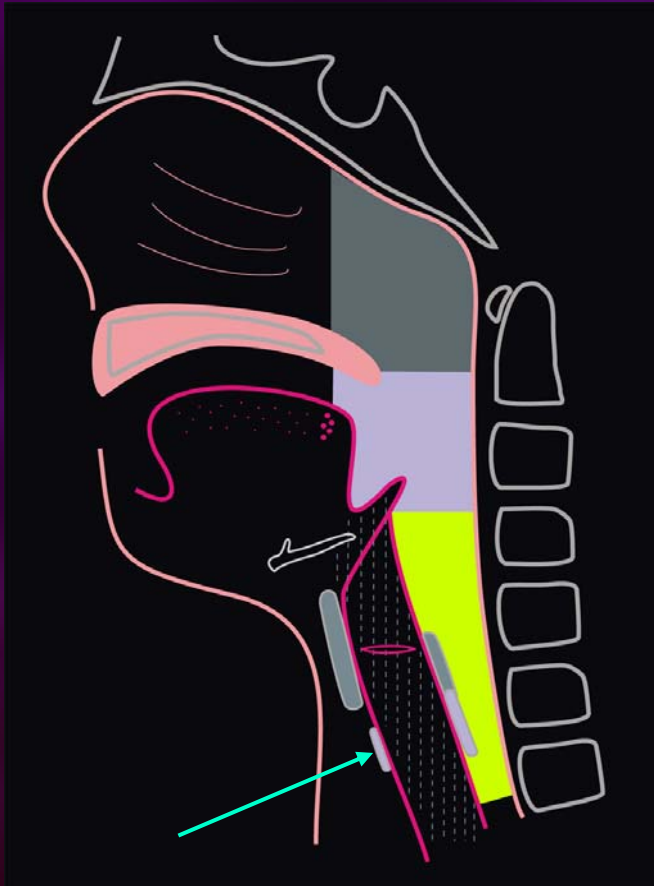
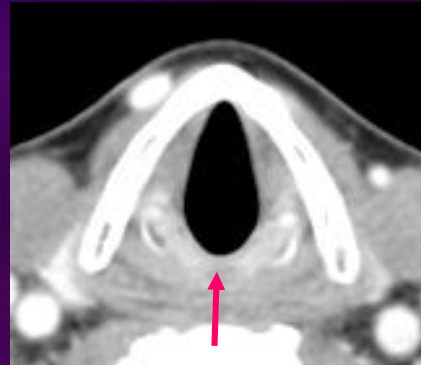
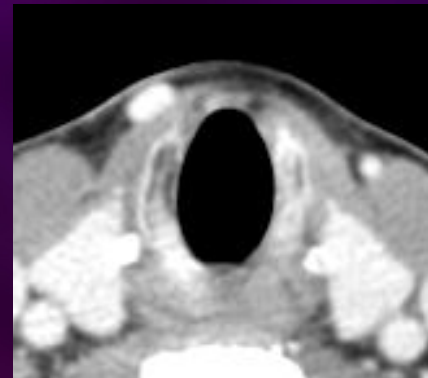
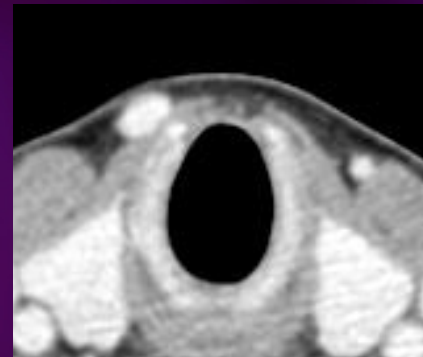
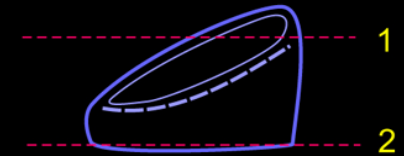
Central body and notch

Superior and inferior horns (paired)



3. Cricoid cartilage

“Signet ring” configuration
(back higher than front)



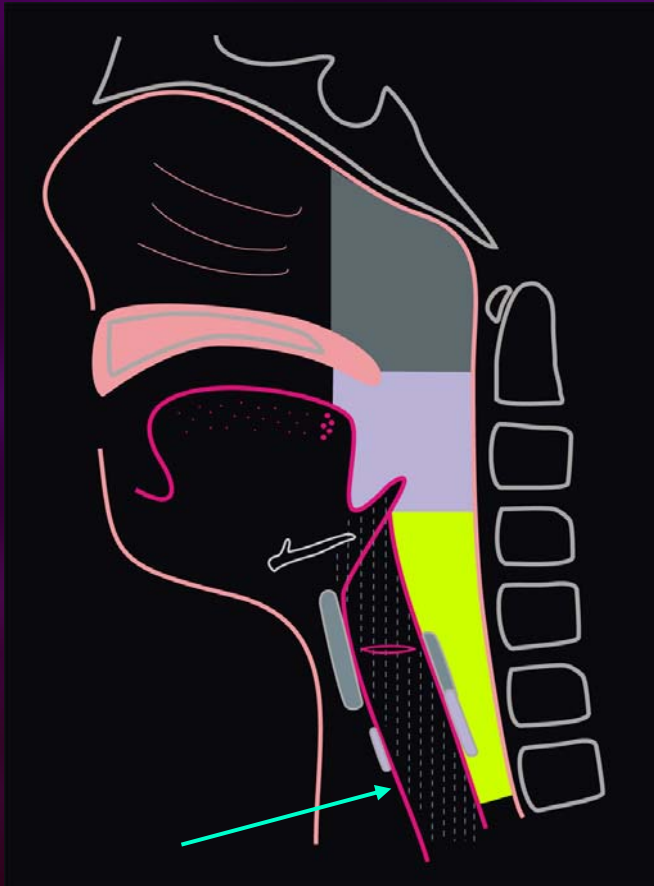
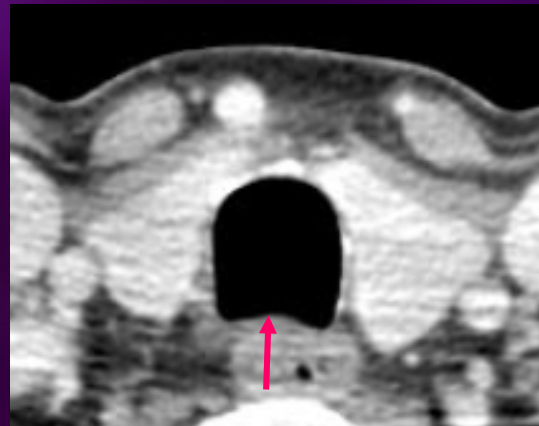
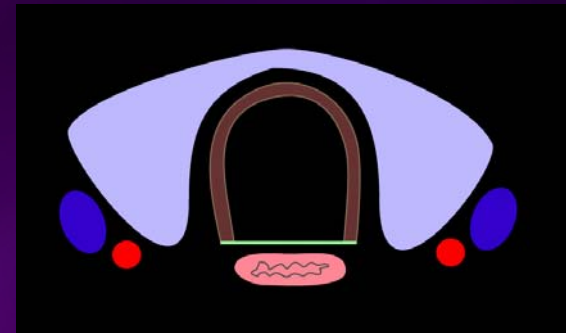
incomplete ring



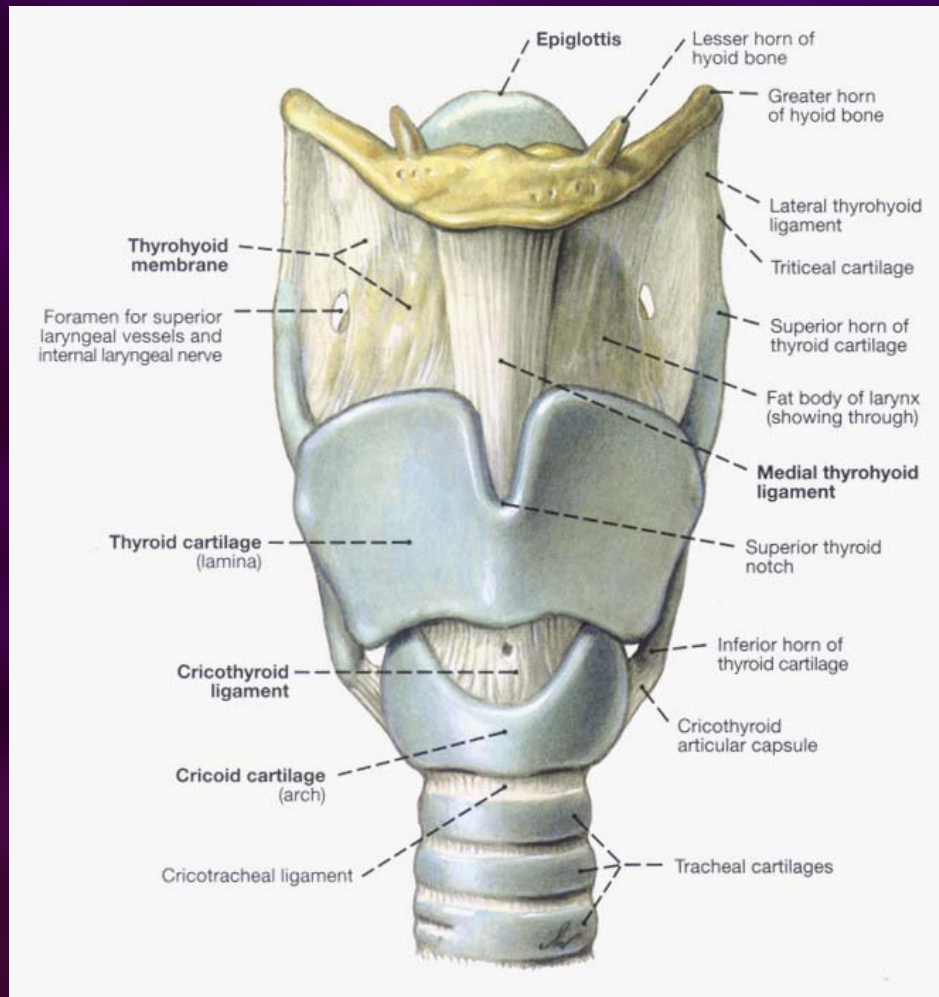
complete ring



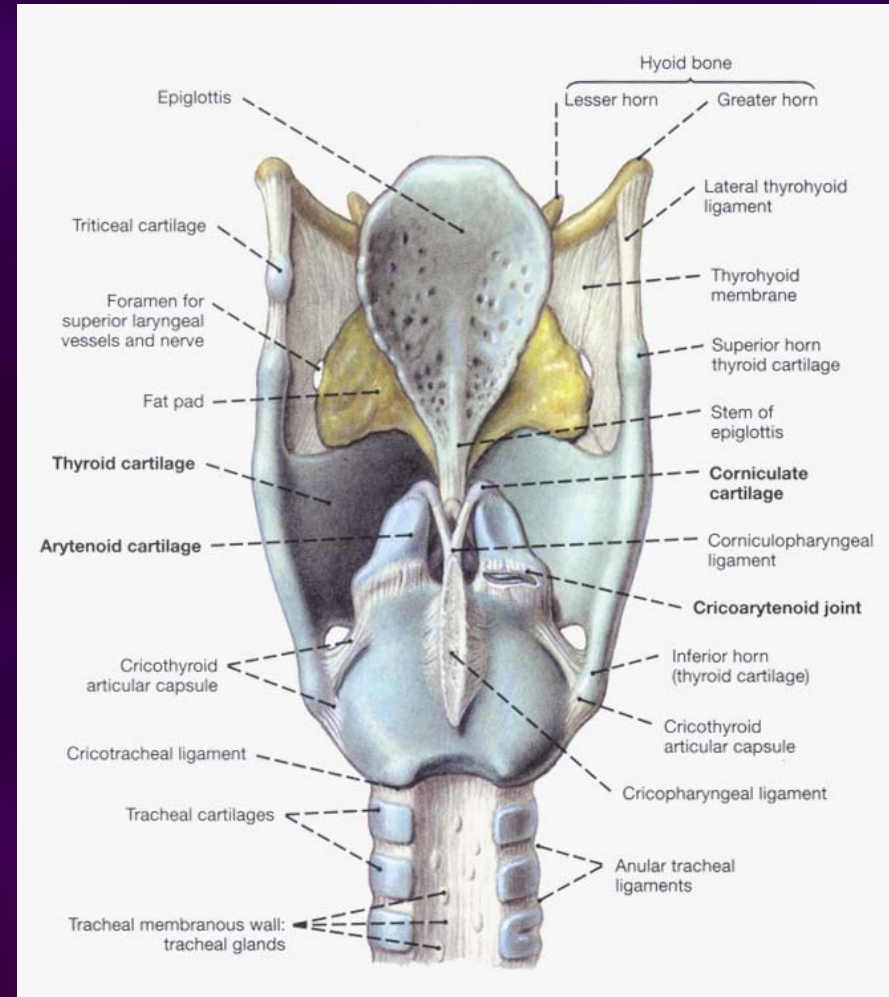
4. First tracheal ring



Laryngeal cartilages – coronal views

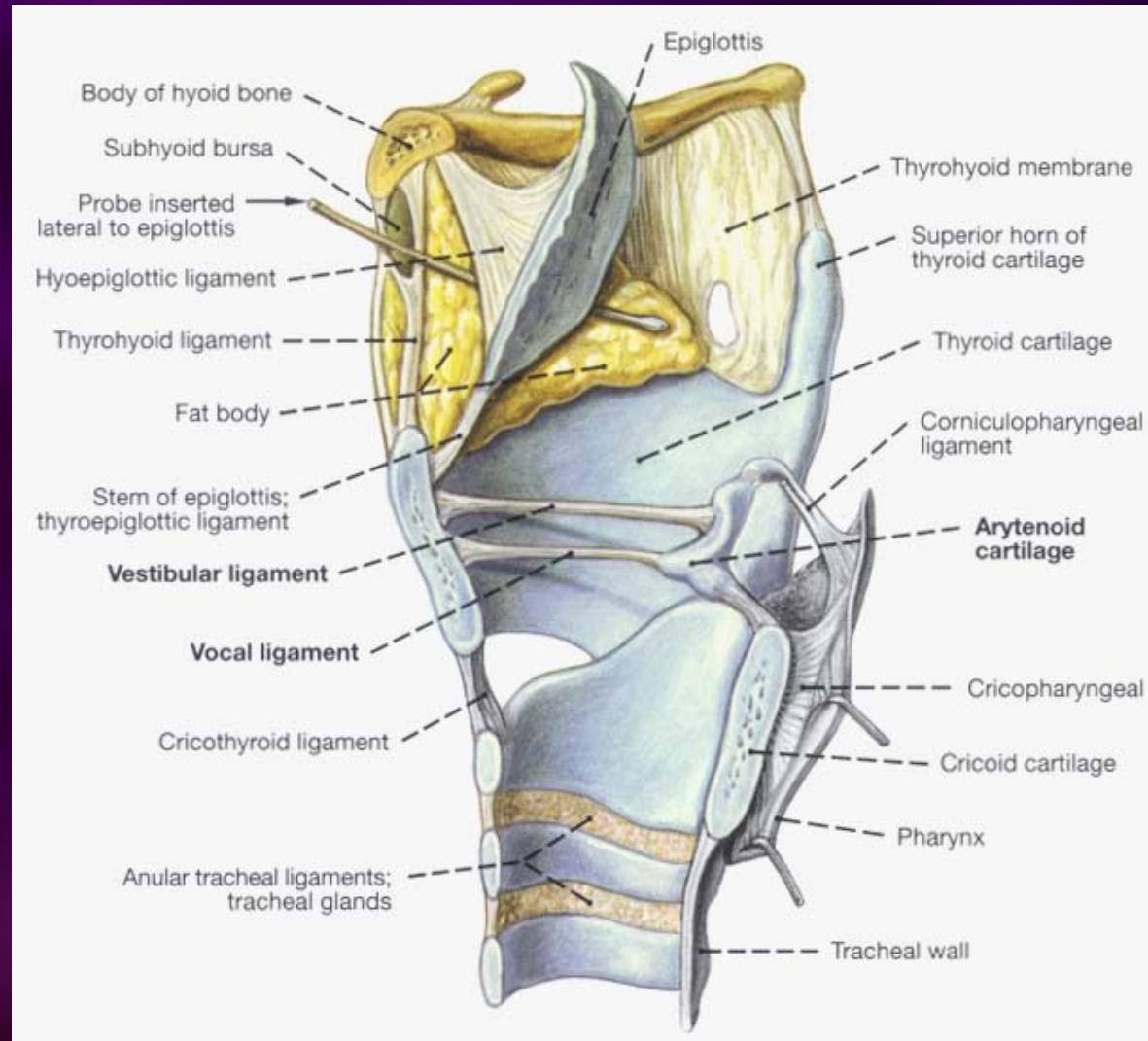


anterior

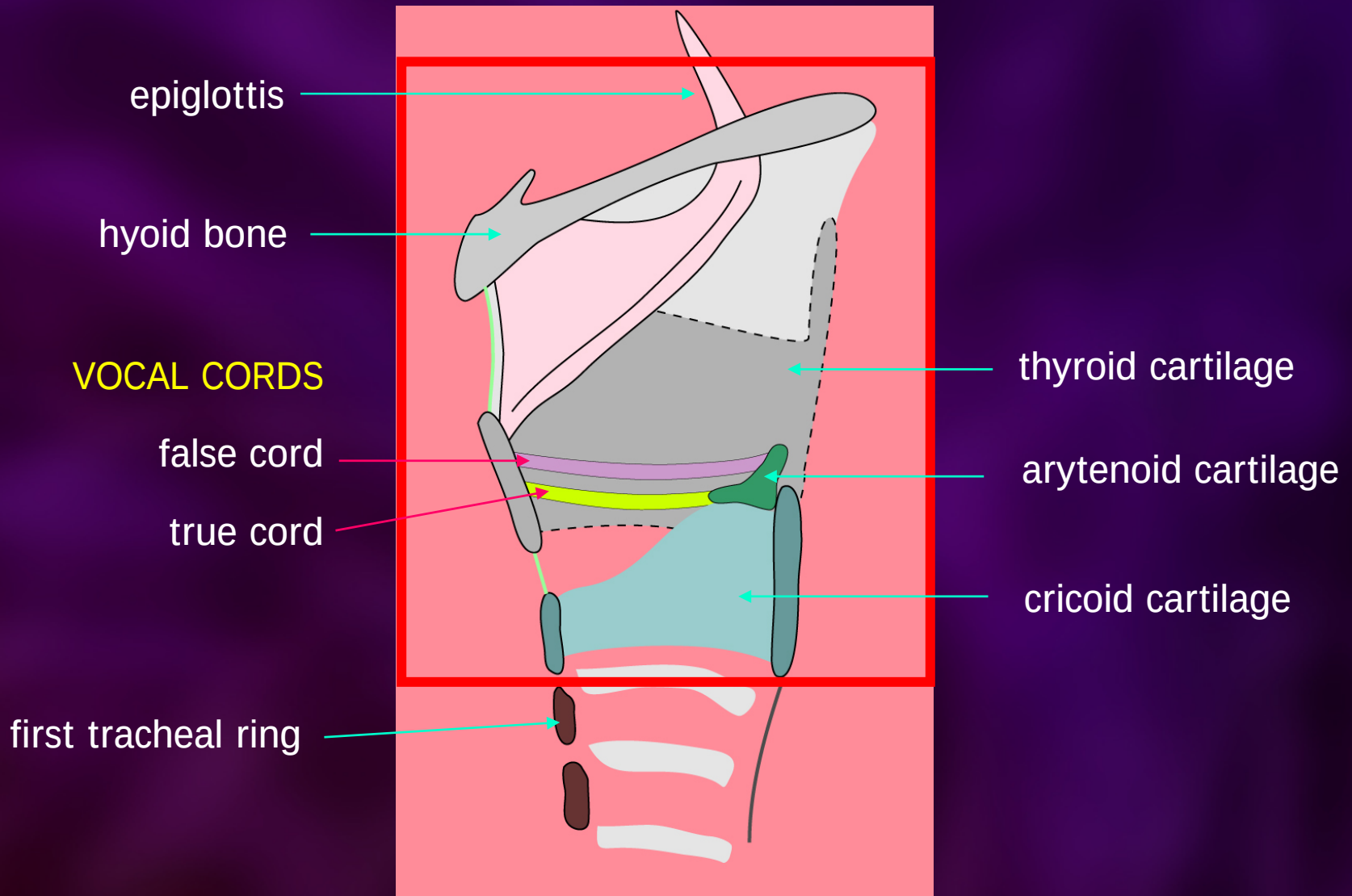


posterior

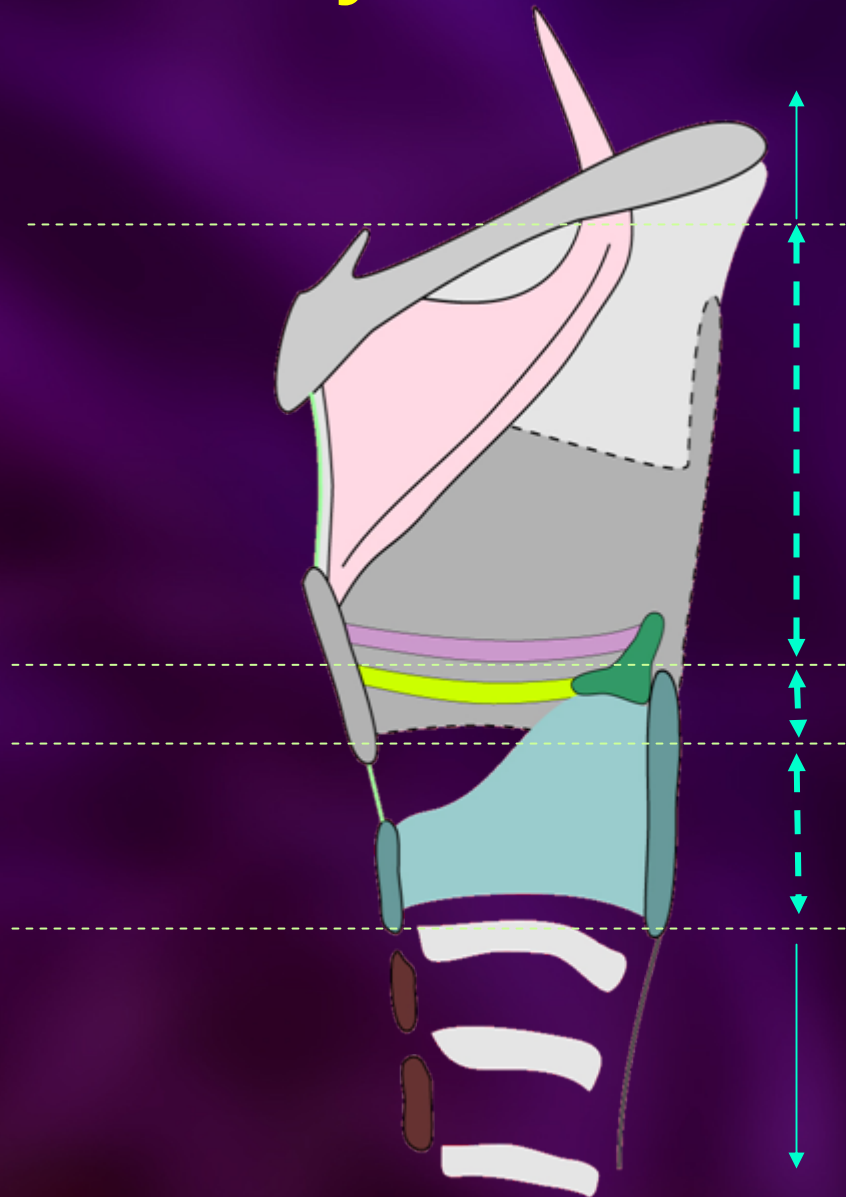
Laryngeal cartilages – sagittal view



Larynx – boundaries and framework

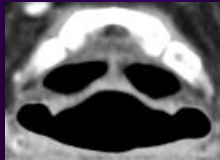


Larynx - Subdivisions



Oropharynx

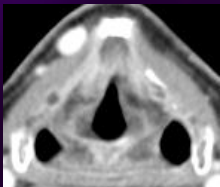
*Behind the hyoid bone:
Donald Duck & epiglottic valleculae*



Supraglottis

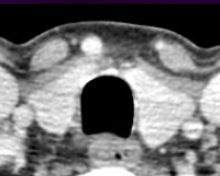
(main content is false cords)

*Behind the thyroid cartilage:
False cord & piriform recesses*



Glottis

(main content is true cords)

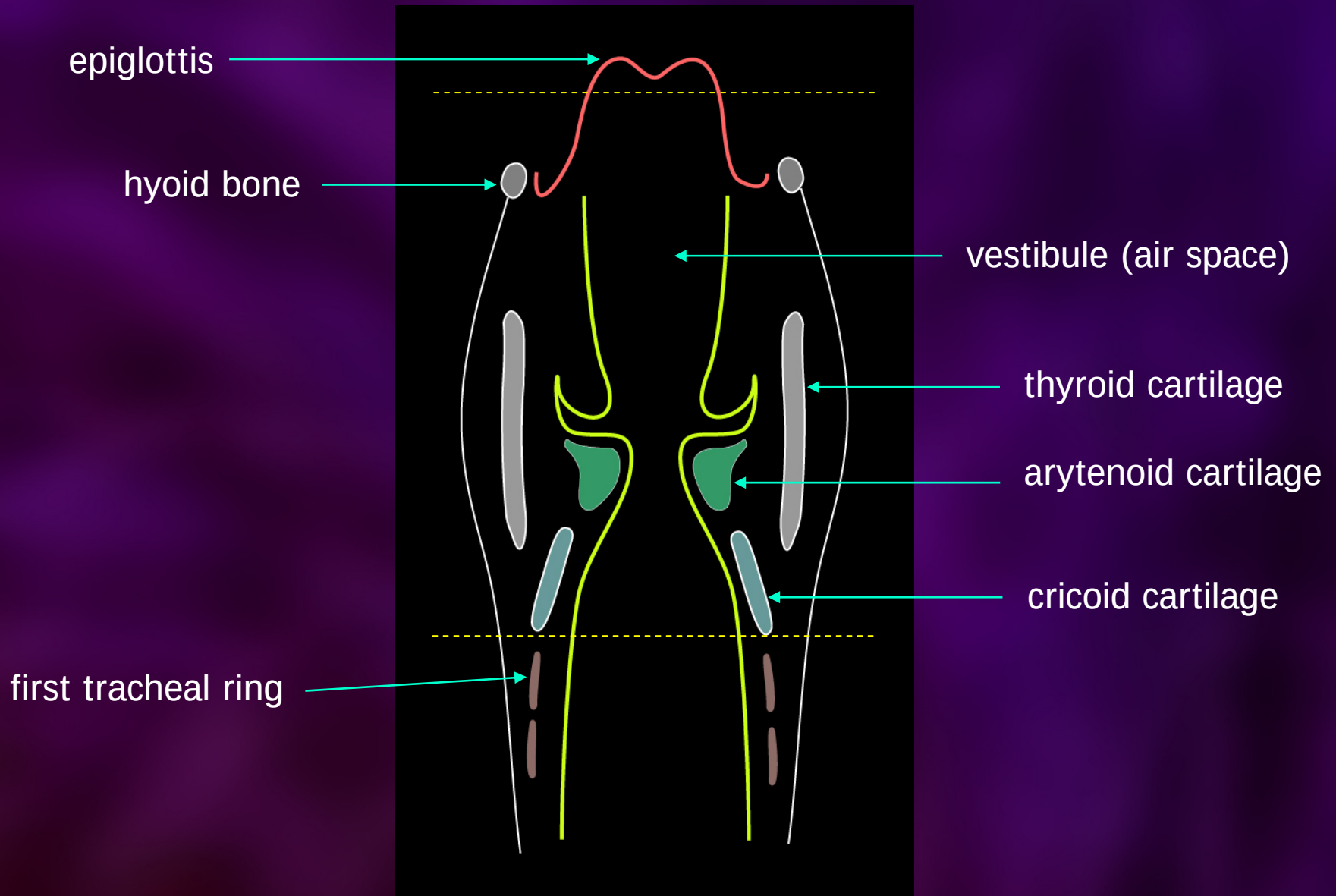


Infraglottis

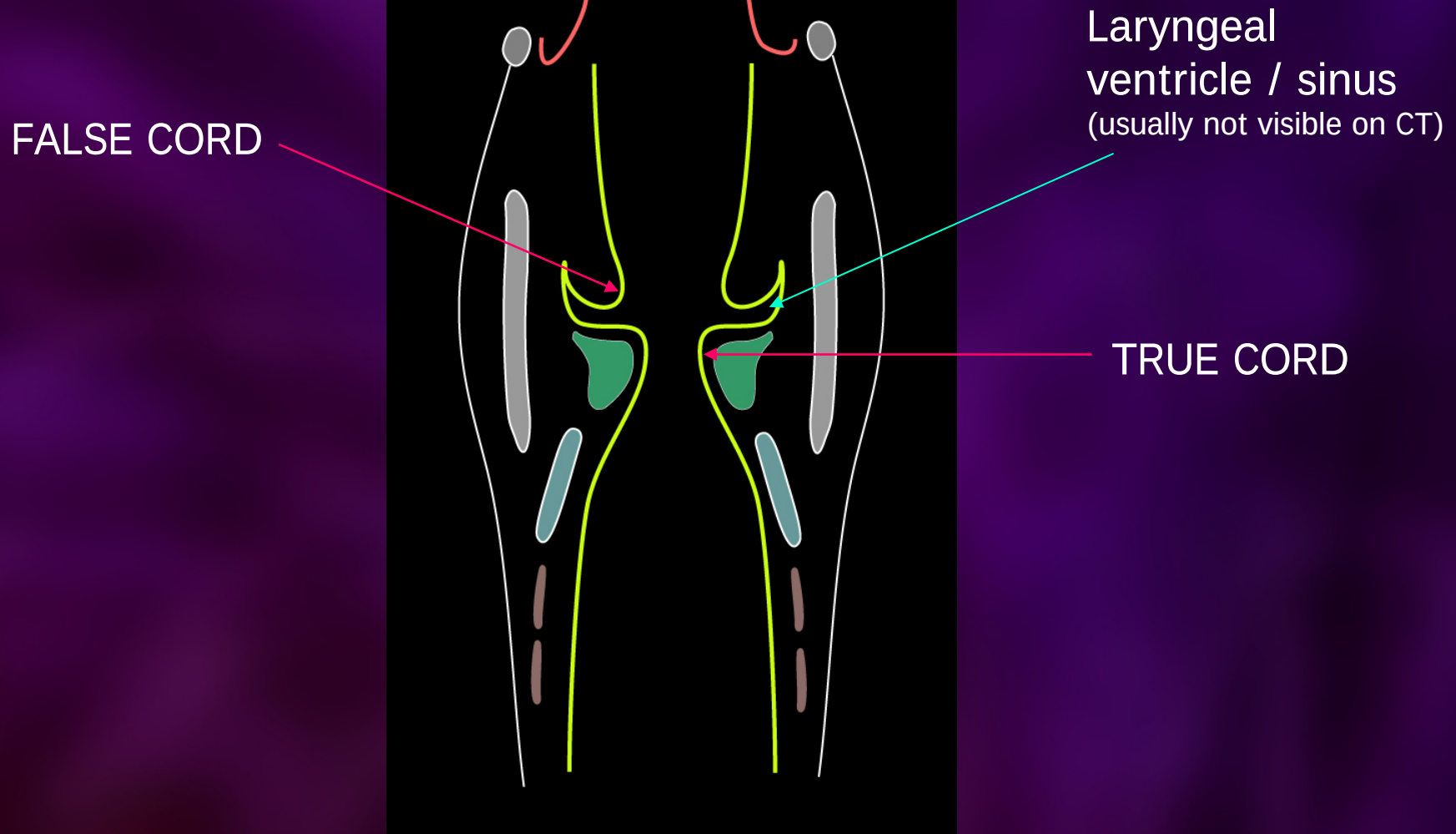
Trachea

Behind the first tracheal ring

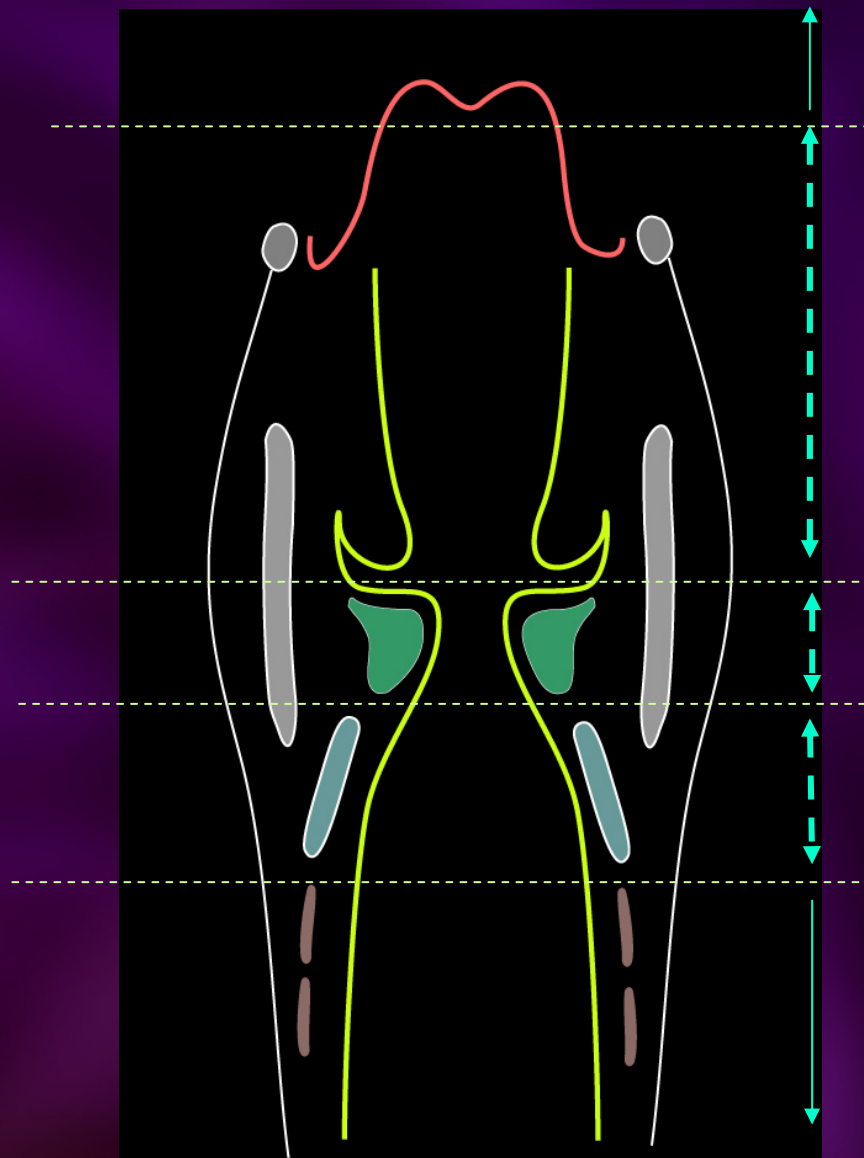
Larynx – boundaries and framework



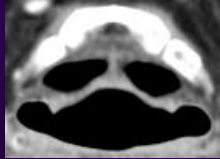
Vocal cords



Larynx - Subdivisions



Oropharynx

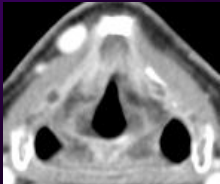


Behind the hyoid bone

Supraglottis

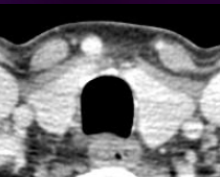
(main content is false cords)

Behind the thyroid cartilage



Glottis

(main content is true cords)

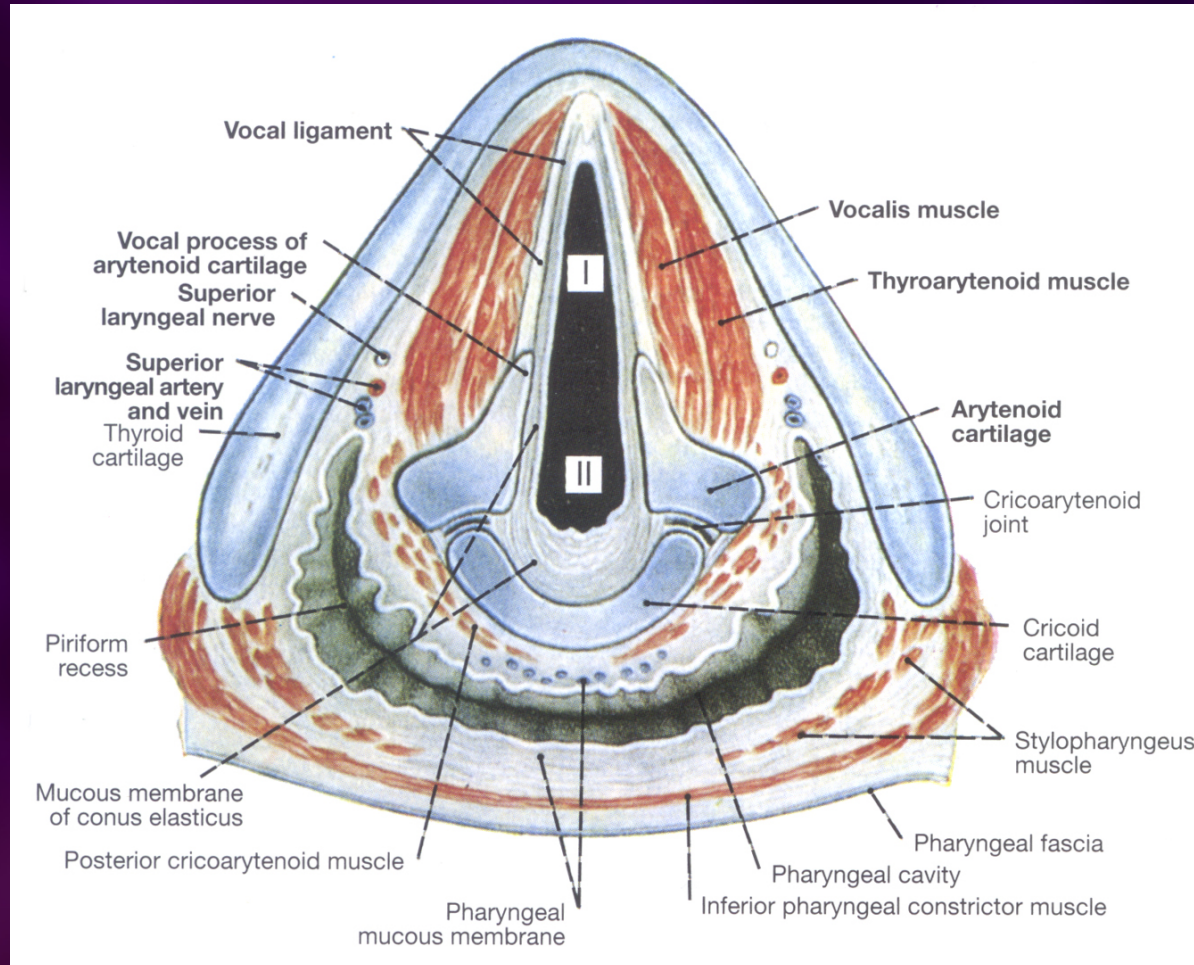


Infraglottis

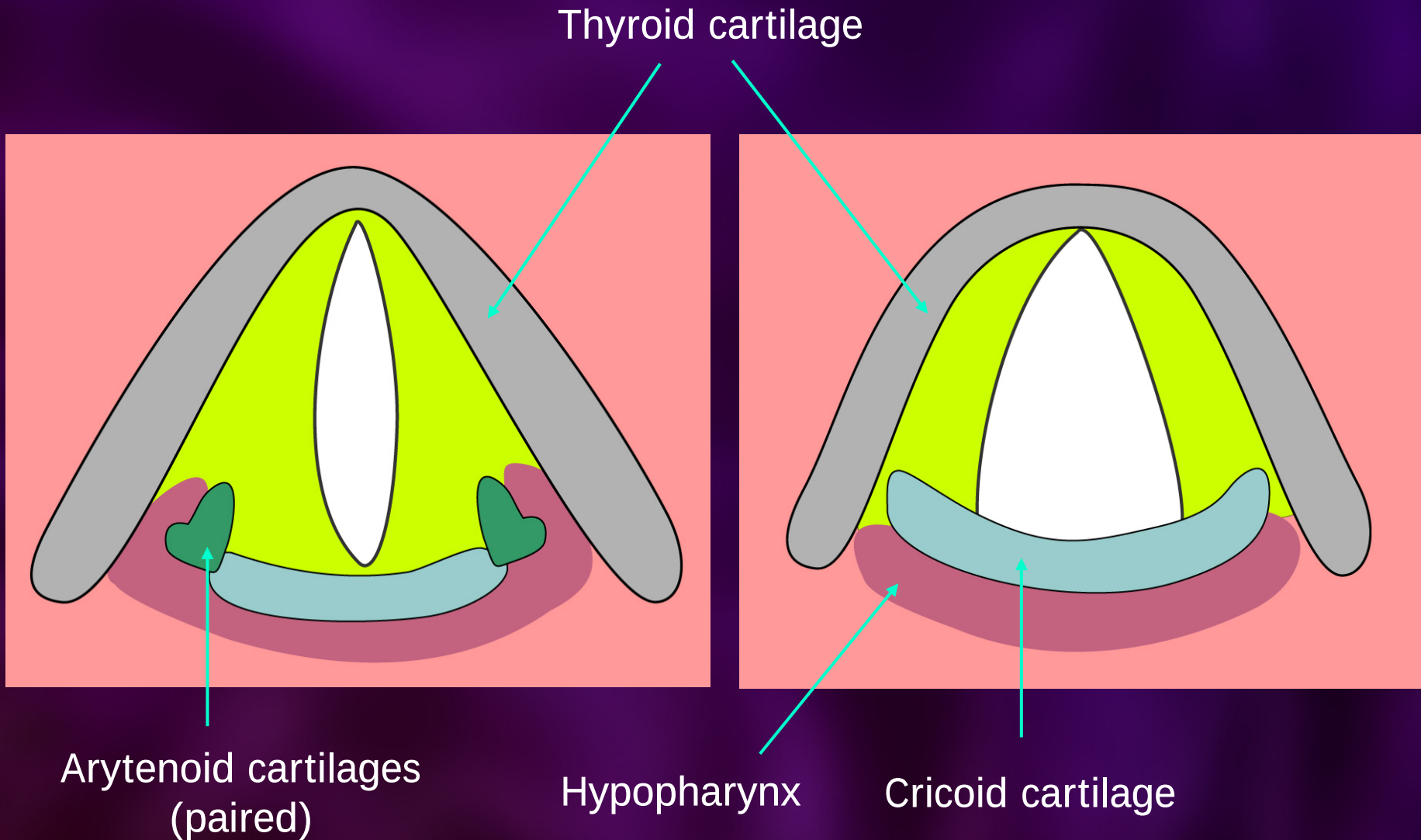
Trachea

Behind the first tracheal ring

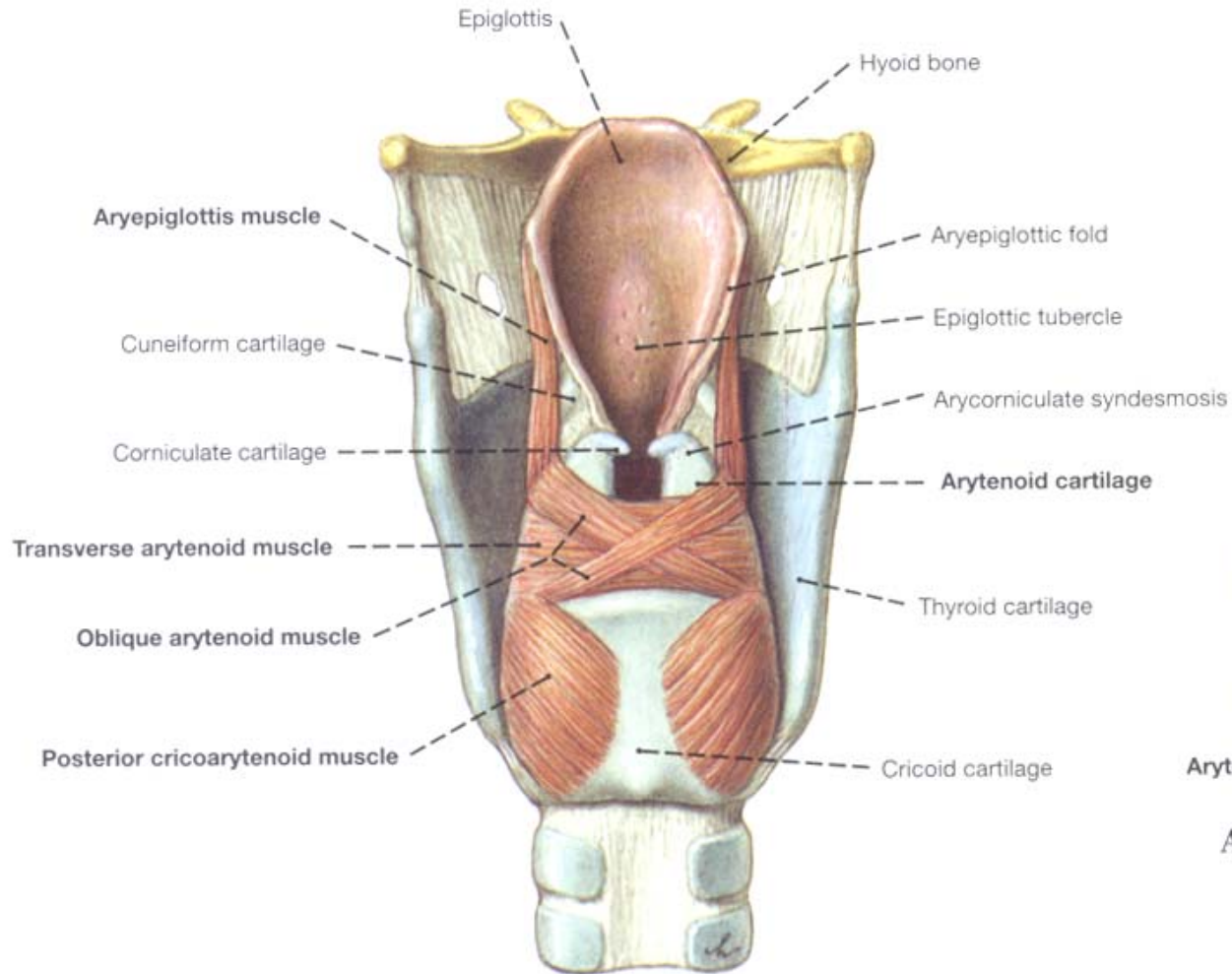
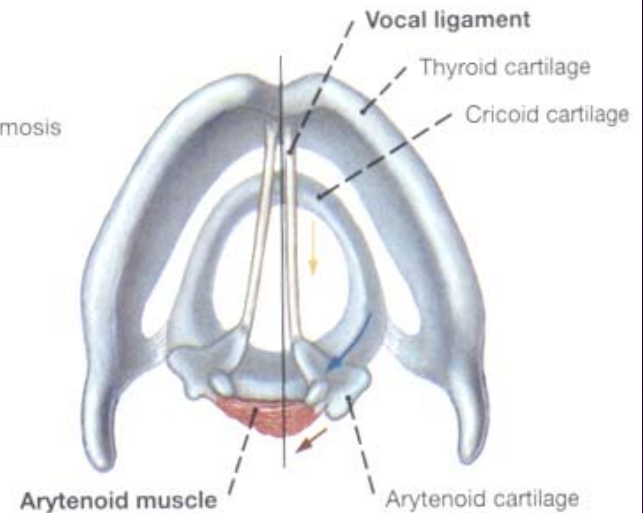
True cords – axial view



True cords – Axial landmarks

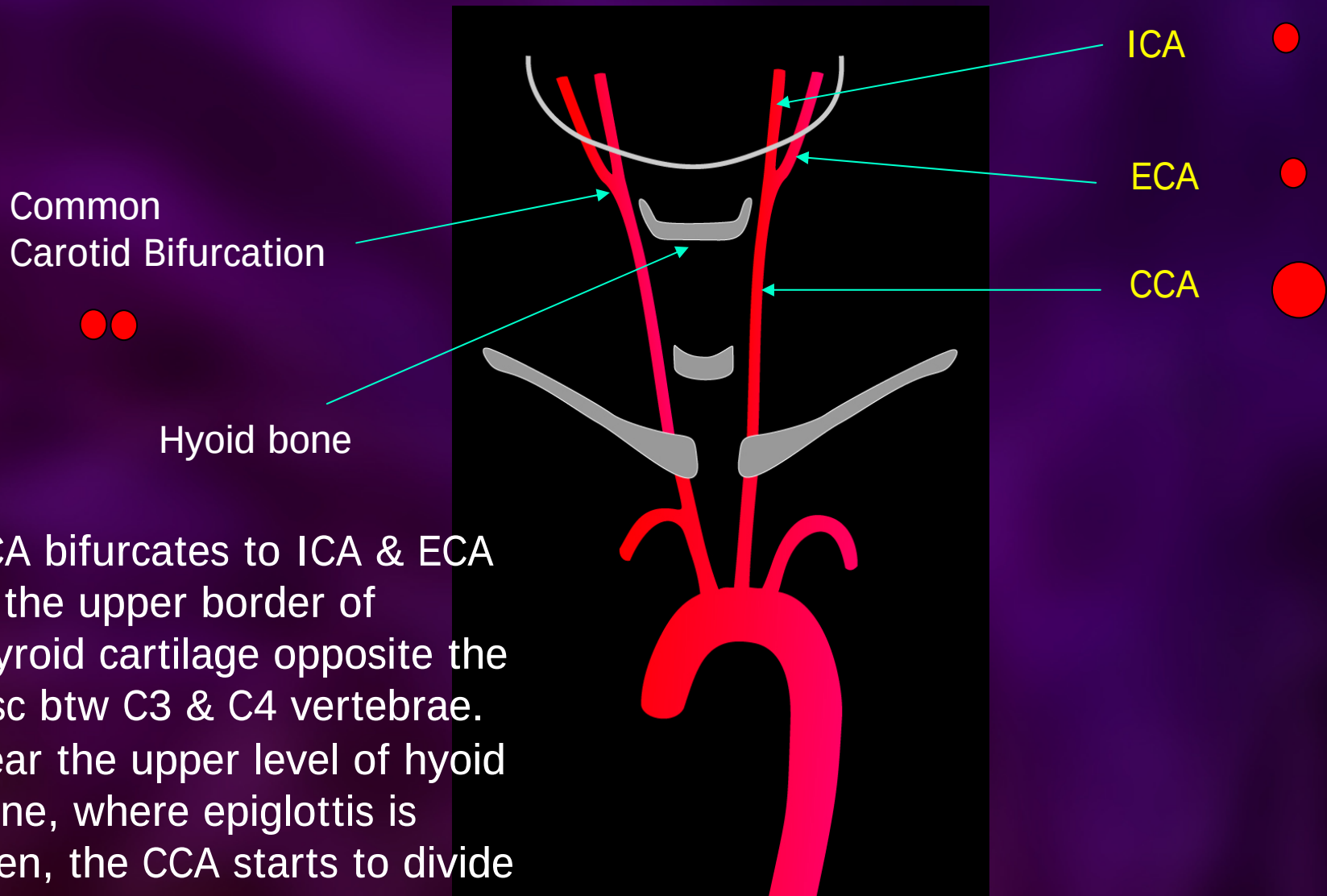


Larynx – muscles



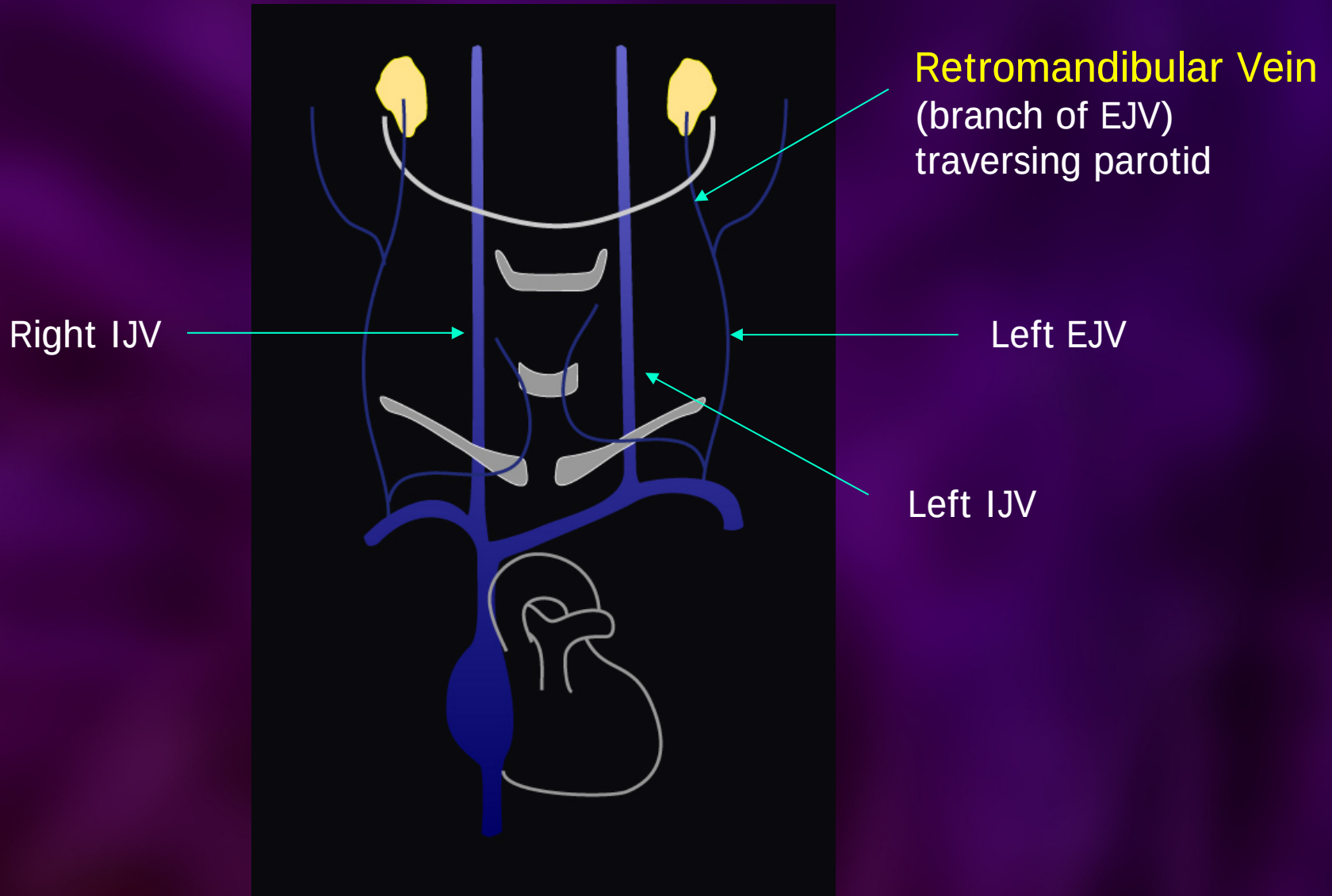
Action of Arytenoid Muscle

Vascular Landmarks: Carotid Arteries



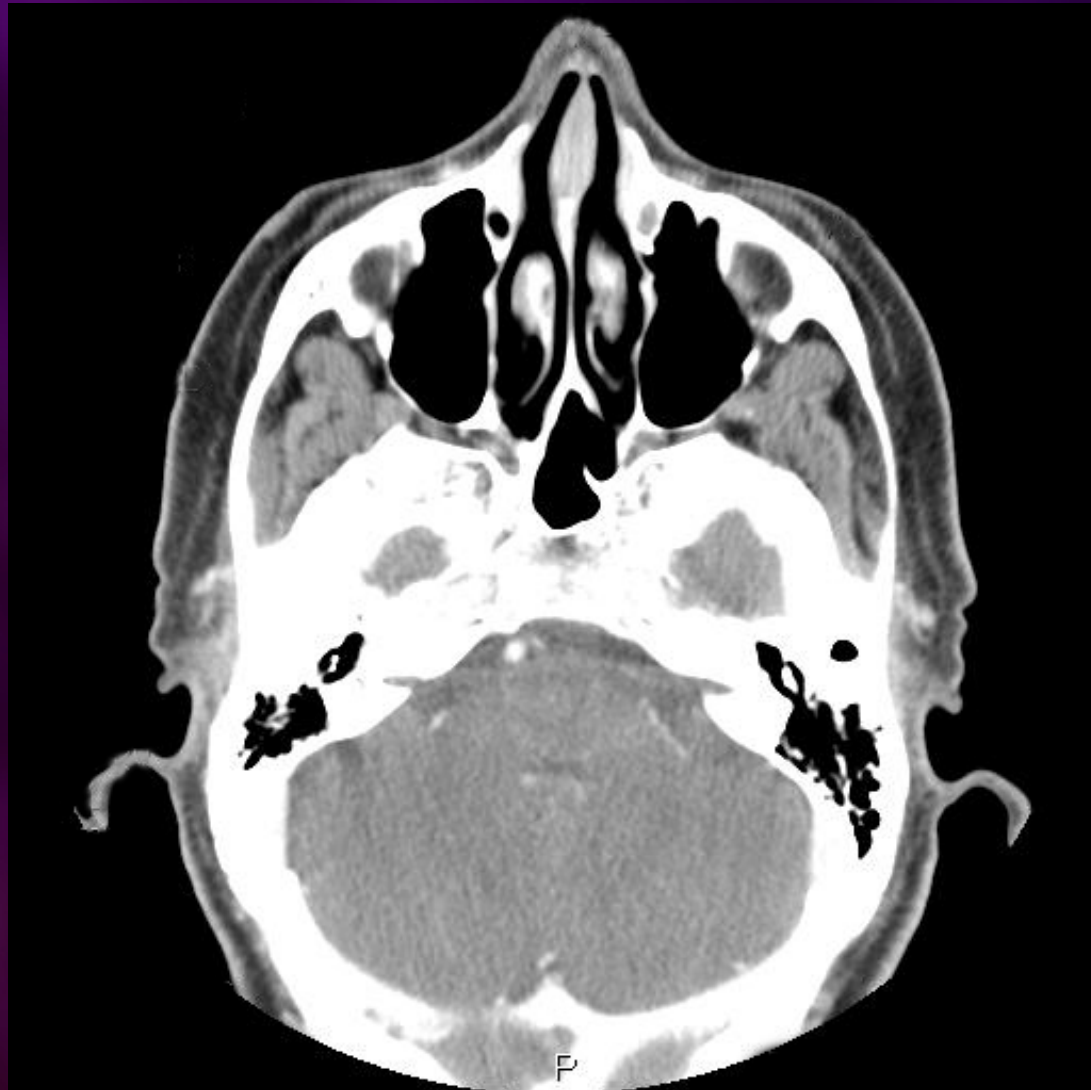
CCA bifurcates to ICA & ECA at the upper border of thyroid cartilage opposite the disc btw C3 & C4 vertebrae. Near the upper level of hyoid bone, where epiglottis is seen, the CCA starts to divide into ICA & ECA

Vascular Landmarks: Jugular Veins



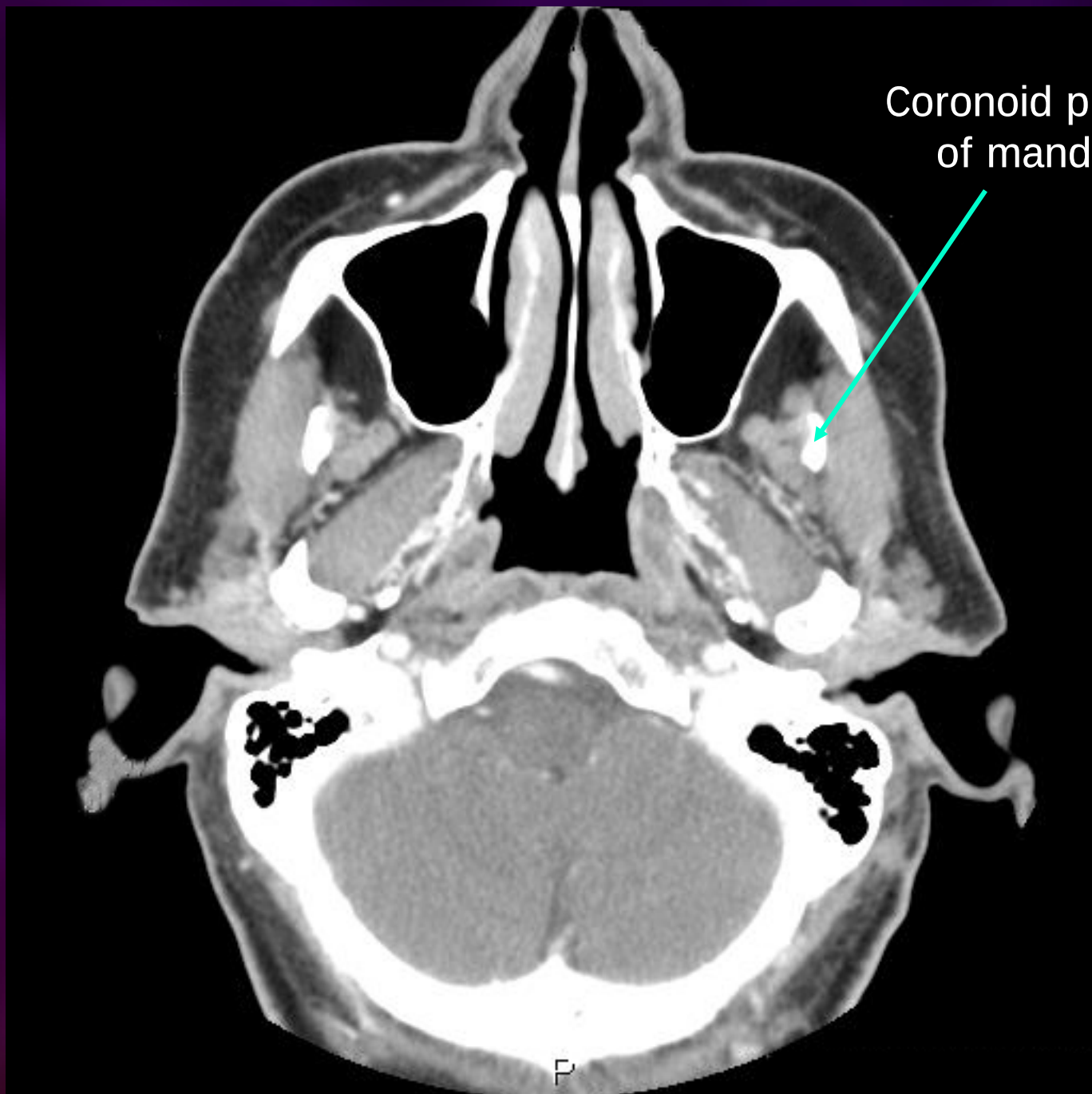
Round 1: Bone and Cartilage Landmarks

“Where am I?”









