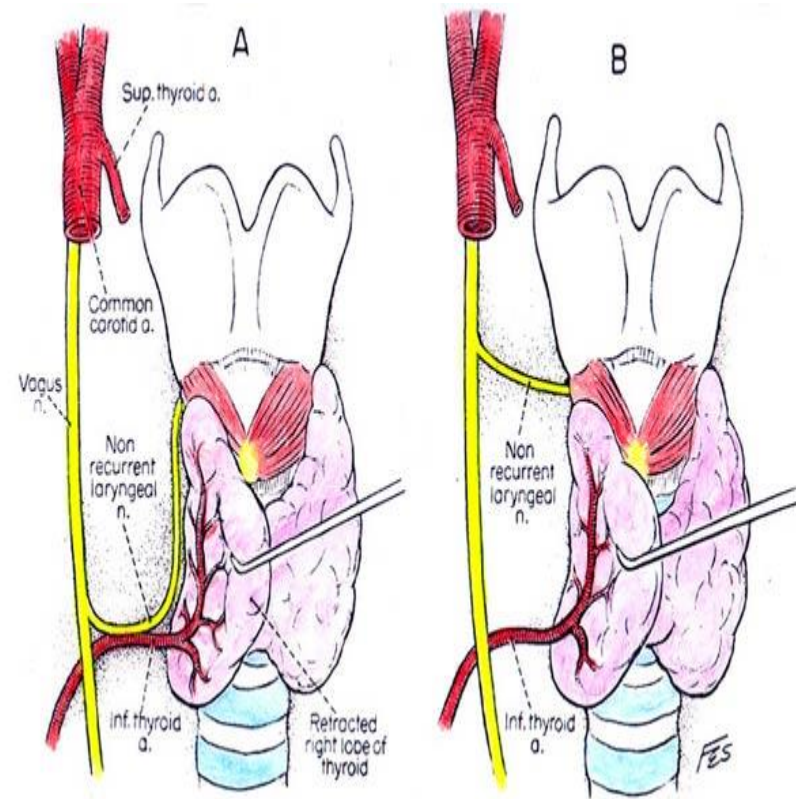


ANATOMY OF THE THYROID GLAND

AKPALABA I. O

OUTLINE

- INTRODUCTION
- EMBRYOLOGY
- GROSS ANATOMY
- BLOOD SUPPLY
- NERVE SUPPLY
- LYMPHATIC DRAINAGE
- HISTOLOGY
- APPLIED ANATOMY



INTRODUCTION

- Largest endocrine gland
- Thyroid hormones (T3 , T4)
 - BMR
- Thyrocalcitonin
 - Calcium

EMBRYOLOGY

- 1st endocrine glands to develop, 24th day of gestation.
- 2 main structures:
 - the primitive pharynx and the neural crest.
- Lateral thyroid (neural crest cells)
- median thyroid (primitive pharynx)
- Forms as a proliferation of endodermal epithelial cells (median surface of the developing pharyngeal floor).
- The site, 2 key structures, the **tuberculum impar** and **the copula (foramen cecum)**.

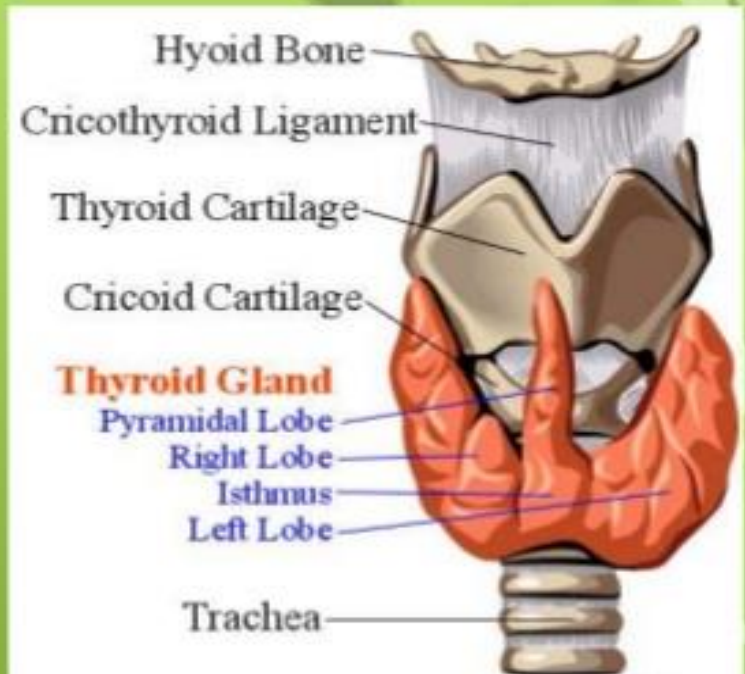
EMBRYOLOGY

- The thyroid gland, originates from between the first and second pouches.
- The thyroid precursor develops to form the thyroid diverticulum.
- whose lumen, is the thyroglossal duct
- Parafollicular cells—ULTIMOBRANCHIAL BODY
(5th pharyngeal pouch)

GROSS ANATOMY

THYROID GLAND

- ✓ Endocrine gland, situated in the lower part of the front and sides of the neck.
- ✓ **Extends** : from oblique line of thyroid cartilage to the 5th or 6th tracheal ring.
- ✓ Lie against C5,C6,C7 & T1.
- ✓ Consist Right & Left lobes, joined by isthmus.
- ✓ A 3rd pyramidal lobe may project upwards from the isthmus.
- ✓ **Capsules**: two; True & false.
- ✓ Larger in females than males.
- ✓ **Development**: from the endoderm of the floor of primitive oral cavity in the region of the future foramen caecum and ultimobranchial body.



Adapted from Corel Draw 9

family
FP practice
notebook.com

GROSS ANATOMY cont'd

- Pyramidal lobe– isthmus to hyoid bone
(inferior border)
- Attachment – Fibrous tissue
-- Muscle Fibres
(Levator Glandulae thyroideae)
ext laryngeal nerve
- * Isthmus attachment –Suspensory ligament of Berry
(cricoid cartilage and upper tracheal ring)

