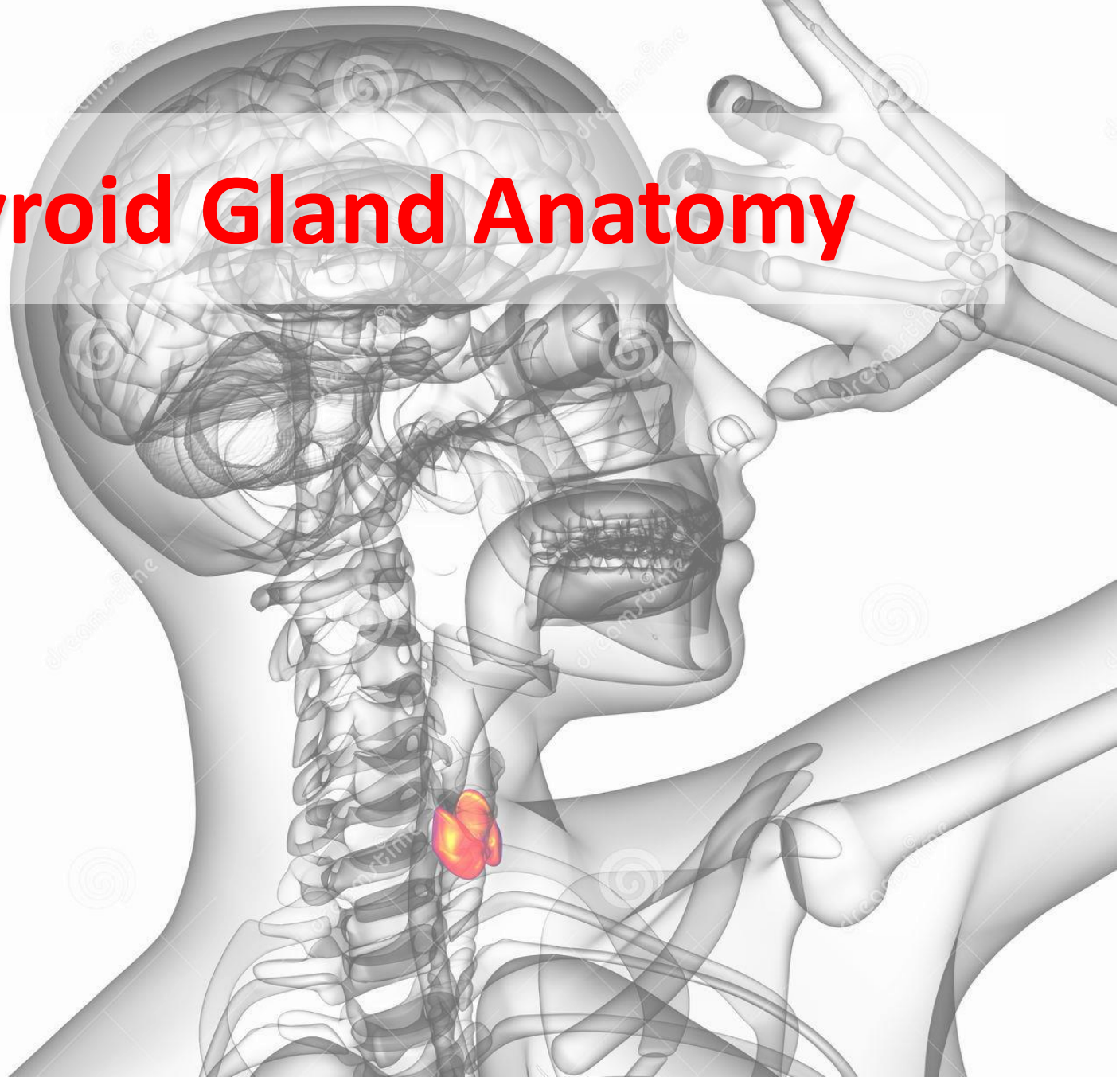
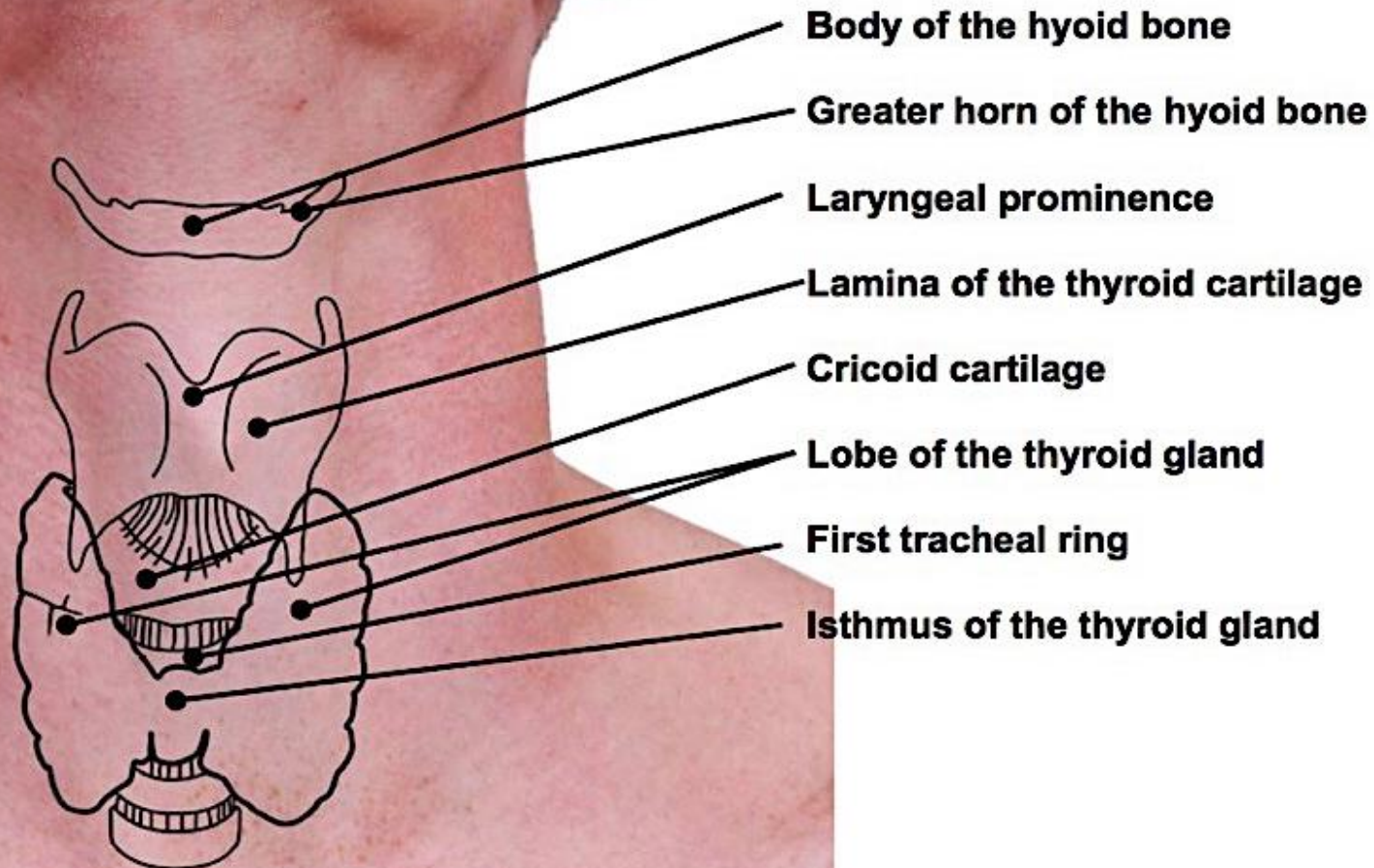


# Thyroid Gland Anatomy

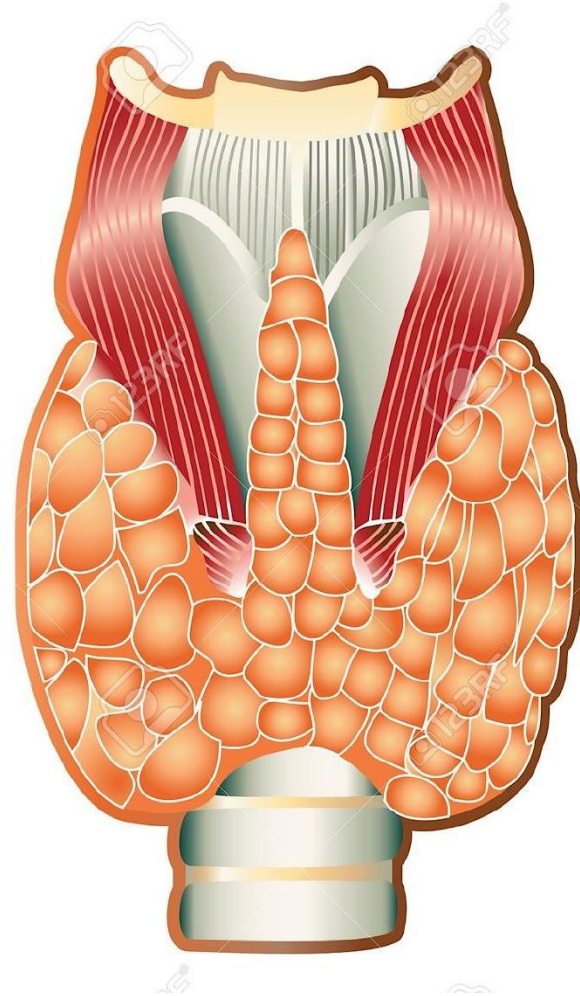


# Surface Anatomy

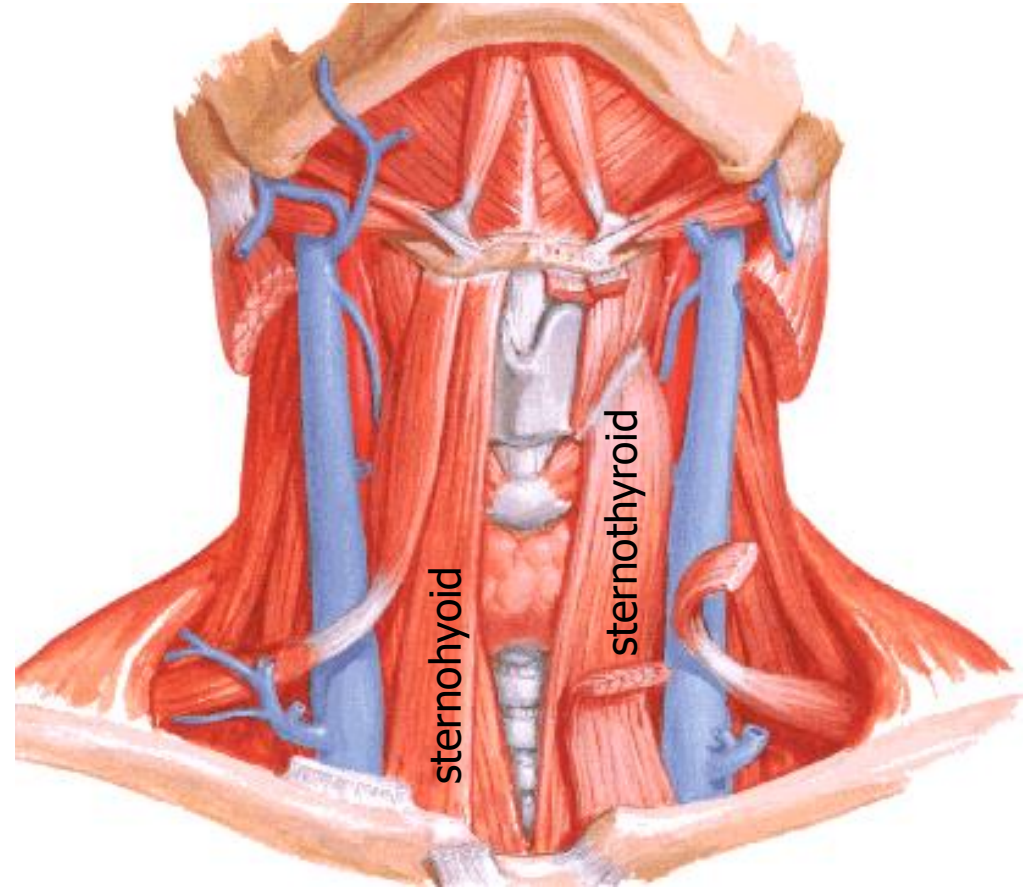
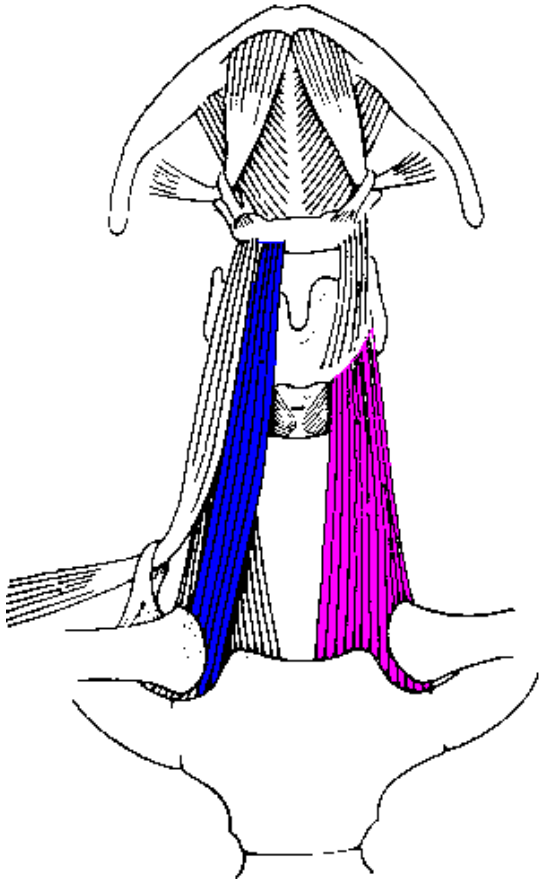


# Thyroid Lobes

- The thyroid gland consists of two lobes united in front of the second, third and fourth tracheal rings by an isthmus of gland tissue.

