

The Endocrine System

Hypothalamus

Pituitary gland

Pineal gland (epiphysis)

Thyroid gland

Parathyroid gland

Adrenal (suprarenal)

Pancreas

Ovaries

Testicles

Endocrine practical Anatomy Revision

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Maha edrees

Ghadah alahmed

Jumanah alshunify

Anfal alshalawi

Blu box = team notes •

Green box = important •

 = extra •

Thyroid gland

You need to know:

Fascia

Level

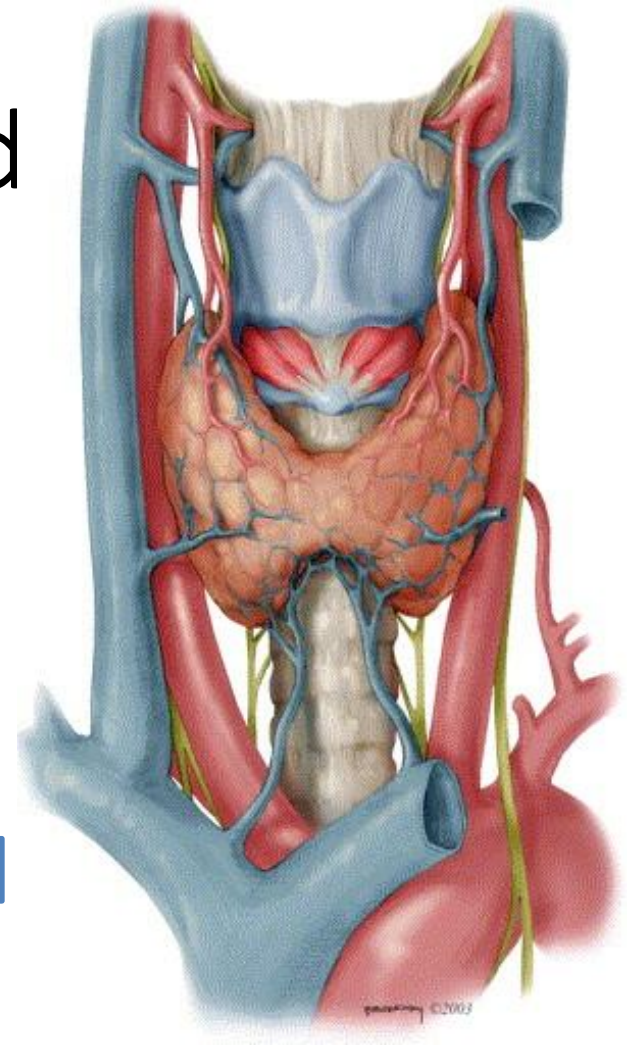
Relation

Identify structures

The question could be about any structure in the diagram

Blood supply

Clinical scenario “e.g. thyroidectomy”





Relations of the thyroid gland

Posteriorly:

Carotid sheath & its contents.

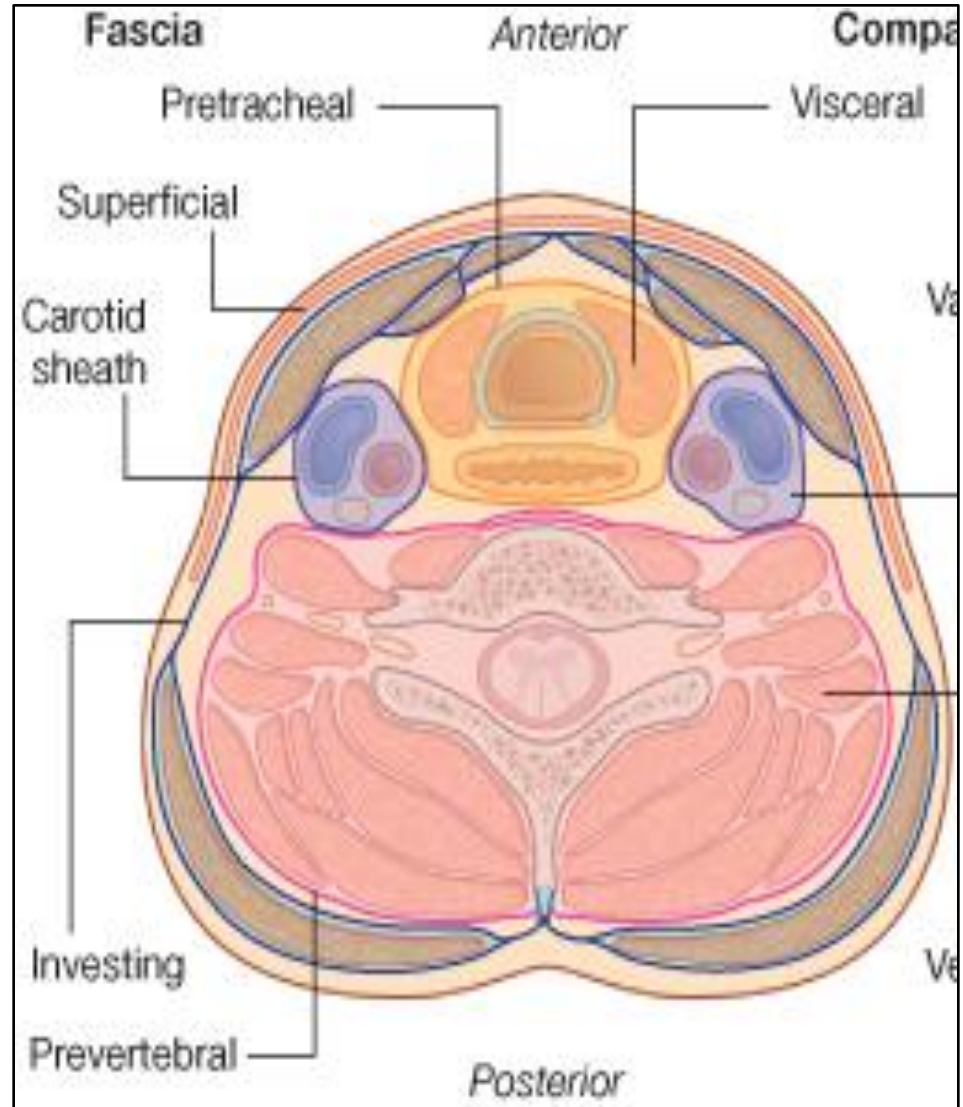
- **Medially:**

Above: Larynx & pharynx .

Below: Trachea & esophagus.

Recurrent laryngeal nerve in between.

Cricothyroid muscle & external laryngeal nerve.



Relation of thyroid gland

Mention 2 nerves related to the thyroid gland medially ?

A.

B.

Key:

A. Recurrent laryngeal nerve .

B. External laryngeal nerve.

Mention 2 structures related to both isthmus and lobe of the thyroid gland Anteriorly.

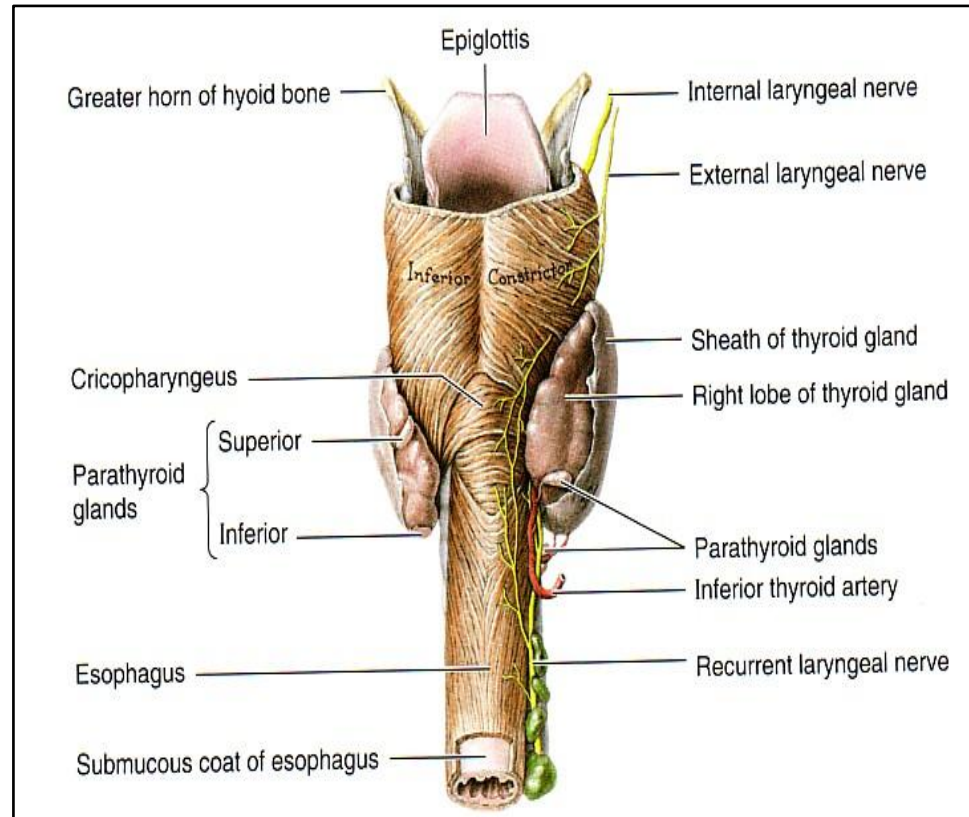
1- -----

2- -----

Key:

1- Sternothyroid.

2- Sternohyoid.





Thyroidectomy

3 layers deep fascia or deep cervical fascia of the neck:

1- Investing layer.

2- Pretracheal layer.

3- Prevertebral layer.



These 2 layers should be incised during thyroidectomy.

The following nerves should be protected from injury during thyroidectomy:

1- The external laryngeal nerve.

2- The recurrent laryngeal nerve

Thyroidectomy

With thyroidectomy operation
Mention;

- A. Fascia incised.
- B. Nerves protected from injury.

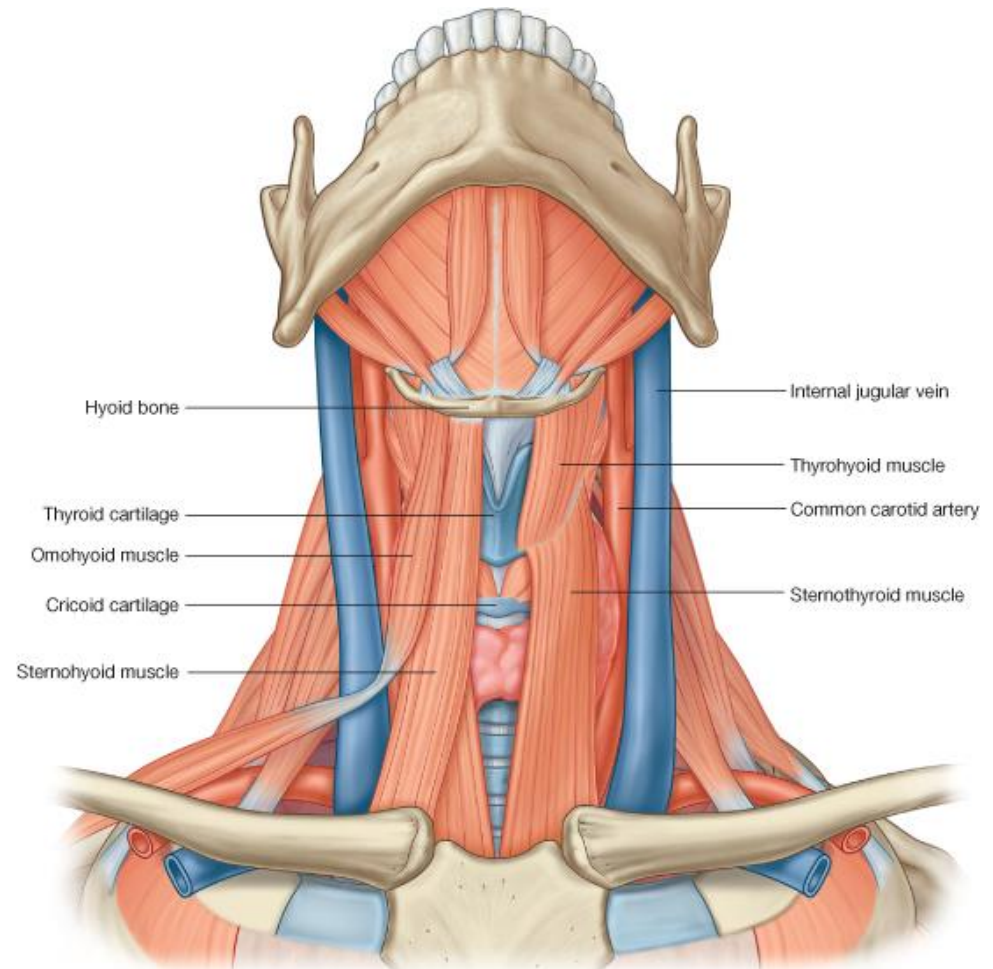
Key:

A.