Thyroid movement with deglutition

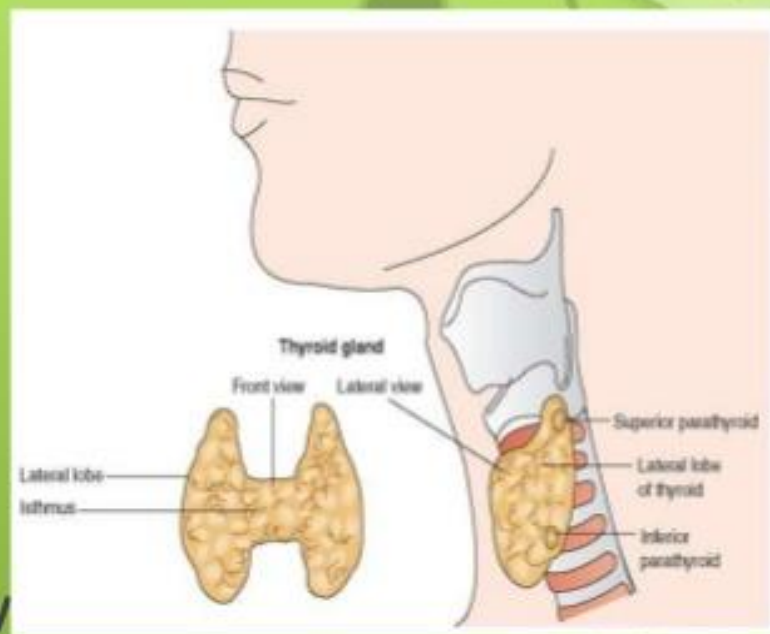
GROSS ANATOMY cont'd

- Weight = 25g
- Shape – pear or butterfly shape, each lobe conical
- 2poles – narrow upper pole
-- broader lower pole
- Enlarges in pregnancy & menstruation

RELATIONS

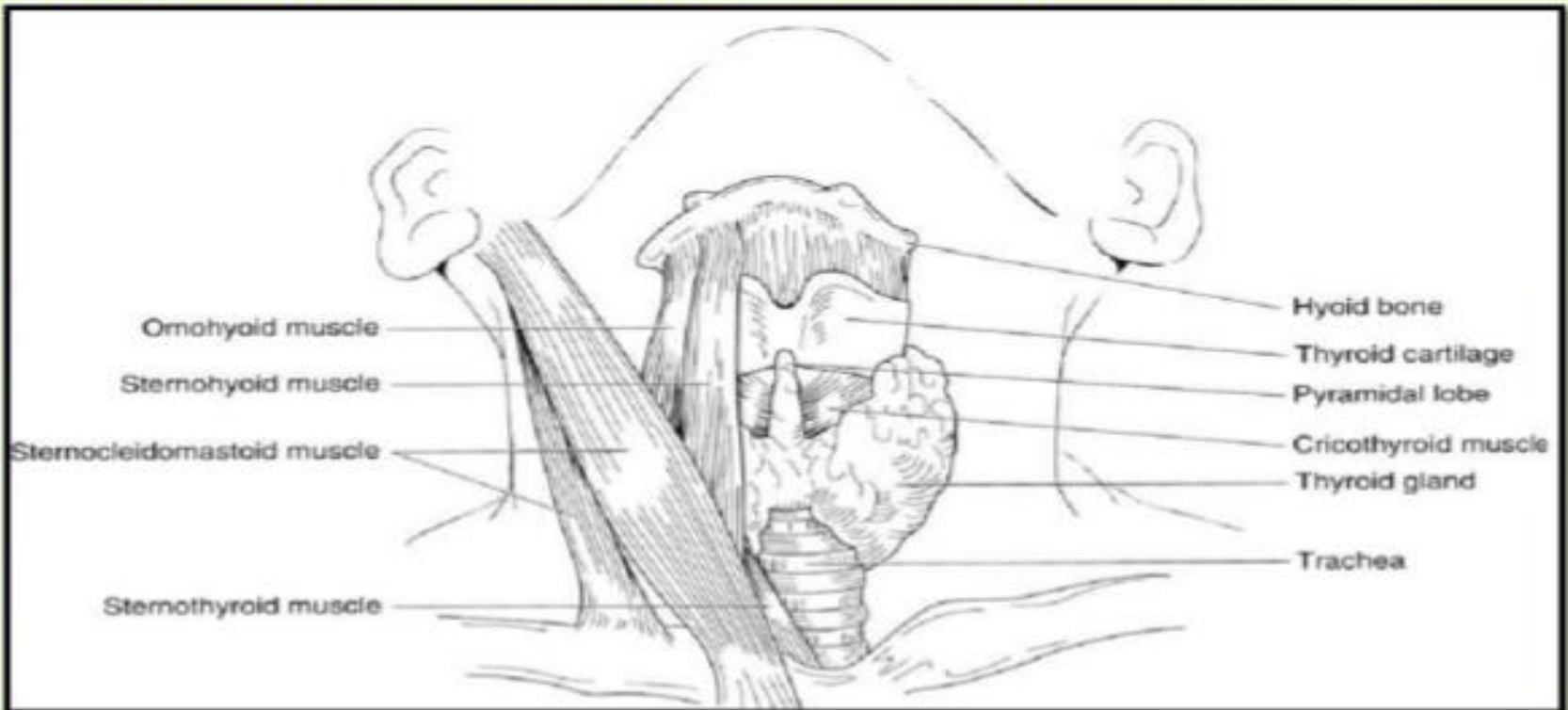
RELATIONS OF THE LOBES

- ✓ The lobes are conical in shape having:
 - An apex
 - A base
 - Three surfaces: Lateral, medial, posterolateral
 - Two borders: Anterior and posterior
- **Apex:**
 - directed upwards and slightly laterally.
- **Base:** on level with the 4th or 5th tracheal ring.