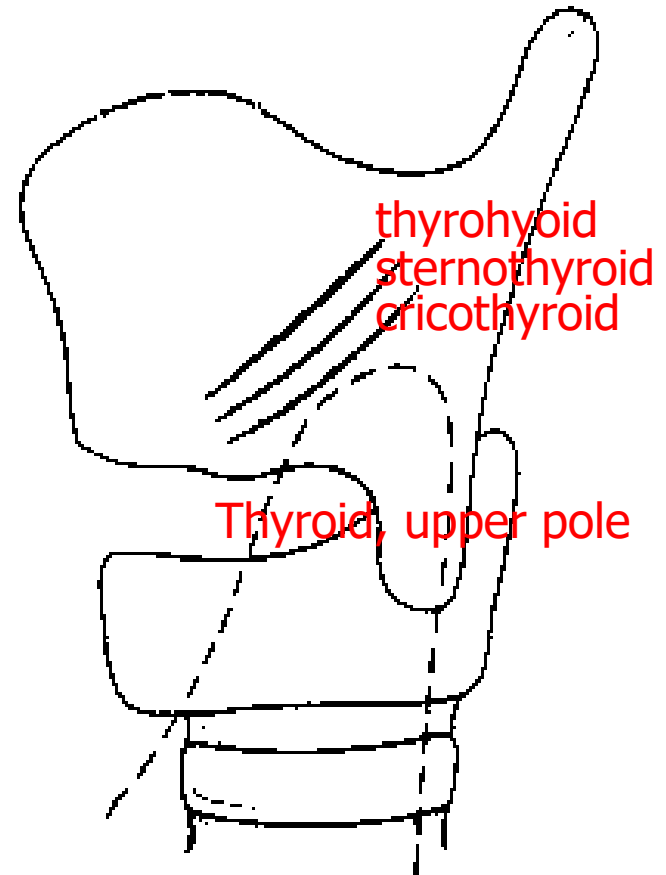
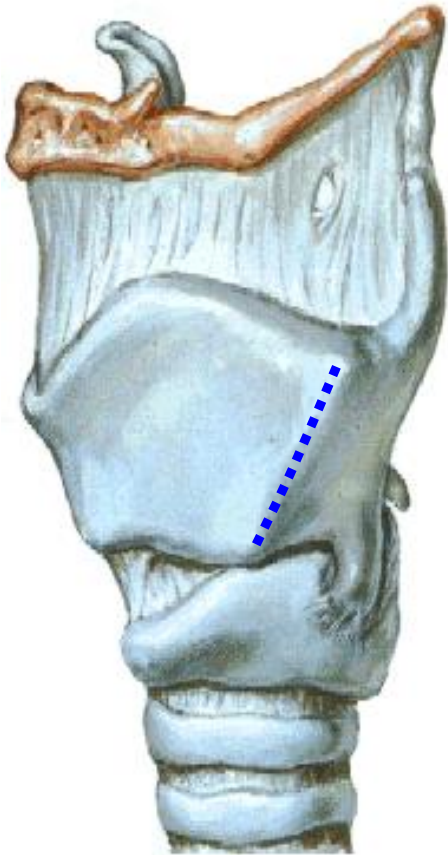


# Thyroid Gland Position



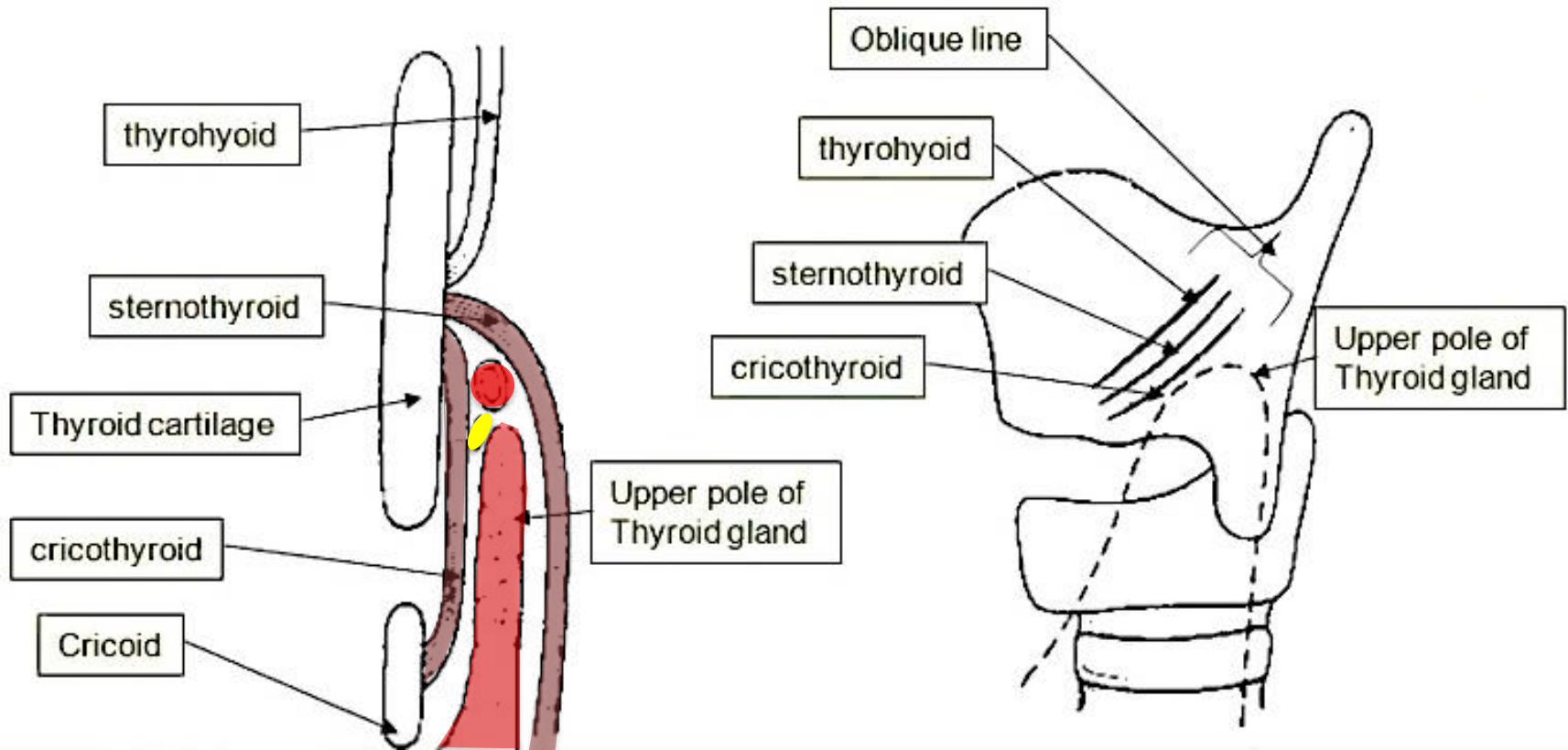
- It lies under cover of **sternothyroid** and **sternohyoid** muscles on the side of the larynx and trachea

# Thyroid Gland Position



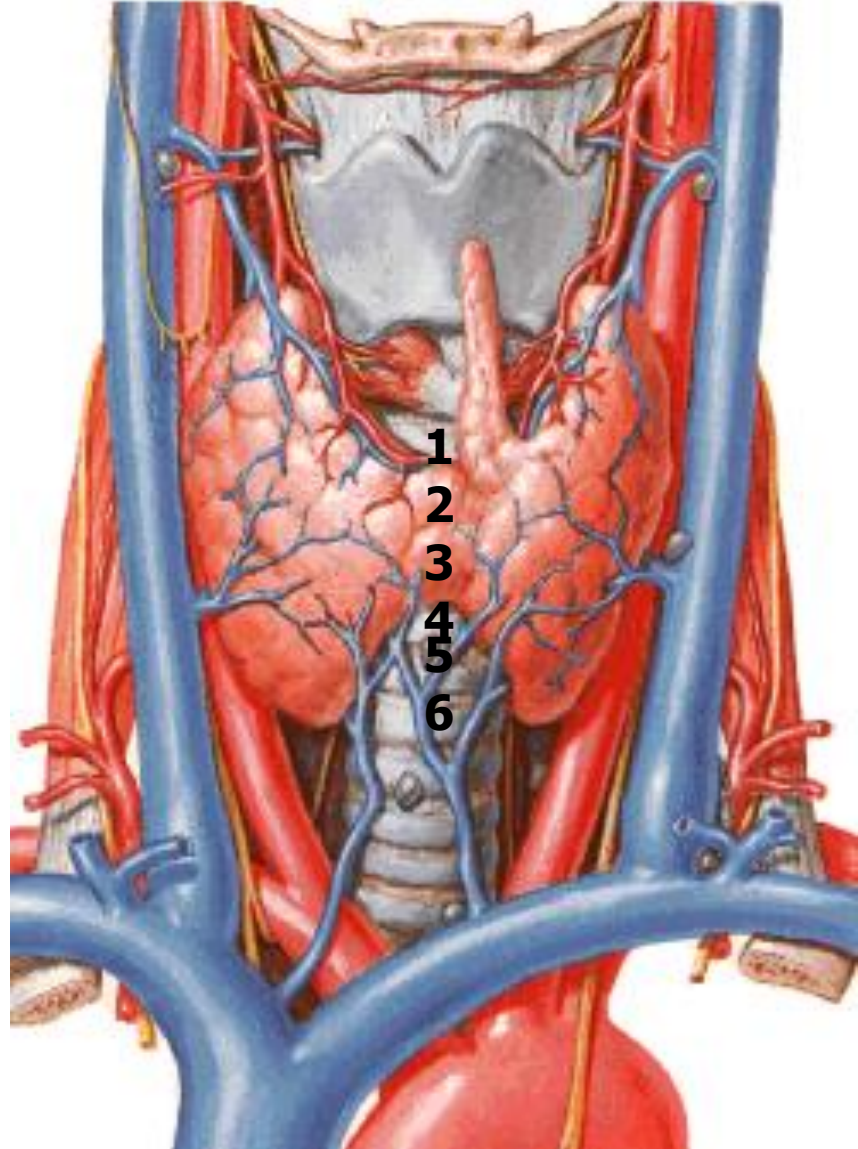
- The upper pole of the thyroid cannot normally rise above the level of the **oblique line** of the thyroid cartilage

# Thyroid Gland Position

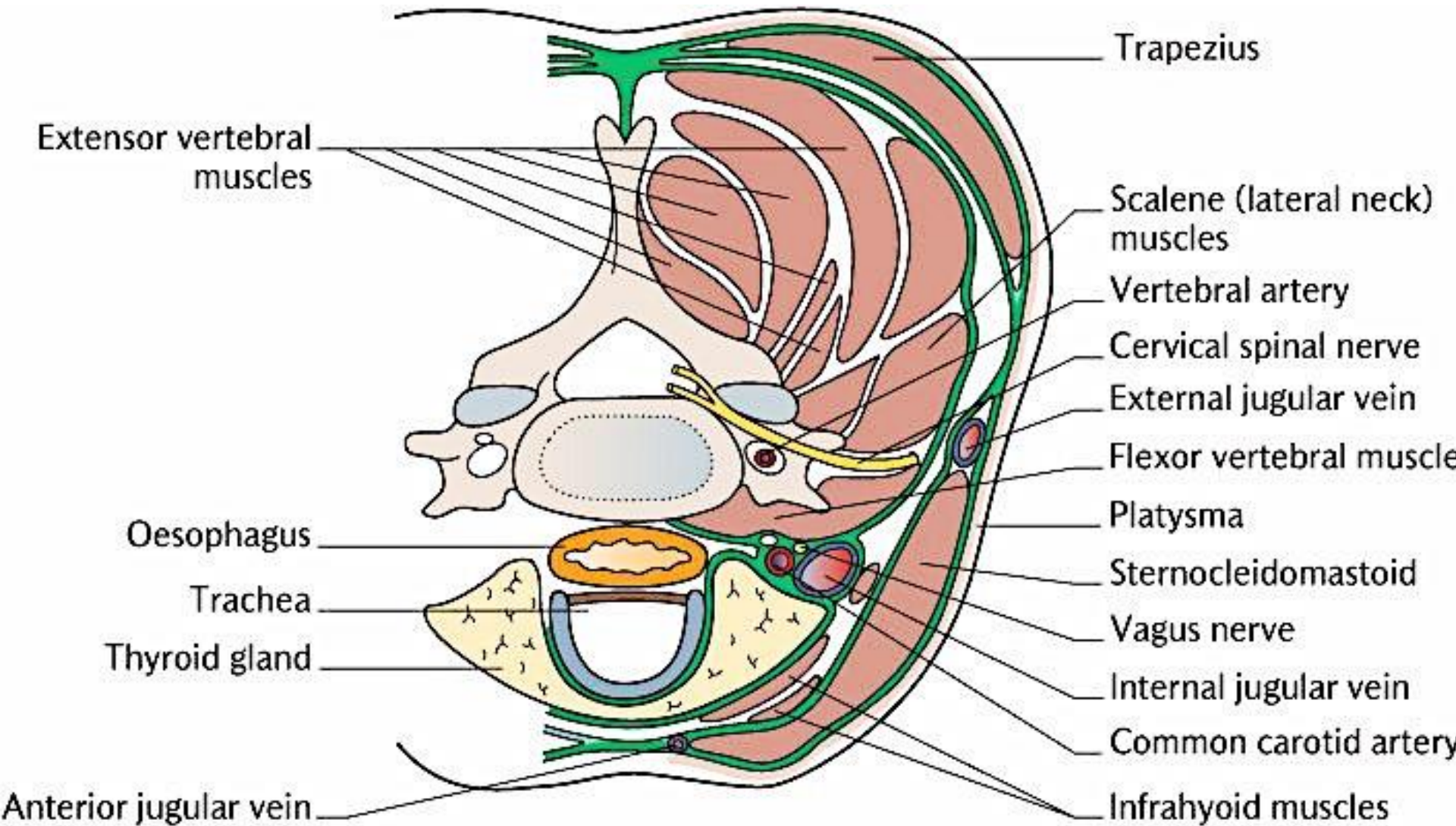


# Thyroid Gland Position

- The lower pole of the thyroid gland extends along the side of the trachea as low as the sixth tracheal ring



# Thyroid Gland Position

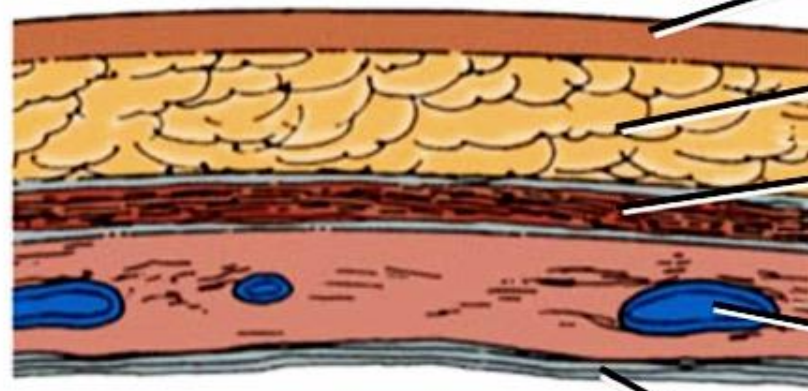




# Fascia & Spaces

## superficial fascia

Skandalakis' Surgical Anatomy 2004



skin

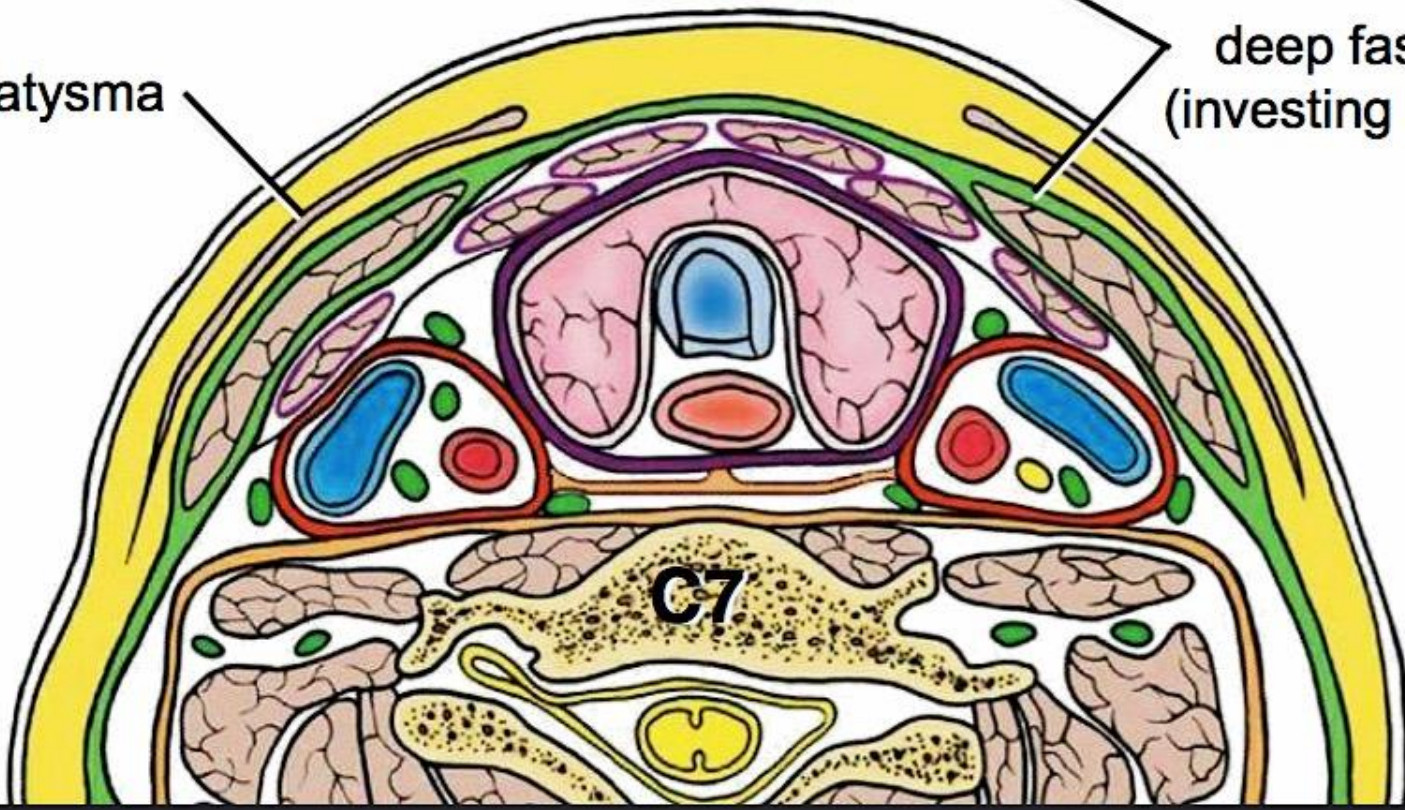
fat

platysma

veins (ant. & ext. jug.) and cutaneous nn.