- 1- Investing layer.
- 2- Pretracheal layer.

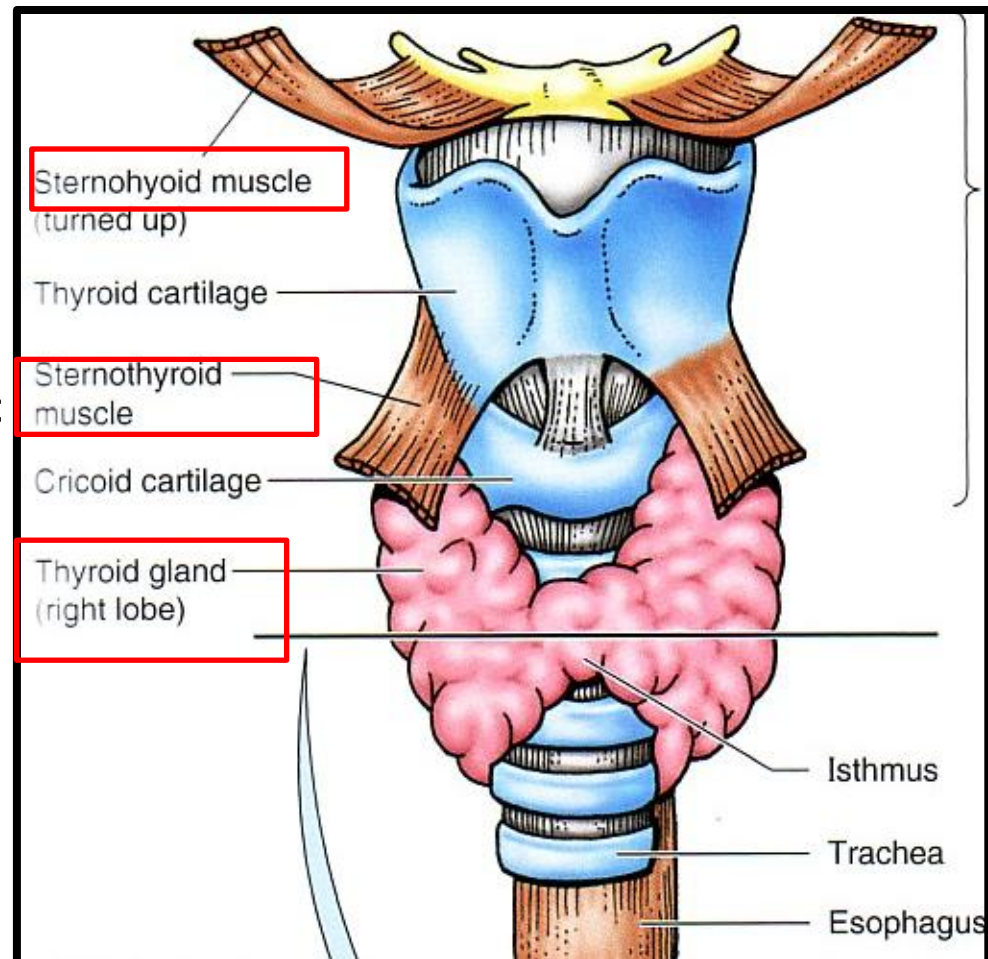
B.

- 1- The external laryngeal nerve.
- 2- The recurrent laryngeal nerve



Level of thyroid gland

- Each lobe is pear shaped, with **its apex** directed upward as far as the **oblique line of the thyroid cartilage**; **its base** lies at the **4th 5th tracheal ring** (the level of thyroid lobes).
- The thyroid gland consists of right & left lobes, these 2 lobes are connected to each other by a narrow **isthmus**, which overlies the **2nd 3rd & 4th tracheal rings**.



Level of thyroid gland

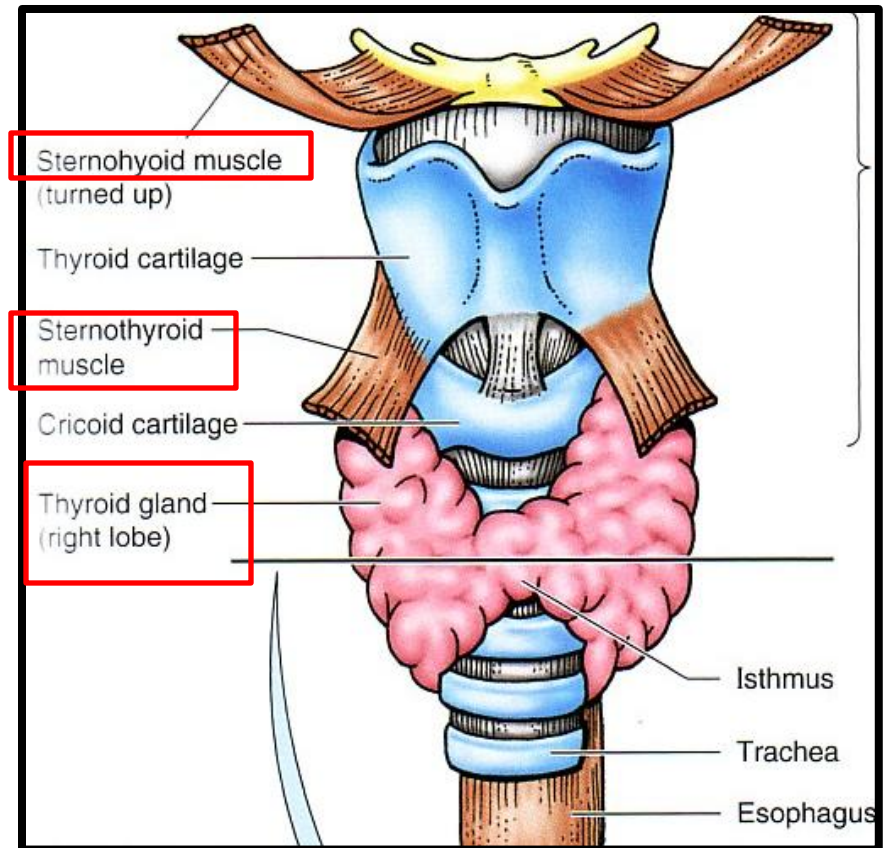
Level of thyroid lobes;

Obliqu line

Level of 4-5 tracheal rings

Level of thyroid Isthmus;

Front of 2- 3- 4- tracheal rings



Relations

Anterolaterally: (inside to outside)

1. Sternothyroid.
2. Sternohyoid.
3. Superior belly of omohyoid
4. Sternomastoid.

Posterior:

Carotid sheath & its contents.

Medially:

Above:

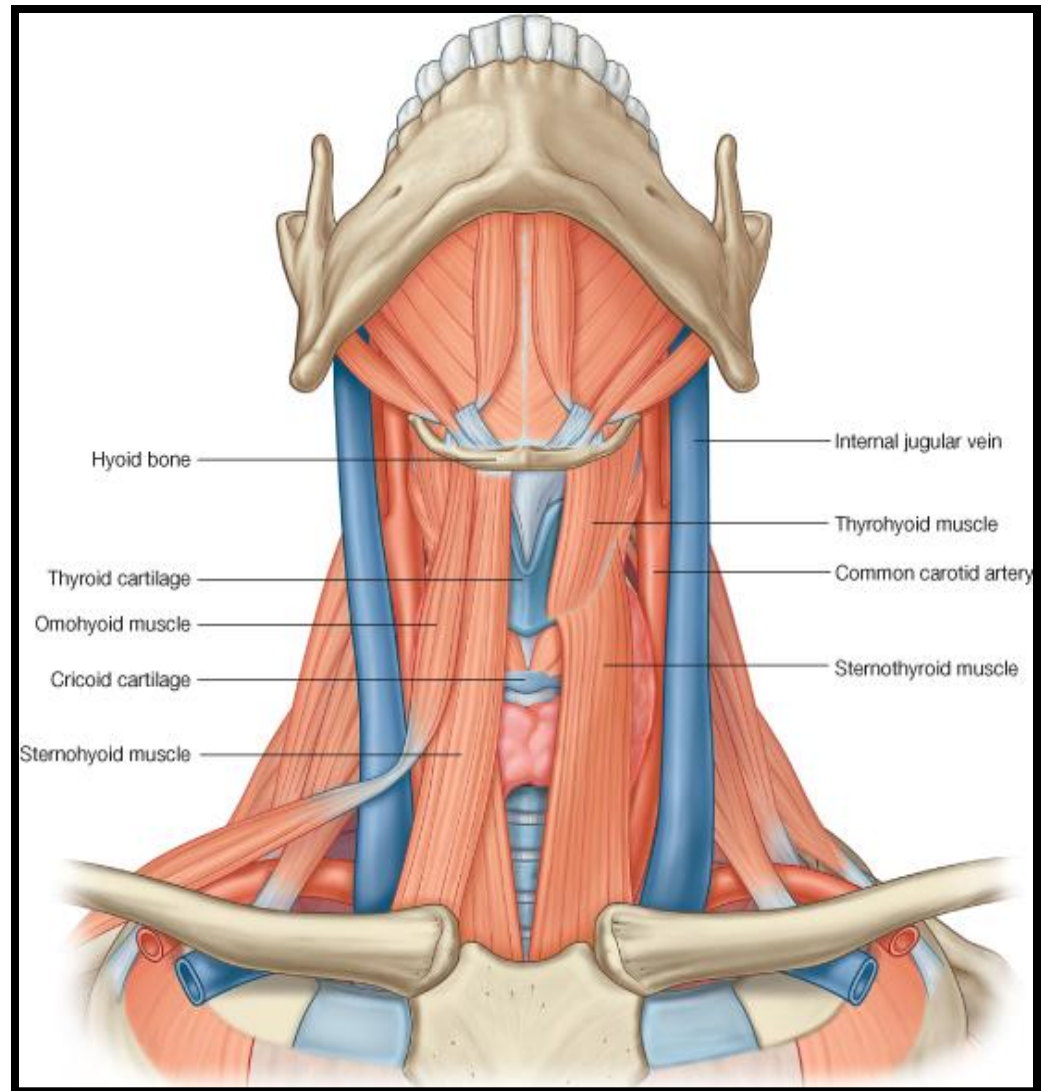
Larynx & pharynx .

Below:

Trachea & esophagus.

Recurrent laryngeal nerve in between.

Cricothyroid muscle & external laryngeal nerve.