SURFACES

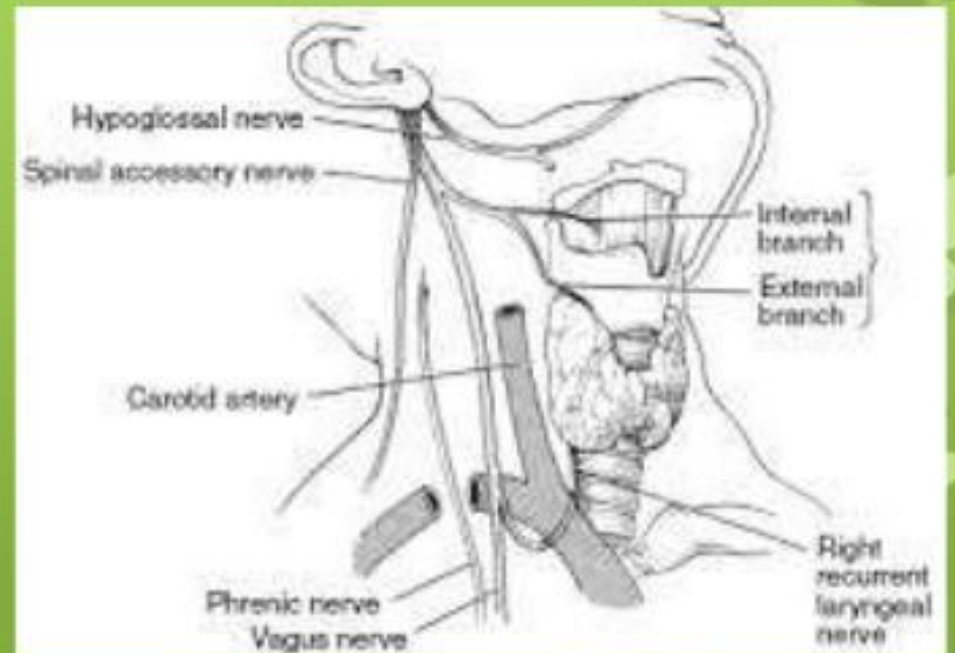
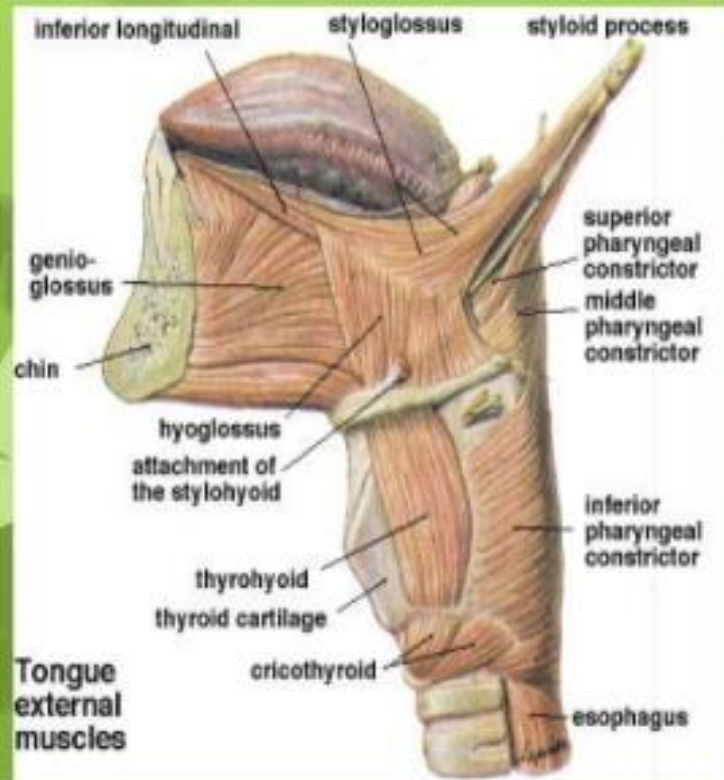
- *Lateral surface: convex and covered by*
 - Sternohyoid
 - Superior belly of omohyoid
 - Sternothyroid
 - Anterior border of sternocleidomastoid



SURFACES cont'd

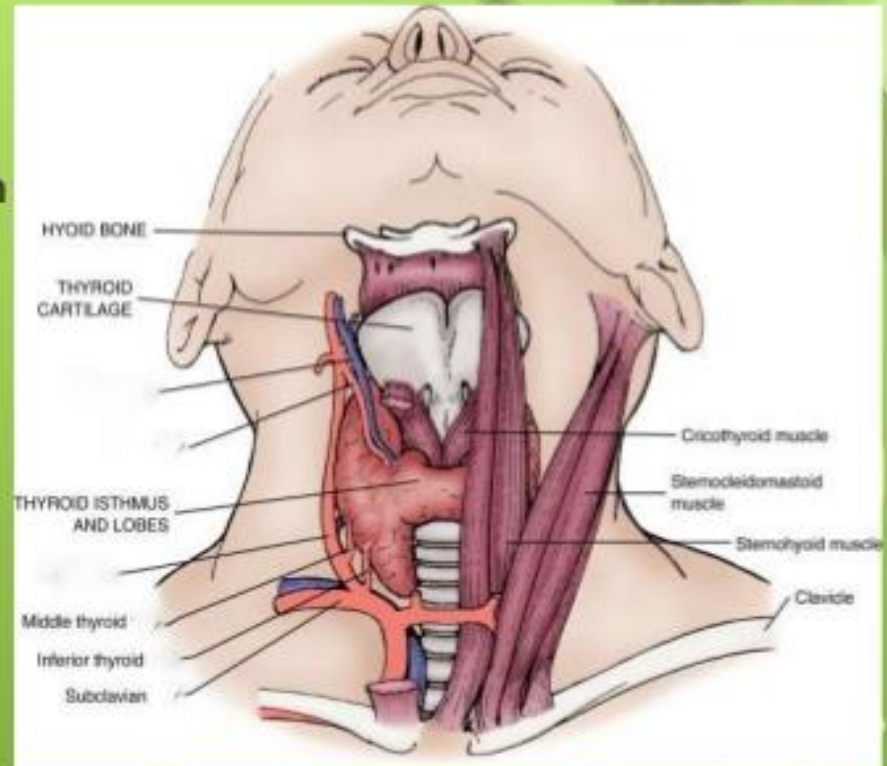
➤ *Medial surface:*

- 2 tubes, trachea and oesophagus
- 2 muscles, inferior constrictor and cricothyroid
- 2 nerves, external laryngeal and recurrent laryngeal



SURFACES cont'd

- **Posterolateral surface:** carotid sheath and overlaps common carotid artery.
- **Anterior border:** anterior branch of superior thyroid artery
- **Posterior border:** separates medial and posterior surfaces.
- Inferior thyroid artery
- Anastomosis between superior and inferior thyroid arteries
- Parathyroid glands
- On left side thoracic duct