platysma

deep fascia (investing layer)

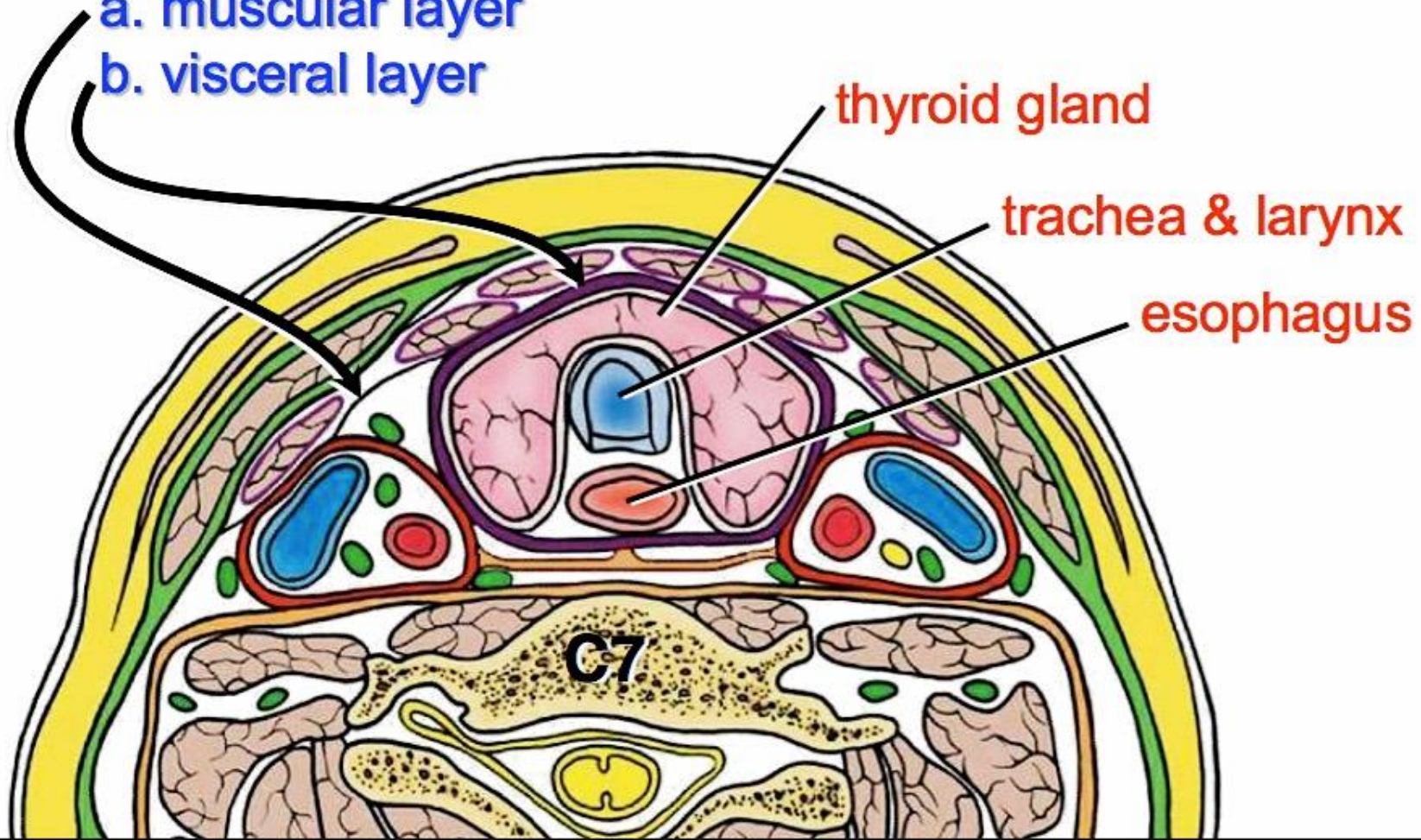


C7

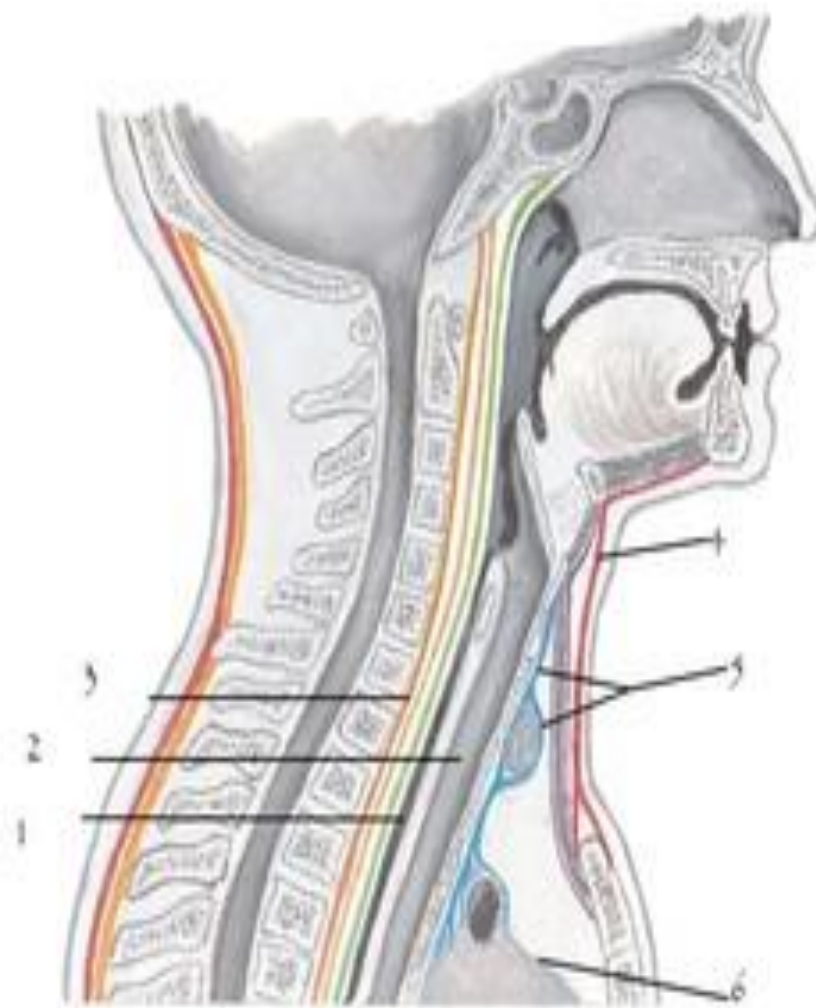
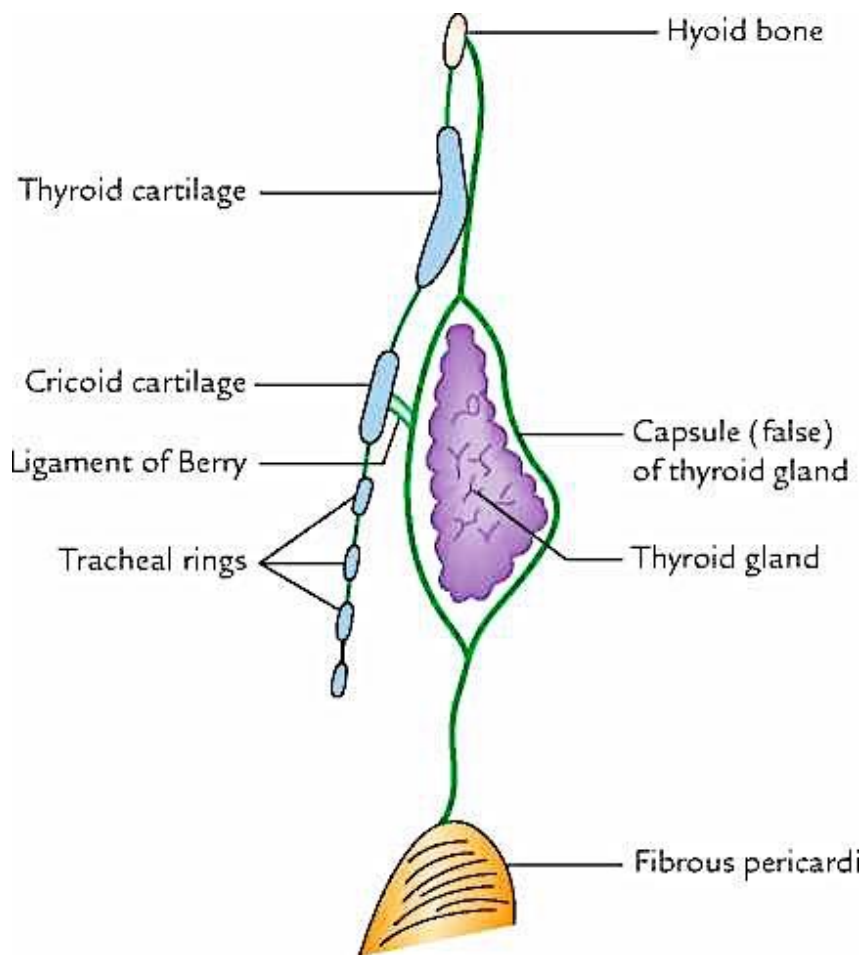
# Fascia & Spaces

## Deep Fascia

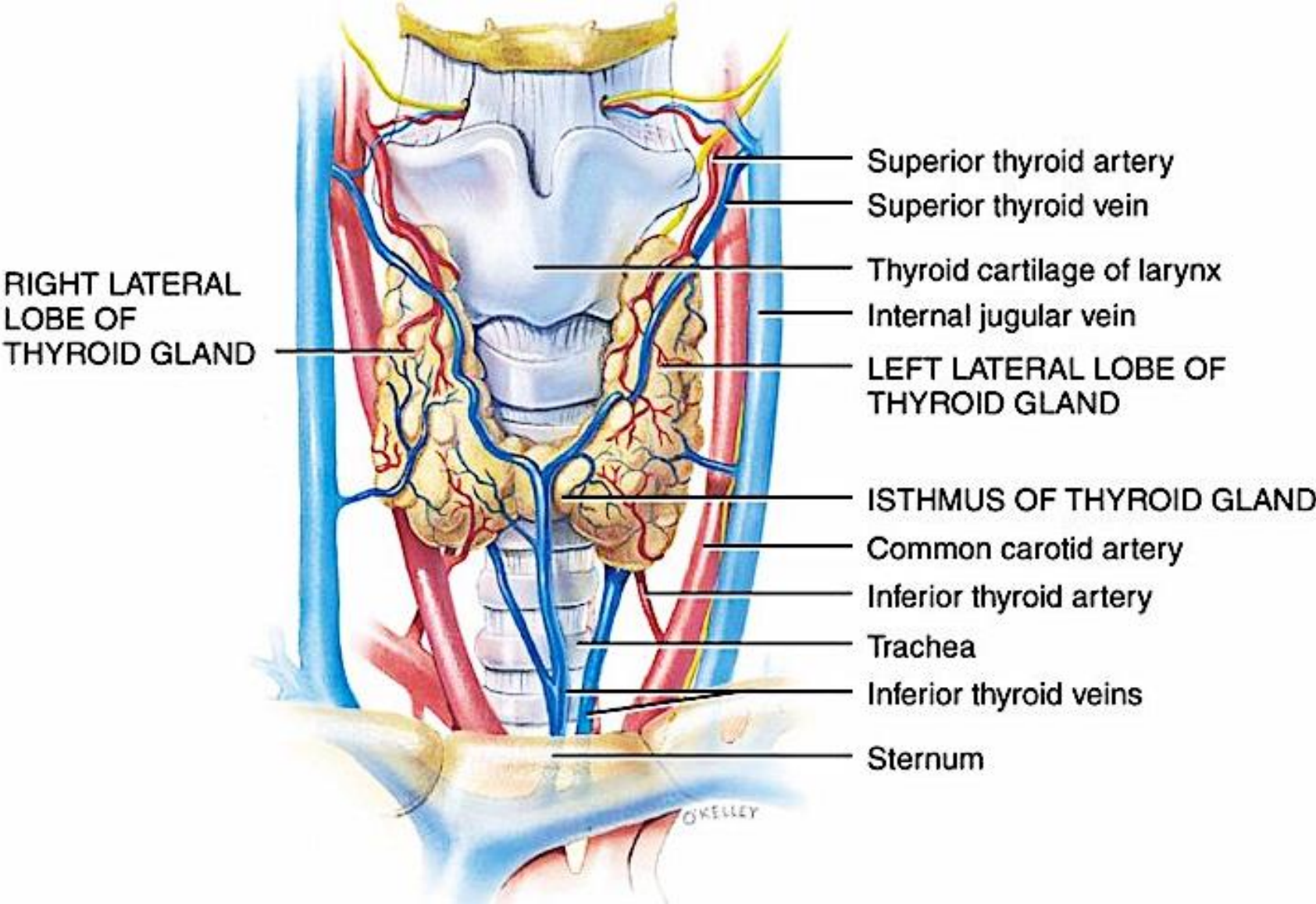
1. investing fascia
2. pretracheal fascia
  - a. muscular layer
  - b. visceral layer
3. prevertebral fascia
4. carotid sheath



