

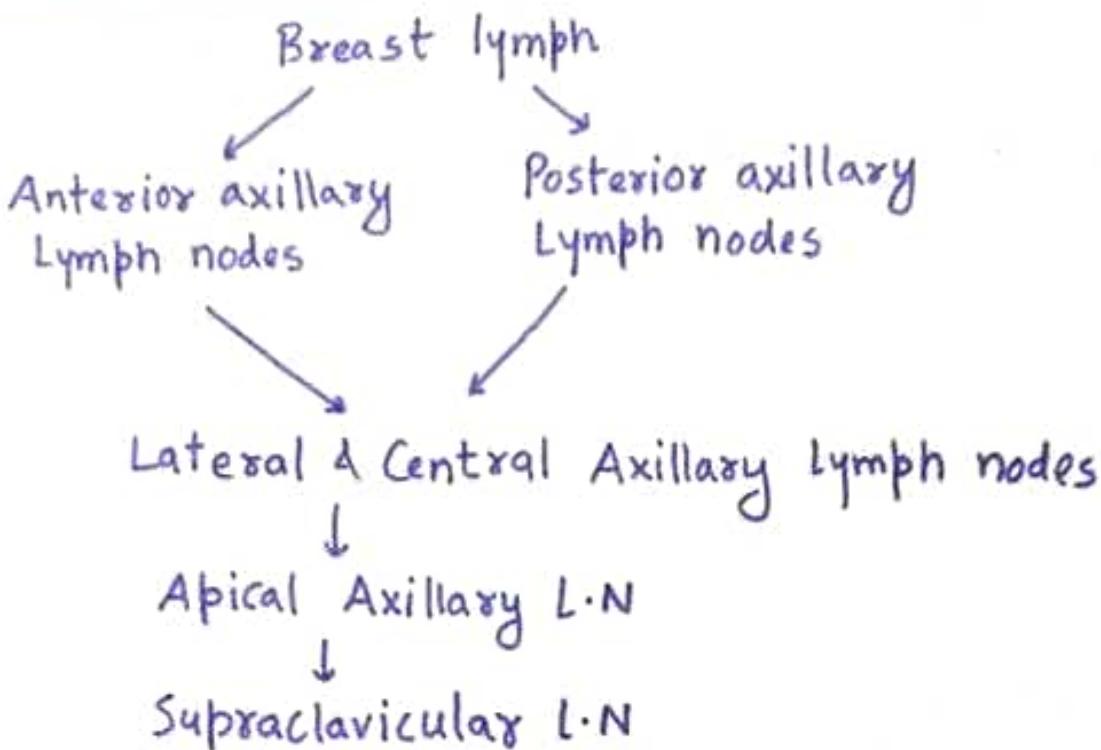
### Lymph Nodes Draining The Breast

→ Anterior Axillary Lymph Nodes .



Subareolar Plexus  
of Sappey

RAJ



★ Internal mammary L.N Drain Lymph from  
 ↓  
 Inner half & Outer half

★ Lymphatics from Lower & Inner Quadrants  
 ↓  
 Cross Costal margin  
 ↓  
 Pierce anterior abdominal wall  
 ↓  
 Drain into Subdiaphragmatic and  
 Subperitoneal lymph plexus

RAZ

# LYMPHATIC DRAINAGE OF MAMMARY GLAND / BREAST

## \* Lymph nodes Surrounding Breast

① Axillary lymph nodes

- Anterior
- Posterior
- Lateral
- Central
- Abaxial

② Internal mammary lymph nodes

③ Subclavicular lymph nodes

④ Posterior intercostal lymph nodes

⑤ Subdiaphragmatic lymph nodes

⑥ Subperitoneal lymph nodes

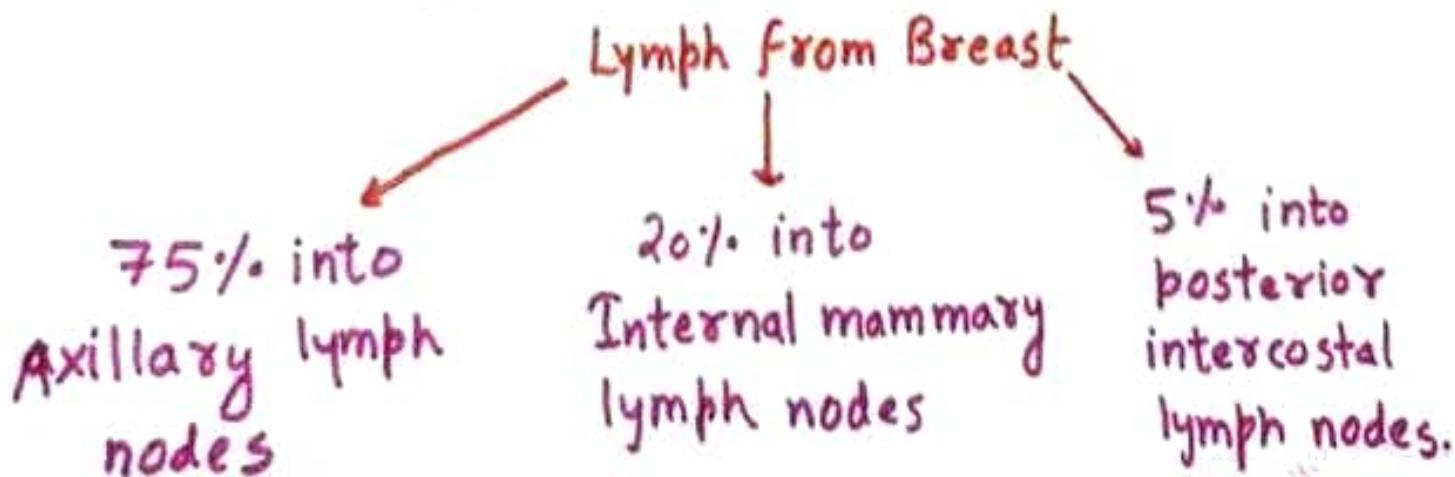
⑦ Cephalic (deltpectoral) lymph nodes

## \* Lymphatic Vessels of Breast

① Superficial lymphatics :- Drain skin over breast except nipple and Areola.

② Deep lymphatics :- Drain parenchyma, nipple and Areola of Breast.

## \* Lymphatic Drainage



## DELTOID

### Origin

1. Anterior border of the lateral  $\frac{1}{3}$ rd of Clavicle.
2. Lateral border of the acromion where 4 Septa of Origin are attached.
3. Lower lip of the crest of Spine of Scapula.

### Insertion

Deltoid tuberosity of humerus where 3 septa of Insertion are attached.

### ● Nerve Supply

Axillary Nerve ( $C_5, C_6$ )

### Actions

1. Powerful Abductor of Arm at Shoulder Joint from  $0^\circ - 90^\circ$ .
2. Anterior fibres are flexors and medial rotators of Arm.
3. Posterior fibres are extensors and lateral rotators of Arm.

### Speciality

- Multipennate muscle

↓ Allows

Large no. of muscle fibres into a relatively small ~~area~~ volume.

↓

High strength of contraction.

\* Strength of muscle contraction  $\propto$  No. of muscle fibre

\* Strength of muscle contraction doesn't depend on length of muscle fibre.