CROSS SECTIONAL SURFACE

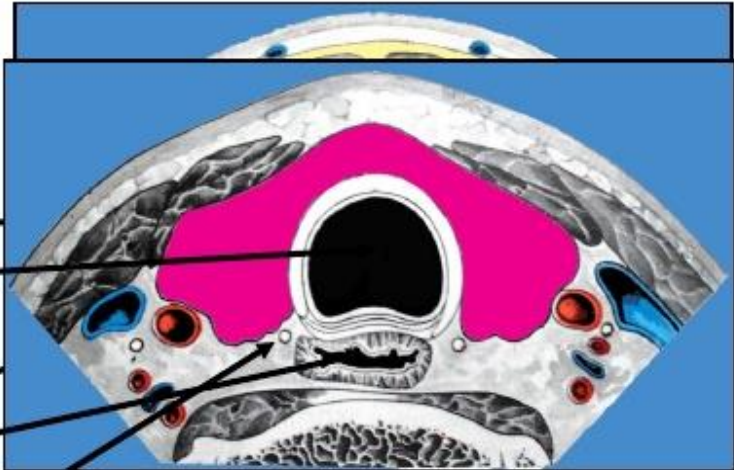
medial

lower part

larynx
trachea

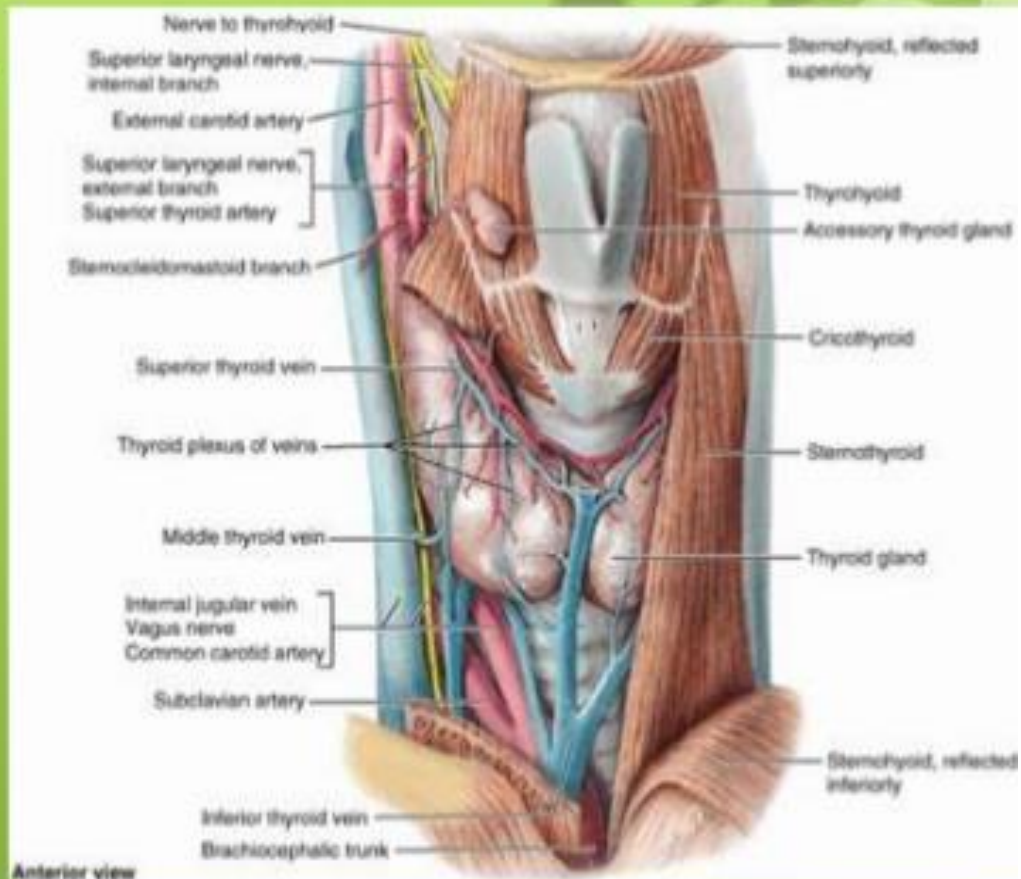
pharynx
esophagus

R.L.N.



RELATIONS OF ISTHMUS

- ✓ Connects lower parts of the 2 lobes.
- ✓ *Anterior surface:* covered by,
 - Sternothyroid and sternohyoid
 - Anterior jugular vein
 - Fascia and skin
- ✓ *Posterior surface:* 2nd to 4th tracheal rings.
- ✓ *Upper border:* anastomosis between right and left superior thyroid arteries.
- ✓ *Lower border:* Inferior thyroid veins.



✓ **Blood supply:**

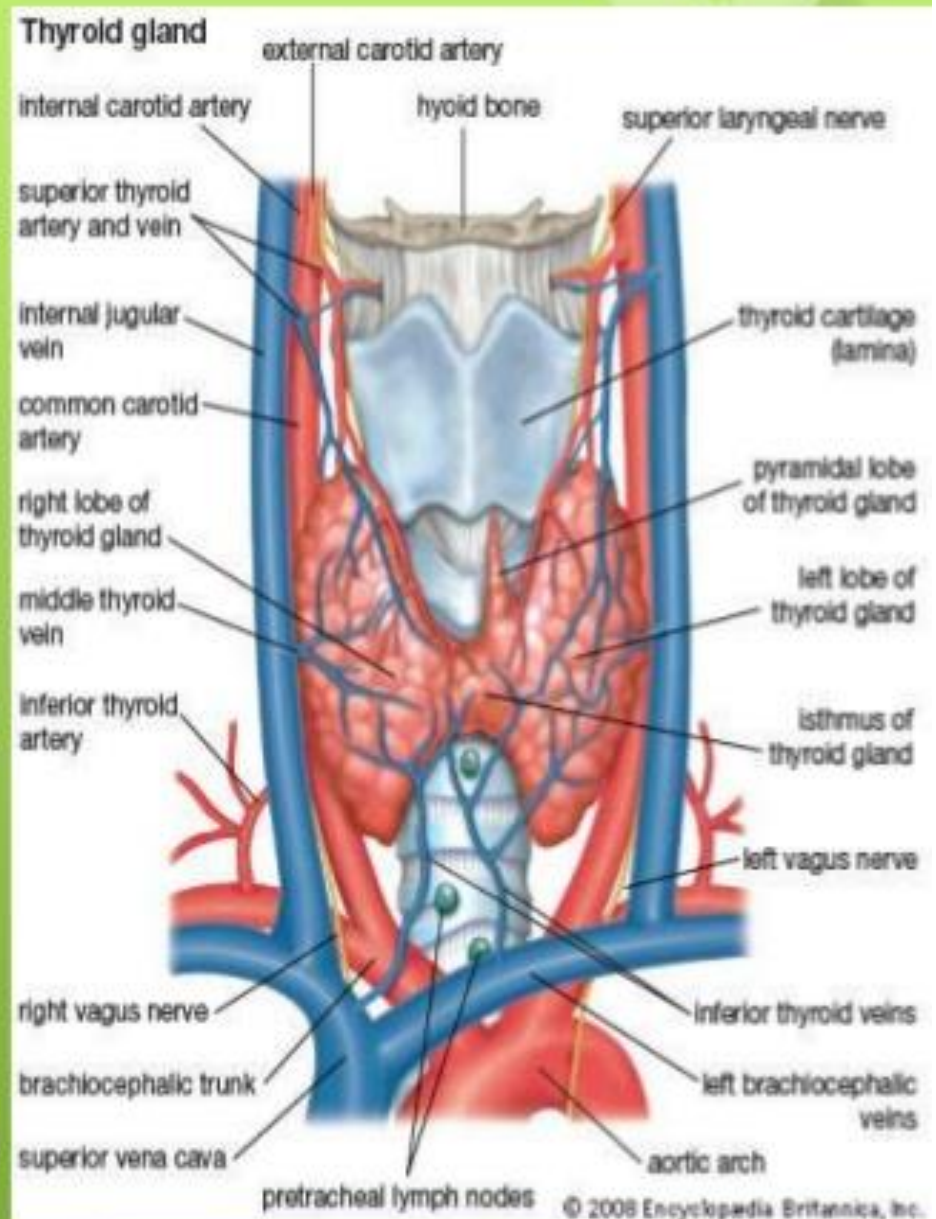
- Superior and inferior thyroid arteries.
- Superior, middle and inferior thyroid veins.