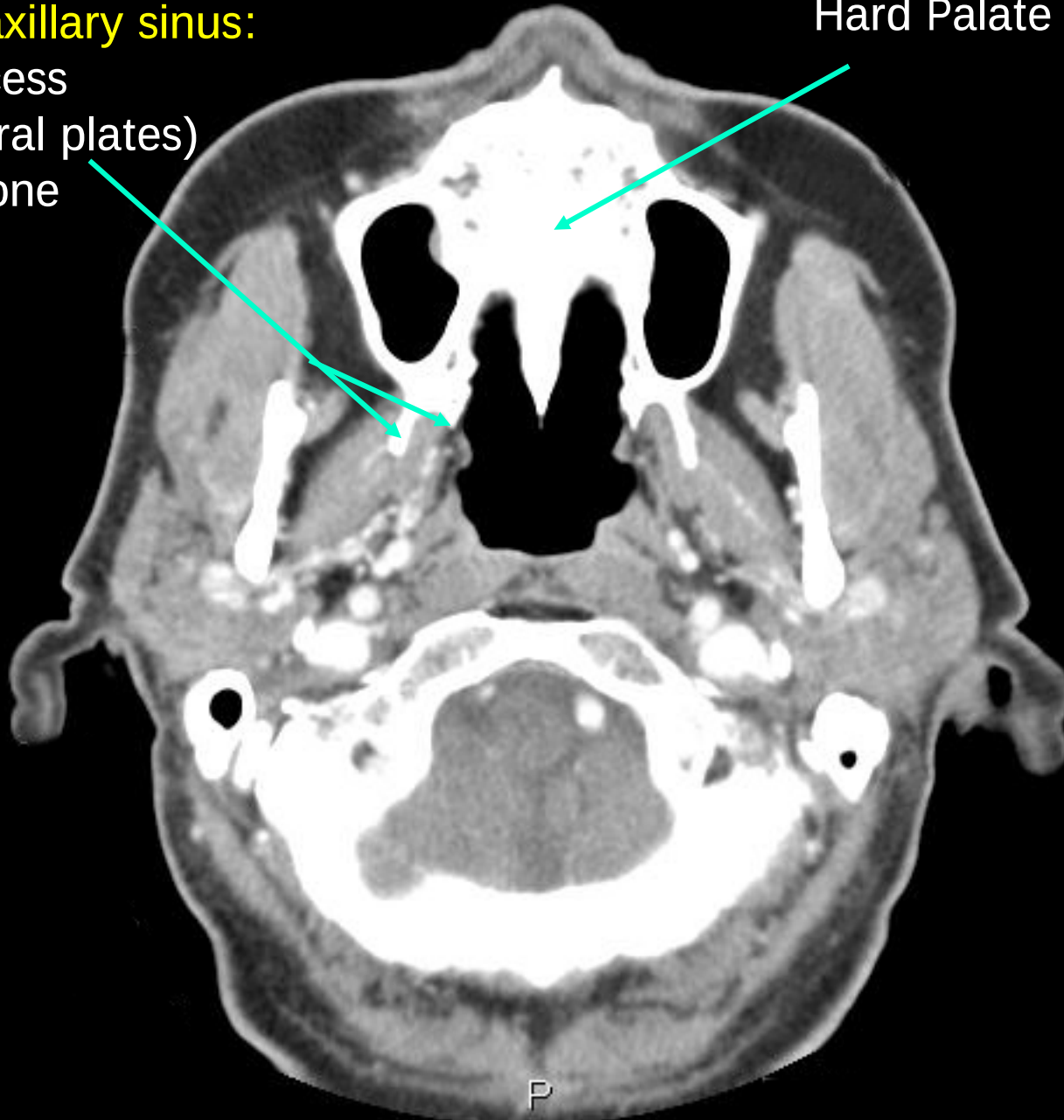
Coronoid process
of mandible

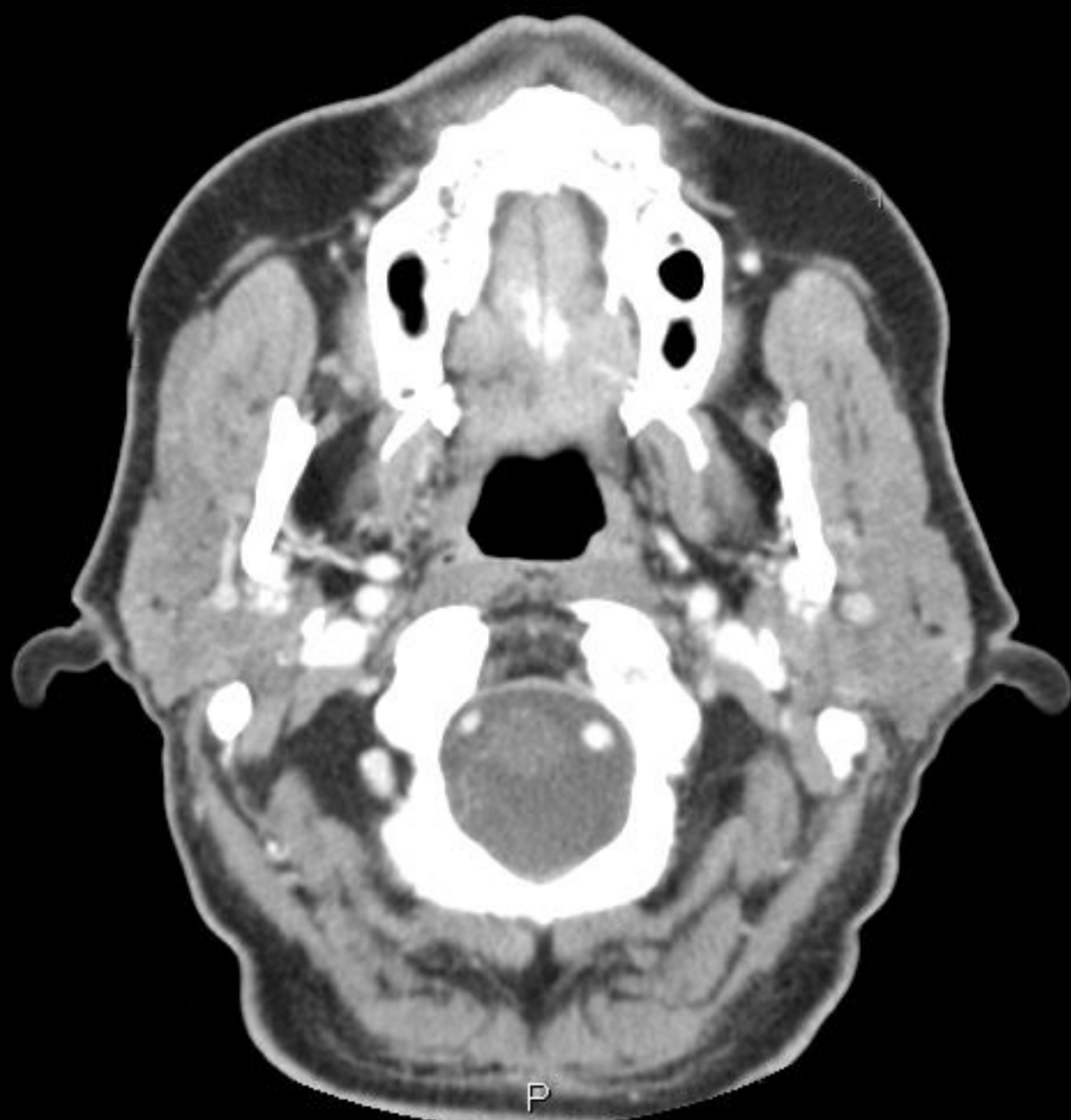


Behind the maxillary sinus:

Pterygoid process
(medial & lateral plates)
of sphenoid bone

Hard Palate



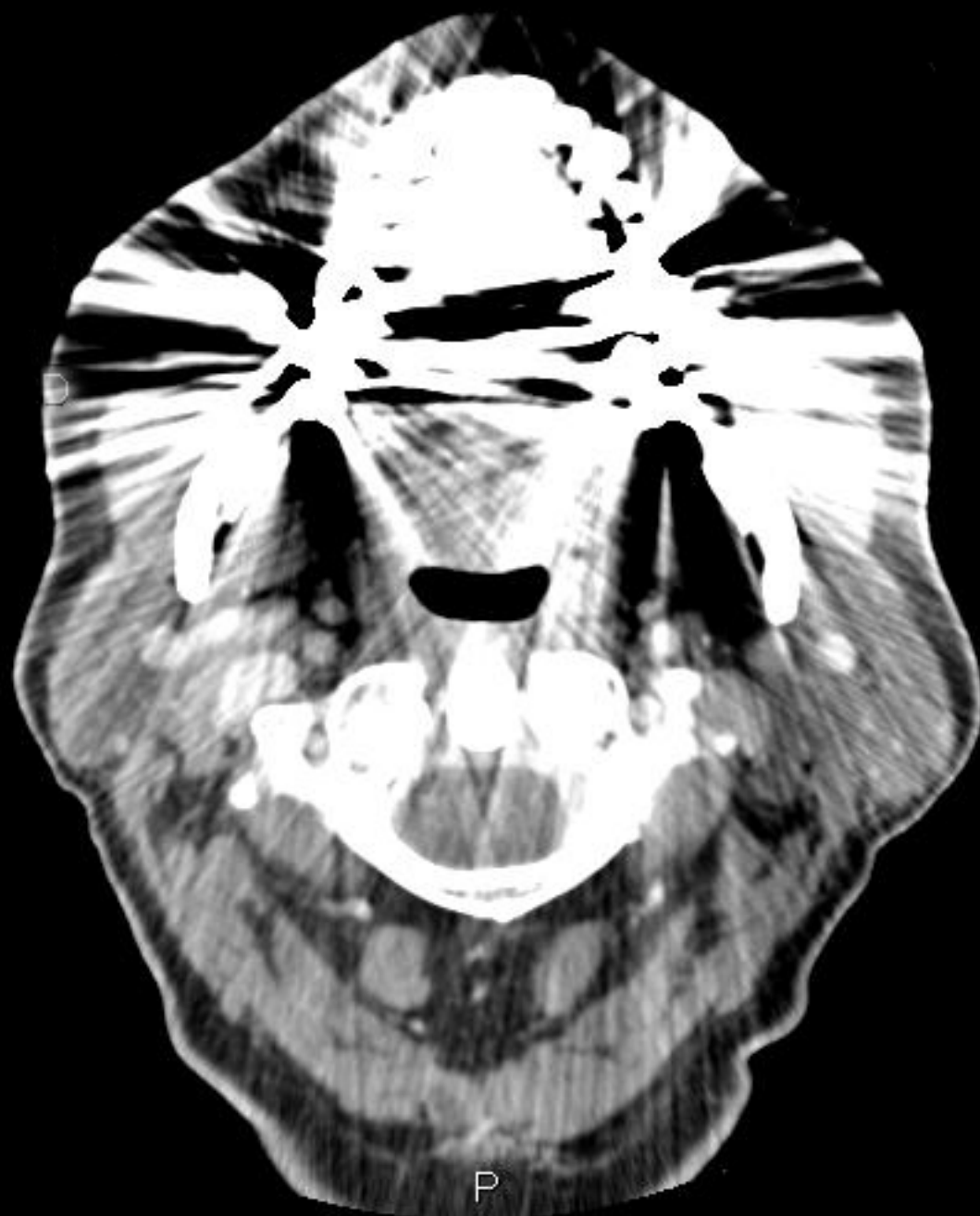


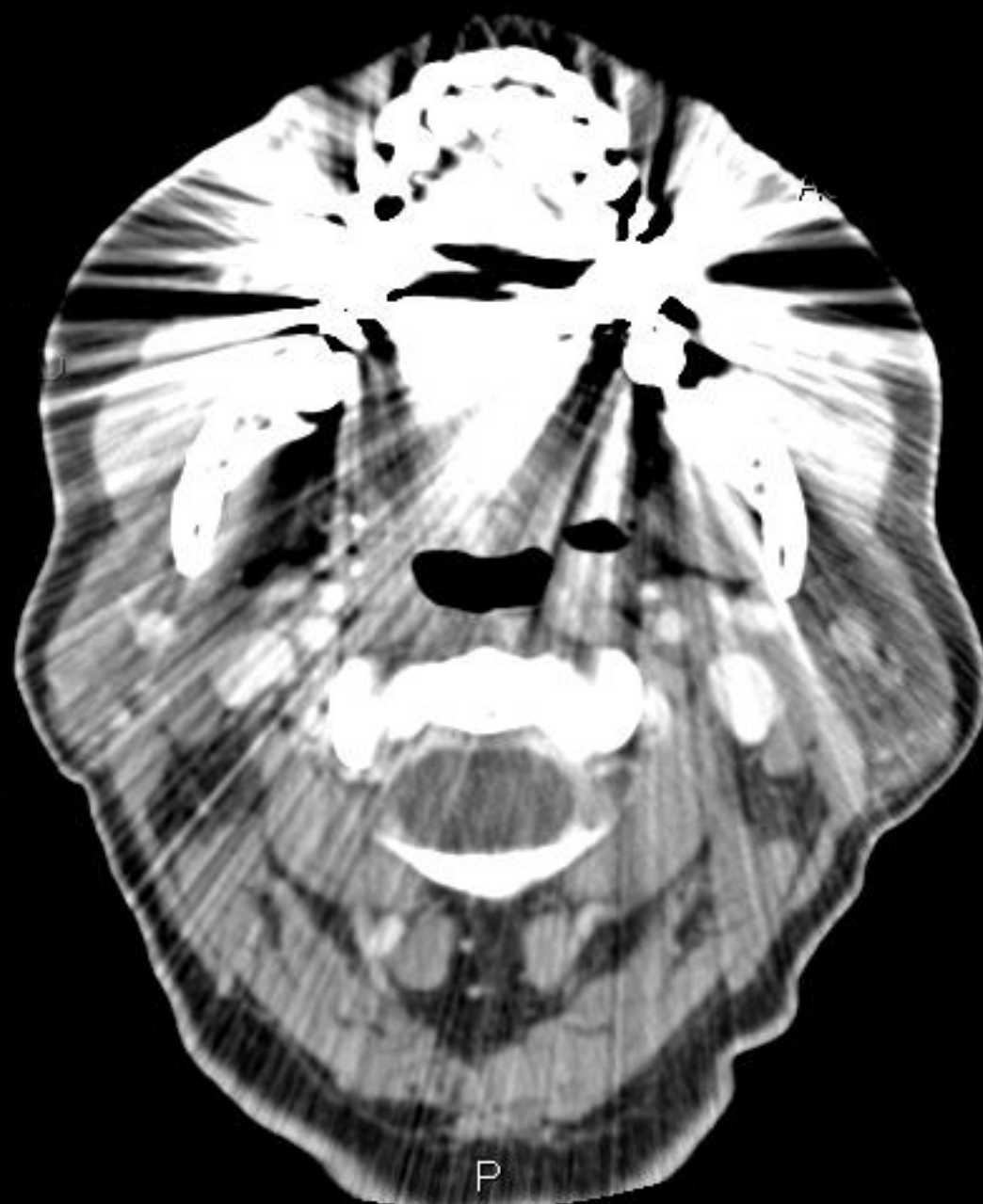
Maxilla

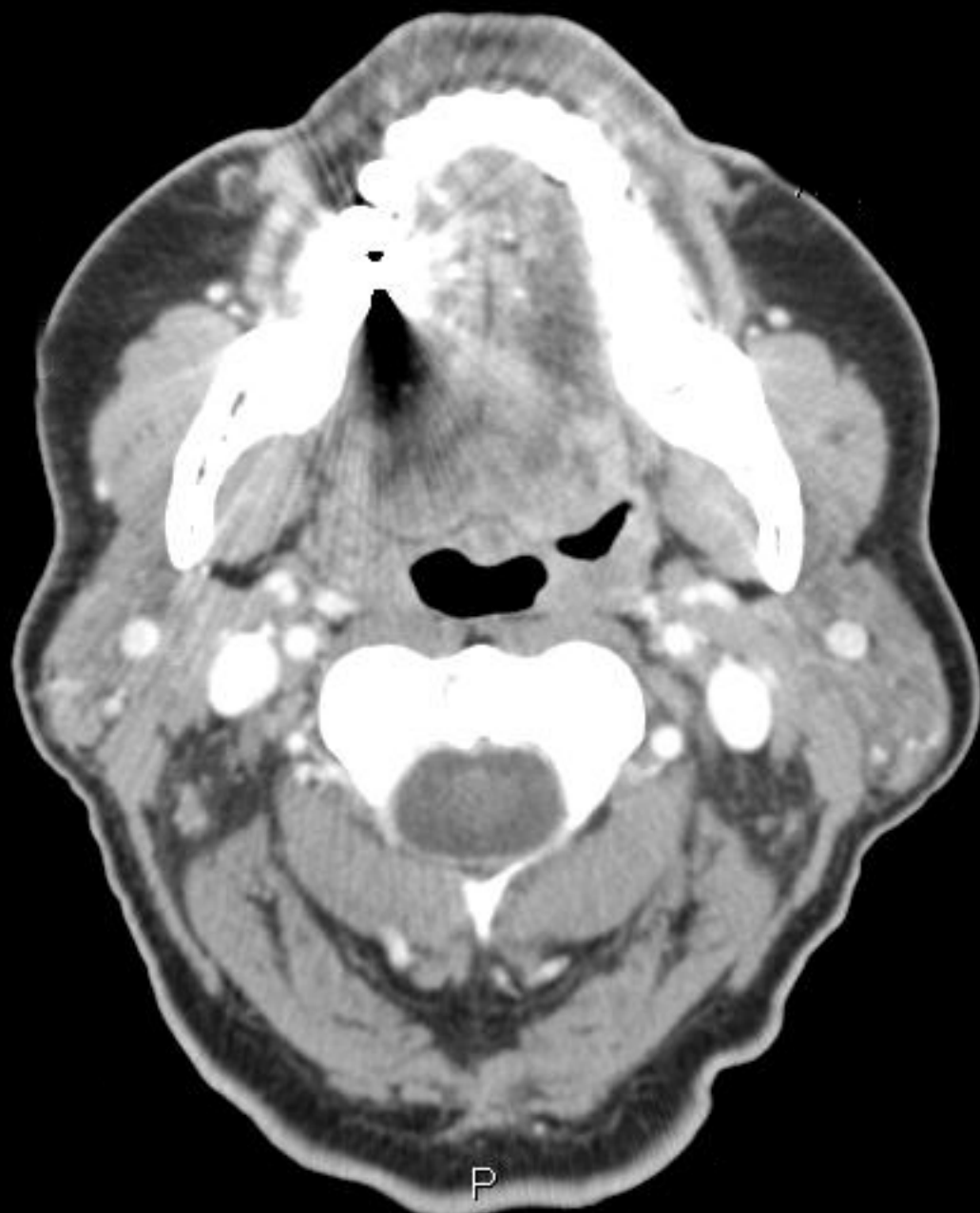
Ramus of
Mandible

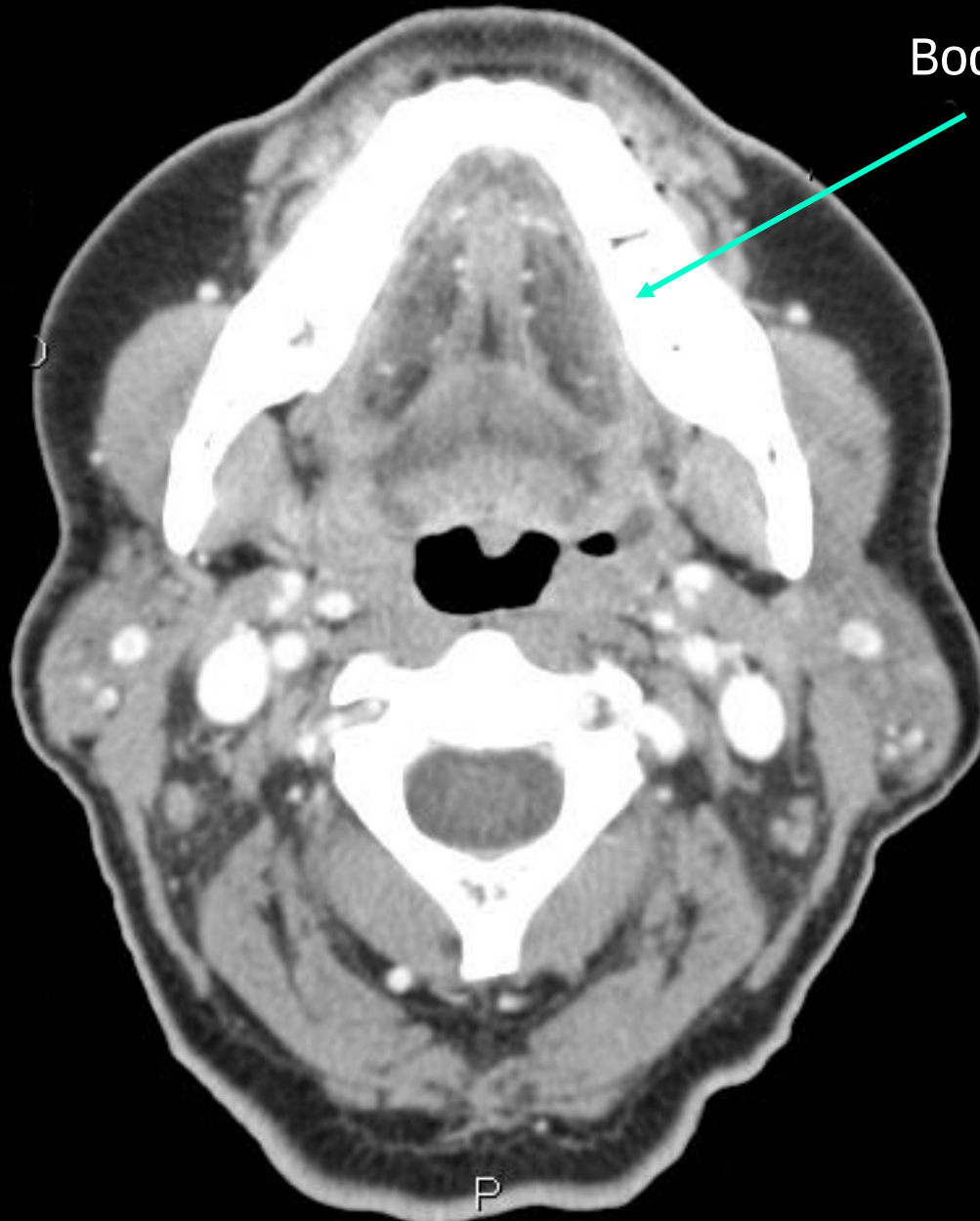




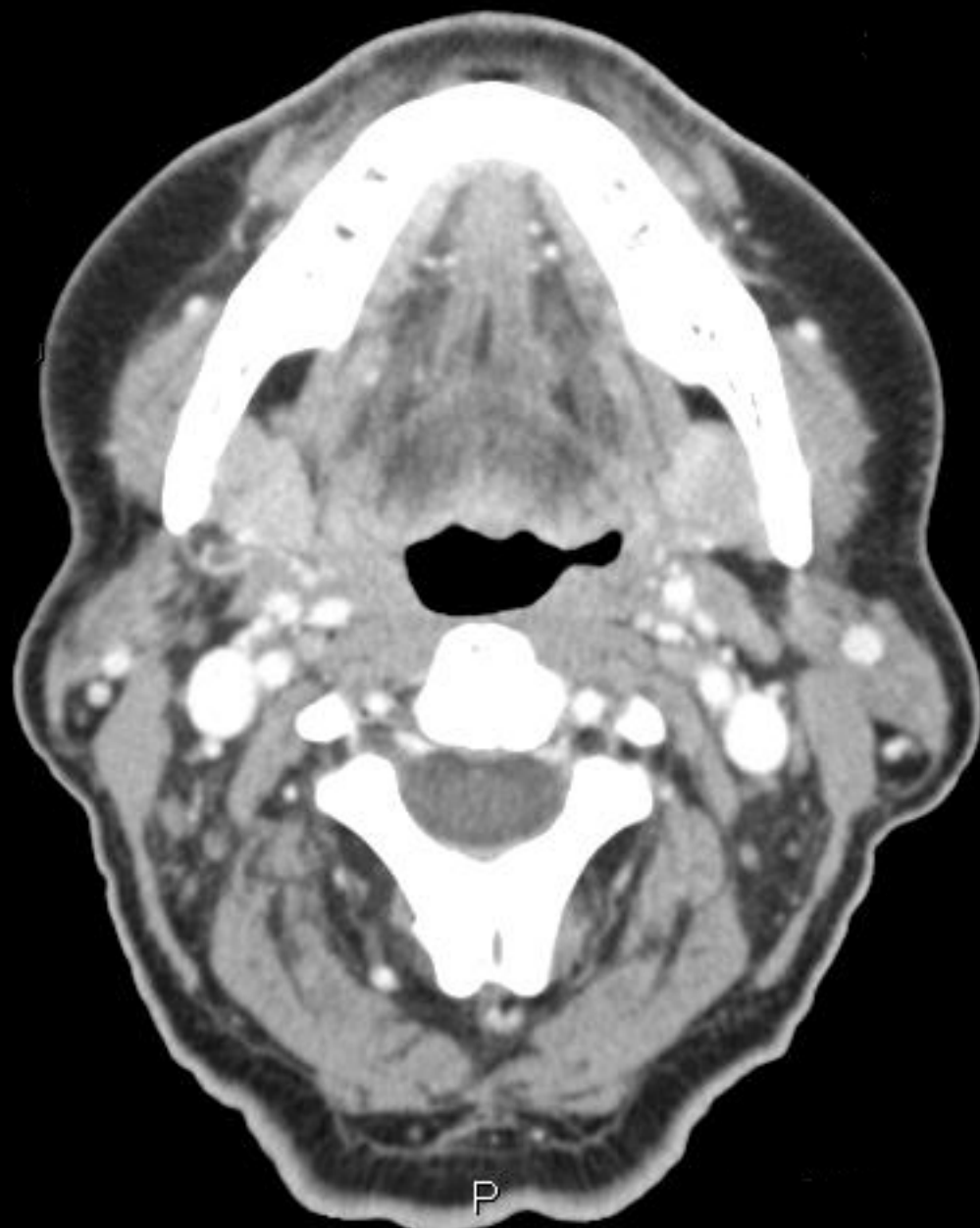


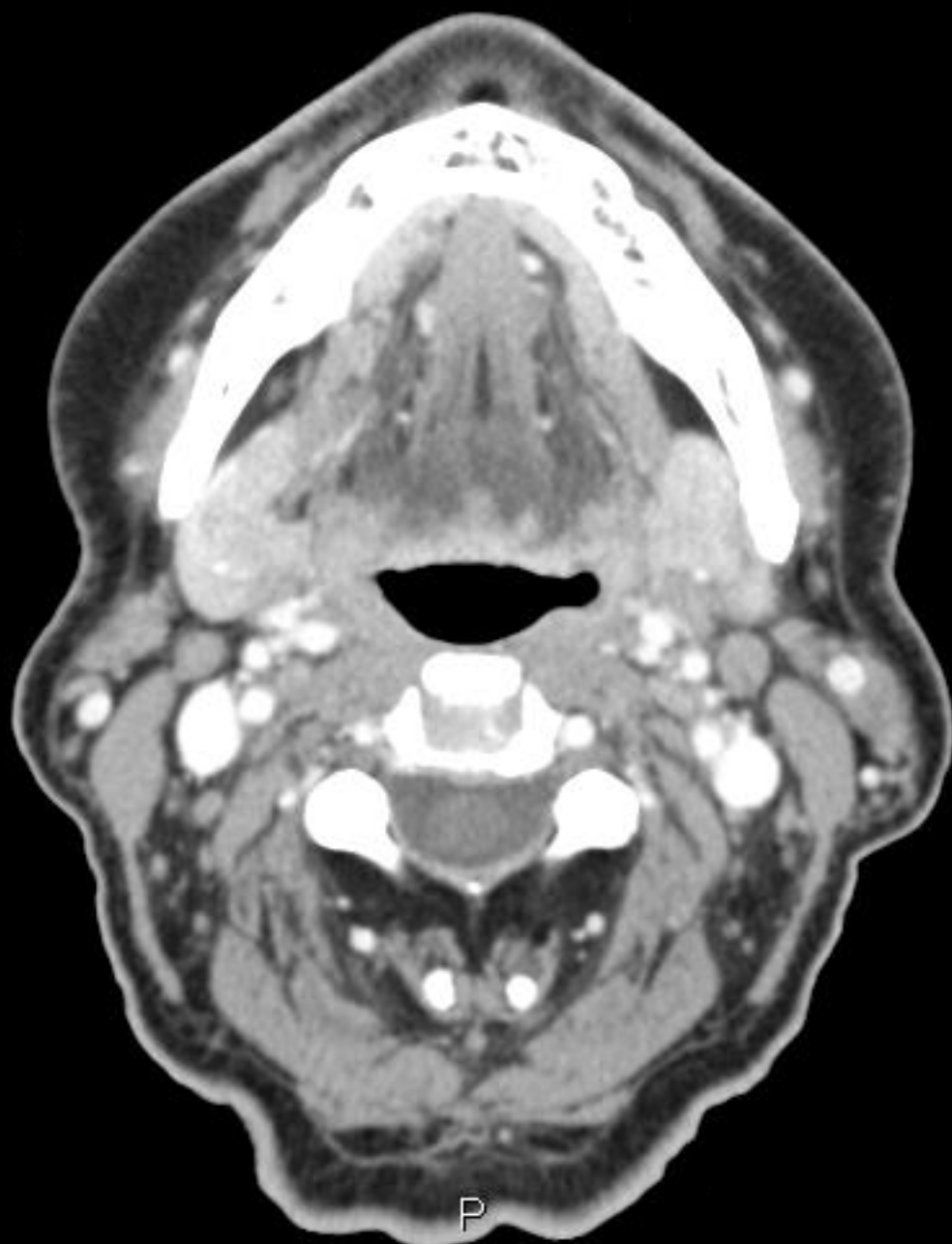


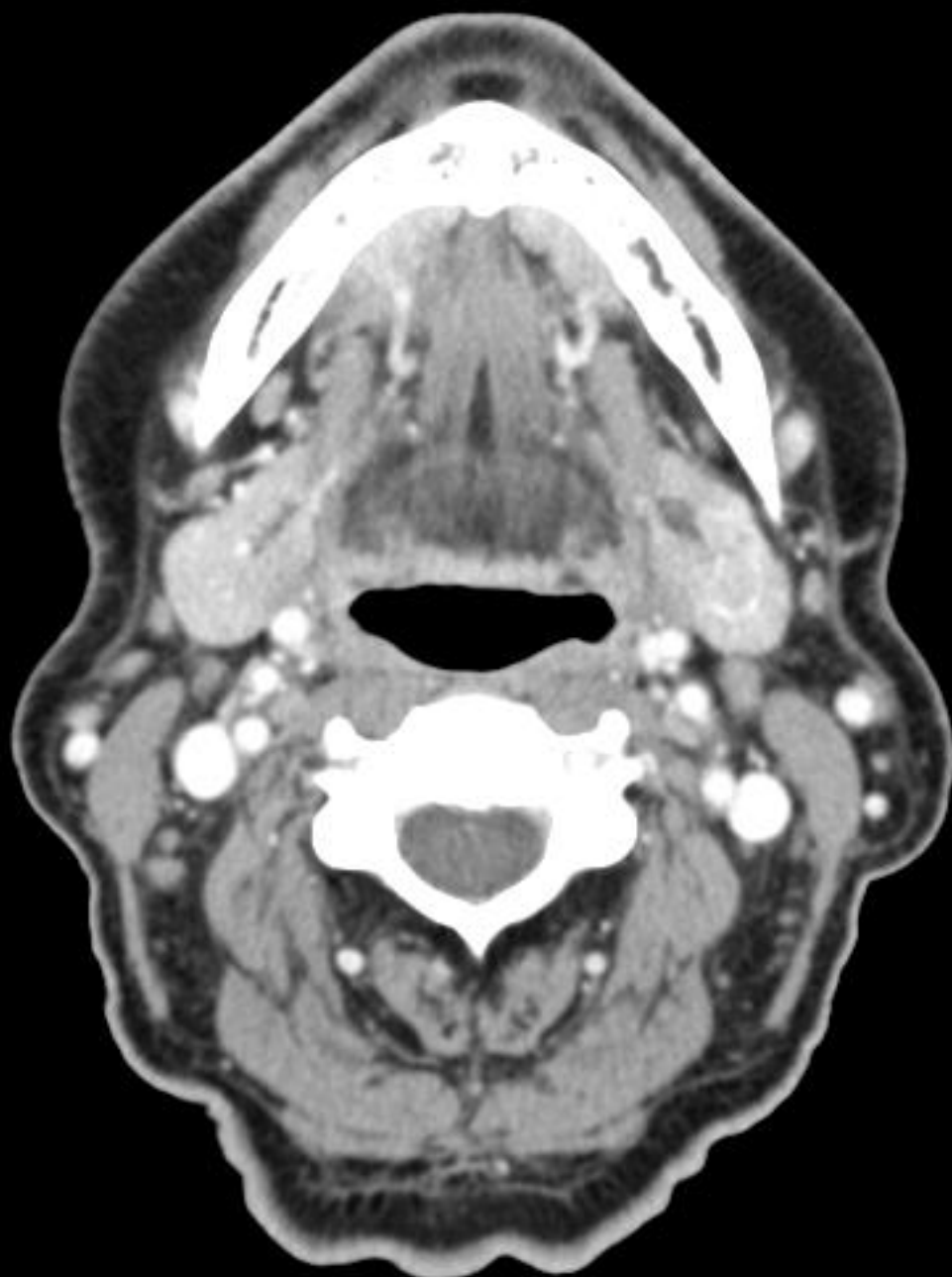


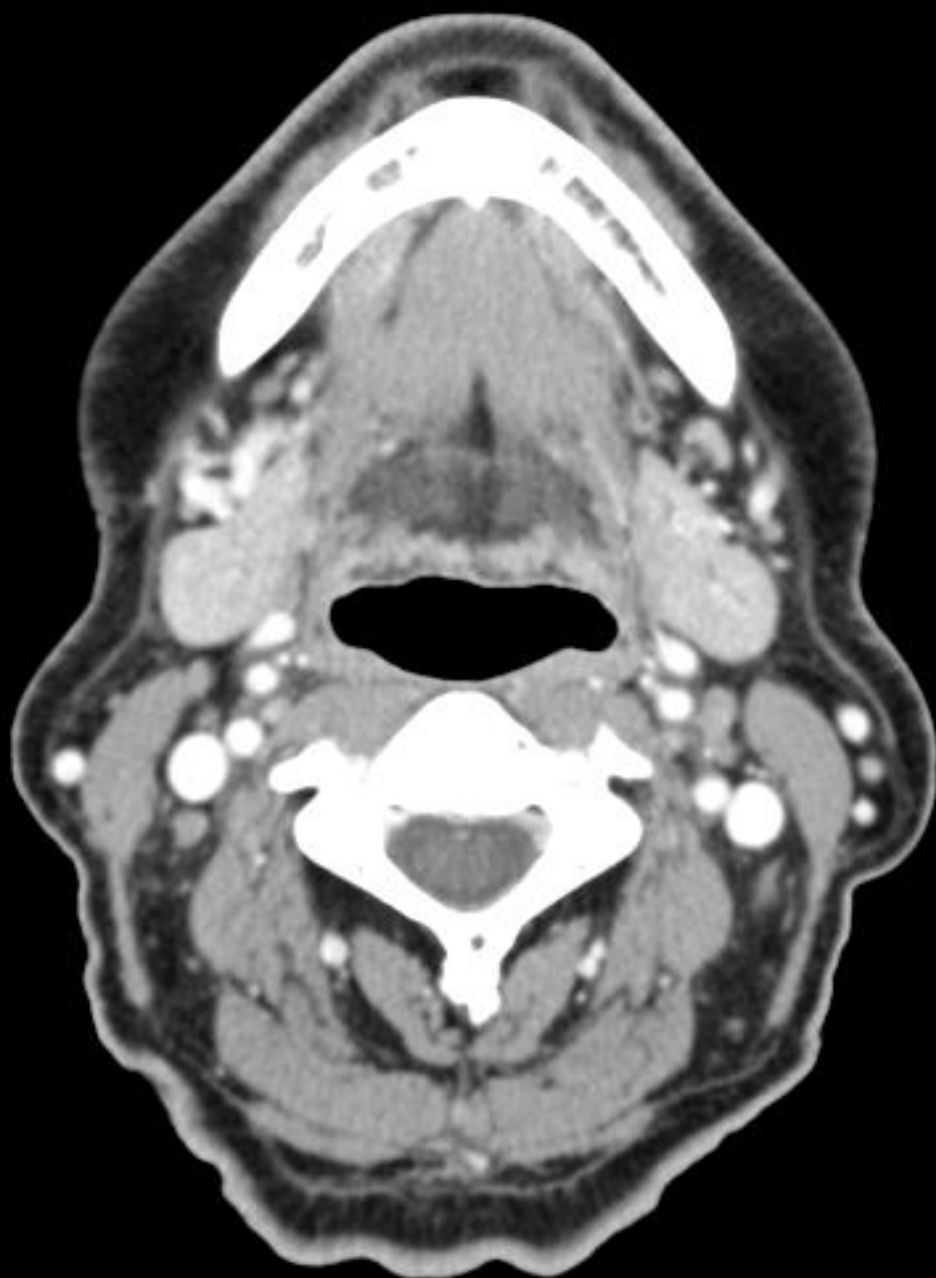


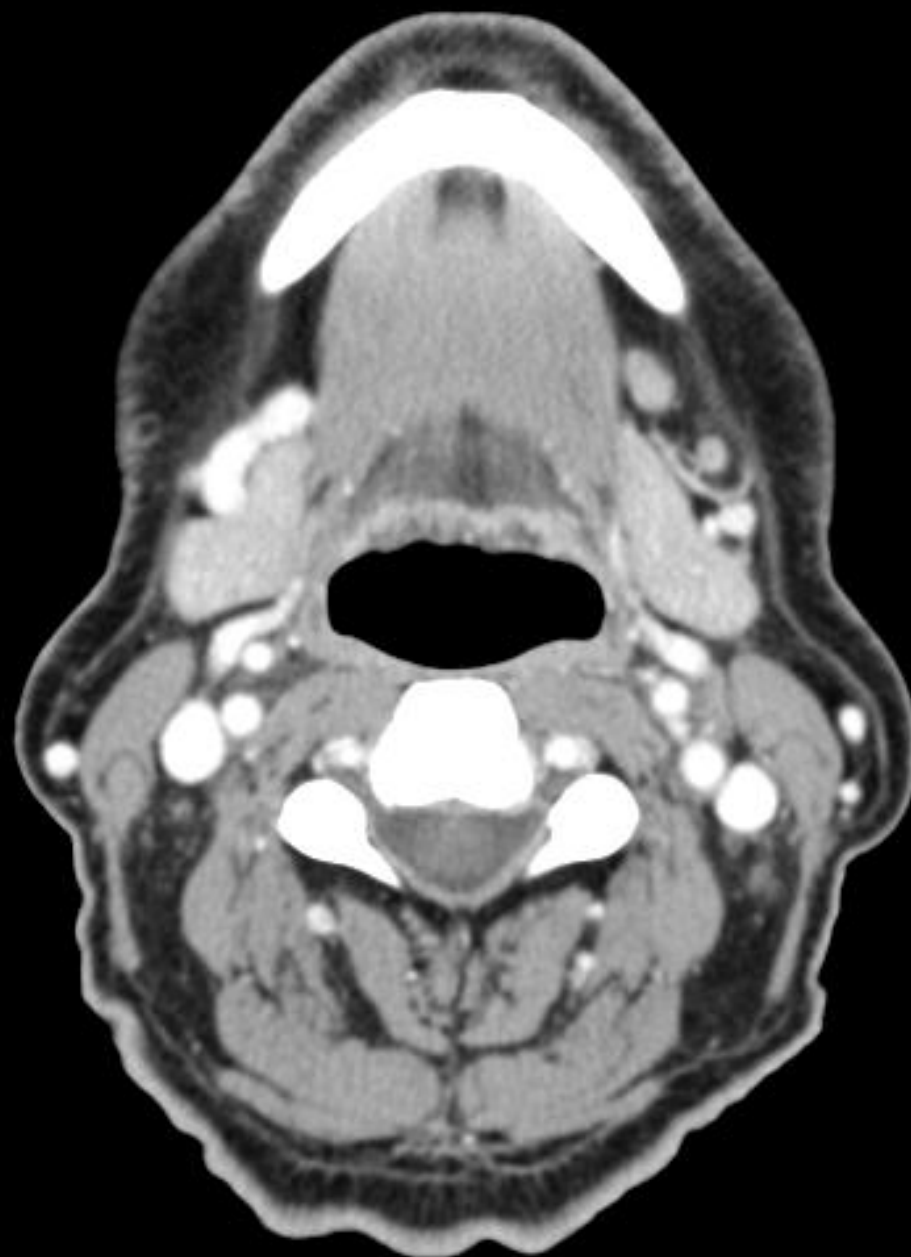
Body of Mandible

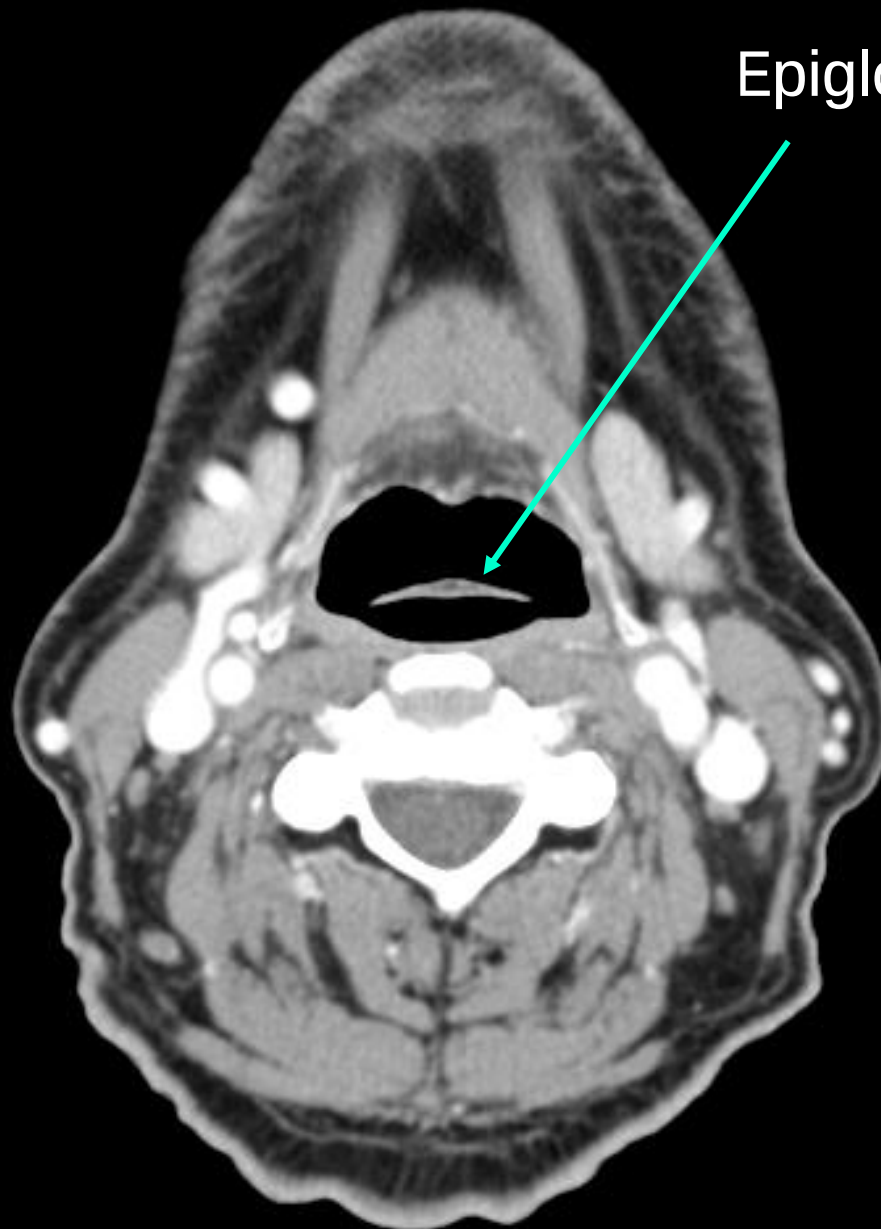




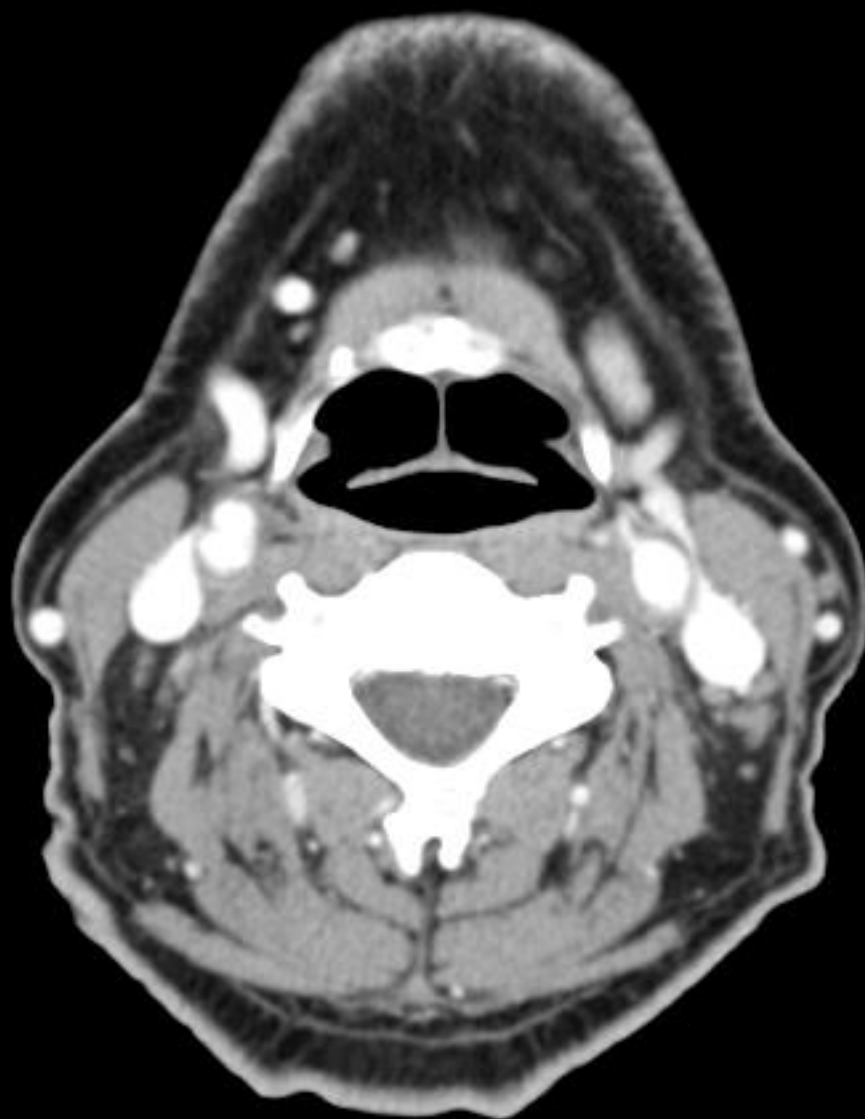








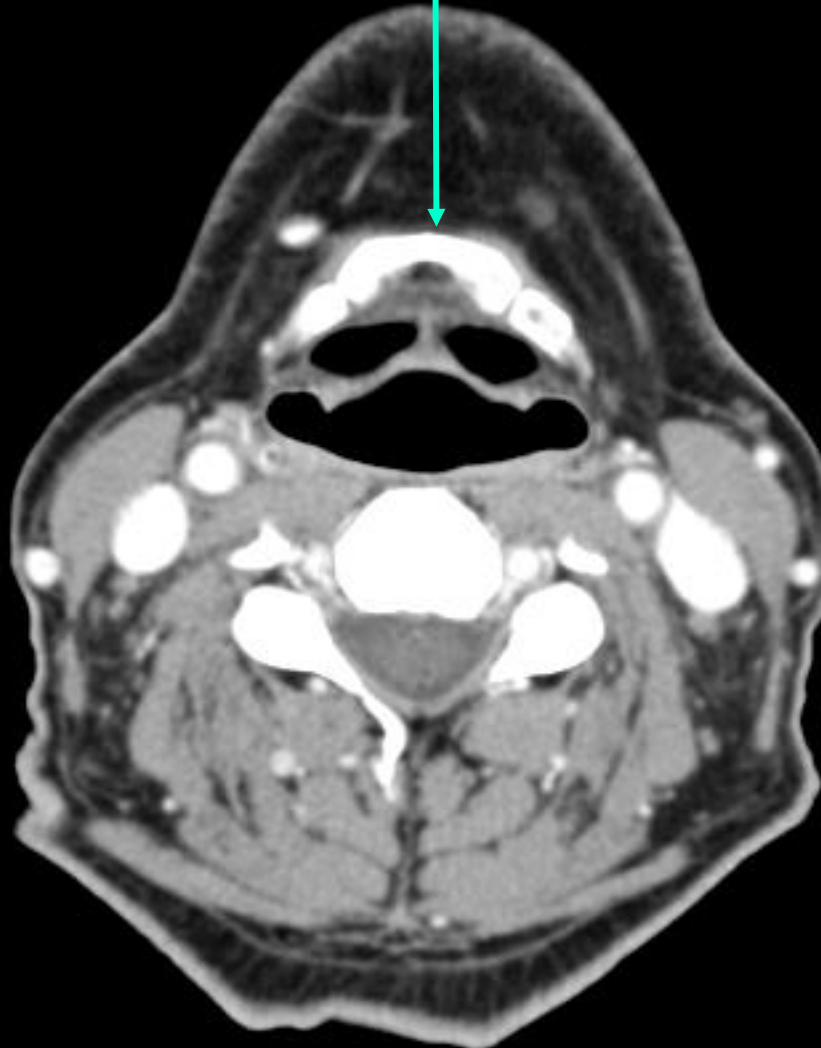
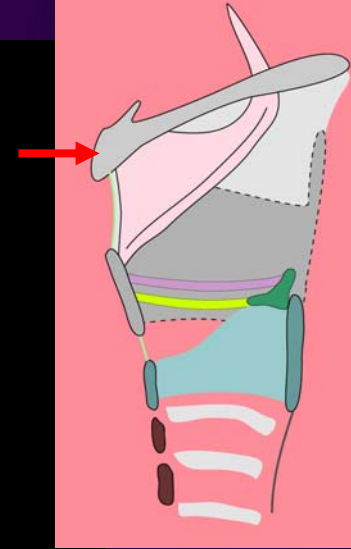
Epiglottis



Landmarks (“Donald Duck” configuration!)

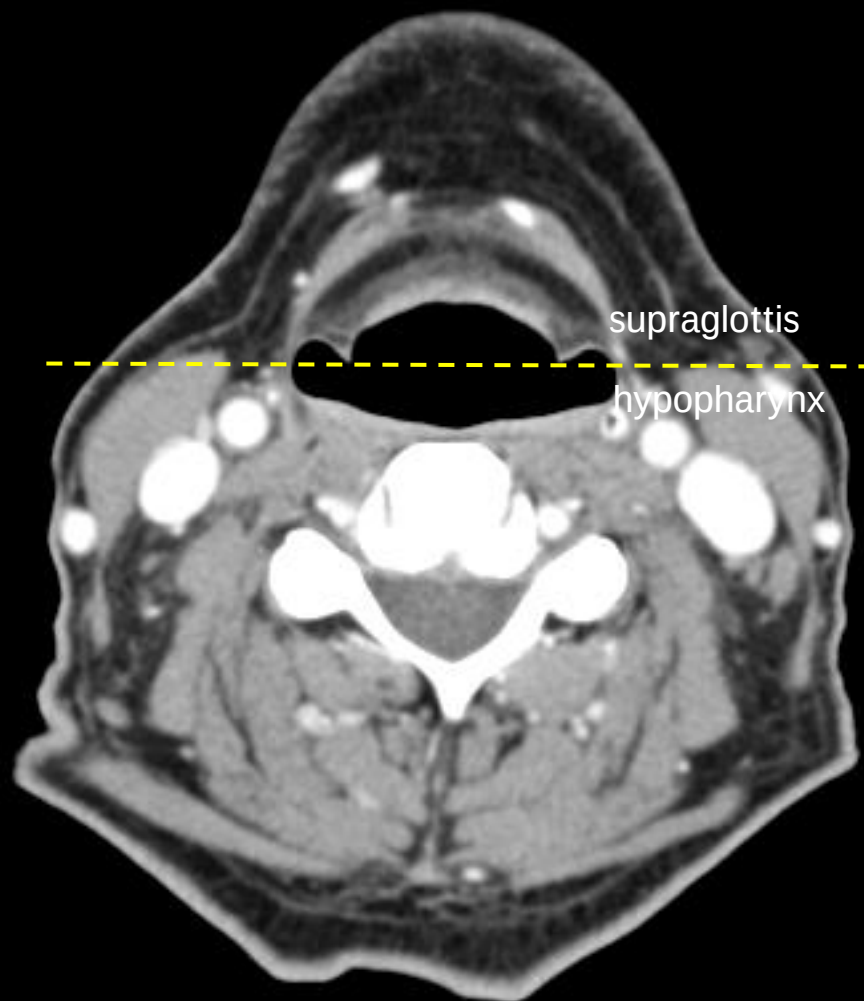
- valleculae— lowest part of oropharynx
- piriform recesses and hypopharynx

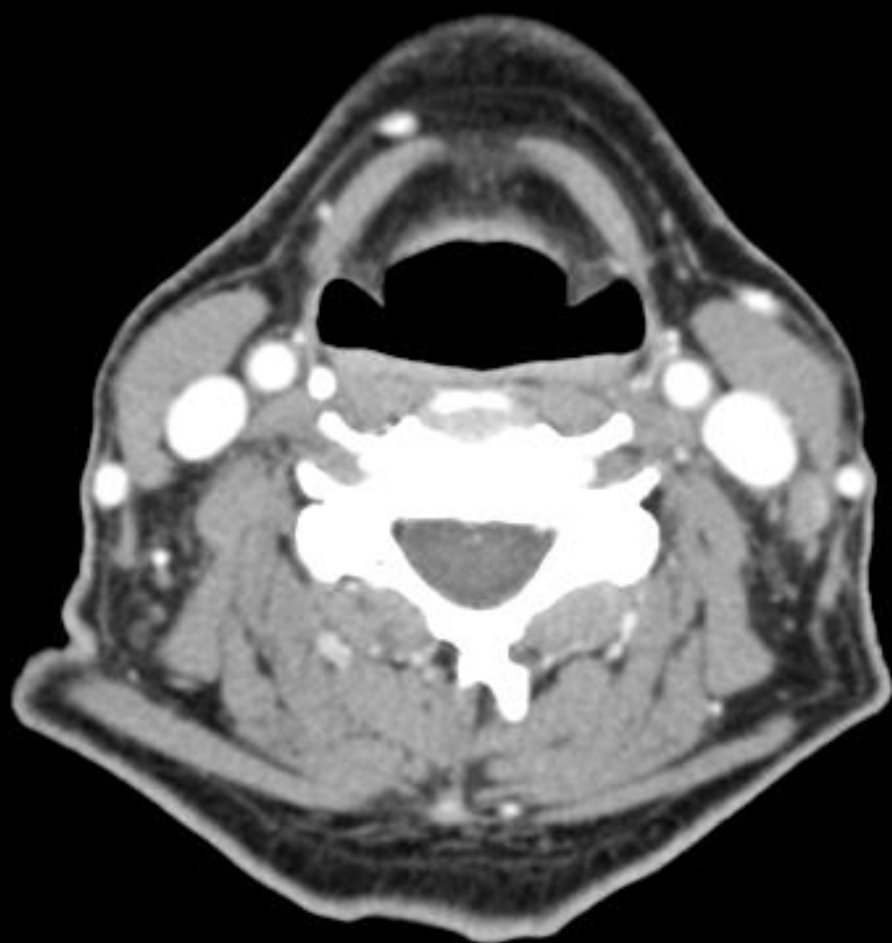
HYOID BONE



Landmarks

- aryepiglottic folds (dividing line between supraglottis and hypopharynx)





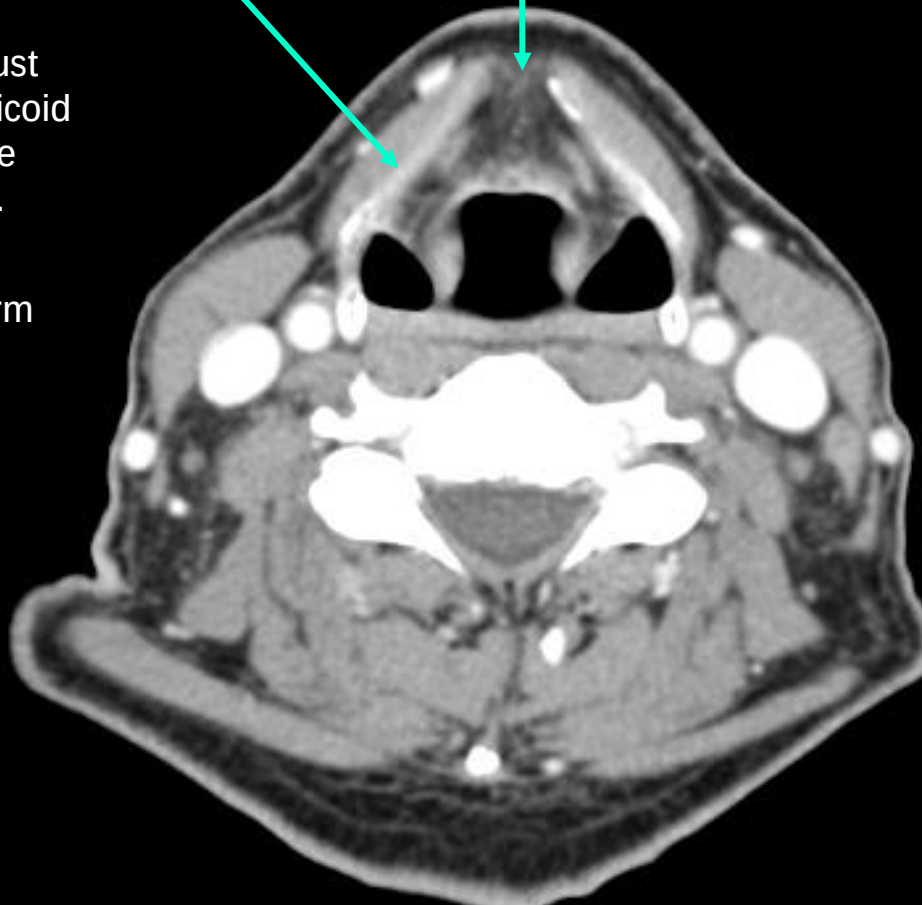
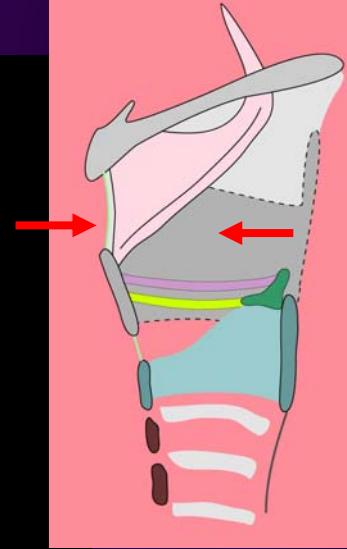
Thyroid Notch

THYROID CARTILAGE

Landmarks

Larynx: more anterior, just behind the thyroid and cricoid cartilage, below the visible cross section of epiglottis.

Hypopharynx: more posterior, including piriform recesses

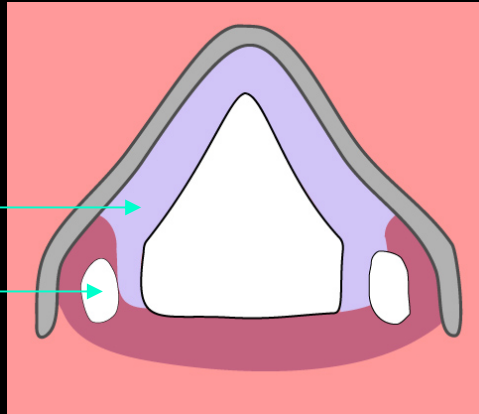
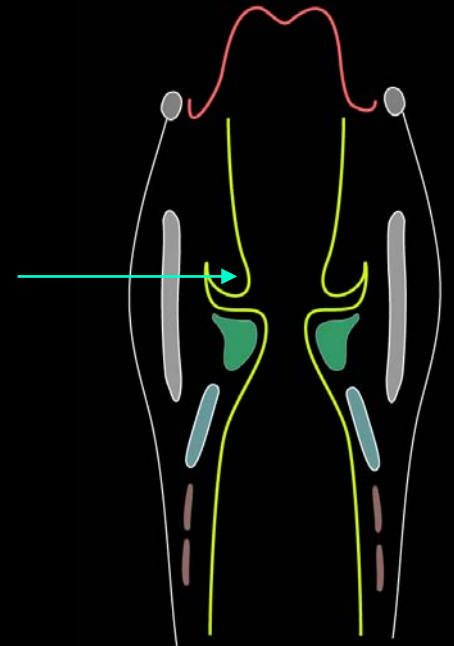
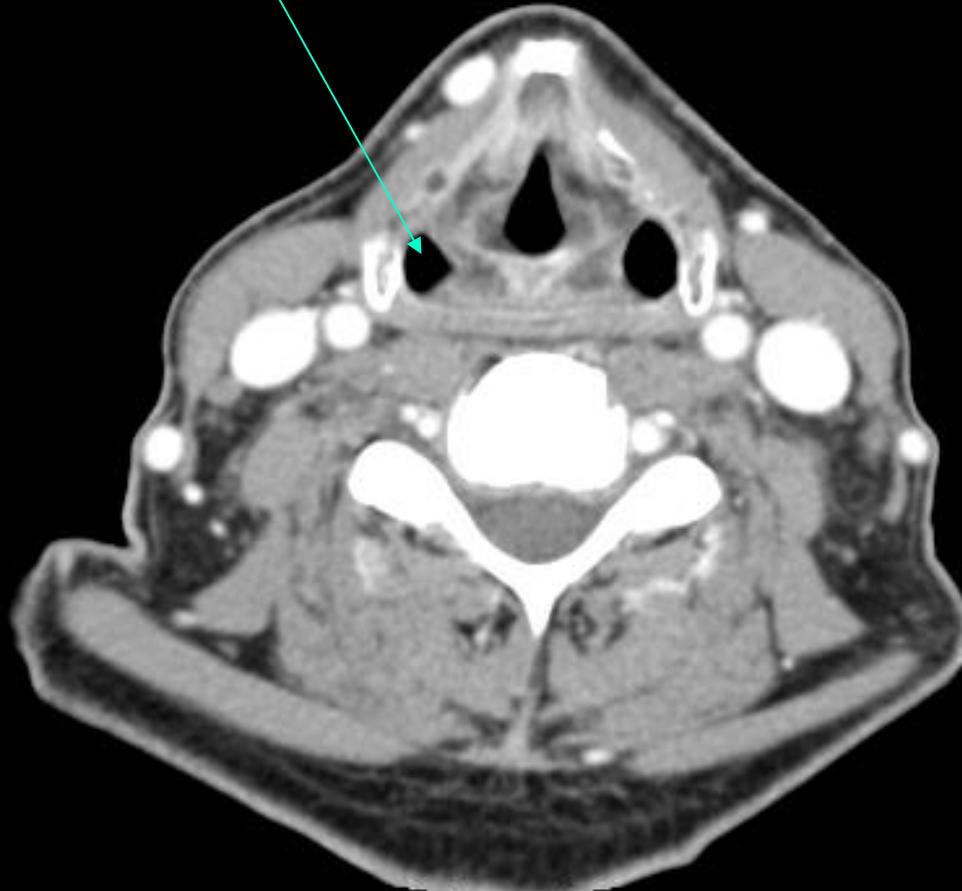