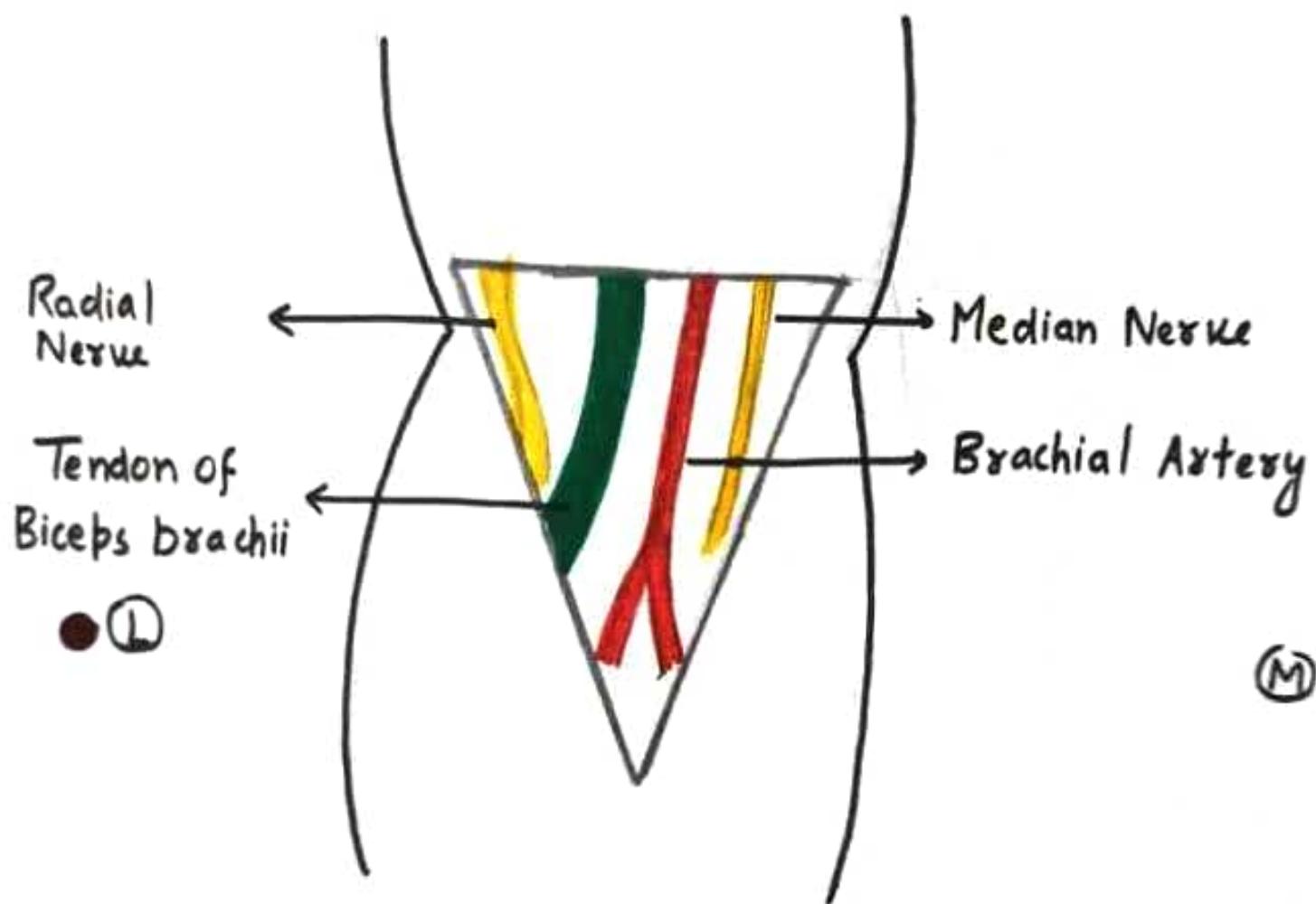
### Abduction of Shoulder Joint

$0^\circ - 15^\circ$  = Supraspinatus & Deltoid .

$15^\circ - 90^\circ$  = Deltoid

$90^\circ - 180^\circ$  = Serratus anterior & Trapezius

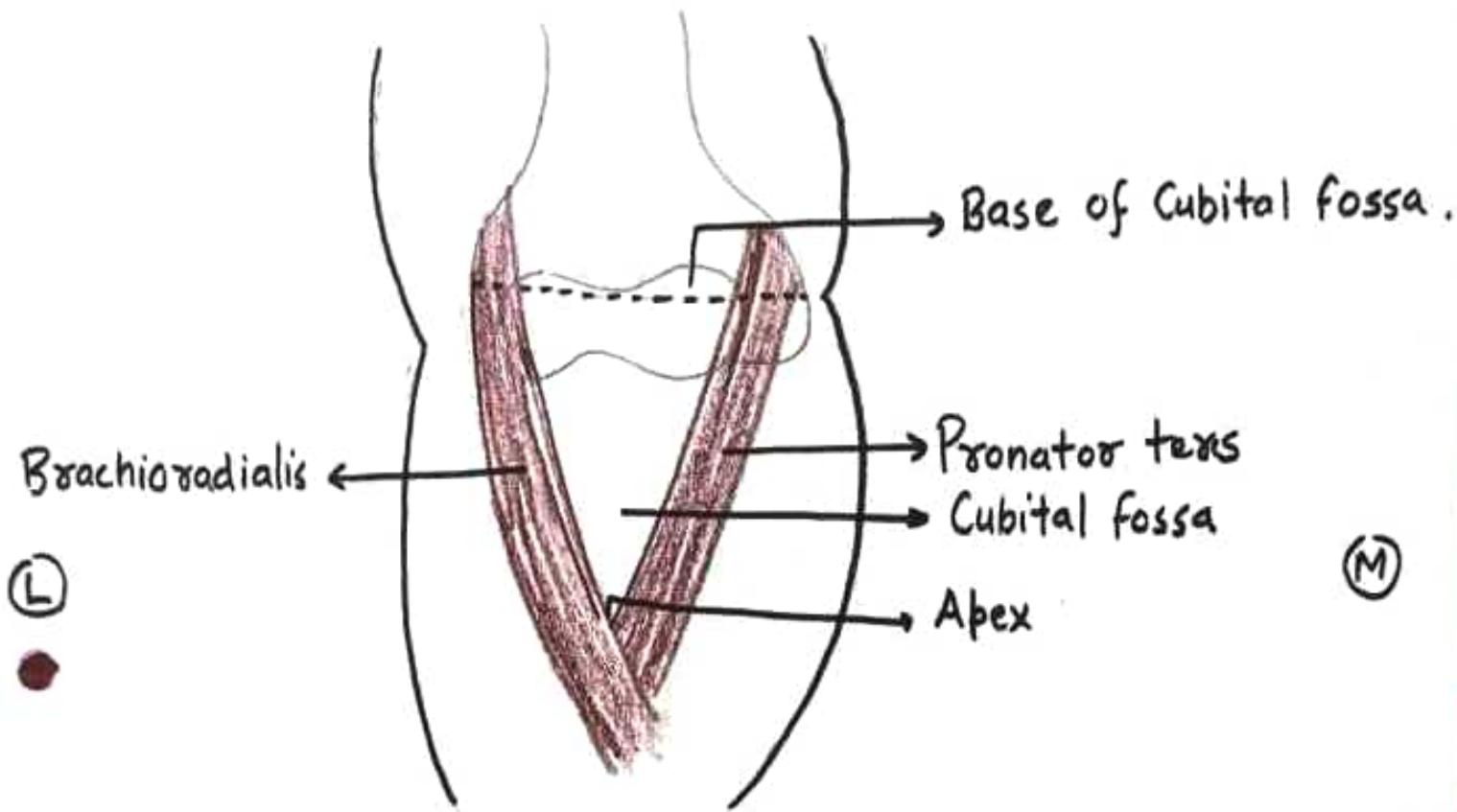
## Content of Cubital fossa



### Content from Medial to lateral

- ① Median Nerve
- ② Brachial Artery
- ③ Tendon of Biceps brachii
- ④ Radial Nerve

## Boundaries of Cubital Fossa



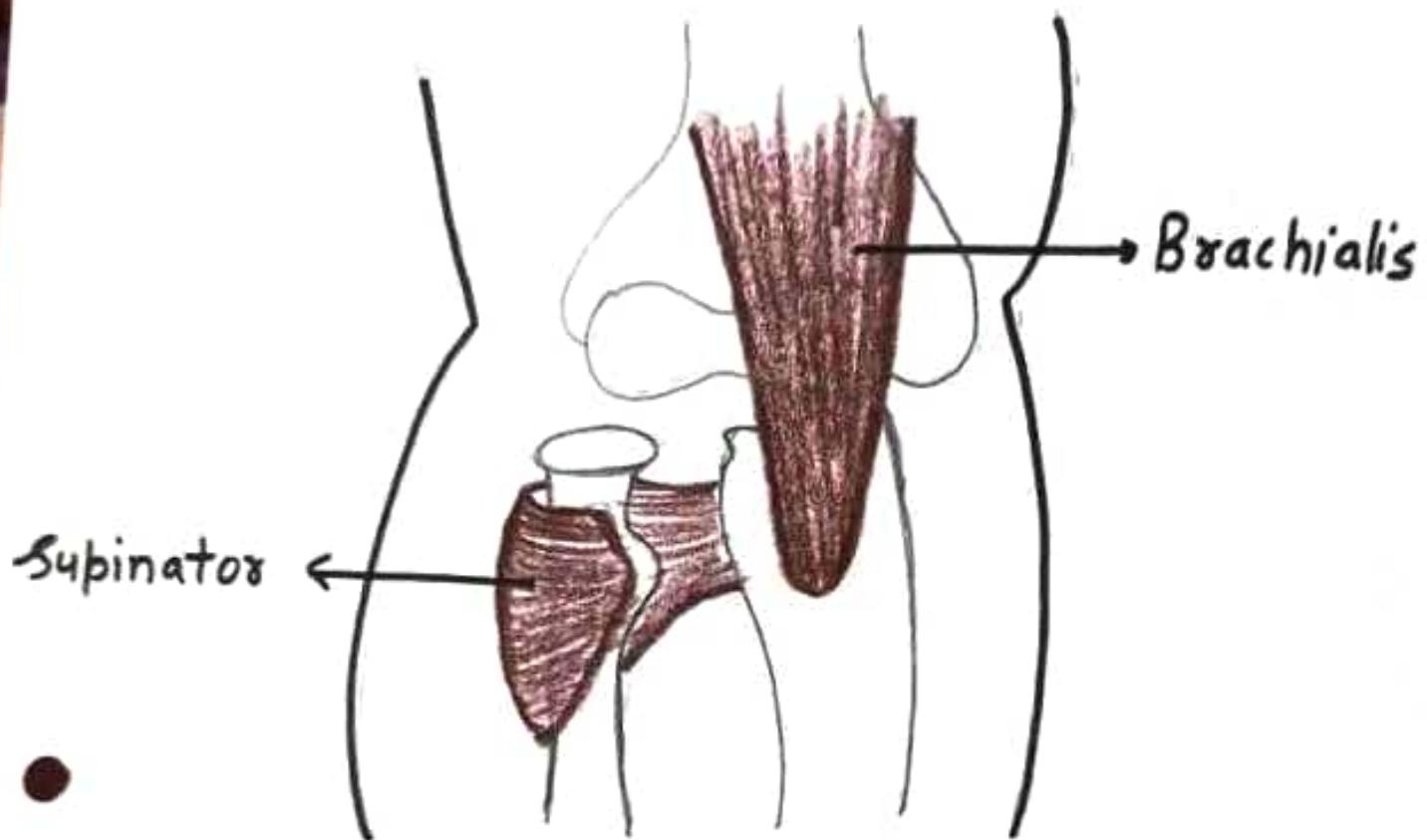
Lateral = Medial border of brachioradialis.