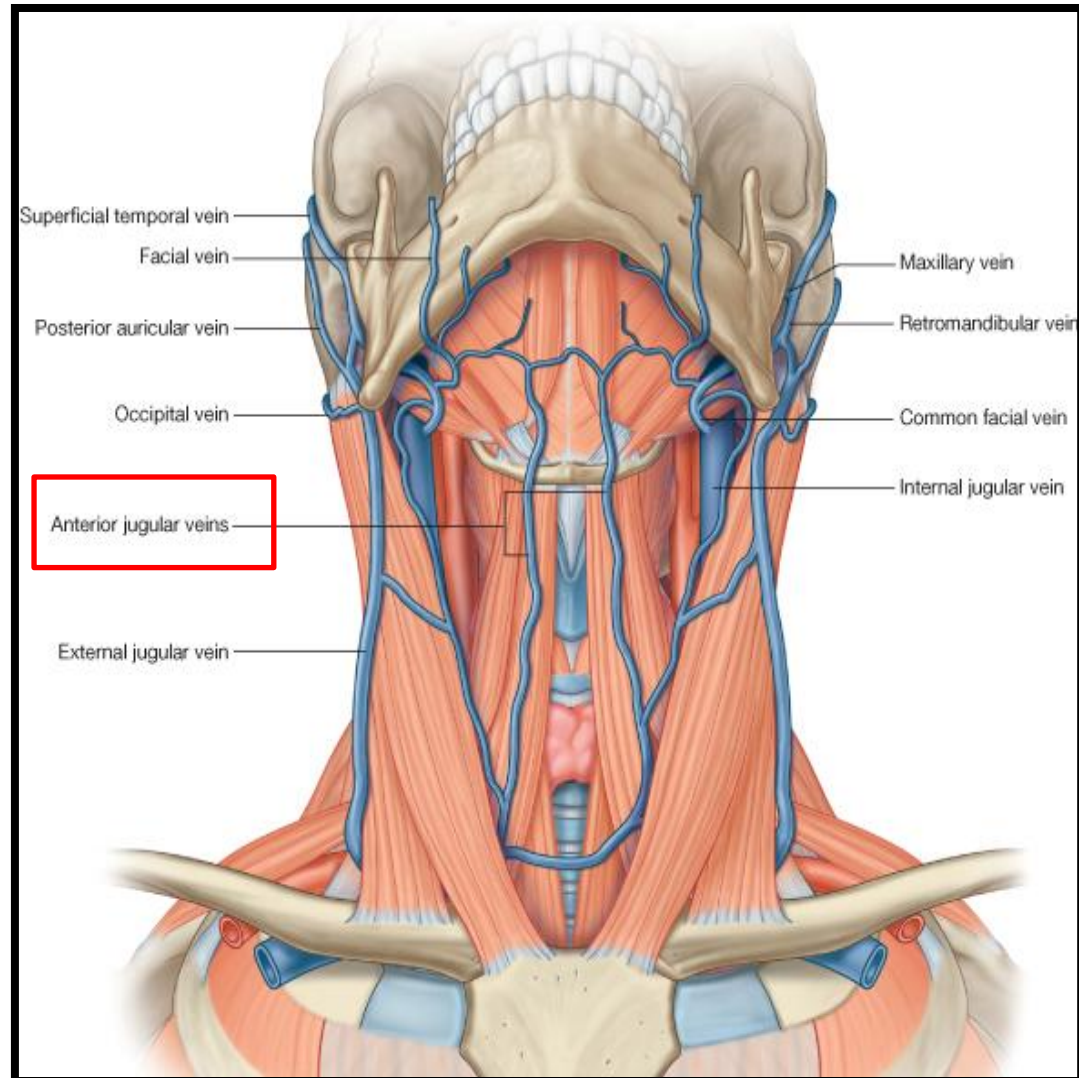
Relation of the isthmus

Anteriorly:

- 1- Sternothyroid,
- 2- Sternohyoid,
- 3- Anterior jugular vein,
- 4- Fascia & skin.

Posteriorly:

2nd, 3rd, & 4th tracheal rings
Terminal branches of the two superior thyroid arteries as they anastomosis along the upper border.





Arterial supply

1-Superior thyroid artery :

It is a branch from the external carotid artery.

It descends to the upper pole of the lobe, with the **external laryngeal nerve**.

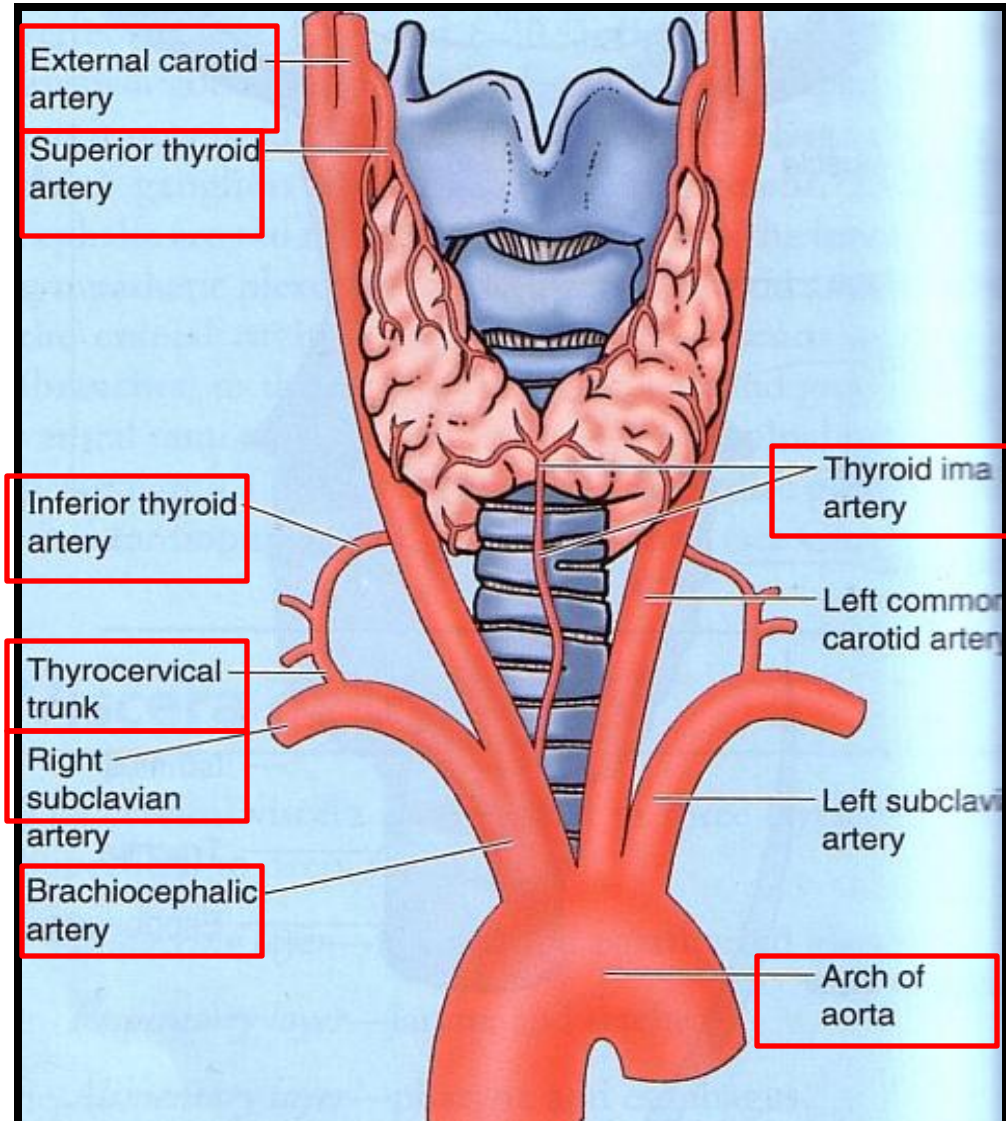
2- Thyroid ima artery :

If present, it arises from aortic arch or from **brachiocephalic artery**.

3-Inferior thyroid artery :

From the **thyrocervical** trunk of 1st part of subclavian artery.

The recurrent laryngeal nerve crosses either in front or behind it.



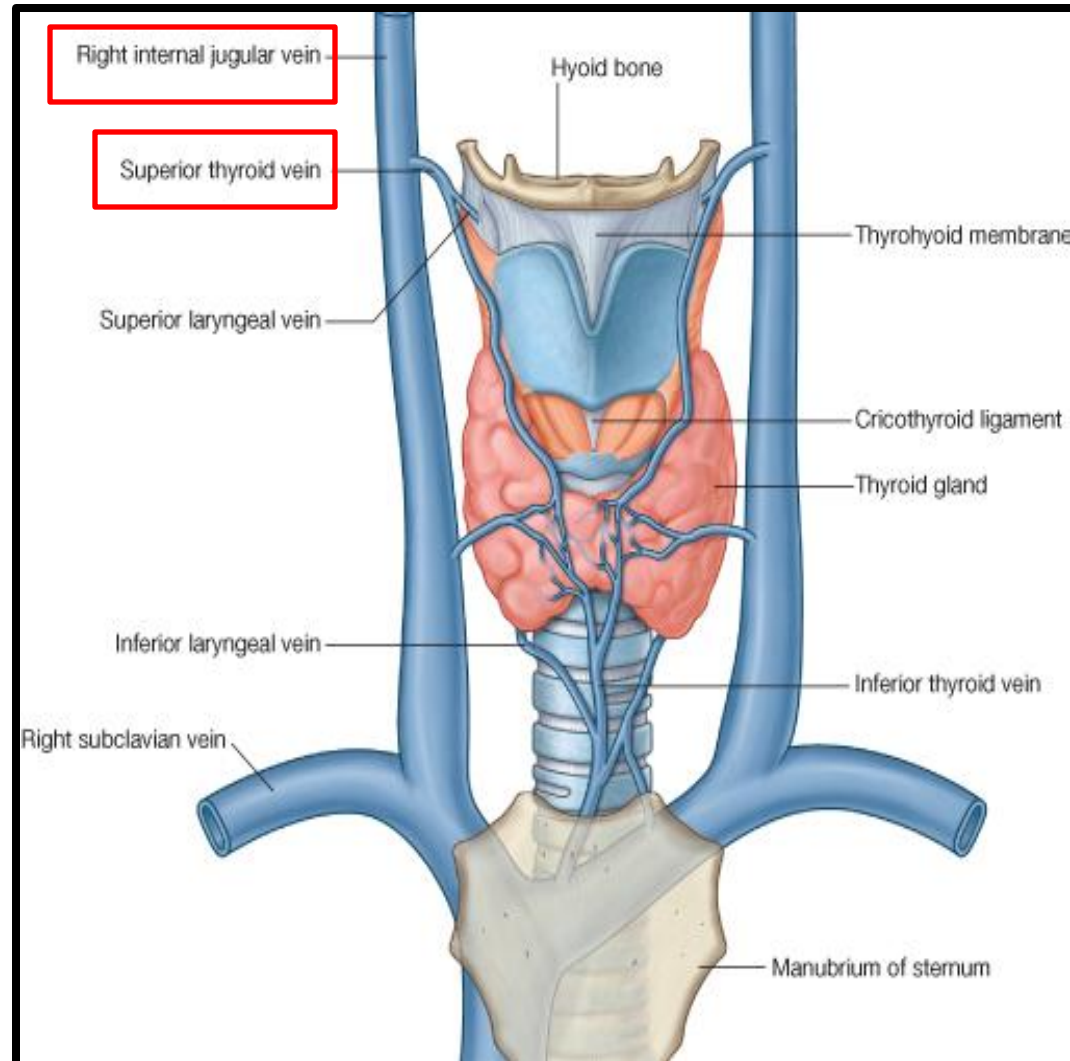


Veins of the thyroid gland

1- **Superior thyroid vein** which drains into internal jugular vein

2- **Middle thyroid vein** which drains into internal jugular vein

3- **Inferior thyroid vein** which drains into left brachiocephalic vein



Arteries of the thyroid

For the thyroid gland Mention;