Landmarks

- thyroid cartilage
- FALSE CORDS

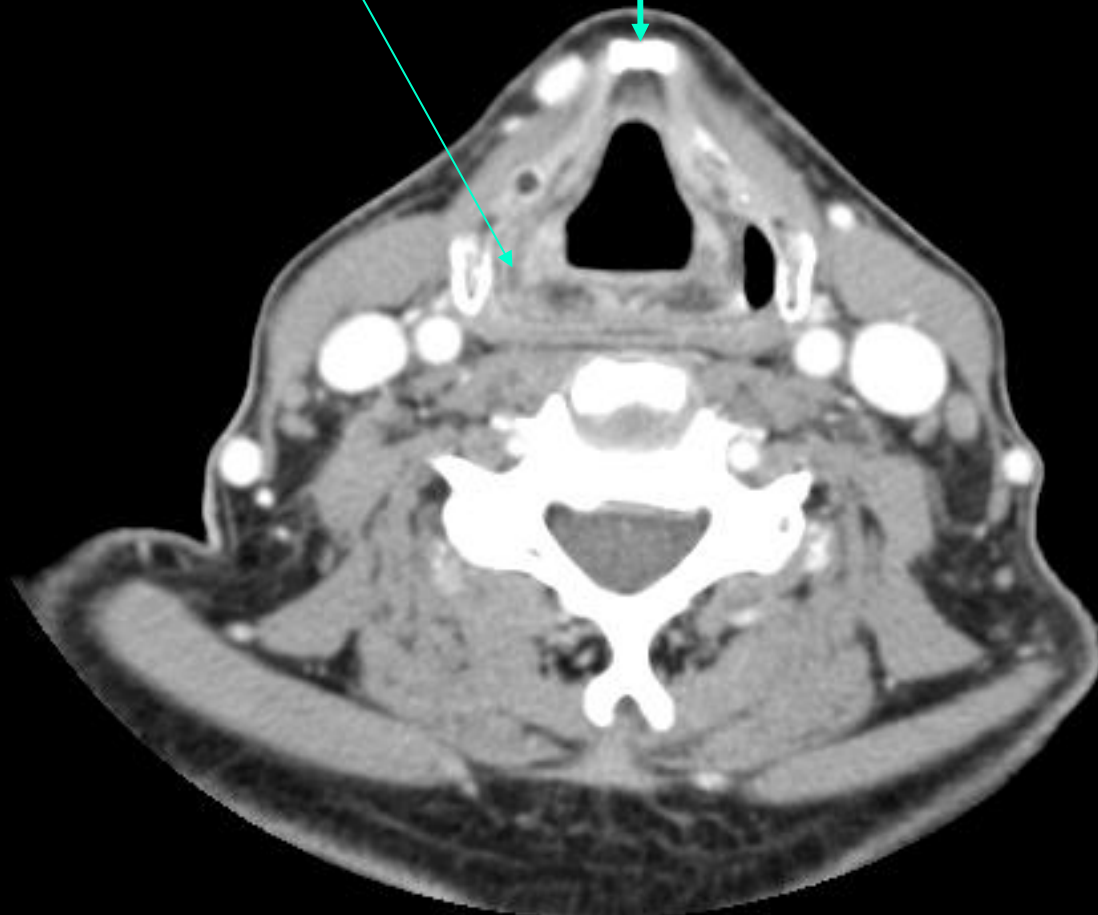
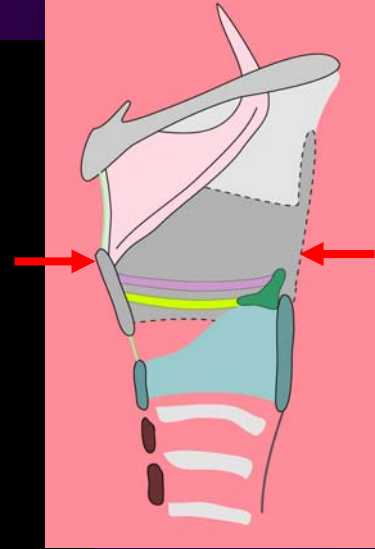
false cord

piriform recess

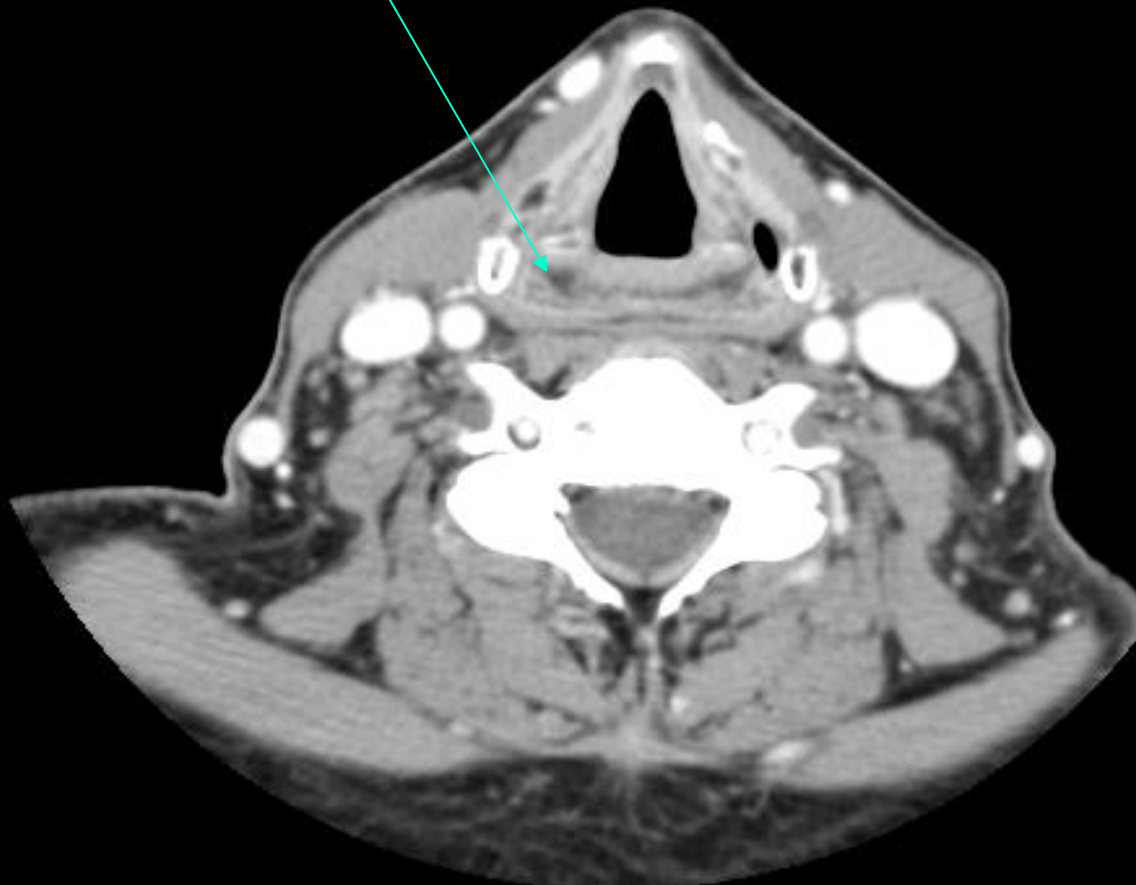


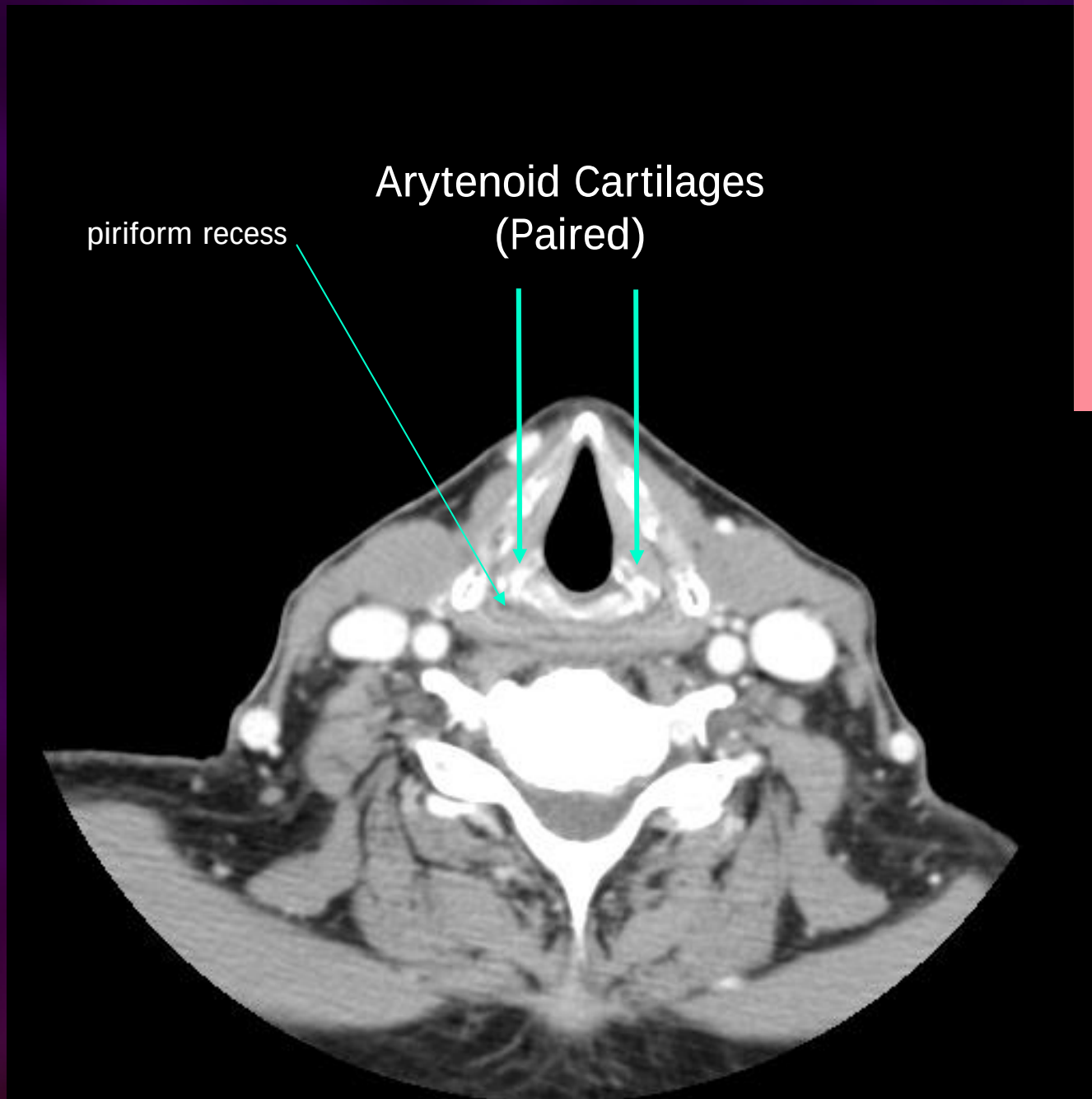
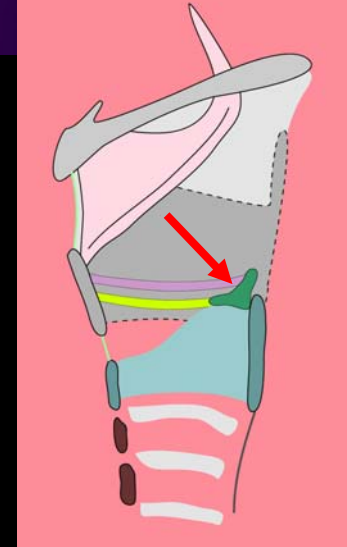
THYROID CARTILAGE

piriform recess

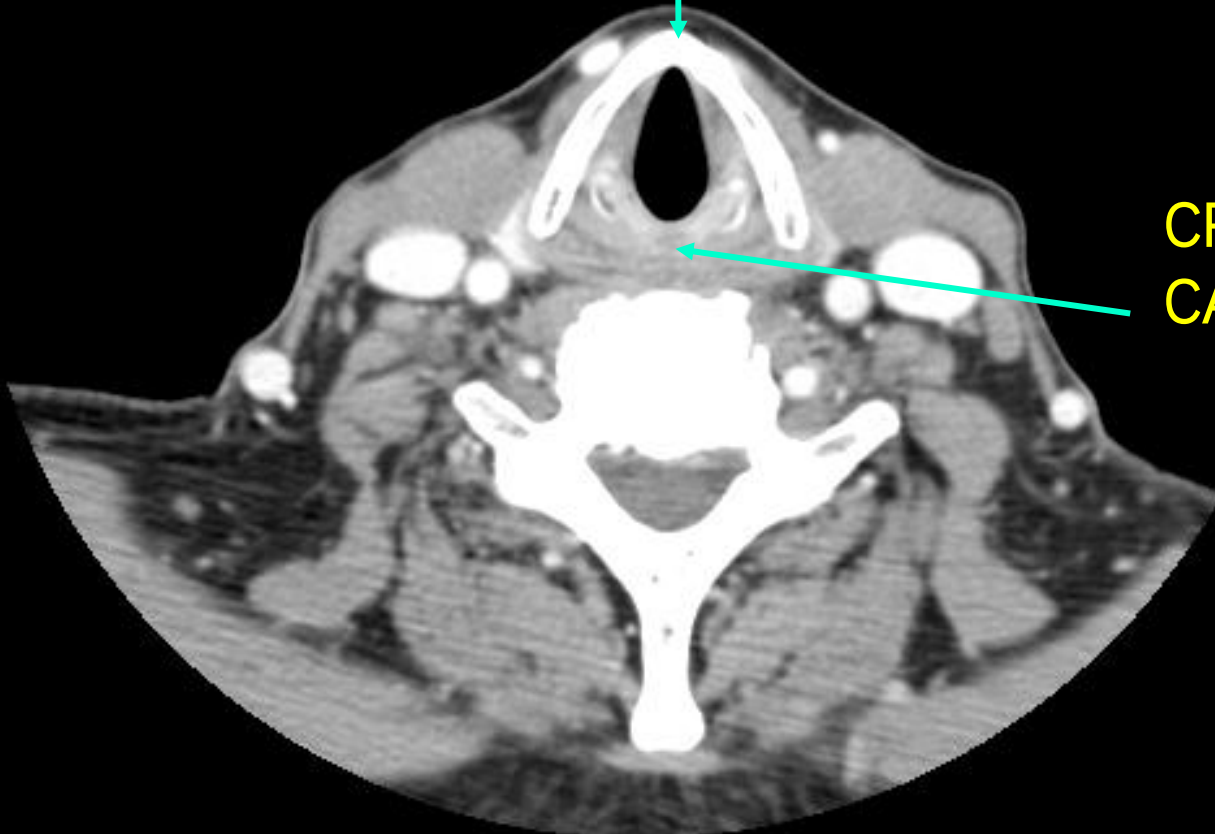


piriform recess

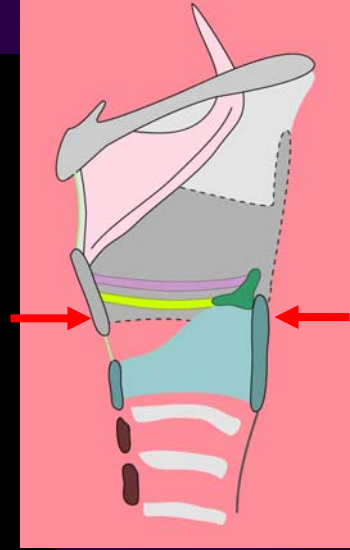


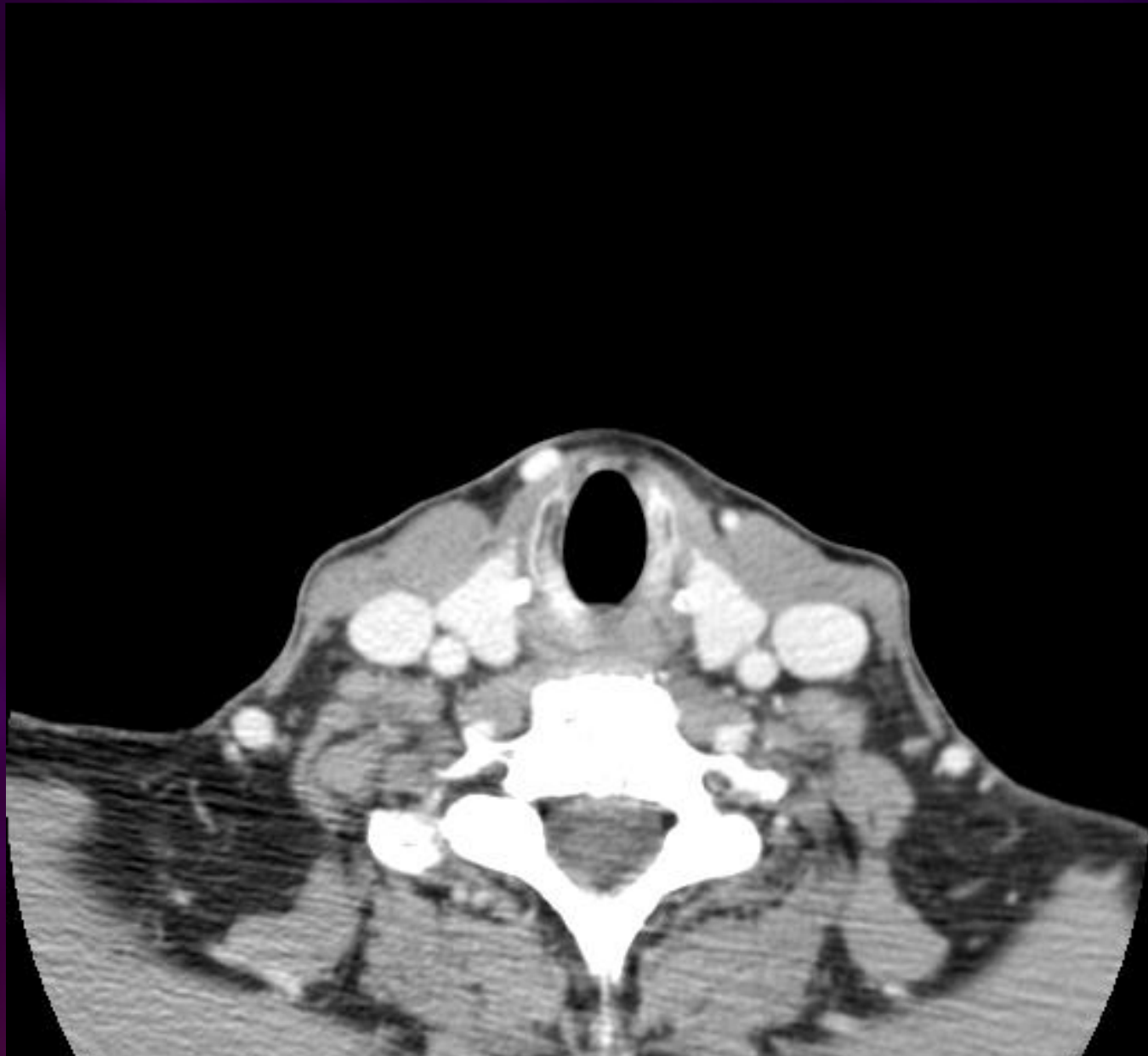


Thyroid Cartilage

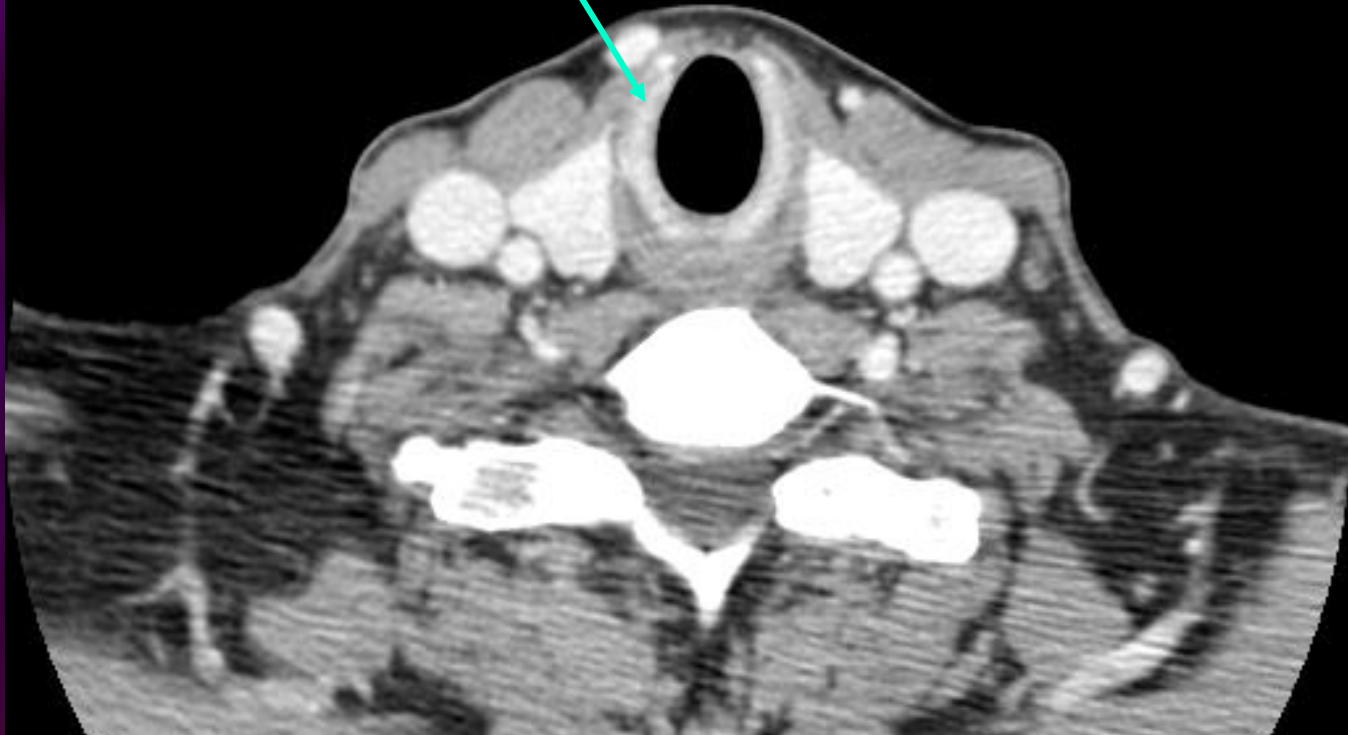
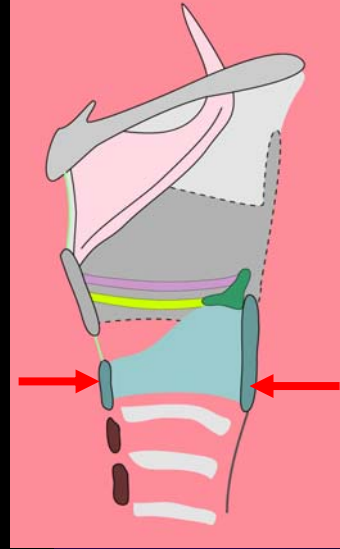


CRICOID
CARTILAGE





CRICOID CARTILAGE

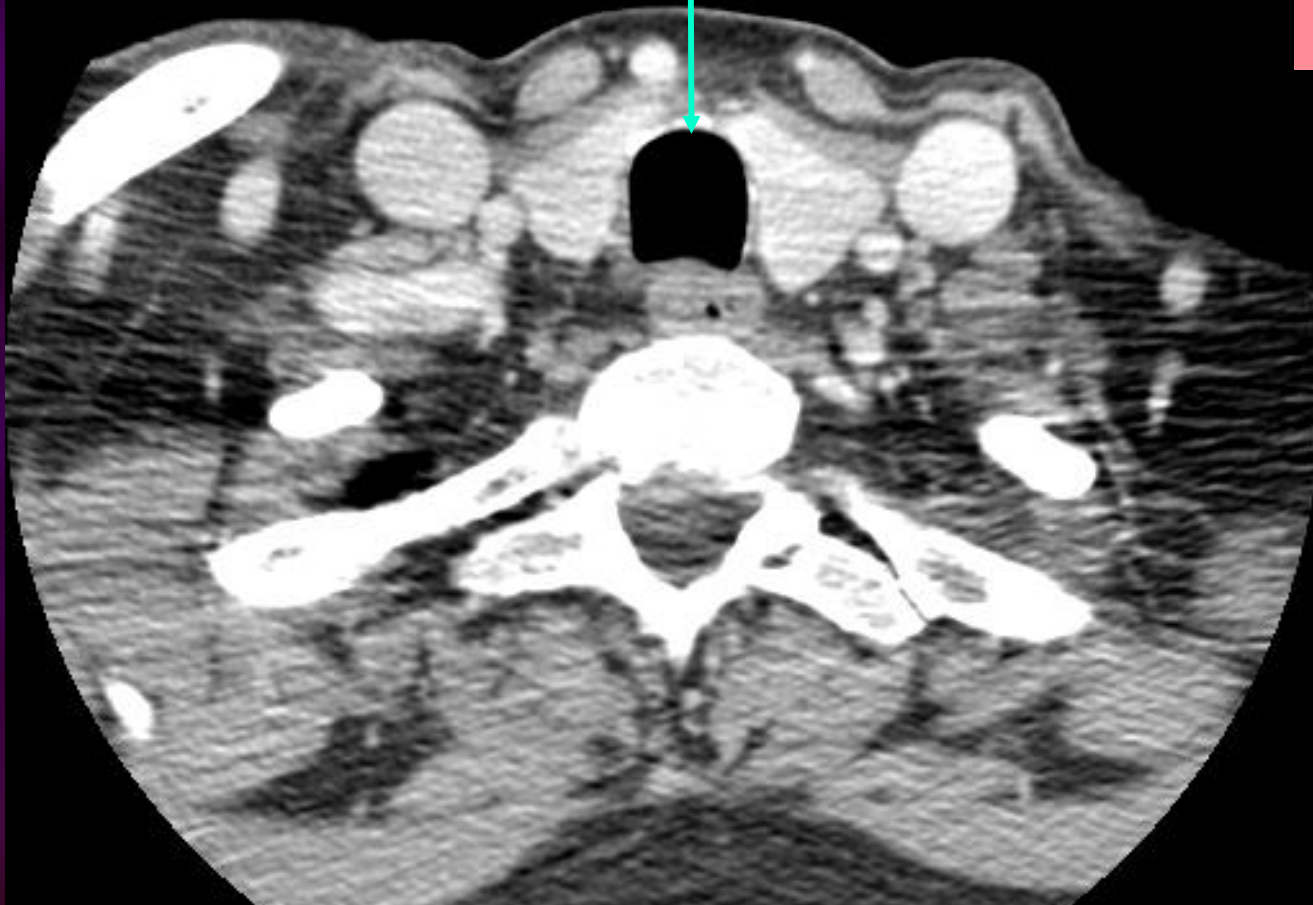
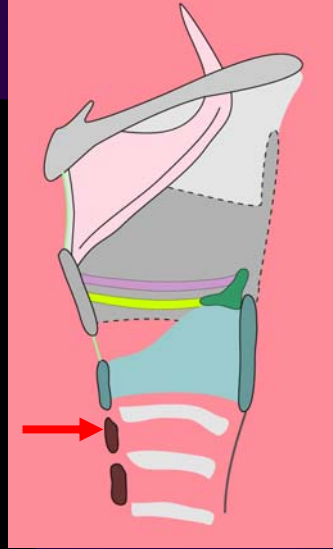


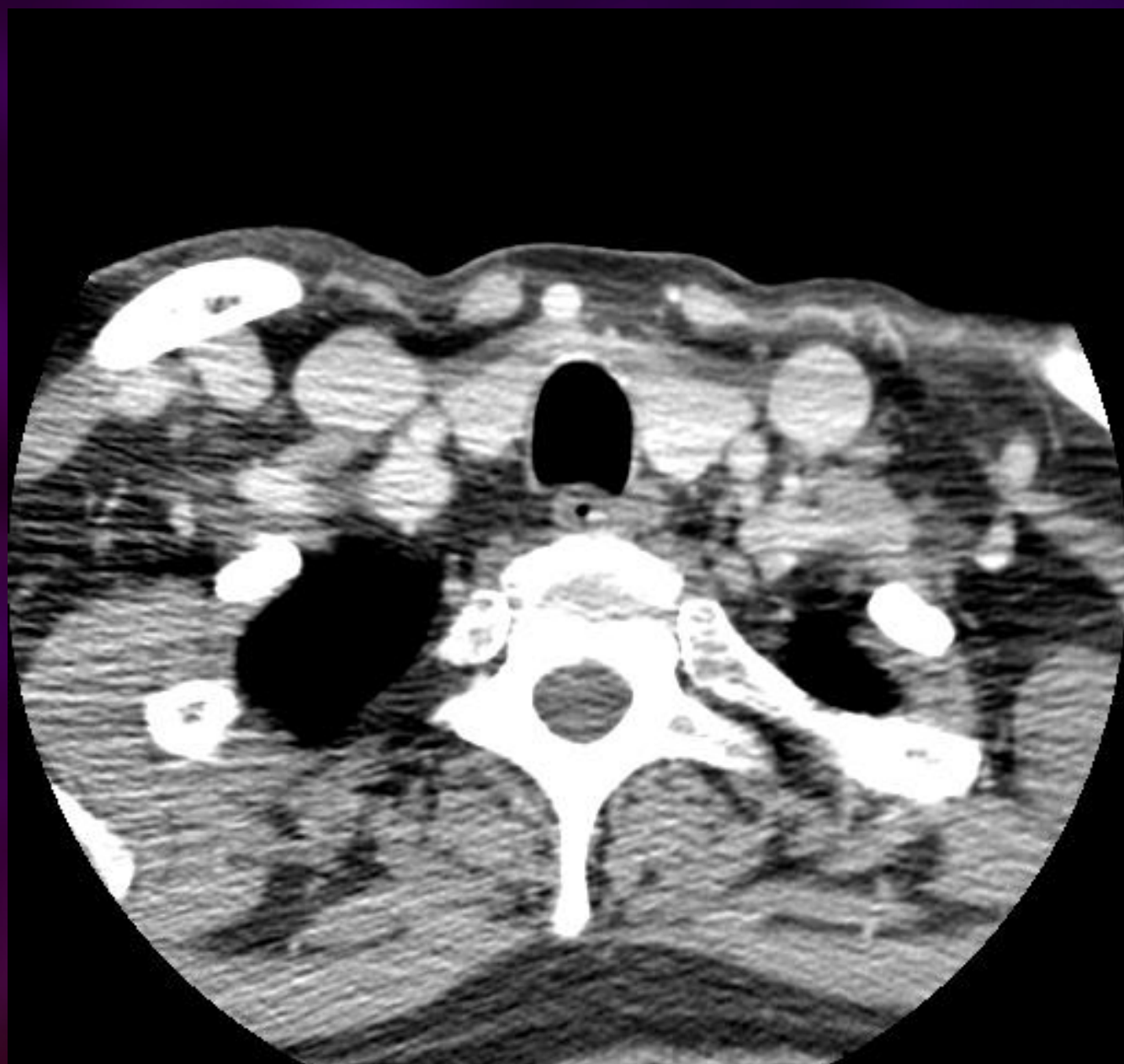


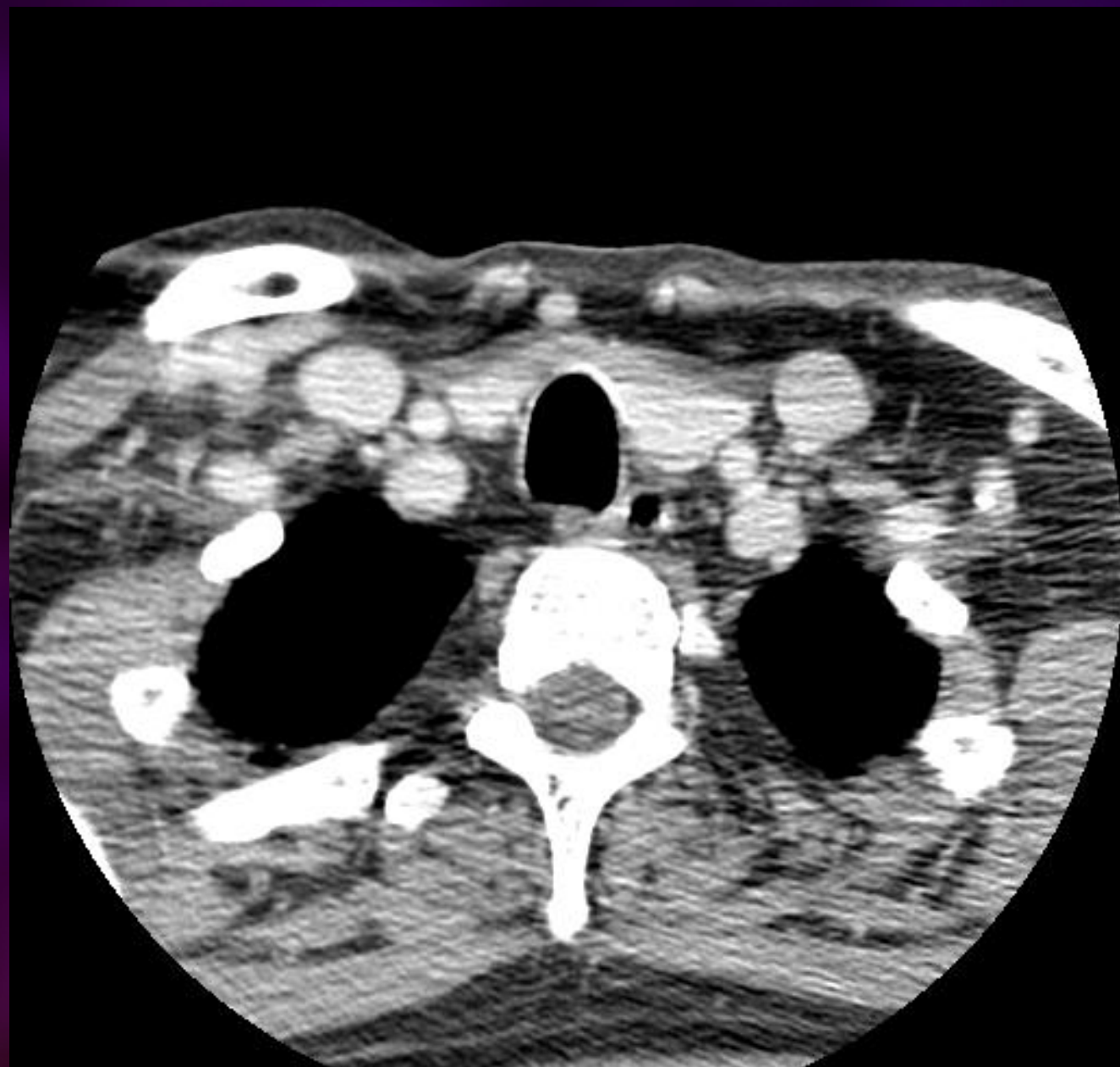




First Tracheal Ring

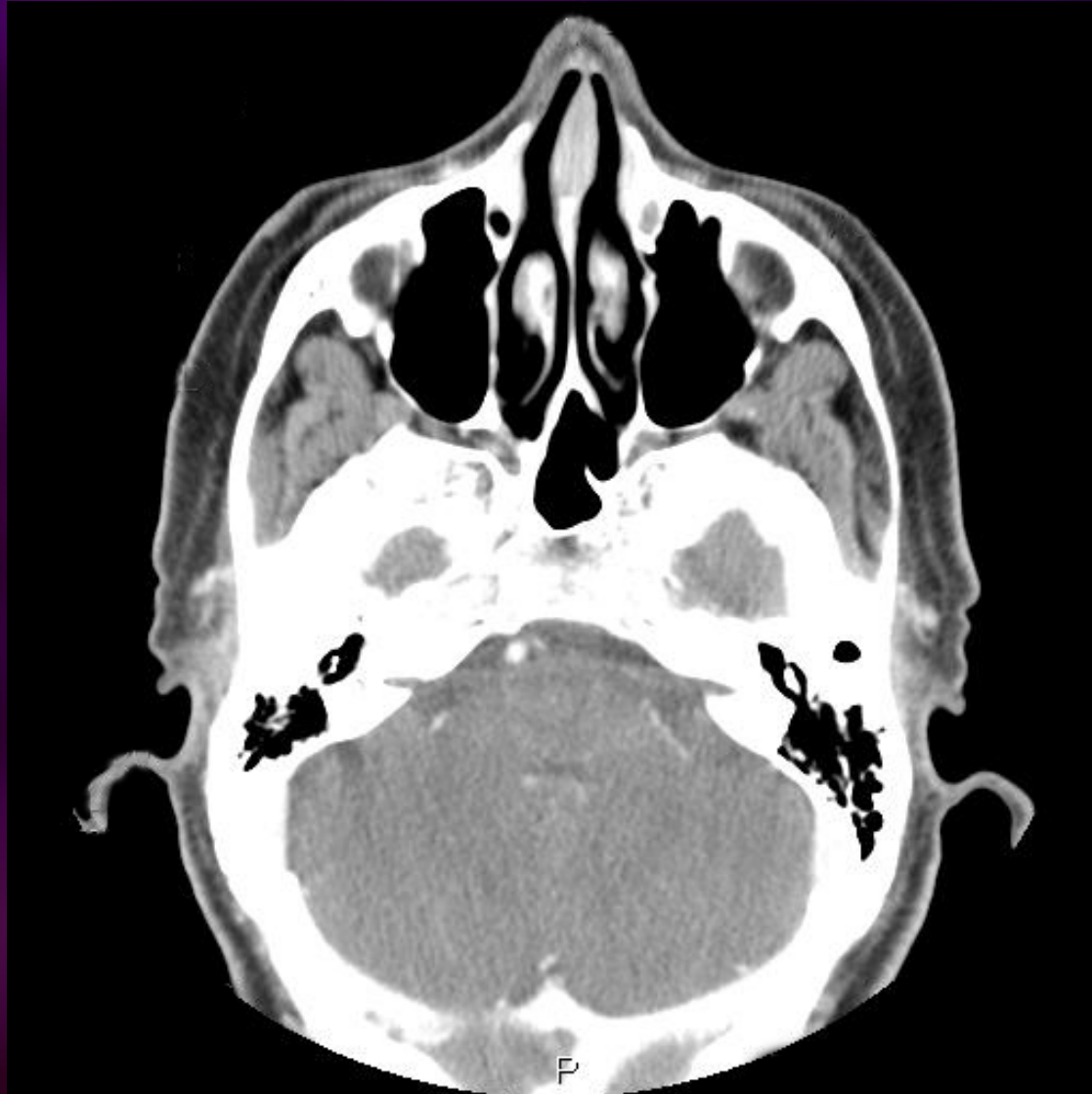






Round 2: Pharynx and Larynx

“What am I looking at?”

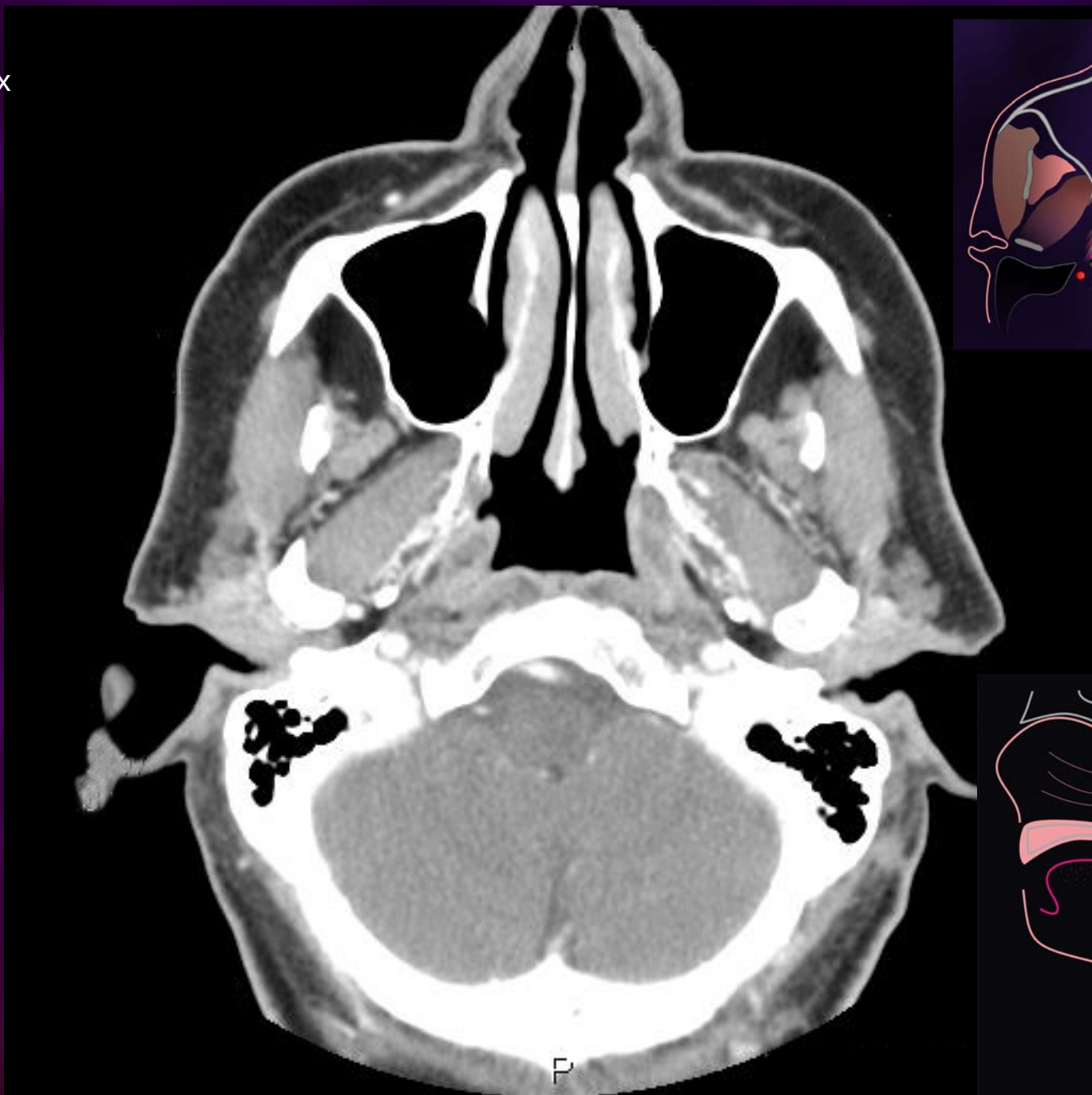
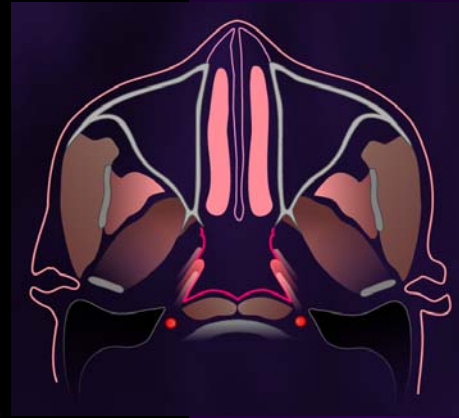
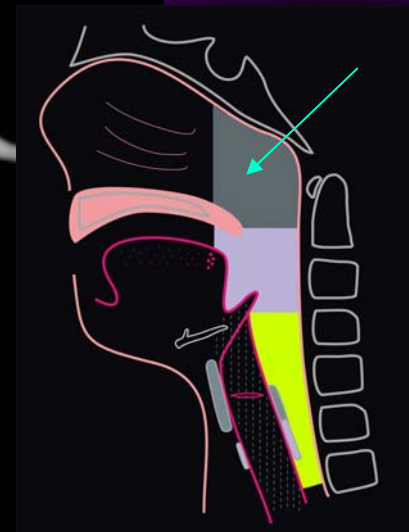






Landmarks

- nasopharynx



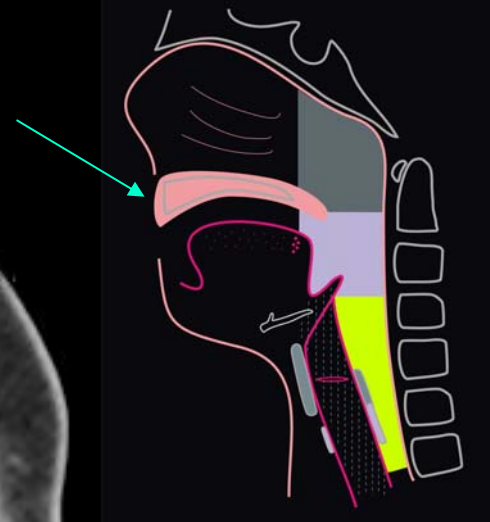
Landmarks

- pterygoid plates



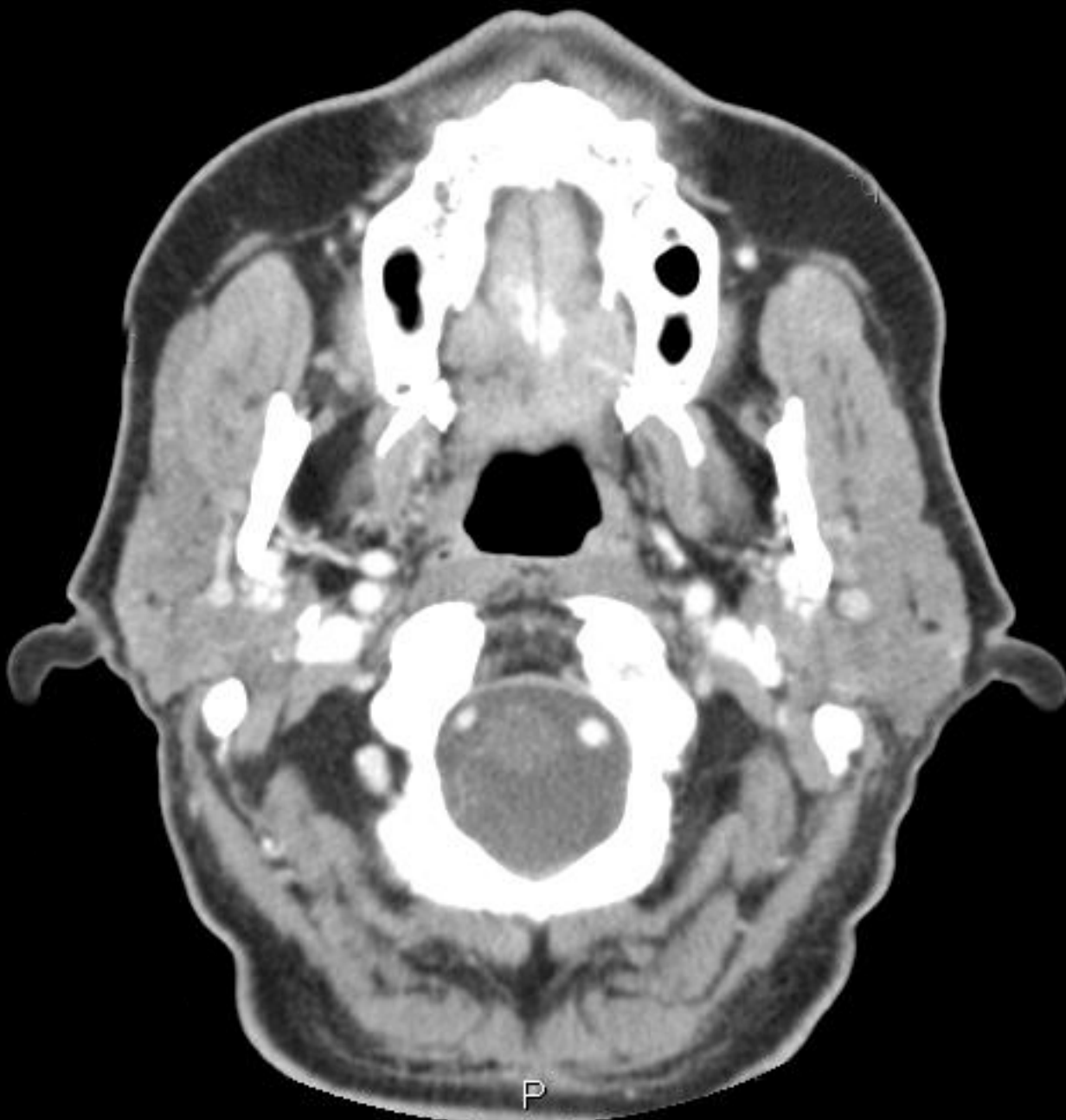
Landmarks

- hard palate
- parotids



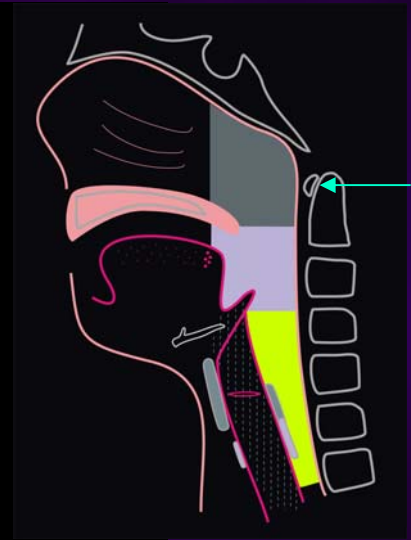
Landmarks

- oropharynx



Landmarks

- C1 arch



Landmarks

- C1 arch
- parapharyngeal space

A retropharyngeal space is typically situated btw the prevertebral muscles and the ICA.

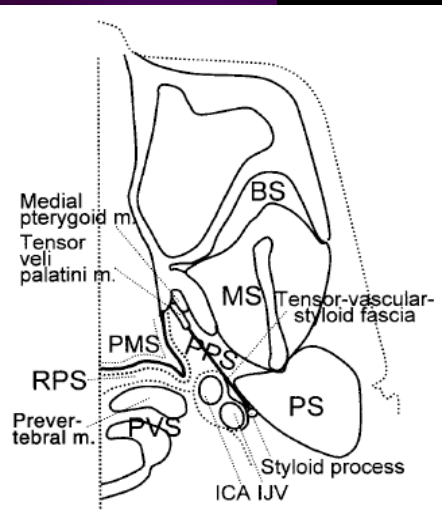
parapharyngeal space (PPS)

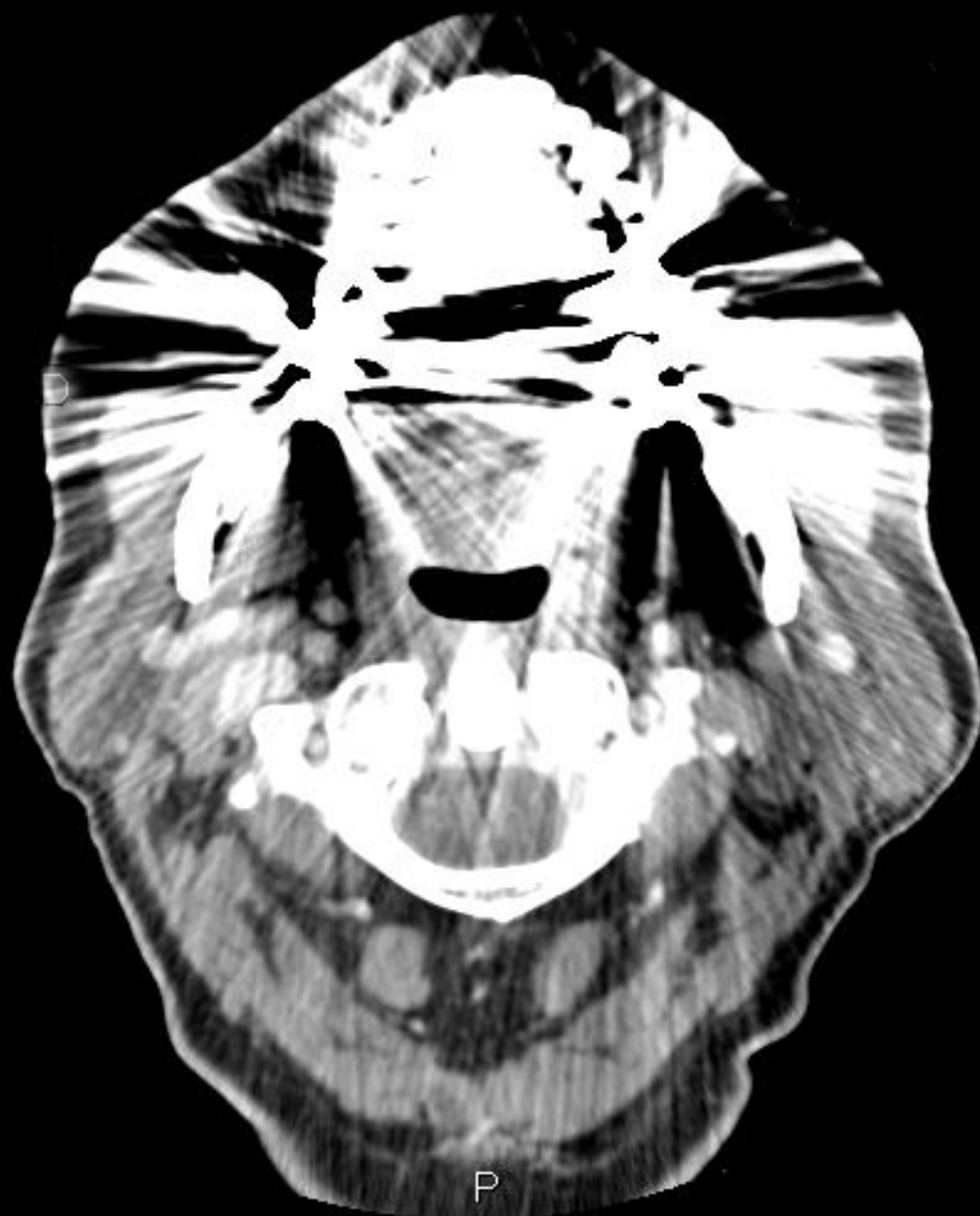
carotid space

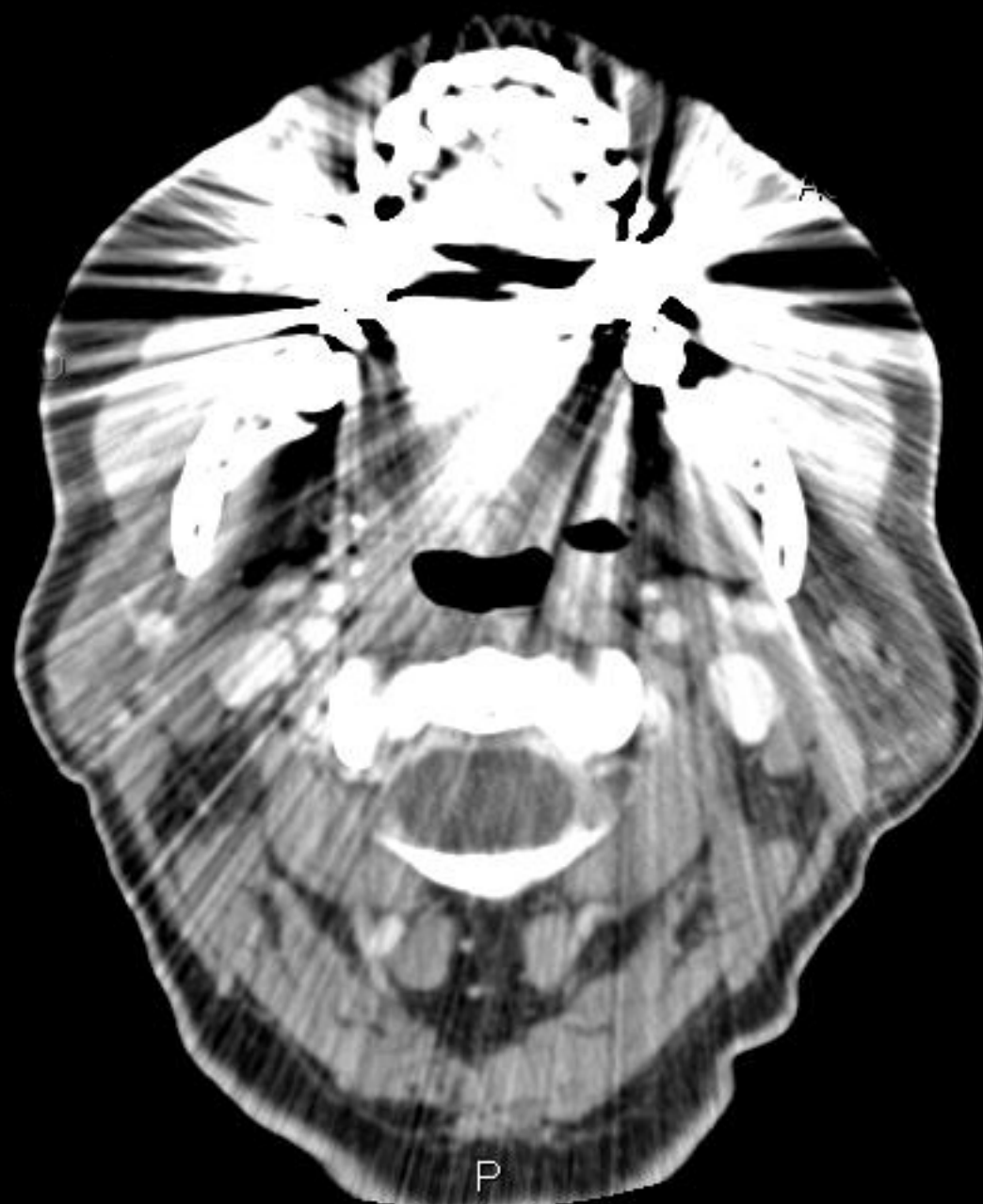
retropharyngeal space (RPS)

parotid space (PS)

prevertebral space (PVS)

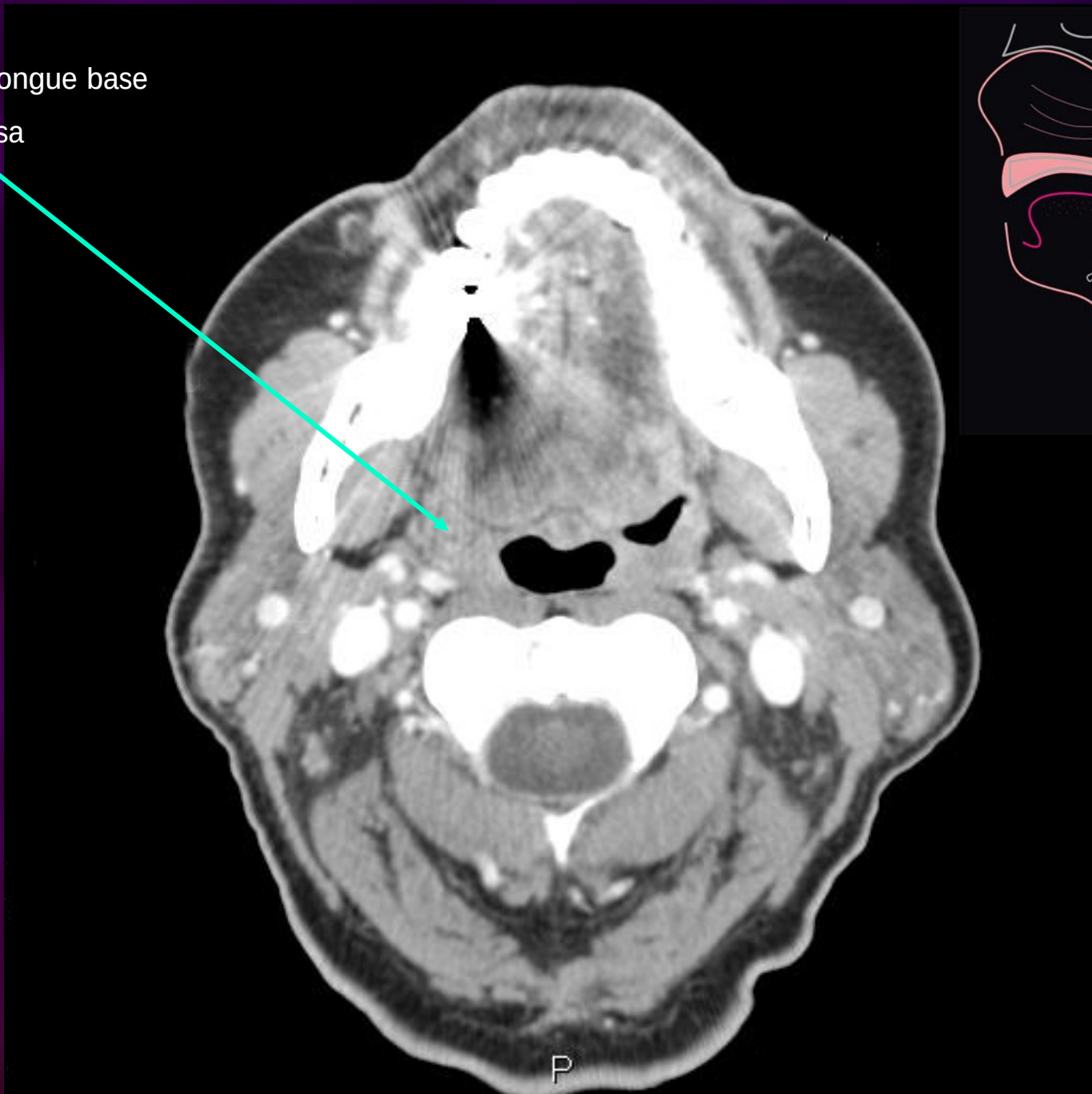
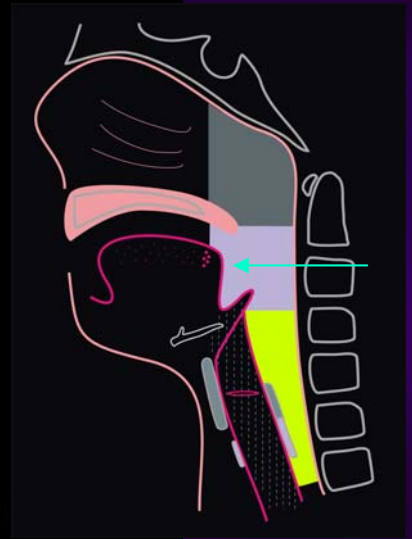


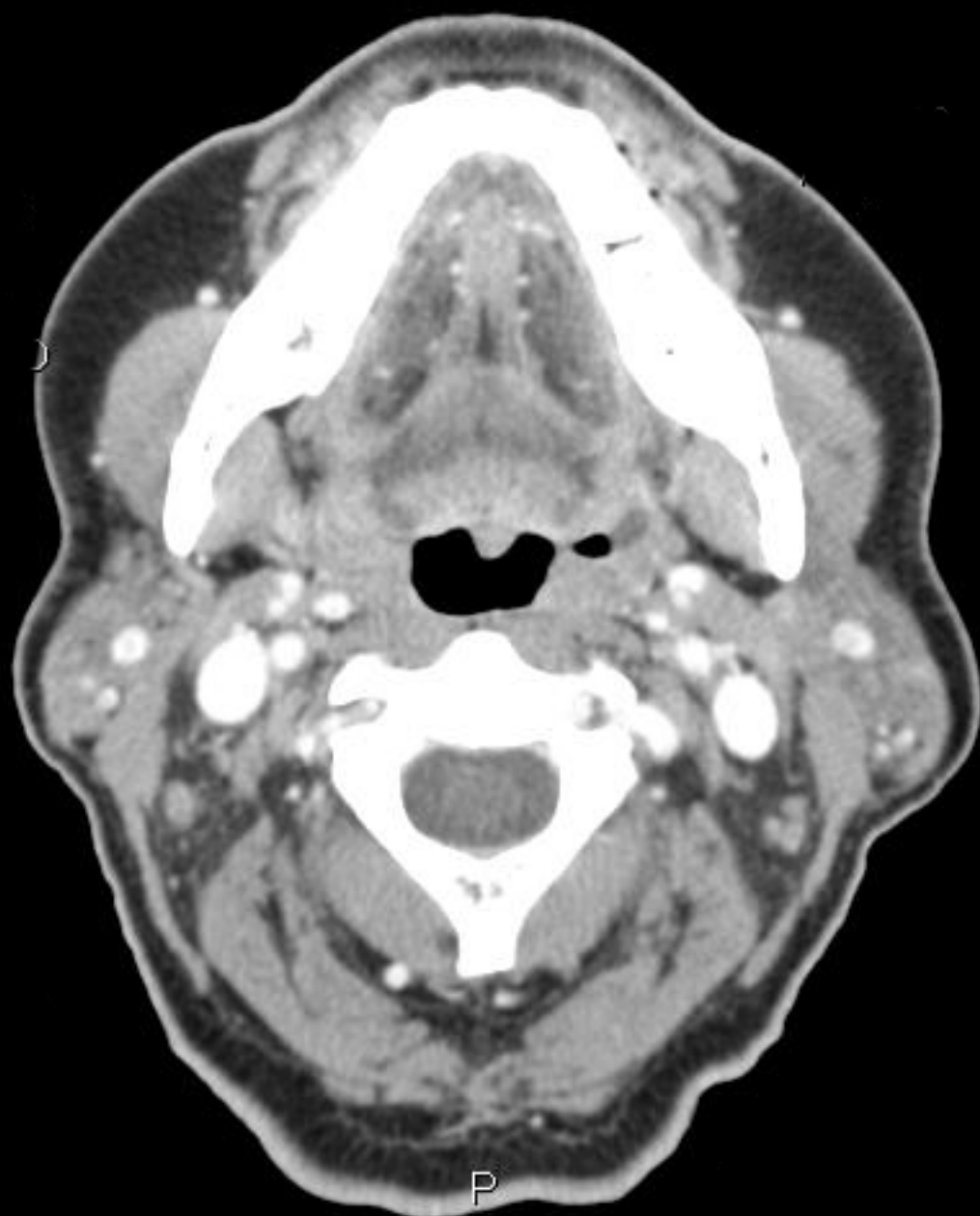


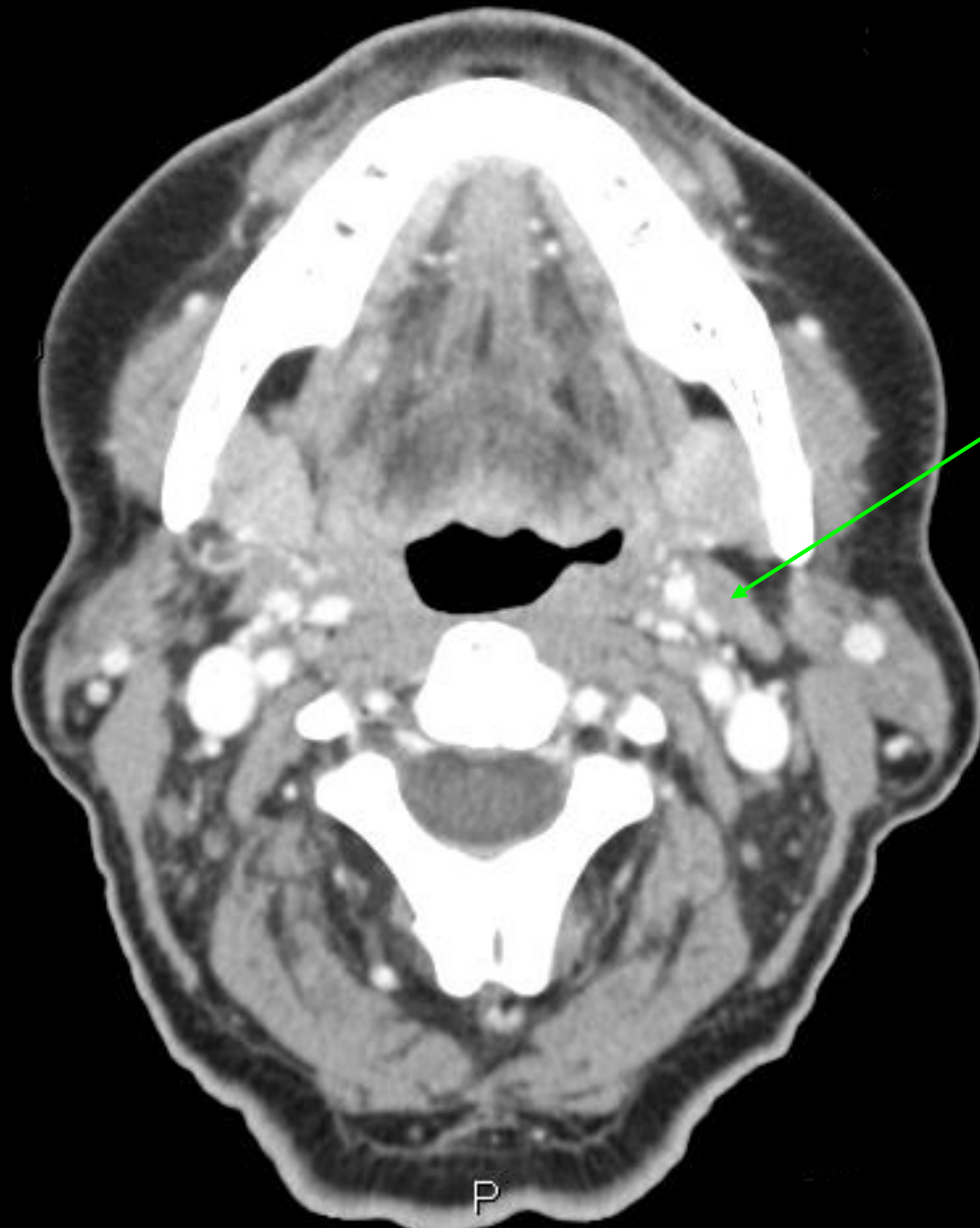


Landmarks

- tongue -> tongue base
- tonsillar fossa



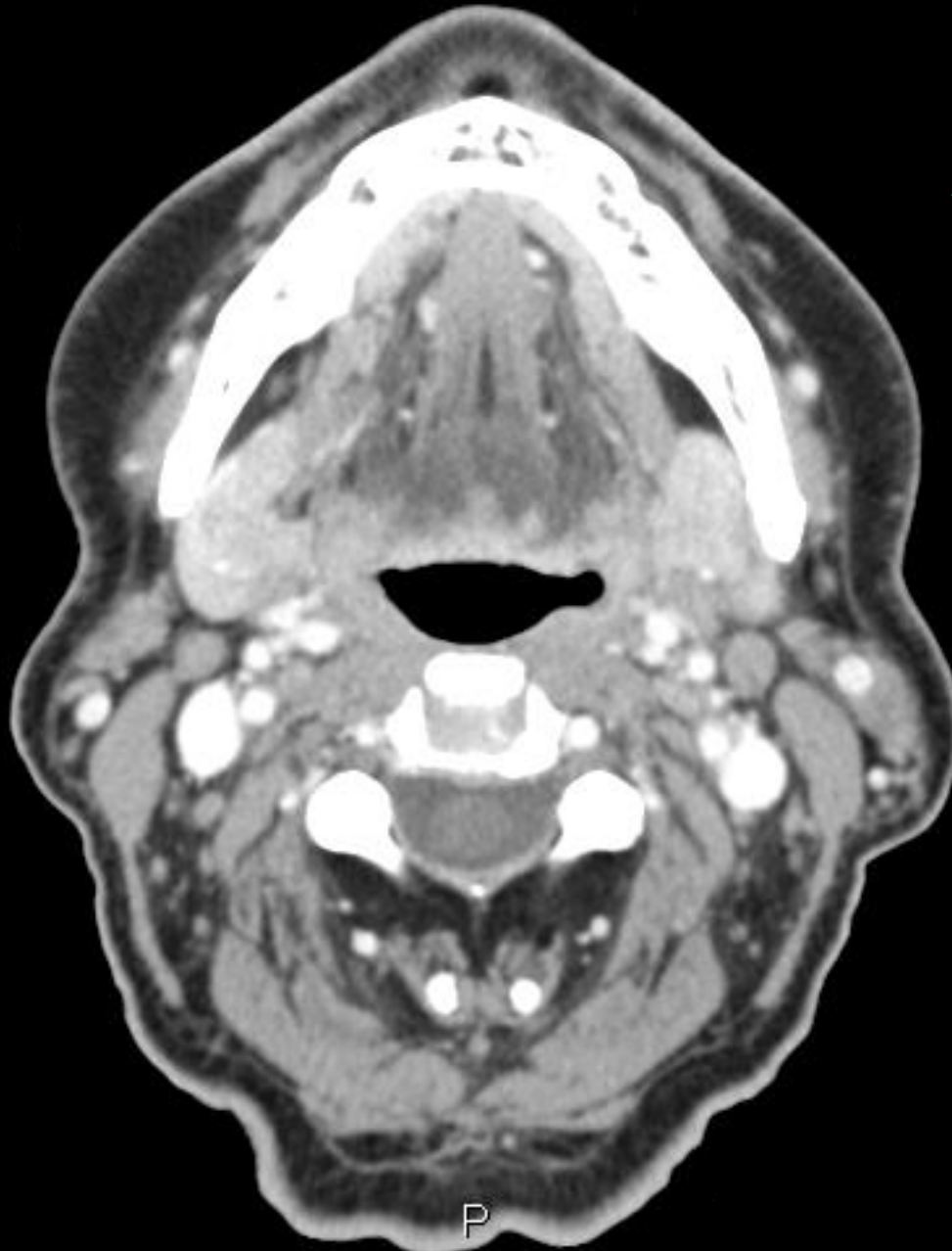
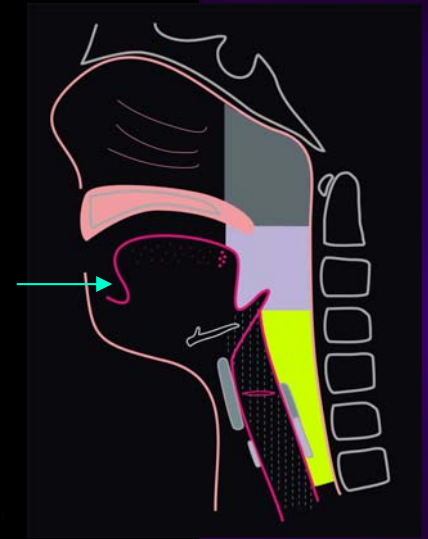


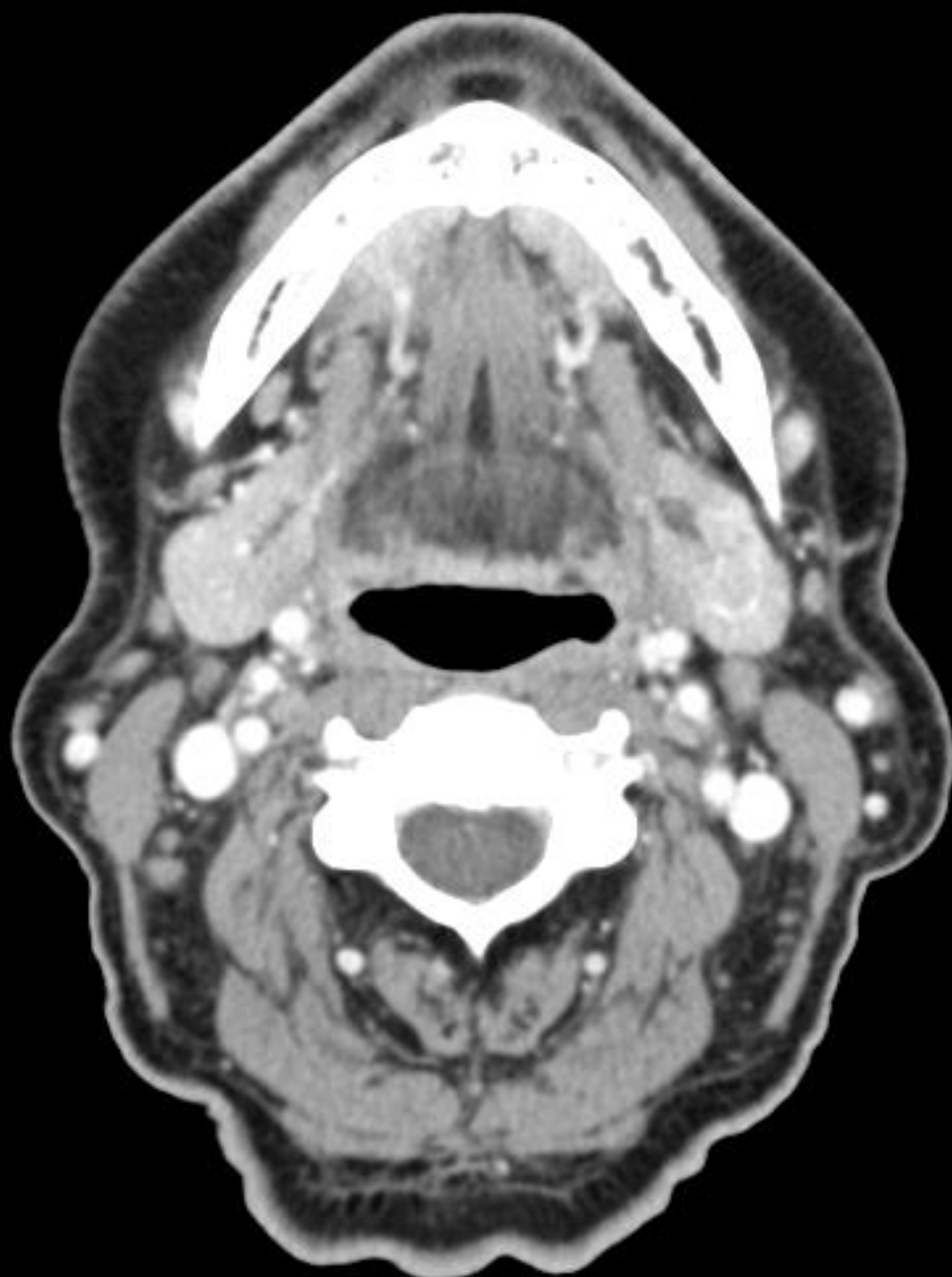


Digastric muscle:
posterior belly
(above hyoid bone)