Medial = Lateral border of pronator teres

Base = Imaginary line joining the two epicondyle of humerus

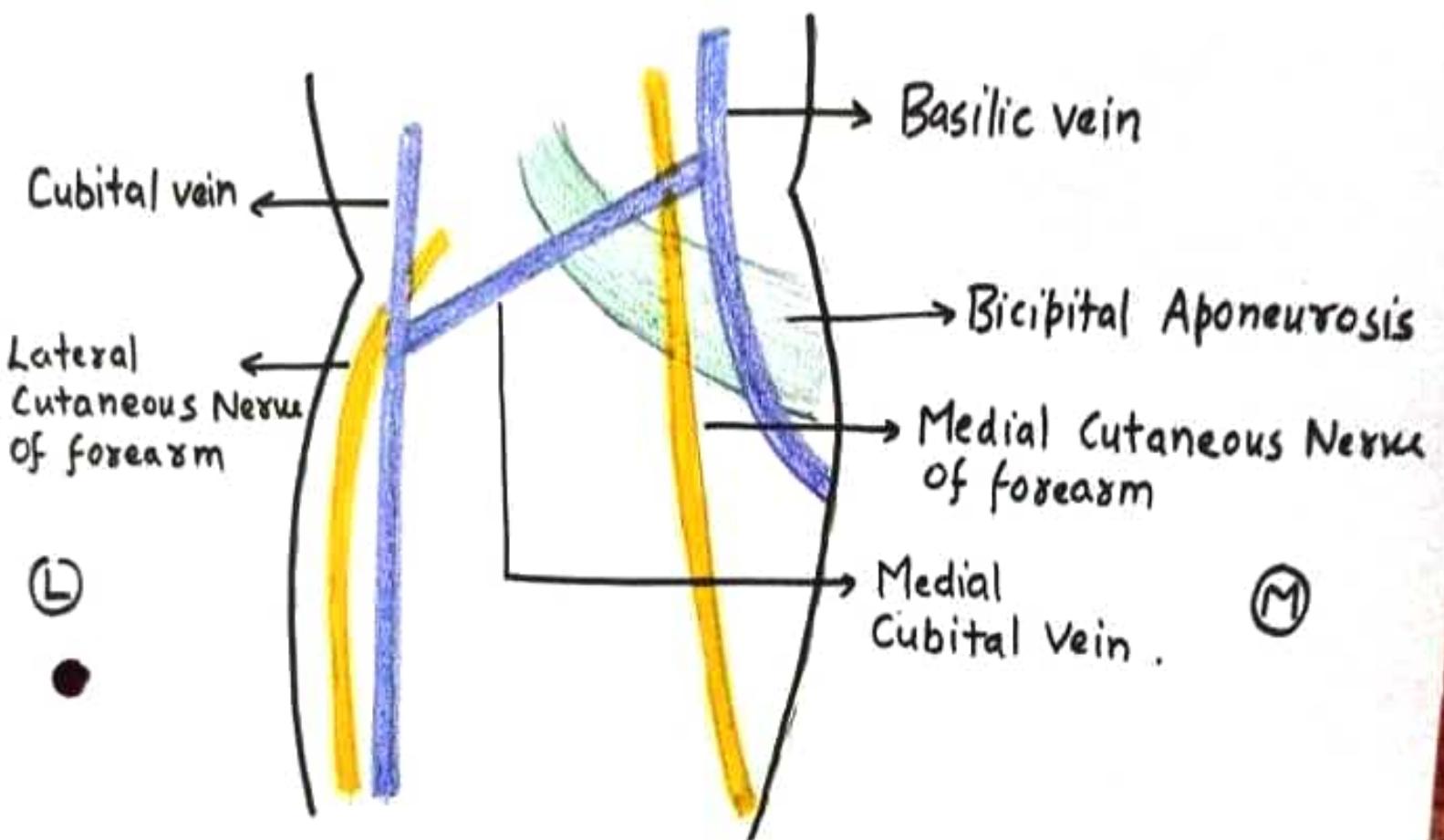
Apex = Area where Brachioradialis crosses the Pronator teres muscle.

## Floor of Cubital fossa



- **Brachialis**
- **Subinator surrounding upper part of radius.**

## Roof of Cubital fossa



- Skin
- Superficial fascia containing
  - Medial Cubital Vein
  - Cephalic Vein
  - Basilic Vein
  - Lateral Cutaneous Nerve of forearm
  - Medial Cutaneous Nerve of forearm .
- Deep fascia
- Bicipital Aponeurosis

## Anastomosis Around Elbow Joint

① In front of lateral epicondyle

Anterior descending / Radial collateral  $\longleftrightarrow$  Radial Recurrent

② Behind the lateral epicondyle

Posterior descending / Middle collateral  $\longleftrightarrow$  Interosseous recurrent

③ In front of Medial epicondyle

Inferior Ulnar Collateral  $\longleftrightarrow$  Anterior Ulnar Recurrent

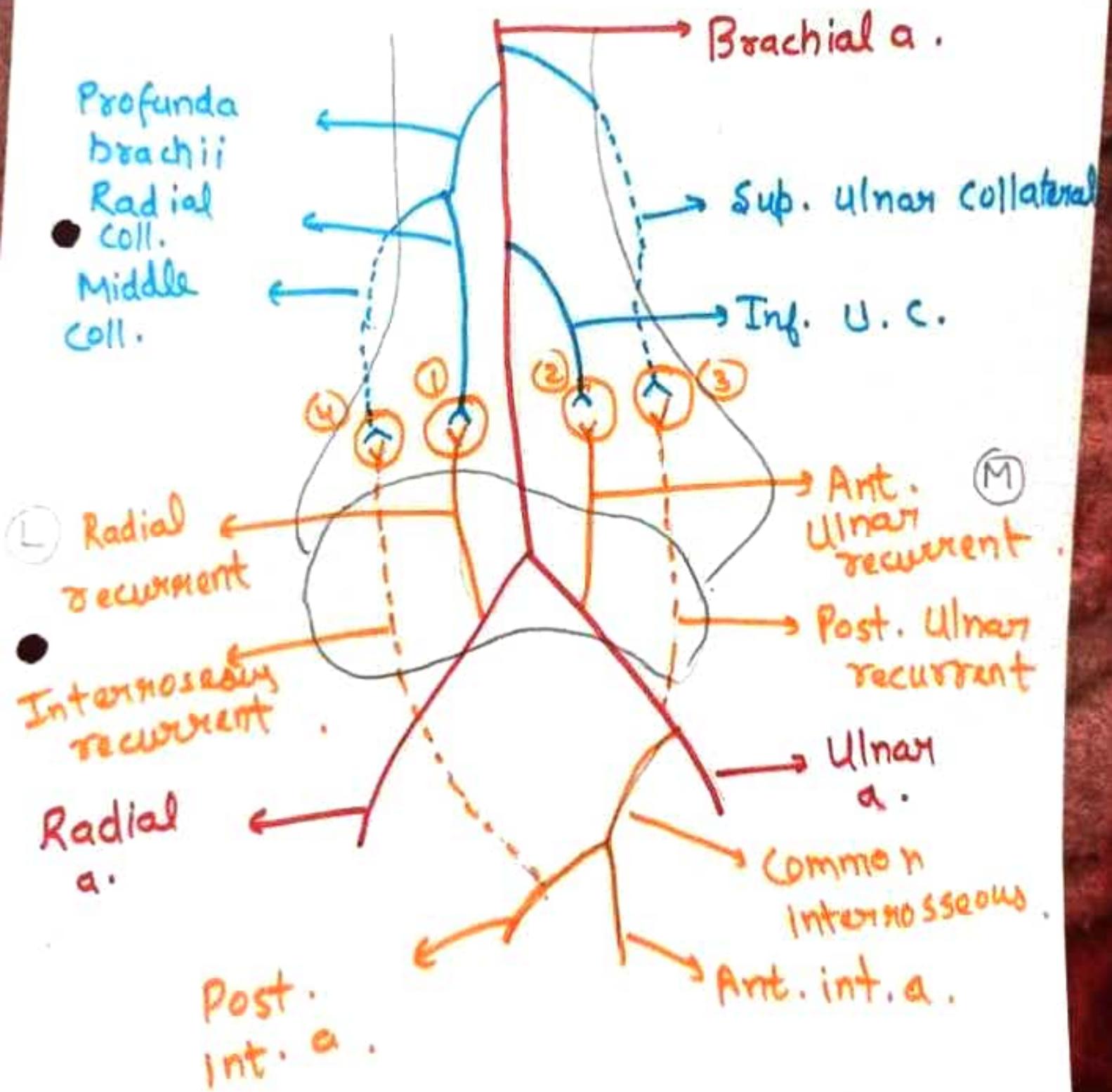
④ Behind the medial epicondyle

Superior Ulnar Collateral  $\longleftrightarrow$  Posterior Ulnar Recurrent

## Branches of Brachial Artery

- Profunda brachii artery
- Superior Ulnar collateral a.
- Inferior Ulnar Collateral a.
- Radial a. (Terminal branches)
- Ulnar a.
- Nutrient branches to humerus.

## Anastomoses Around Elbow Joint



## BOUNDARIES OF INTER MUSCULAR SPACES

### ① Quadrangular Space

Superior = Inferior border of Teres Minor

Inferior = Superior border of Teres Major

Medial = Lateral border of long head of triceps brachii

Lateral = Surgical neck of humerus

### ② Upper Triangular Space

Superior = Inferior border of Teres Minor.