# Pre-tracheal fascia attachment

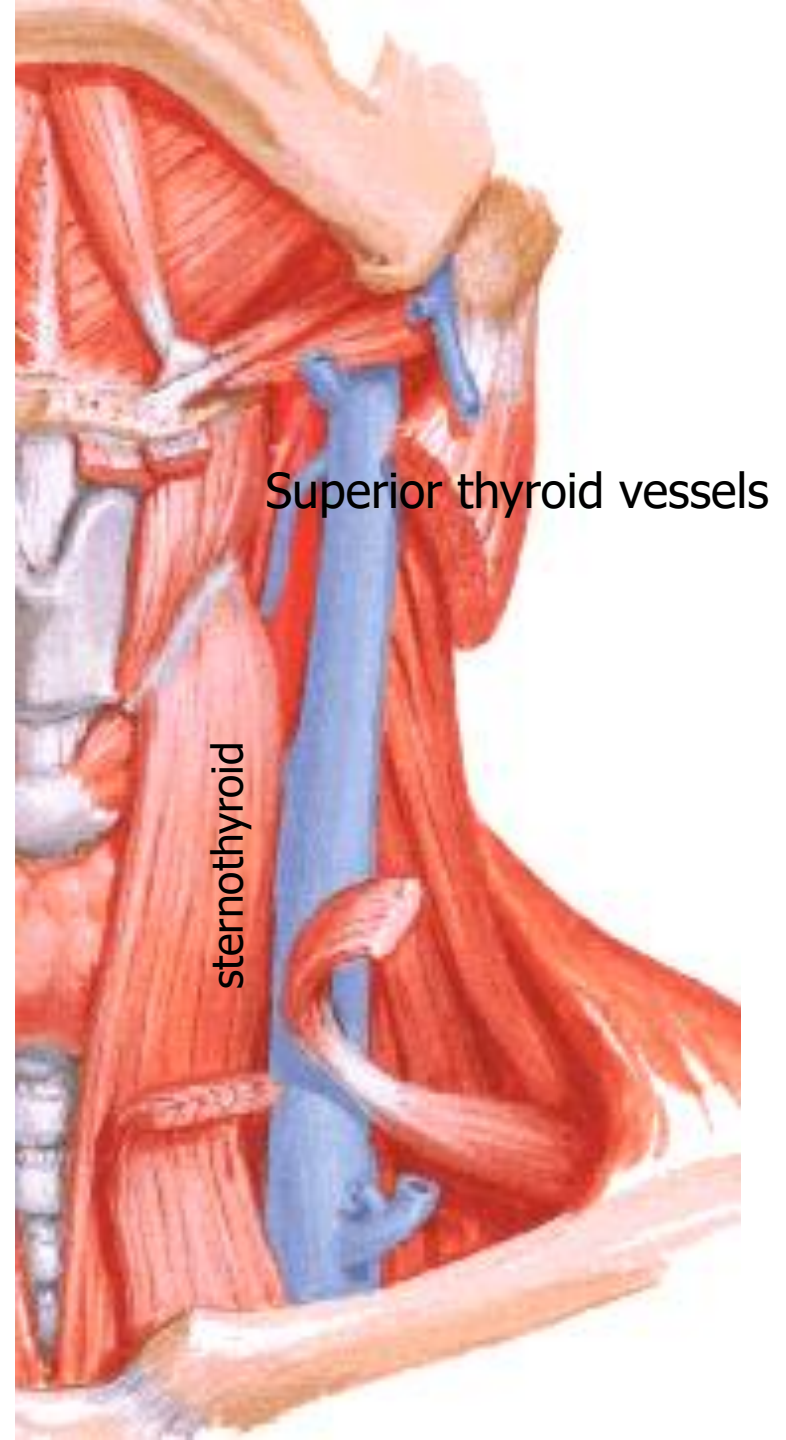
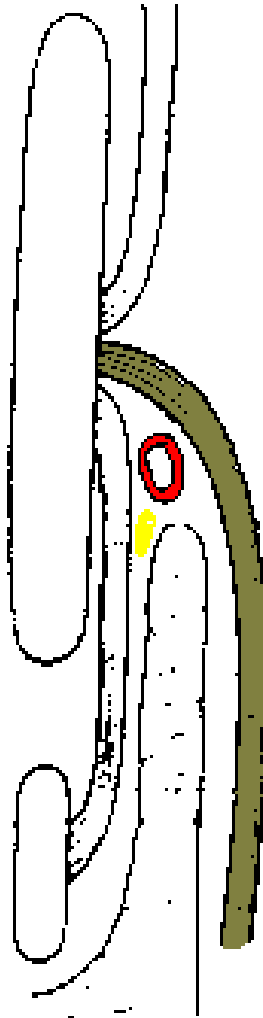


# Thyroid Blood Supply



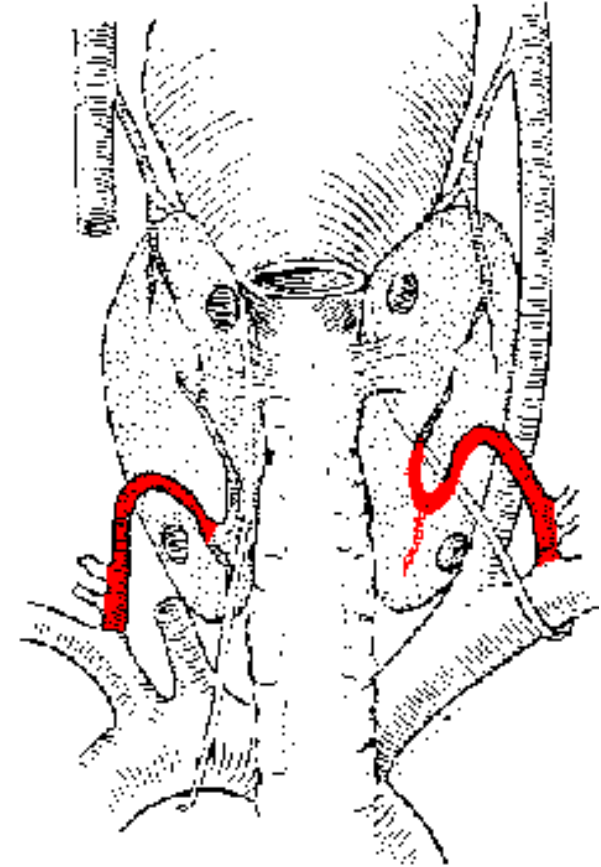
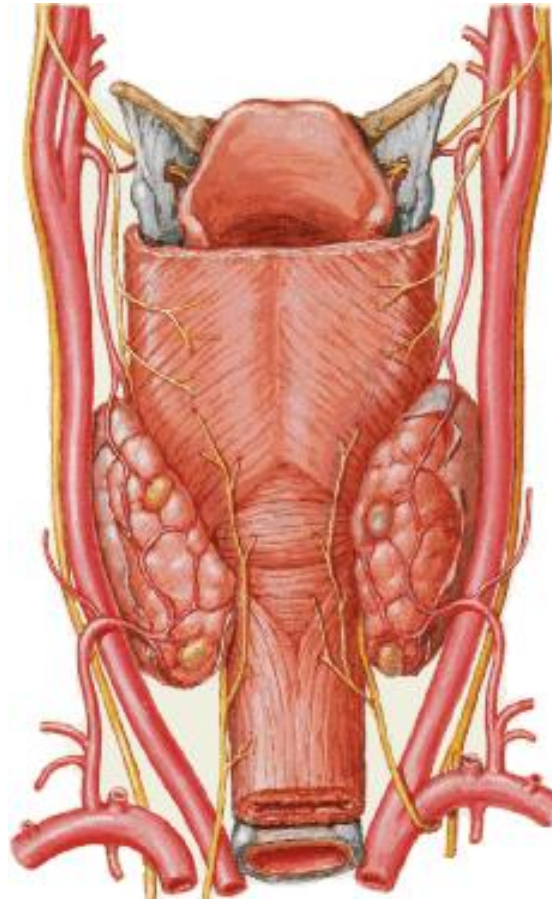
# Superior thyroid artery

- enters deep to sternothyroid

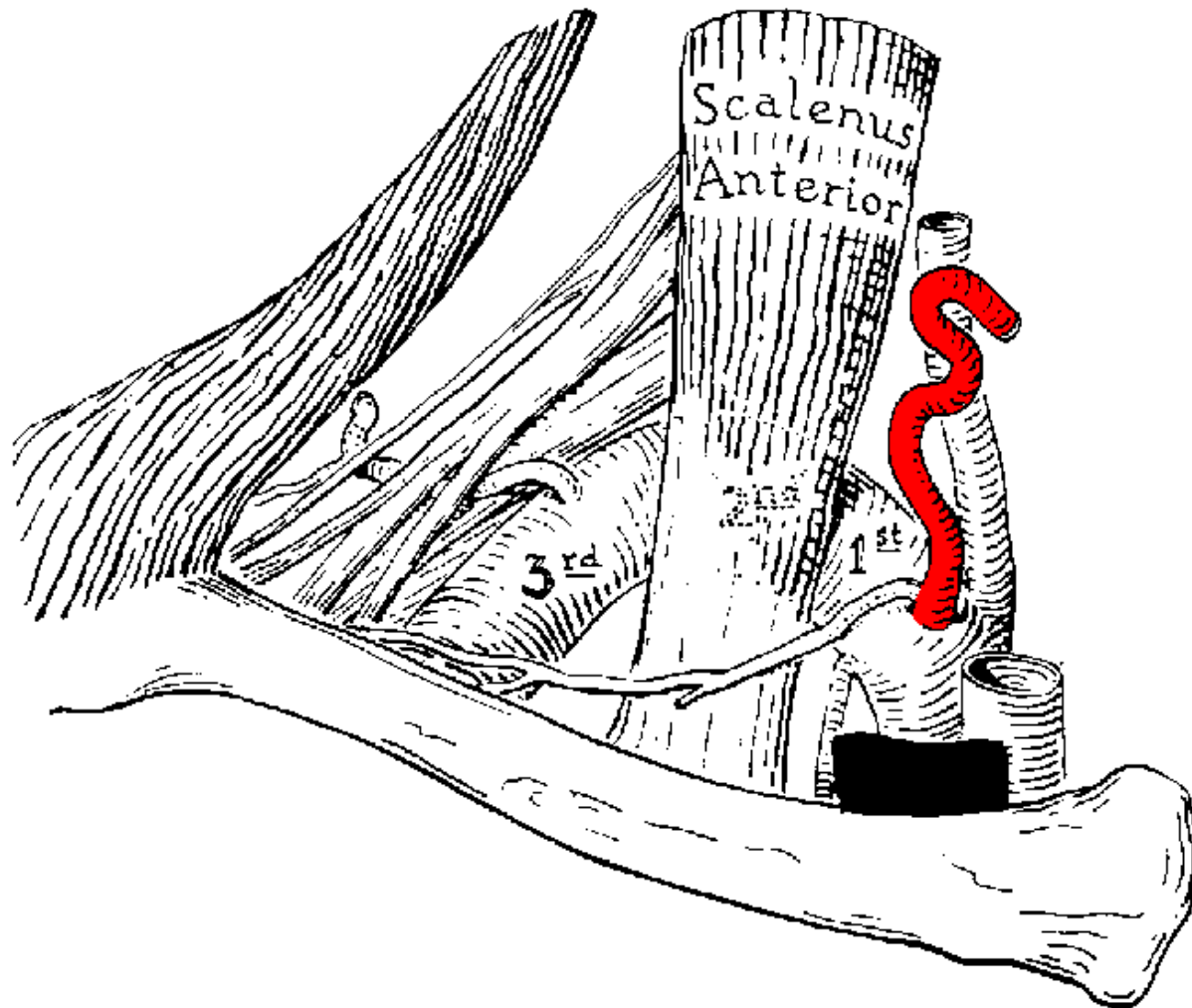


# Inferior thyroid artery

- Ascends and turns medially at the level of the cricoid cartilage to enter the back of the gland some distance above the lower pole.



# Inferior thyroid artery

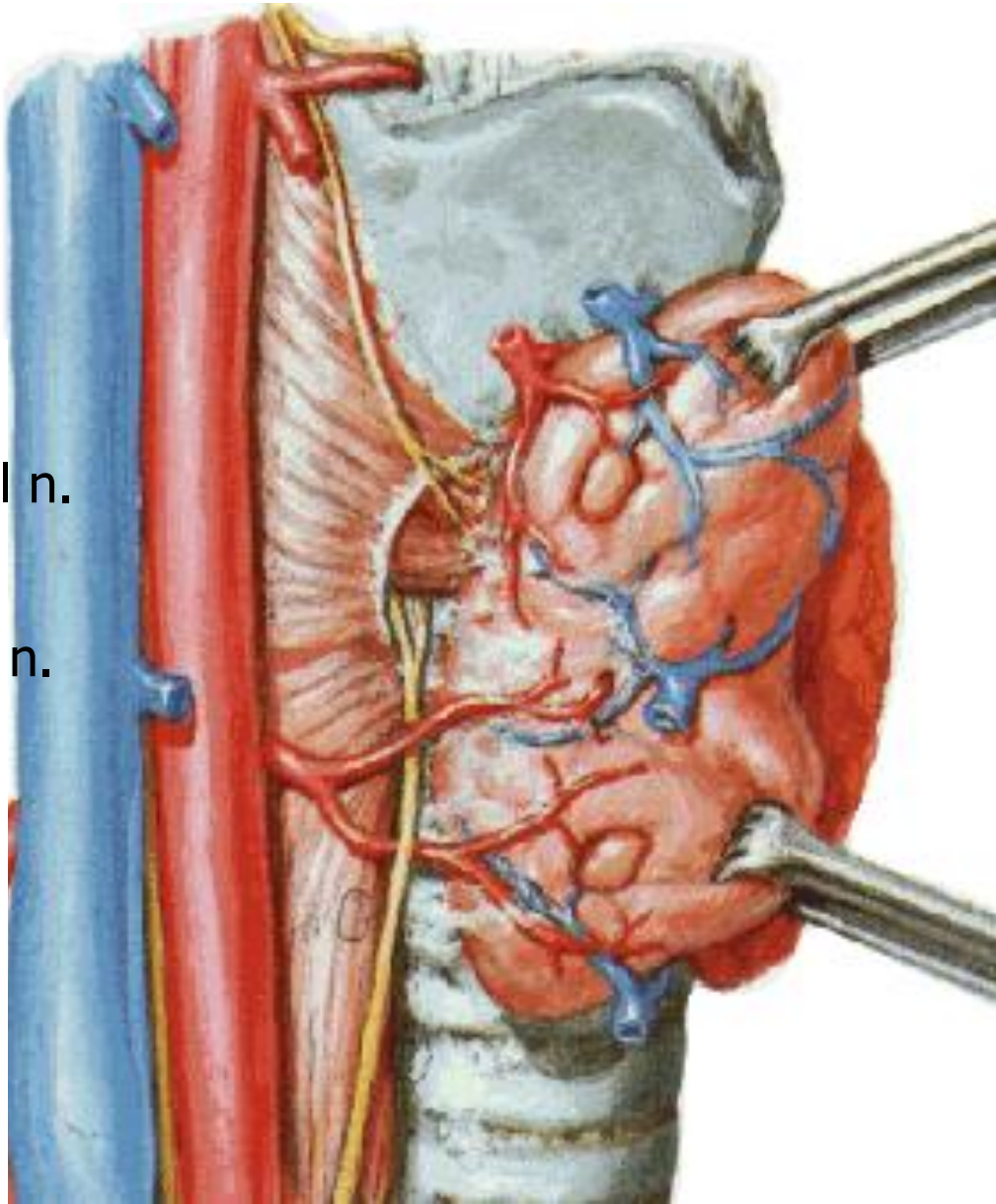
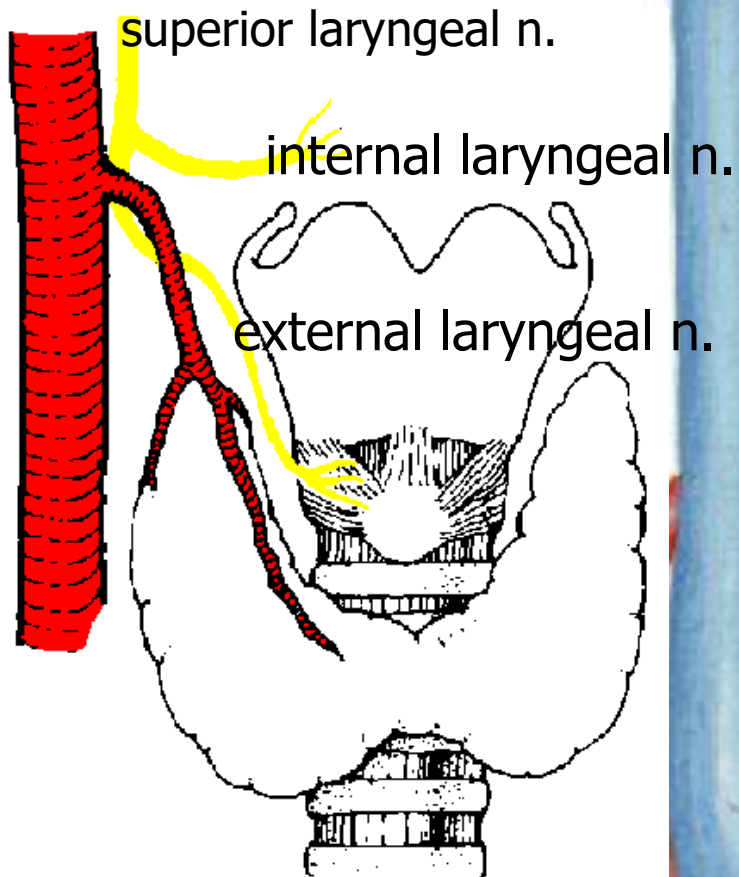