Landmarks

- floor of mouth
- submandibular glands





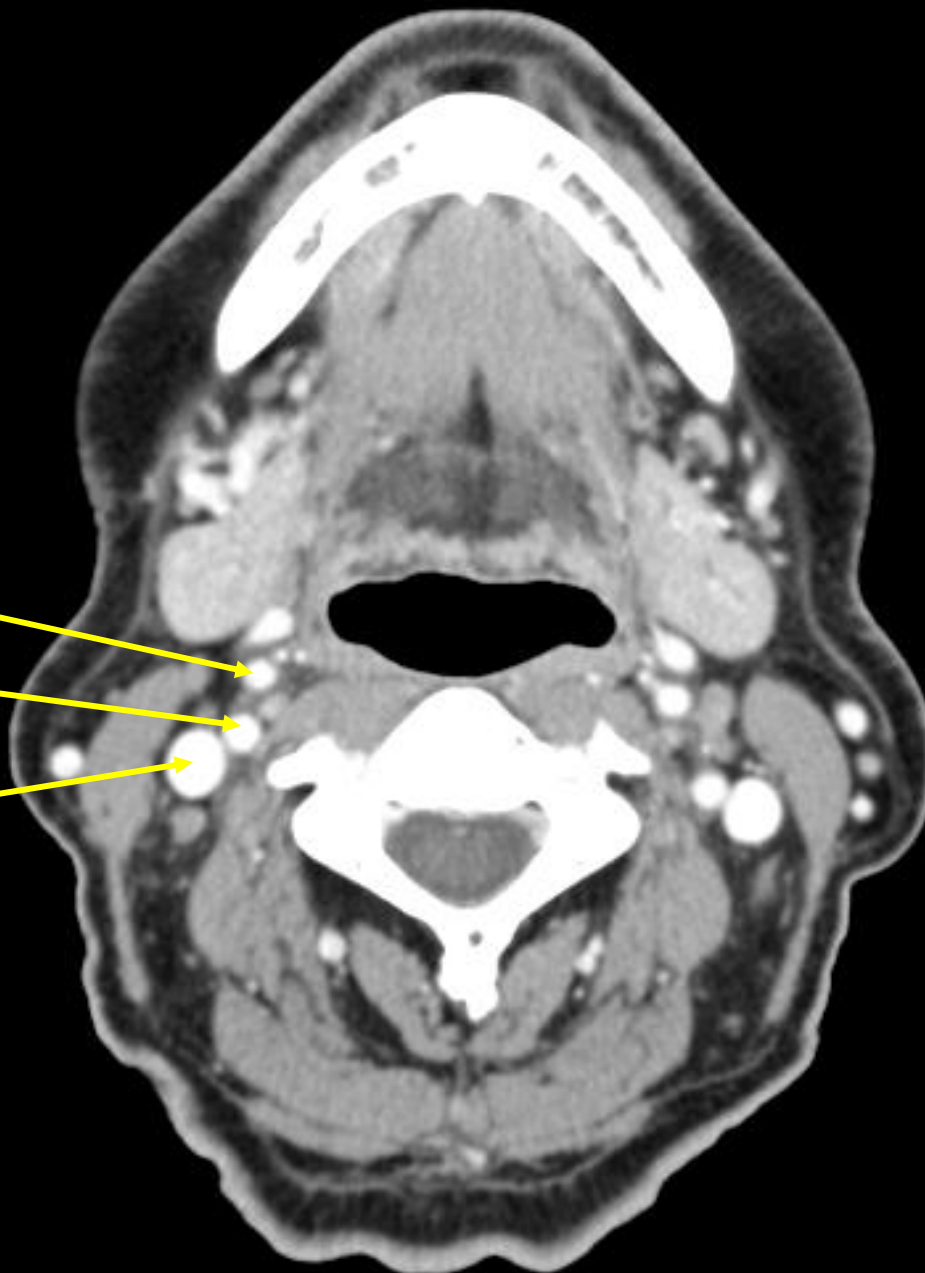
Landmarks

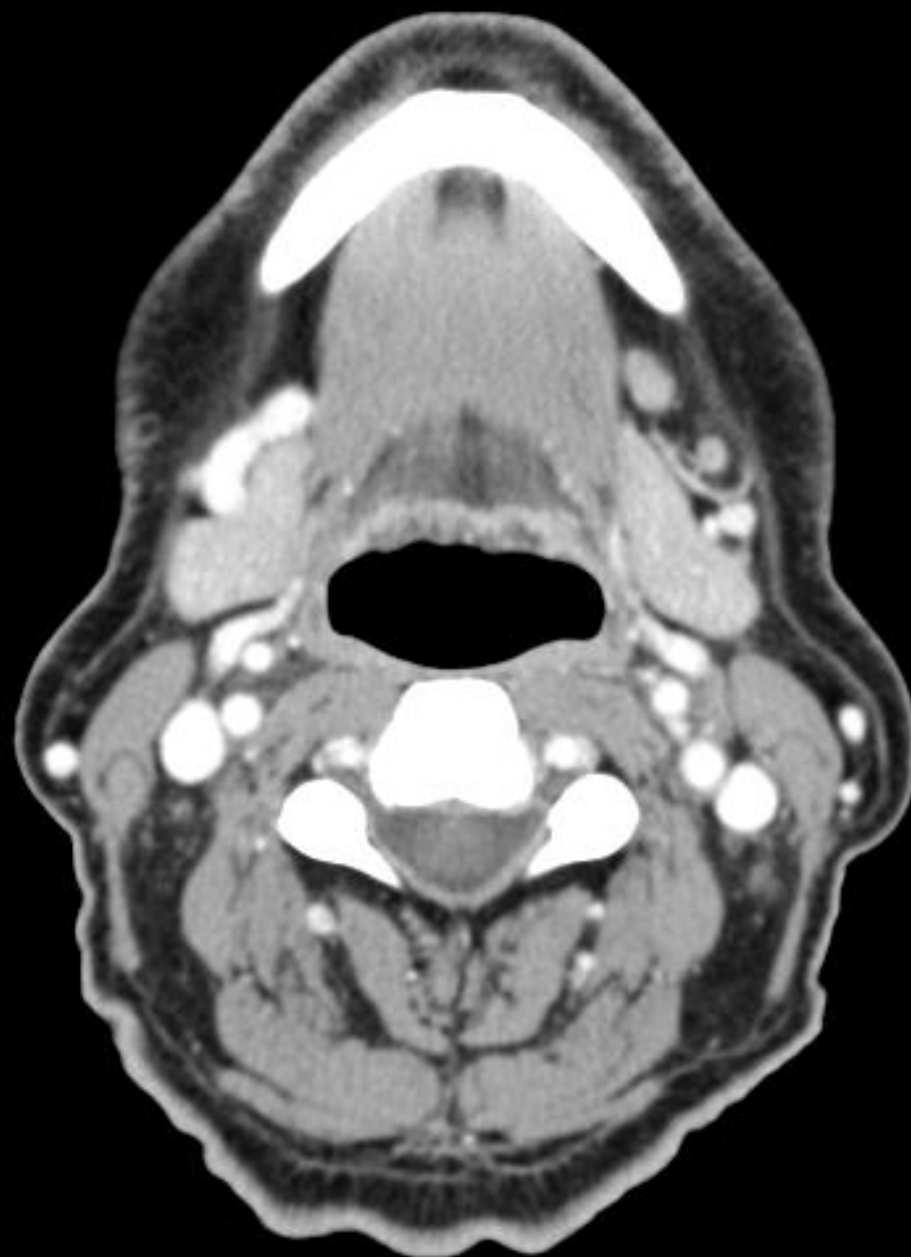
- ICA and ECA; IJV
- sternomastoid muscles

ECA

ICA

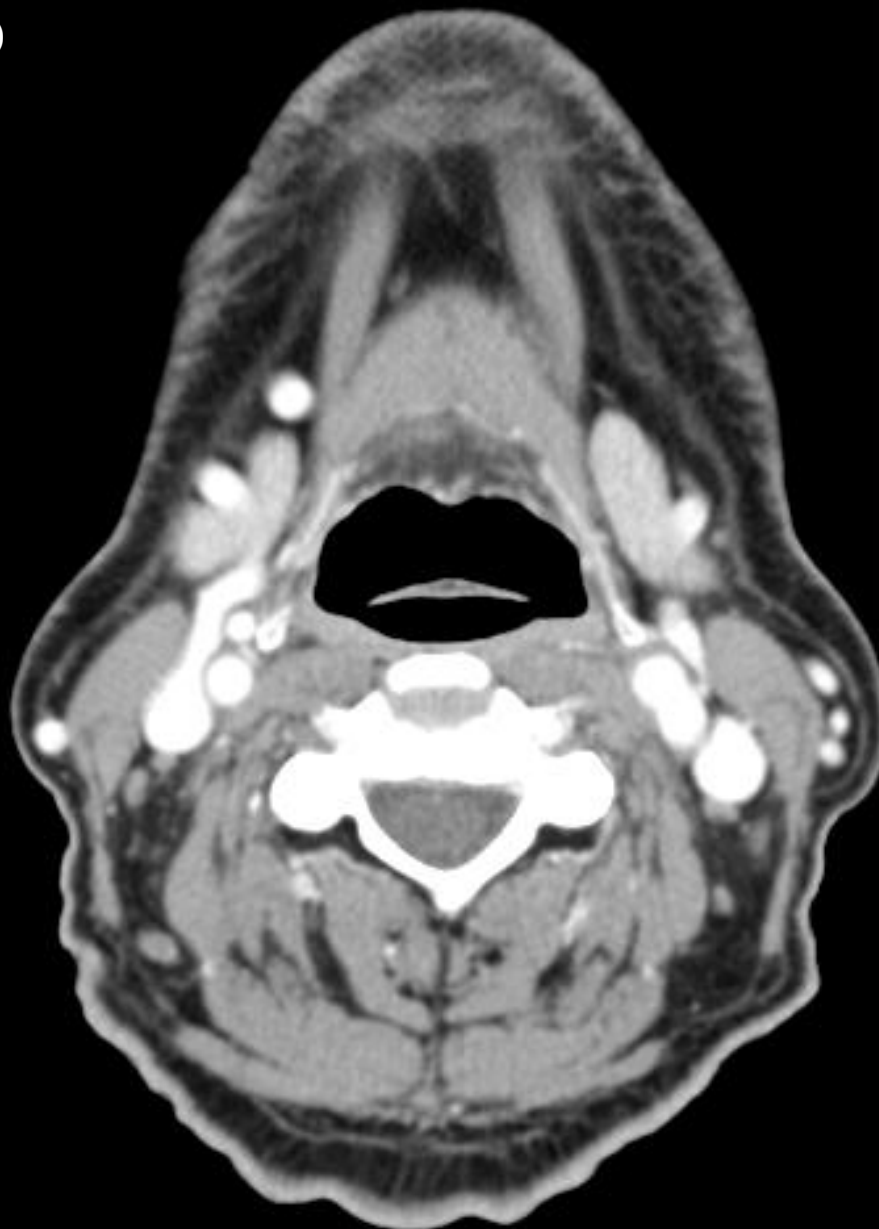
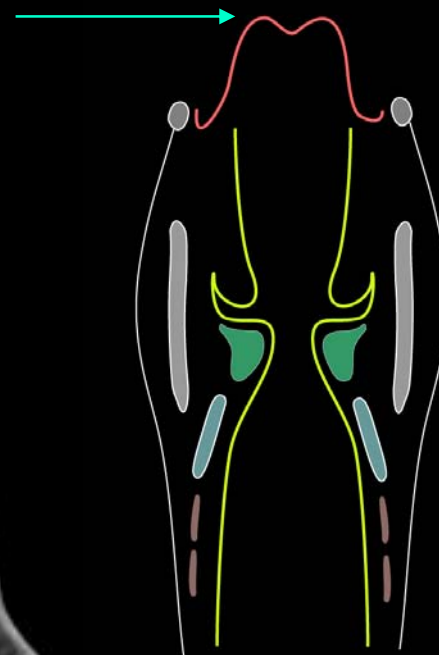
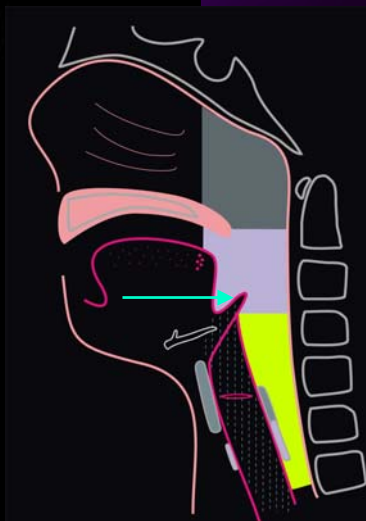
IJV





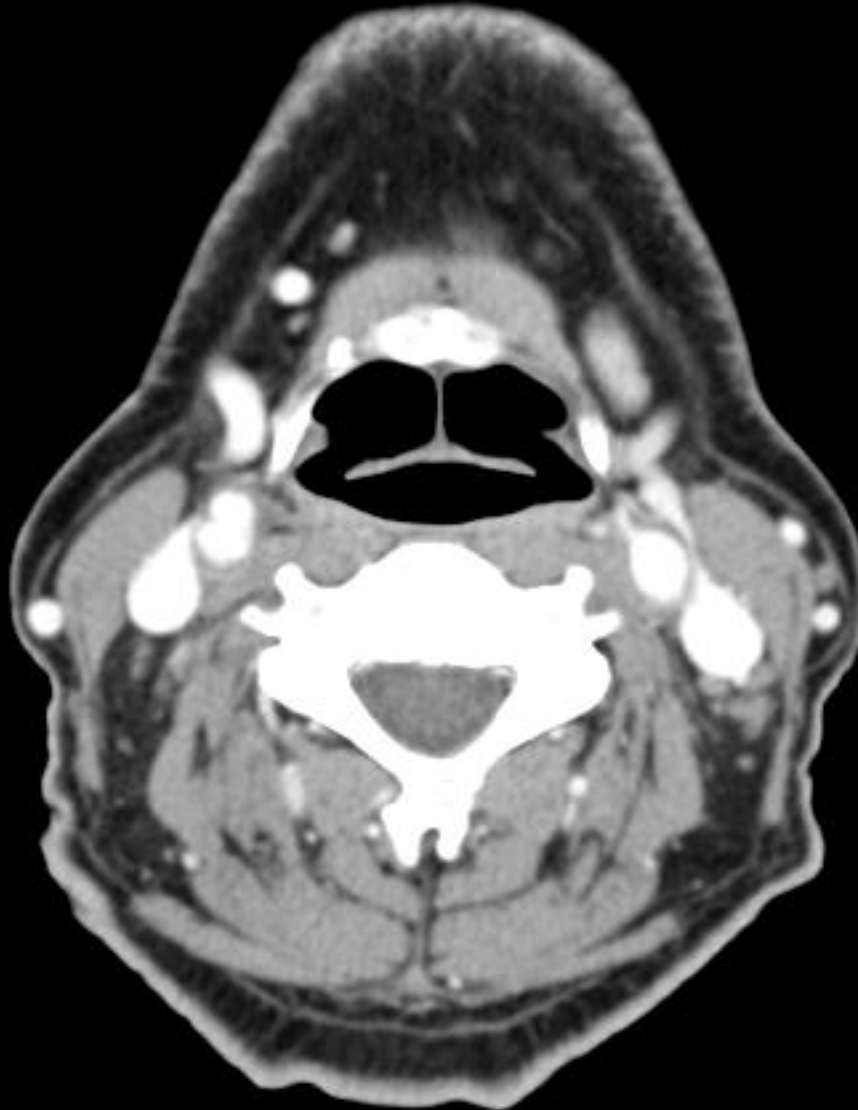
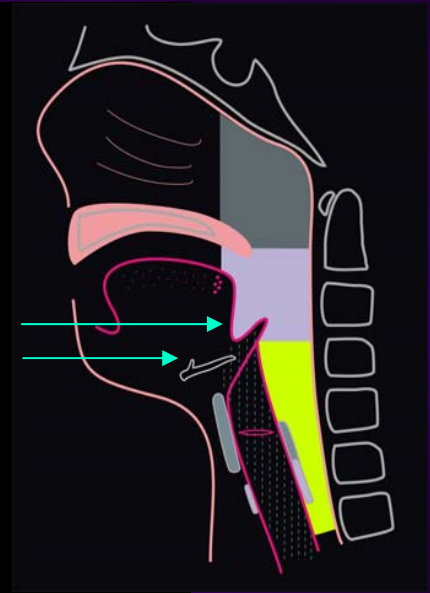
Landmarks

- epiglottic free margin
- diaphragmatic muscle (ant. belly)



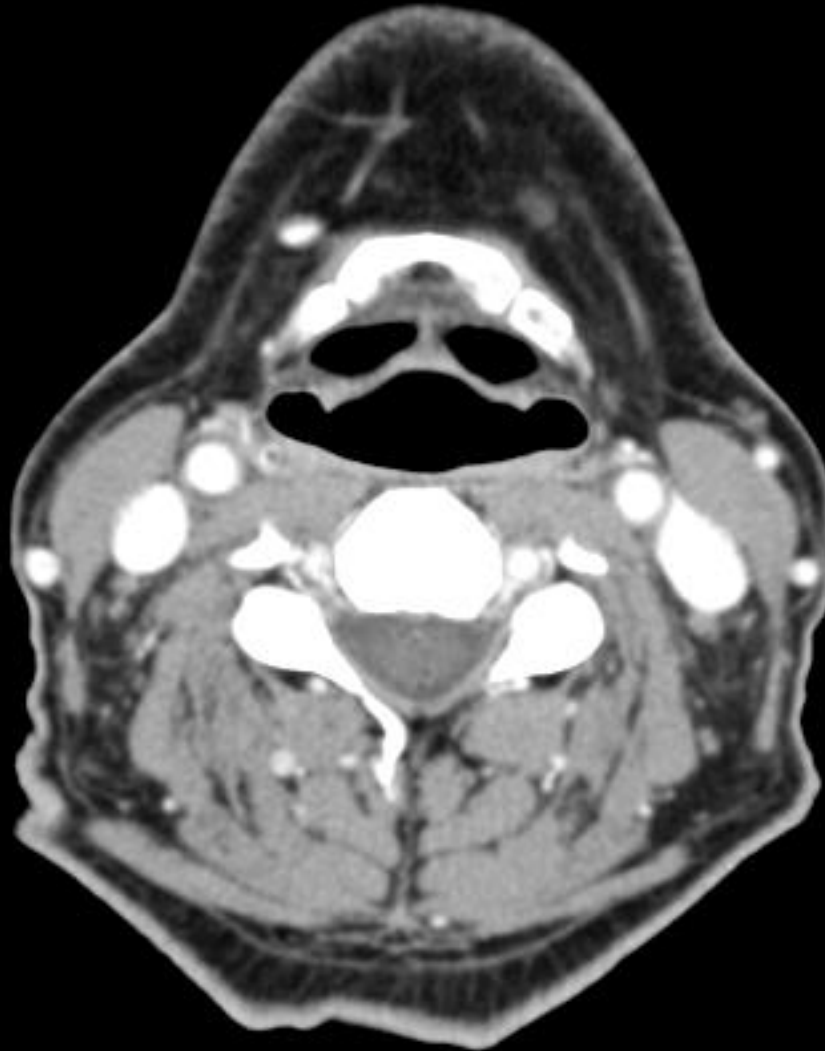
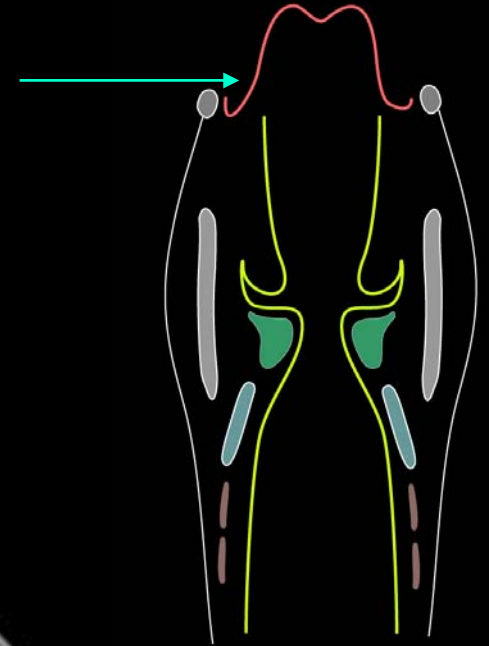
Landmarks

- HYOID BONE
- glossoepiglottic fold
- valleculae



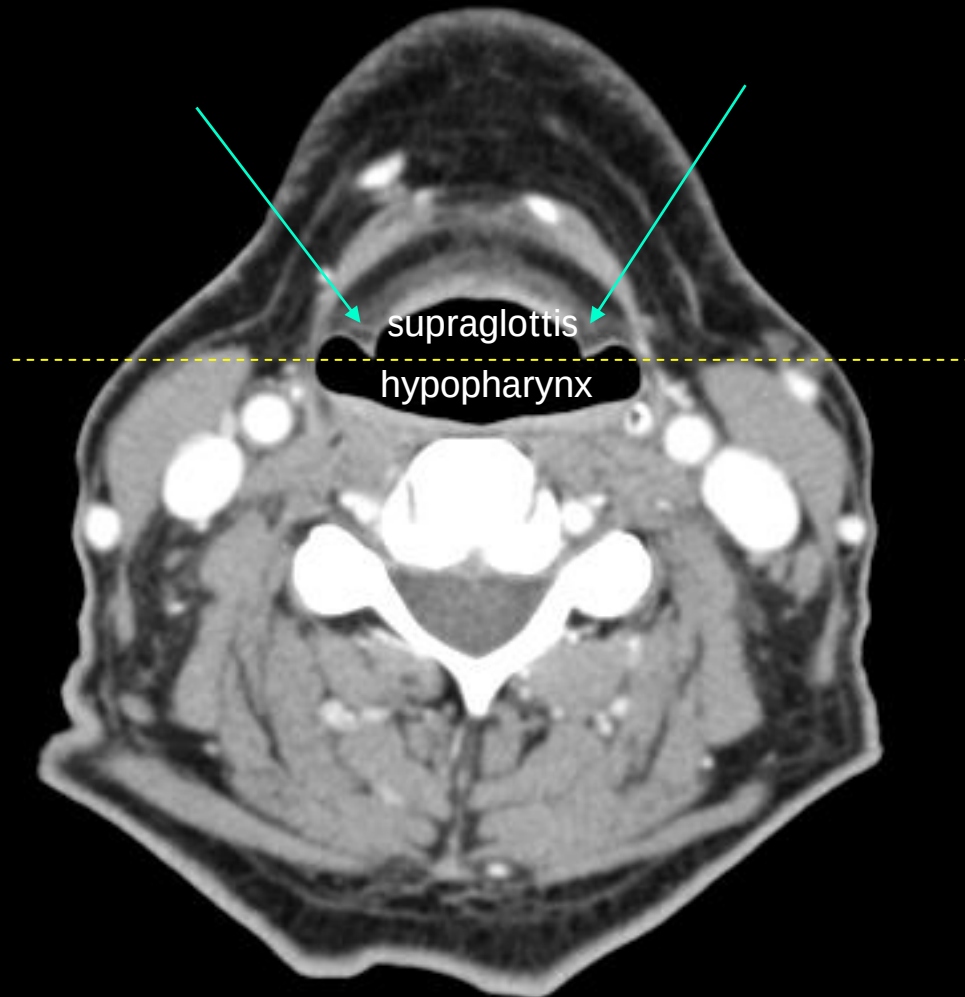
Landmarks

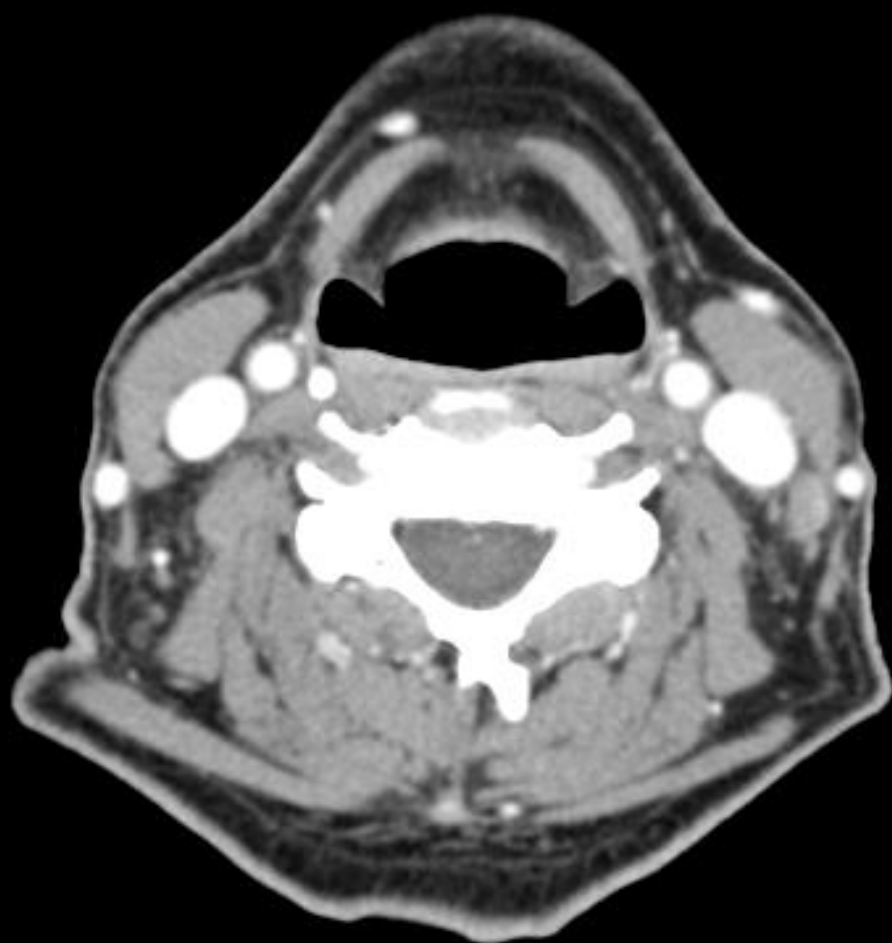
- valleculae (“Donald Duck” configuration!) – lowest part of oropharynx
- piriform recesses and hypopharynx



Landmarks

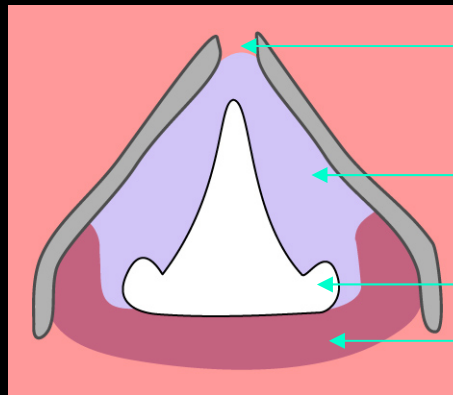
- aryepiglottic folds (dividing line between supraglottis and hypopharynx)





Landmarks

- thyroid notch
- piriform recesses
- commencement of false cords

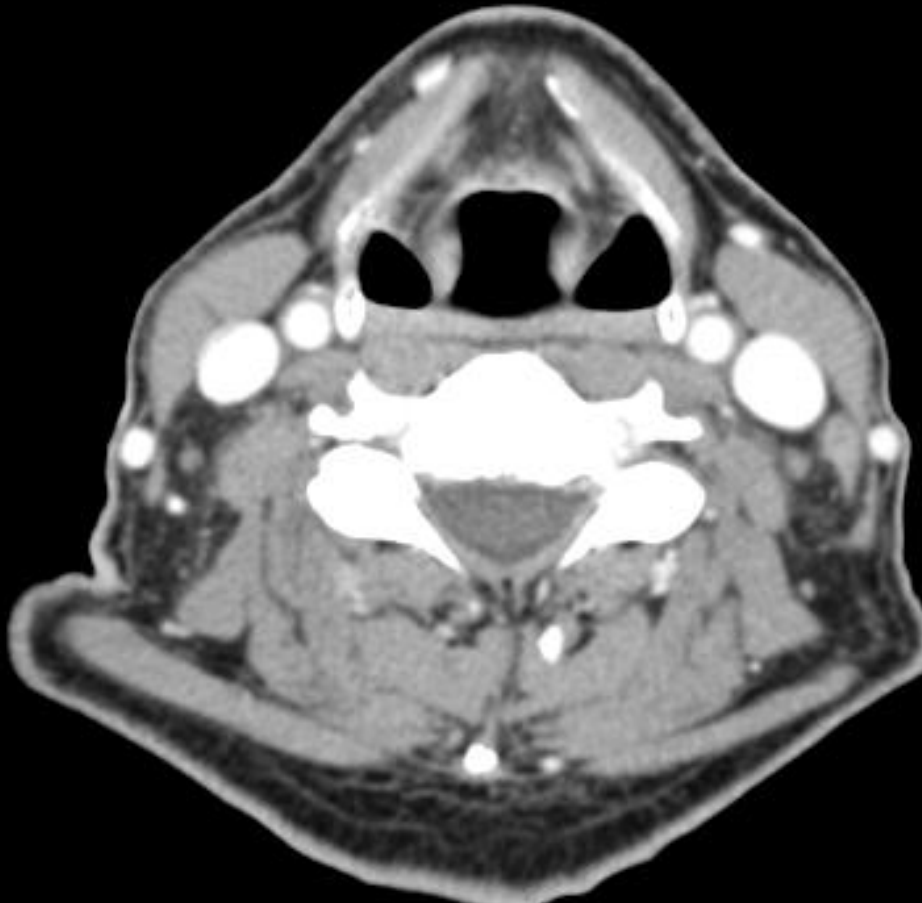


thyroid notch

false cord

piriform recess

hypopharynx

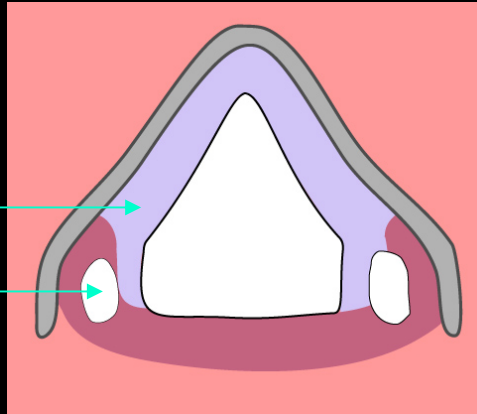
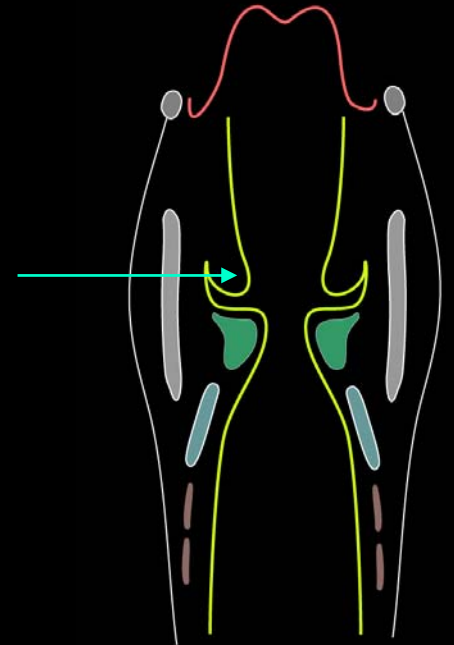
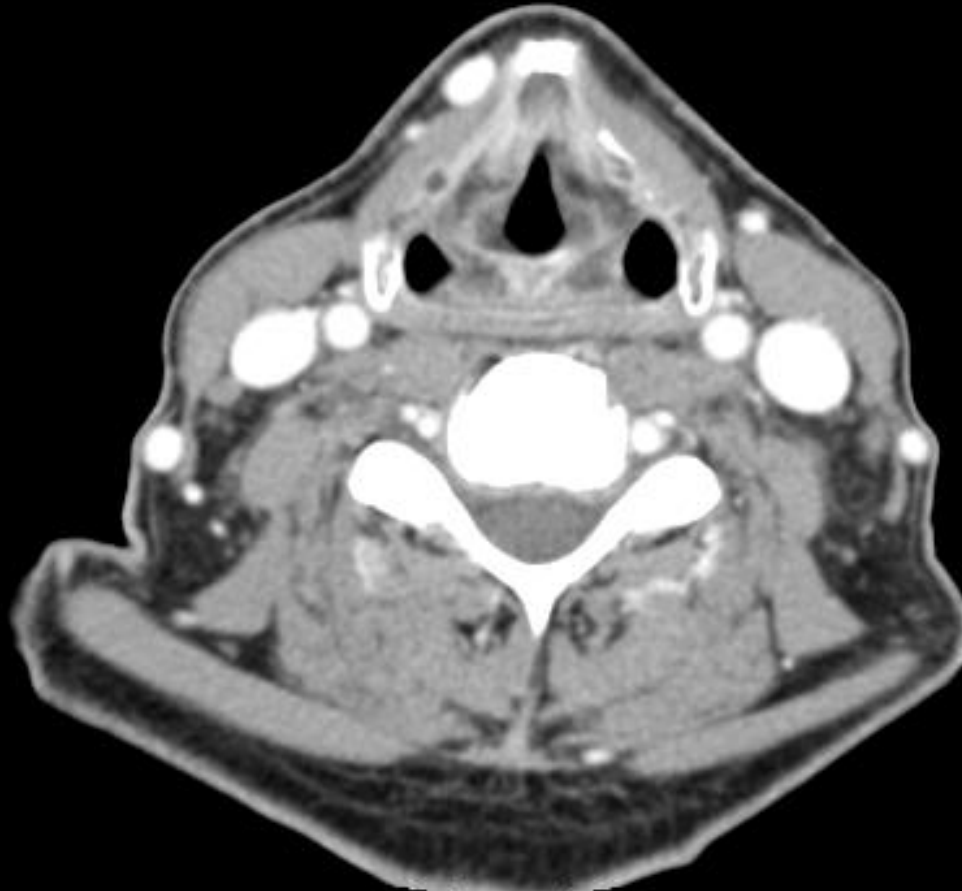


Landmarks

- thyroid cartilage
- FALSE CORDS

false cord

piriform recess



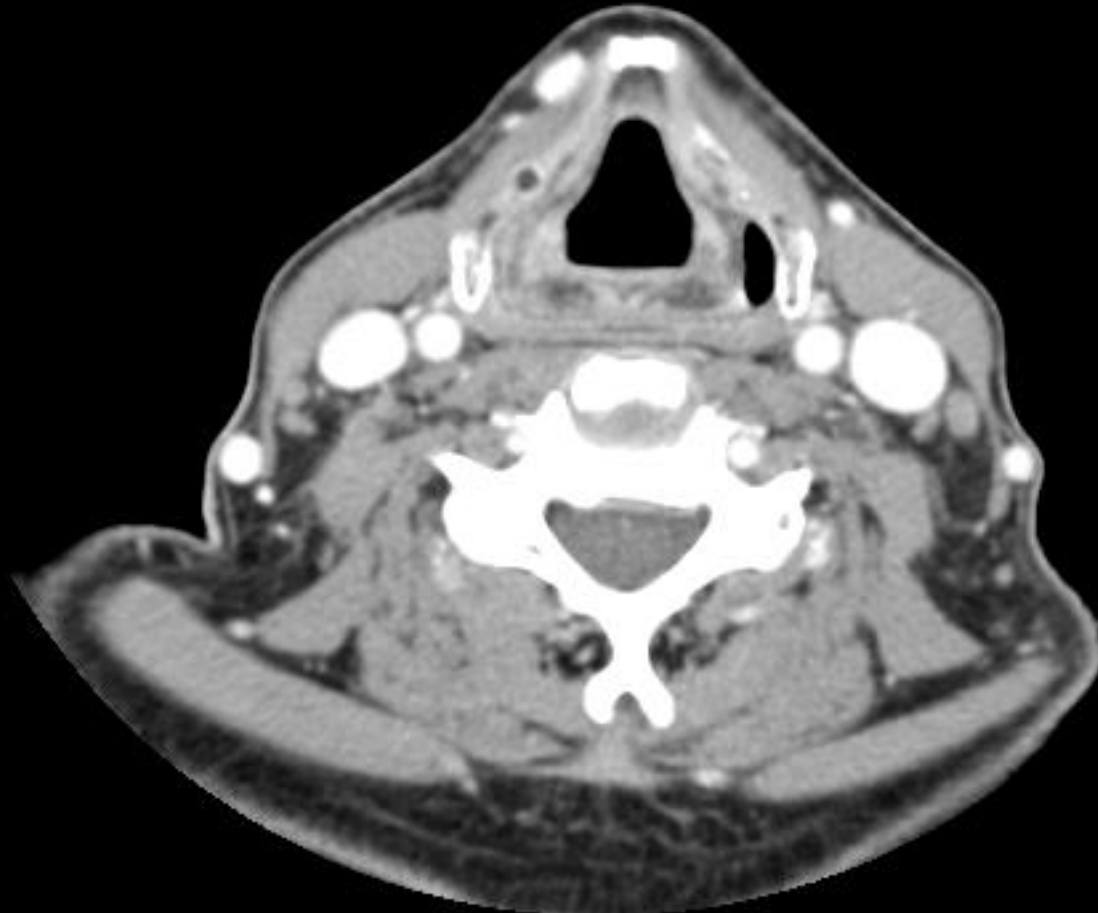
Landmarks

- FALSE CORDS
- hypopharynx

false cord

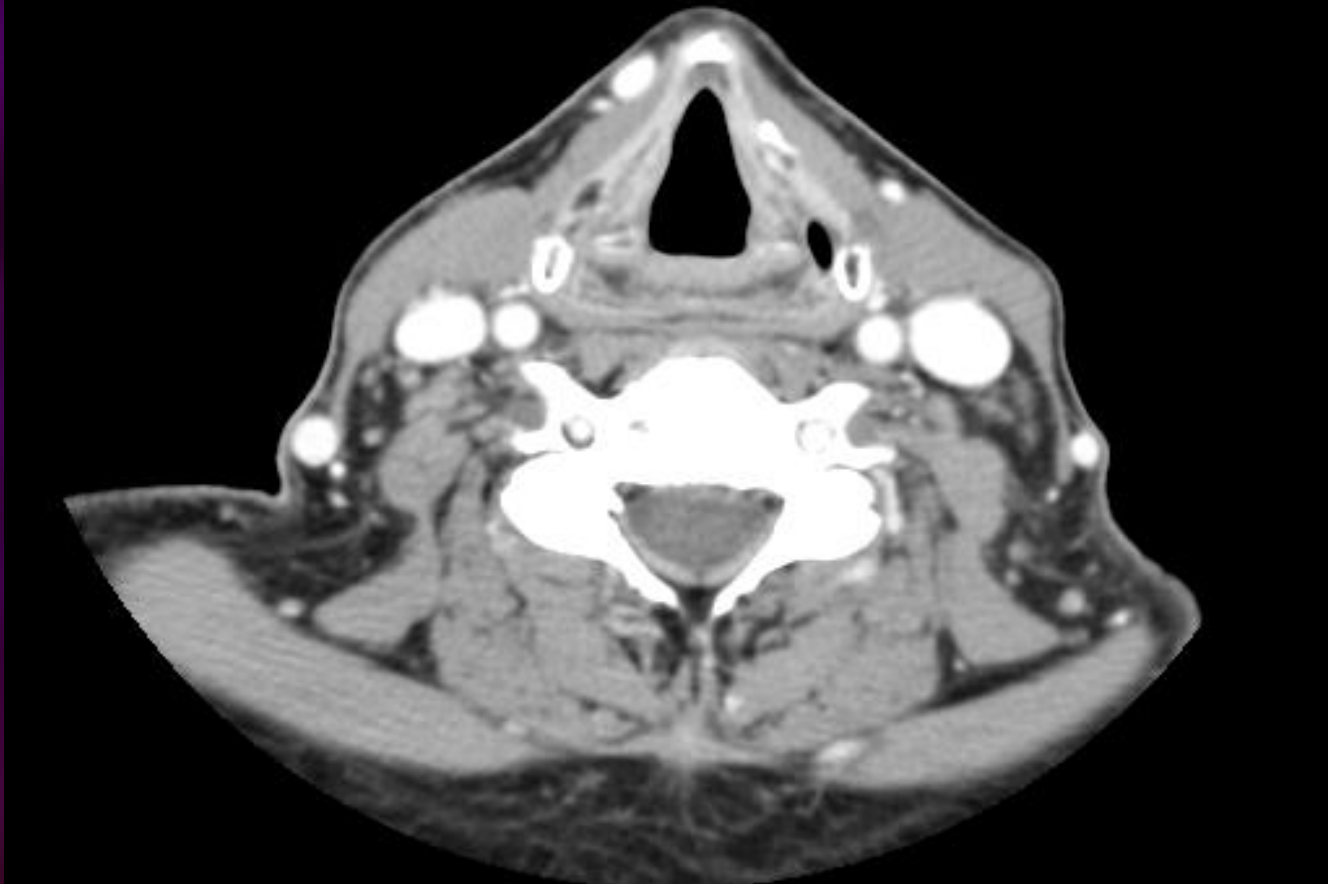
supraglottis

hypopharynx



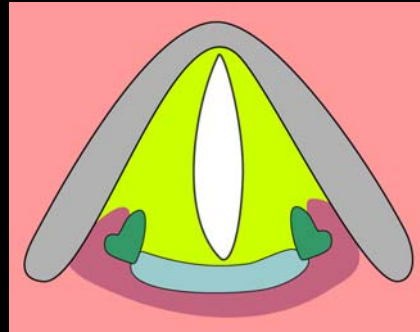
Landmarks

- arytenoid cartilages

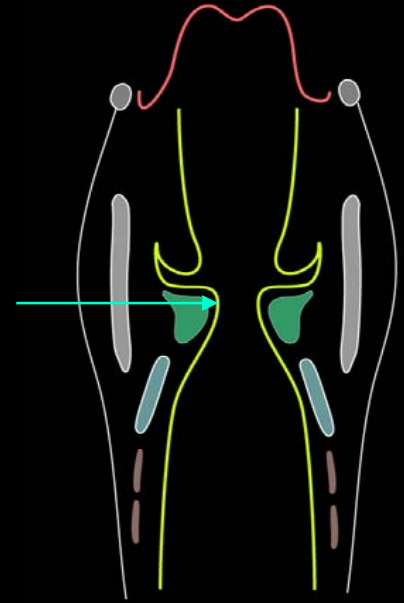
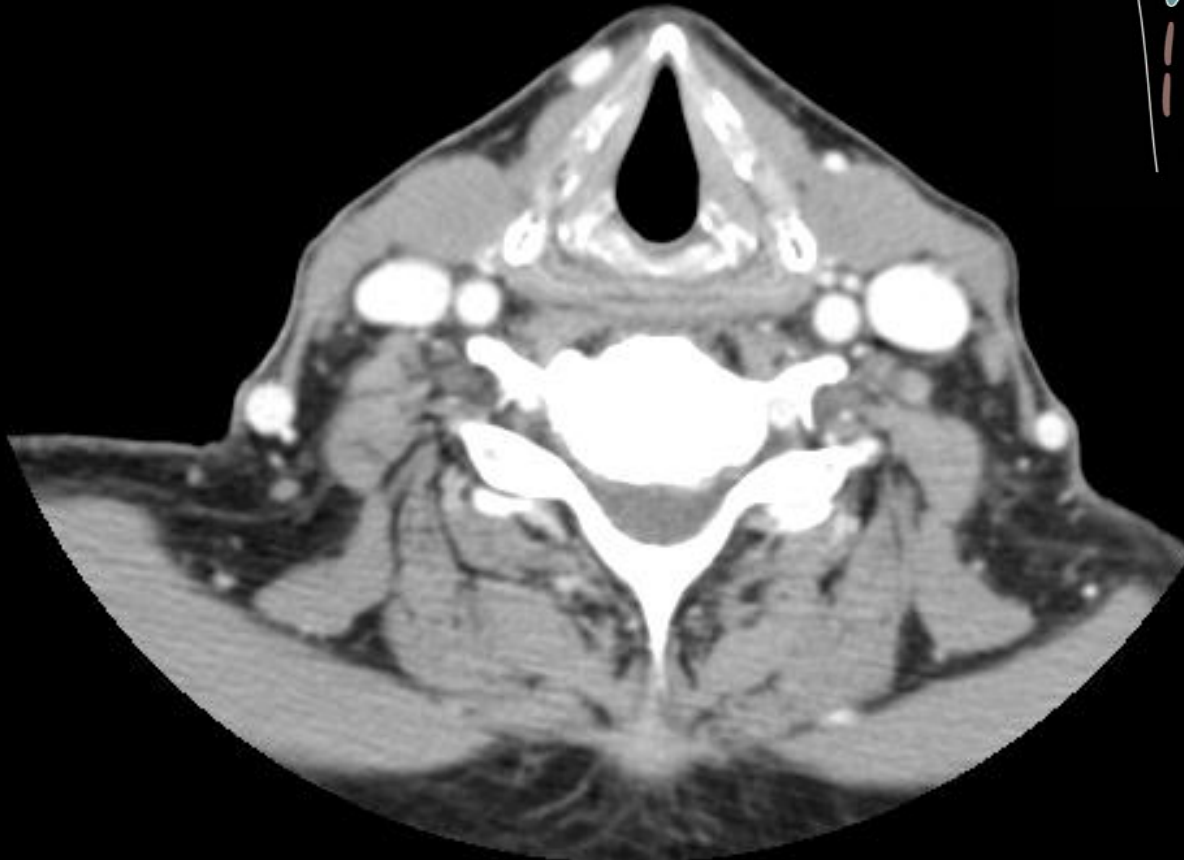


Landmarks

- arytenoid cartilages
- cricoid cartilage
- TRUE CORDS -> glottis

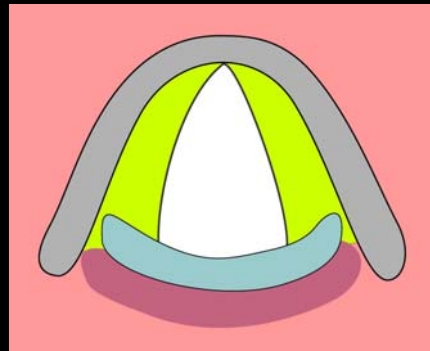


true cords

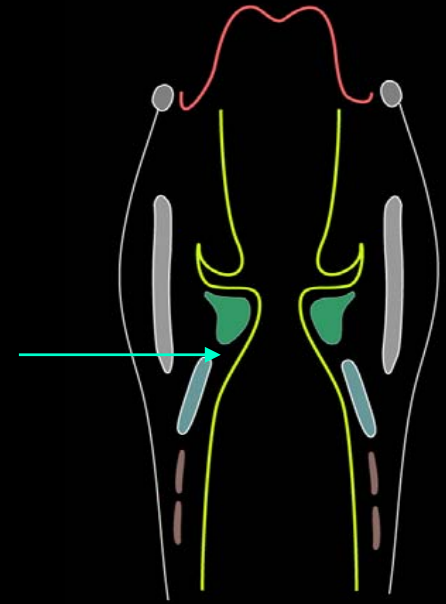
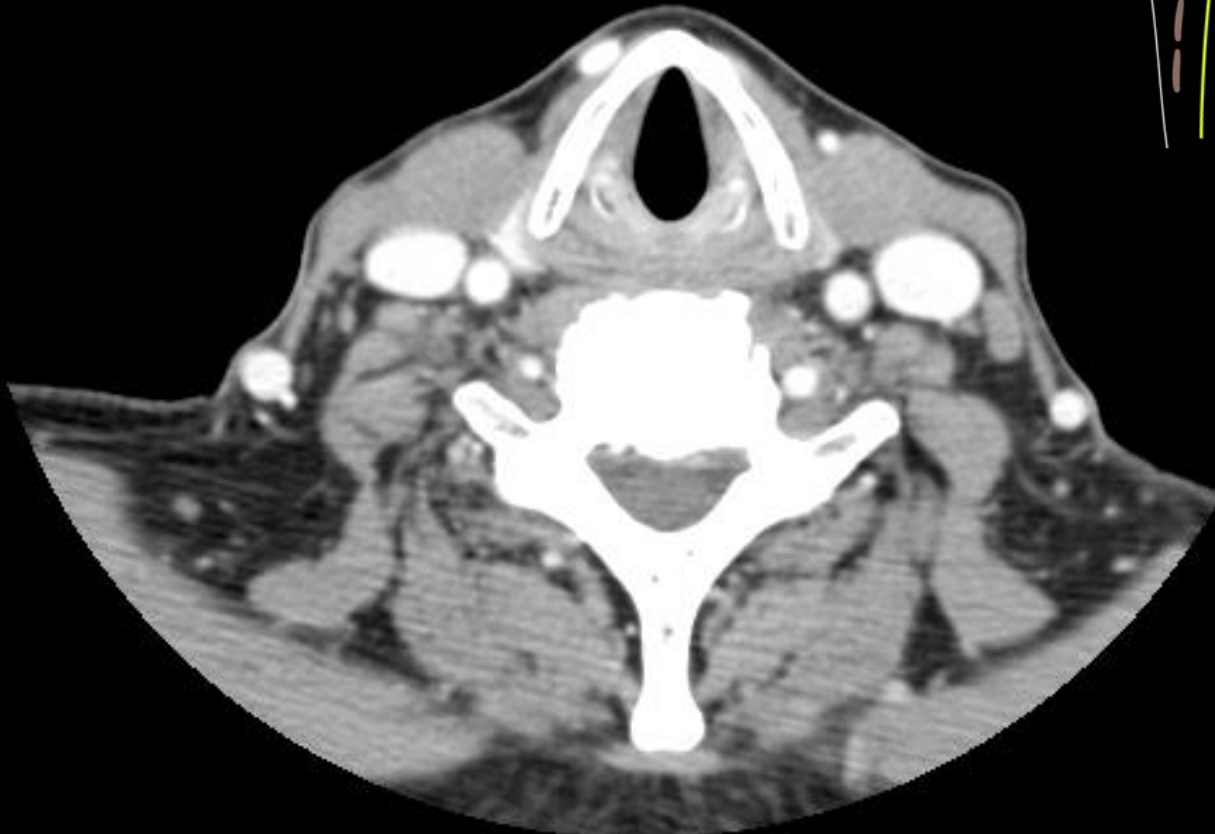


Landmarks

- cricoid cartilage
- true cords (undersurface)

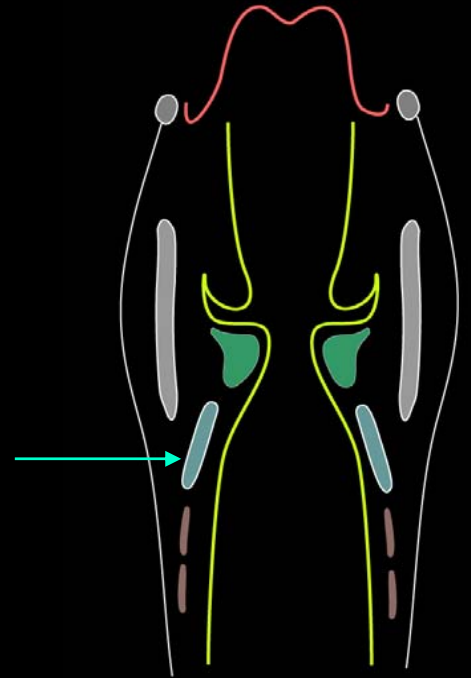


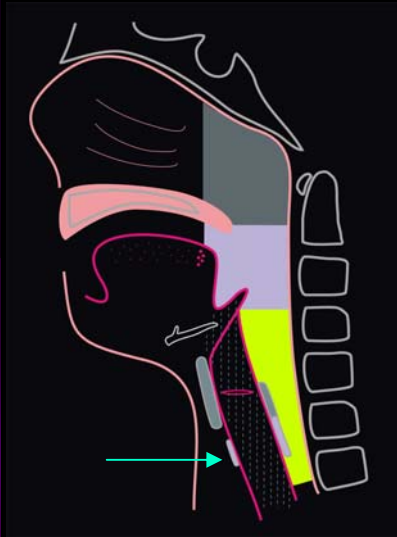
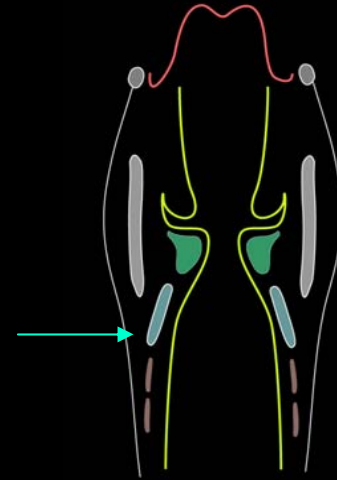
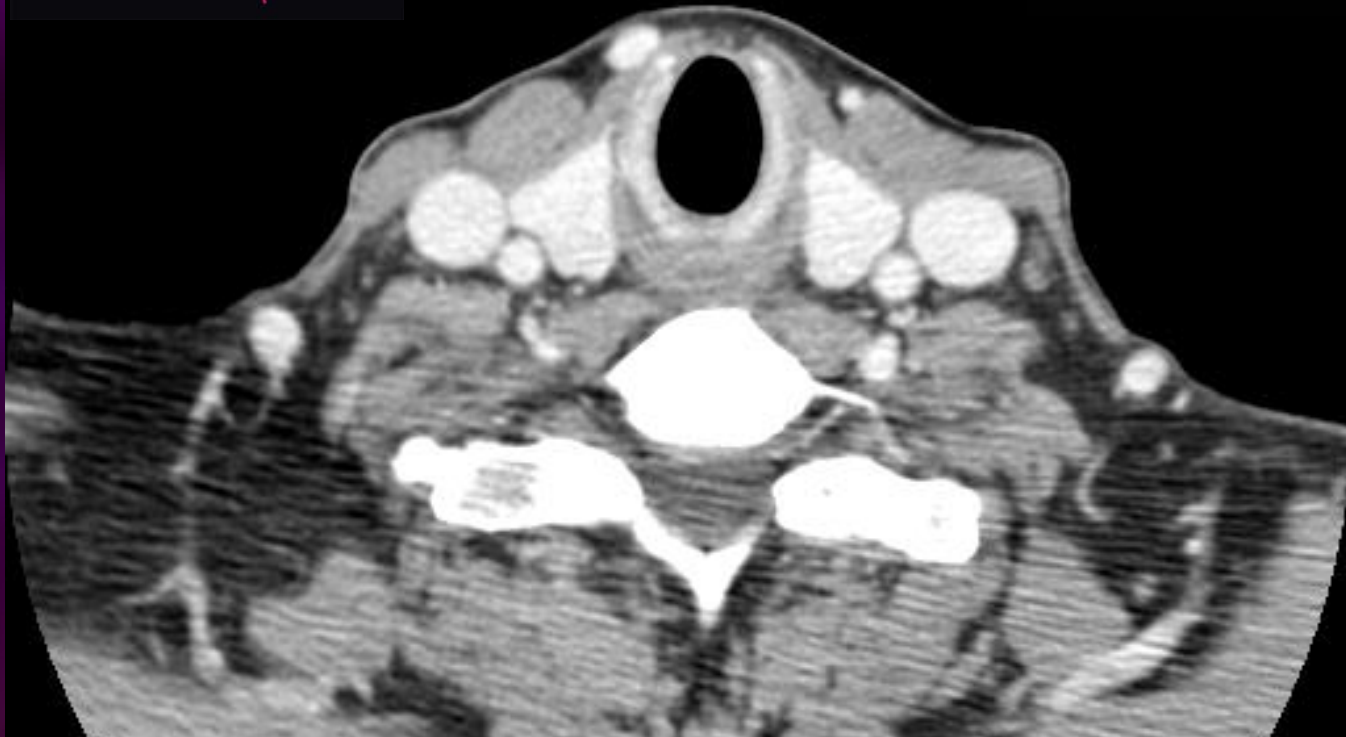
undersurface of true cords



Landmarks

- cricoid cartilage becoming almost complete ring
- infraglottis
- thyroid







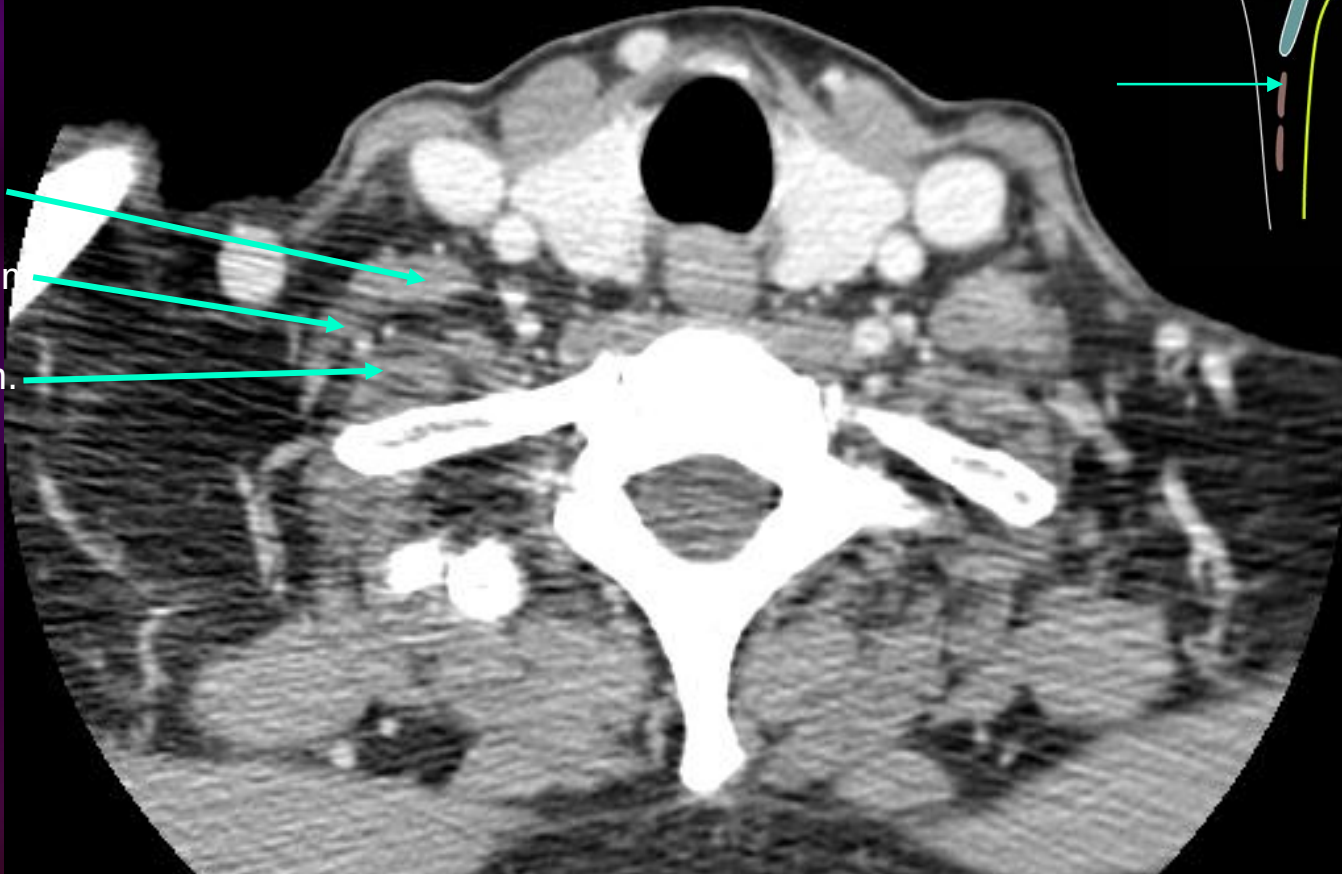
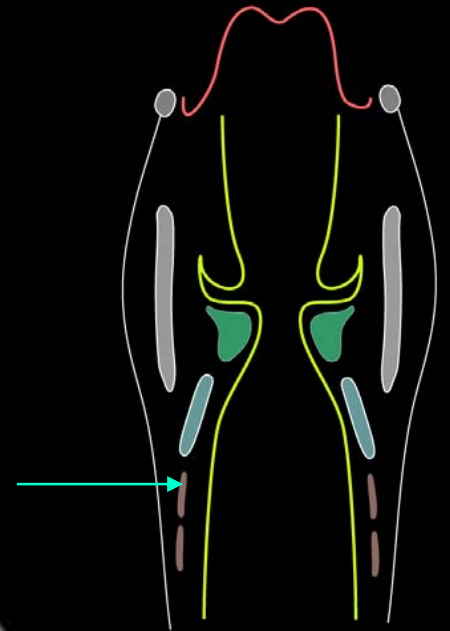
Landmarks

- FIRST TRACHEAL RING – Thoracic Inlet
- Larynx becomes trachea
- Hypopharynx becomes oesophagus
- T1 vertebral body
- Thyroid

Ant. scalene m.

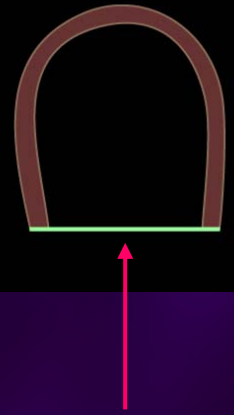
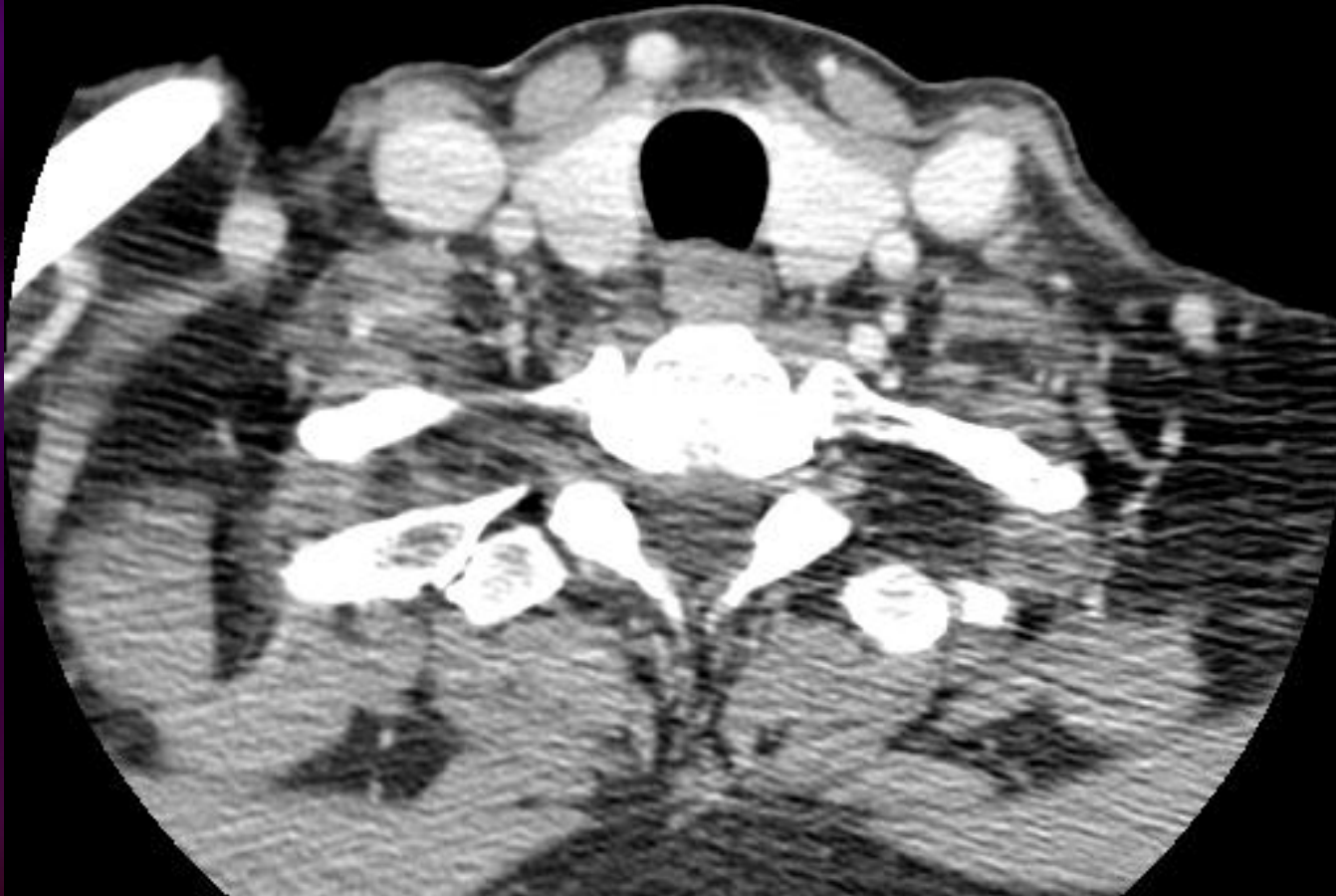
Middle scalene m.

Post. scalene m.