● Lateral = Medial border of long head of triceps brachii.

Inferior = Superior border of Teres Major.

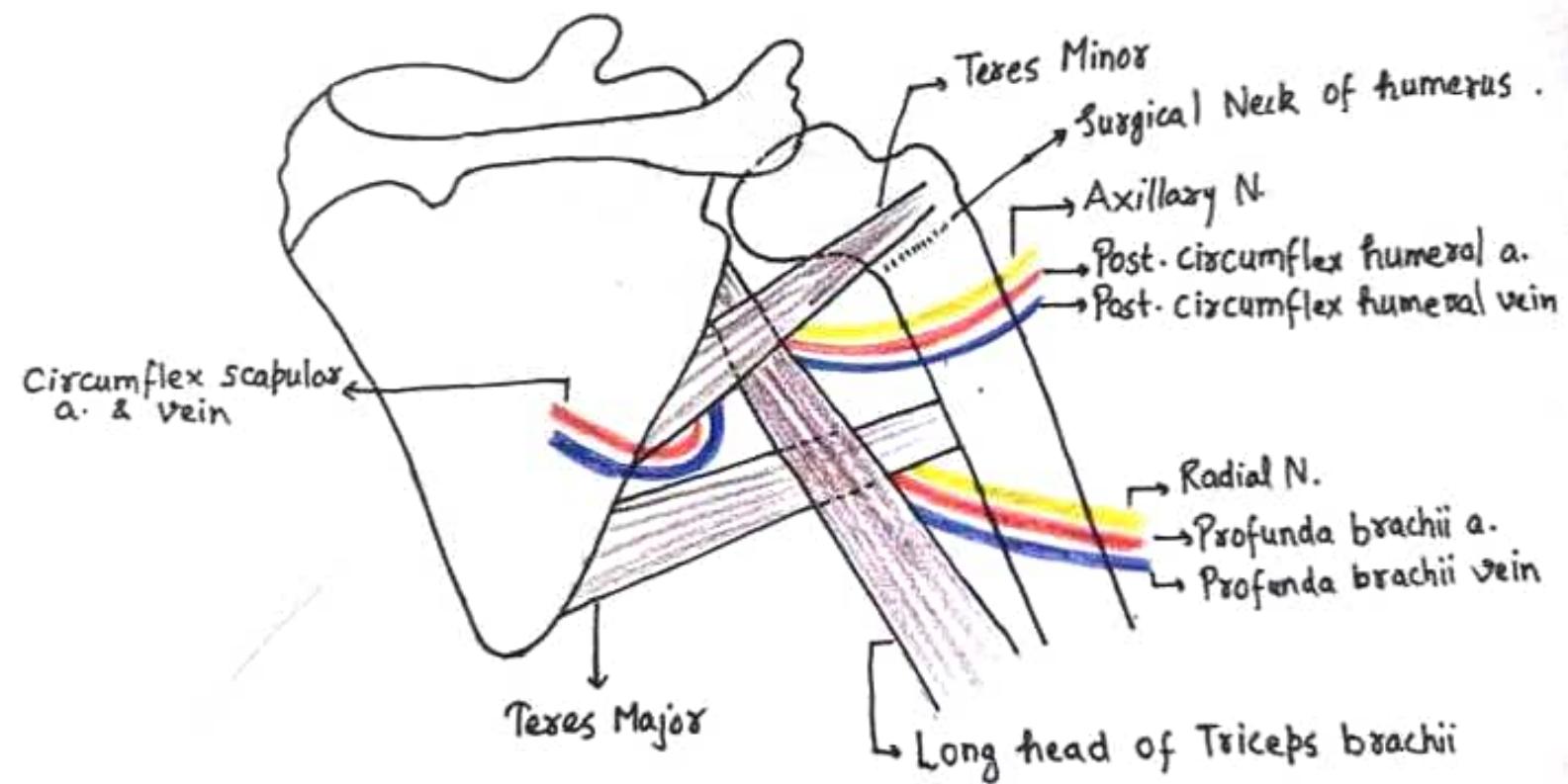
### ③ Lower Triangular Space

Medial = Lateral border of long head of triceps brachii

Lateral = Medial border of humerus

Superior = Lower border of teres major .

## INTER MUSCULAR SPACES OF SCAPULAR REGION



## Shoulder Joint / Glenohumeral Articulation

- Synovial Joint of Ball and Socket variety
- Weak Joint

Reason = Head of humerus is four time the size of glenoid cavity.

### Ligaments of Shoulder Joint

- ① Capsular ligament.
- ② Superior Glenohumeral ligament.
- ③ Middle Glenohumeral ligament
- ④ Inferior Glenohumeral ligament.
- ⑤ Coracohumeral ligament.
- ⑥ Transverse humeral ligament.
- ⑦ Glenoid labrum.

## Capsular ligament

- Least Supported inferiorly → Dislocations are common  
↓  
Damage closely related Axillary l.

### Attachment

Medially = To Scapula beyond Supraglenoid tubercle & margins of labrum.

Laterally = To Anatomical Neck of humerus

Inferiorly = Surgical Neck of humerus

Superiorly = Deficient for passage of tendon of Long head of Biceps Brachii

## Glenohumeral ligament

- Reinforce capsular ligament anteriorly.
- Area b/w Superior and Middle Glenohumeral ligament (Foramen of Weitbrecht)  
↓  
Point of Weakness in capsule
- Common site of Anterior dislocation of humeral head

## Coracohumeral ligament

- Extend from root of Coracoid process to neck of humerus opposite the greater tubercle.

## Transverse humeral ligament

- Between greater & lesser tubercle of humerus
- Tendon of Biceps Brachii passes deep to the ligament.

### Glenoidal labrum

- Fibrocartilaginous Rim around Glenoid Cavity.
- Increase the depth of cavity.

## Branches of Root

- ① Dorsal Scapular Nerve ( $C_5$ )
- ② Long Thoracic Nerve ( $C_5, C_6, C_7$ ) .

## Branches of Trunk

- From Upper Trunk      ③ Nerve to Subclavius ( $C_5, C_6$ )  
                                 ④ Suprascapular Nerve ( $C_5, C_6$ )

## Branches of Cord

- Lateral Cord      ⑤ Lateral Pectoral Nerve ( $C_5, C_6, C_7$ )  
 Lucy Loves Me      ⑥ Lateral root of Median Nerve ( $C_5, C_6, C_7$ )  
                                 ⑦ Musculocutaneous Nerve ( $C_5, C_6, C_7$ )

## Posterior Cord

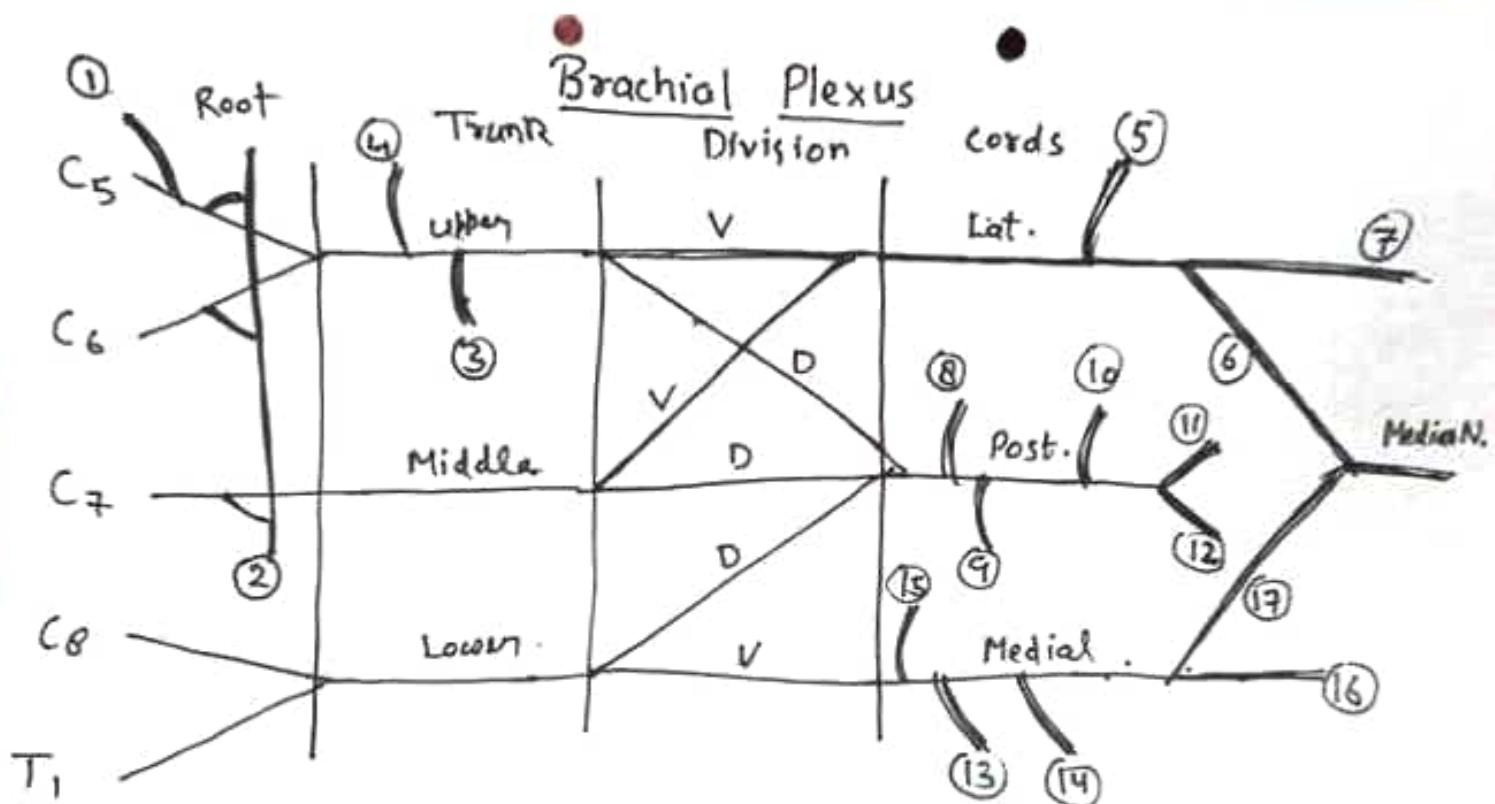
● ULNAR

- ⑧ Upper Subscapular N. ( $C_5, C_6$ )
- ⑨ Lower Subscapular N. ( $C_5, C_6$ )
- ⑩ Nerve to Latissimus Dorsi ( $C_6, C_7, T_1$ )
- ⑪ Axillary N. ( $C_5, C_6$ )
- ⑫ Radial N. ( $C_5 - T_1$ )