✓ **Lymphatic drainage:**

- Upper & lower deep cervical lymph node
- Pretracheal and paratracheal lymph node

✓ **Nerve supply:**

- Middle cervical ganglion
- Superior and inferior cervical ganglia

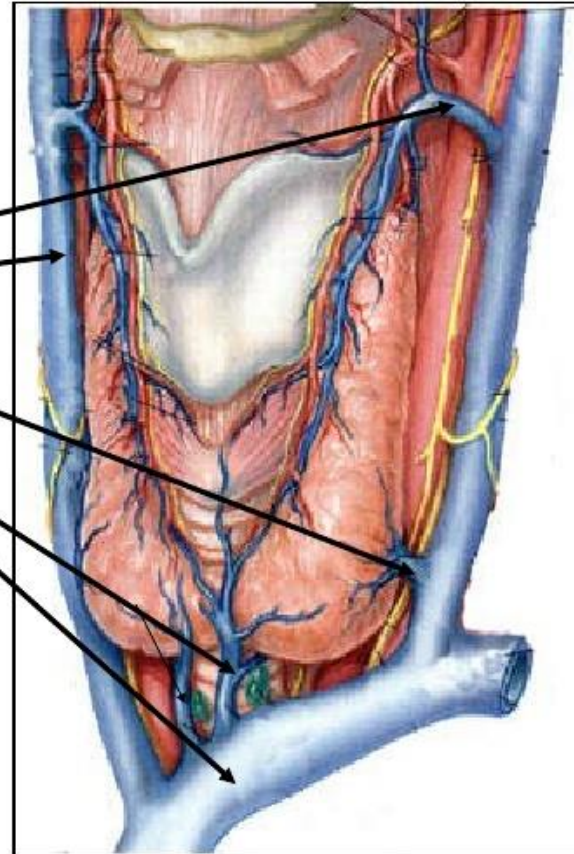


VENOUS DRAINAGE

2- venous :

Superior thyroid vein
drain to I.J.V.
middle thyroid vein
drain to I.J.V.
inferior thyroid veins
drain to left innominate vein

The middle thyroid vein
Is the shortest so it is the
1st. To be ligated



BLOOD SUPPLY CONT'D

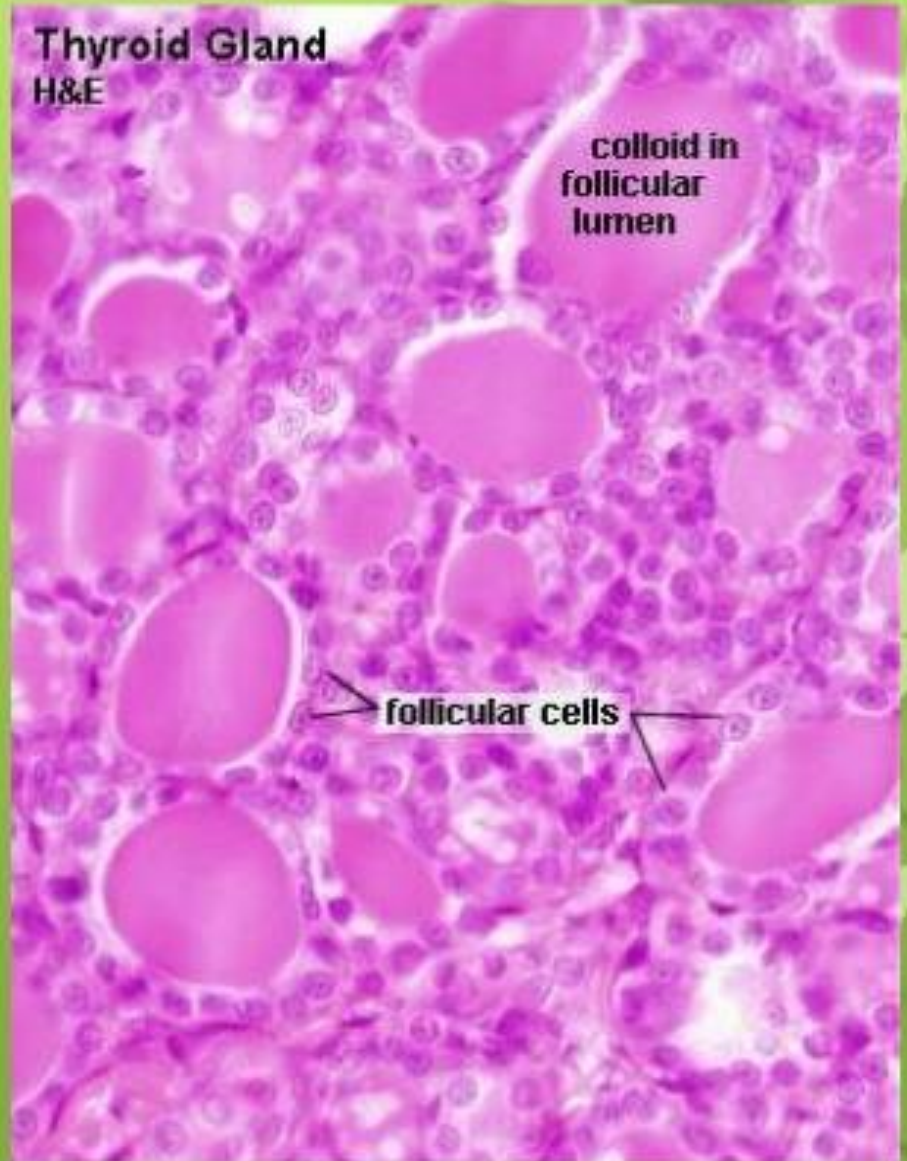
- Inferior thyroid artery – Thyrocervical trunks
- THYROIDEA IMA ARTERY (3% individuals)
 - Brachiocephalic trunk
 - Arch of the Aorta
 - Right common Carotid artery

*(Prelyngeal nodes– Delphian nodes)

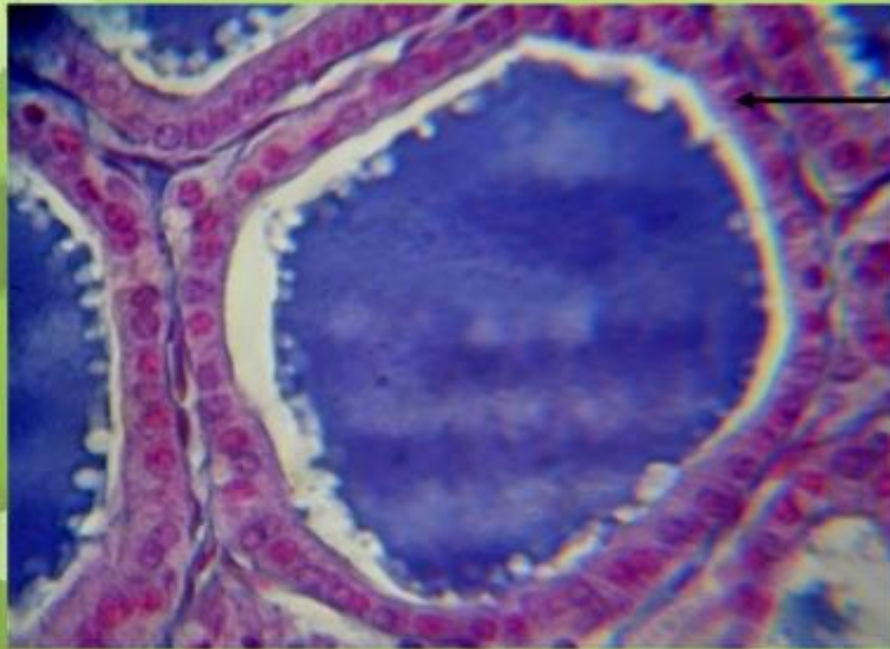
*Innervation Sympathetic vasoconstrictor (superior, middle and inferior cervical ganglia)

HISTOLOGY

- ✓ *2 types of cells :*
- follicular & parafollicular.
- ✓ The follicular cells secrete T3 & T4.
- ✓ T3 & T4 binds with glycoproteins to form the thyroglobulin (colloid).
- ✓ Most of the thyroid follicles are full of stored Thyroglobulin (colloid).
- ✓ Parafollicular cells/clear (C) cells are found among the follicular cells.
- ✓ They pale staining cells with a granular cytoplasm.
- ✓ Unlike follicular cells, they are not exposed to the follicular lumen.
- ✓ They secrete Calcitonin which help regulating blood calcium levels.