First Tracheal Ring

Flat backed configuration
(2/3 cartilage; posterior wall is membranous)

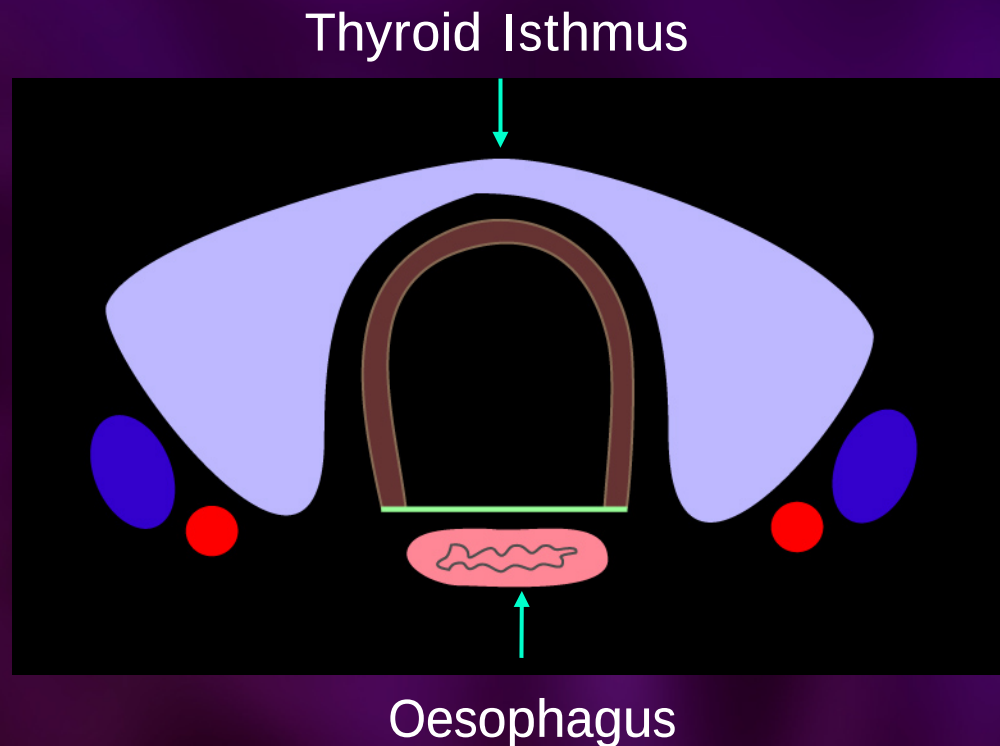


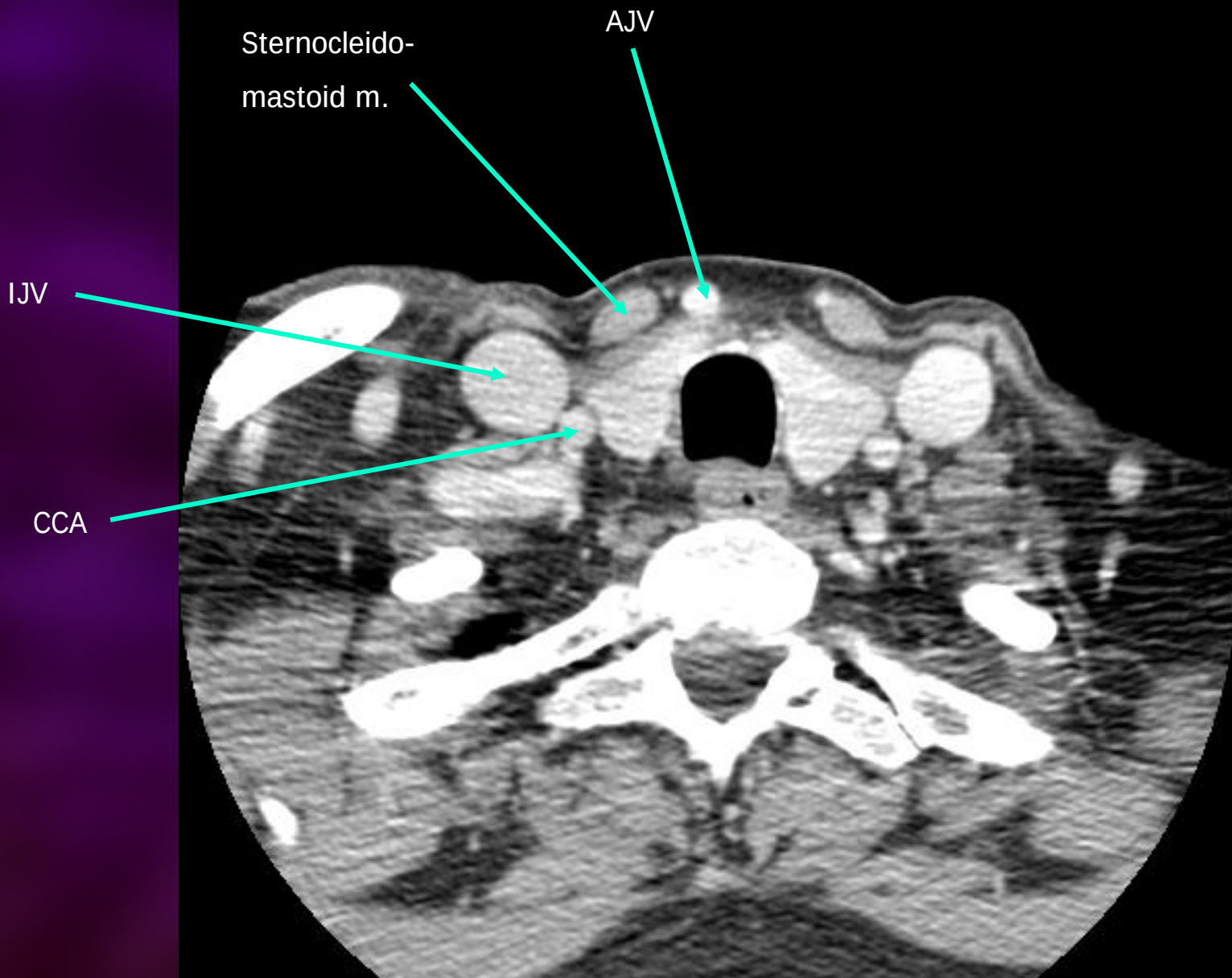
First Tracheal Ring

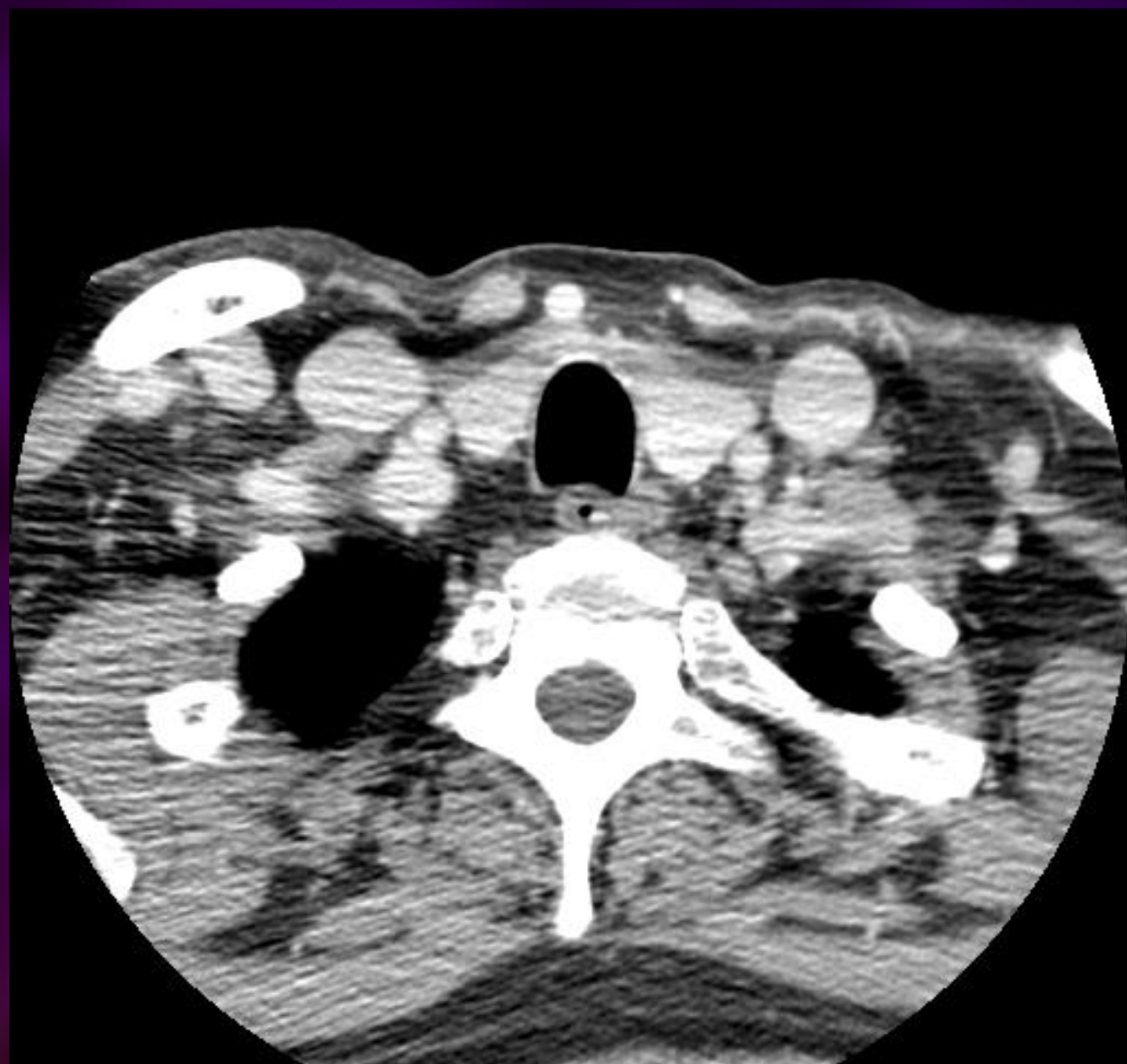
This is a landmark slice! Hence it has its own slide! 😊

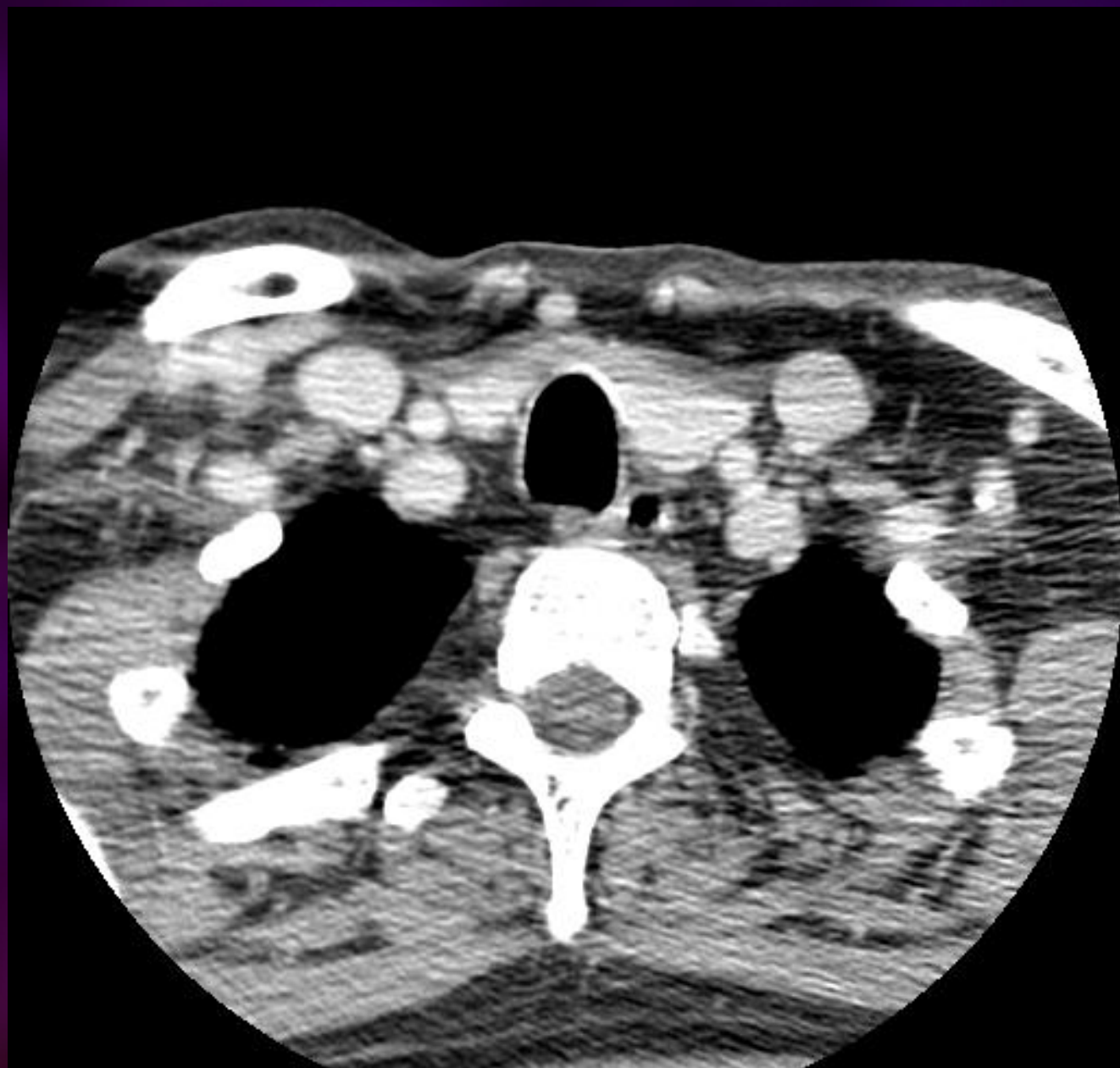
At this level:

- the **larynx** ends and becomes the **trachea**
- the **hypopharynx** ends and becomes the **oesophagus**

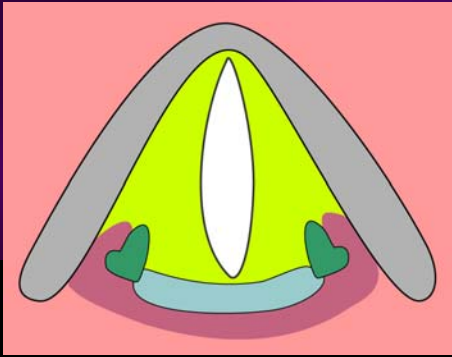
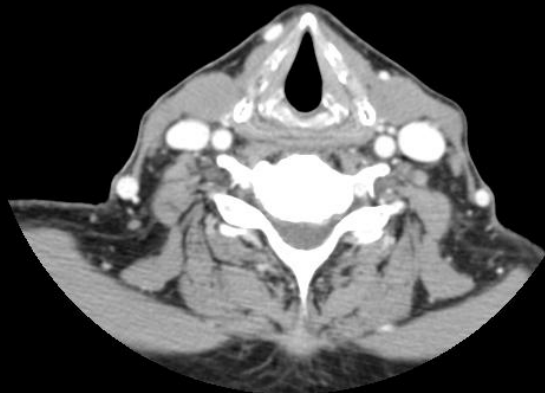