## Medial Cord

Most Medical  
Men Uses  
Morphine

- ⑬ Medial Cutaneous N. of Arm ( $C_8, T_1$ )
- ⑭ Medial Cutaneous N. of forearm ( $C_8, T_1$ )
- ⑮ Medial Pectoral N. ( $C_8, T_1$ )
- ⑯ Ulnar N. ( $C_7, C_8, T_1$ )
- ⑰ Medial Root of Median N. ( $C_8, T_1$ )



Root Trunk Division Cord Branches .

Ready	To	Drink	Cold	Beer
-------	----	-------	------	------

## FLEXOR RETINACULUM

- Strong fibrous band.
- Bridges anterior Concavity of Carpal & form Carpal Tunnel.

### Attachments

Medially :- ① Pisiform bone  
                  ② Hook of hamate

Laterally :- ① Tubercle of Scaphoid  
                  ② Crest of Trapezium

### ● Slips

- ① Lateral Deep Slip  $\Rightarrow$  Attached to groove on trapezium.  
 $\Rightarrow$  Tunnel for tendon of flexor carpi radialis.
- ② Medial Superficial Slip (Volar Carpal ligament)  
 $\Rightarrow$  Attached to Pisiform bone  
 $\Rightarrow$  Tunnel for Ulnar nerve and vessels.

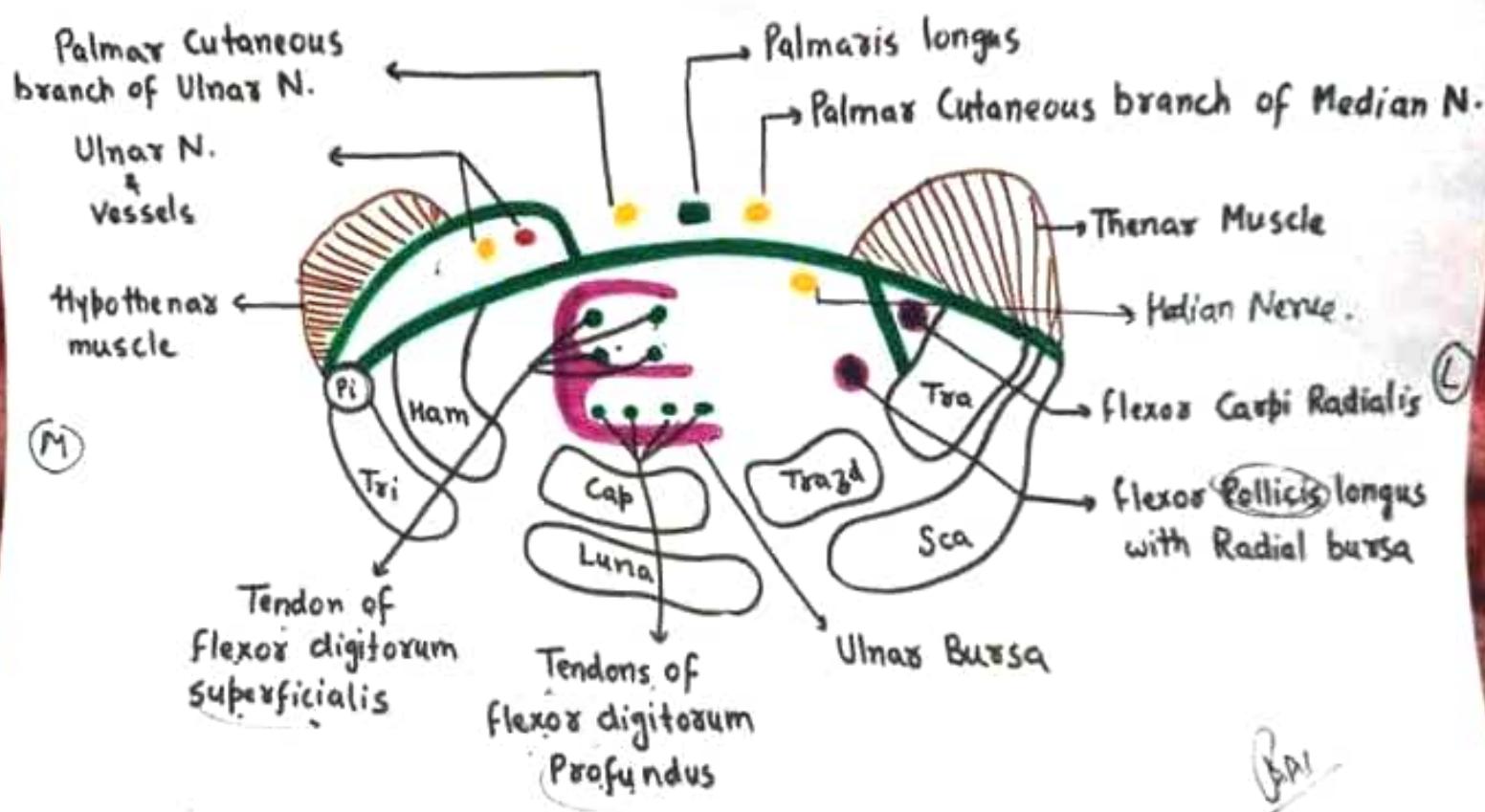
### Structures Passing Superficial To flexor Retinaculum

- ① Palmar Cutaneous branch of Median Nerve
  - ② Palmaris longus tendon
  - ③ Palmar Cutaneous branch of Ulnar Nerve .
  - ④ Ulnar Vessels
  - ⑤ Ulnar Artery Nerve
- \* Thenar and Hypothenar Muscles arise from Retinaculum

## Structures Passing Deep to flexor Retinaculum

- ① Median Nerve
- ② Tendon of flexor carpi radialis
- ③ 4 Tendons of flexor Digitorum Superficialis.
- ④ 4 Tendons of flexor Digitorum Profundus
- ⑤ Tendon of flexor Pollicis longus
- ⑥ Ulnar bursa
- ⑦ Radial bursa .

B.P.W.



## FLEXOR RETINACULUM

## RECTUS SHEATH

- Aponeurotic sheath covering Rectus abdominis.