# Remember this!

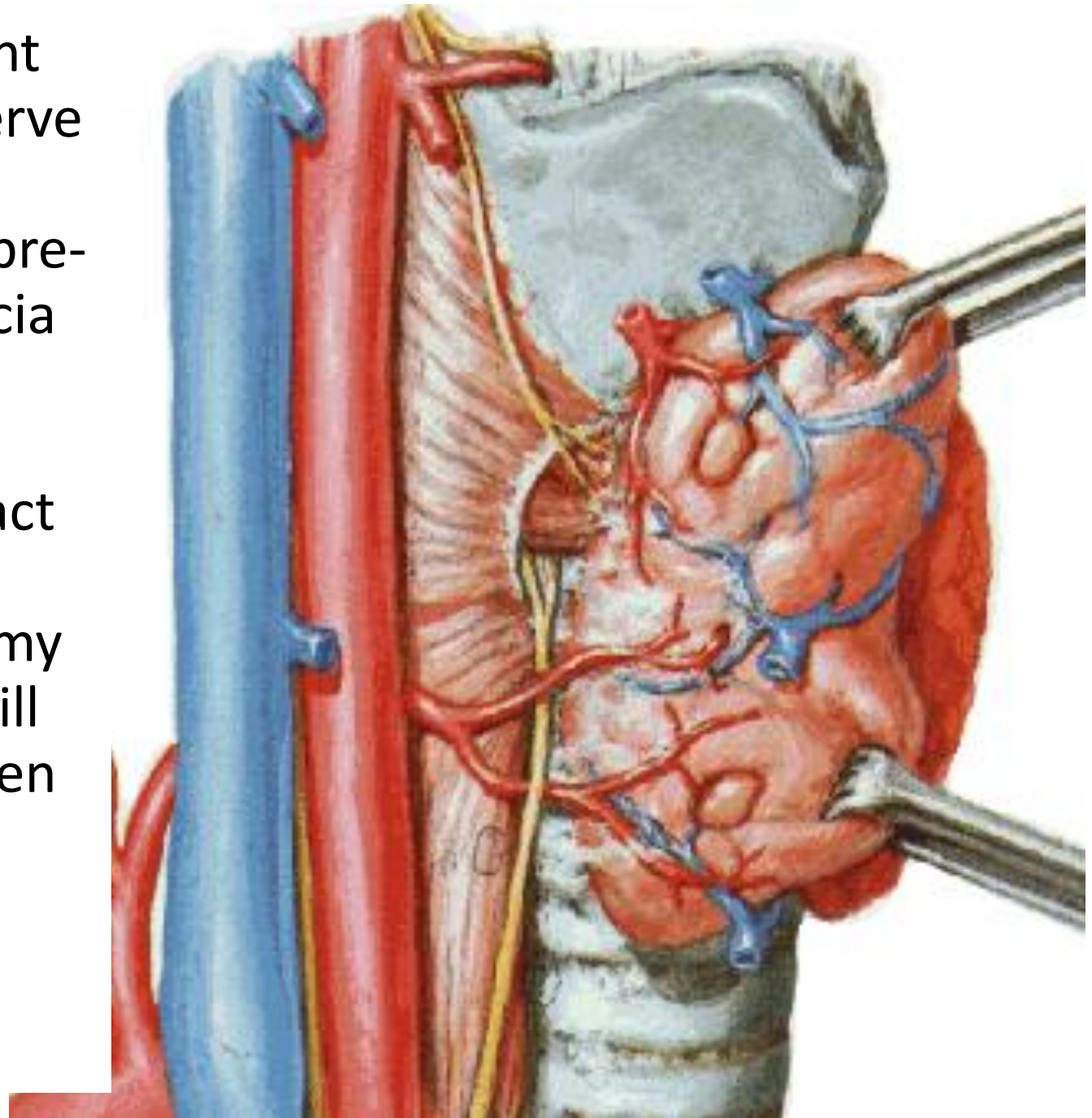
- The inferior thyroid artery divides outside the pretracheal fascia into four or five branches that pierce the fascia separately to reach the lower pole of the gland.
- The superior thyroid artery divides within the pretracheal fascia.



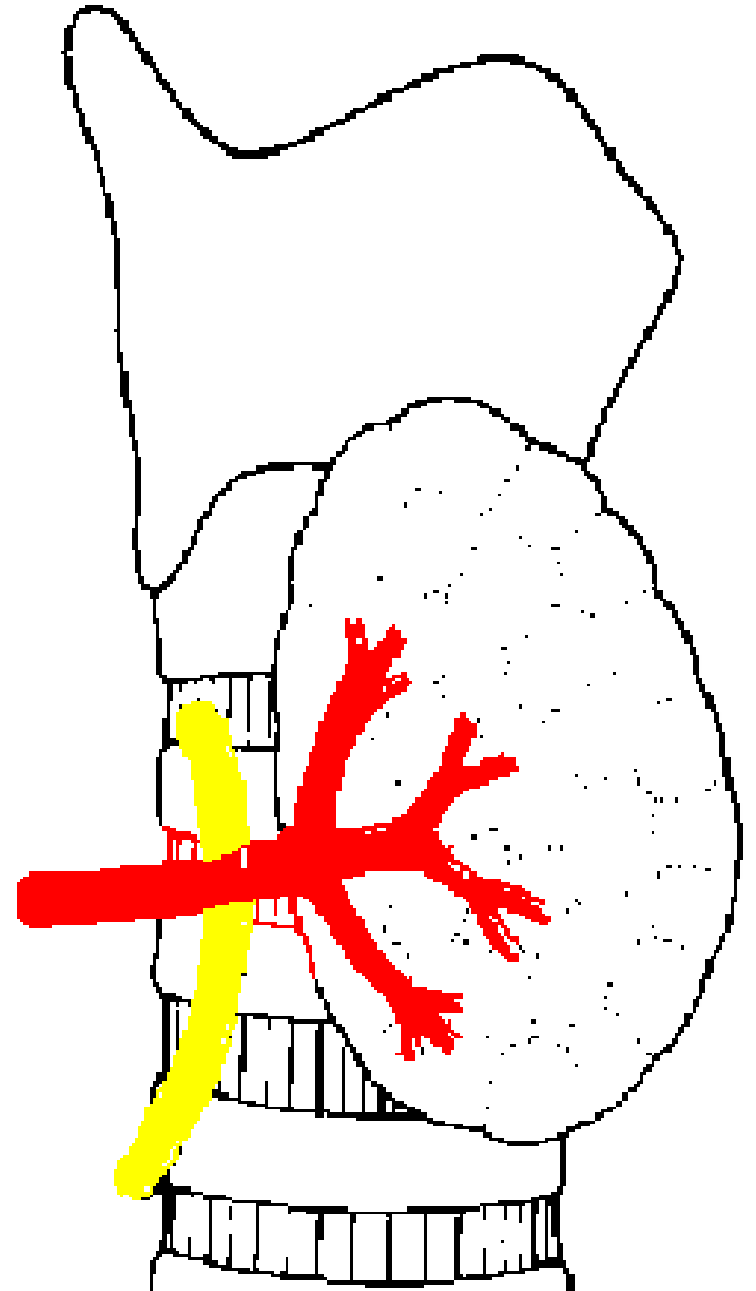
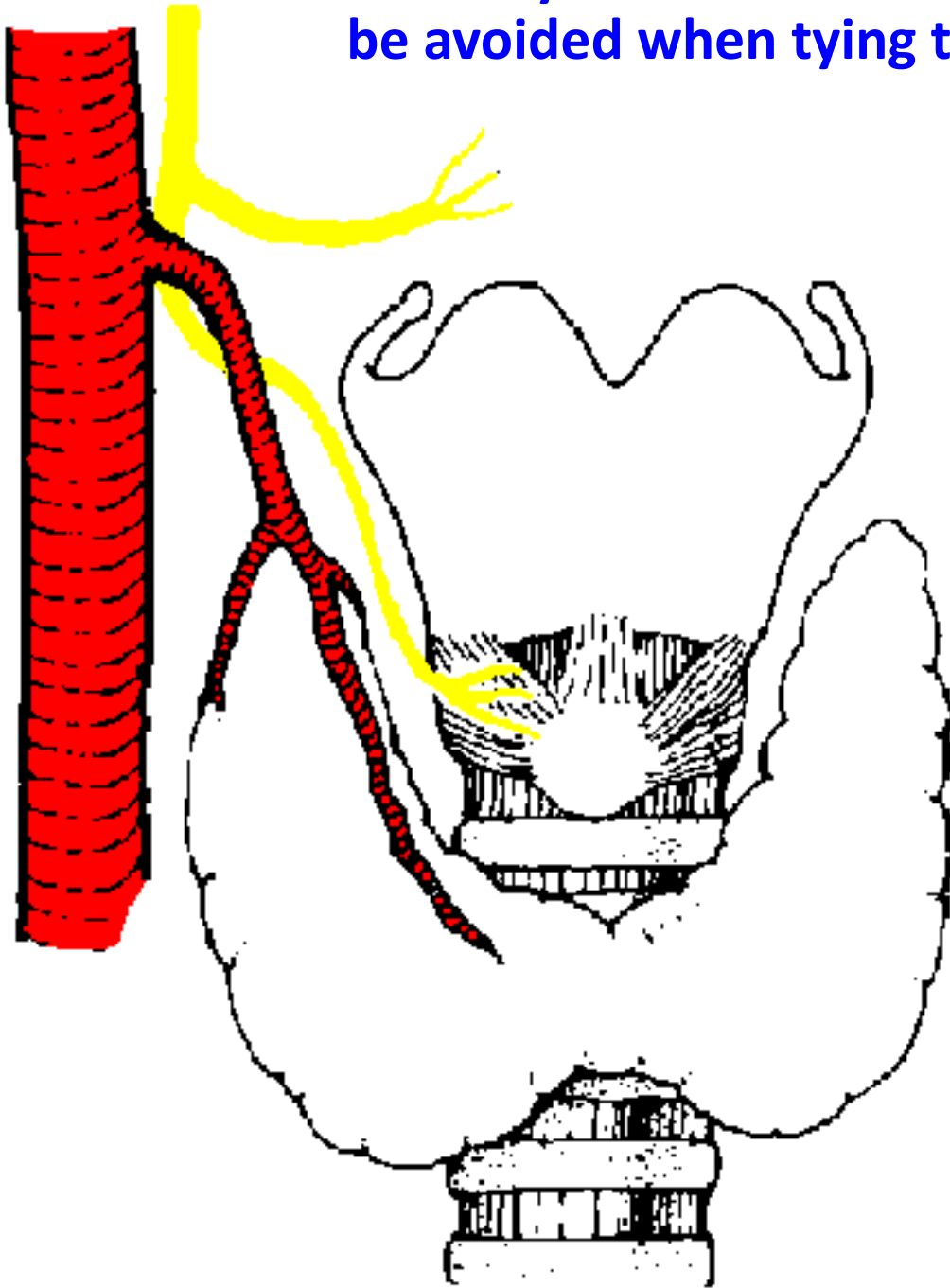
- A little distance behind the superior thyroid artery is the external laryngeal nerve.