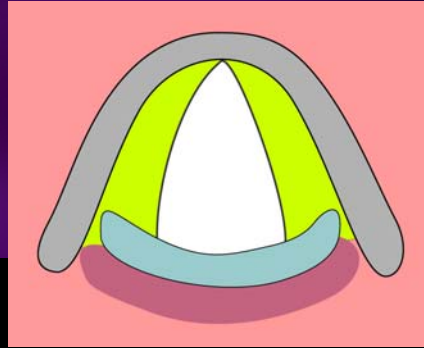




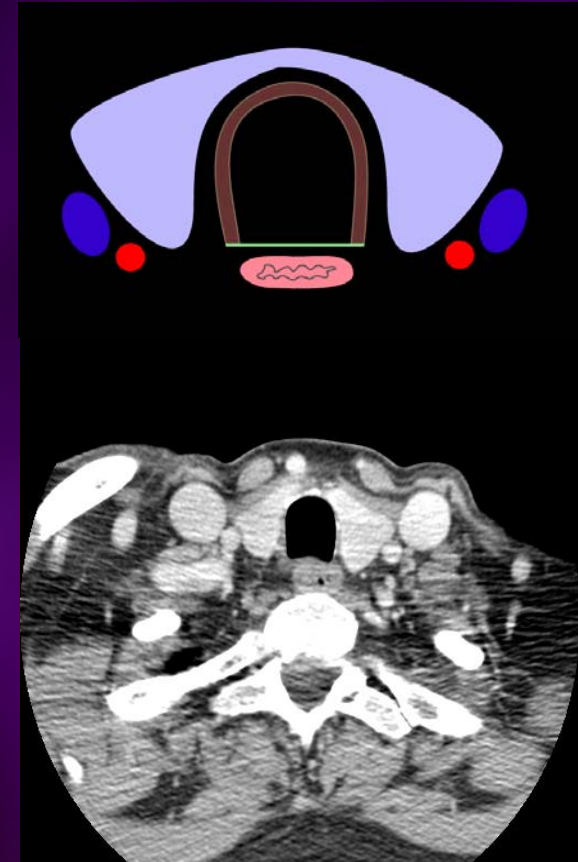
Laryngeal Landmark Slices



true cords

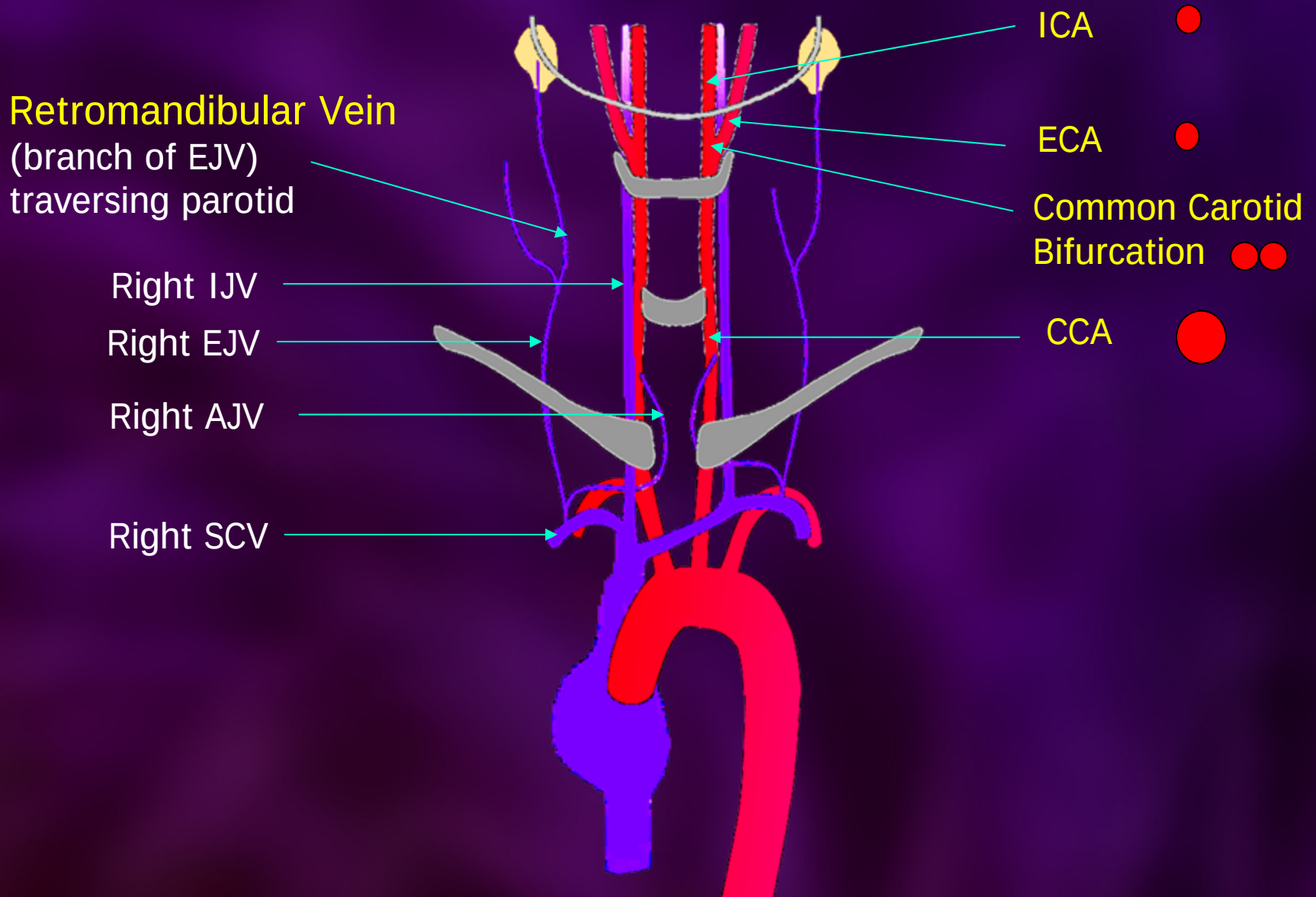


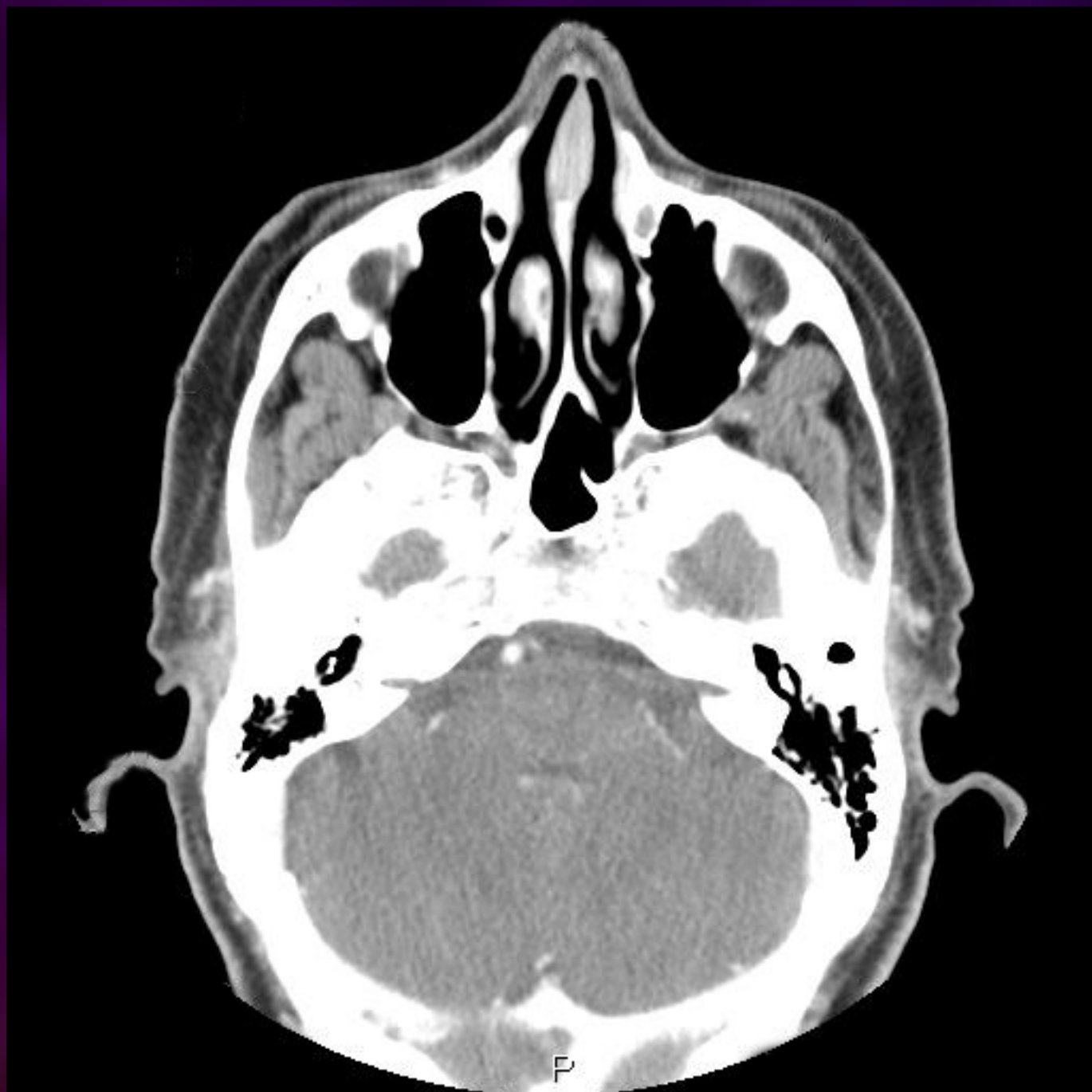
undersurface of true cords

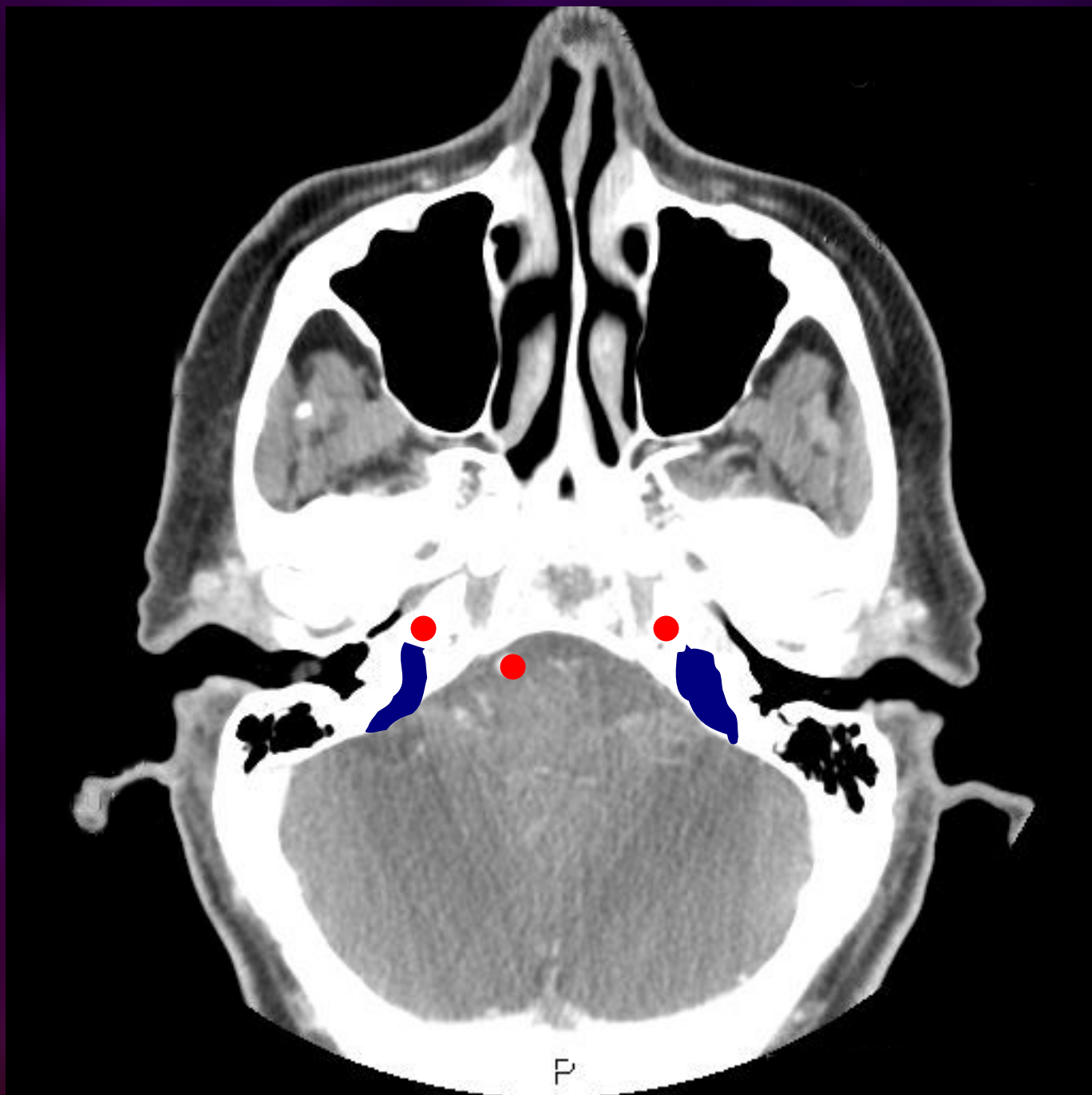


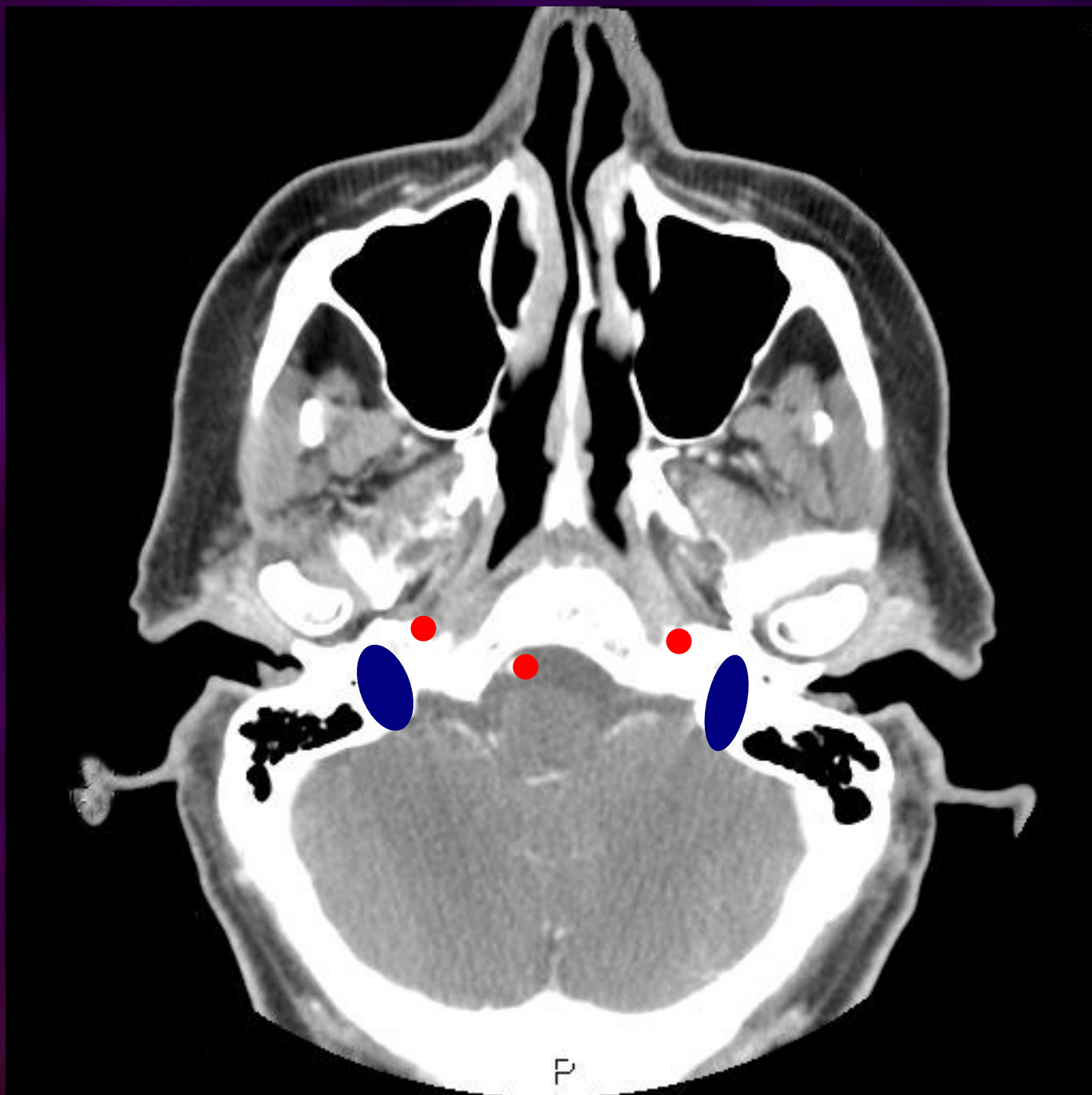
first tracheal ring

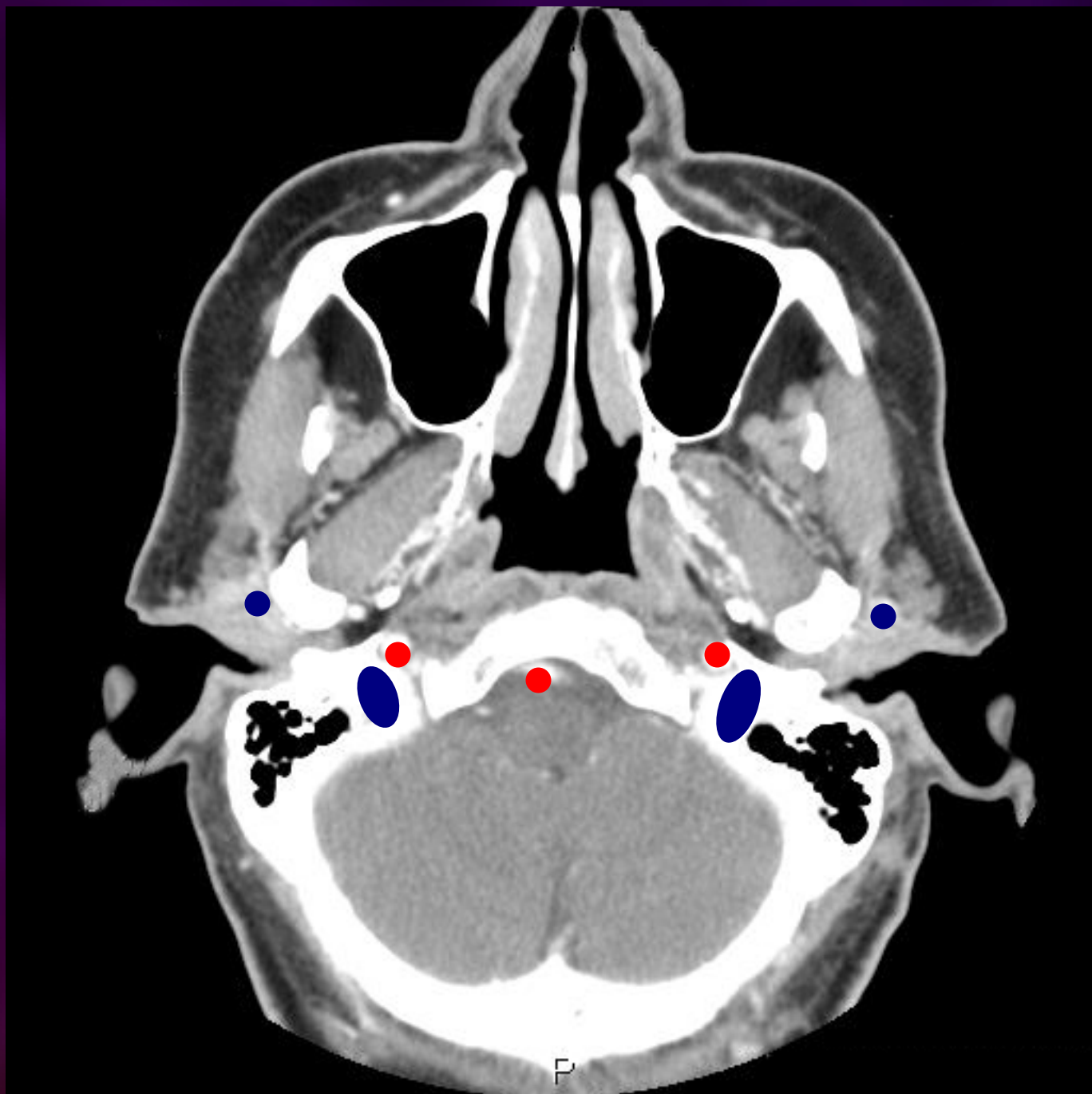
Round 3: Vessels of the Neck

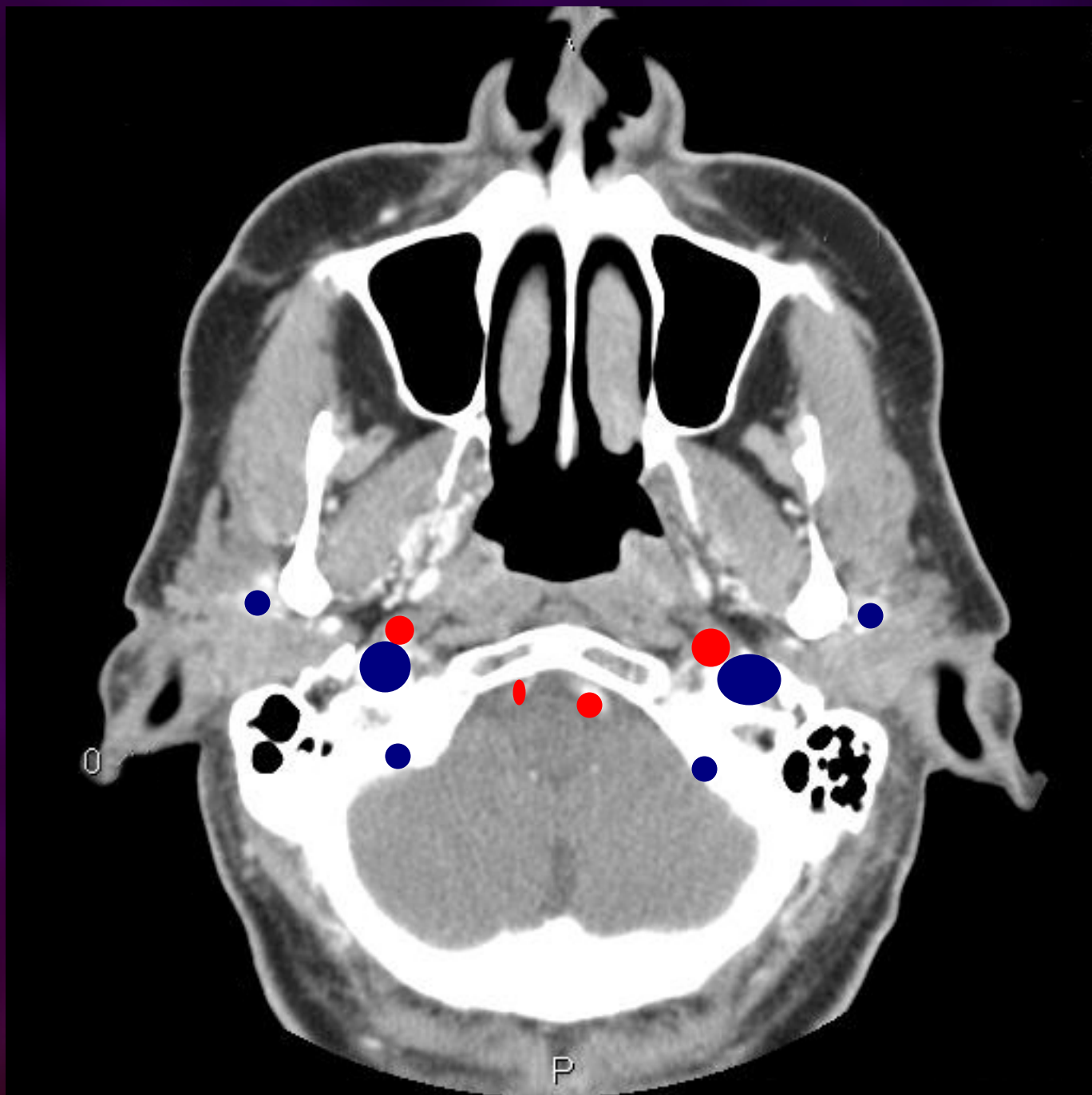




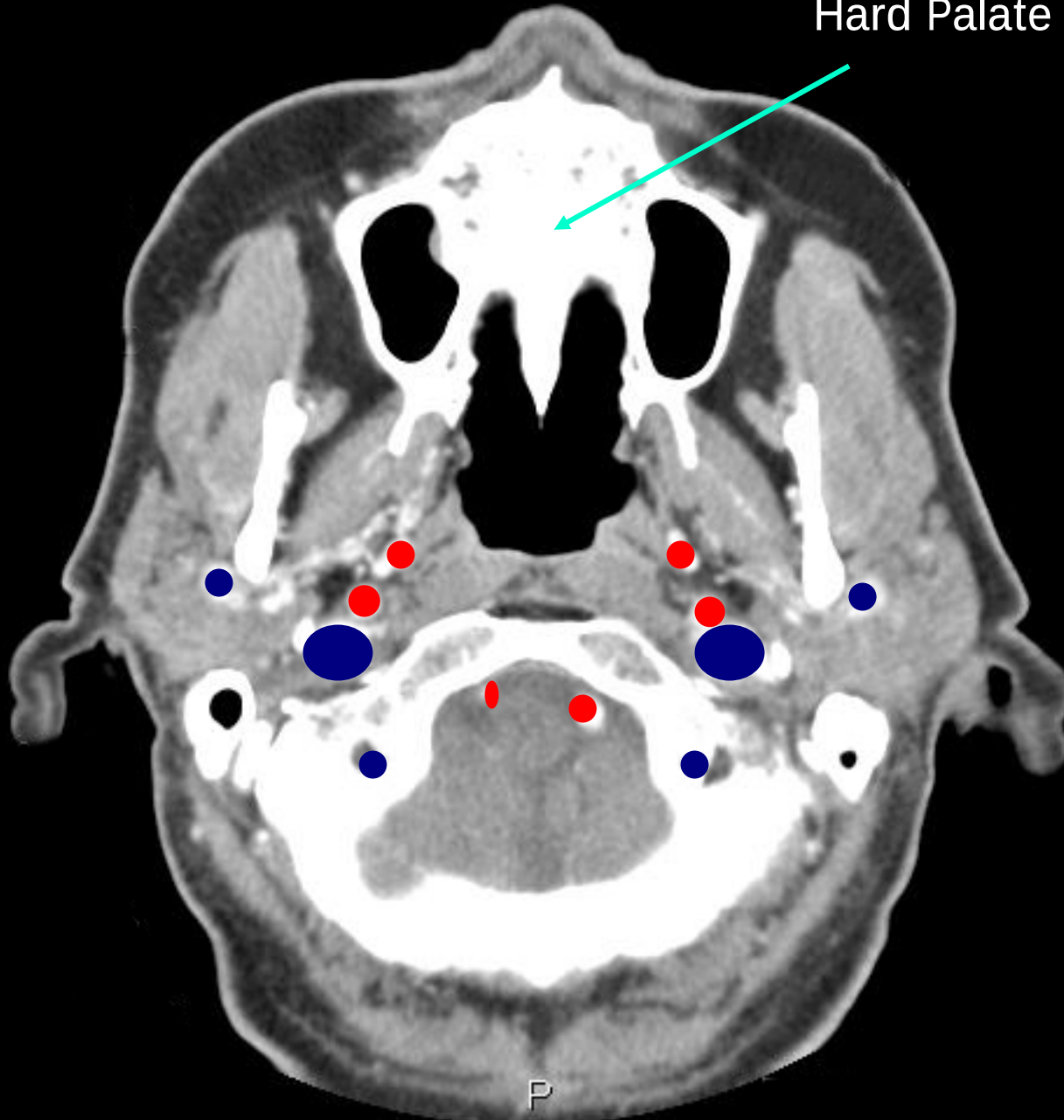


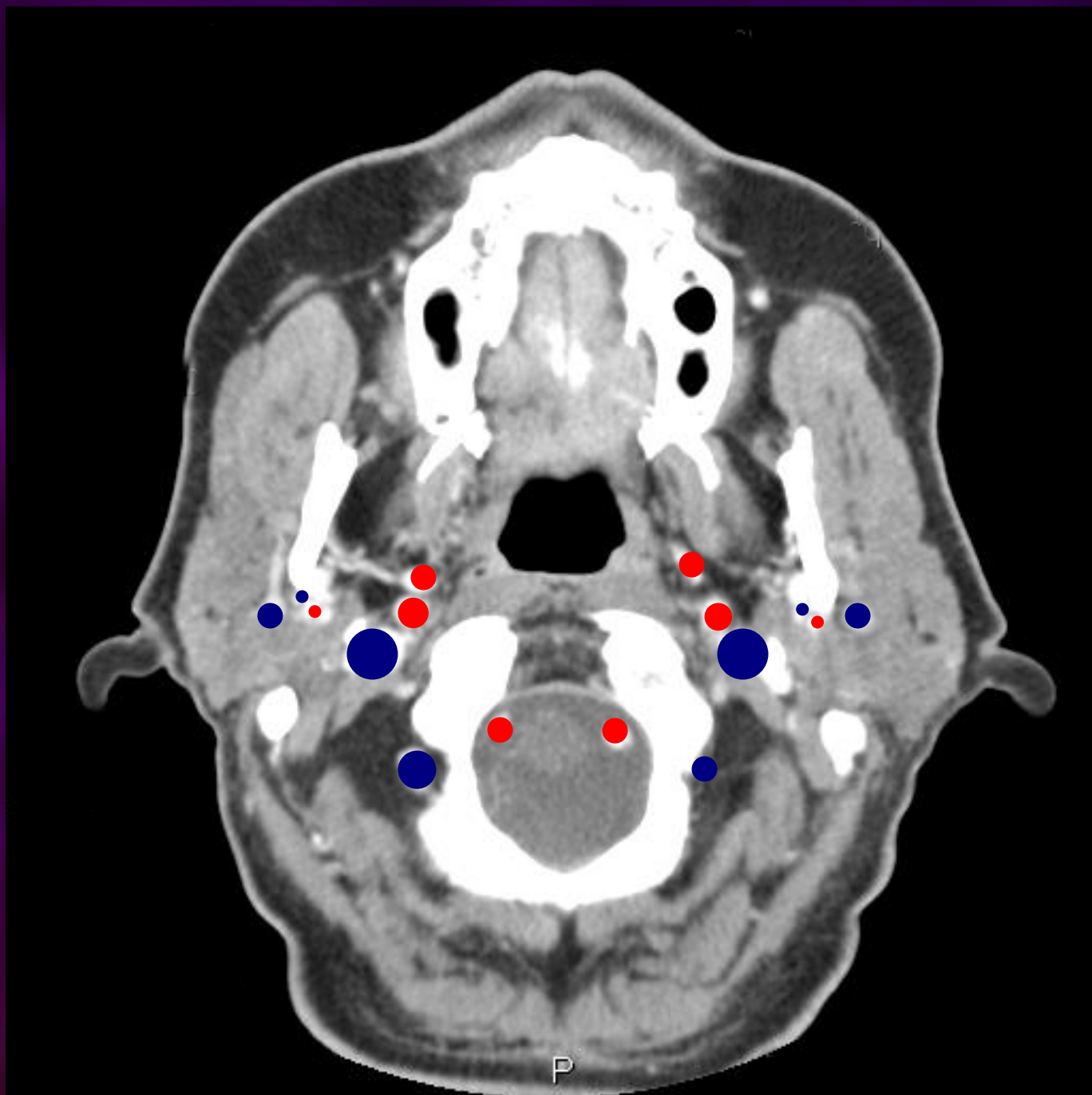






Hard Palate

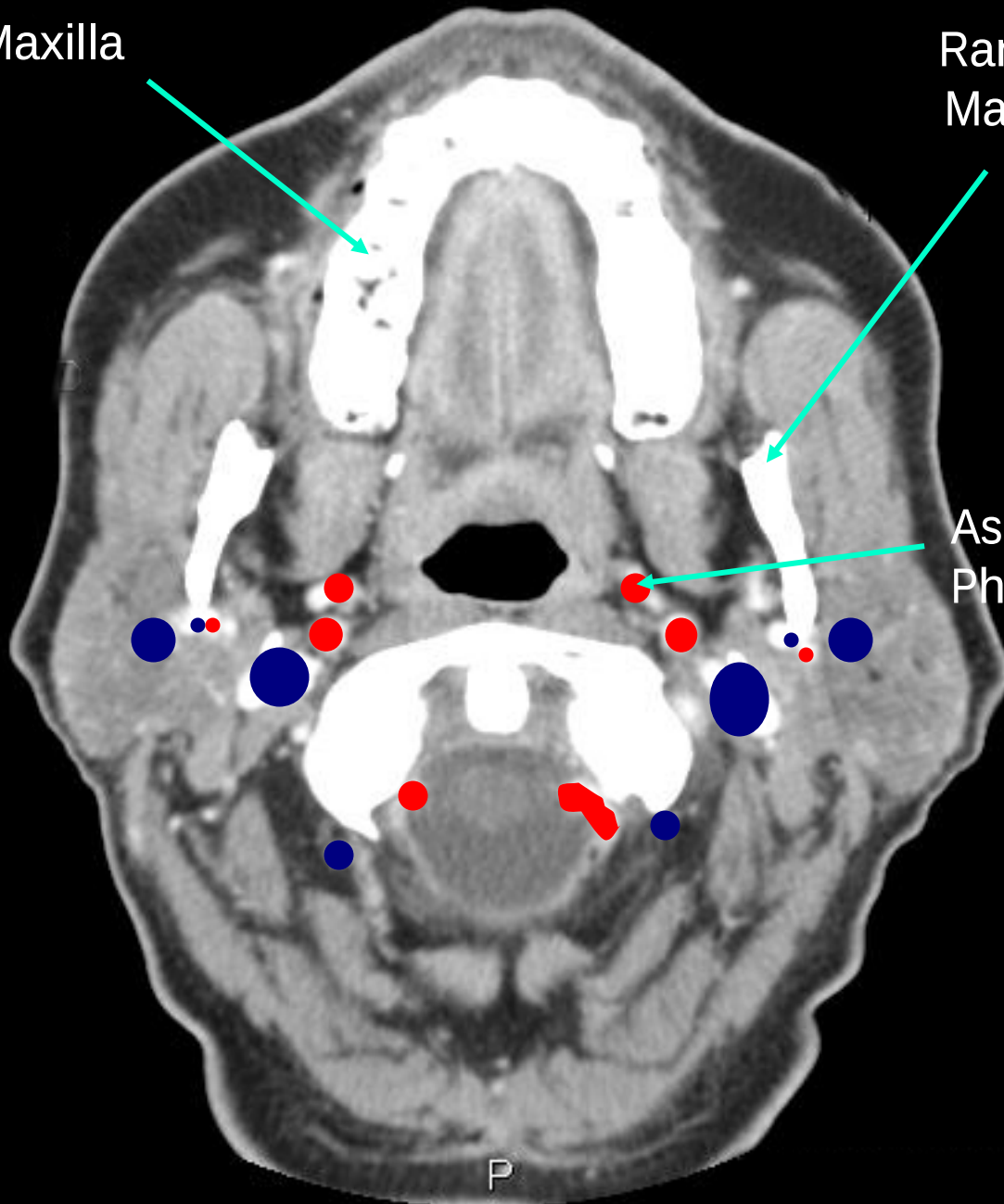


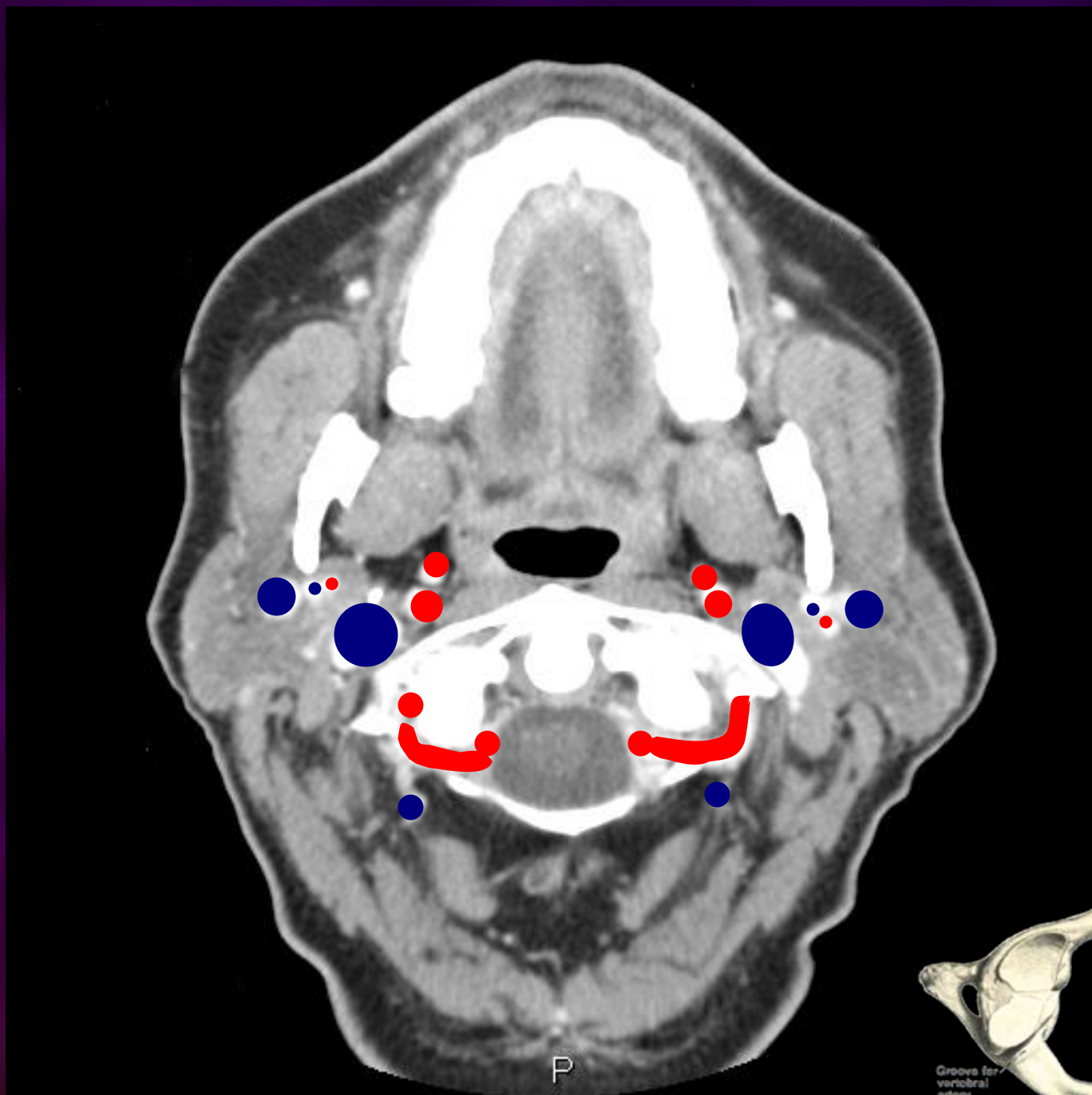


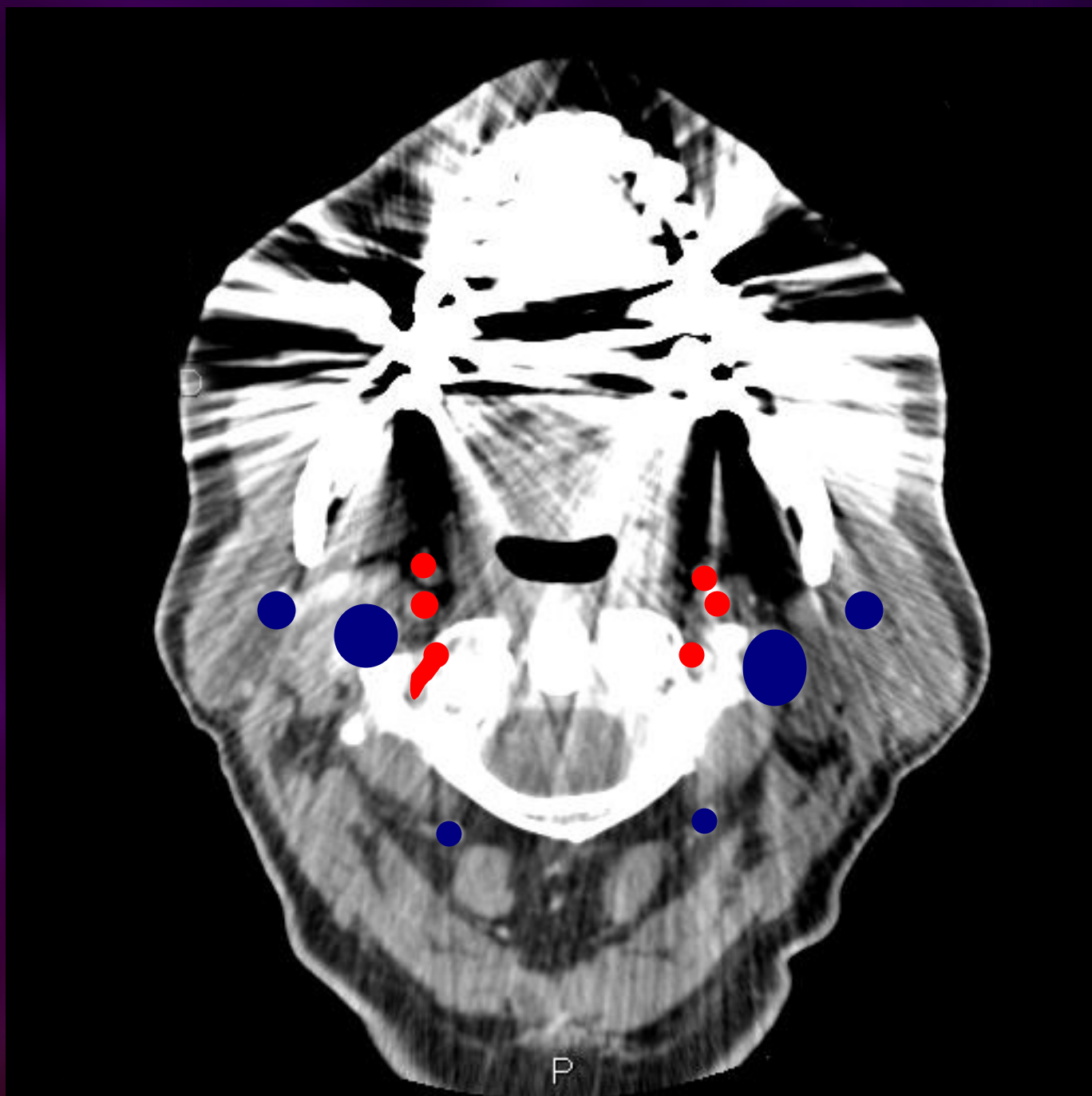
Maxilla

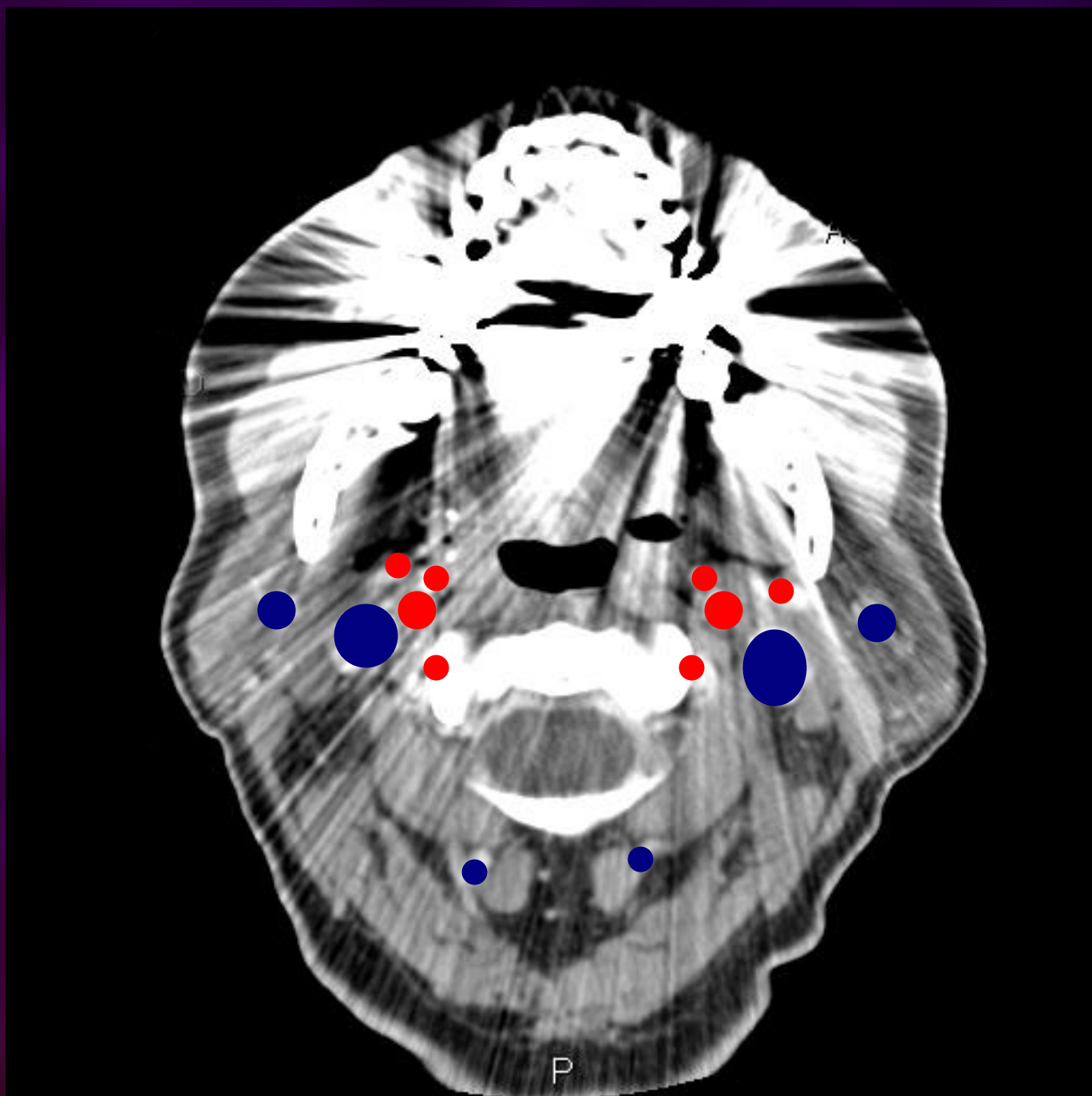
Ramus of
Mandible

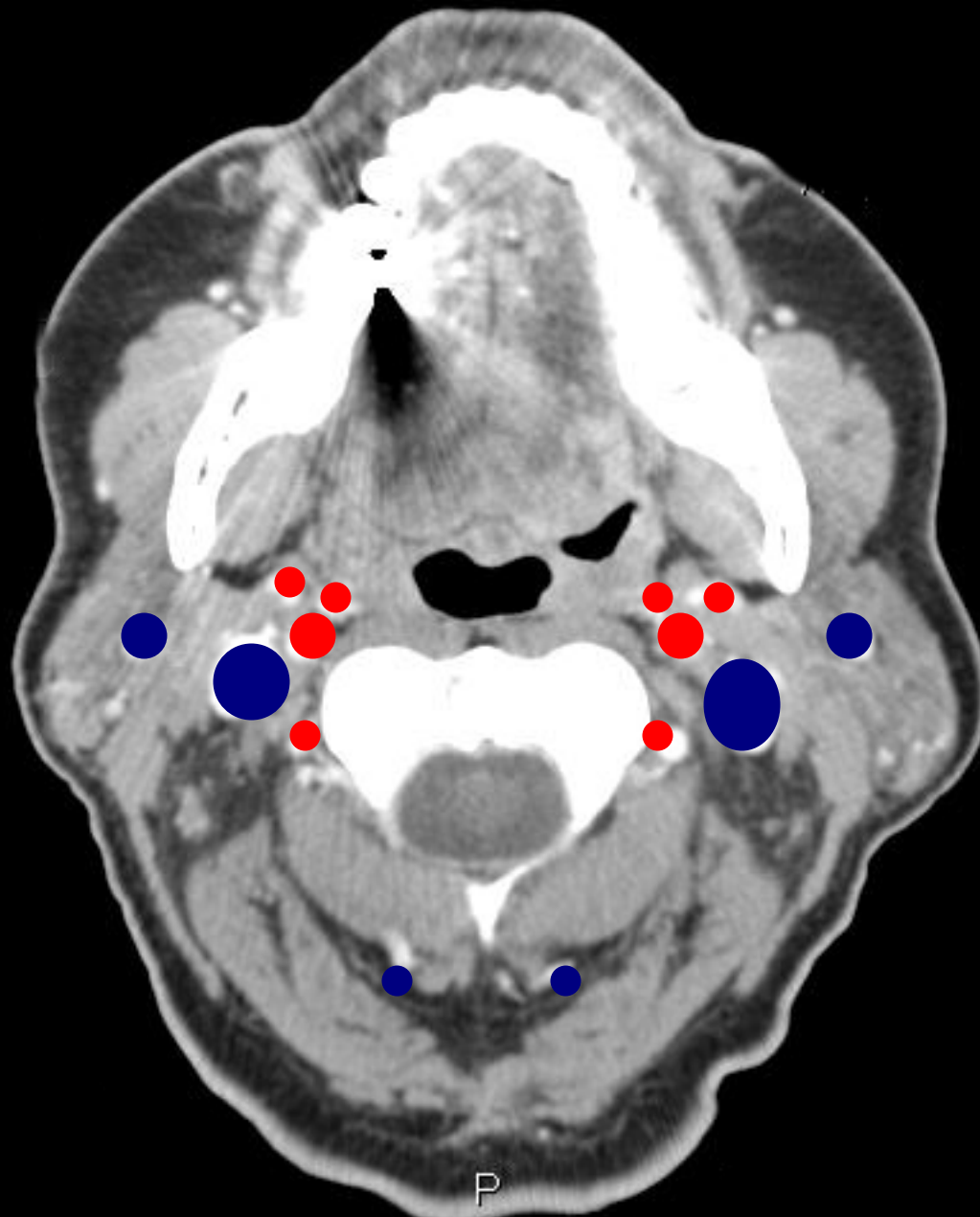
Ascending
Pharyngeal artery



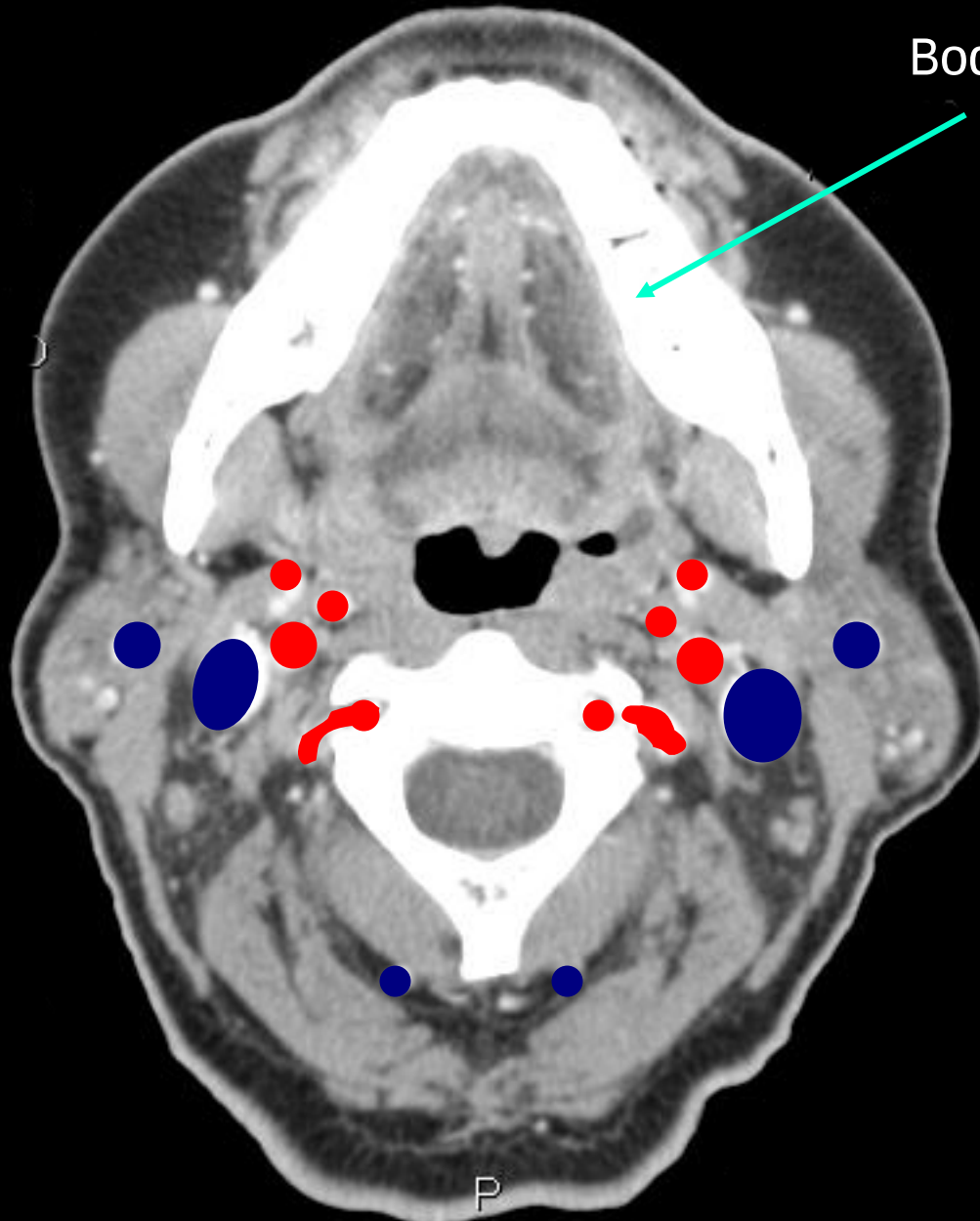


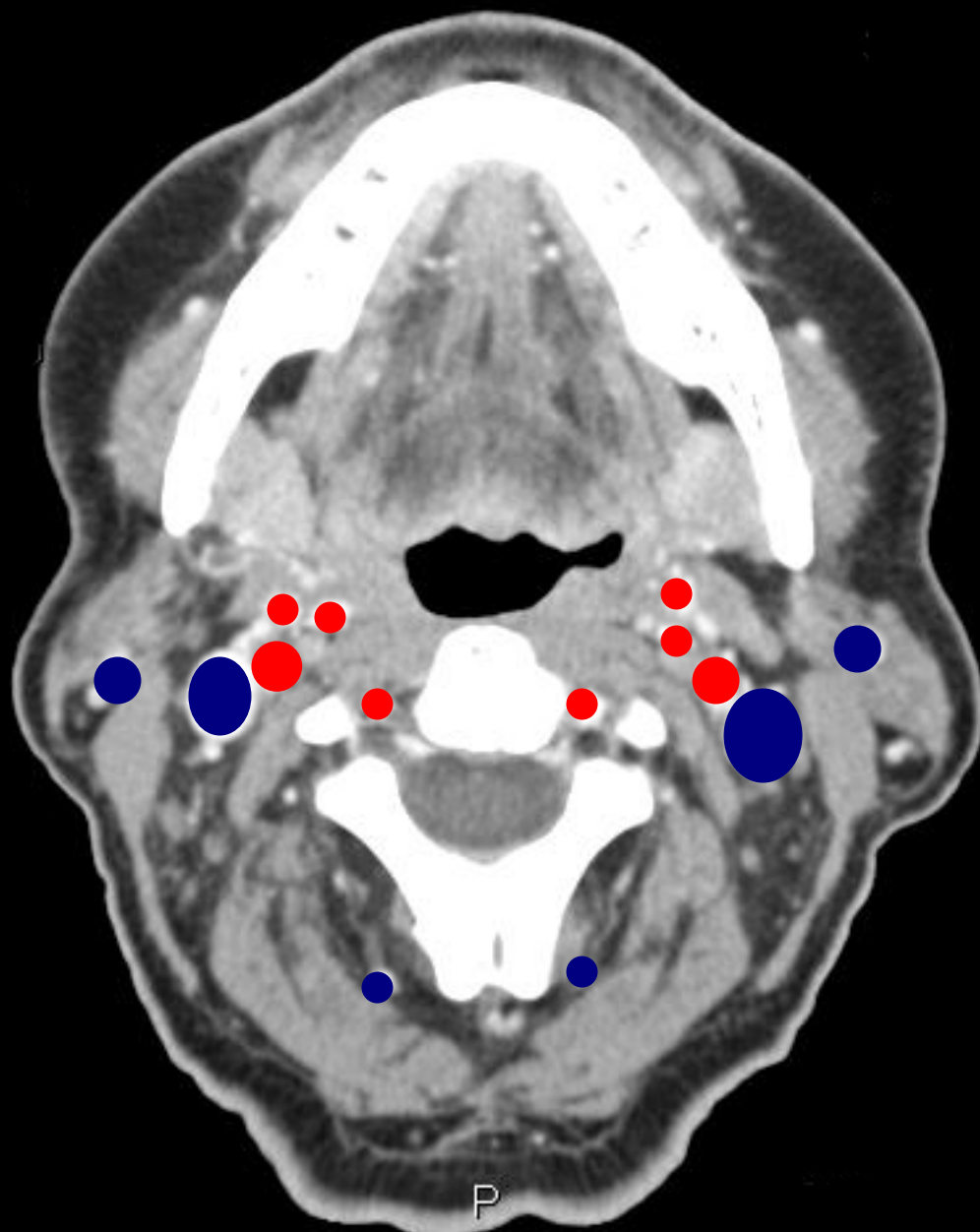


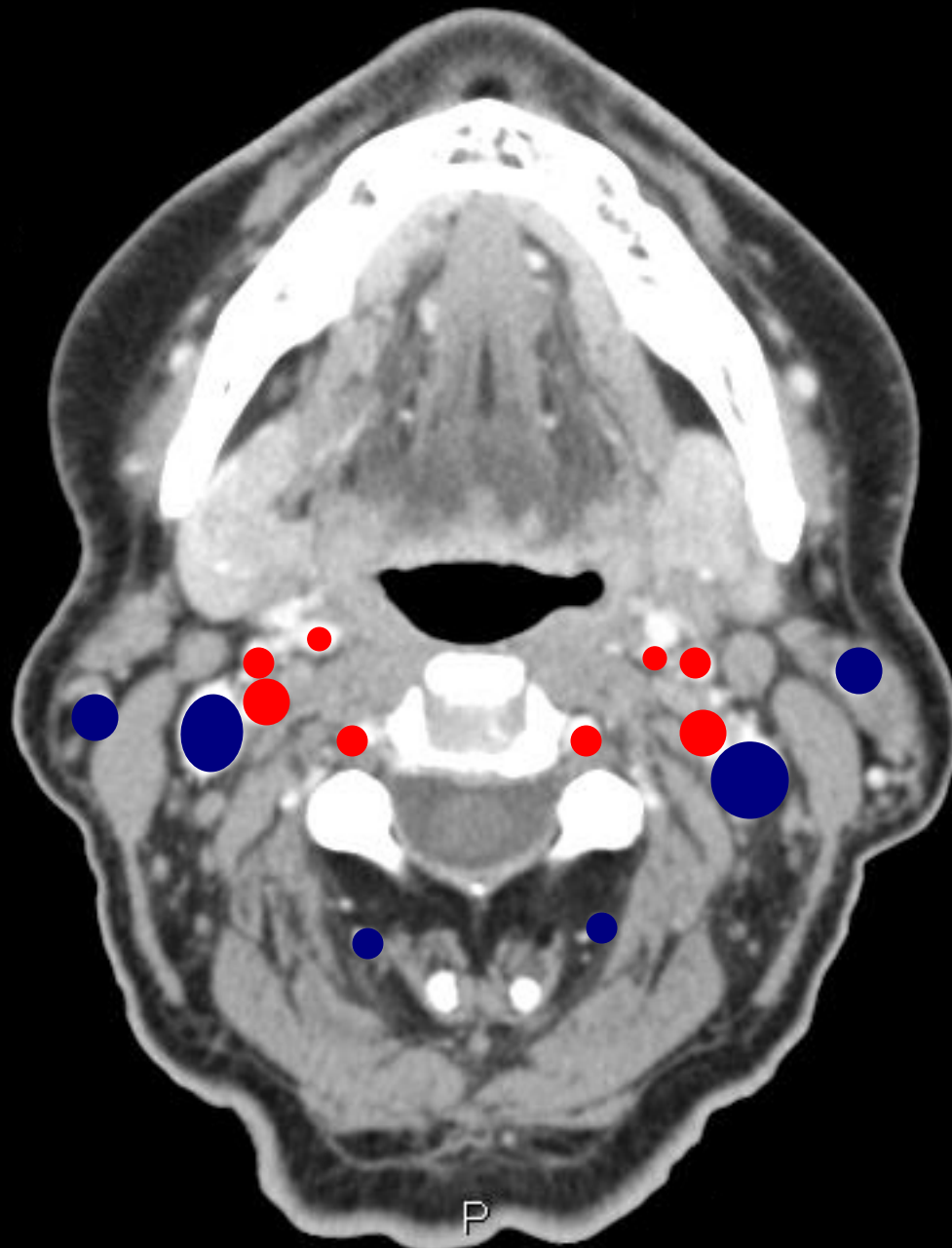


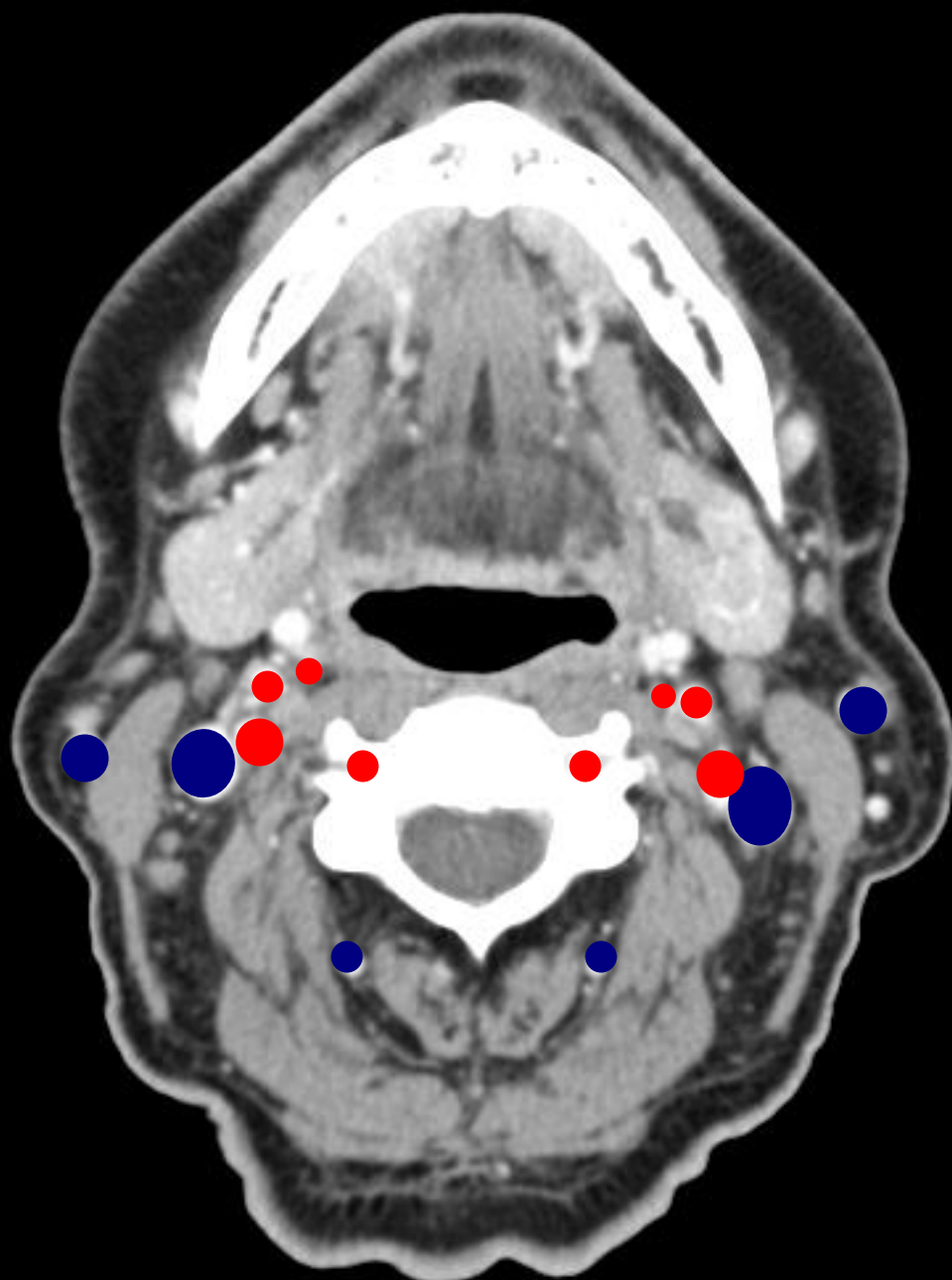


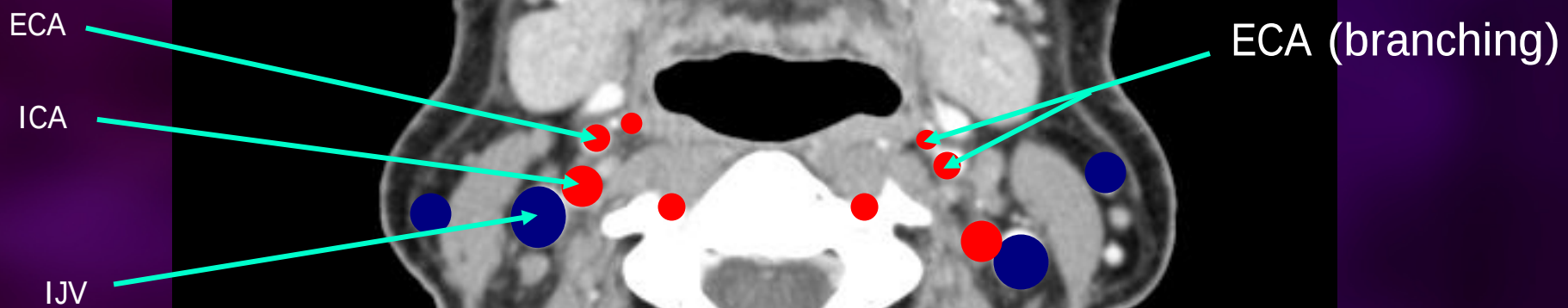
Body of Mandible

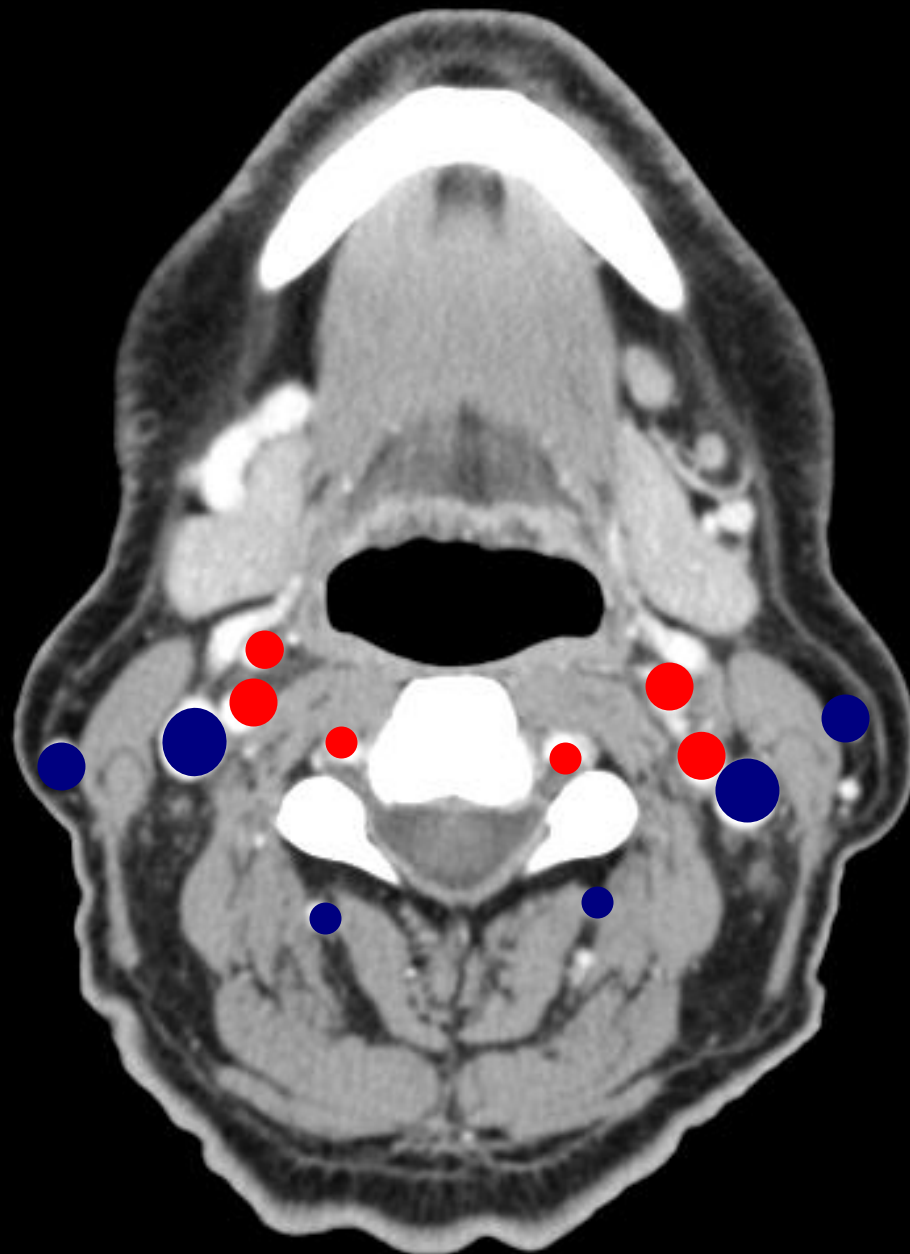


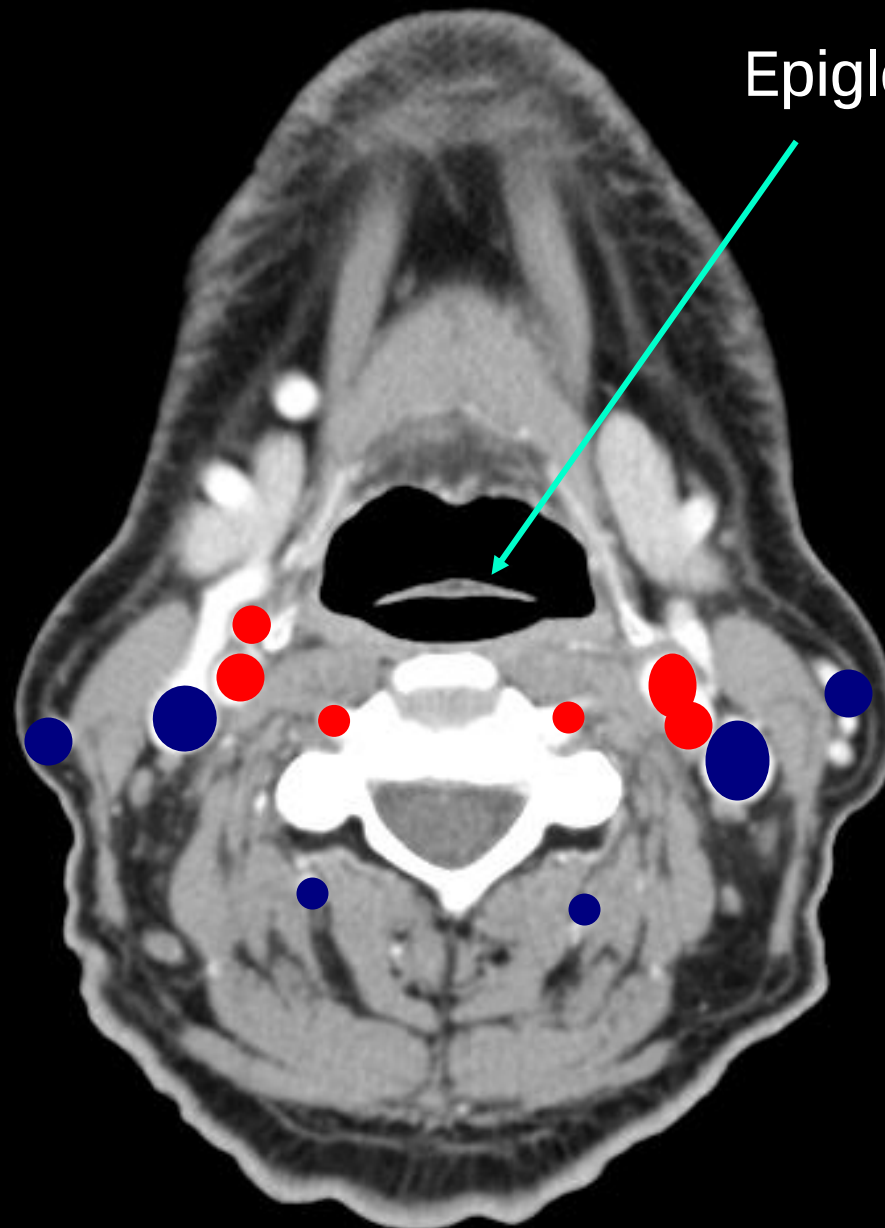




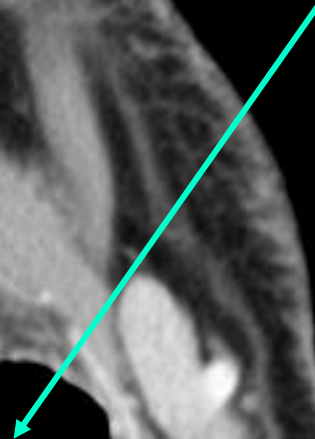








Epiglottis

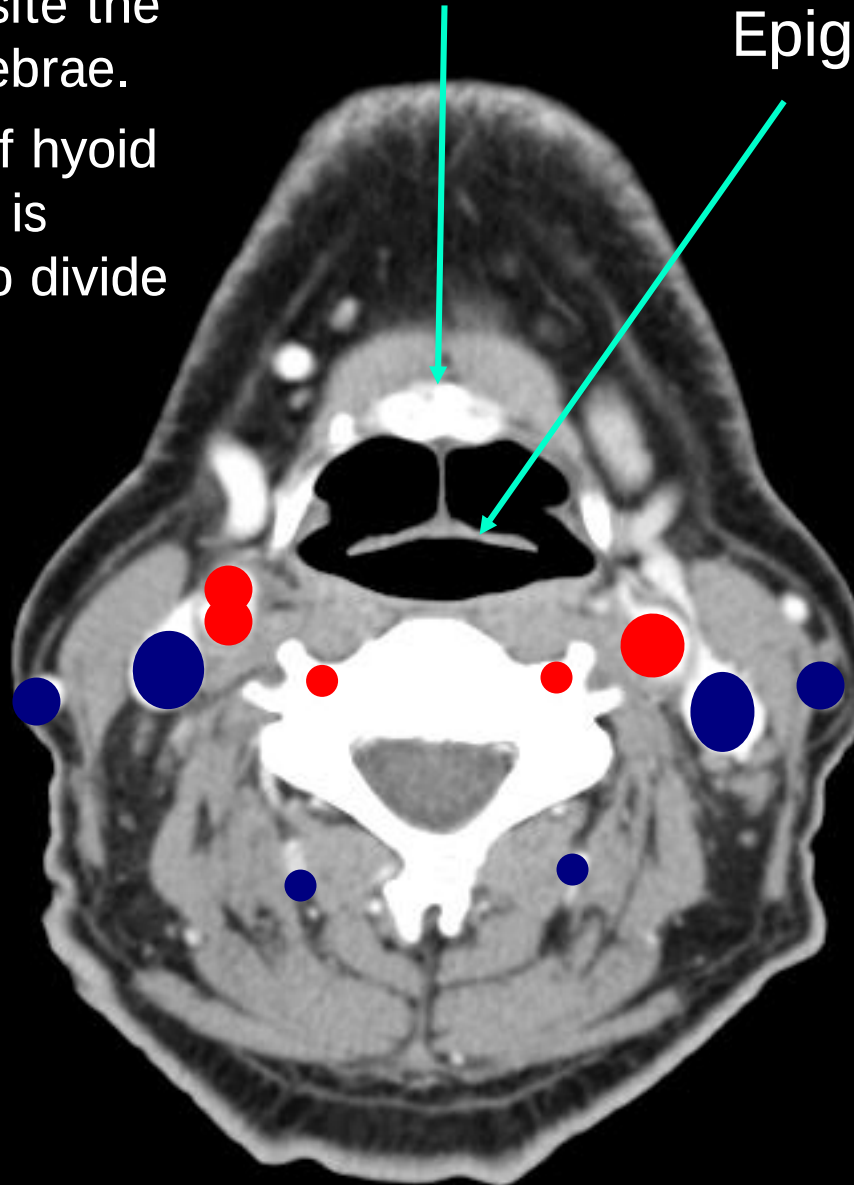


CCA bifurcates to ICA & ECA
at the upper border of
thyroid cartilage opposite the
disc btw C3 & C4 vertebrae.

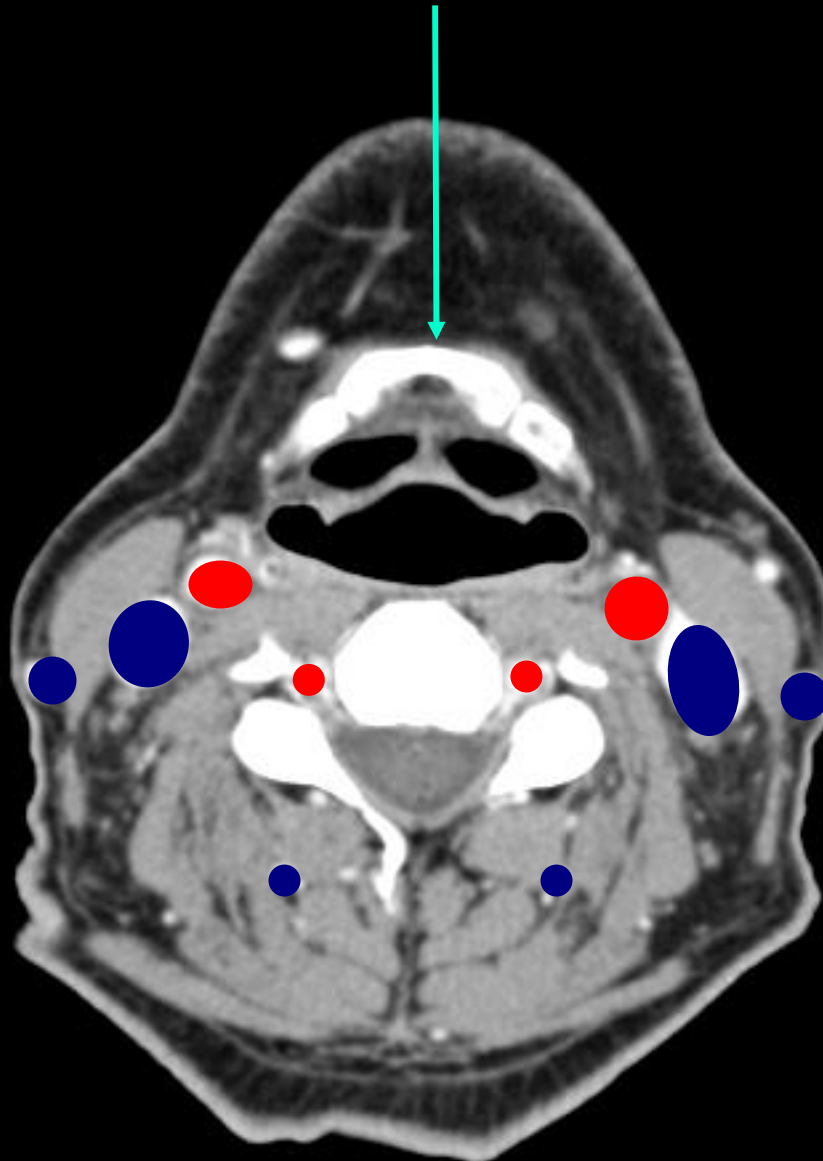
Near the upper level of hyoid
bone, where epiglottis is
seen, the CCA starts to divide
into ICA & ECA

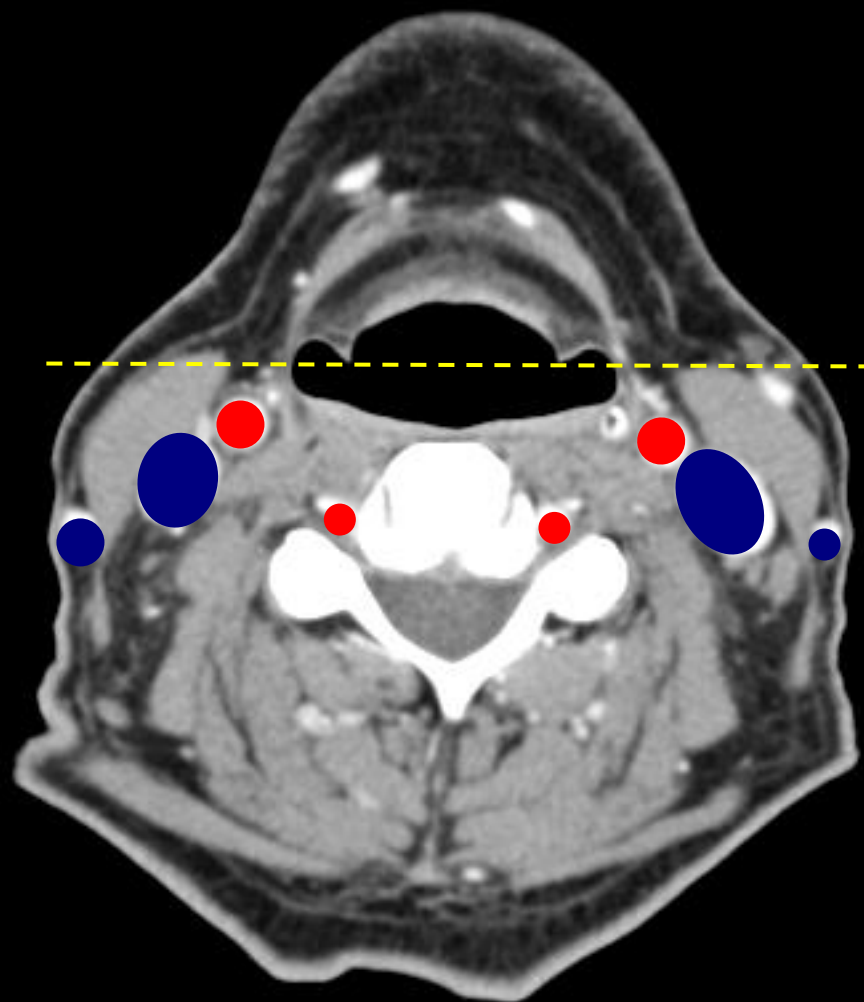
HYOID BONE

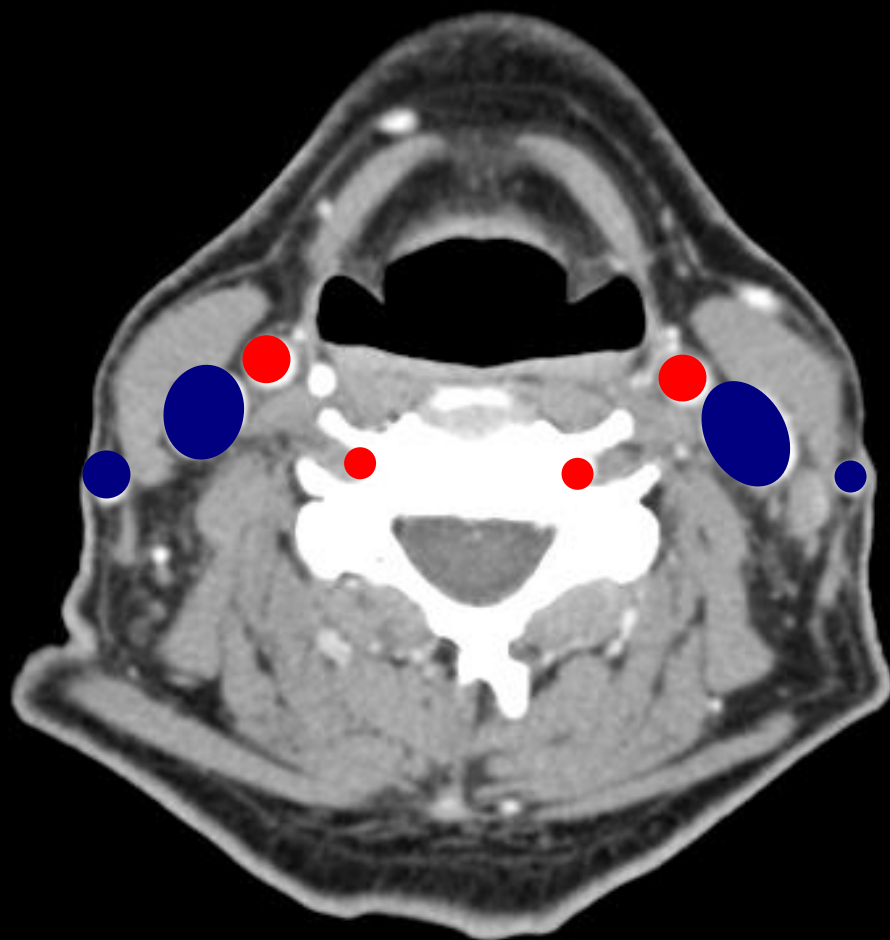
Epiglottis



HYOID BONE

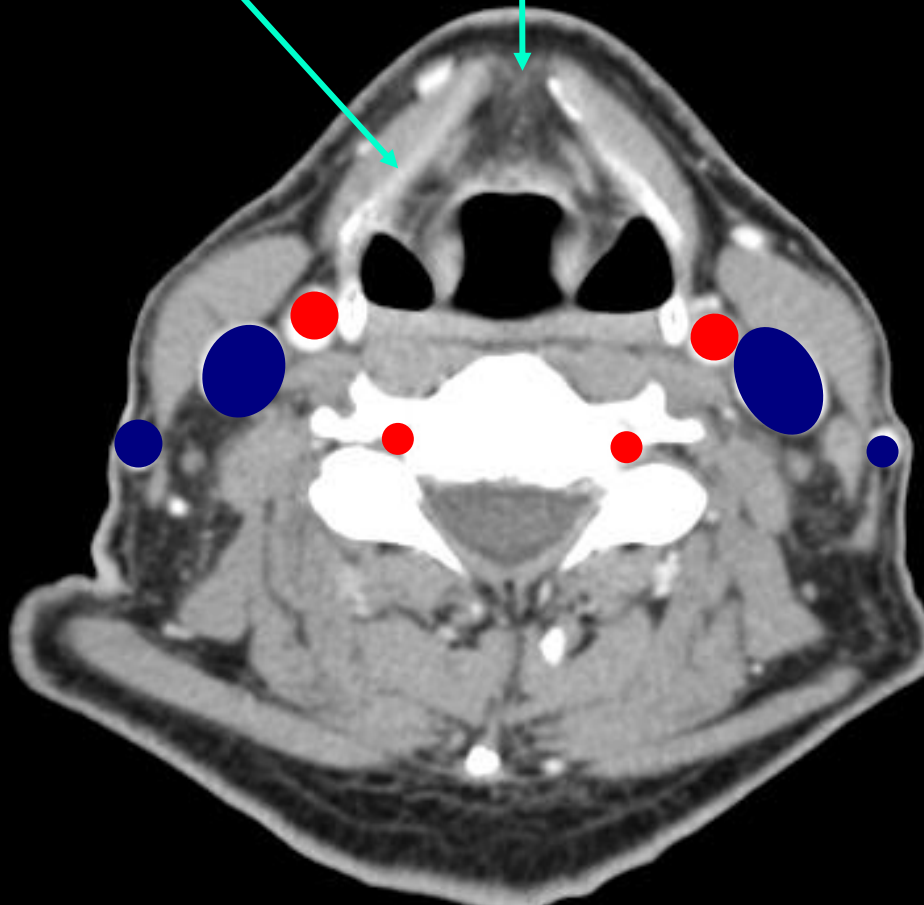


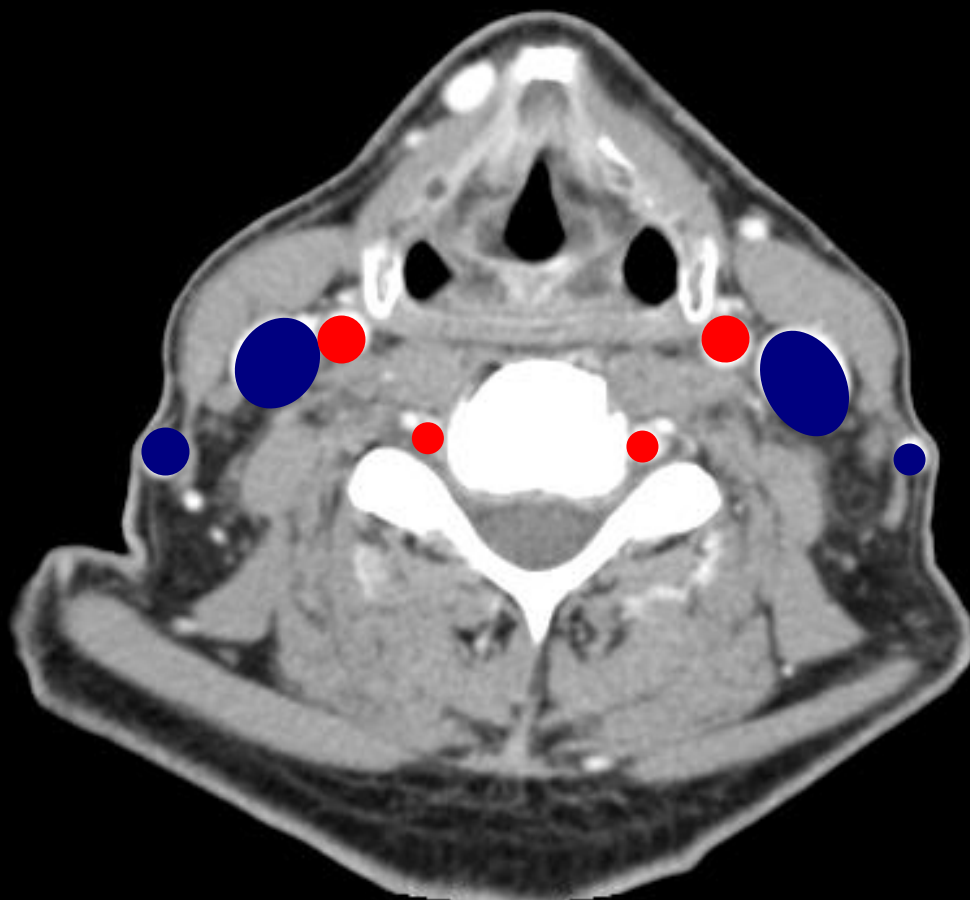




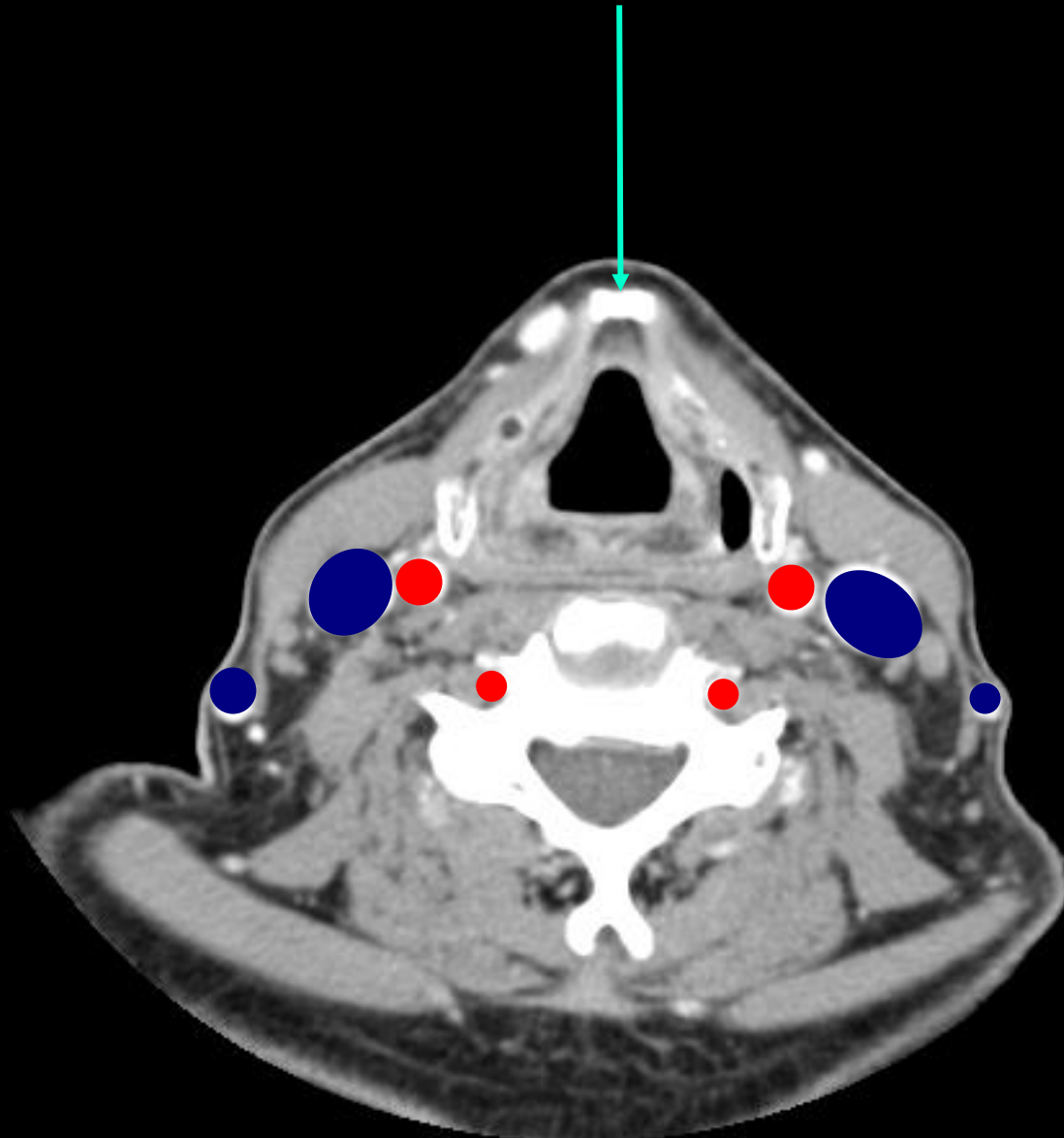
Thyroid Notch

THYROID CARTILAGE

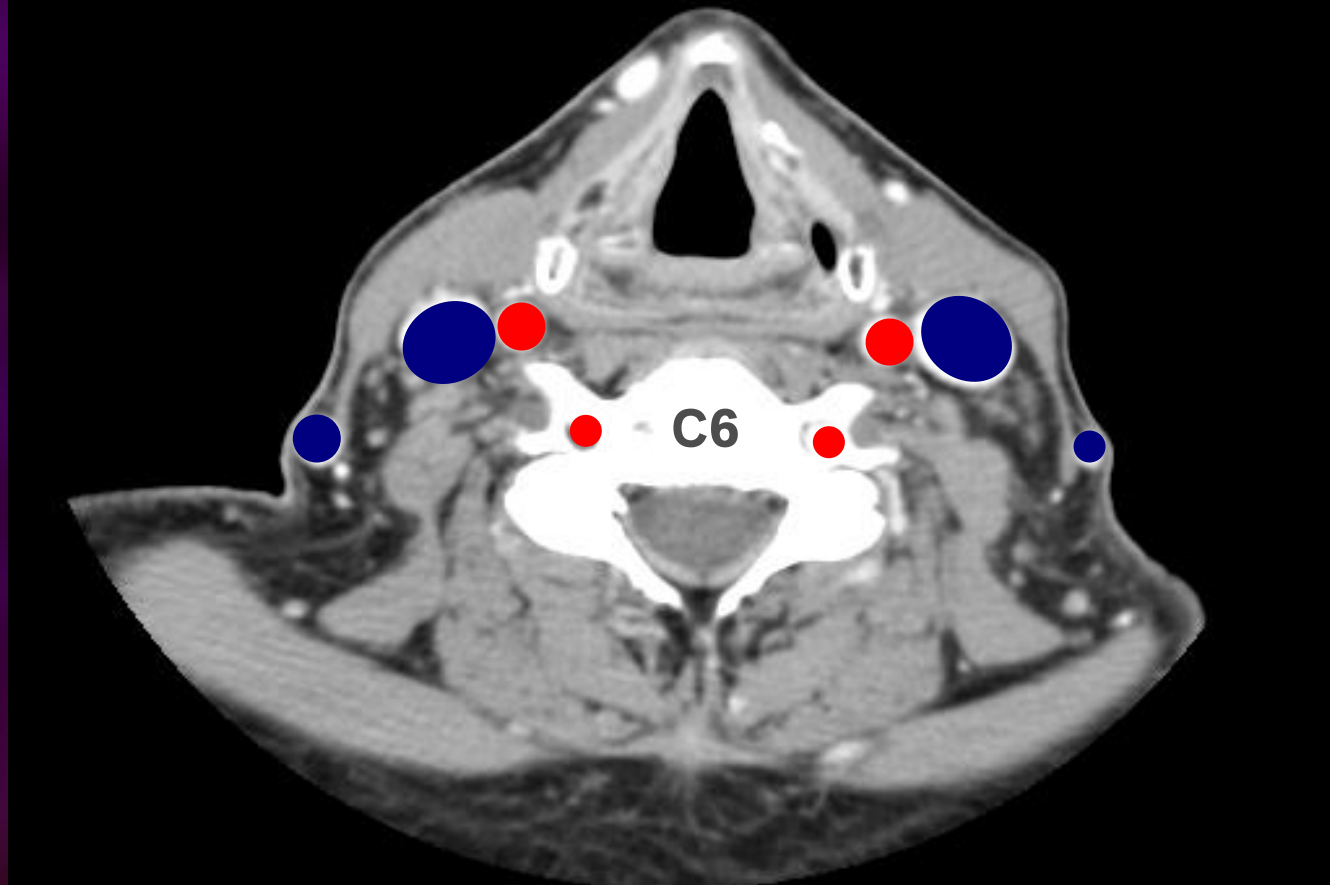




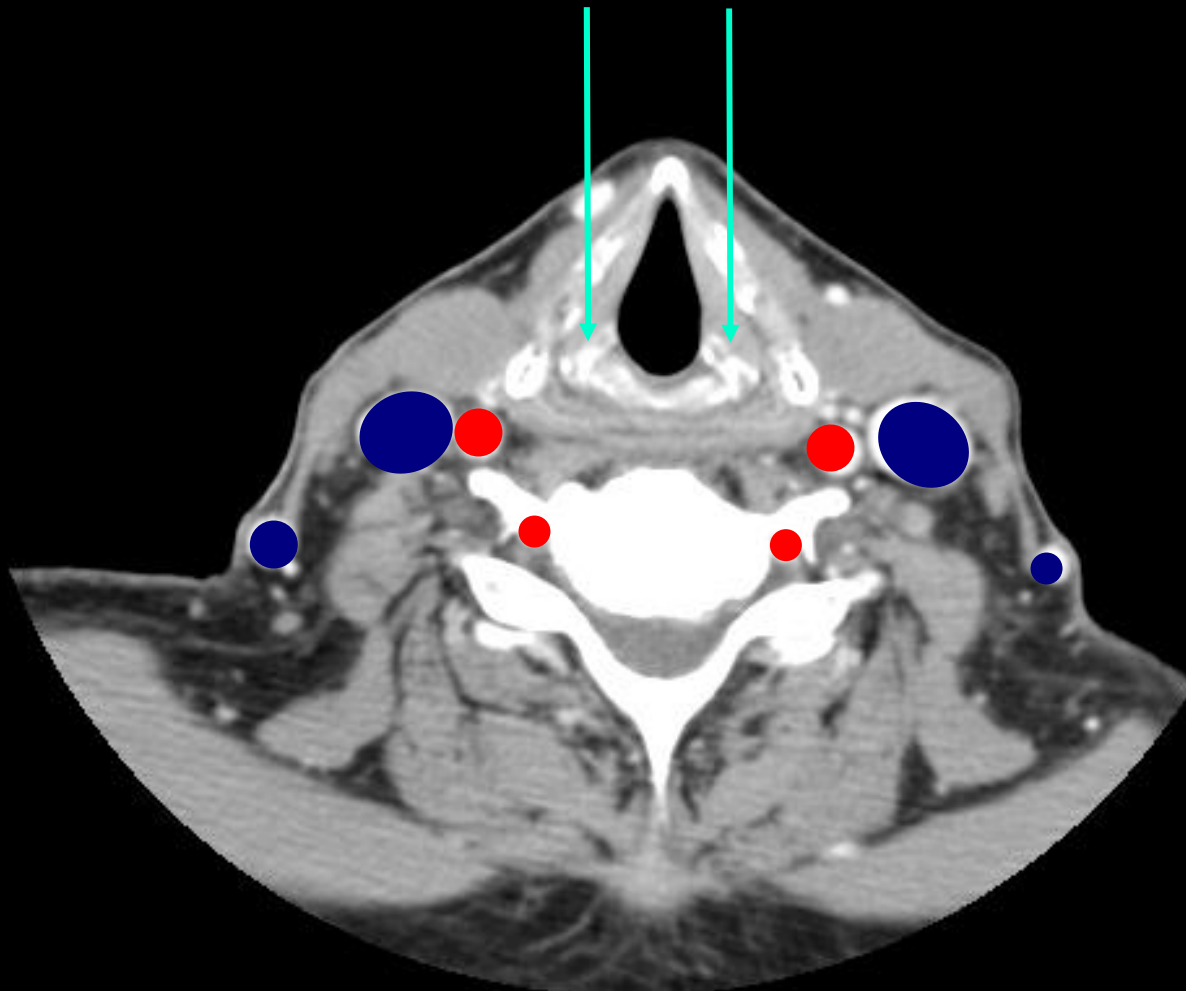
THYROID CARTILAGE



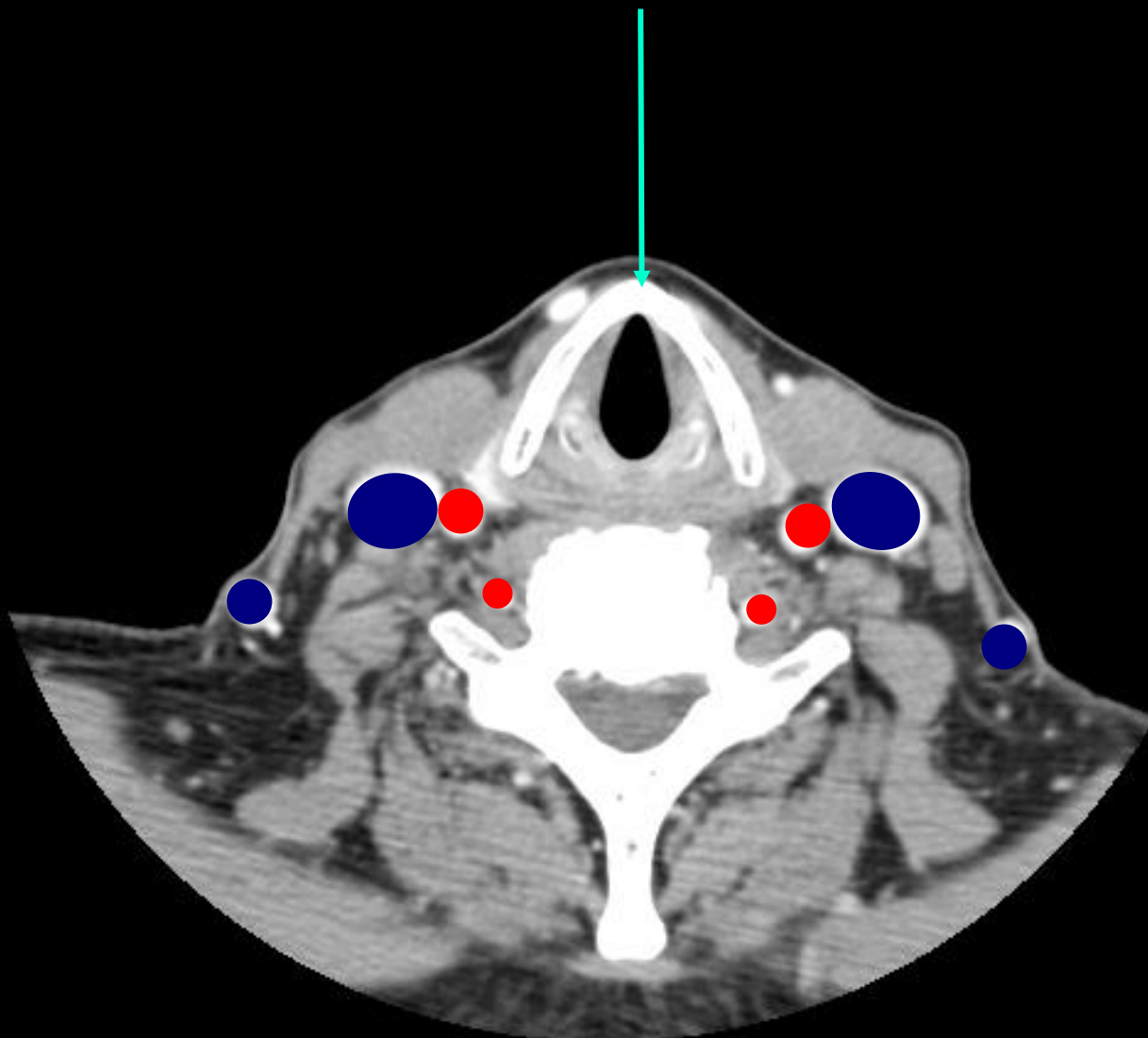
The vertebral art. Bifurcate at 1st part of suclavian artery and enter the foramen transversarium of C6.

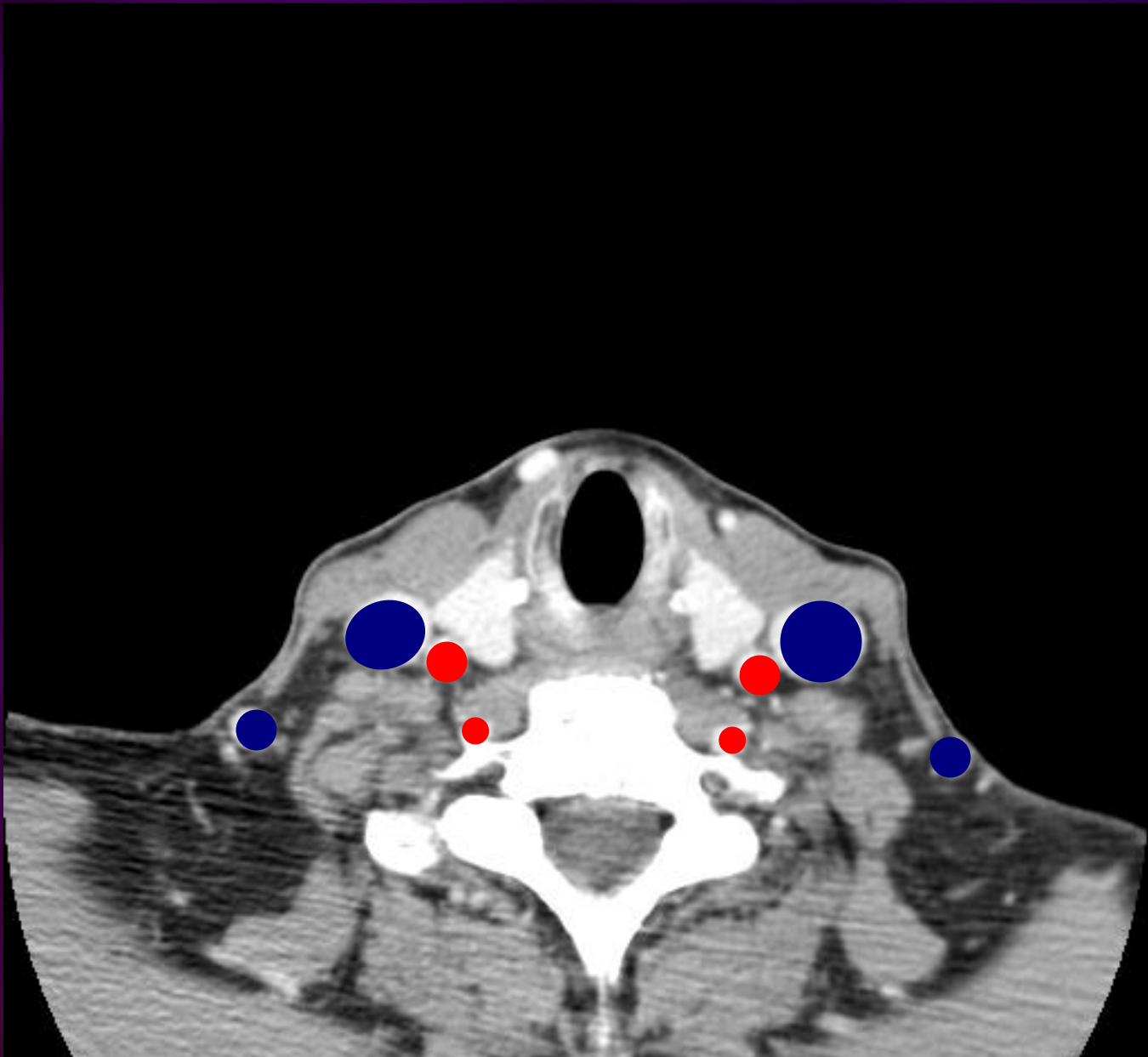


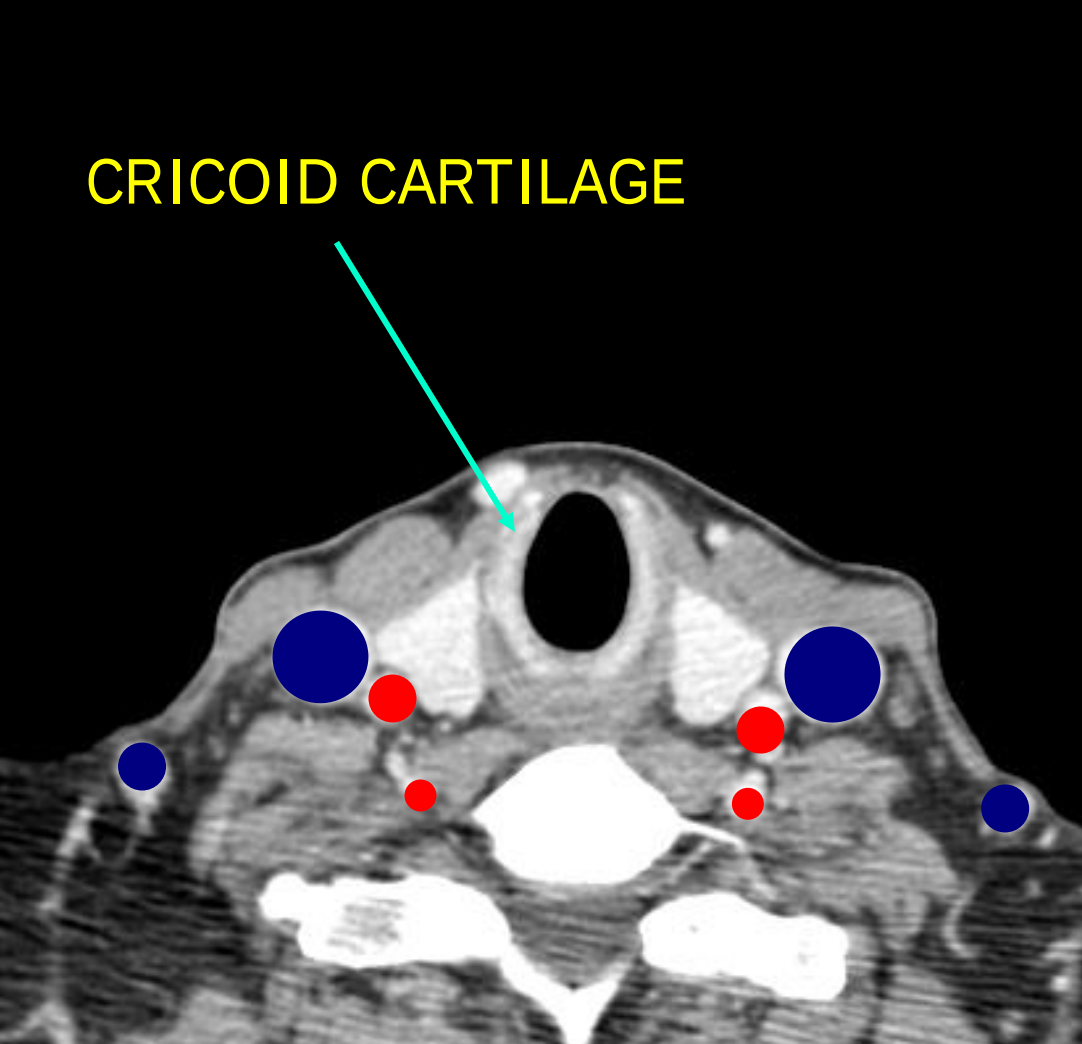
Arytenoid Cartilages
(Paired)



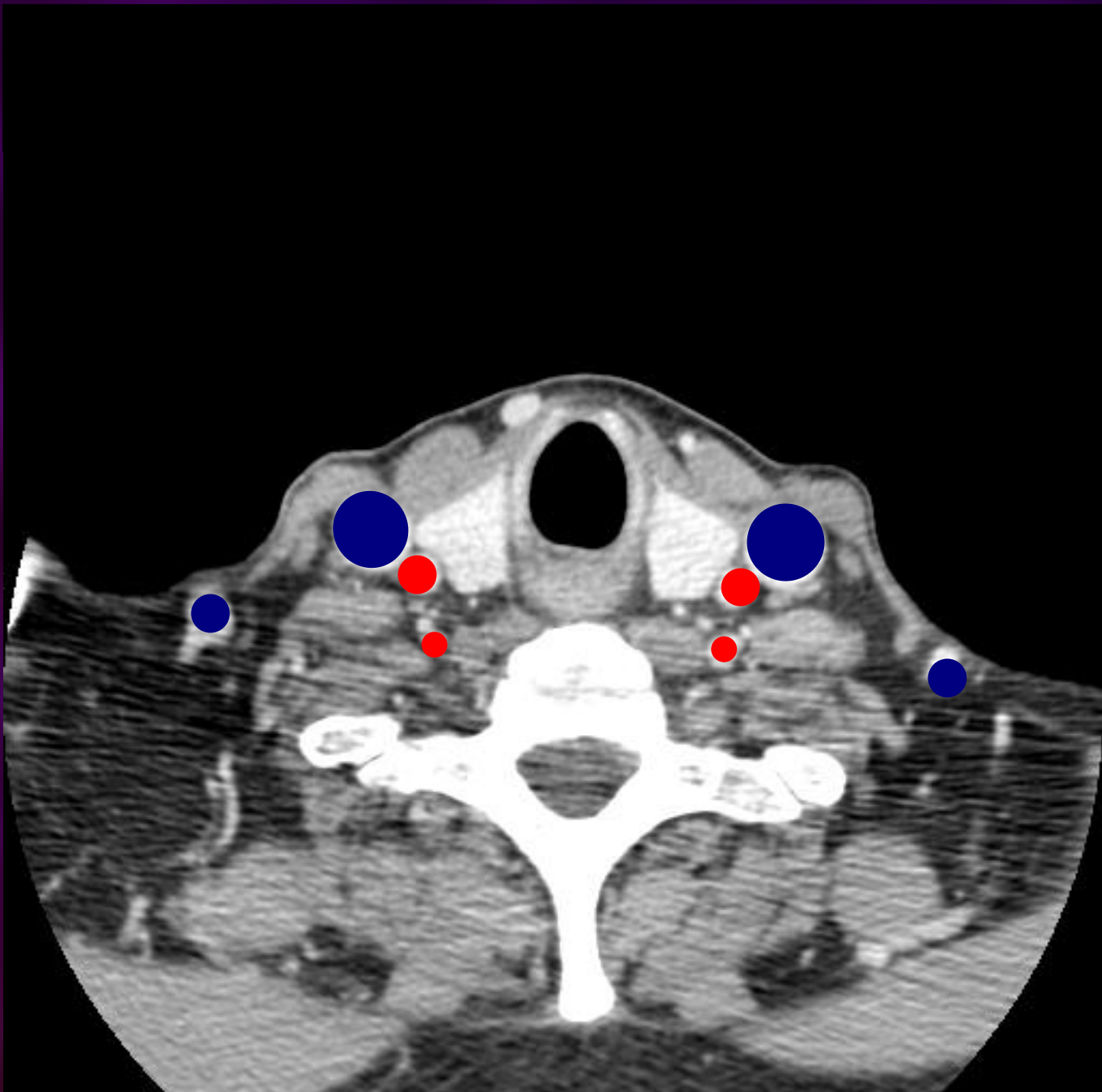
Thyroid Cartilage







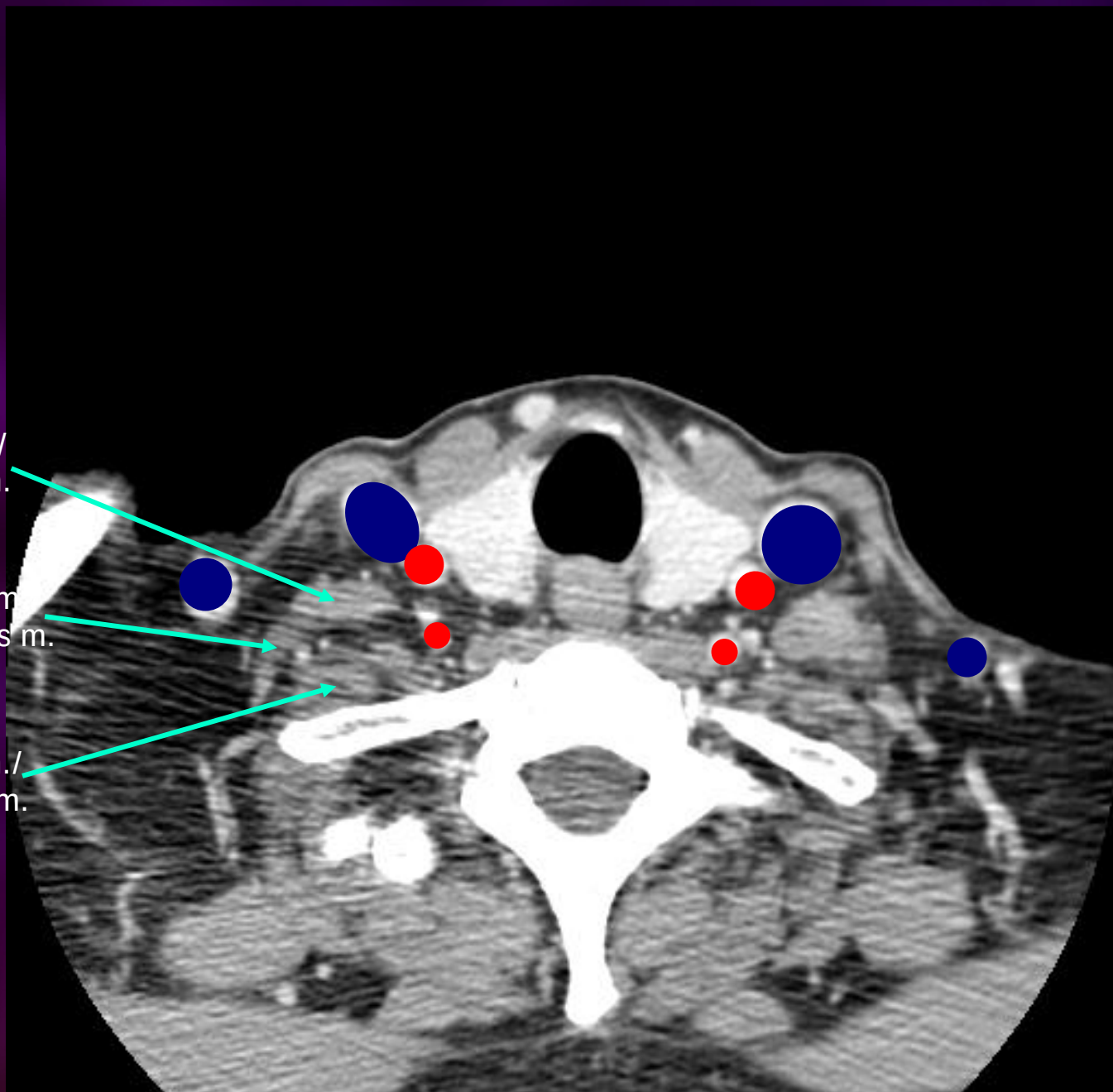
CRICOID CARTILAGE



Ant. scalene m./
Scalenus ant. m.

Middle scalene m./
Scalenus medius m.

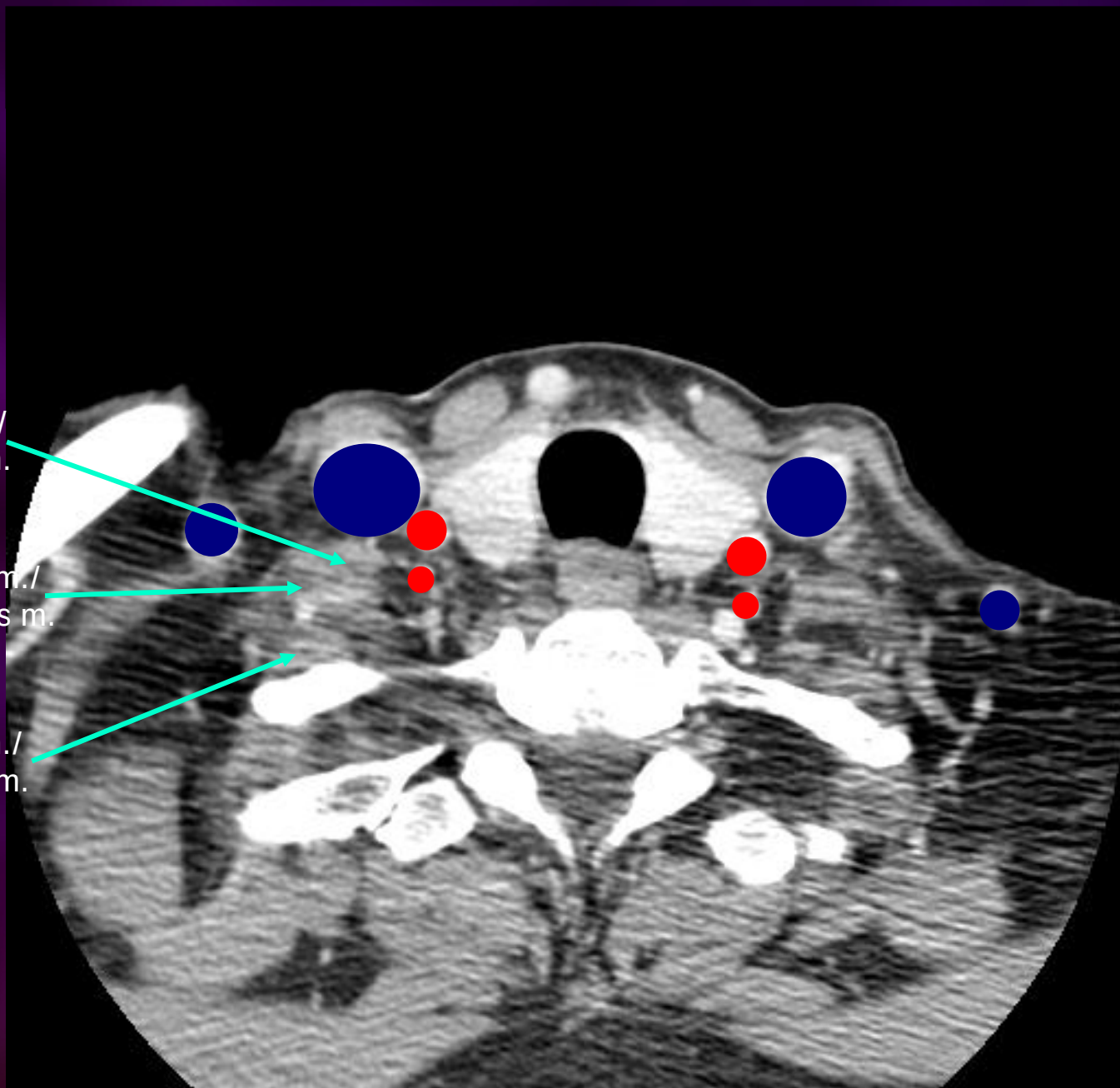
Post. scalene m./
Scalenus post. m.