- Rectus sheath has 2 walls

### (i) Anterior Wall

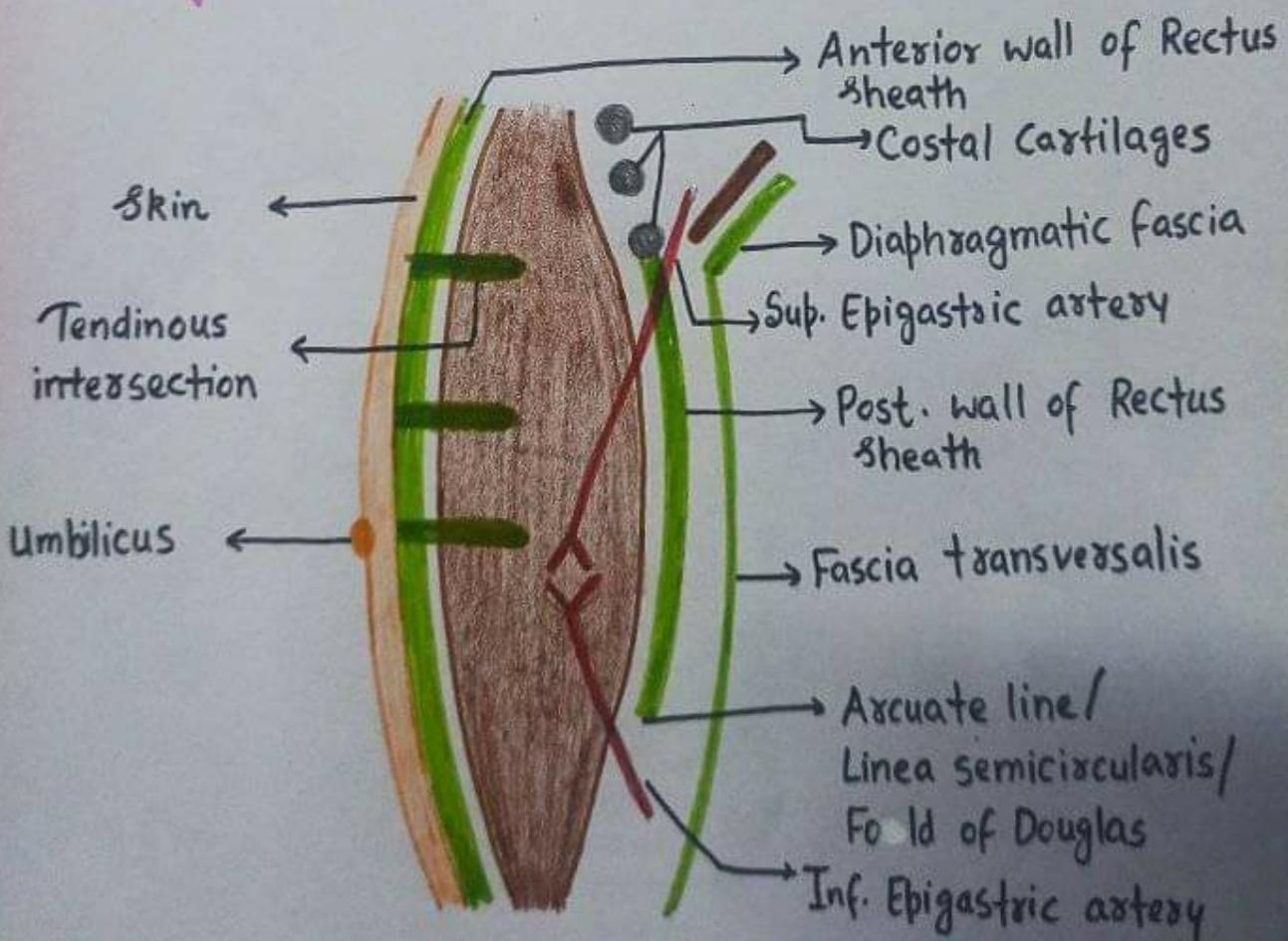
- Complete, covering muscle end to end

- Firmly adherent to tendinous intersection of Rectus muscle

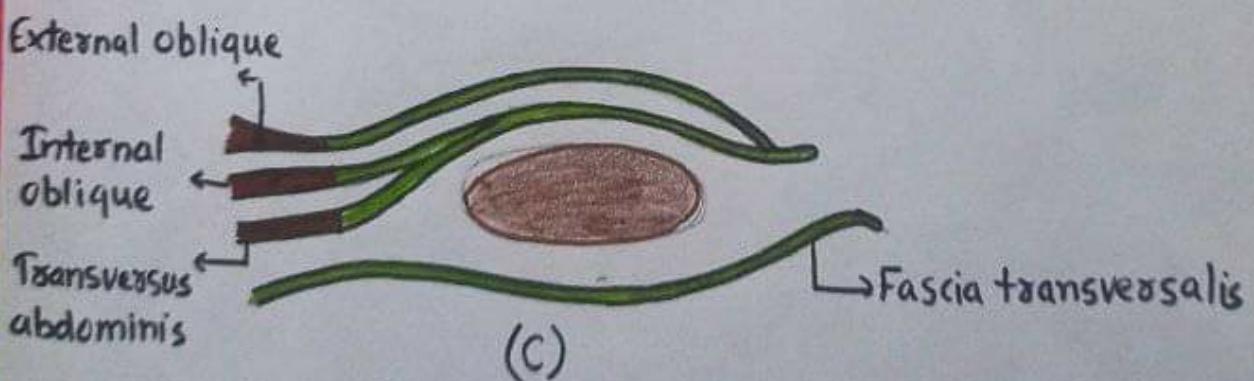
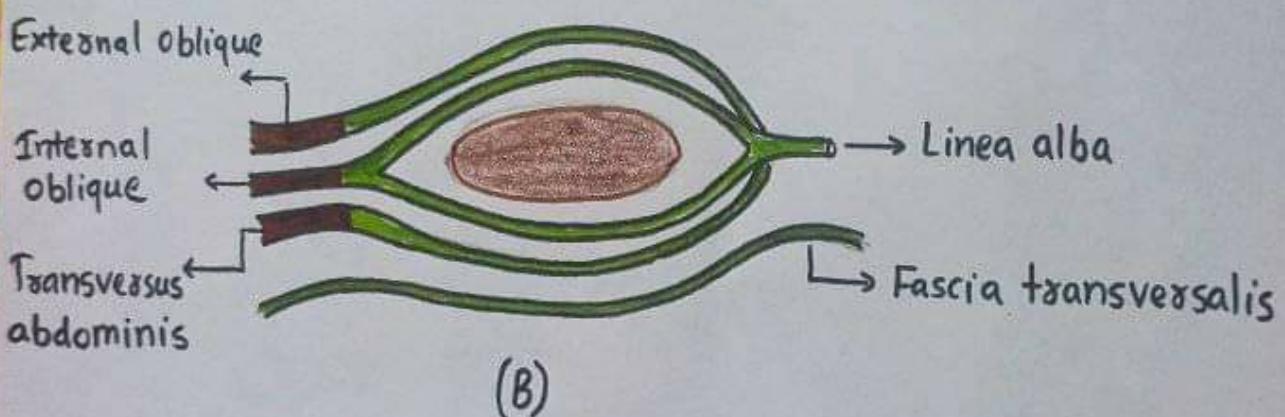
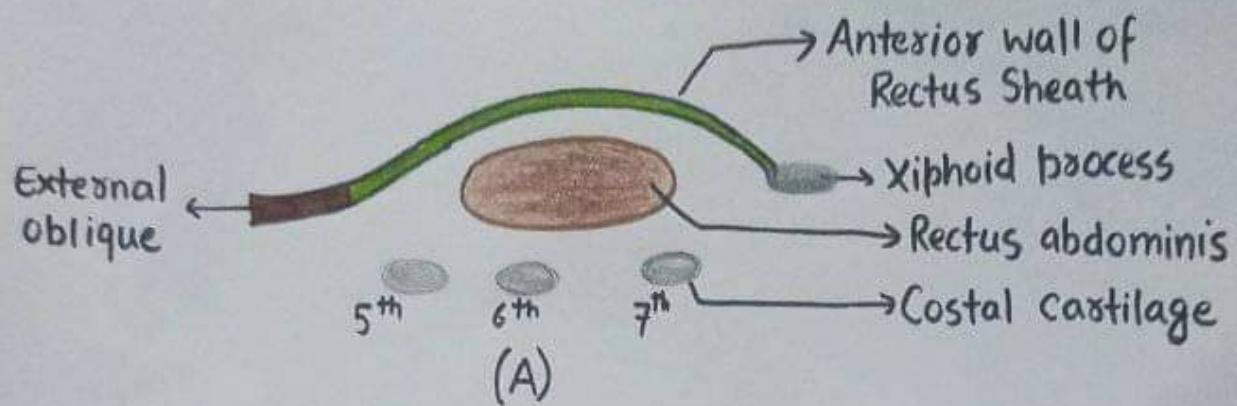
### (ii) Posterior Wall

- Incomplete, deficient above costal margin & below arcuate line

- Free from Rectus muscle.



SAGITTAL SECTION THROUGH THE RECTUS SHEATH



### TRANSVERSE SECTION THROUGH RECTUS ABDOMINIS & ITS SHEATH

- (A) Above the Costal Margin
- (B) Between Costal Margin & Arcuate line
- (C) Below Arcuate line

## Contents of Rectus Sheath

Muscles → Rectus abdominis  
→ Pyramidalis (if present)

Arteries → Superior Epigastric artery  
→ Inferior Epigastric artery

Veins → Superior Epigastric venae comitantes  
→ Inferior Epigastric venae comitantes

Nerves → Terminal parts of lower 6 thoracic nerves  
including lower 5 intercostal nerves & subcostal nerve

## Functions of Rectus Sheath

- Increase efficiency of rectus muscle
- Maintains the Strength of anterior abdominal wall.

## INGUINAL CANAL

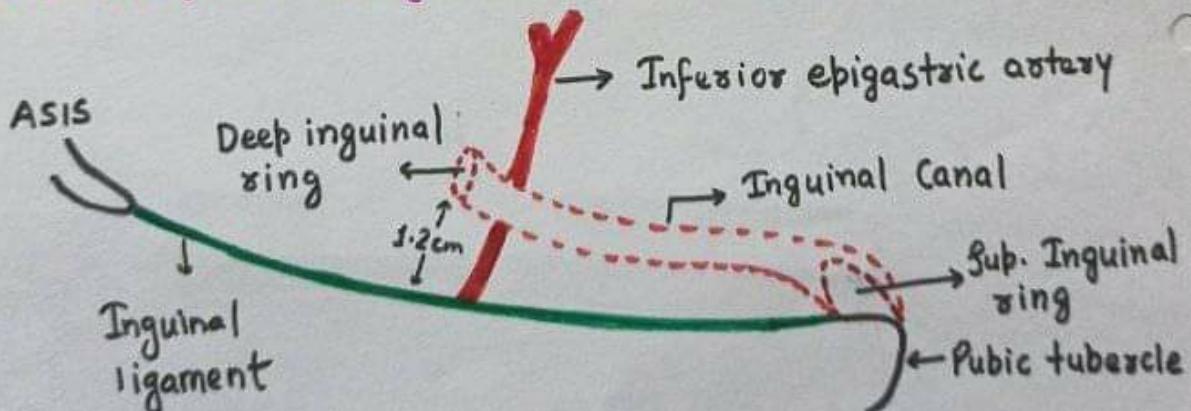
- Oblique Intermuscular passage.
- Location:- Anterior abdominal wall, just above medial half of Inguinal ligament
- Length:- About 4cm
- Direction:- Downward, forward & Medially.
- Extends from Deep inguinal ring to Superficial inguinal ring.