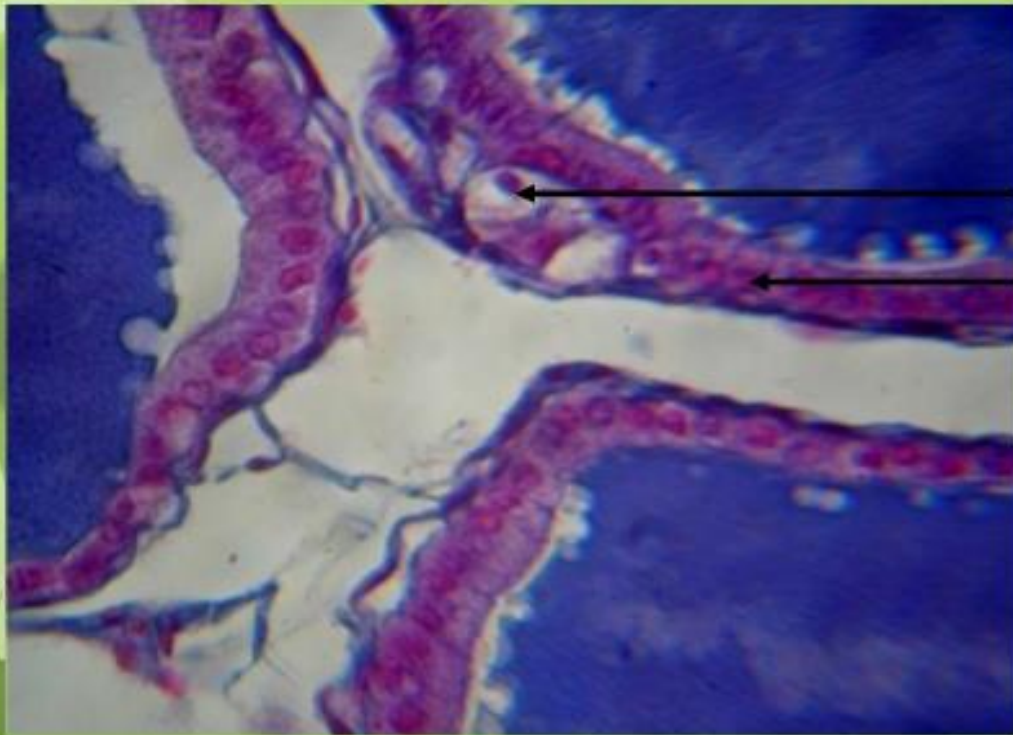
HISTOLOGY- FOLLICULAR CELLS



Follicular cells

Thyroid: high power x 45

HISTOLOGY- PARAFOLLICULAR CELLS



Parafollicular or C cells

Follicular cells

Thyroid gland: high power x 45

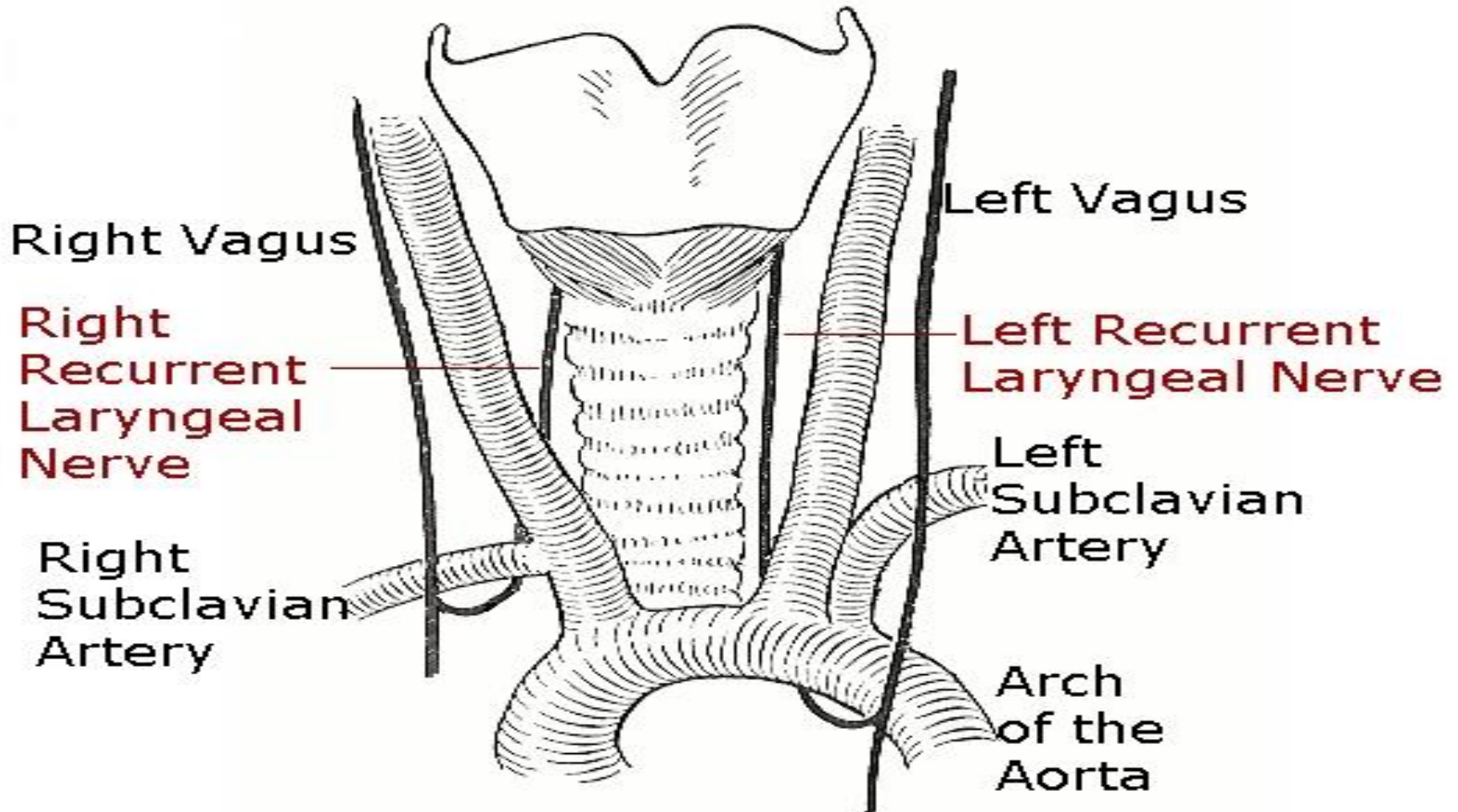
SURGICAL ANATOMY

- Sternothyroid muscles- oblique line of thyroid cartilage ,prevent the lobes from moving upwards
- Presence of isthmus makes palpating the tracheal cartilages difficult and difficult tracheostomy
- Presence of thyroidae ima A- chance of profuse bleeding procedures in neck below isthmus •