Ant. scalene m./
Scalenus ant. m.

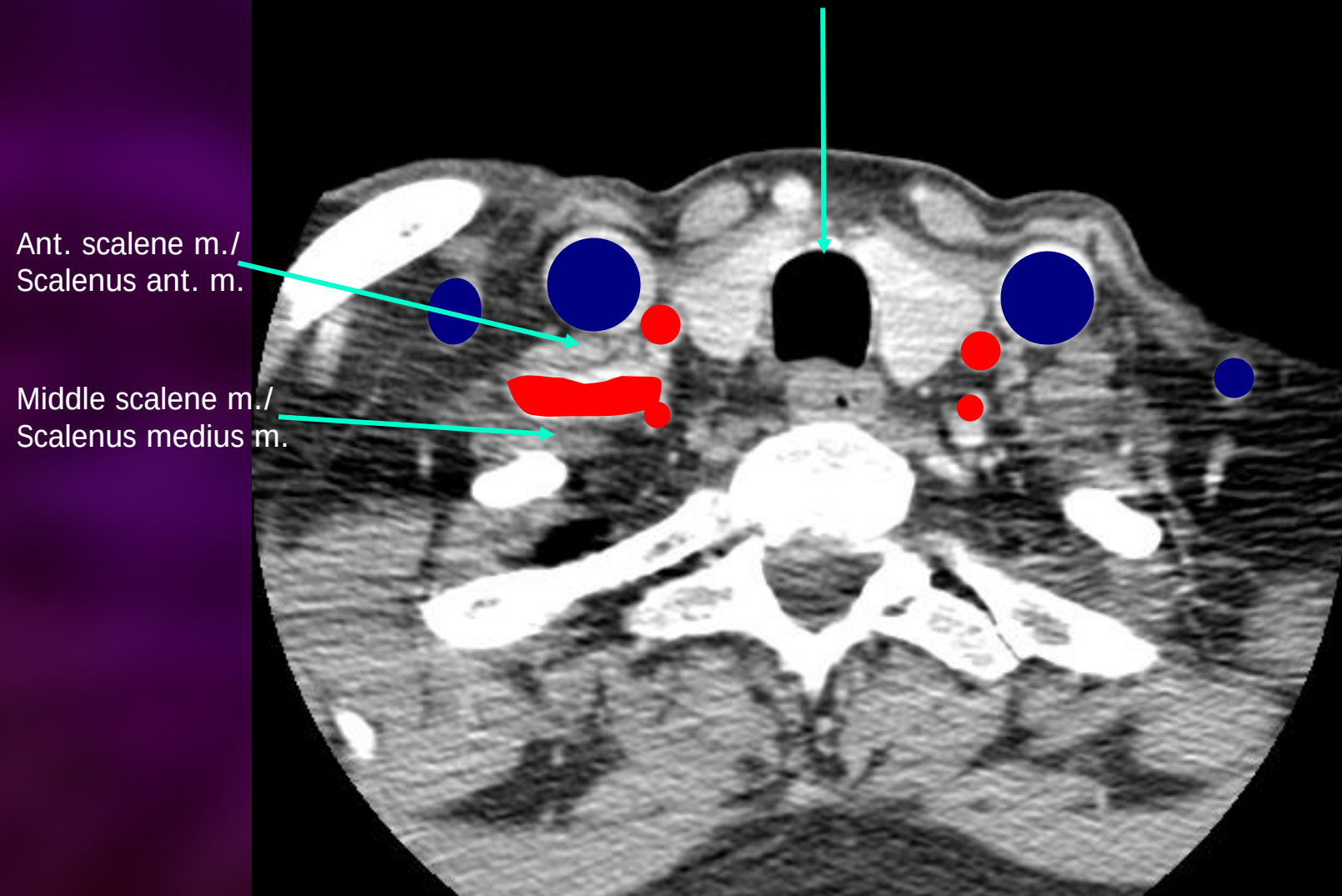
Middle scalene m./
Scalenus medius m.

Post. scalene m./
Scalenus post. m.

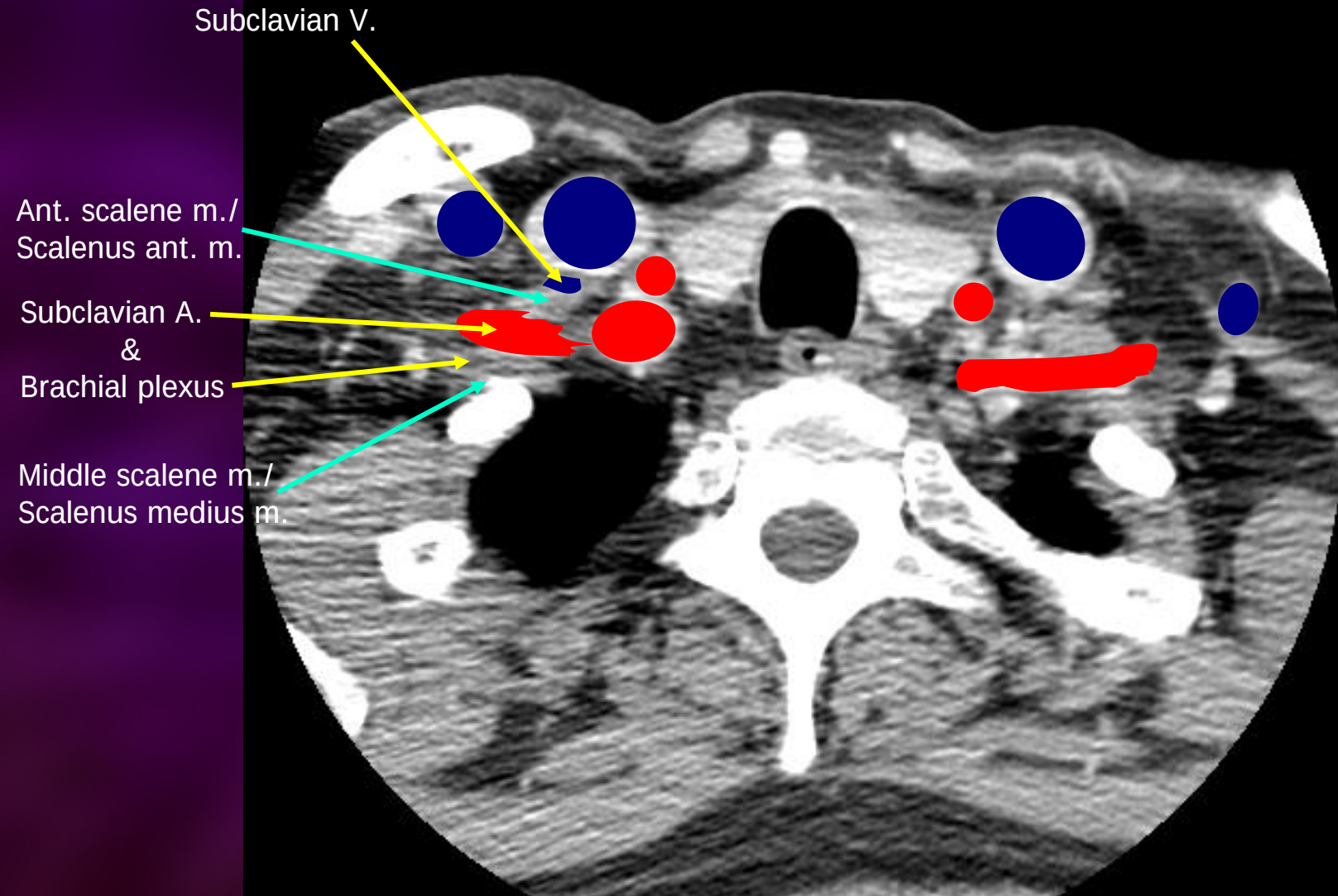


EJV comes downward to join AJV and later Subclavian Vein

First Tracheal Ring

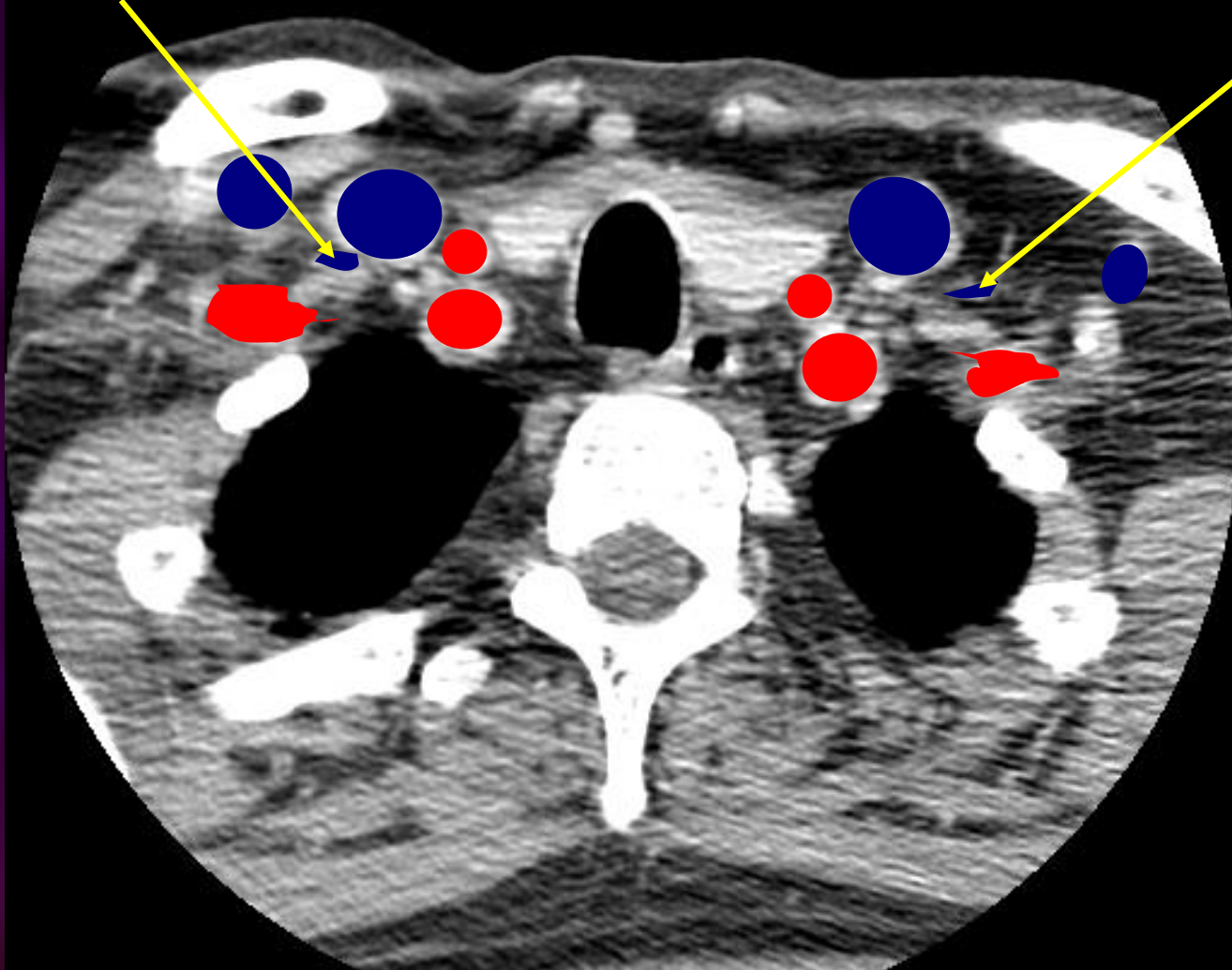


Subclavian V runs anterior to Subclavian A over the 1st rib.
Anterior scalene muscle separates the subclavian artery & vein.



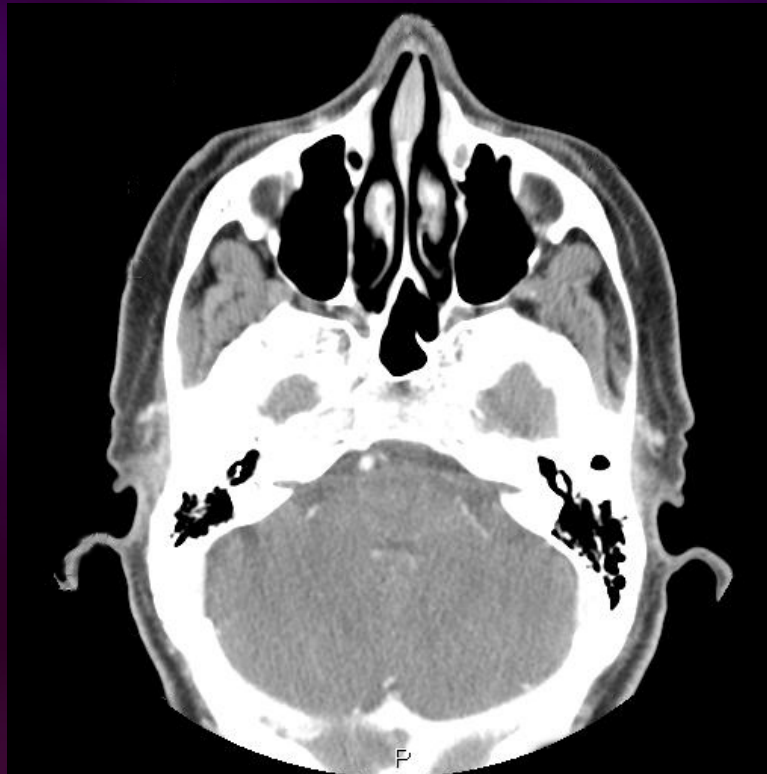
Subclavian V.

Subclavian V.

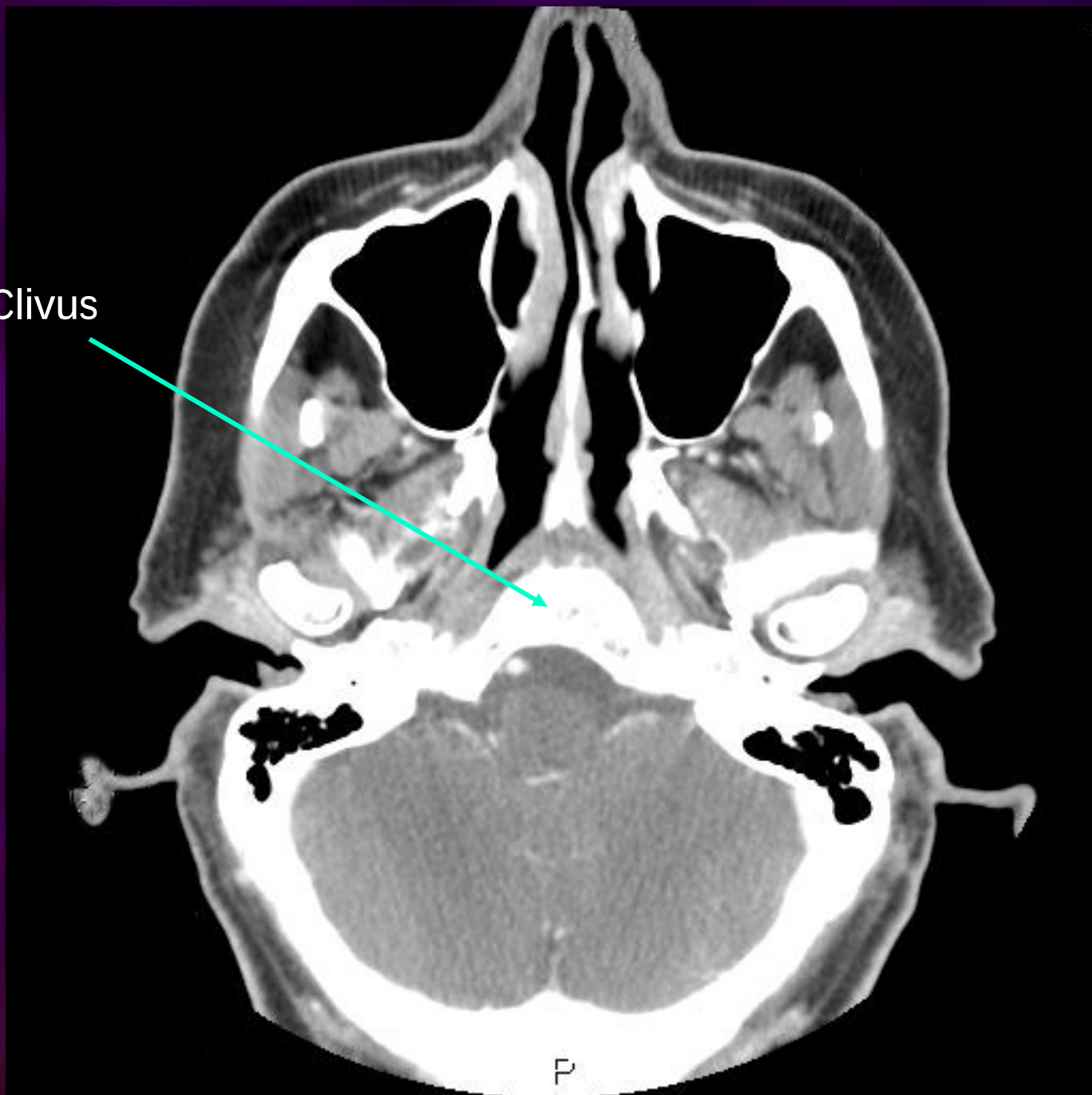


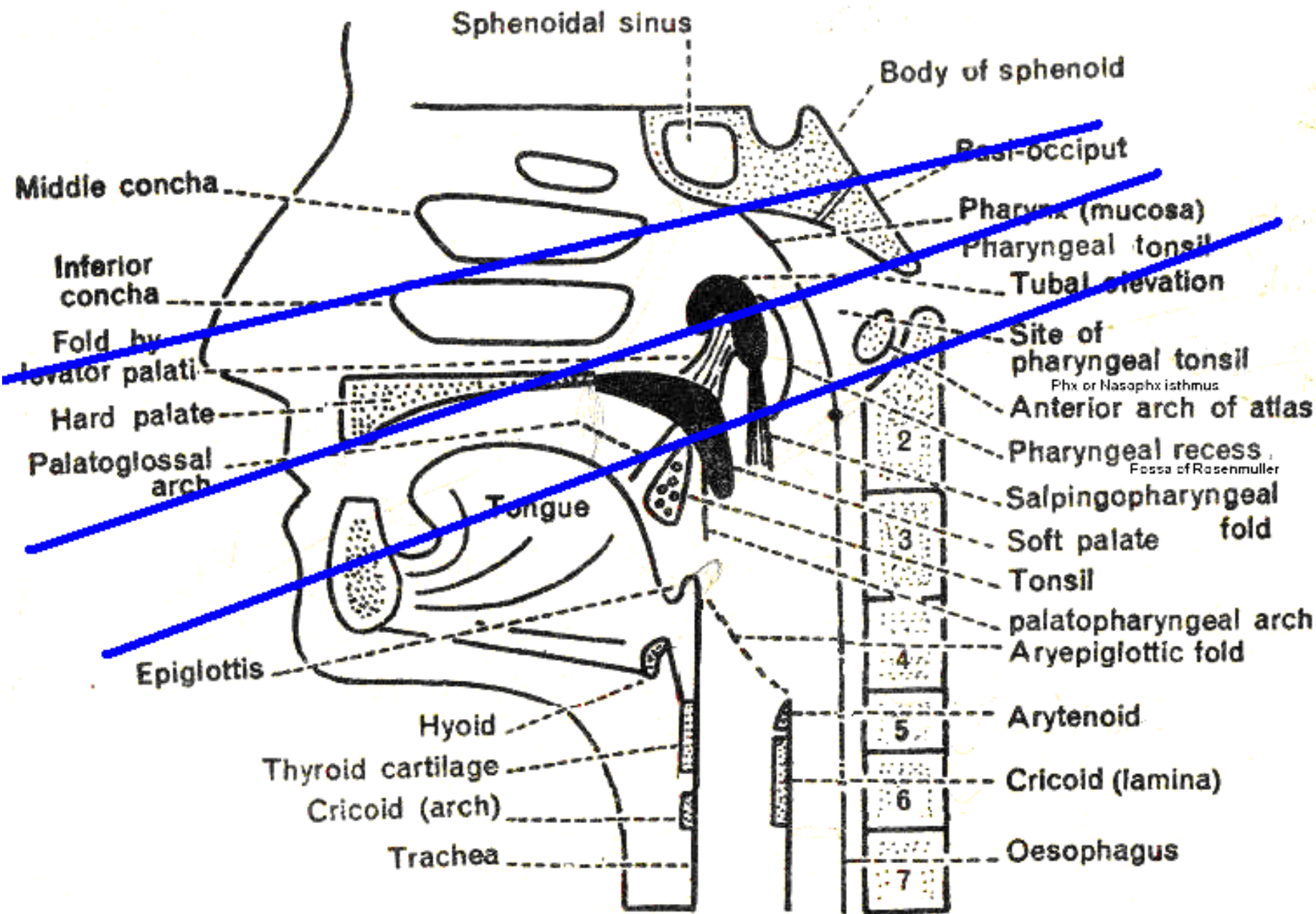
Round 4: Everything else (almost!)

Plus a review of what we've already seen

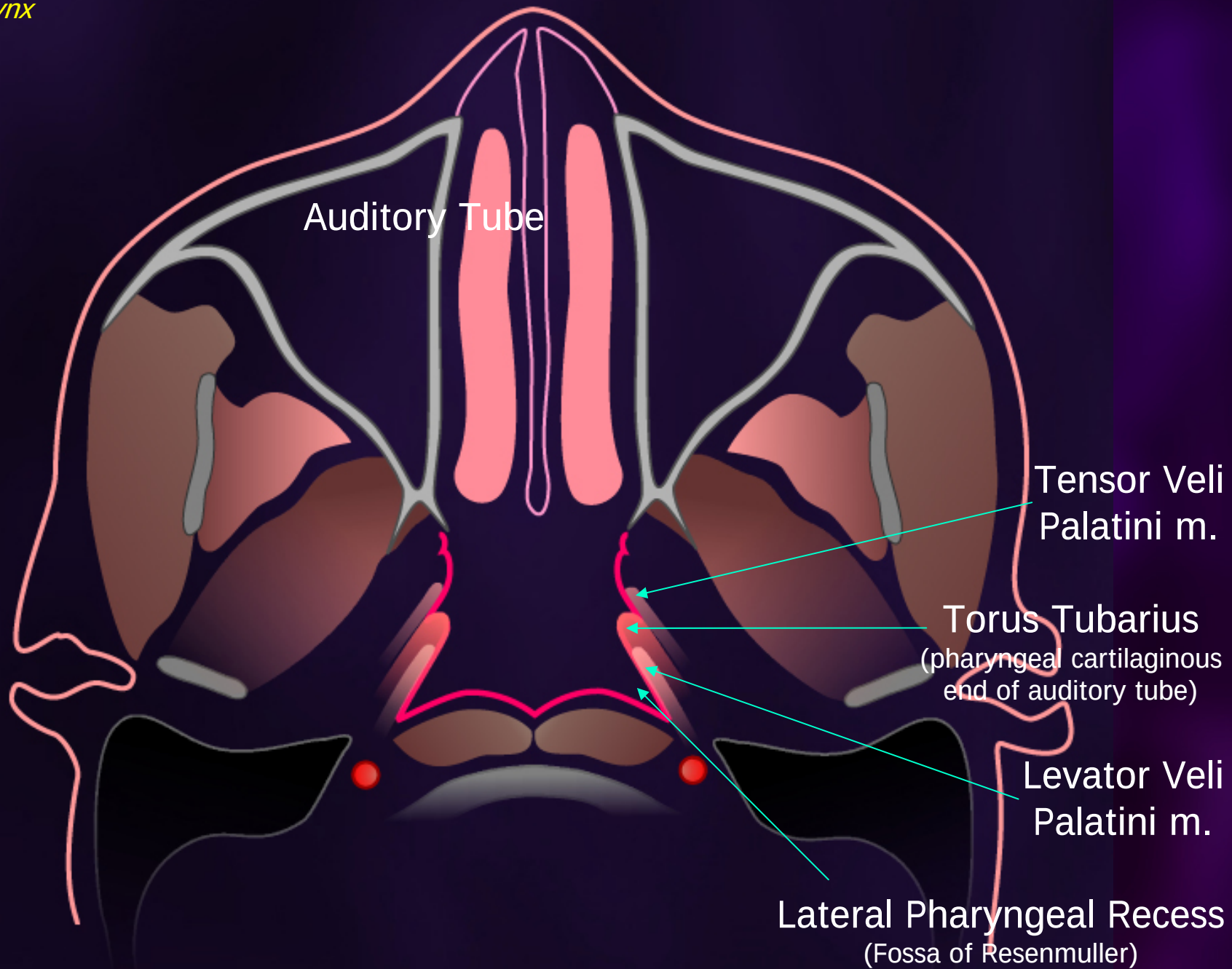


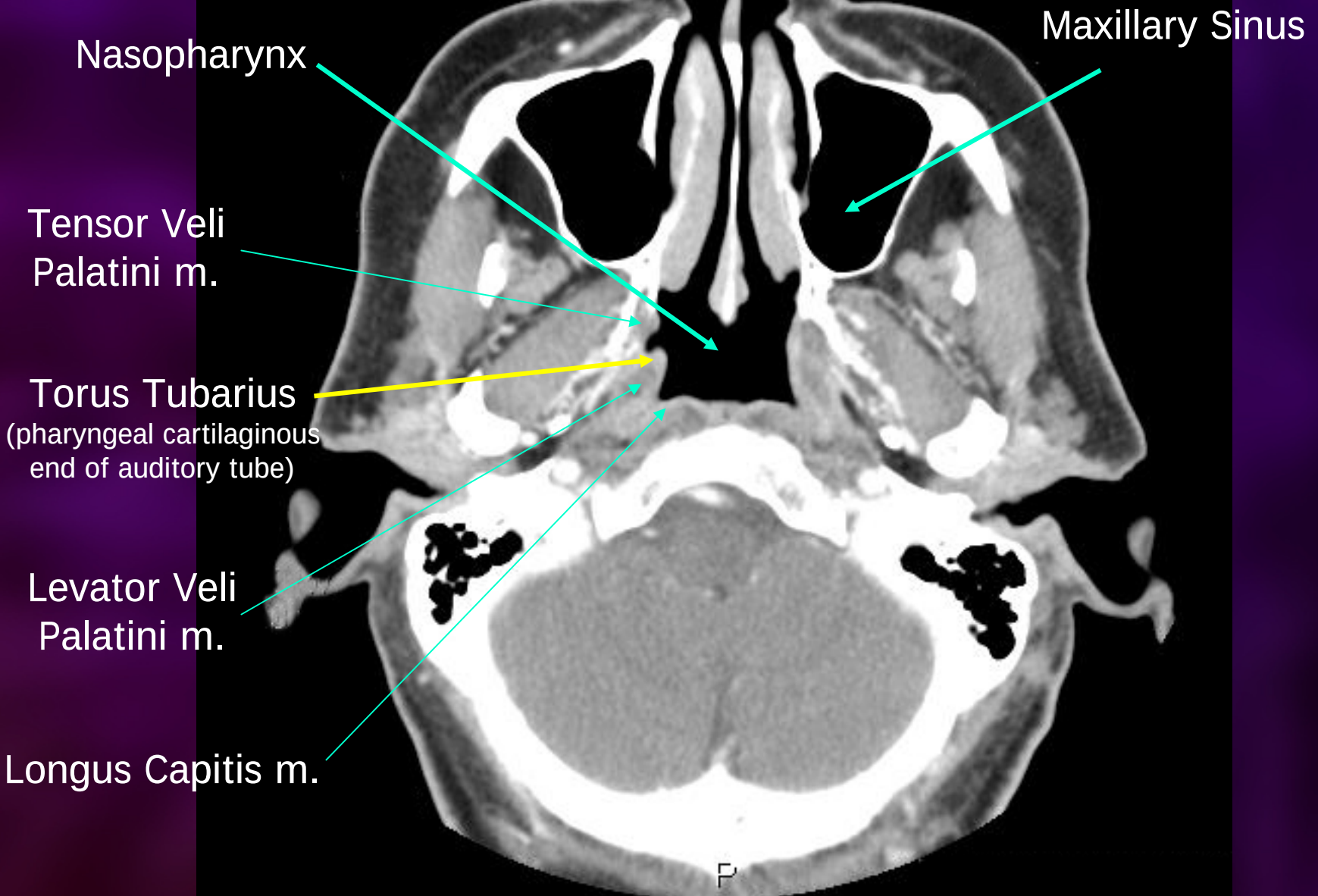
Clivus





Nasopharynx





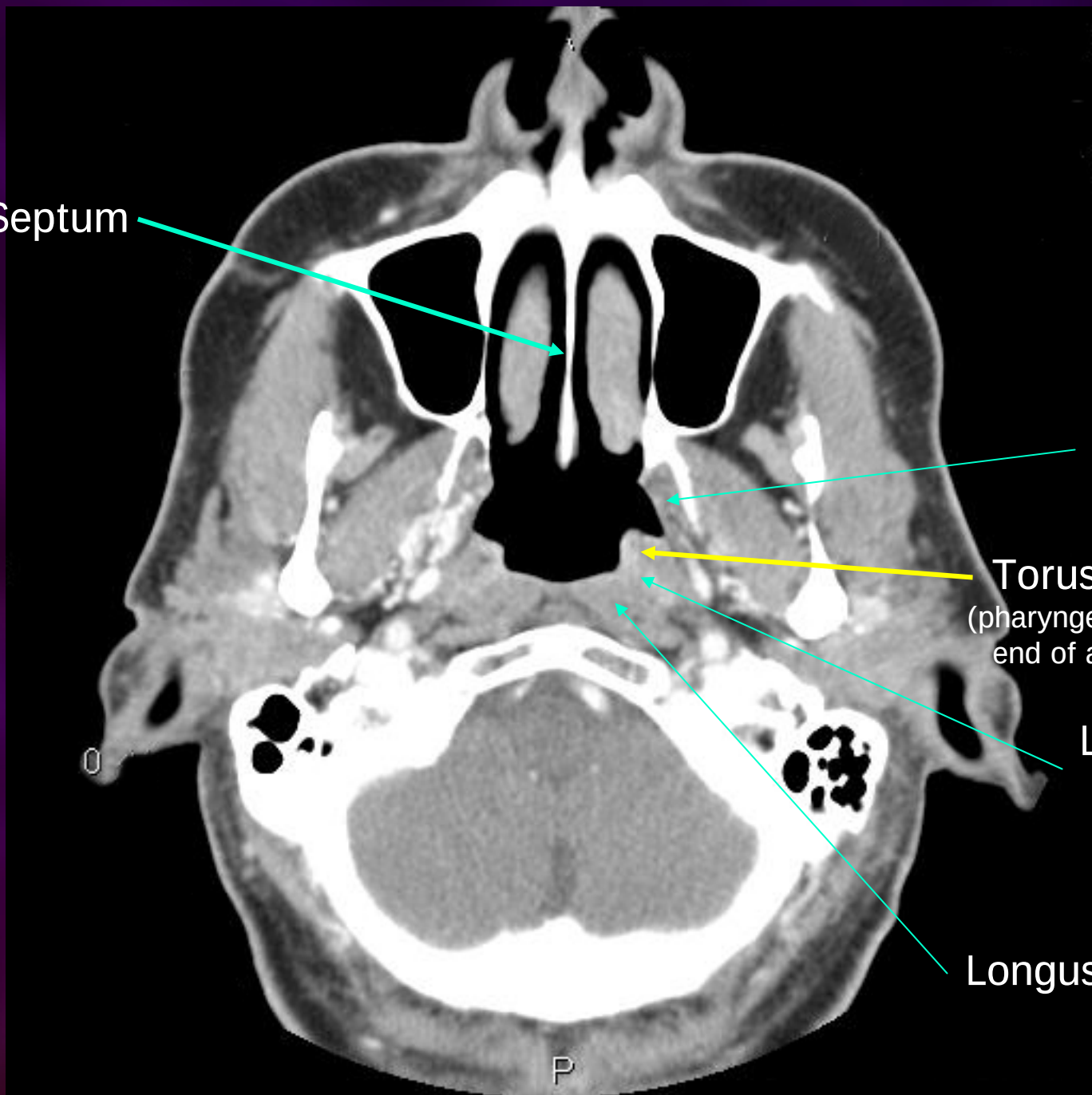
Nasal Septum

Tensor Veli
Palatini m.

Torus Tubarius
(pharyngeal cartilaginous
end of auditory tube)

Levator Veli
Palatini m.

Longus Capitis m.



Hard Palate

Masseter
muscle

Pterygoid Plates

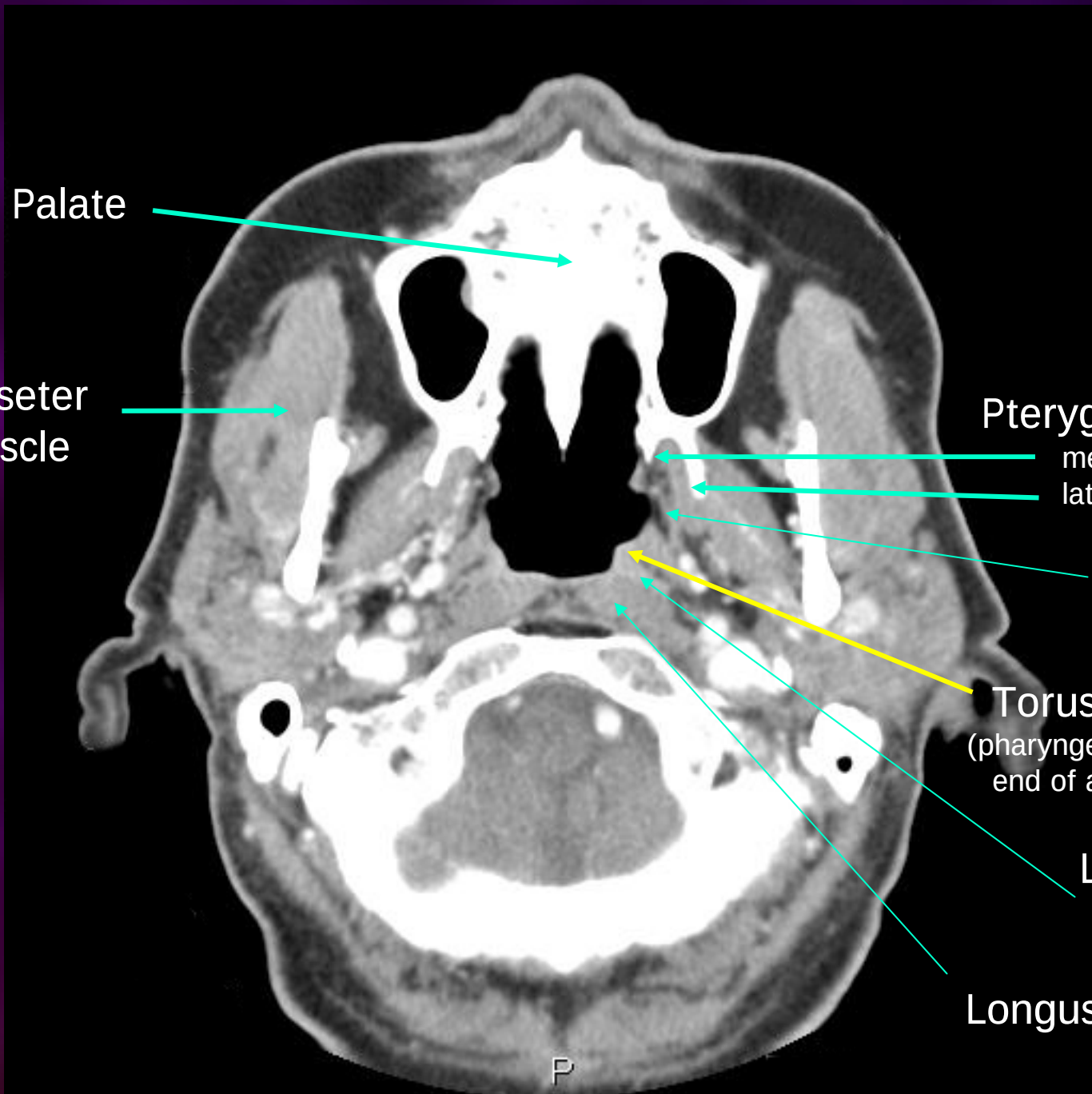
medial
lateral

Tensor Veli
Palatini m.

Torus Tubarius
(pharyngeal cartilaginous
end of auditory tube)

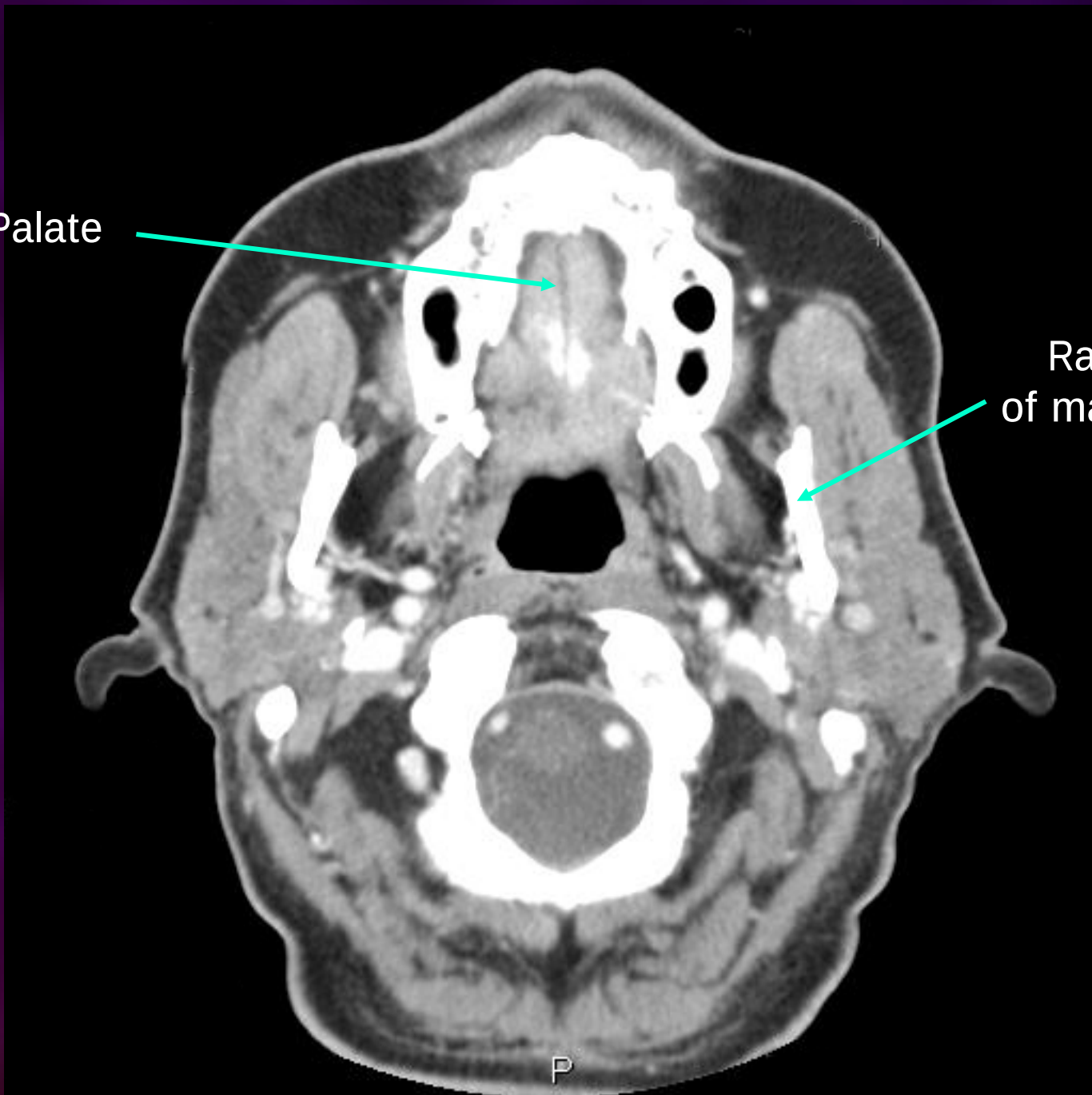
Levator Veli
Palatini m.

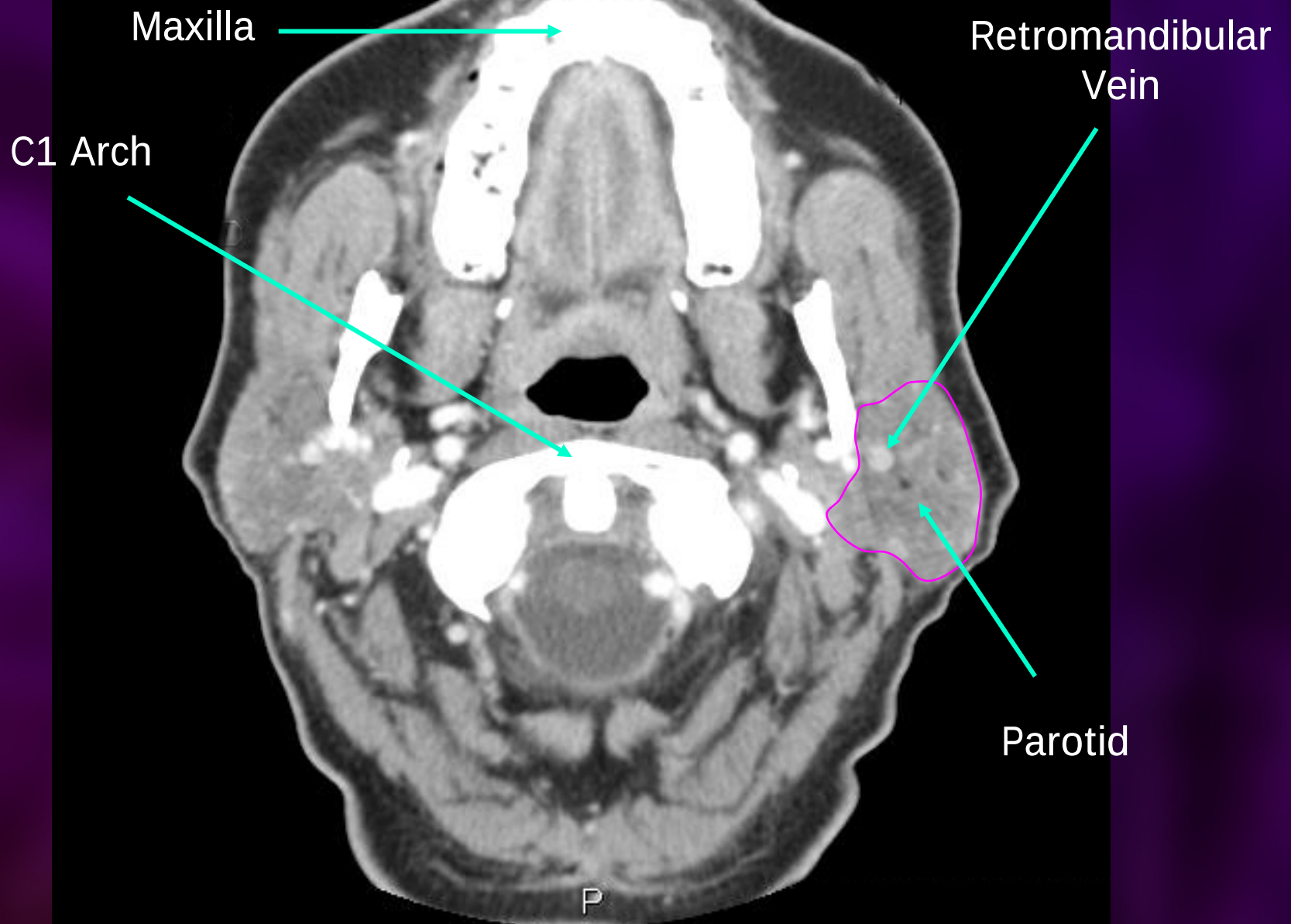
Longus Capitis m.