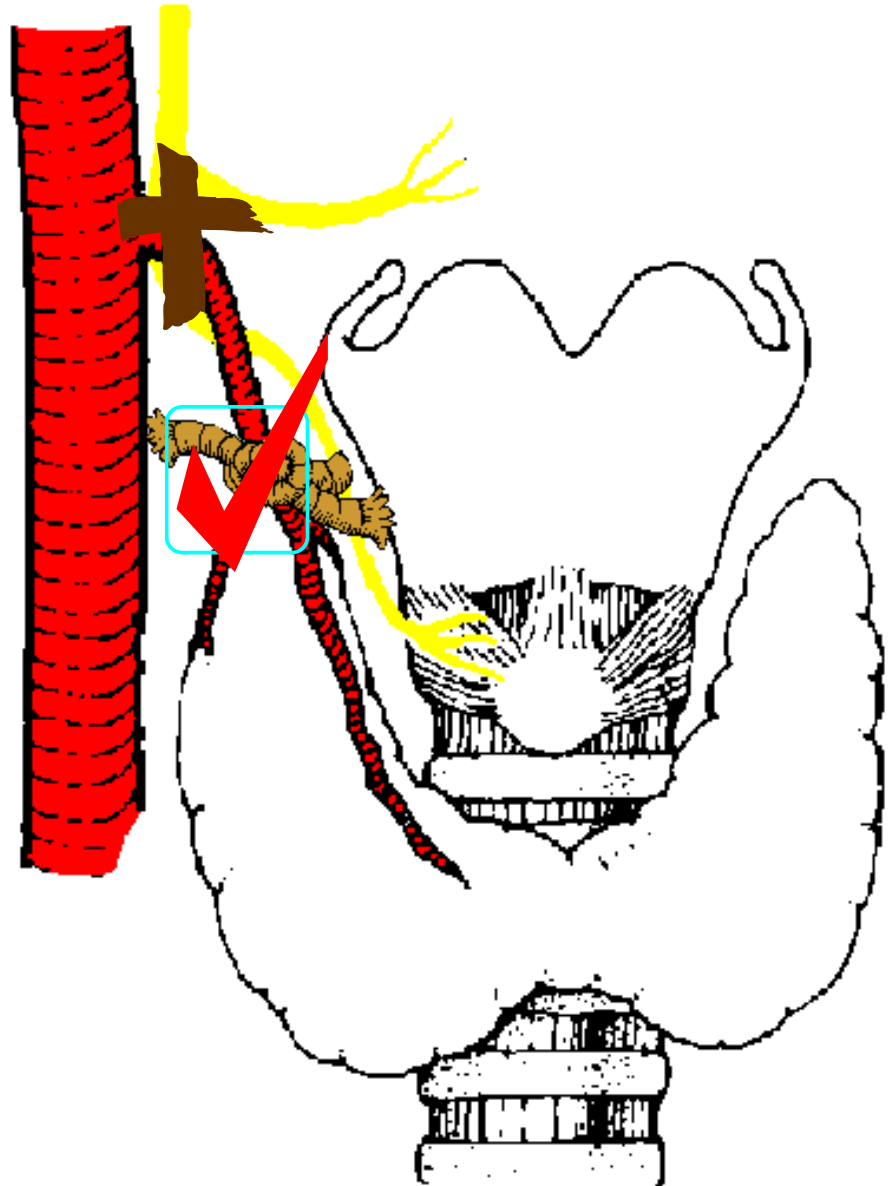
- The recurrent laryngeal nerve always lies behind the pre-tracheal fascia and if this structure remains intact during thyroidectomy the nerve will not have been divided



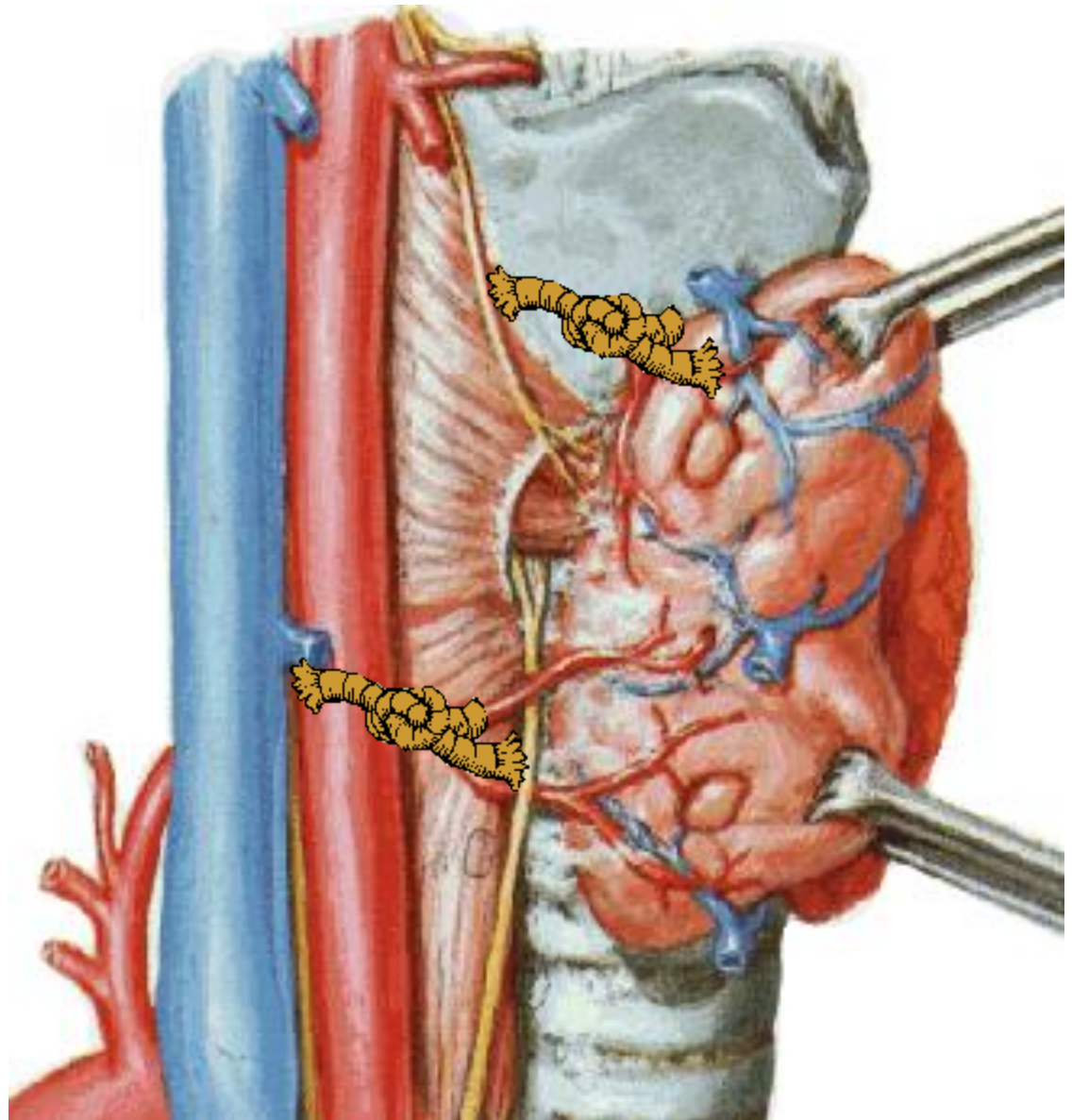
- Both thyroid arteries are related to nerves which must be avoided when tying the arteries.



- To avoid injury to the external laryngeal nerve, the superior thyroid artery is ligated and sectioned near the superior pole of the thyroid gland where it is **not** so closely related to the nerve as it is at its origin.

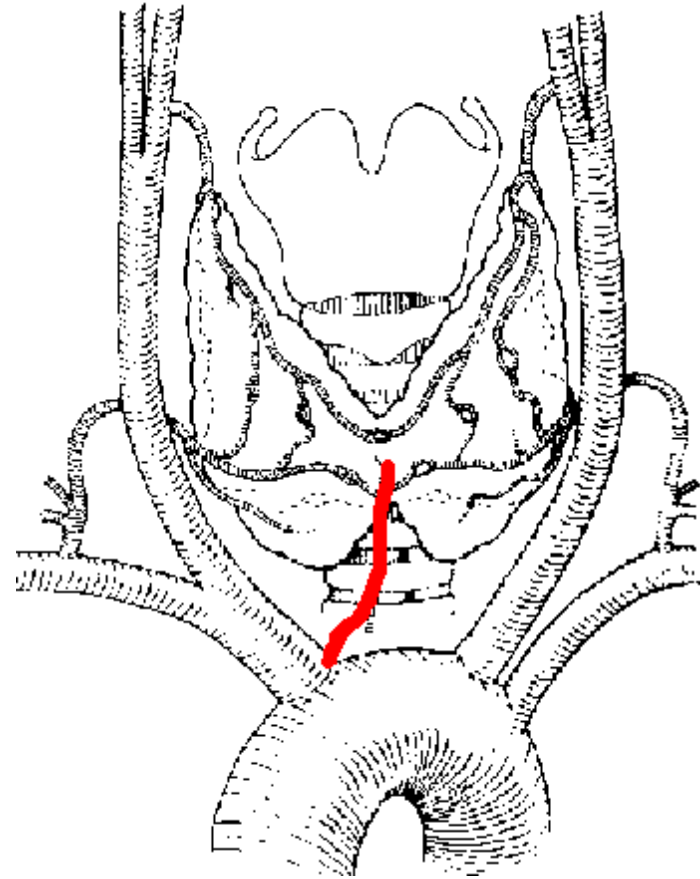


- hence the advisability of **ligating the inferior thyroid artery well lateral to the gland** before it begins to divide into its terminal branches.
- the inferior thyroid artery gives off esophageal and inferior laryngeal branches before its terminal distribution into the thyroid gland



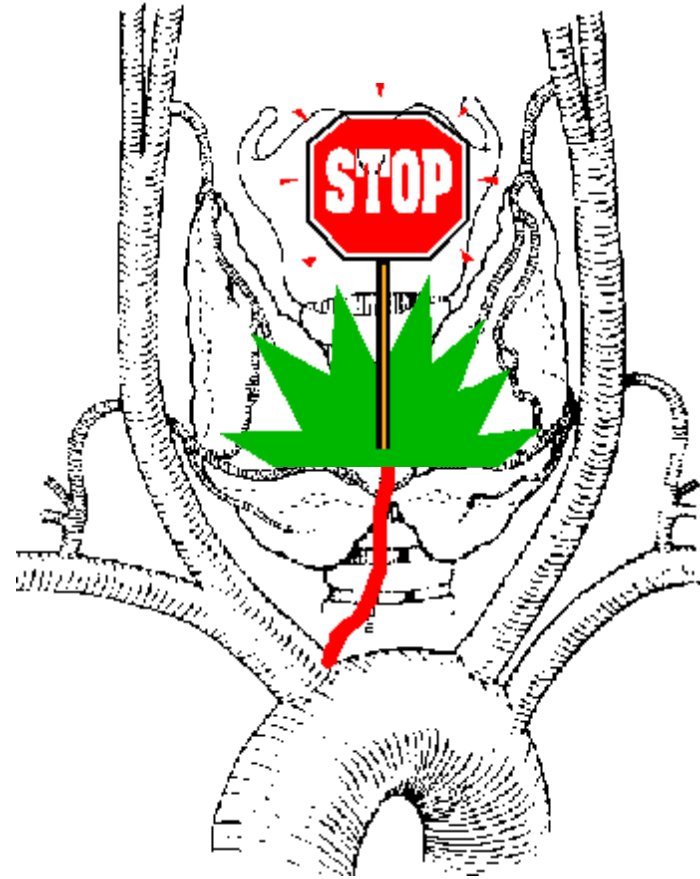
# Thyroidae ima artery

- In about 10% of individuals, an unpaired artery, the thyroidae ima is a small occasional artery from the brachiocephalic trunk, or left common carotid artery, or direct from the arch of the aorta



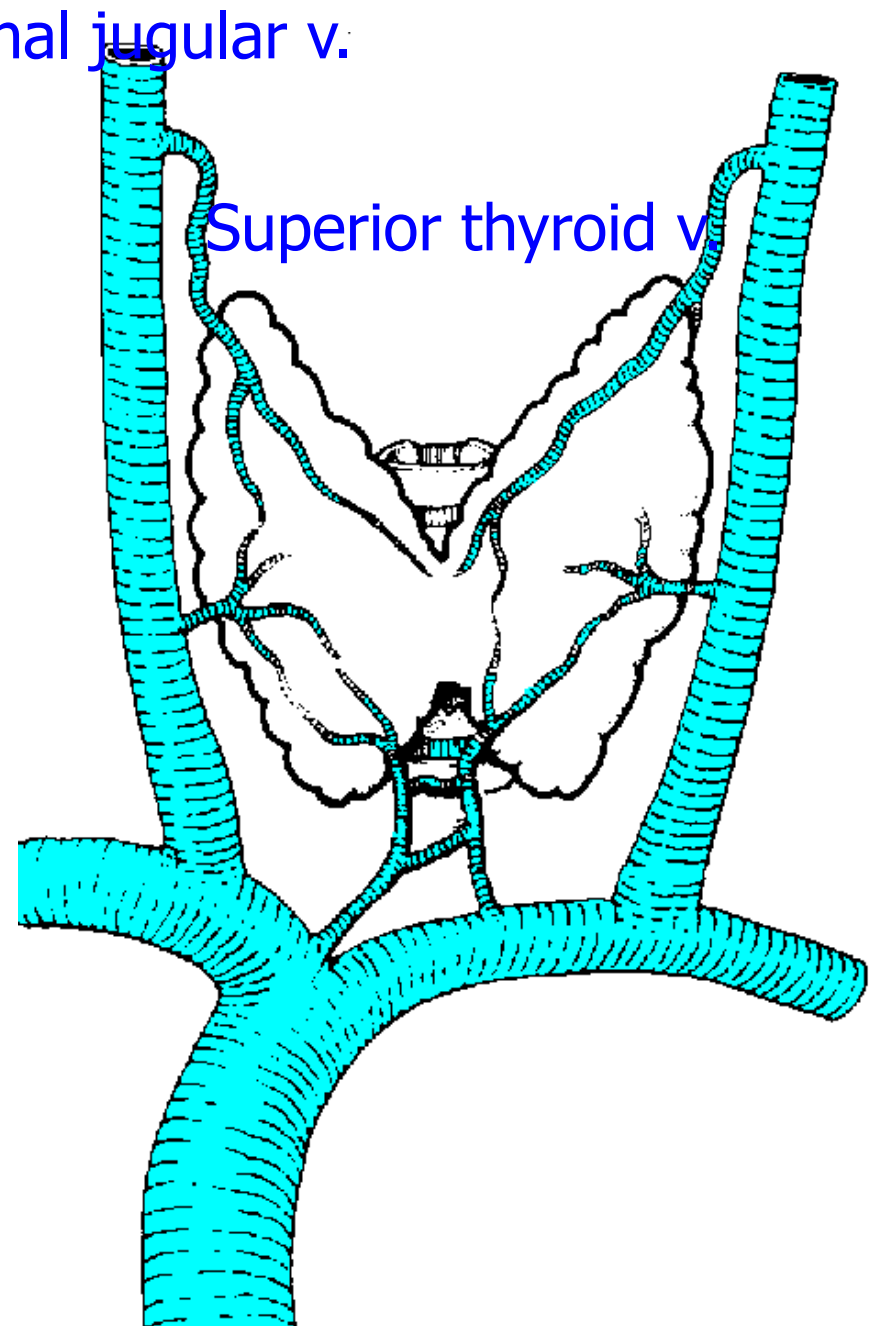
# Thyroidae ima artery

- The possible presence of the thyroid ima artery must be remembered when incising the trachea inferior to the isthmus.
- As the thyroidae ima runs anterior to the trachea, it is a potential source of serious bleeding