### Deep Inguinal ring

- Oval opening in fascia transversalis
- Situated 1.2 cm above the midinguinal point. & Lateral to inferior epigastric artery.

### Superficial Inguinal Ring

- Triangular gap in external oblique aponeurosis
- Base of triangle formed by Pubic Crest.
- 2 sides form margin and are called Cura.



### Surface Marking of Inguinal Canal

RN

## BOUNDARIES OF INGUINAL CANAL

### Anterior Wall

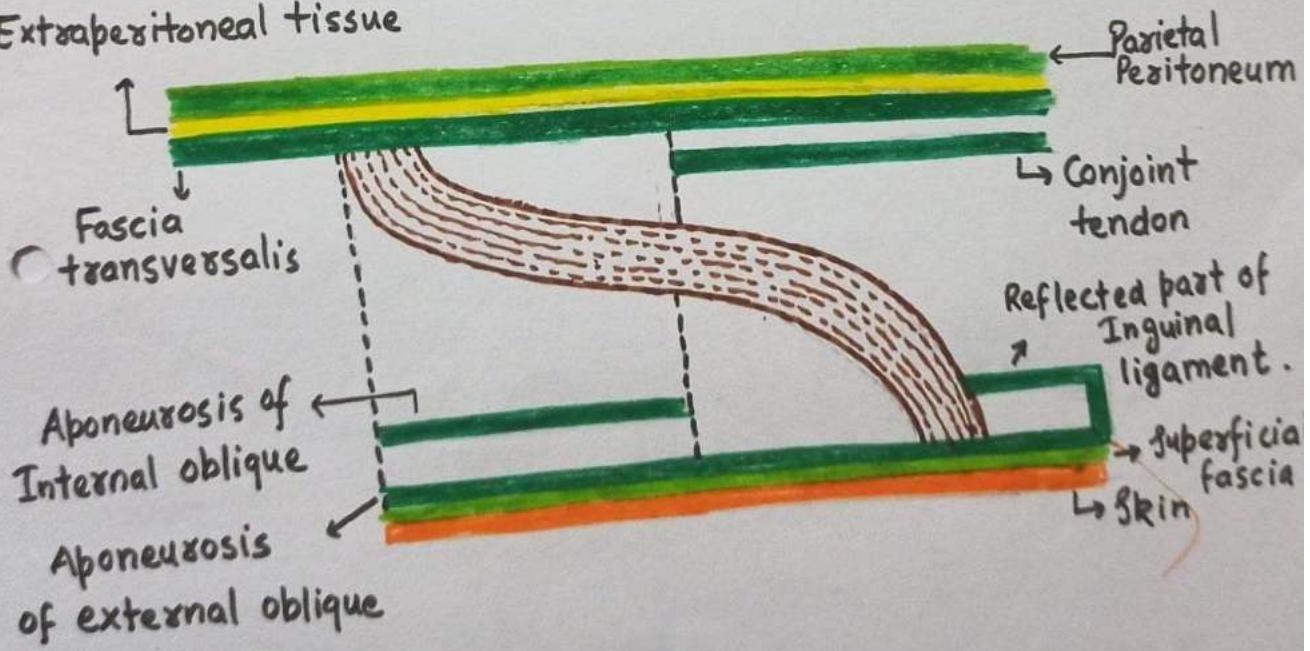
- (a) Skin
- (b) Superficial fascia
- (c) External Oblique aponeurosis
- (d) Fleshy fibres of Internal Oblique Muscle ] - Lateral  $\frac{1}{3}$  rd

In Whole extent

### Posterior Wall

- (a) Fascia transversalis
- (b) Extraabdominal tissue ] In Whole extent
- (c) Parietal peritoneum
- (d) Conjoint tendon
- (e) Reflected part of Inguinal ligament ] Medial  $\frac{2}{3}$  rd

### Extraabdominal tissue



### Anterior And Posterior Walls of Inguinal Canal

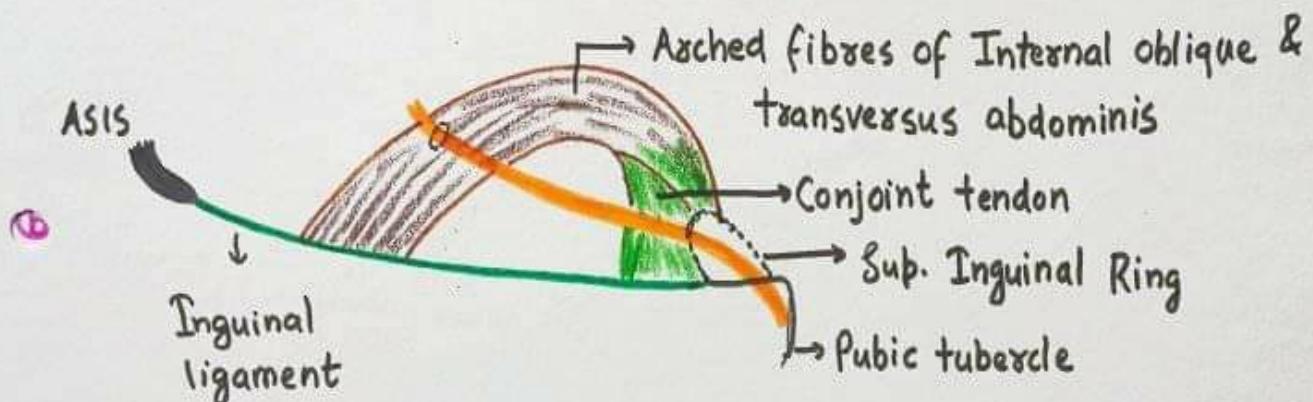
RN

## Roof

Arched fibres of Internal oblique and transversus abdominis muscle.

## Floor

Grooved upper surface of Inguinal ligament

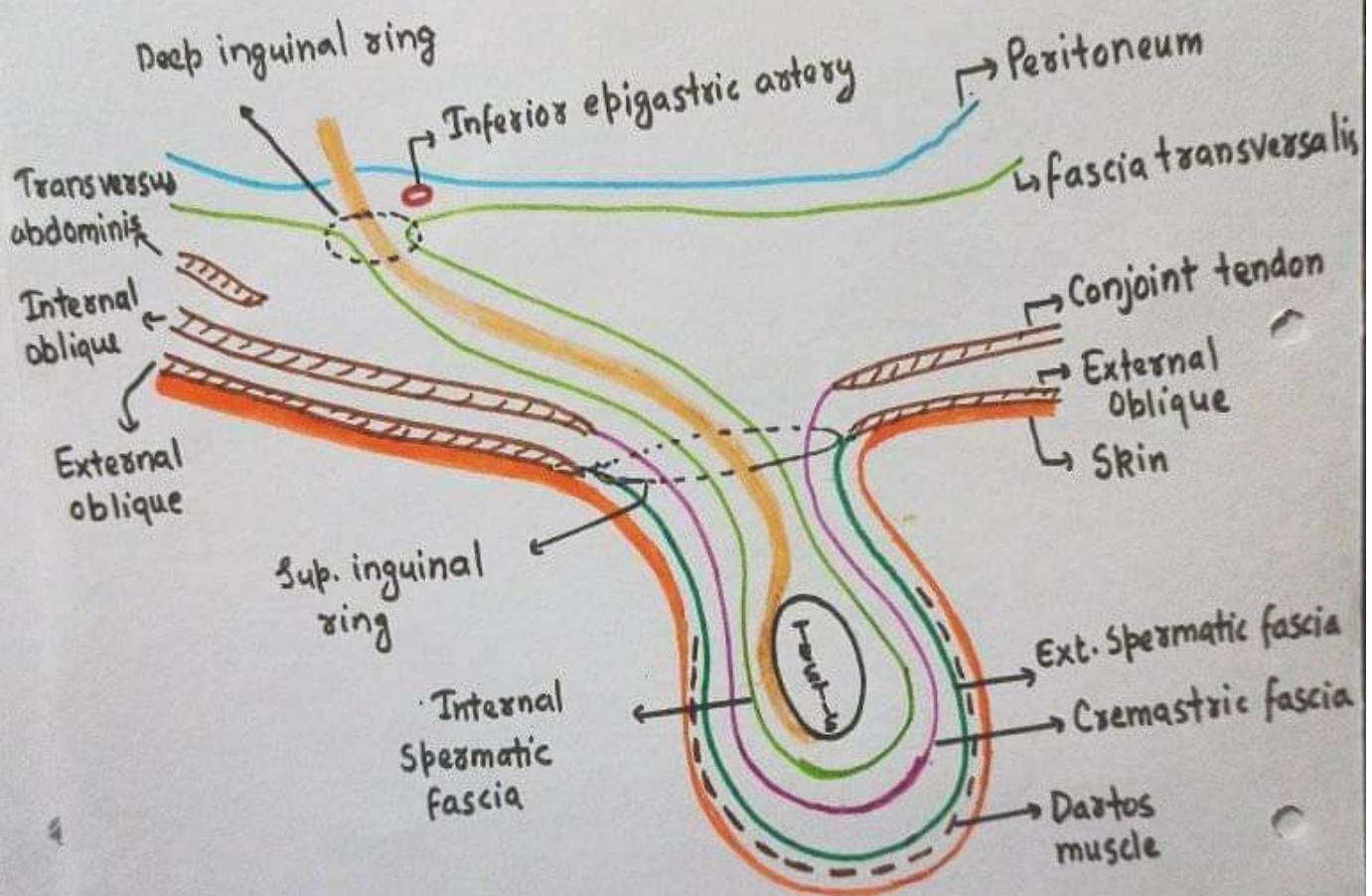


- \* Inguinal Canal is larger in males than in females.