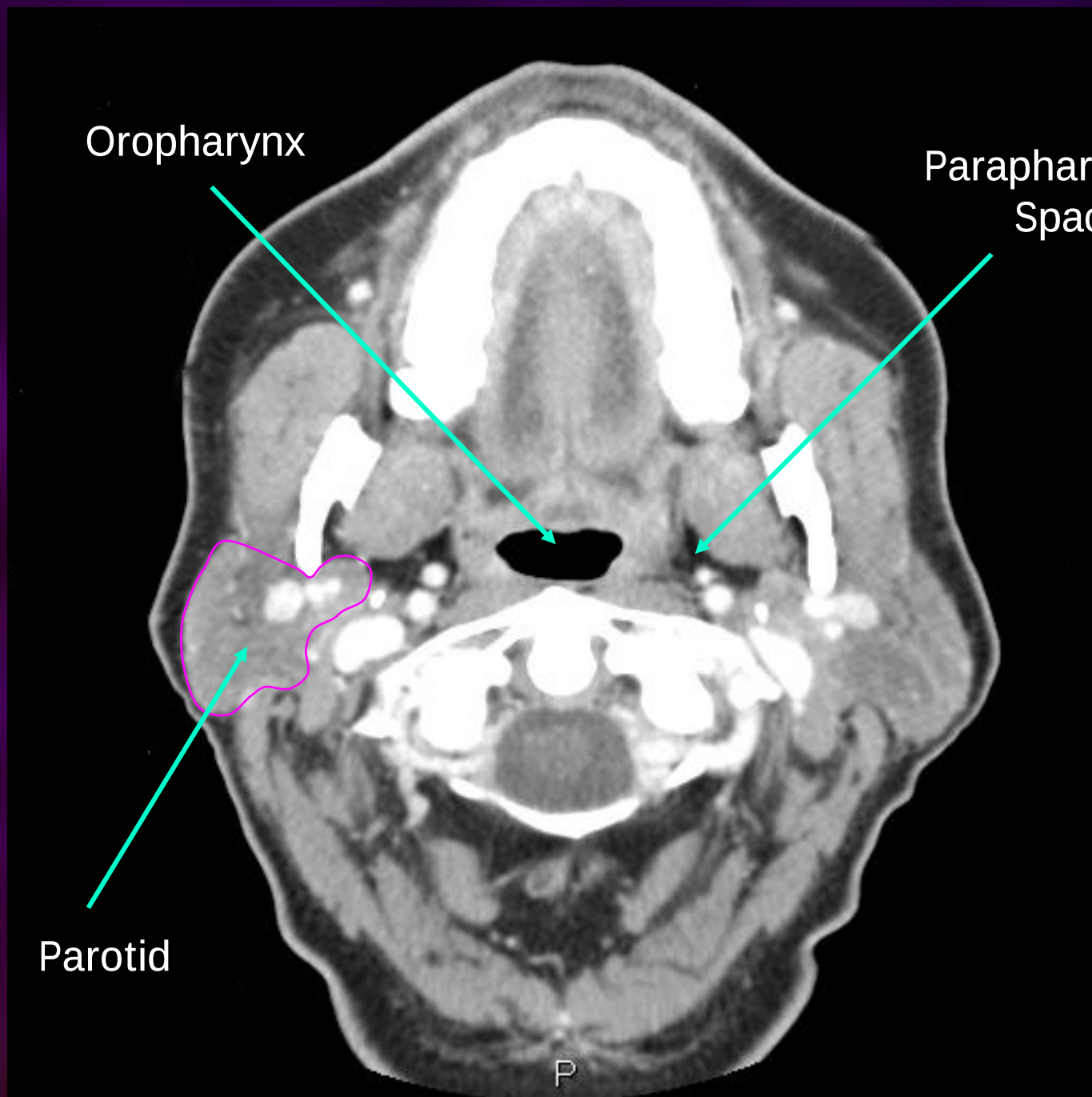


Soft Palate

Ramus
of mandible





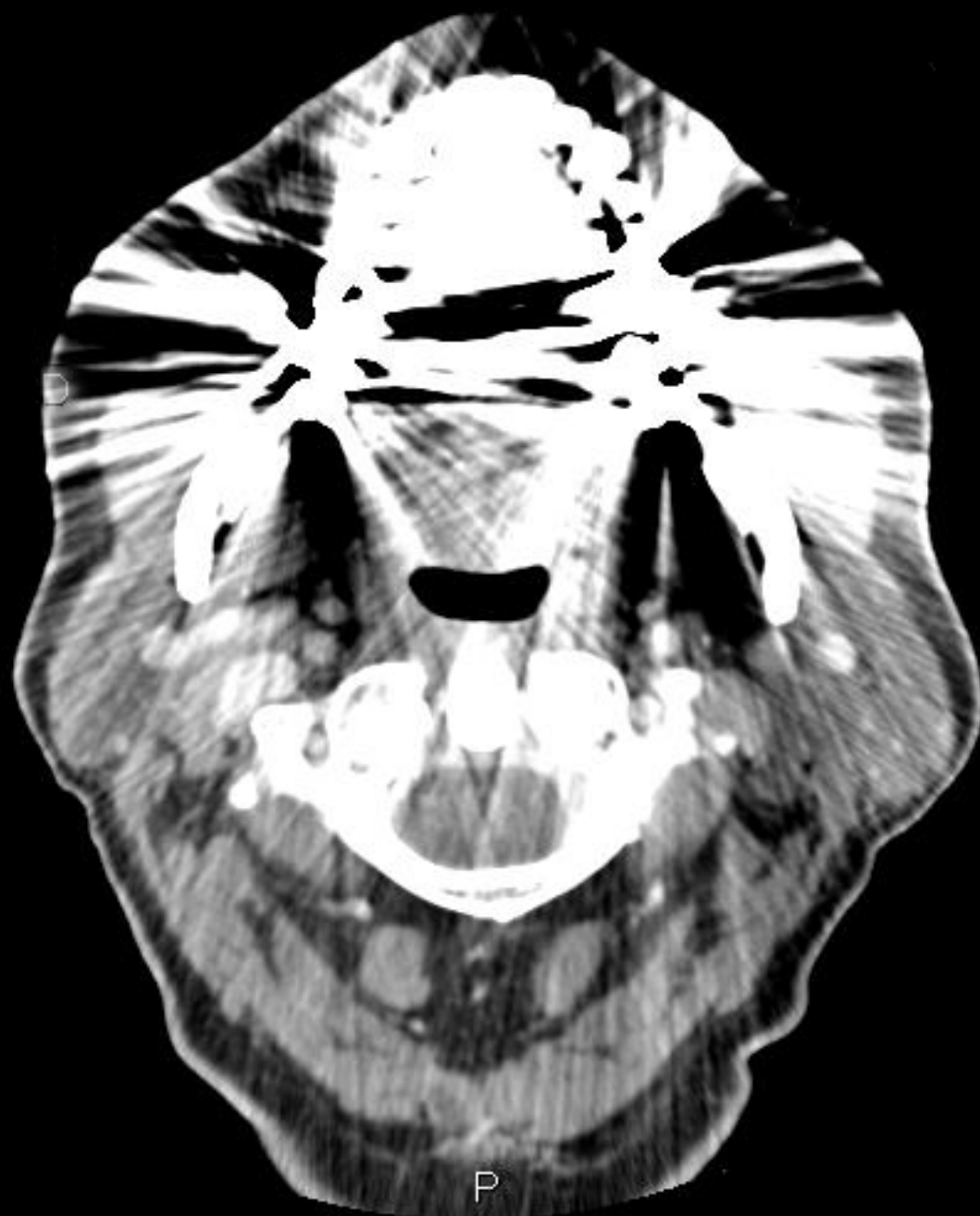


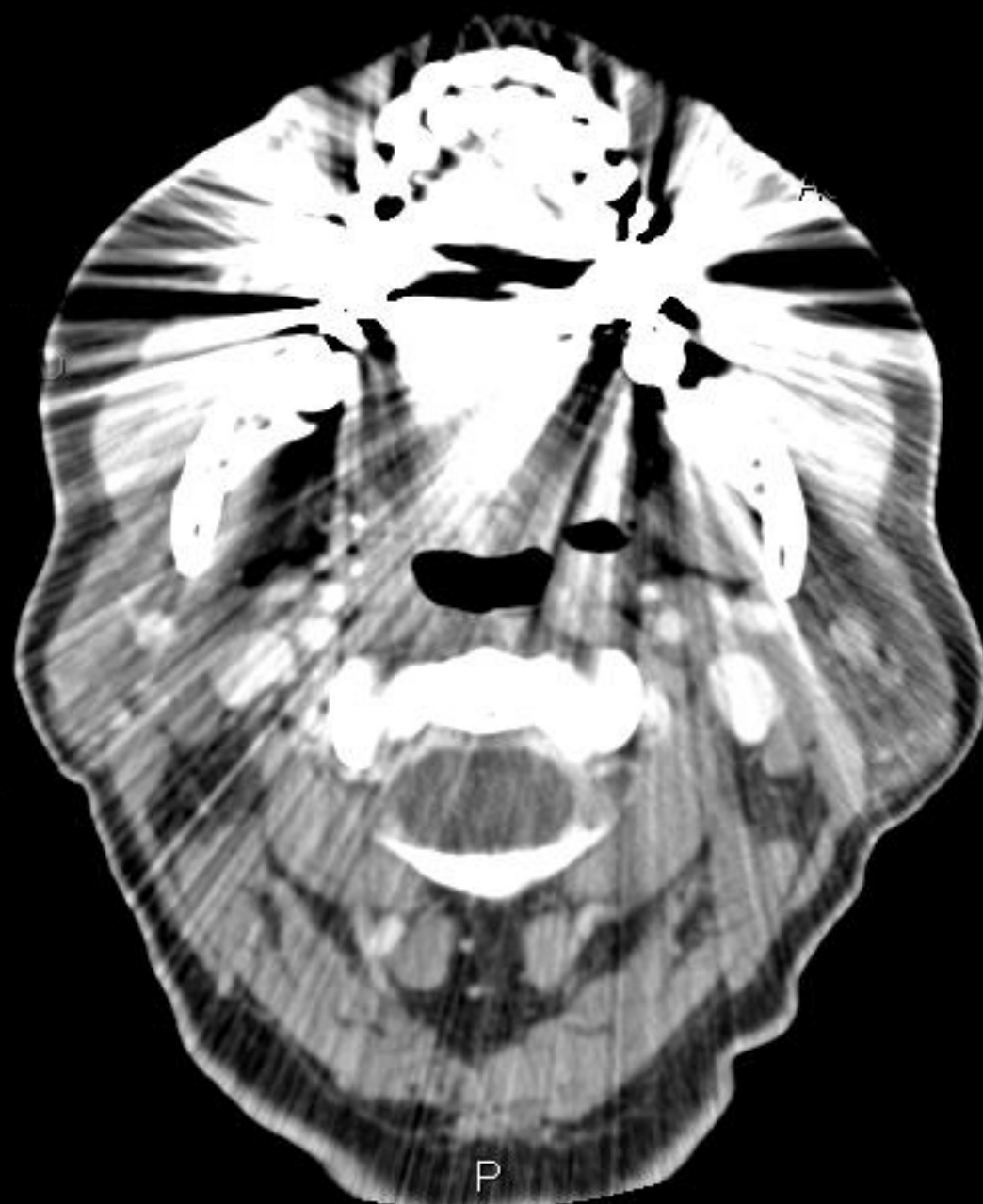
Oropharynx

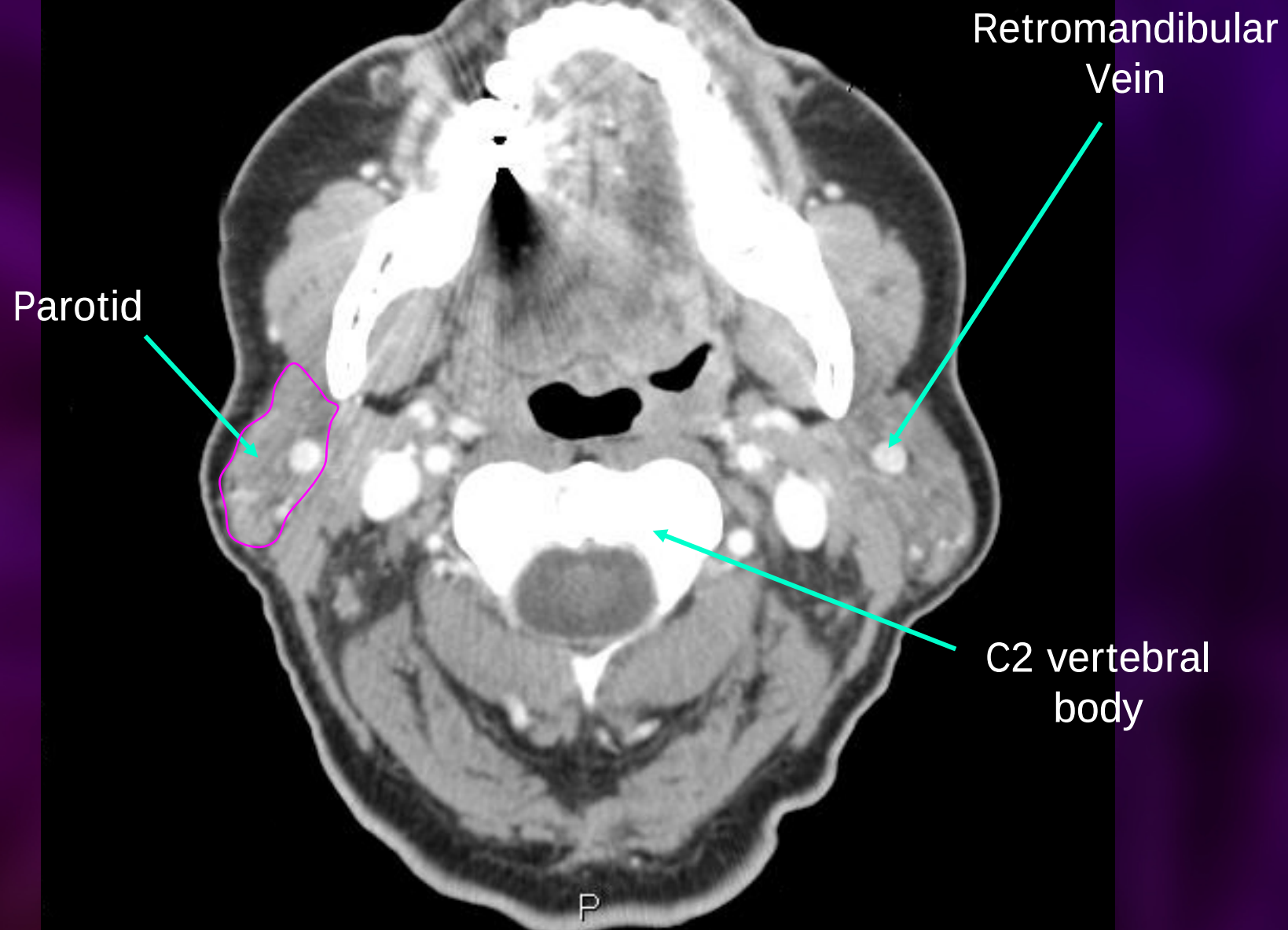
Parapharyngeal
Space

Parotid

P



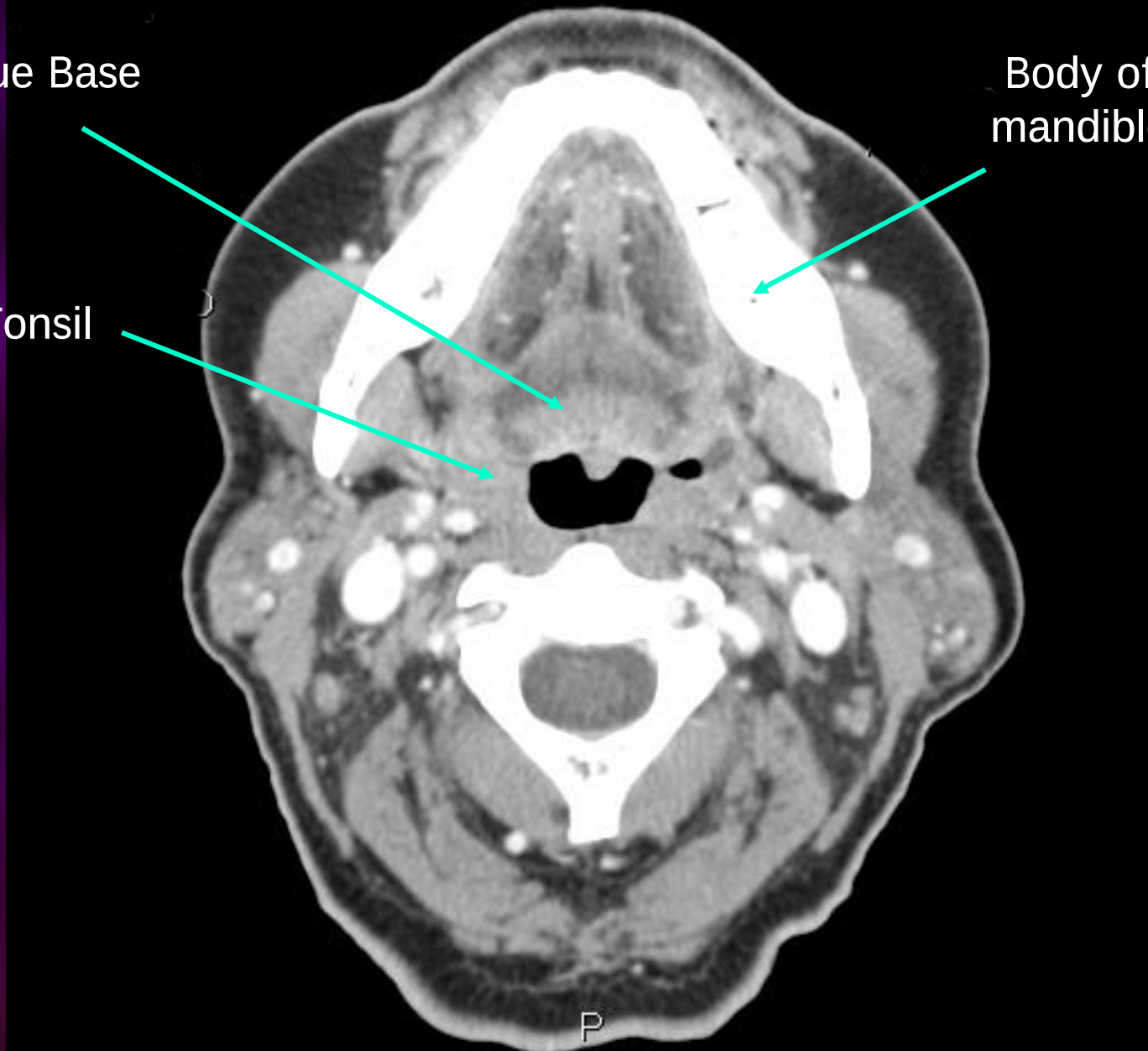


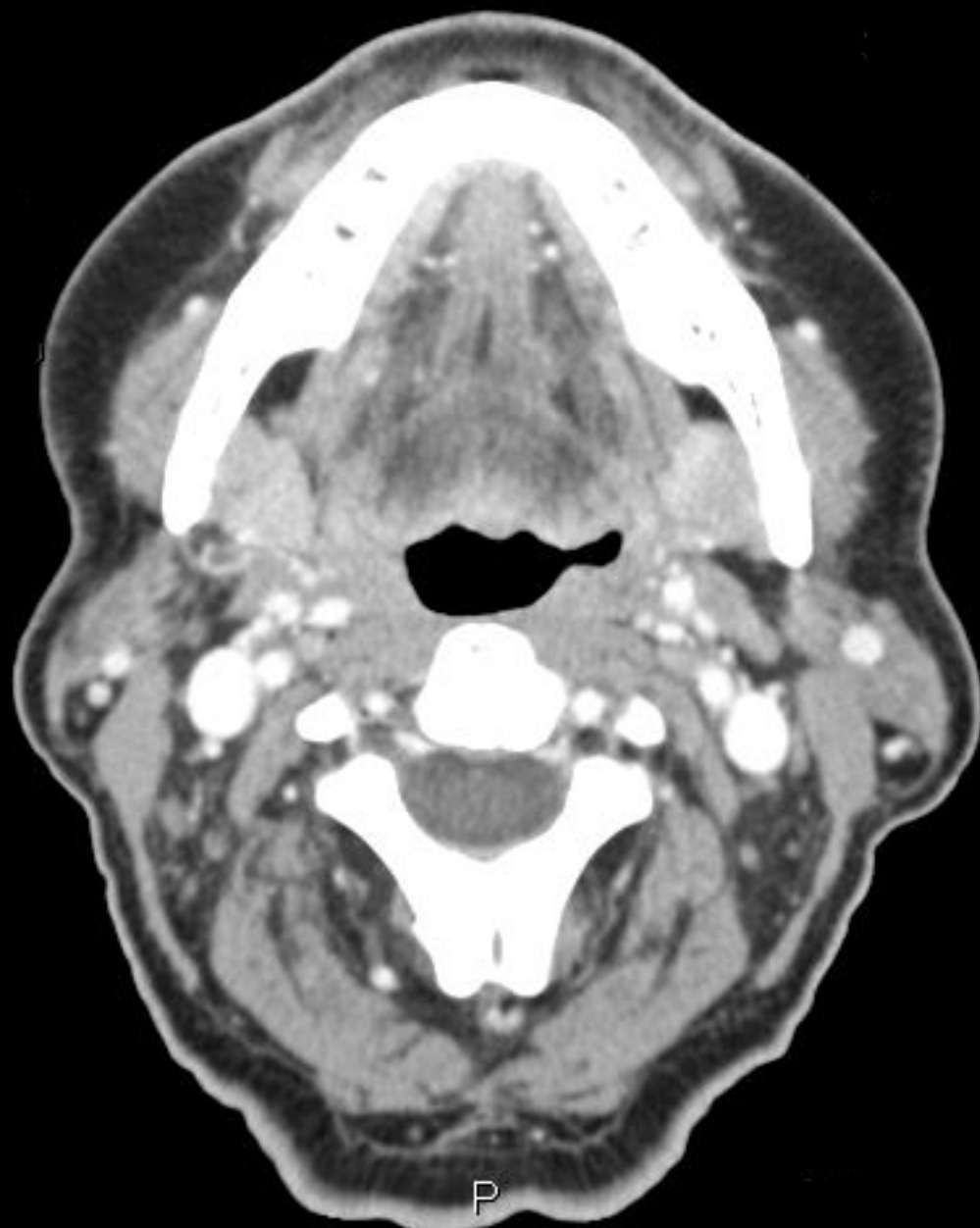


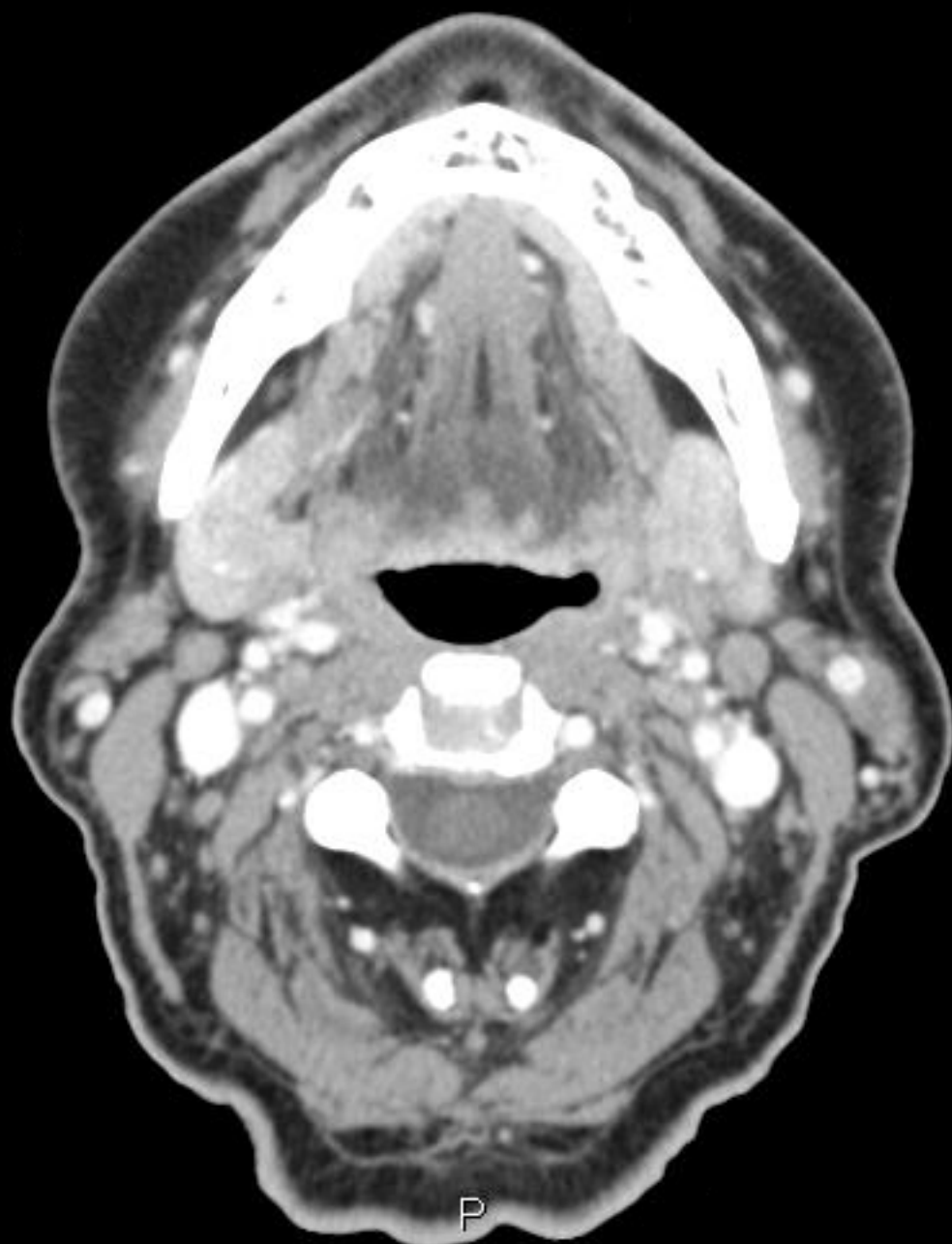
Tongue Base

Body of
mandible

Tonsil

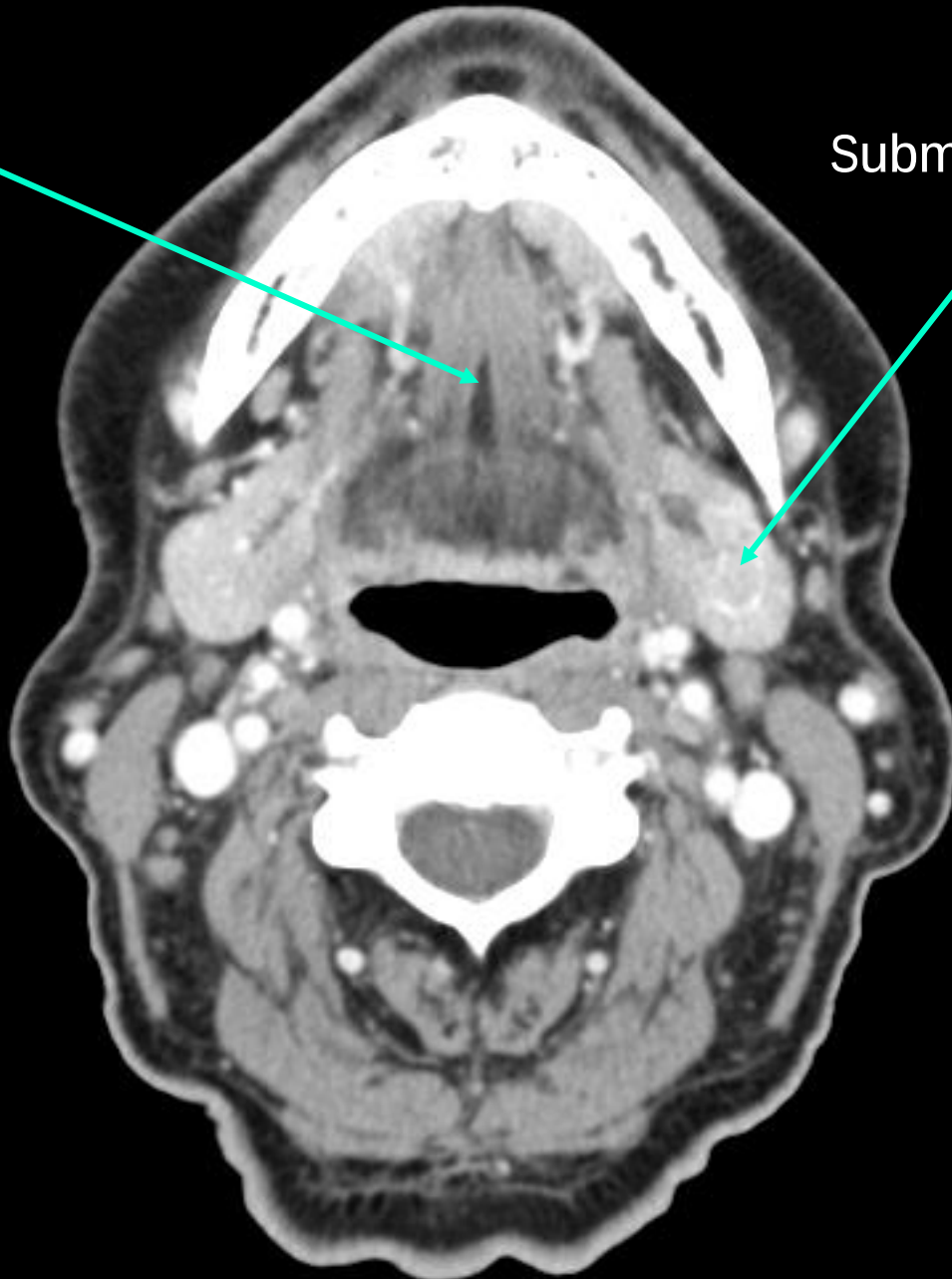




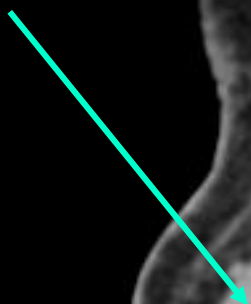


Floor of Mouth

Submandibular Gland

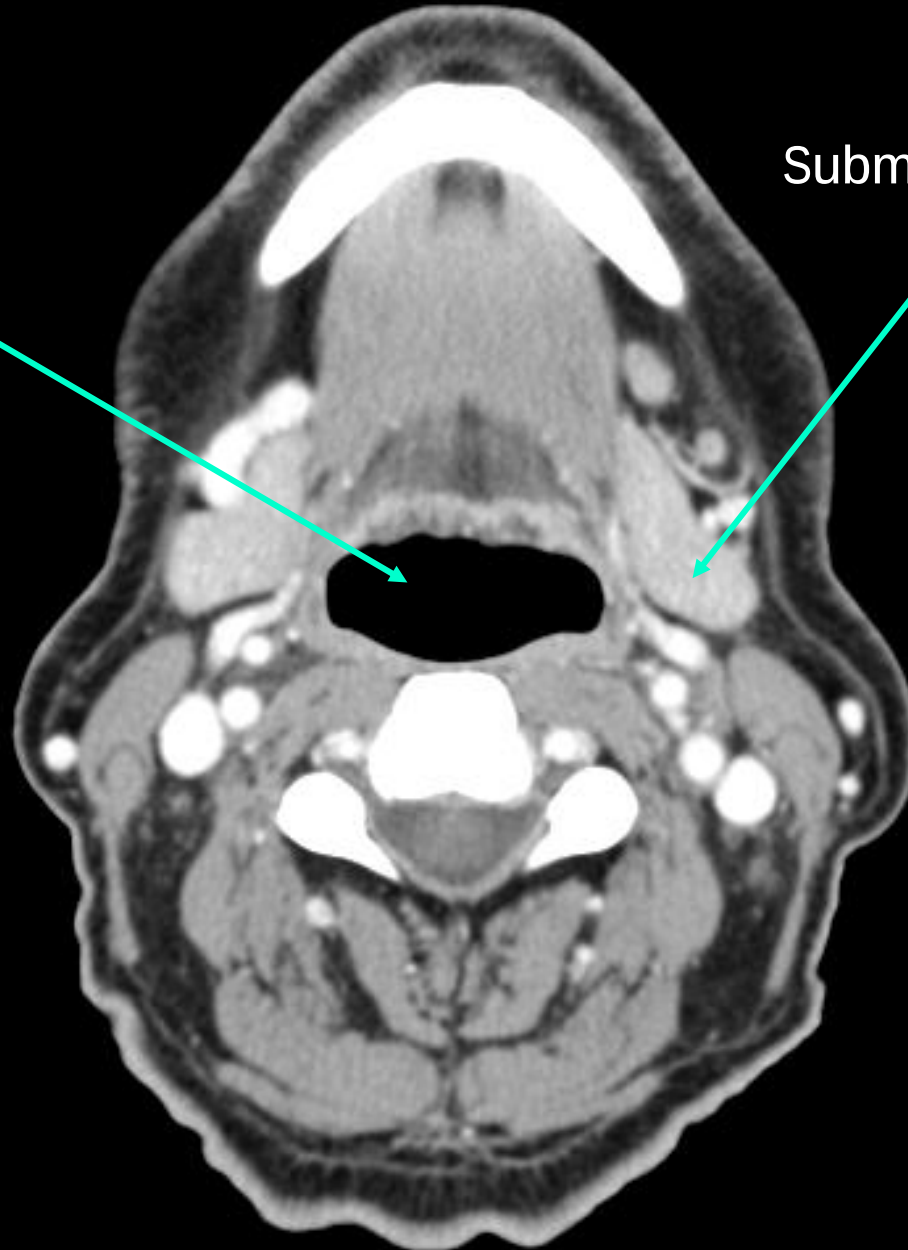


Sternomastoid
Muscle

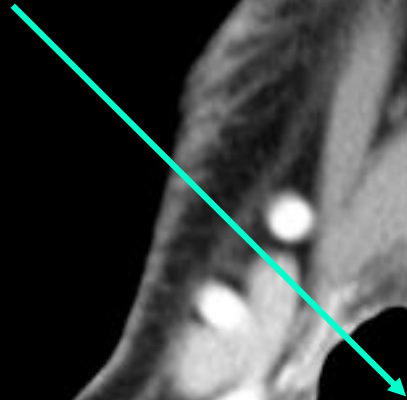


Oropharynx

Submandibular Gland

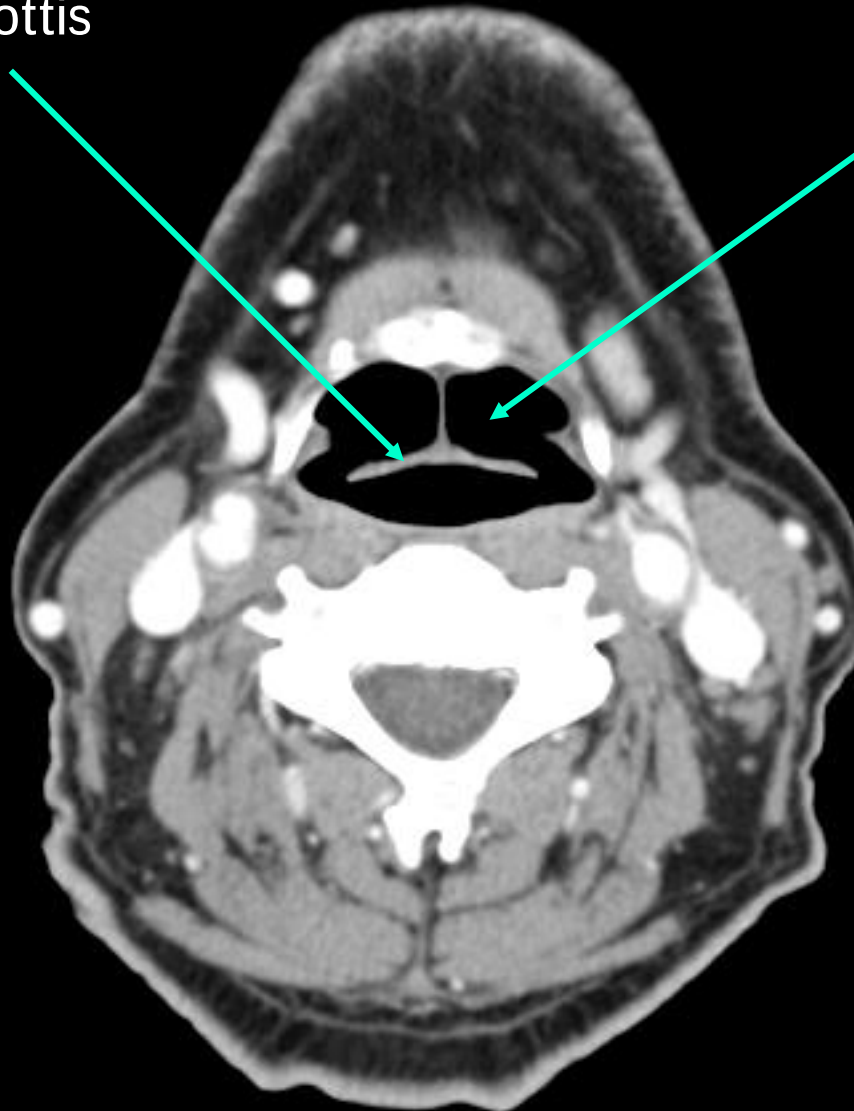


Epiglottitis

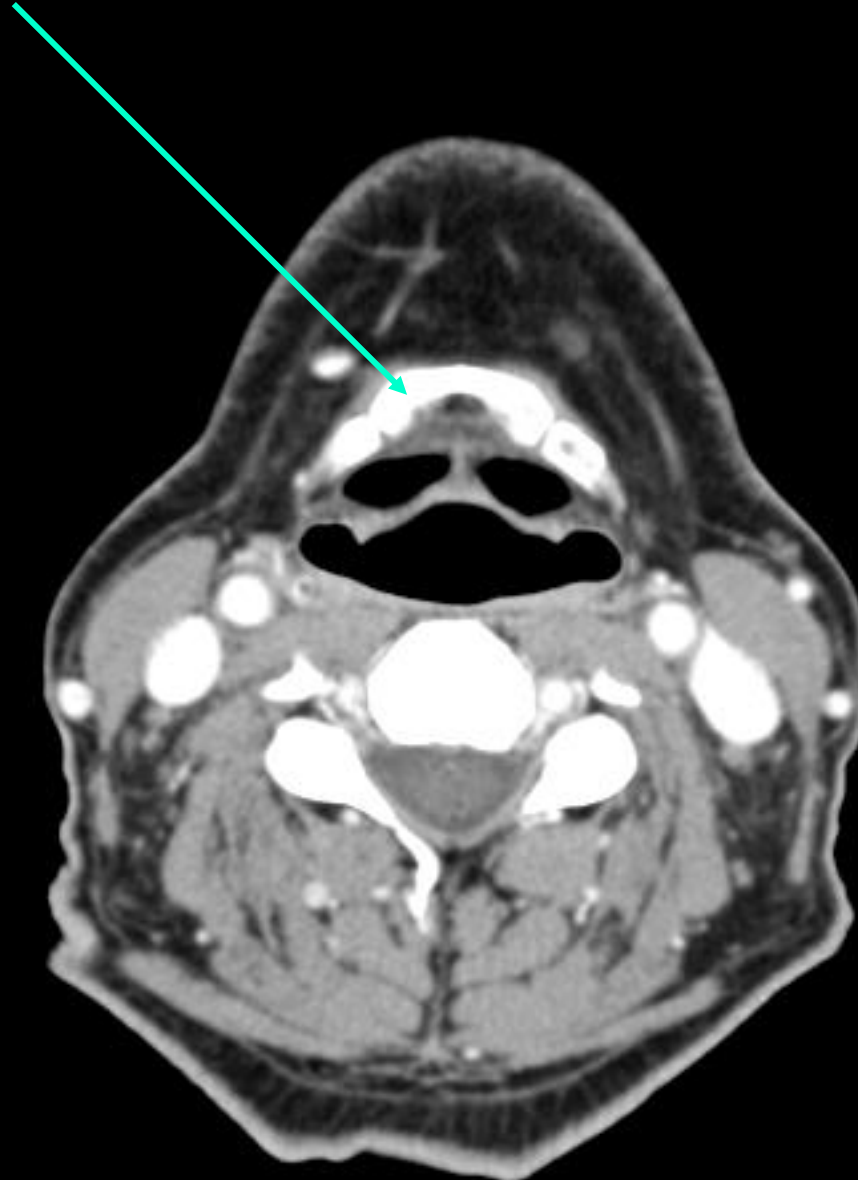


Epiglottis

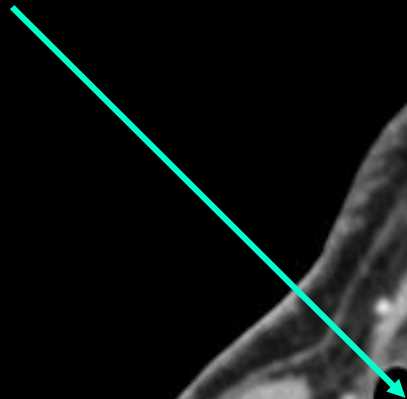
Vallecula



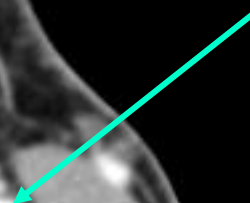
HYOID BONE



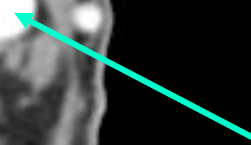
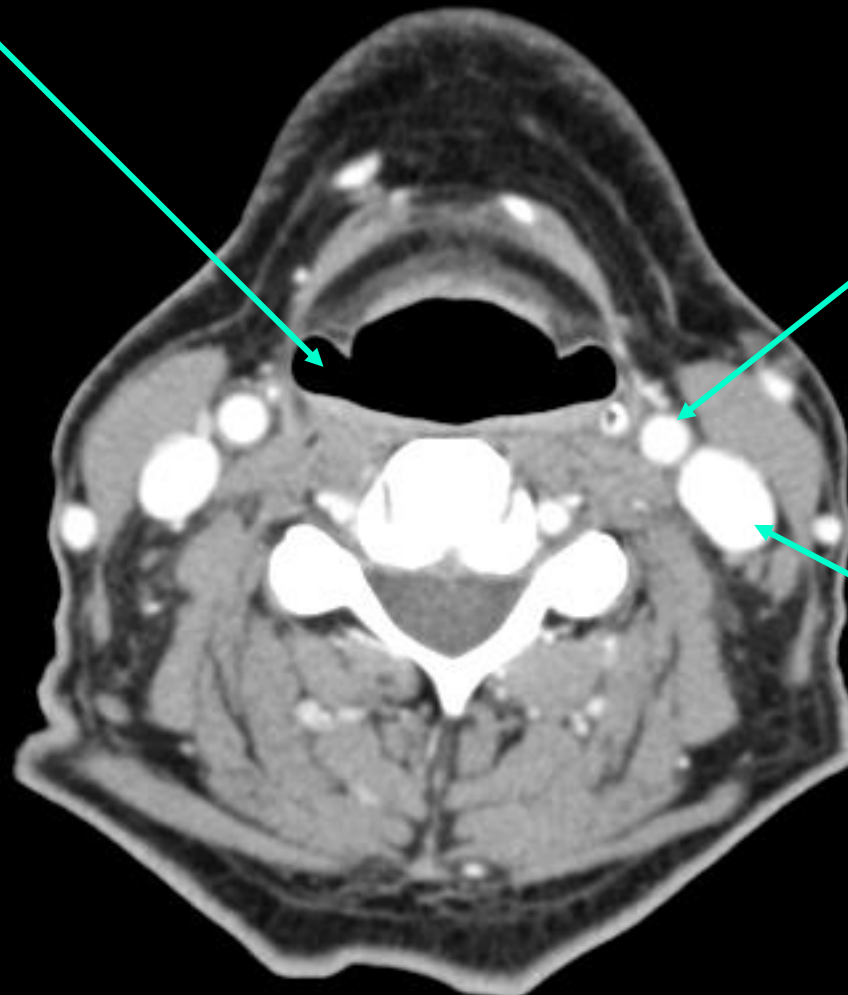
Piriform Recesses
(part of hypopharynx)



CCA



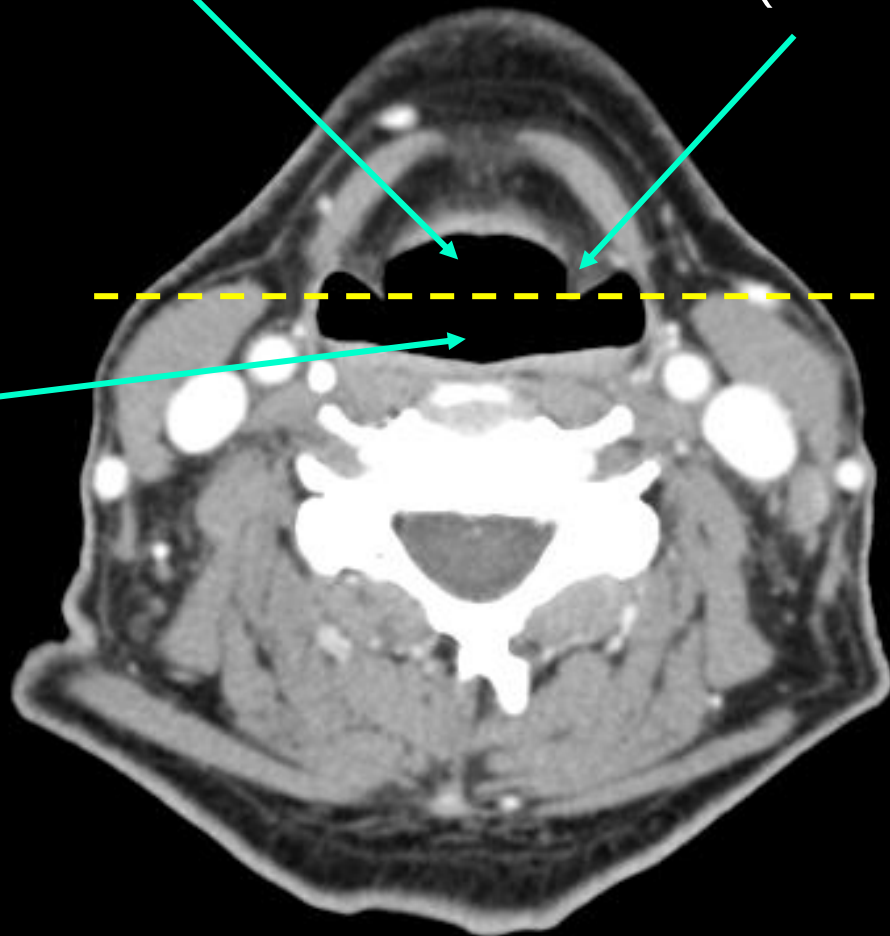
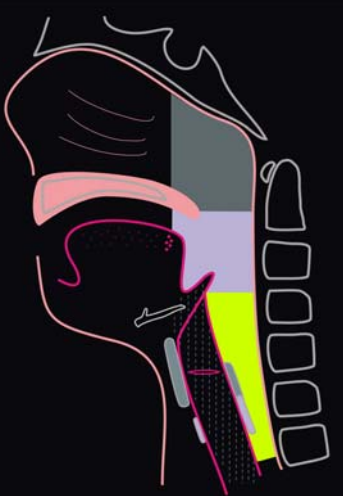
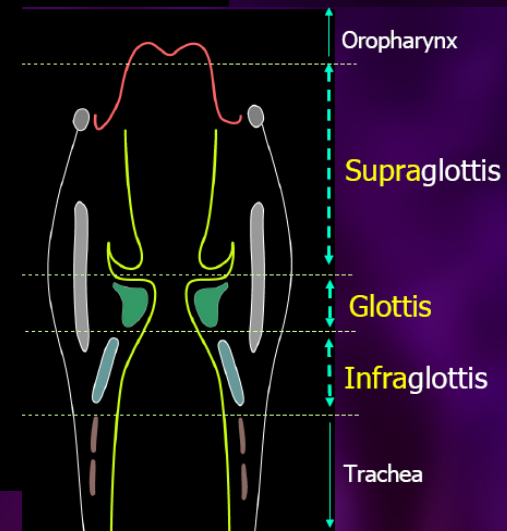
IJV



SUPRAGLOTTIS

Aryepiglottic Fold
(dividing line)

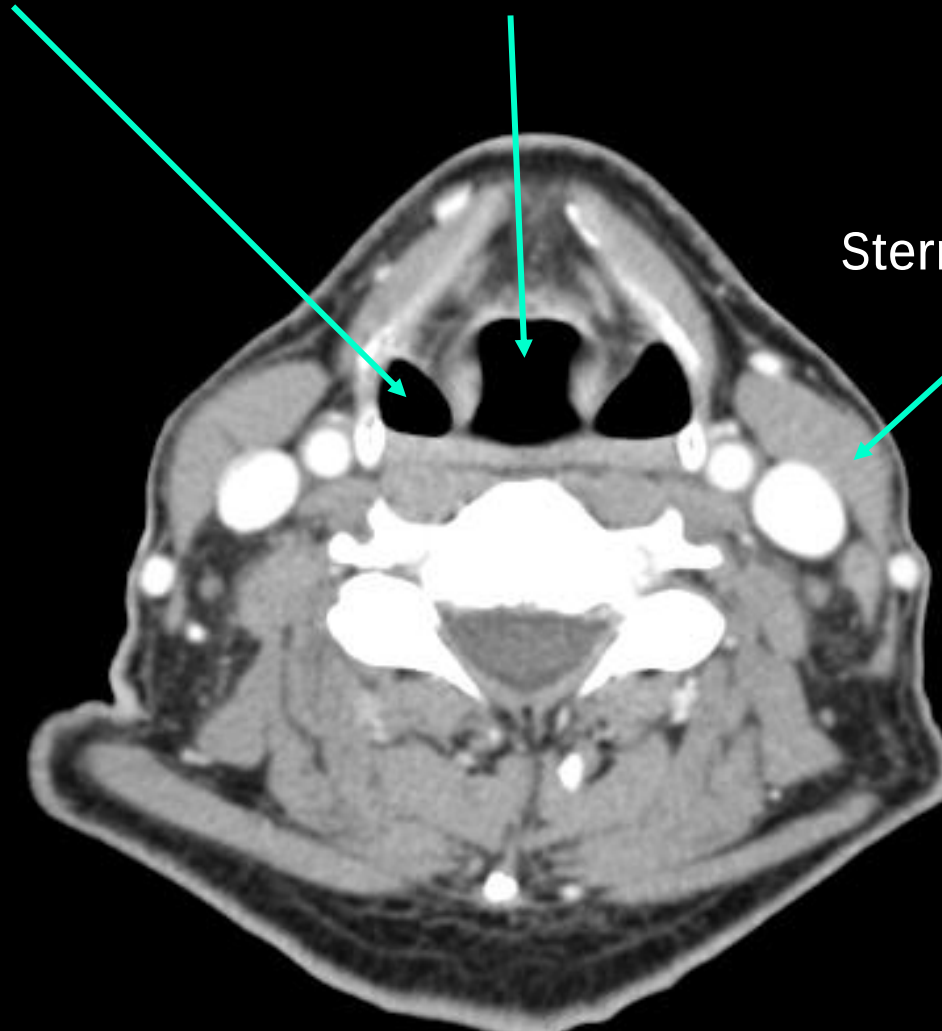
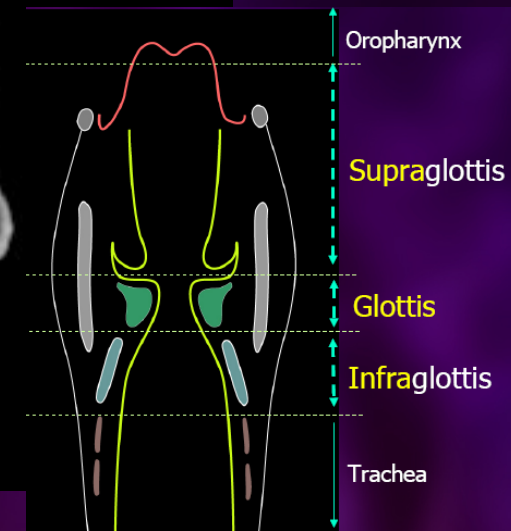
HYPOPHARYNX



Piriform Recesses
(part of hypopharynx)

Supraglottis

Sternomastoid Muscle

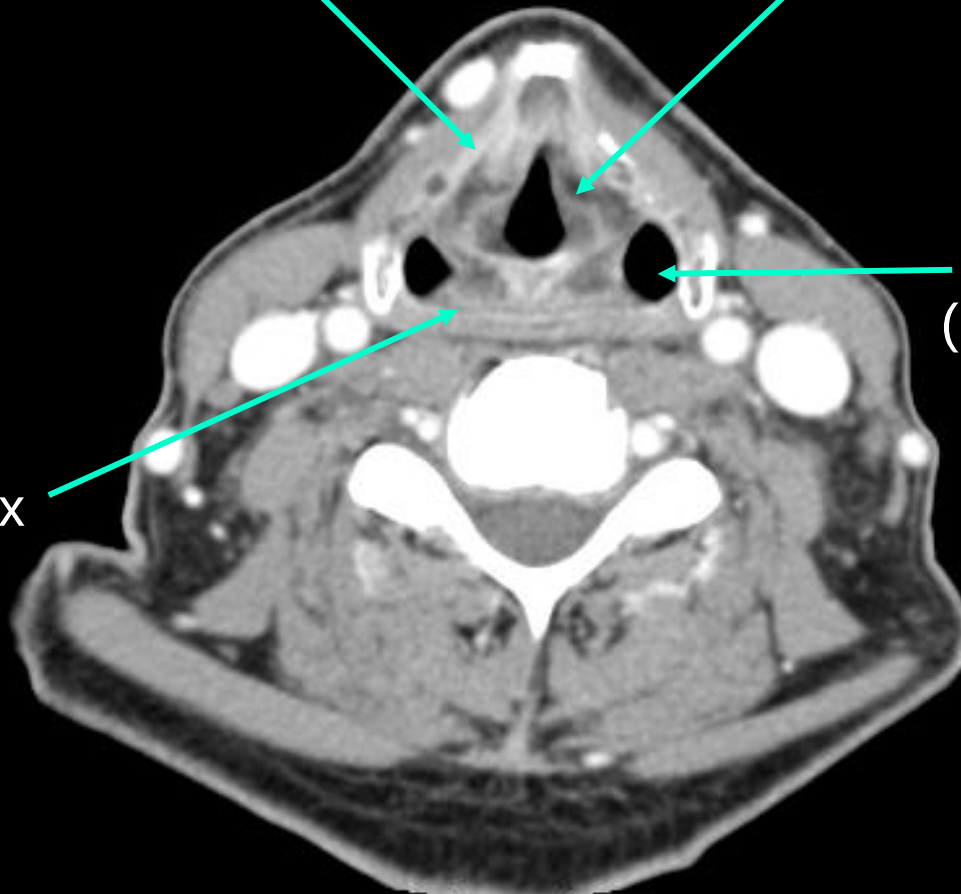
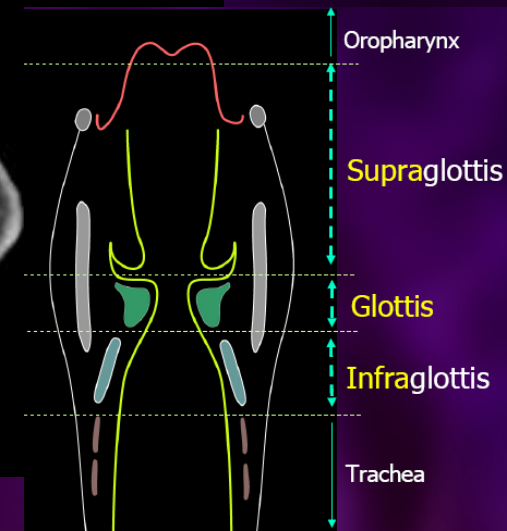


Thyroid Cartilage

False Cords
(part of supraglottis)

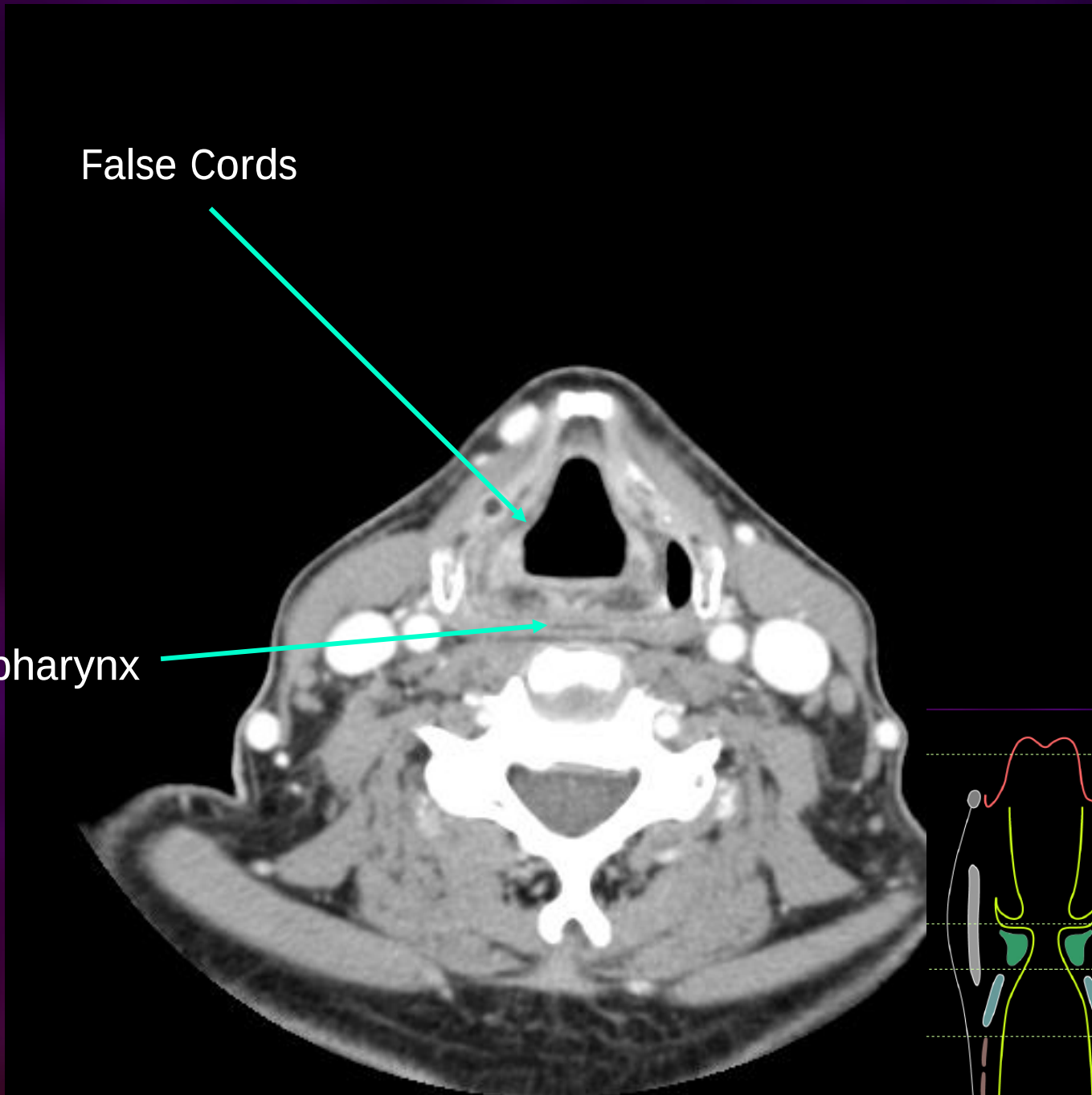
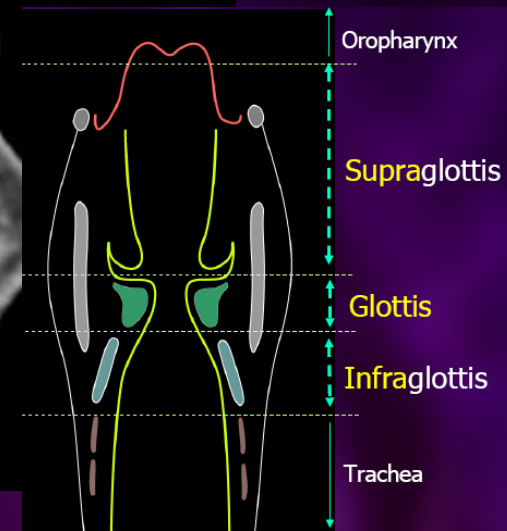
Piriform Recess
(Often asymmetric!)

Hypopharynx

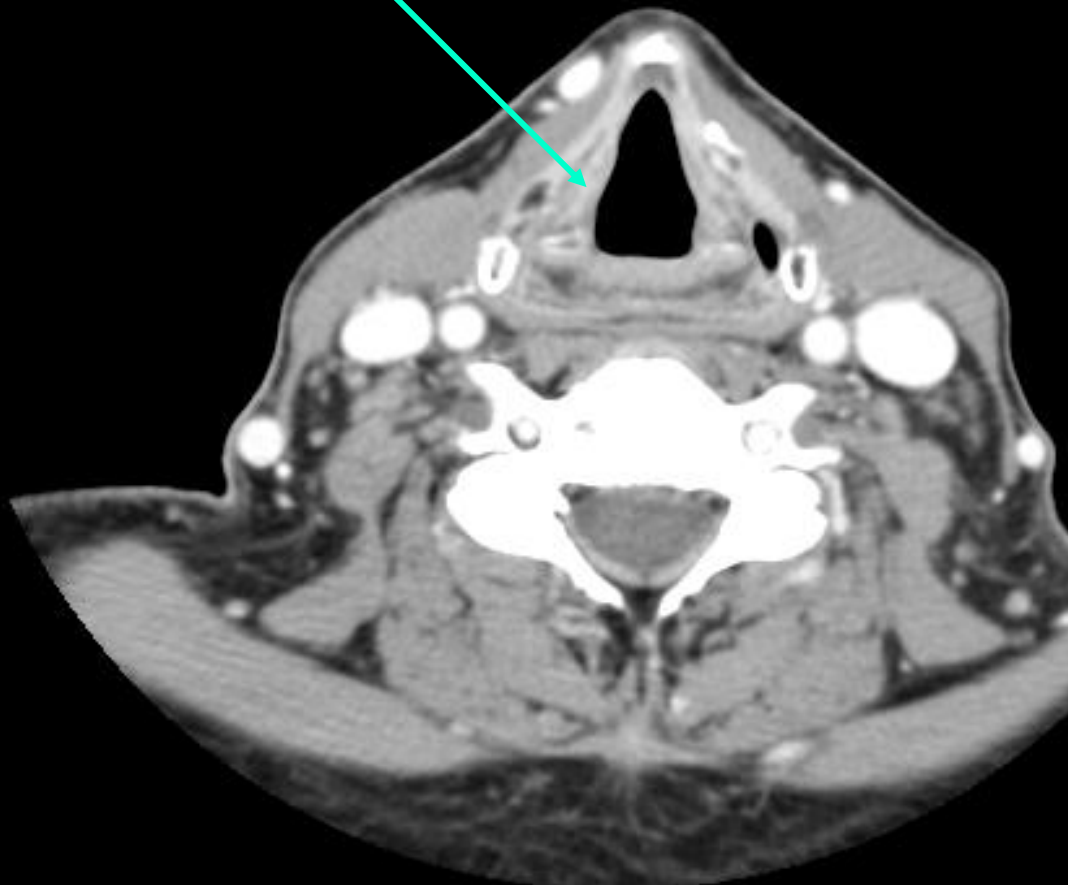
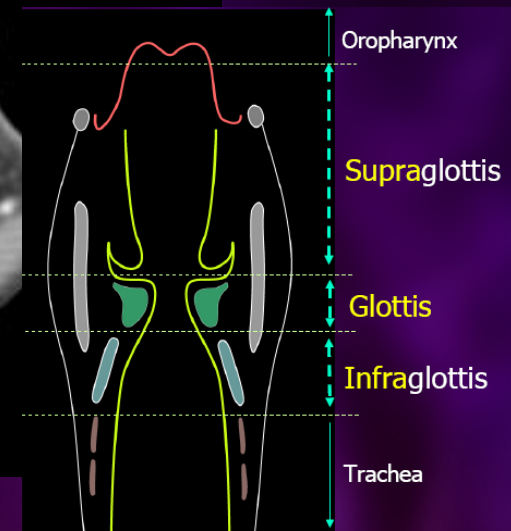


False Cords

Hypopharynx



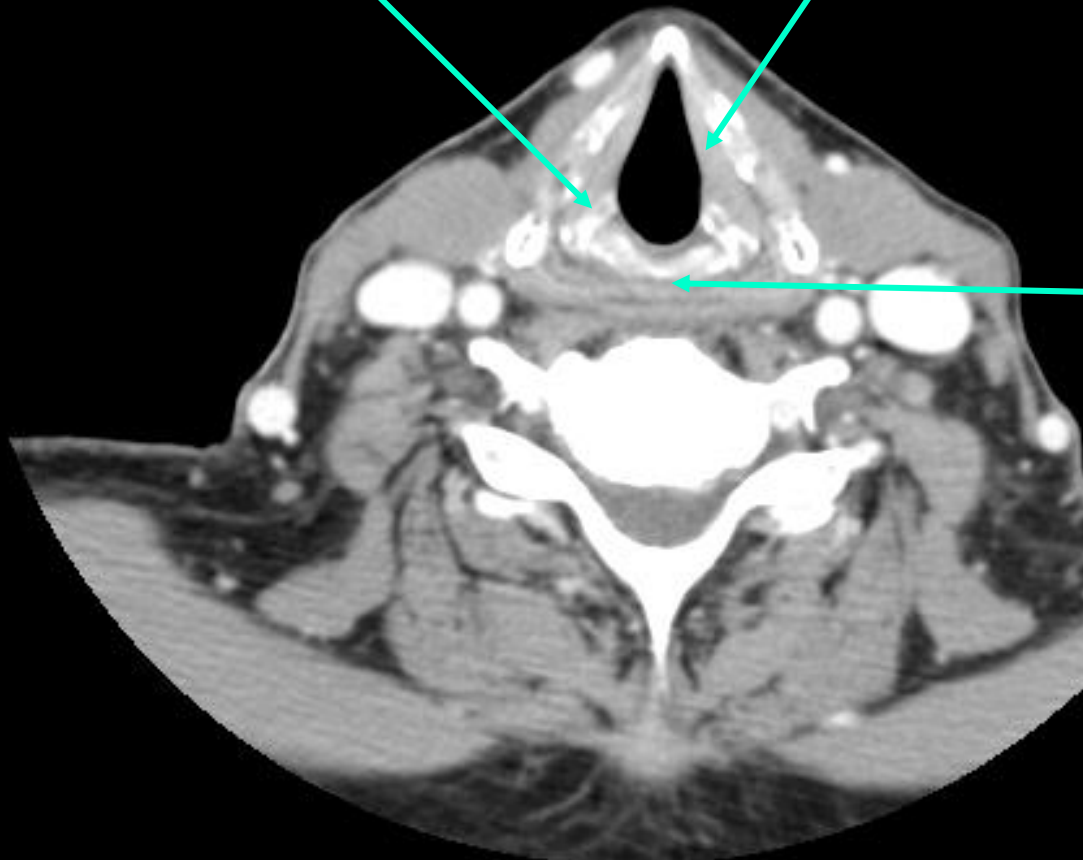
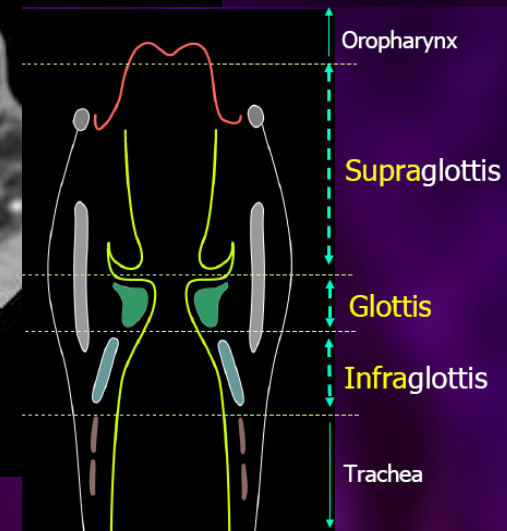
False Cords



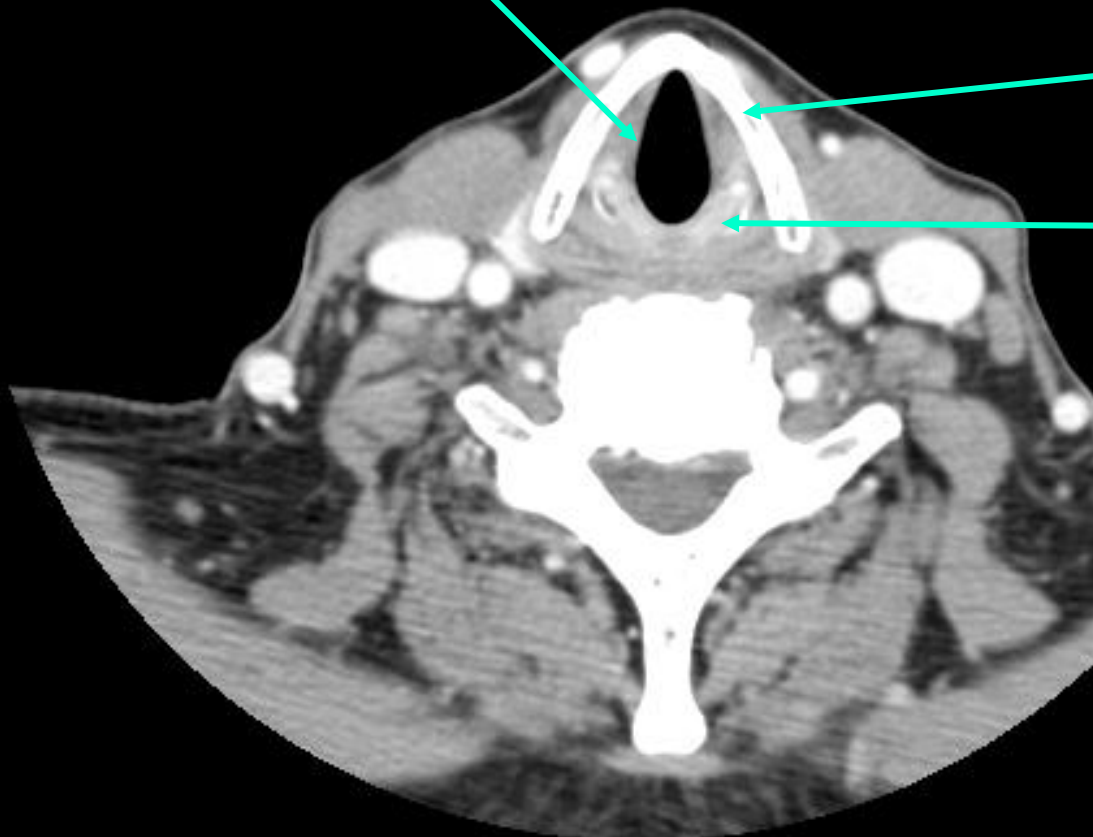
Arytenoid Cartilages
(Important landmark, indicates
level of glottis and true cords)

True Cords (part of glottis)

**Cricoid
Cartilage**

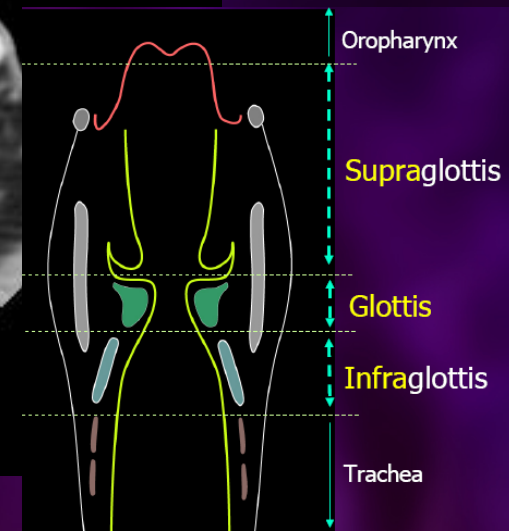


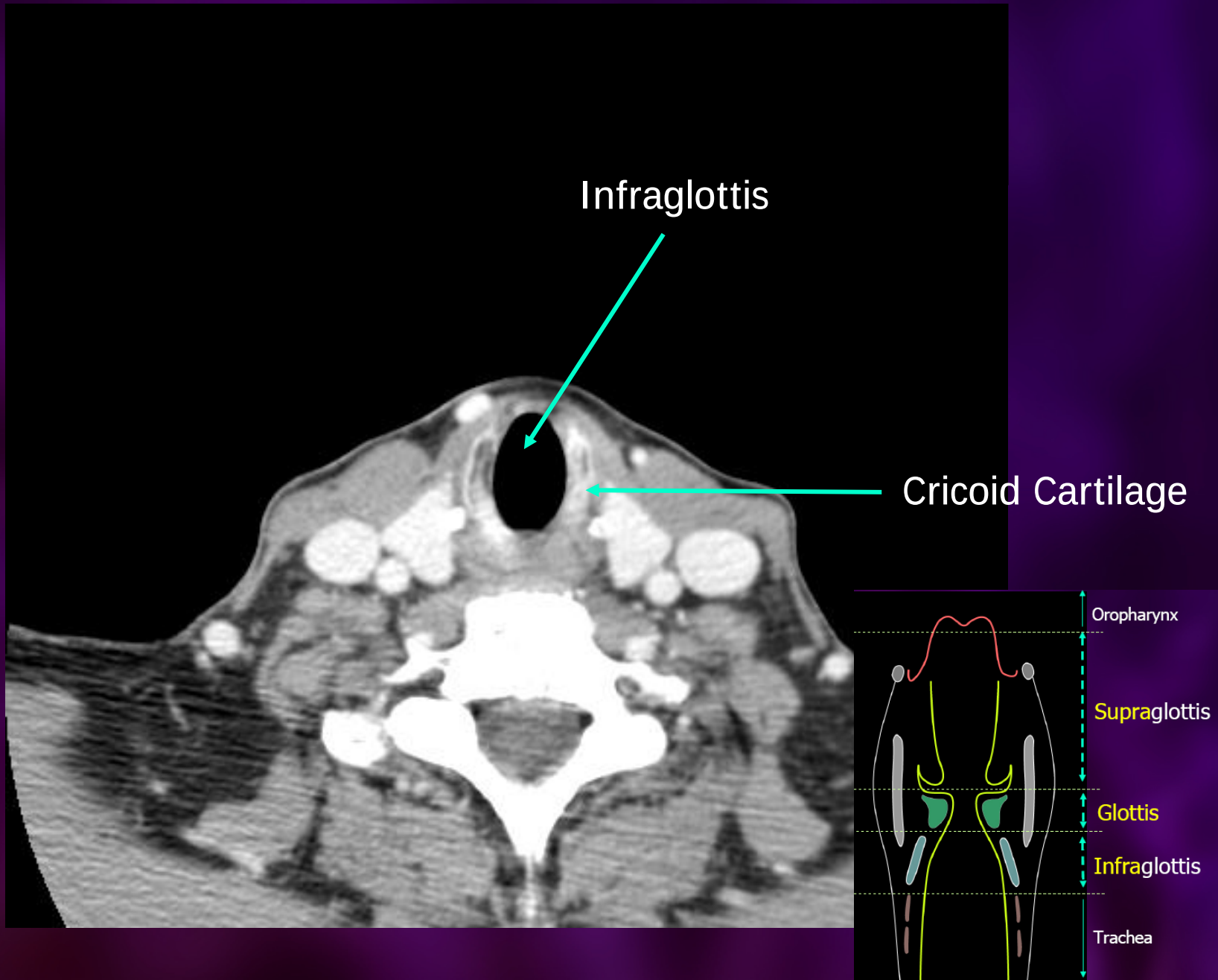
Undersurface of True Cord



Thyroid Cartilage

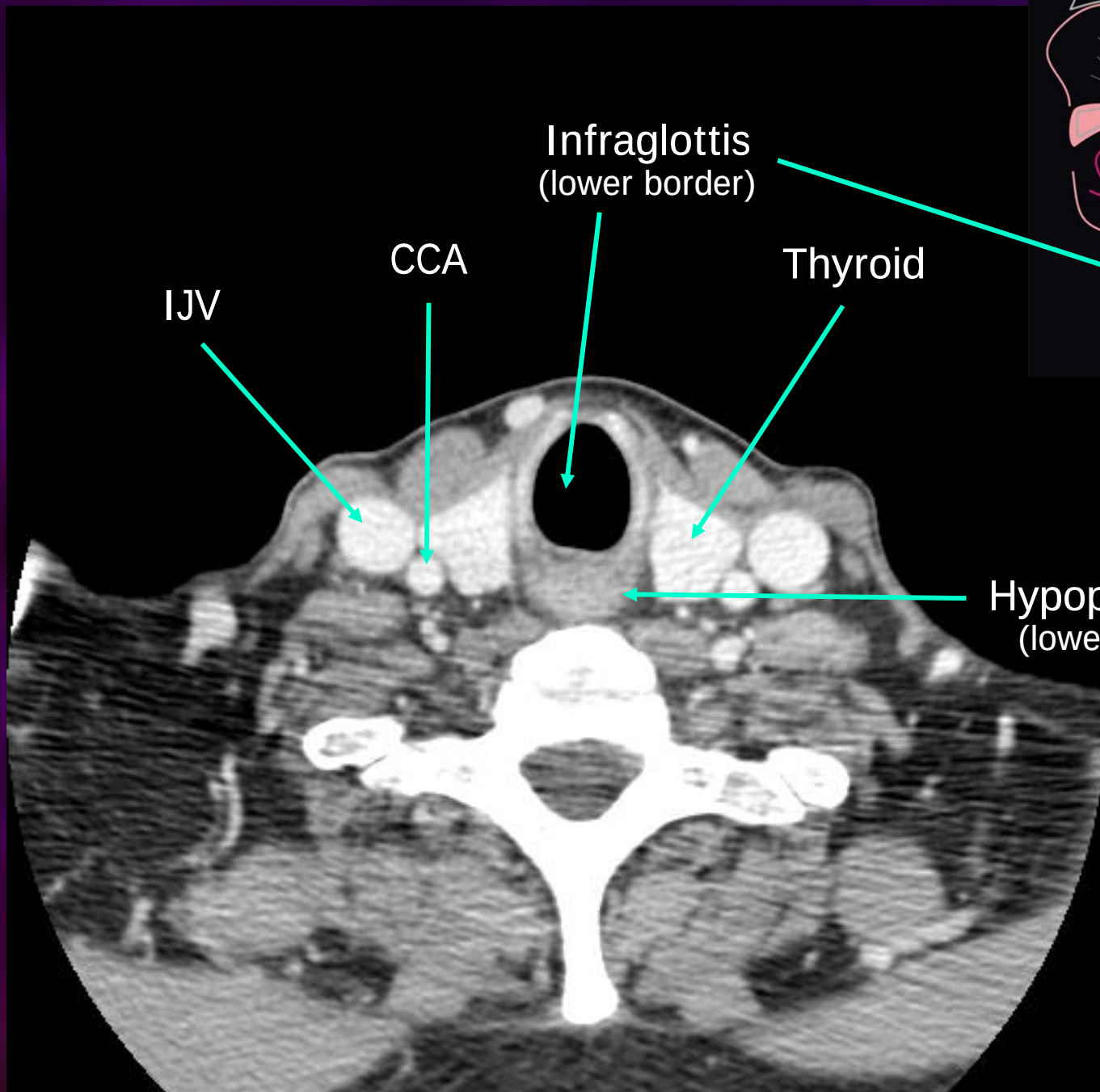
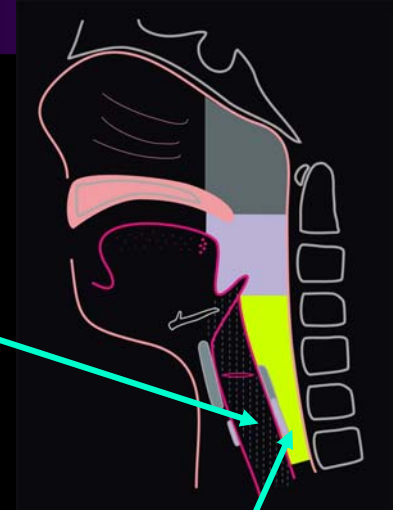
Cricoid Cartilage





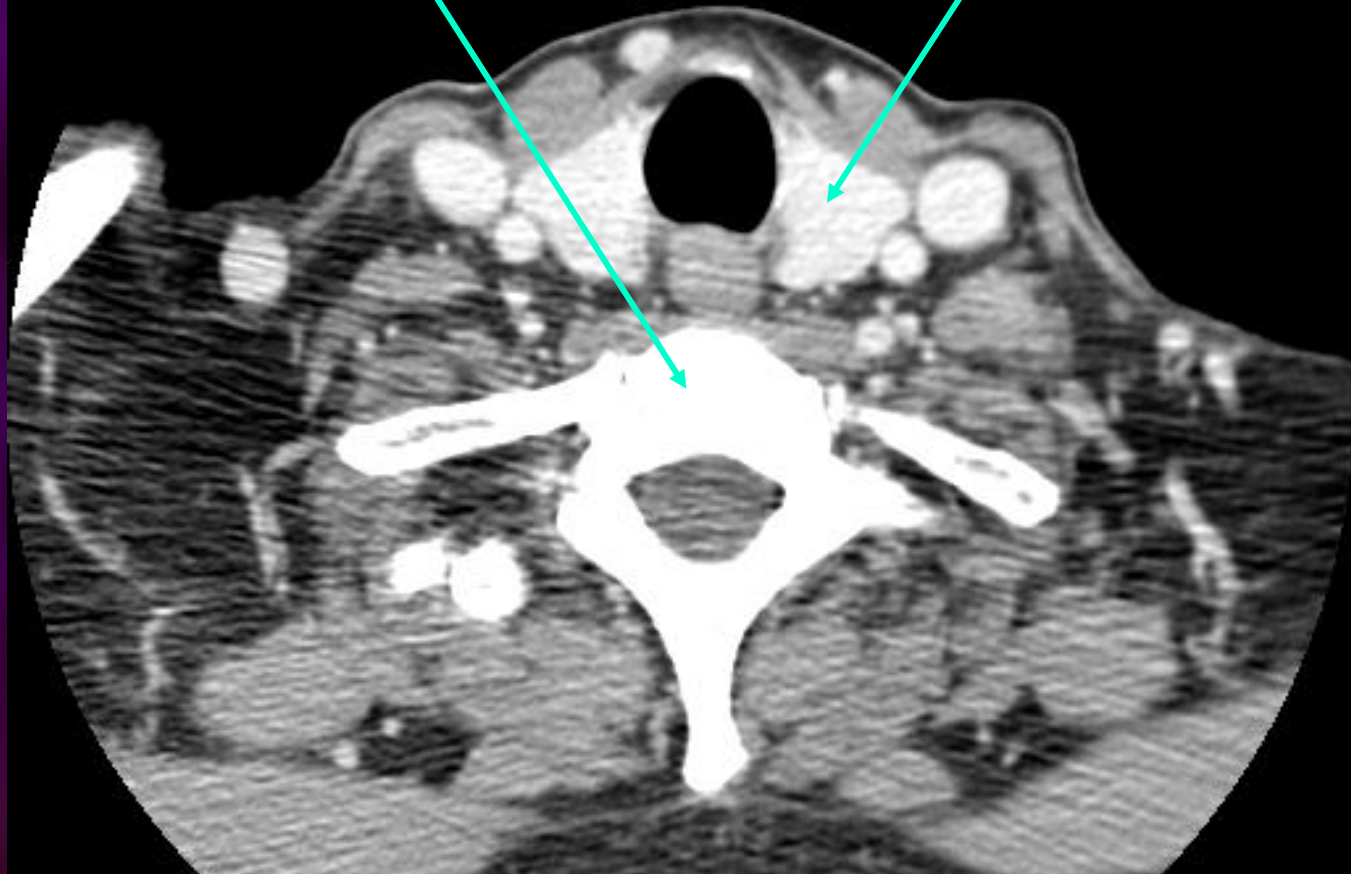


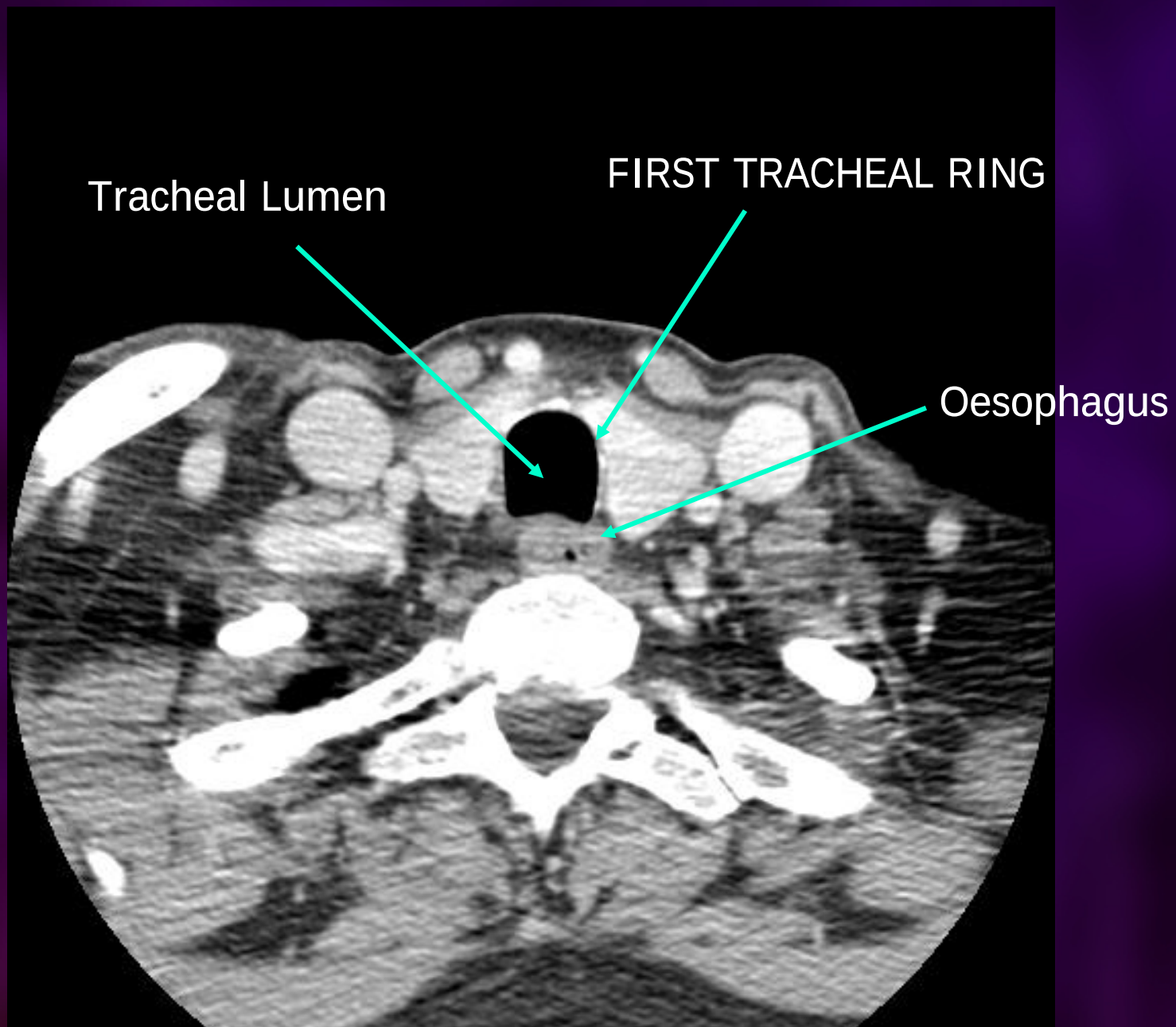
Cricoid Cartilage



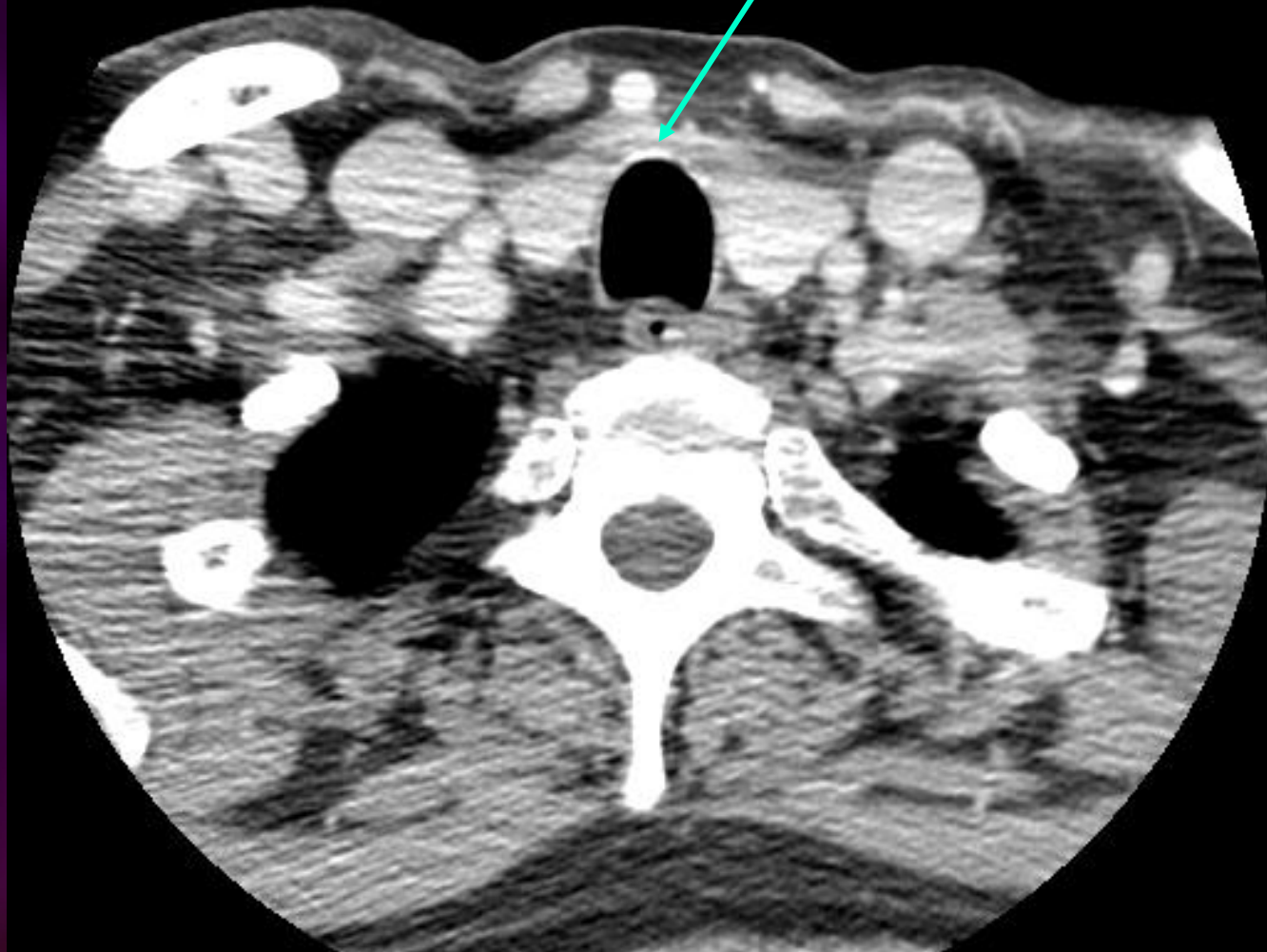
T1 Vertebral Body
and First Rib

Thyroid





Thyroid Isthmus



Summary (1)

- 3 main bony / cartilaginous landmarks
 - hyoid bone
 - thyroid cartilage
 - cricoid cartilage

Use these landmarks for vertical orientation!

- Pharynx has 3 subdivisions
 - nasopharynx
 - oropharynx
 - hypopharynx
 - hypopharynx has 3 parts
 - piriform recesses, posterior pharyngeal wall, postcricoid space

Summary (2)

- Larynx has 3 subdivisions

- supraglottis
- glottis
- infraglottis

Glottic level is easiest to recognise (look for arytenoid cartilages and true cords!)

- First tracheal ring is an important landmark

- Signifies the commencement of the thoracic inlet
- Larynx ends and becomes trachea
- Hypopharynx ends and becomes oesophagus

Again easily recognisable due to characteristic shape

The End