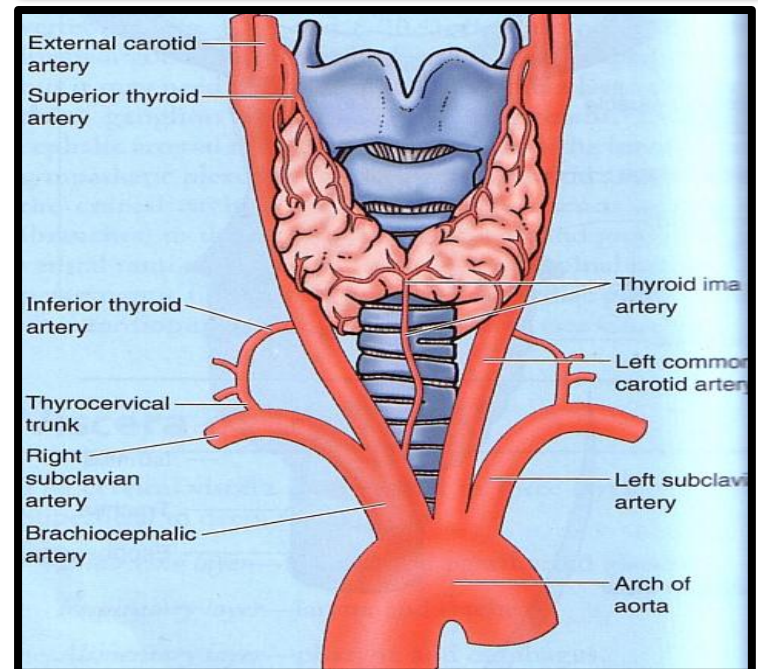
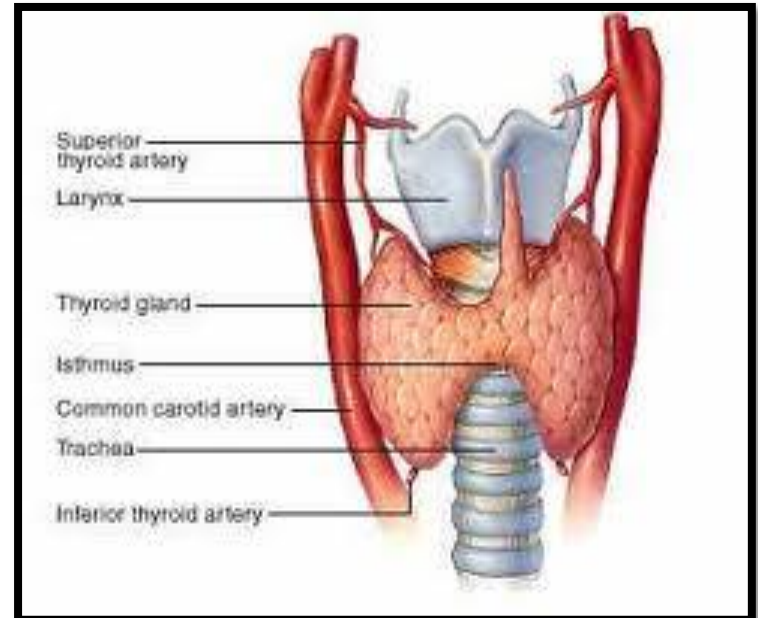
- A. origin of the arterial supply
- B. end of the venous drainage.

A.-----

B. -----.

Key:

- A. 1- external carotid artery .
2- aortic arch or brachiocephalic artery.
3- thyrocervical trunk of 1st part of subclavian artery.
- B. 1- internal jugular.
2- left brachiocephalic



Veins of Thyroid Gland

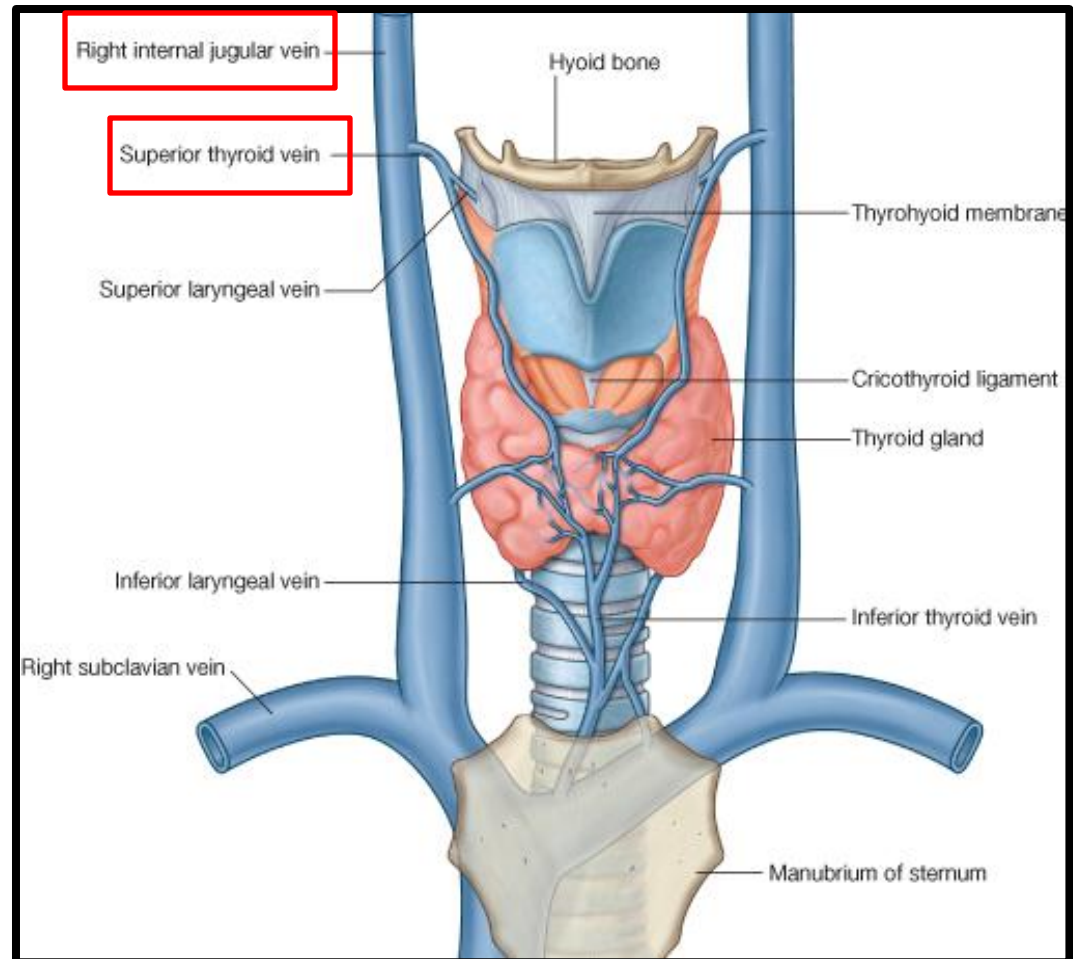
1-Superior thyroid vein of

internal jugular

2- Middle thyroid vein of internal jugular

3- Inferior thyroid vein left

brachiocephalic



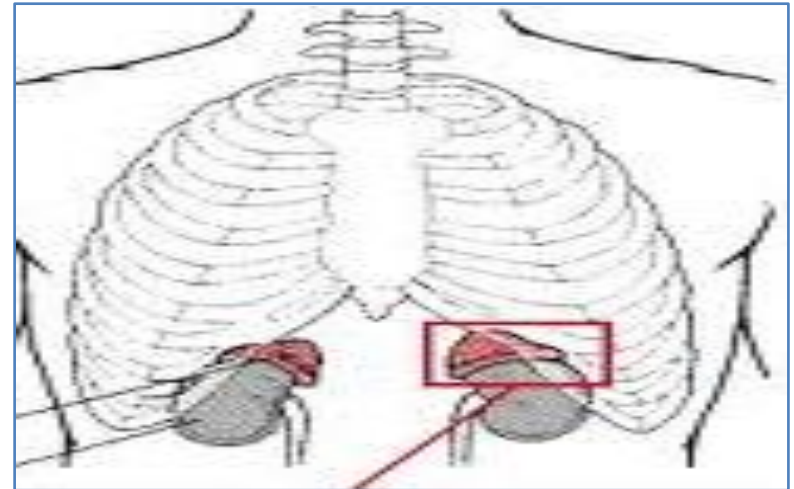
Adrenal gland

- Level.
 - Comparison between R. and L. glands
 - Position
 - Shape
 - Relation
 - Blood supply.
- 
- An anatomical illustration showing the adrenal gland and kidney. The adrenal gland is shown in a cross-section, revealing its internal structure with a central medulla and an outer cortex. The kidney is shown in a reddish-pink color, and the adrenal gland is positioned on top of it. The illustration is set against a light blue background with a red and blue vertical bar on the left side. The text '123RF' is visible on the kidney.

Level of adrenal glands

1- Mention the anatomical level of the adrenal glands.

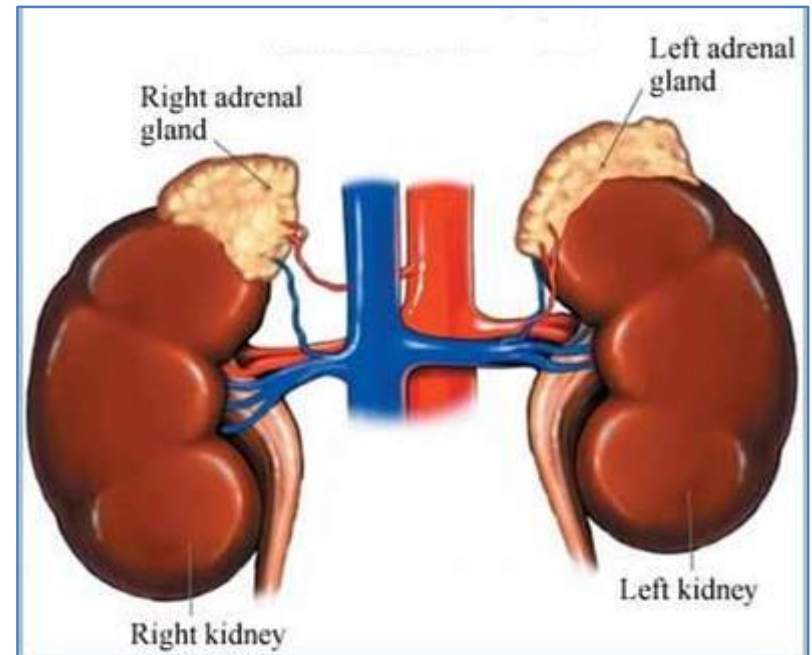
key: just above level of T12



They are **yellowish retroperitoneal** organs that lie on the upper poles of the kidneys,

just above the level of the last thoracic vertebra (T12).

They are **surrounded by renal fascia** (but are separated from the kidneys by the **perirenal fat**).

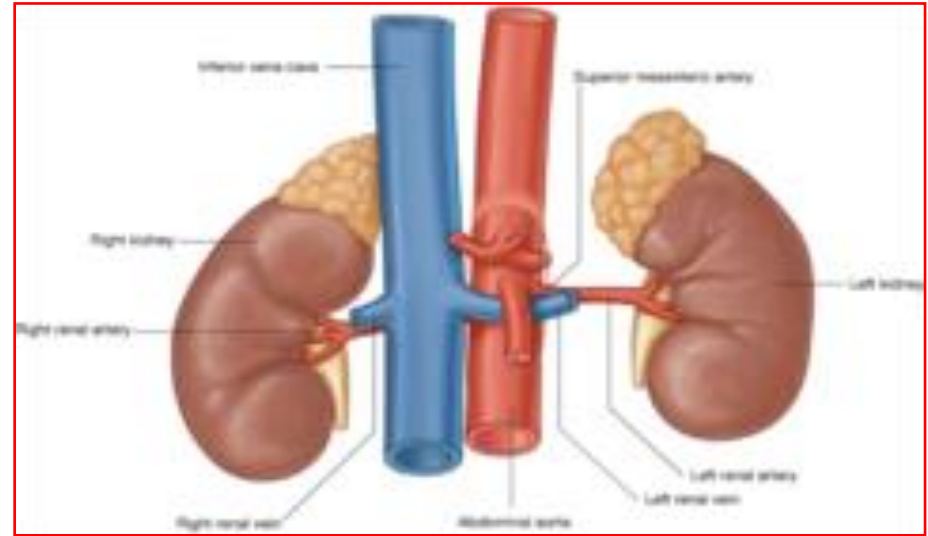




Position & Shape & Relation of adrenal gland

❑ The right suprarenal gland

- Is **pyramid** shaped.
- Caps the upper pole of the right kidney.
- Relations:
 - **Anterior:** right lobe of the liver and inferior vena cava.
 - **Posterior:** diaphragm.