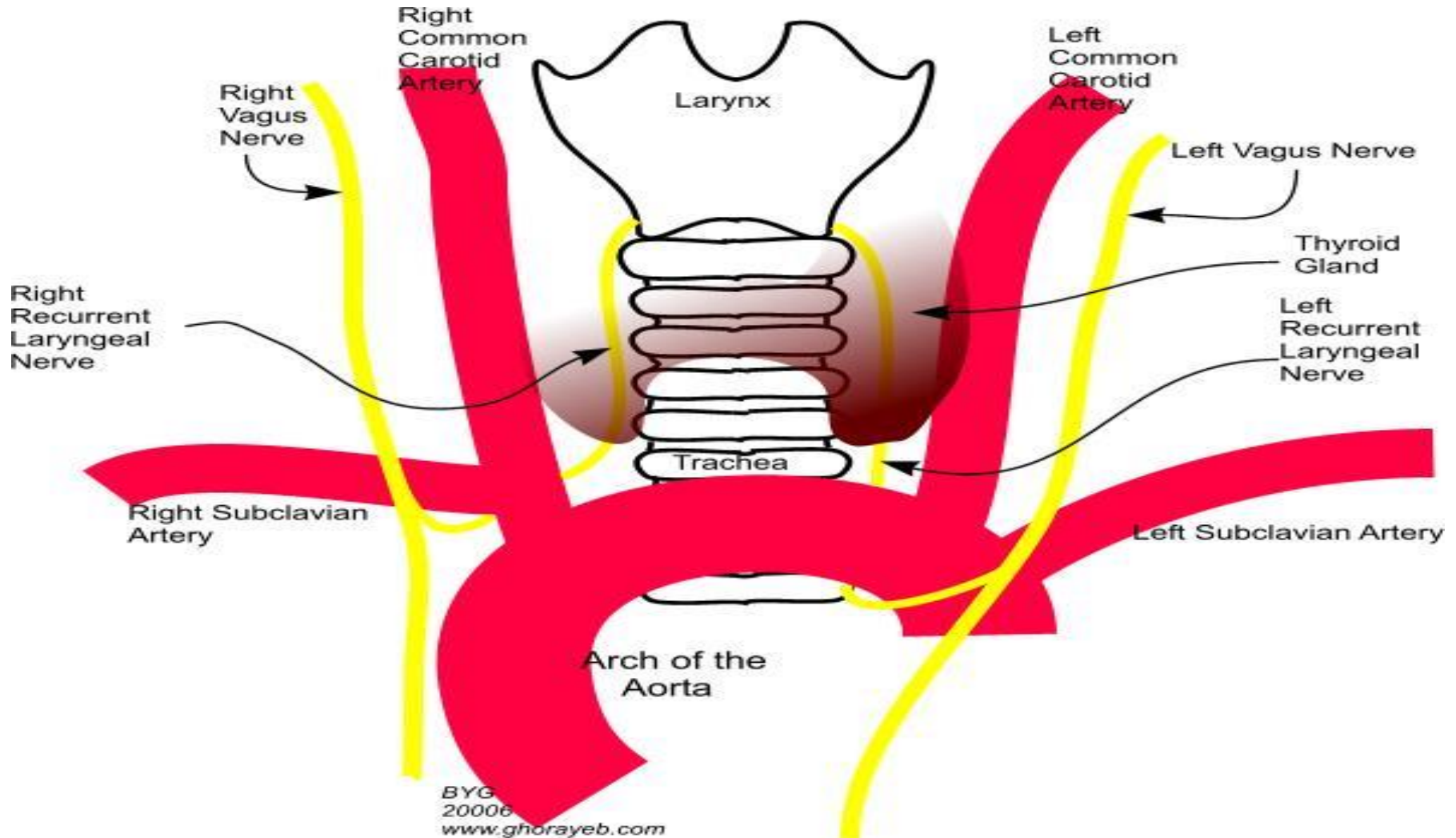
SURGICAL ANATOMY cont'd

- Thyroglossal duct cysts – remnants of thyroglossal ducts
- Pyramidal lobe and presence of levator glandulae thyroideae
- Thyroidea ima artery – Difficult/ bleeding
(Tracheostomy)
- Ectopic thyroid glands – lingual/higher placed
- Accessory thyroid glands – (descent pathway)
in thymus/ on thyrohyoid muscle
- Goiter