# Thyroid veins

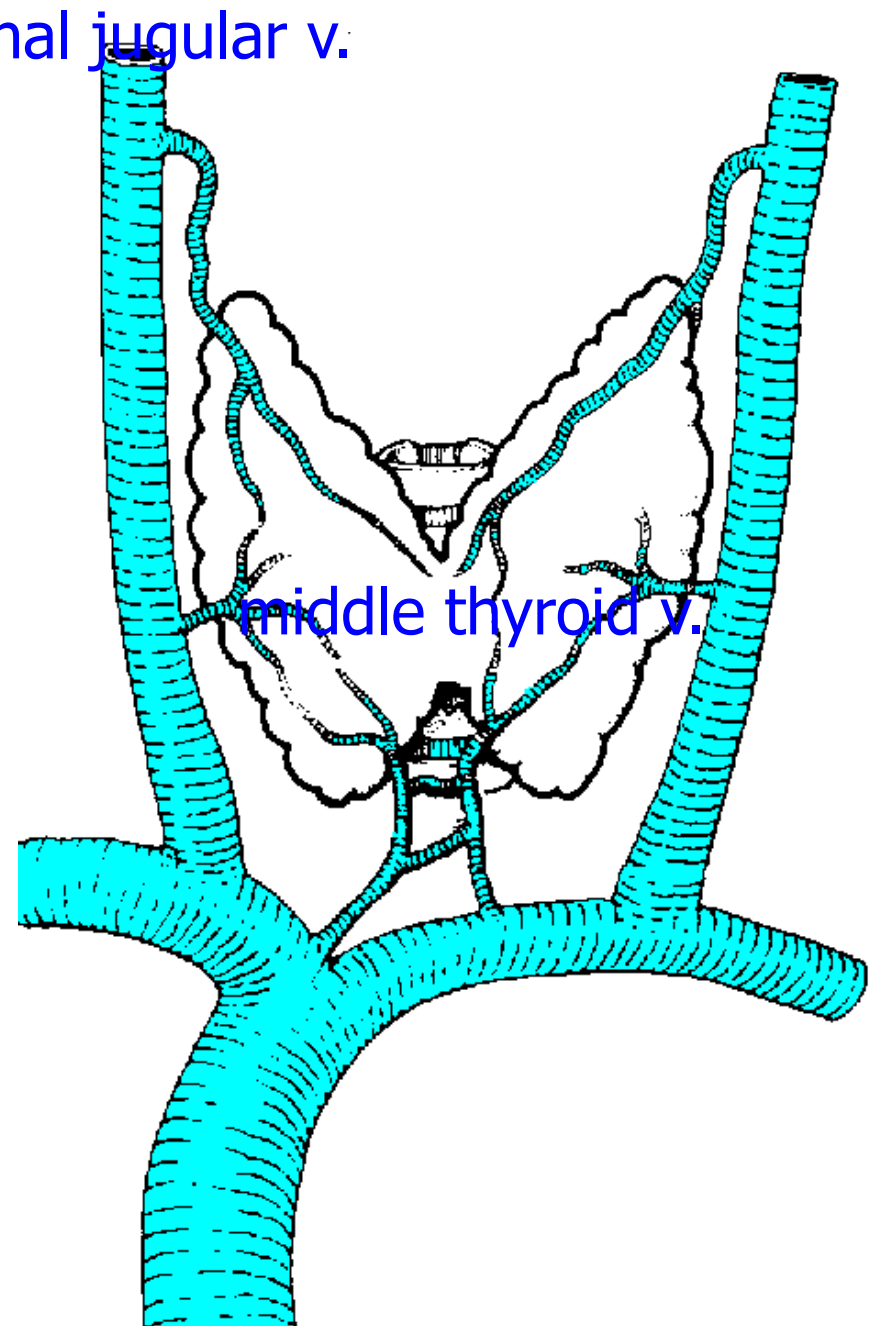
- The veins are three in number on each side
- the **superior thyroid vein** from the upper pole follows the artery and enters the internal jugular vein or the common facial vein





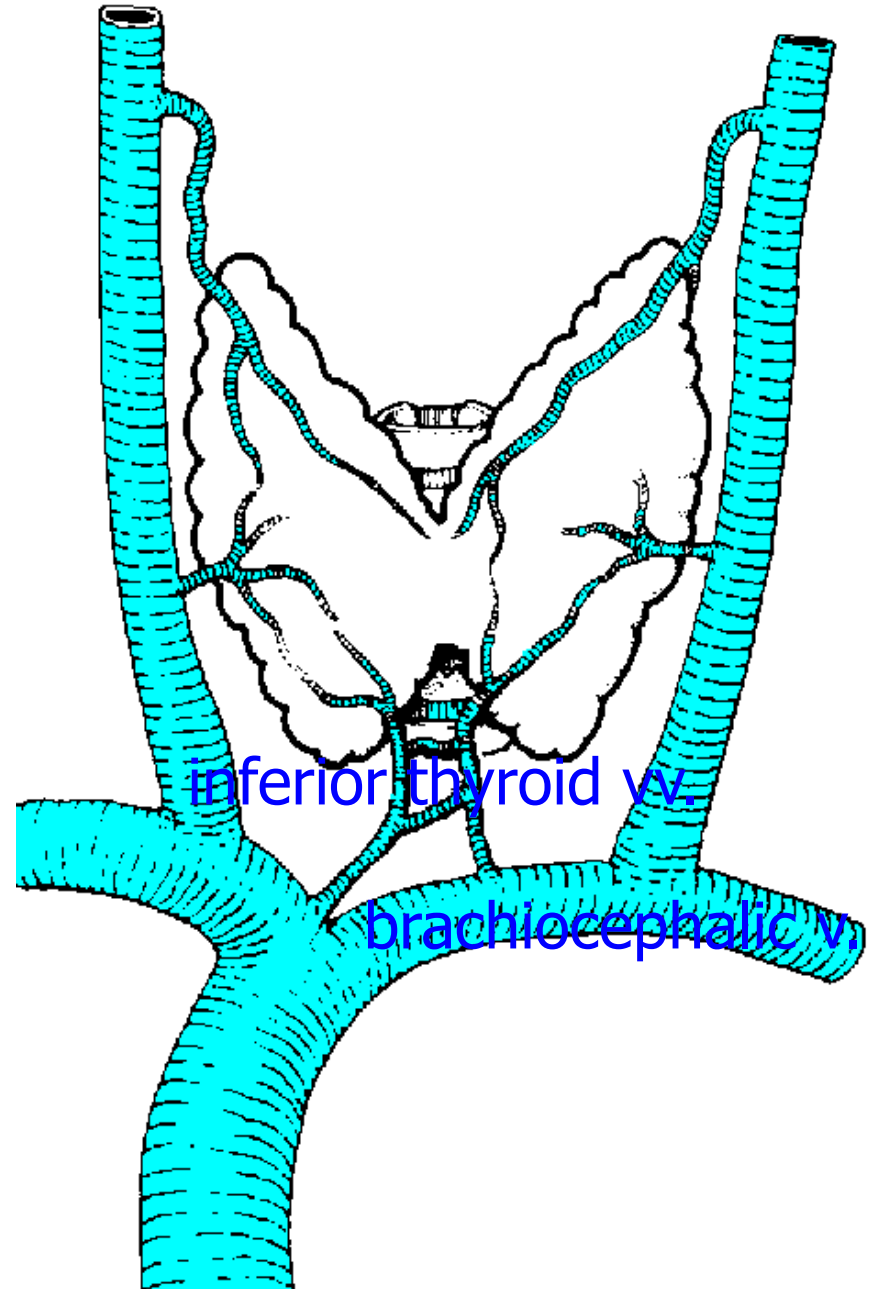
# Thyroid veins

- The **middle thyroid vein** is short and wide, it enters the internal jugular vein



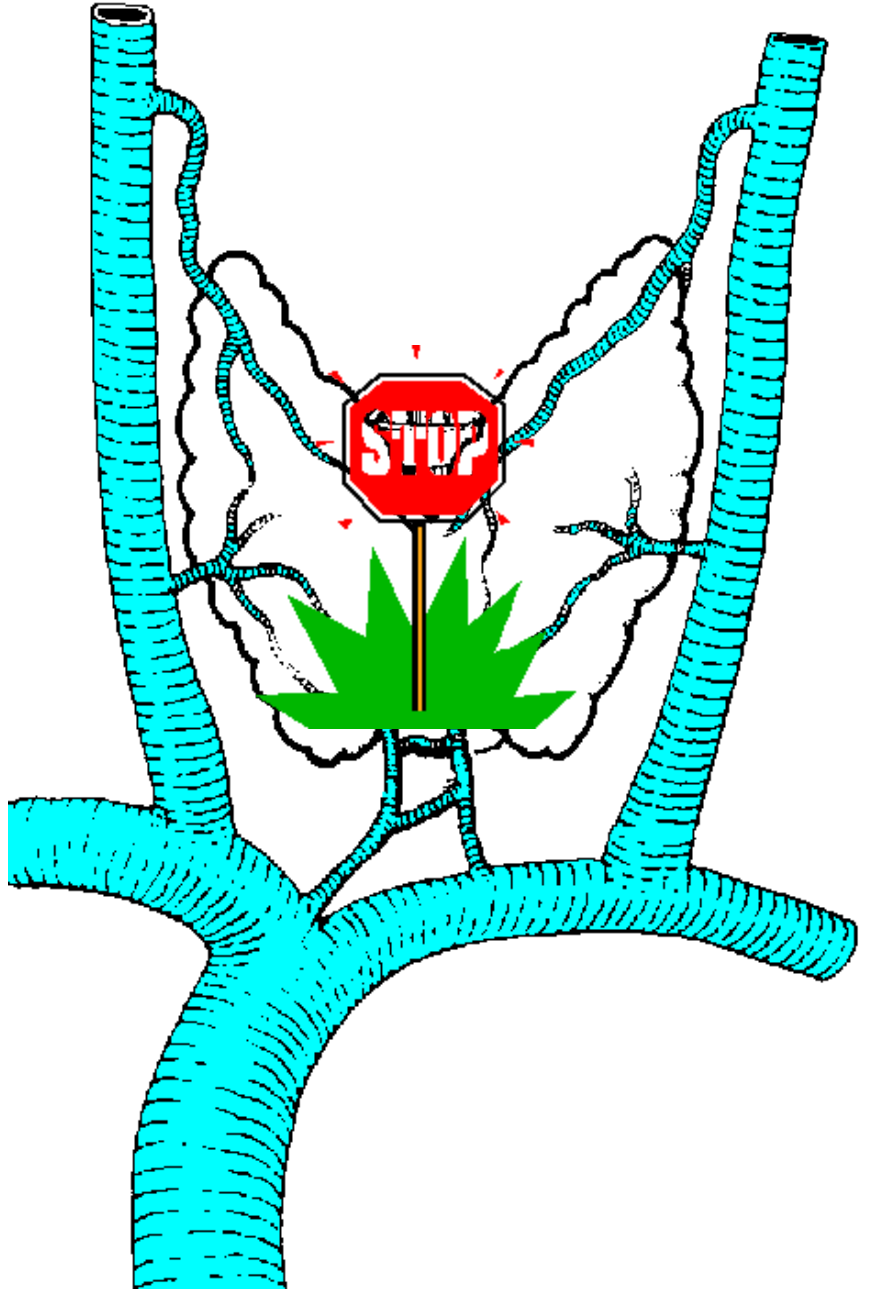
# Thyroid veins

- From the isthmus and lower pole of the gland the **inferior thyroid veins** form a plexus within the pre-tracheal fascia that descends in front of the trachea to reach the left brachiocephalic vein



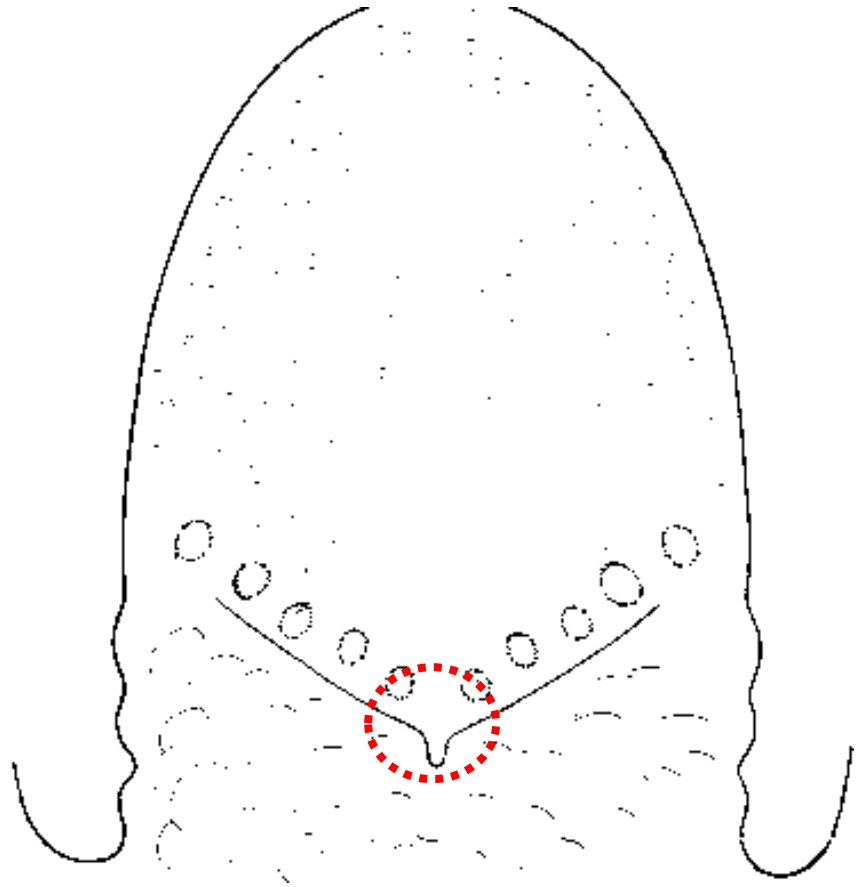
# Inferior thyroid veins

- As the inferior thyroid veins cover the anterior surface of the trachea inferior to isthmus, they are potential sources of bleeding during tracheotomy (also remember the situation of the thyroidae ima artery).



# Development of the thyroid gland

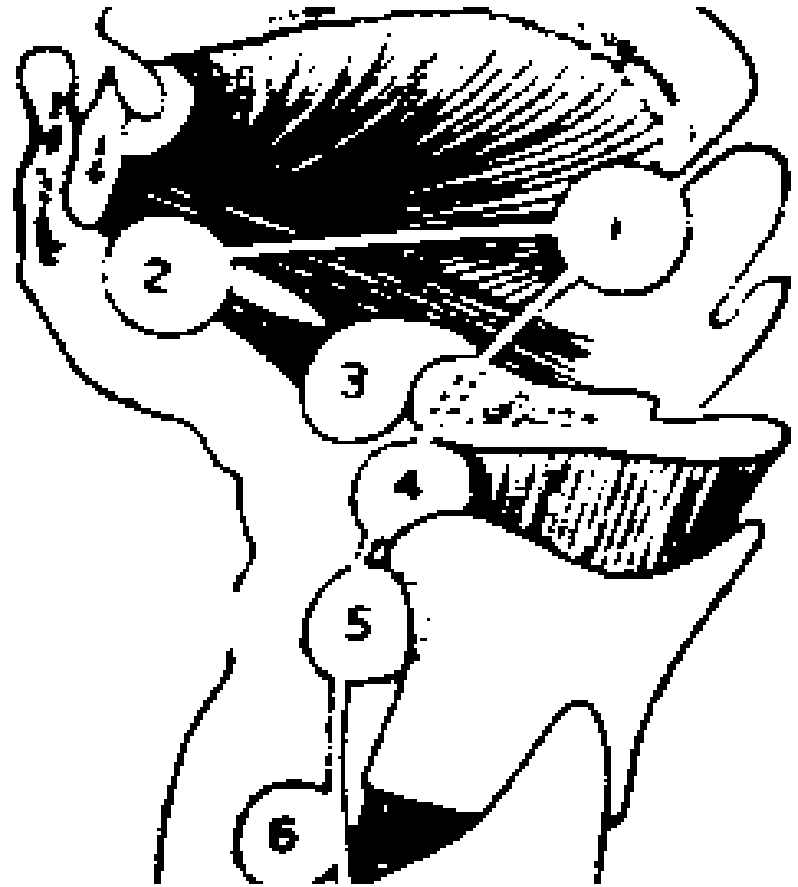
- After the tongue has developed, it can be seen that the point of outgrowth of the thyroglossal duct is the foramen cecum (of Morgagni) [*Morgagni, Giovanni Battista, 1682-1771, a Padua anatomist and pathologist, also known for hydatid of Morgagni (appendix testis) and anal columns (of Morgagni)*].