The left suprarenal gland

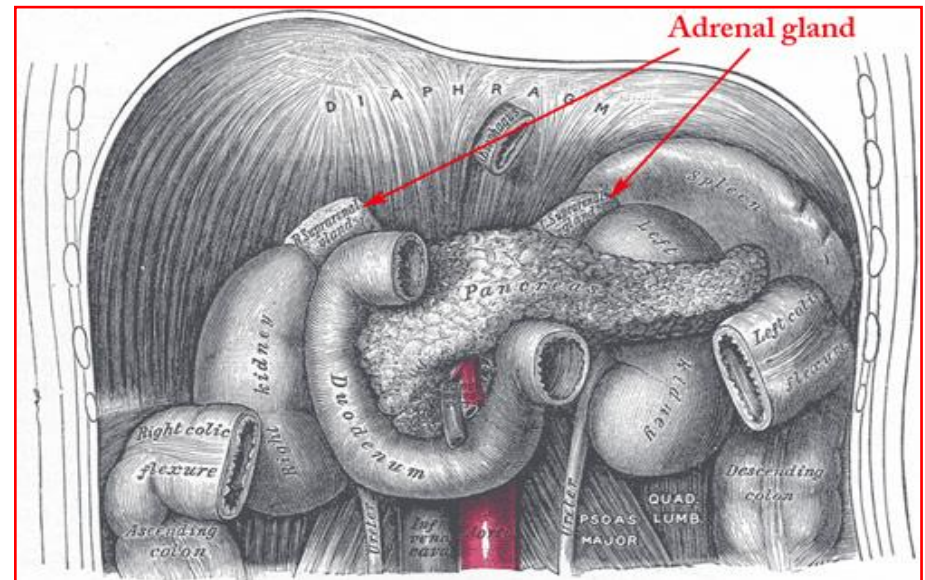
Is **screscentic** in shape

Extends along the medial border of the left kidney from the upper pole to the hilus.

Relations:

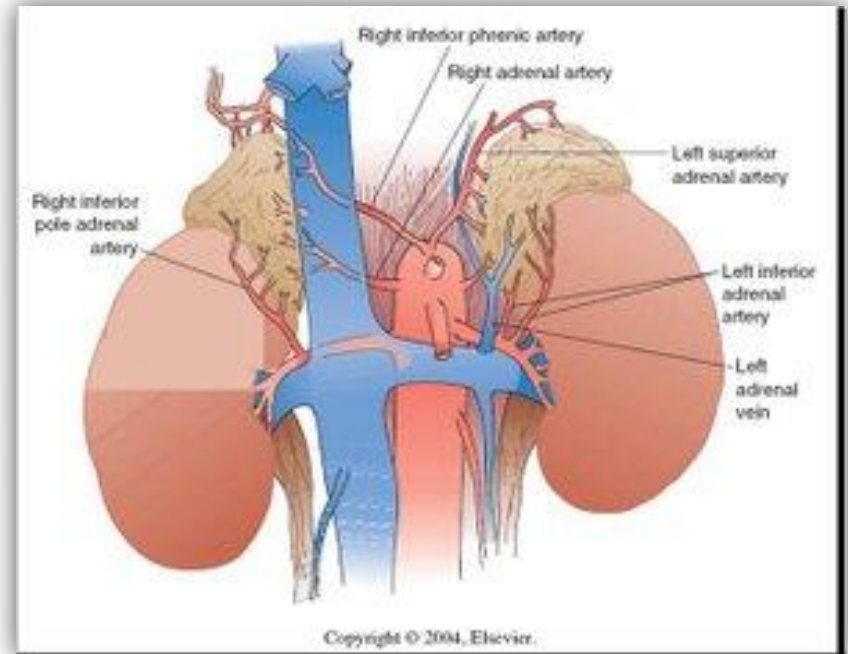
Anterior: pancreas, lesser sac, and stomach

Posterior: diaphragm.



❑ Differences between right and left adrenals

- 1- position and shape
- RAG :Pyramid caps the upper pole
- LAG :crescenticExtends to the hilus
- 2- Relation
- Right
- Anterior: right lobe of the liver and inferior vena cava.
- Posterior: diaphragm.
- Left
- Anterior: pancreas, lesser sac, and stomach
- Posterior: diaphragm





Comparison between R. and L.ADRENAL glands

Comparison	Right	Left
POSTION	Caps the upper pole of the right kidney.	Extends along the medial border of the left kidney from the upper pole to the hilus.
Shape	Pyramid Shaped	Crescent Shape
Anterior Relations	right lobe of the liver and inferior vena cava.	pancreas, lesser sac, and stomach
Venous Drainage	Inferior Vena Cava	Left Renal Vein



Blood supply of adrenal gland

Arteries: The arteries supplying each gland are **three** in number:

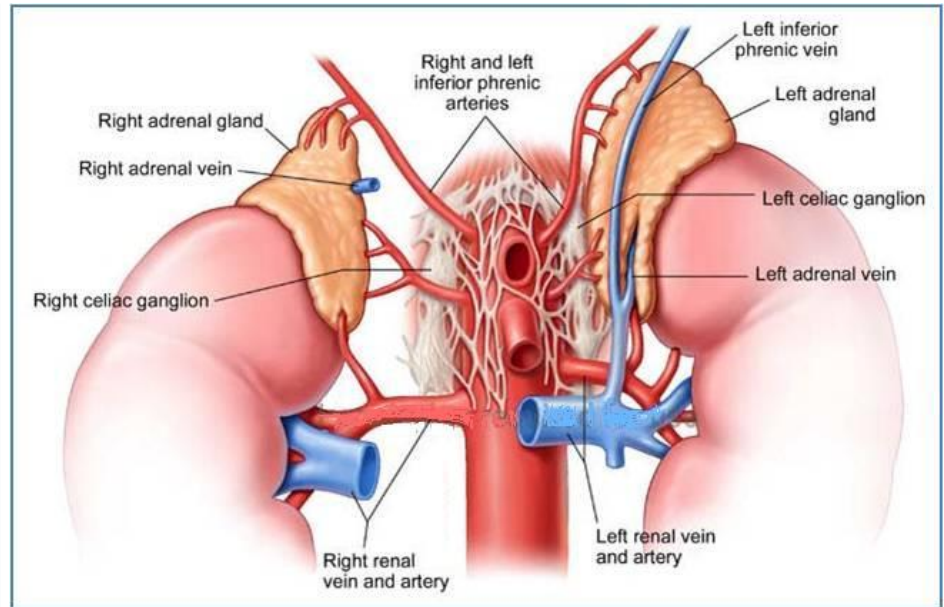
superior, middle, and inferior suprarenal arteries arise from;

inferior phrenic artery, abdominal aorta, and renal artery, respectively.

Veins: A single vein emerges from the hilum of each gland and drains into the **inferior vena cava on the right** and into the **left renal vein on the left**.

Lymph Drainage:

The lymph drains into the **lateral aortic nodes**.



Nerve Supply:

Preganglionic sympathetic fibers

derived from the **splanchnic nerves** supply the glands.

Most of the nerves end in the medulla of the gland.

Arterial supply

2- Mention the origin of the arterial supply of the adrenal glands ?

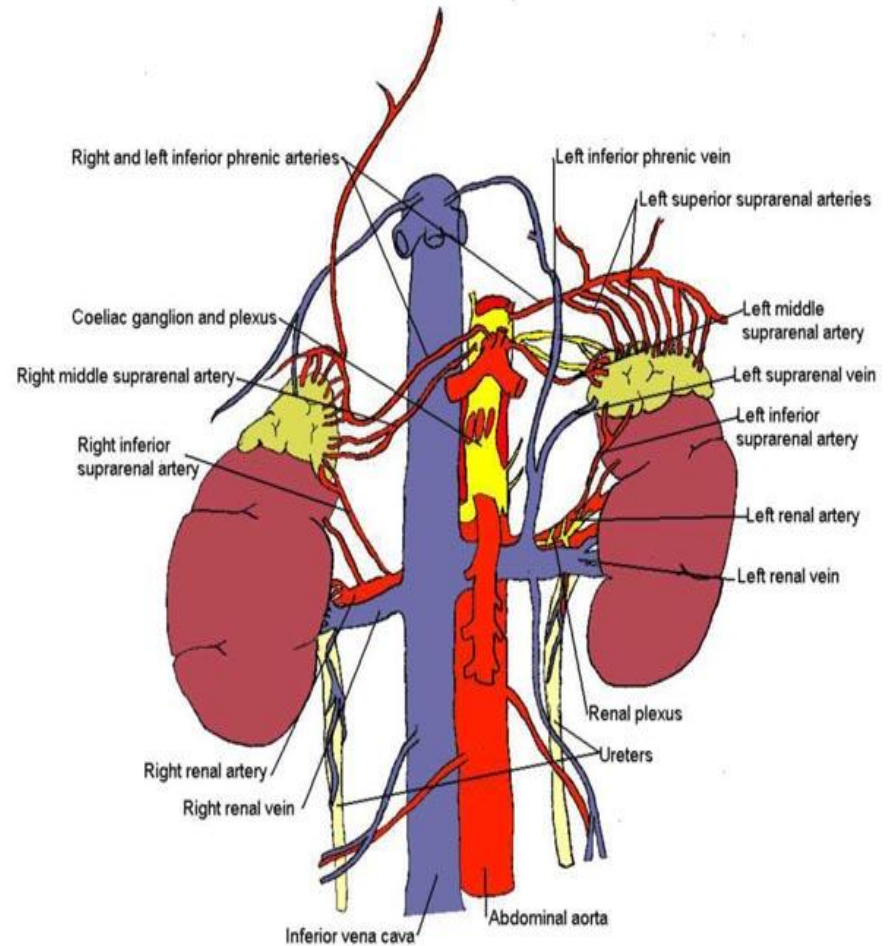
- a.-----.
- b.-----.
- c.-----.

Key :

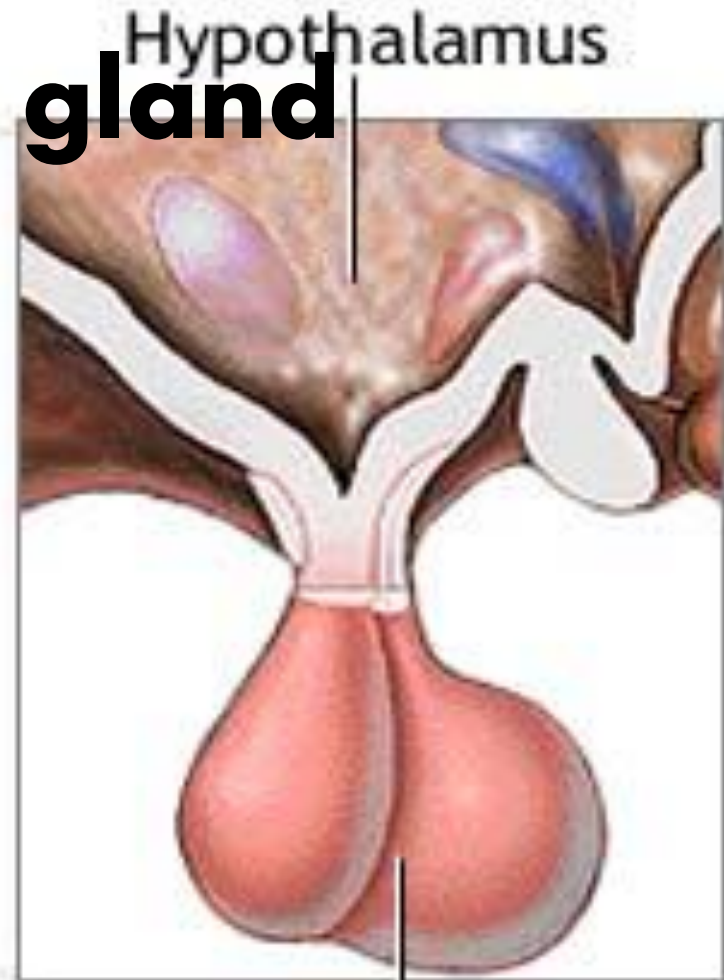
- a. Superior suprarenal (inferior phrenic).
- b. middle suprarenal (abdominal aorta).
- c. Inferior suprarenal (renal arteries)

Mention the origin of the venous drainage of the adrenal glands ?