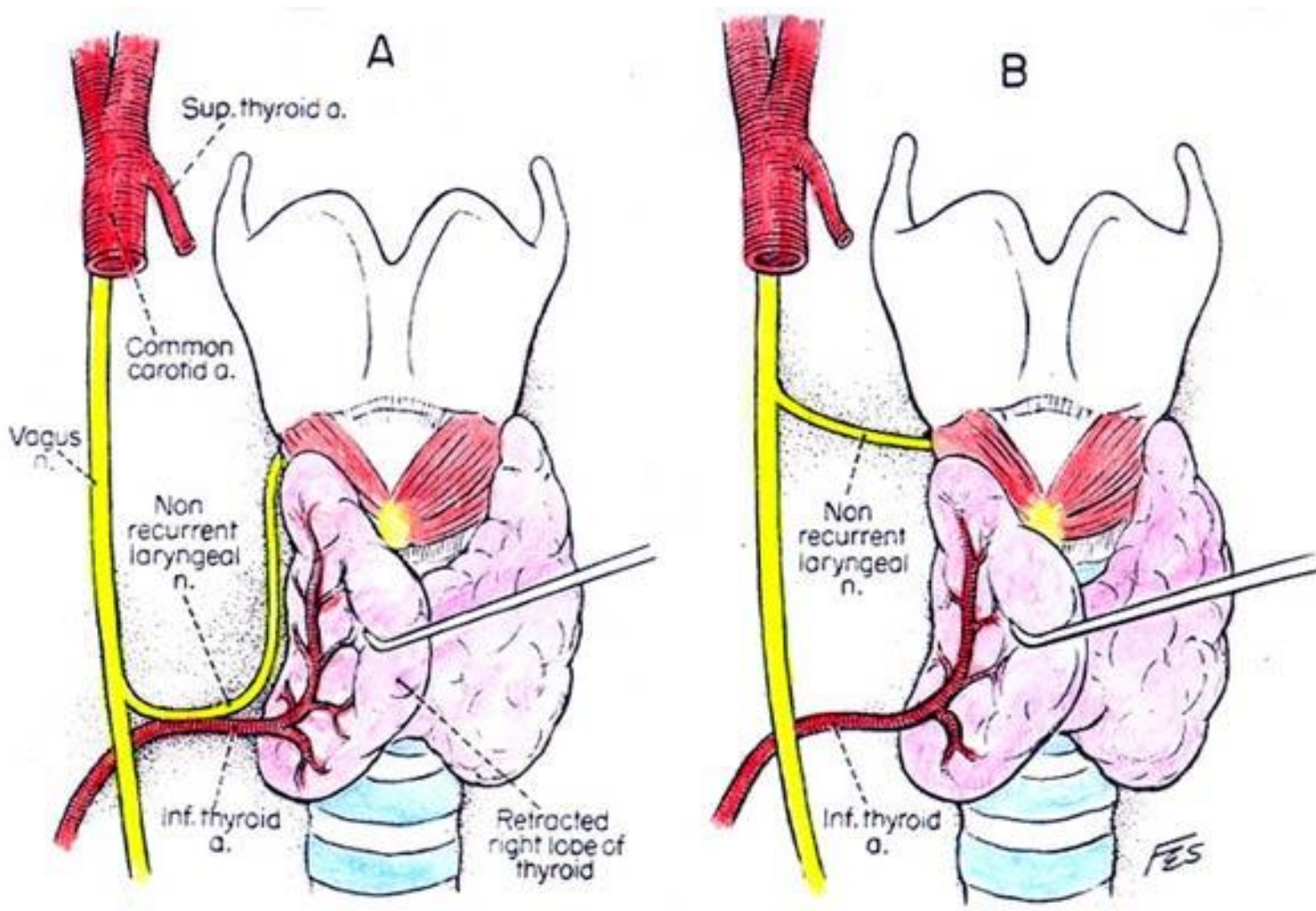
SURGICAL ANATOMY cont'd



SURGICAL ANATOMY



NON RECURRENT LARYNGEAL NERVE (<1%)



SURGICAL ANATOMY

The most common course of the nerve is within TE Groove (48.5%),
NOT DEPICTED HERE

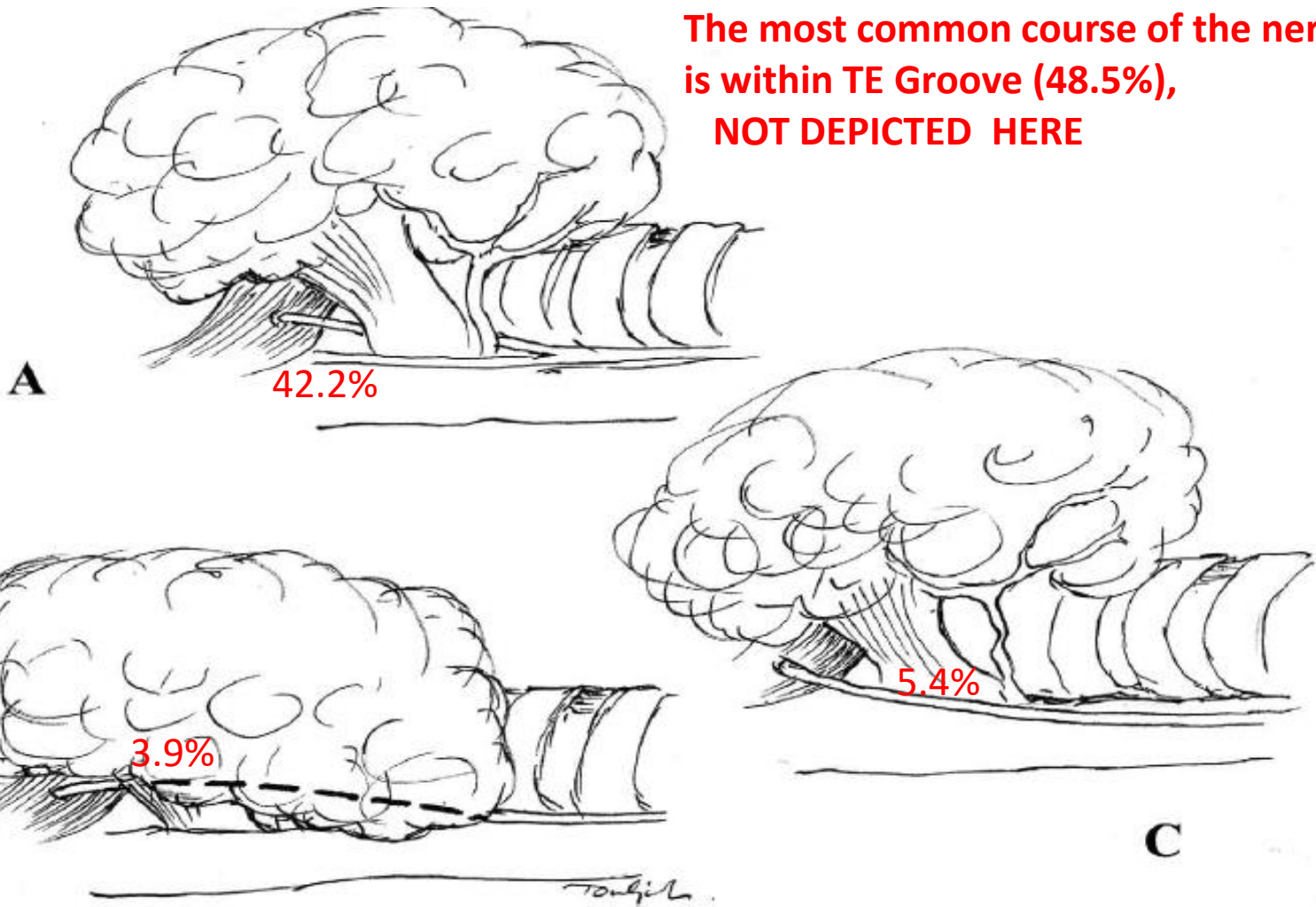


Figure 11 The recurrent laryngeal nerve may pass: (A) paratracheal, (B) within the thyroid parenchyma, or (C) paraesophageal.

SURGICAL ANATOMY cont'd

- Pressure symptoms :
 - Compression of the trachea,
 - Compression of the oesophagus
 - carotid sheath,
 - venous engorgement

SURGICAL ANATOMY cont'd

- Injury to recurrent laryngeal Nerve
 - hoarseness
 - Difficulty in breathing
- Recurrent laryngeal Nerve- supply all laryngeal muscles except *cricothyroid
- * Injury to external laryngeal N – monotonous voice(paralysis of cricothyroid) •
- Inadvertent removal of parathyroid gland – tetany (fatal)

THANKS FOR LISTENING