# Thyroglossal cyst

- cysts derived from the duct may also appear anywhere between the foramen cecum and the normal position in the midline of the neck

1. Beneath foramen cecum
2. Floor of the mouth
3. Suprahyoid
4. Subhyoid
5. On thyroid cartilage
6. At level of cricoid cartilage



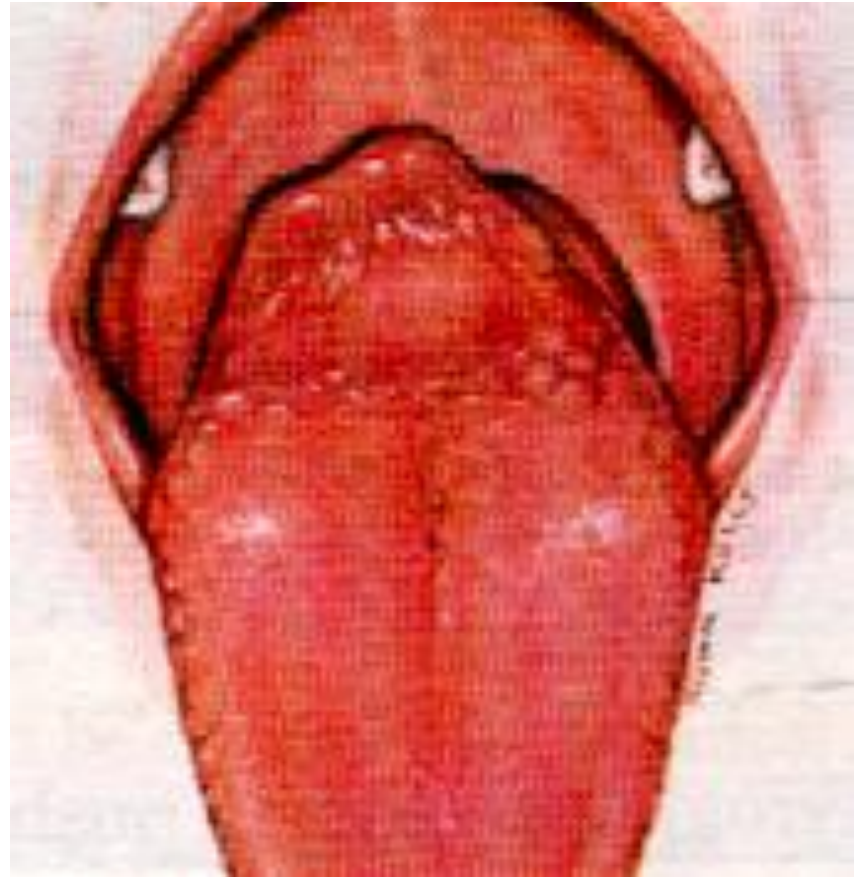
# Thyroglossal cyst

- Can be diagnosed because characteristically it moves upwards as the patient puts his tongue out.



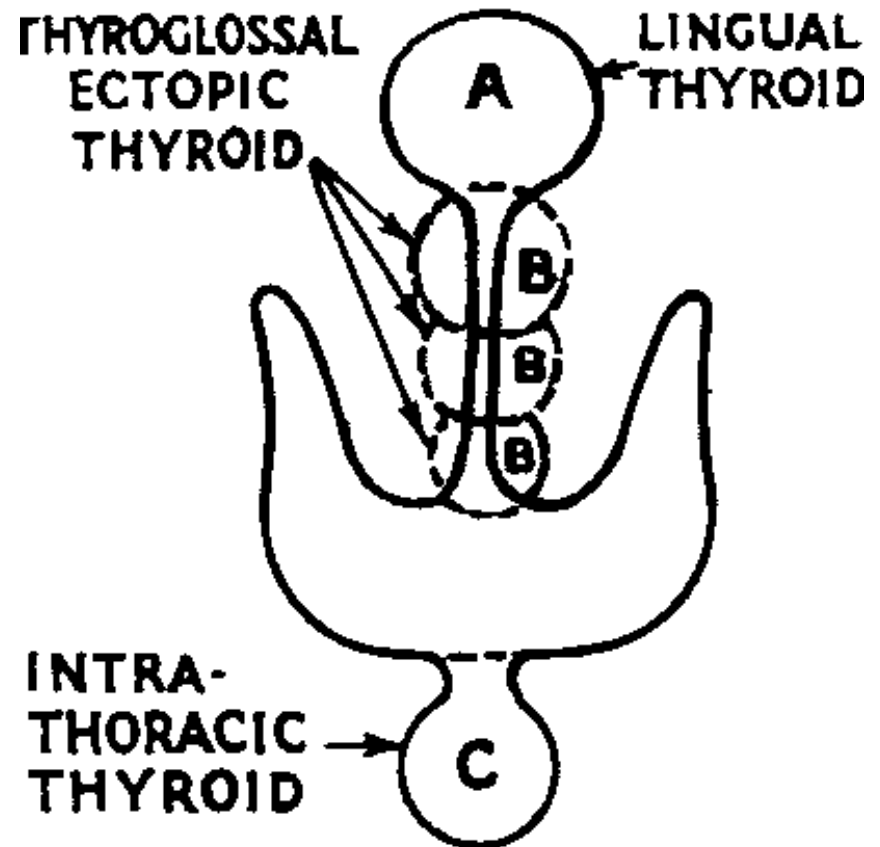
# Lingual thyroid

- Rarely the thyroid fails to descend during development resulting in the development of a lingual thyroid



# Ectopic thyroid

- Failure of descent may result in a superior cervical thyroid in the region of the hyoid bone
- the thyroid may sometimes descend too far and be found in the superior mediastinum





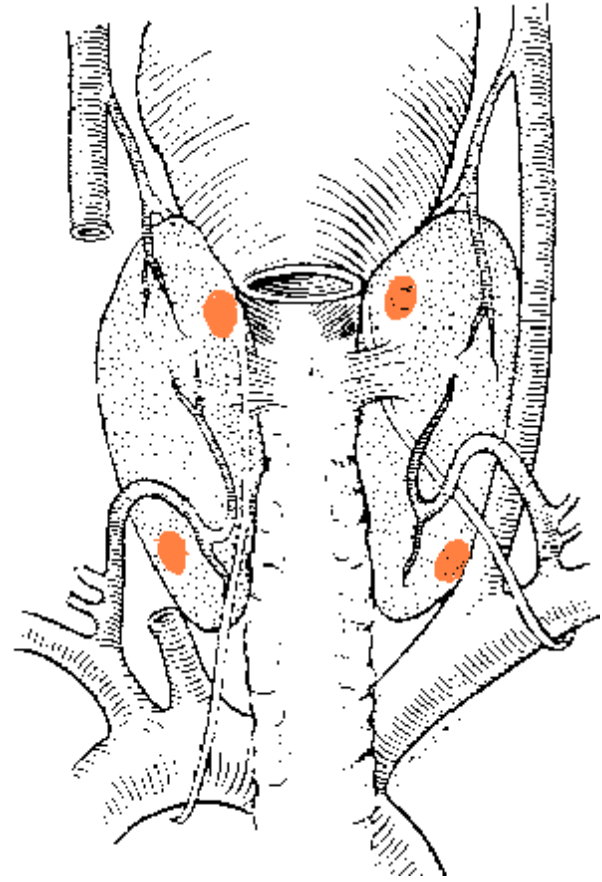
# Parathyroid glands

- Two on each side
- They are yellow-brown endocrine glands, about the size of a small pea (about 0.5x0.8 cm ovoids)
- They are important because of their role in calcium metabolism. They secrete parathormone that mobilizes bone calcium and increases gut and kidney calcium absorption



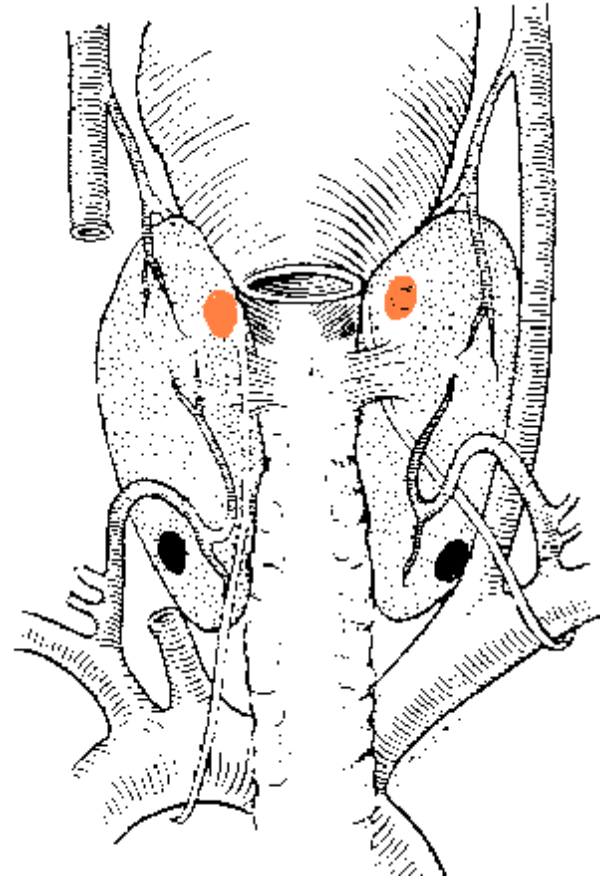
# Parathyroid glands

- Are located posterior to the thyroid gland between its capsule and fascial sheath



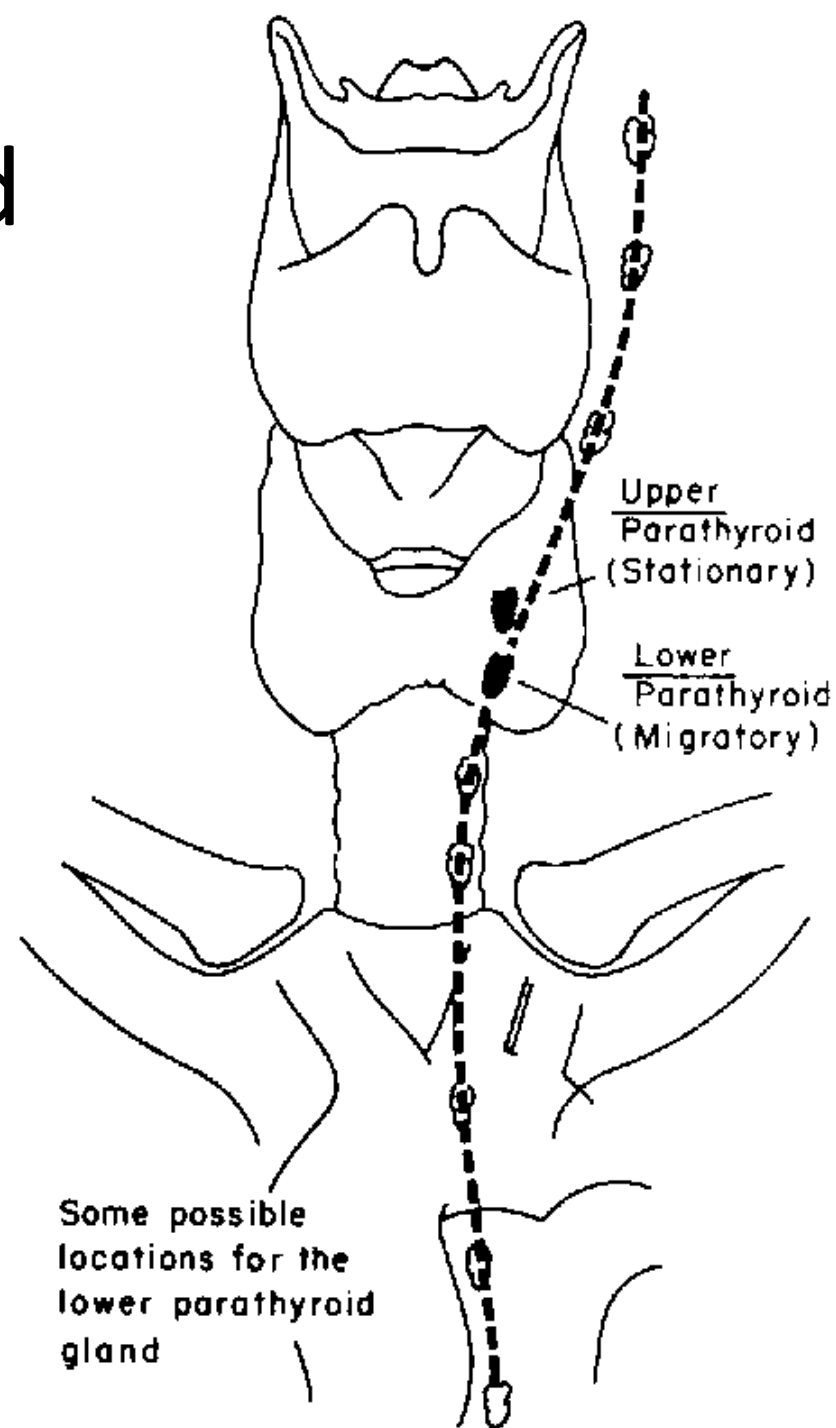
# Superior parathyroid glands

- more constant in position
- embedded in the posterior surface of the thyroid gland, a short distance above the entry of inferior thyroid artery (and the level of the cricoid cartilage).



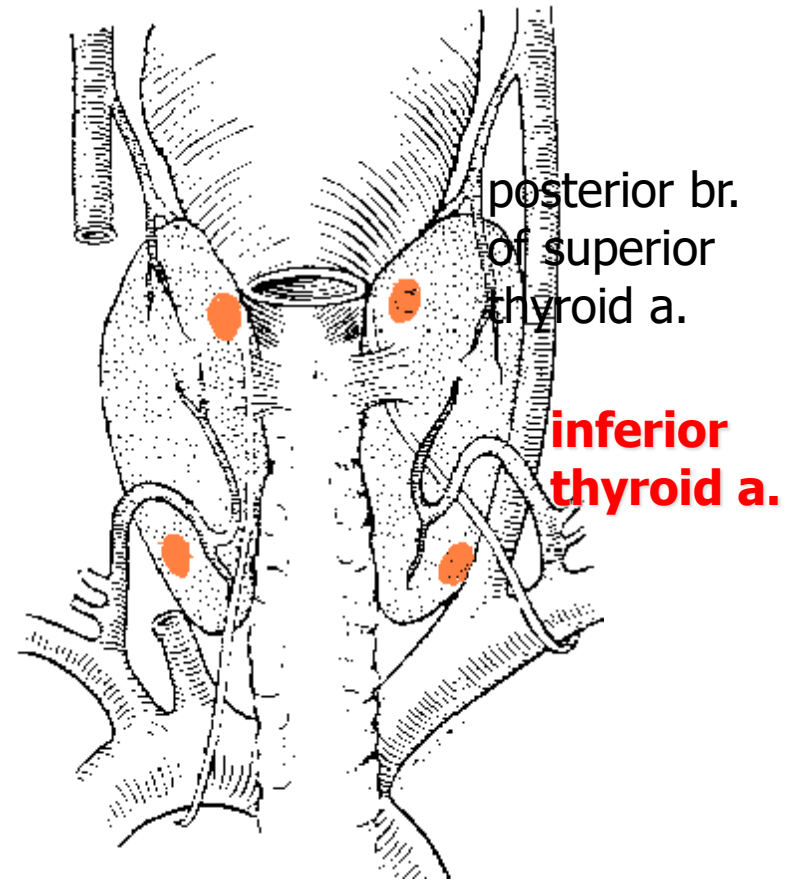
# Inferior parathyroid glands

- variable in position
- usually embedded behind the lower pole but is often found elsewhere (they may even present in the superior mediastinum).



# Parathyroid glands, blood supply

- The glands are usually supplied by the inferior thyroid arteries but may also be supplied by both superior and inferior thyroid arteries



# Parathyroid glands

- Awareness of the close relationship between the parathyroid glands and the thyroid gland is essential to prevent removal or damage of the parathyroid glands during thyroidectomy.