- a. the inferior vena cava on the right
- b. the left renal vein on the left.

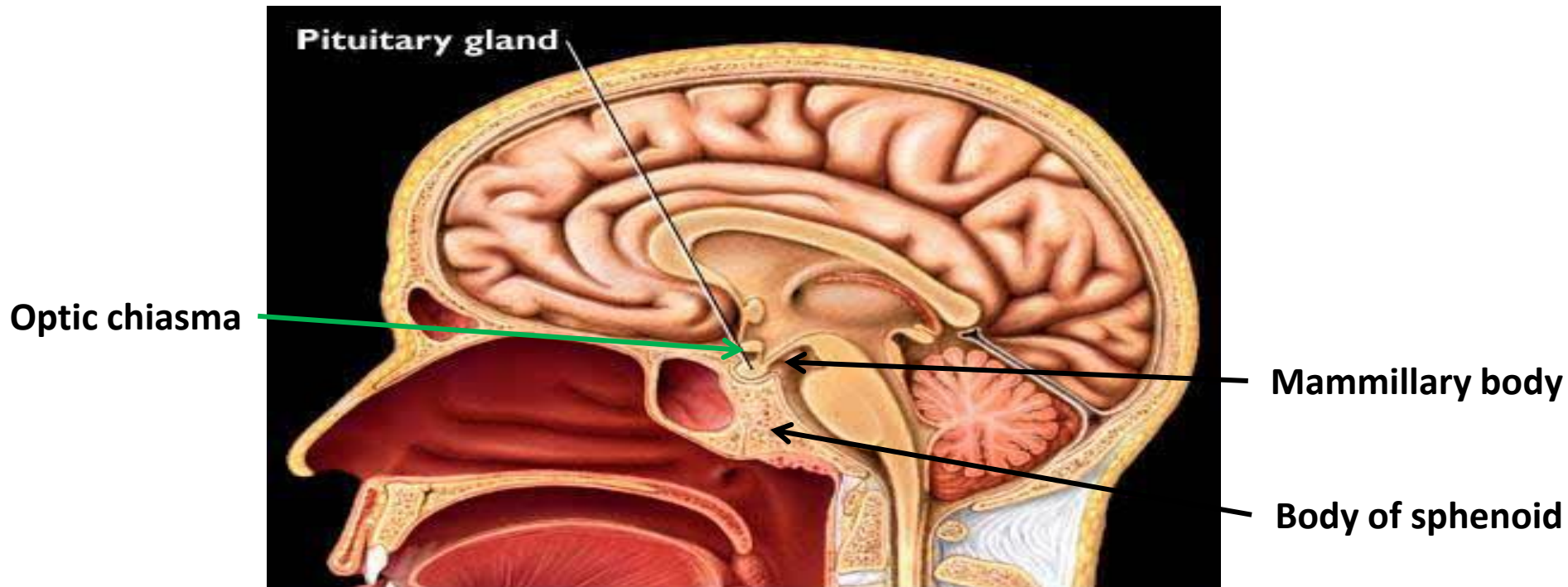


Pituitary gland



Pituitary gland

PITUITARY GLAND (POSITION)



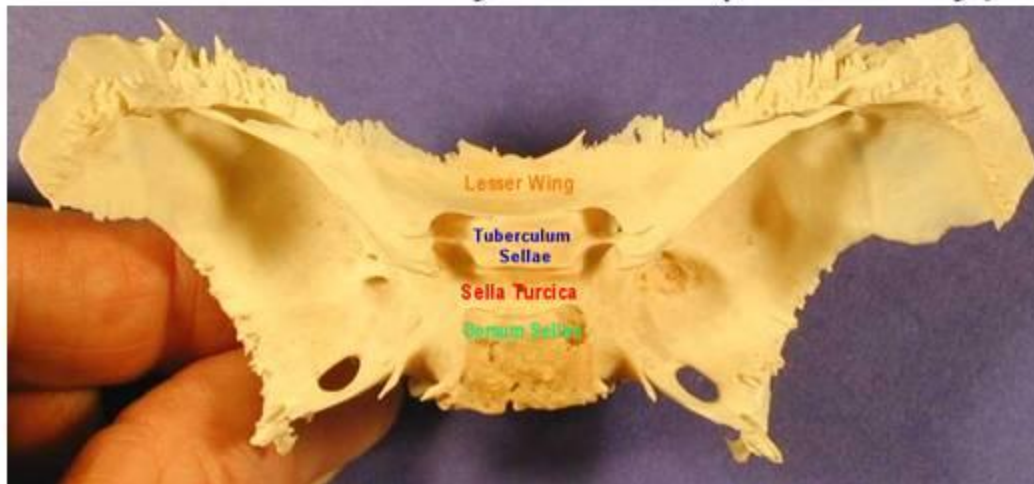
It lies in the hypophyseal fossa of the body of sphenoid bone, between optic chiasma (anteriorly) & mammillary bodies (posteriorly).

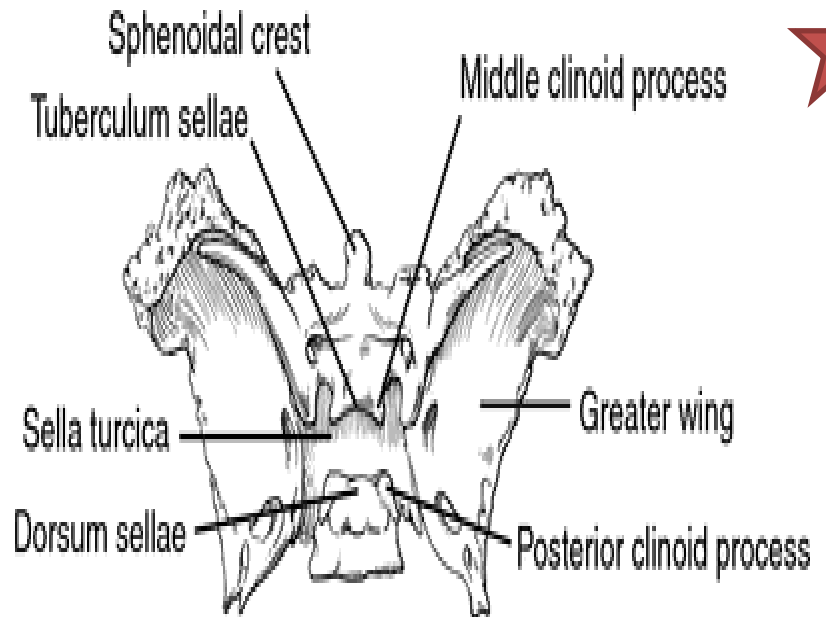
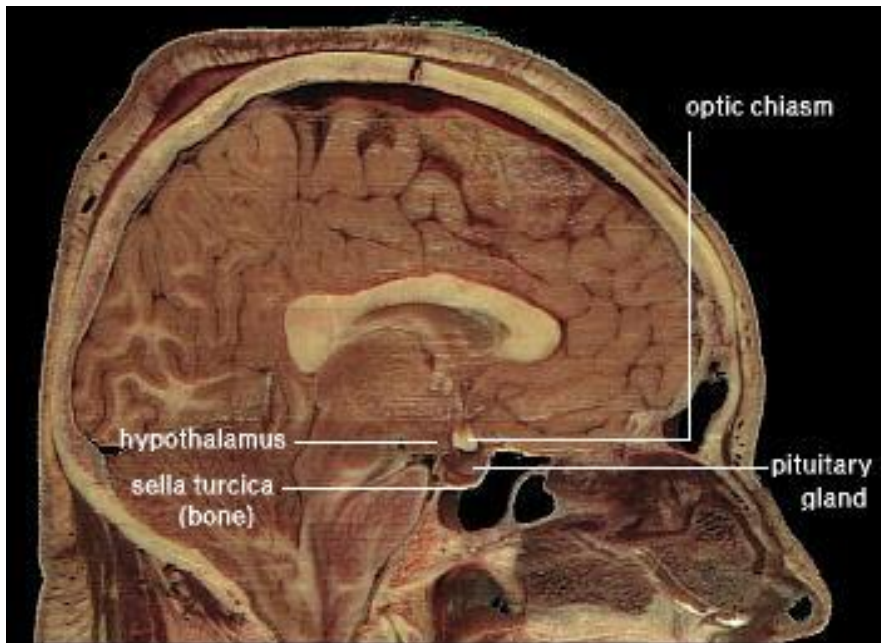
Sphenoid Bone

■ Body of Sphenoid Bone

– Sella Turcica

- Deep depression located within the body
- Anterior portion formed by **Tuberculum Sellae**
- Posterior portion formed by **Dorsum Sellae**
 - Gives rise to **Posterior Clinoid Process**
- Houses the Pituitary Gland (a.k.a. Hypophysis)





Sulcus chiasmatis

Tuberculum Sellae

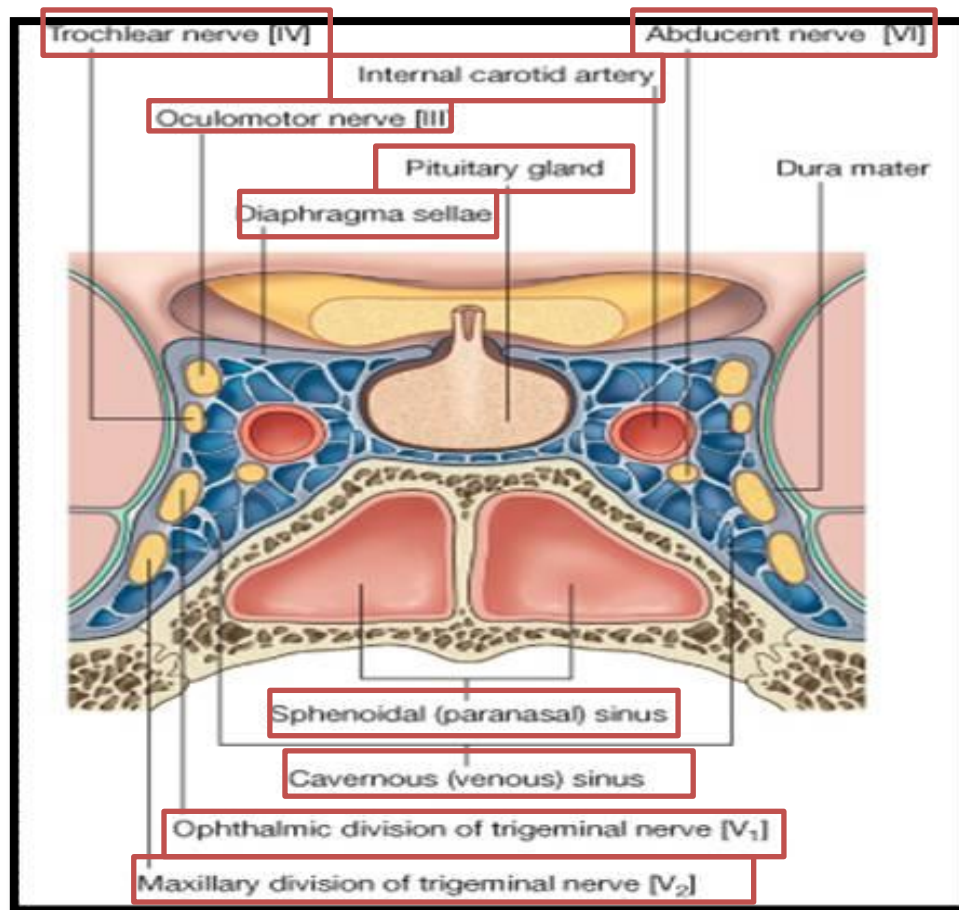
Hypophyseal Fossa (sella turcica)

Dorsum Sella

Relation

Mention important lateral , superior , posterior and inferior relations of pituitary gland

- ❑ Superior: Diaphragmasellae
- ❑ Inferior: Sphenoidal air sinuses
- ❑ Lateral: Cavernous sinuses
- ❑ Anteriorly: optic chiasma
- ❑ Posteriorly: mamillary bodies).



Optic chiasma and cavernous sinus with it's contents are vulnerable for comparison in case of pituitary adenoma

Clinical point !!

Relations

superior :

if he aske one structure>> diaphragma sellae

if he aske 2 structures >> diaphragma sellae +
infundibulum

inferior:

one structure >> sphenoidal air sinus

2 structures >> sphenoidal air sinus + body of sphenoid

Blood supply

Arterial supply

Arteries:

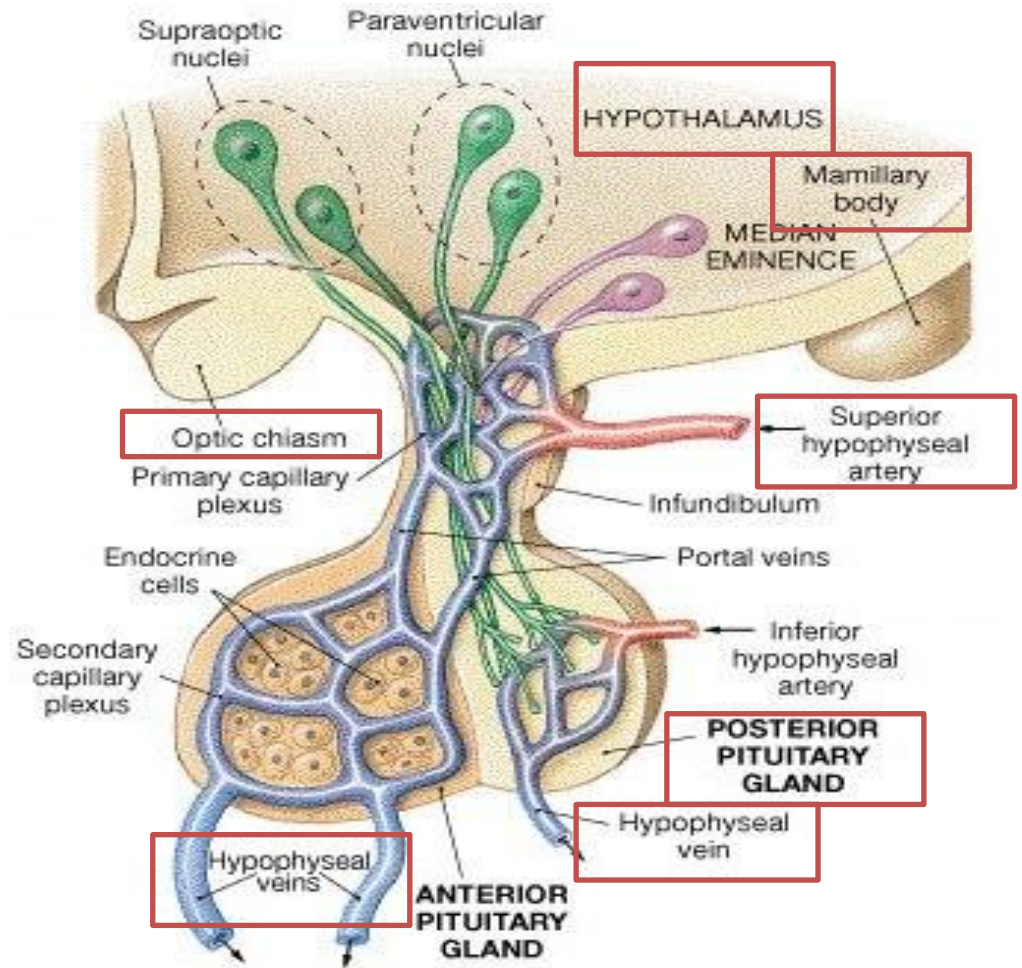
Superior & inferior hypophyseal arteries

Origine : (branches of internal carotid artery)

Venous drainage

Veins:

hypophyseal veins
drain into cavernous sinuses.



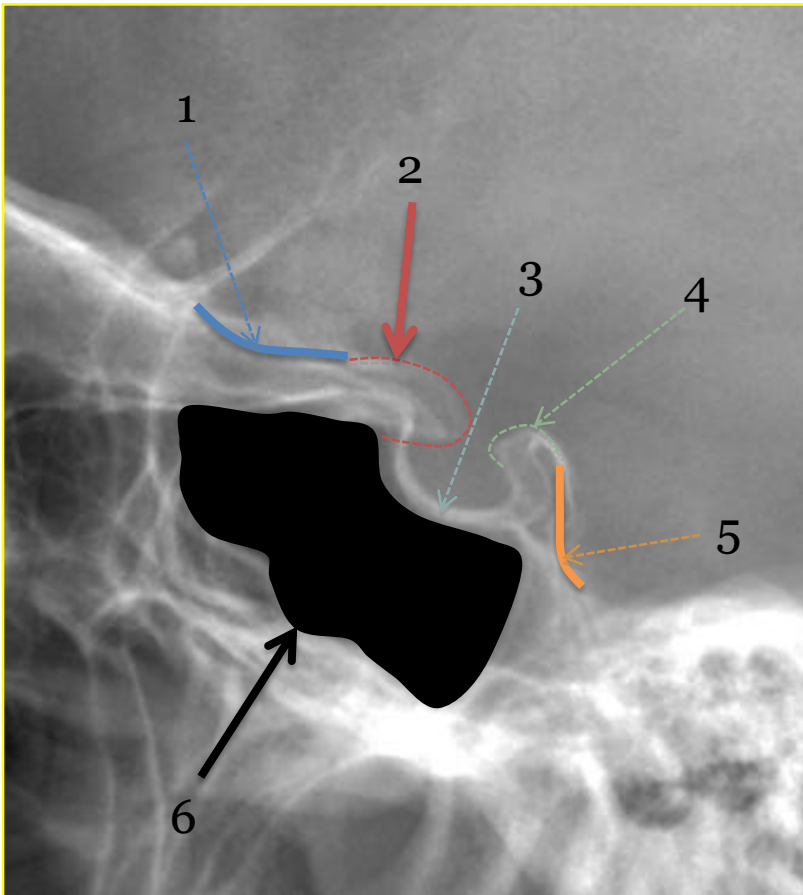
- The inferior hypophyseal:** supplies posterior lobe of pituitary gland.
- The superior hypophyseal:** supplies infundibulum & forms a capillary network from which vessels pass downward & form sinusoids into the anterior lobe of pituitary gland (hypophyseal portal system).

The background of the slide is a collage of various MRI brain scan slices, showing different cross-sections of the brain. The slices are arranged in a grid-like pattern, with some larger and more prominent than others. The overall color scheme is a muted, light gray, giving it a professional and clinical appearance.

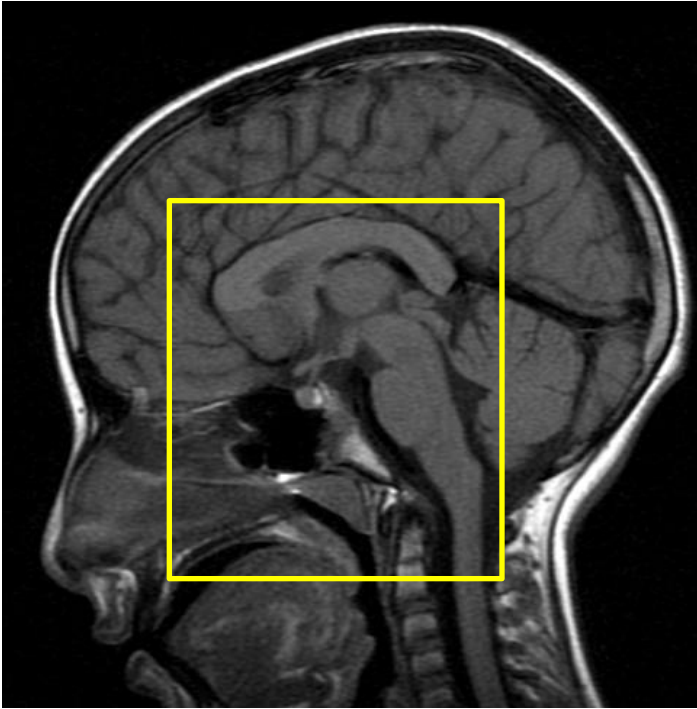
Radiology

Done by :
Anfal alshalawi
Maha edrees
Ghadah alahmed
Jumanah alshunify

X-ray



- 1-Optic sulcus •
- 2- Anterior clinoid •
process
- 3-Floor of •
sellaturcia
(Pituitary fossa)
- 4- Posterior •
clinoid process
- 5- Dorsum sella •
- 6- Sphenoid sinus •

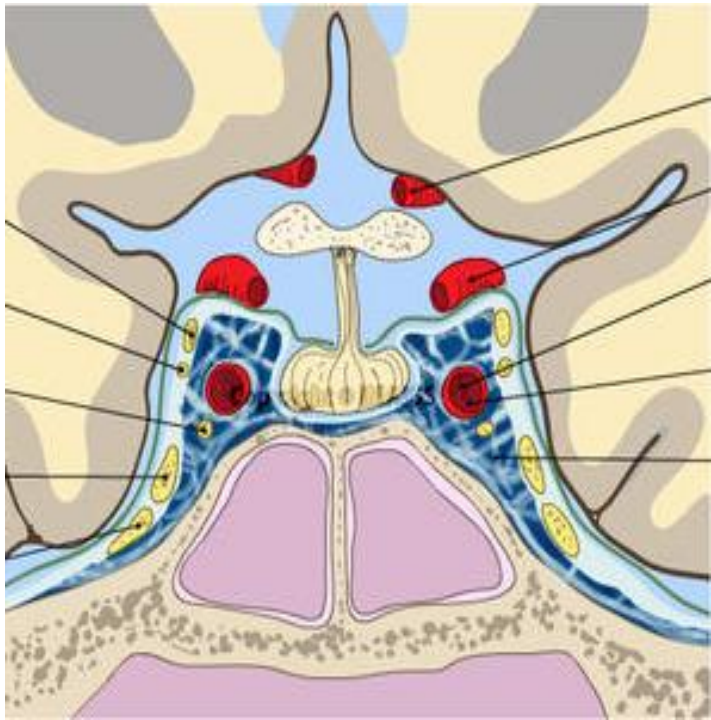
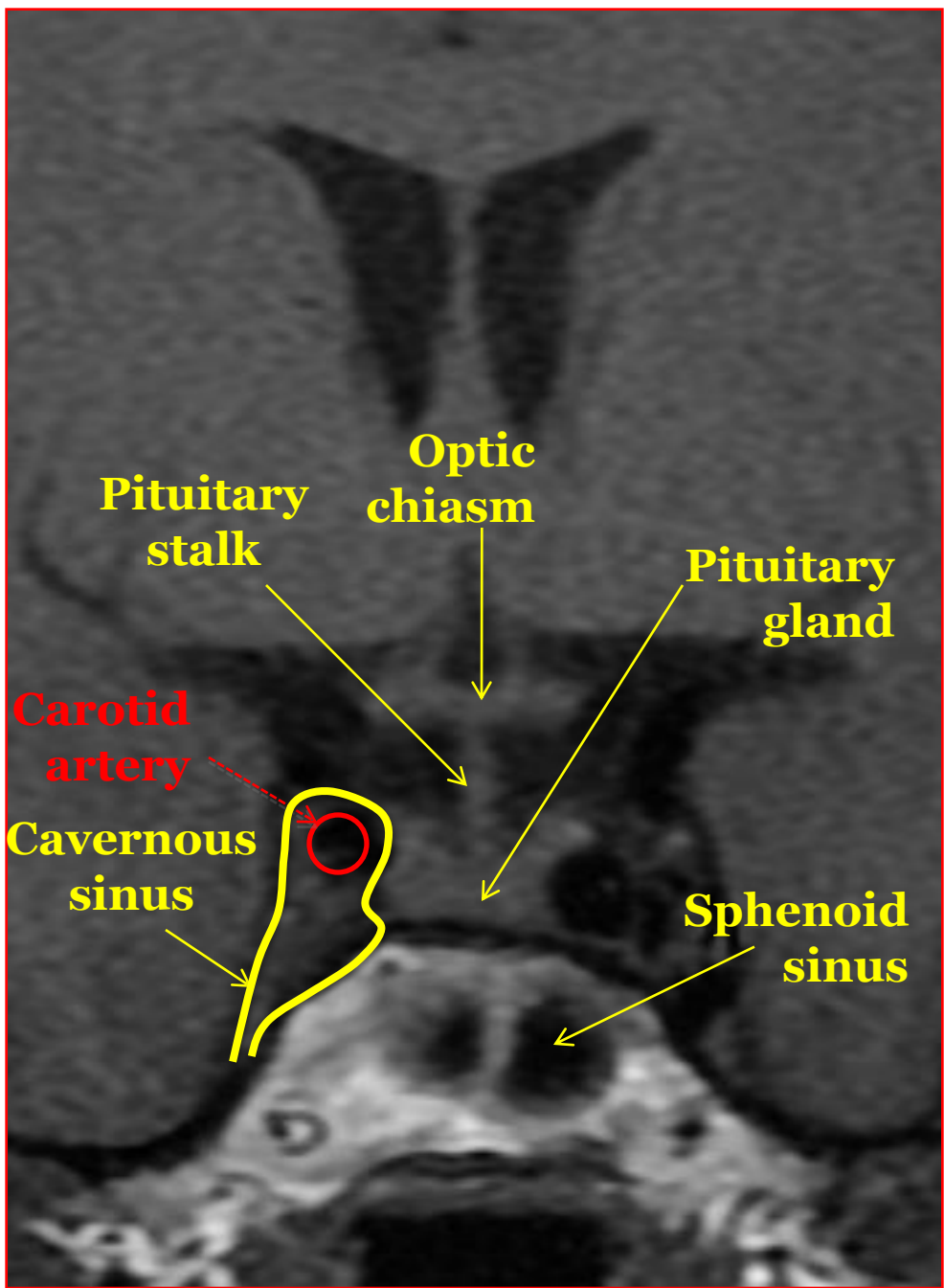
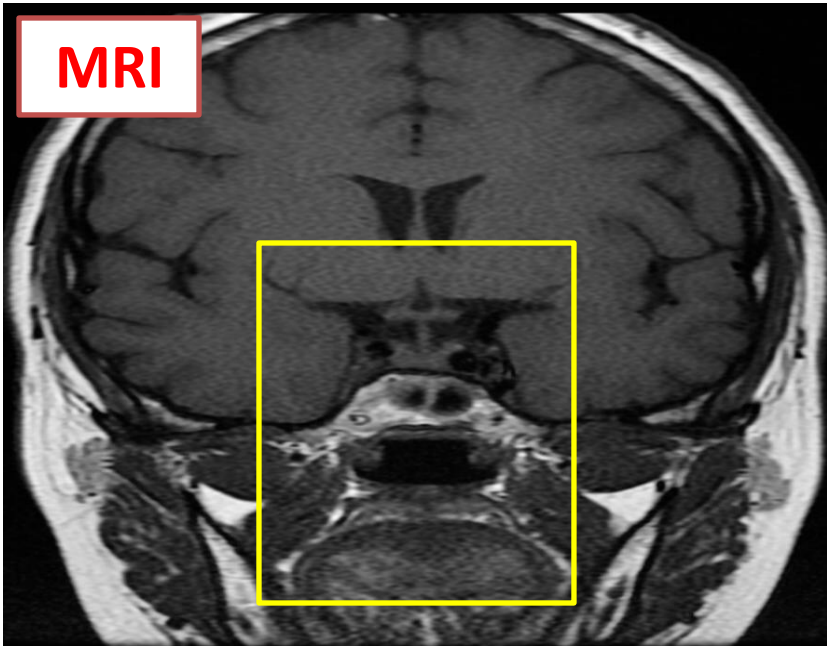


MRI

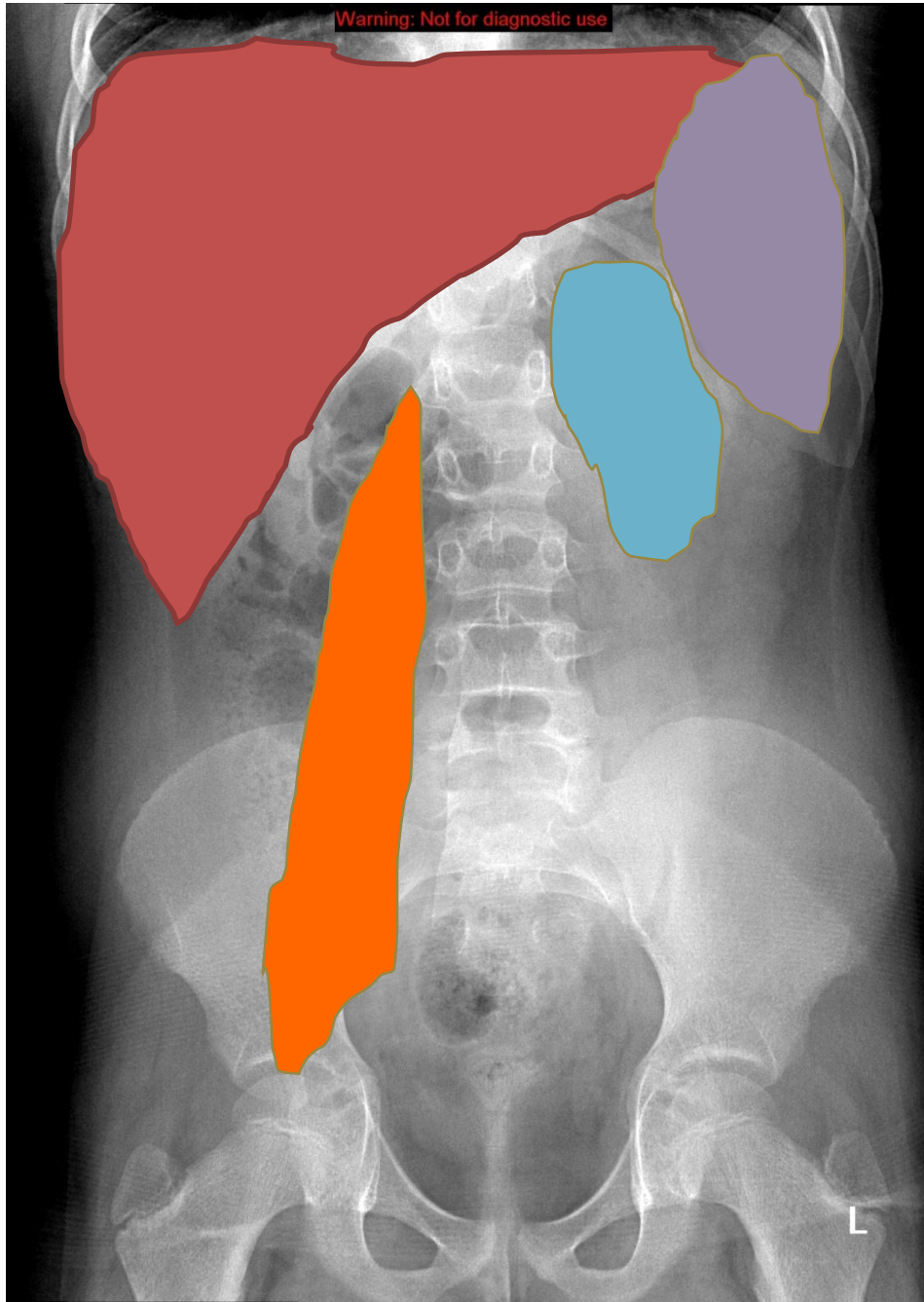
- 1- pituitary gland**
- 2- sphenoid sinus**
- 3- optic chiasm**
- 4- hypothalamus**
- 5- pituitary stalk**
- 6- clavius**



MRI



Warning: Not for diagnostic use



Liver

Kidney

Spleen

Psaos major

CT

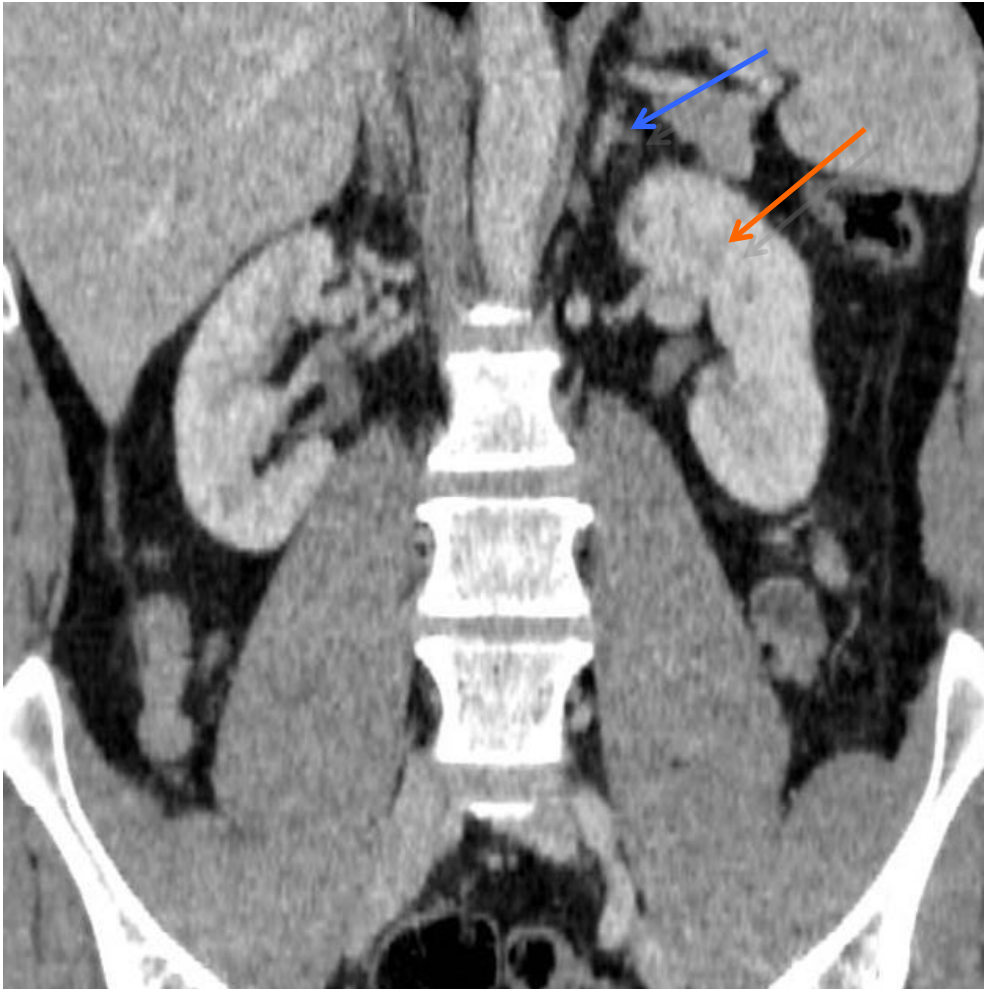


IVC

Pancreas

Adrenal gland

CT



Left adrenal gland
Left kidney

MRI



Thank you