### Structure Passing Through Canal

- ① Spermatic Cord in males      Round ligament of uterus in females
  - Enter through deep inguinal ring
  - Exit through sub. inguinal ring
- ② Ilioinguinal Nerve → Enter through interval b/w external & oblique muscles and exit through sub. inguinal ring.

RAN



BOUNDARIES OF INGUINAL CANAL

BN

# HERNIA

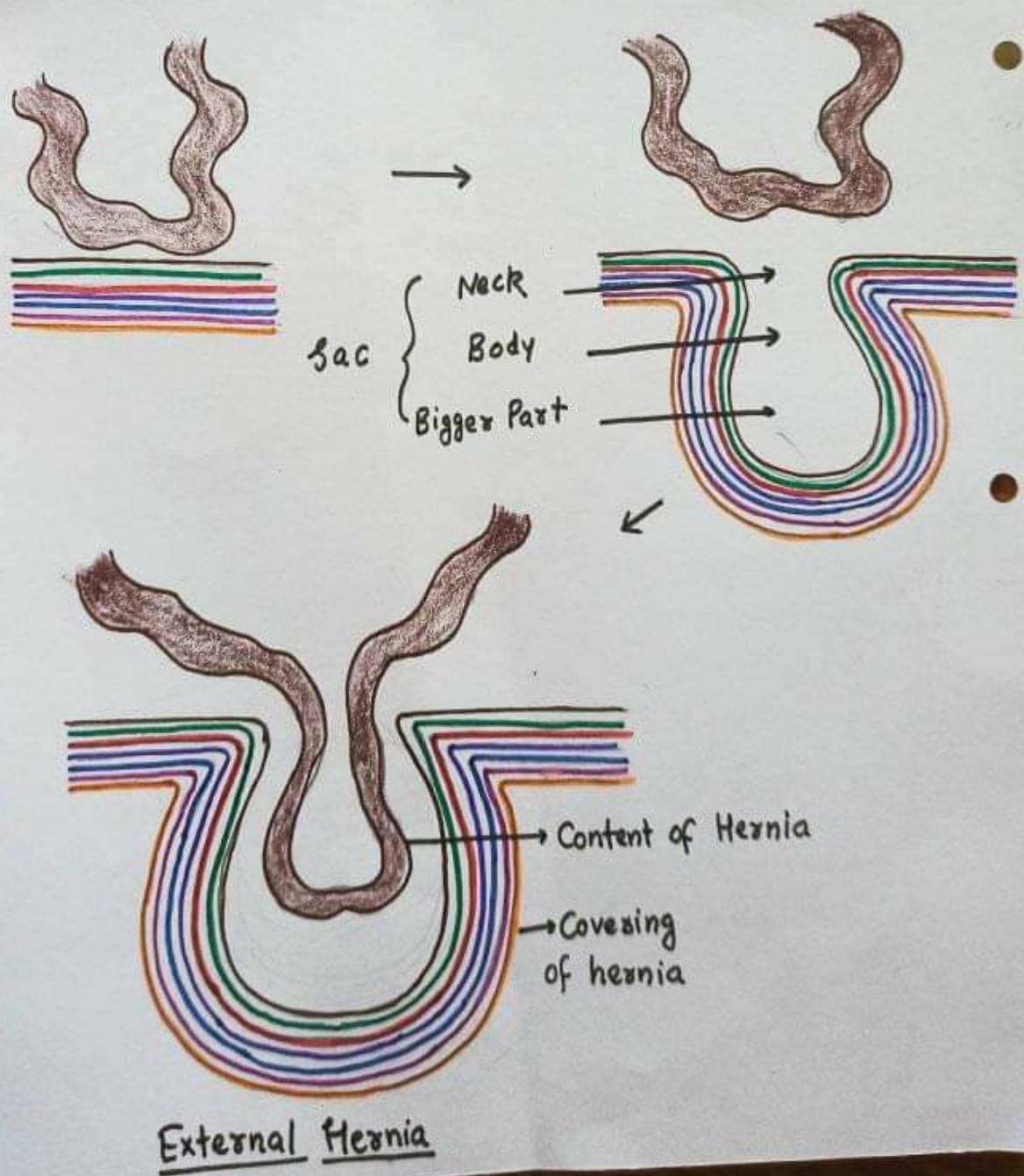
## Internal Hernia

↓  
Protrusion of abdomen contents into the "No entry" zone within the abdominal cavity

e.g. Hernia in epiploic foramen

## External Hernia

↓  
Protrusion of abdomen contents through abdominal walls.



## Hernia Consist of:

- Sac
- Content
- Covering

## Complications

- ① Irreducibility :- Loop of Intestine goes out but doesn't return leading to irreducible hernia.
- ② Obstructions :- Loop may get narrowed in part
  - Contents of loop can't move forward
    - ↓
    - Obstruction
- ③ Strangulation :- Arterial Supply is blocked
  - Loop get Necrosed

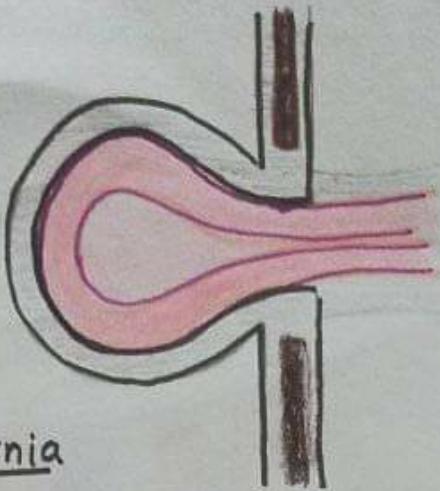
## EXTERNAL HERNIA

- Umbilical
  - Paraumbilical
  - Femoral
  - Inguinal
  - Epigastric
  - Divarication of recti
  - Incisional
  - Lumbar
- Congenital Umbilical hernia

Acquired infantile hernia

## Congenital Umbilical Hernia

→ Due to non-return of midgut loop

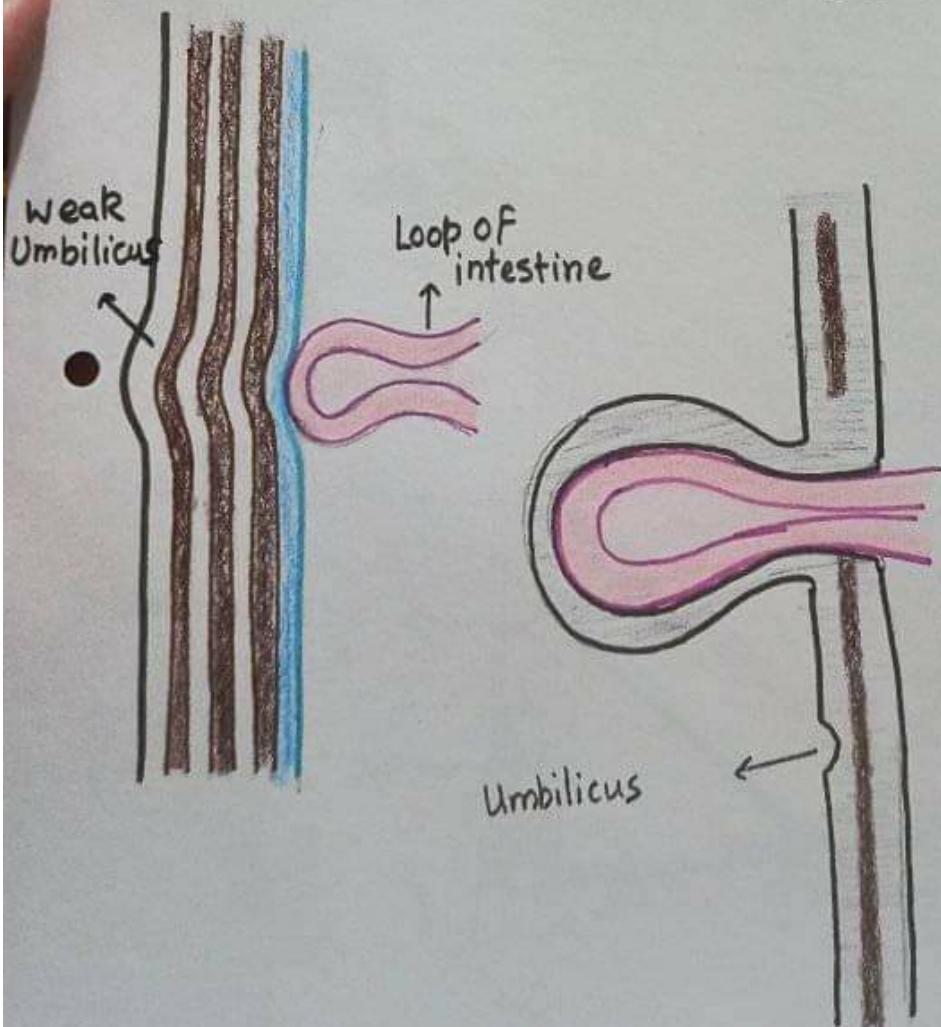


## Acquired Infantile Umbilical Hernia

→ Due to weakness of Umbilical scar

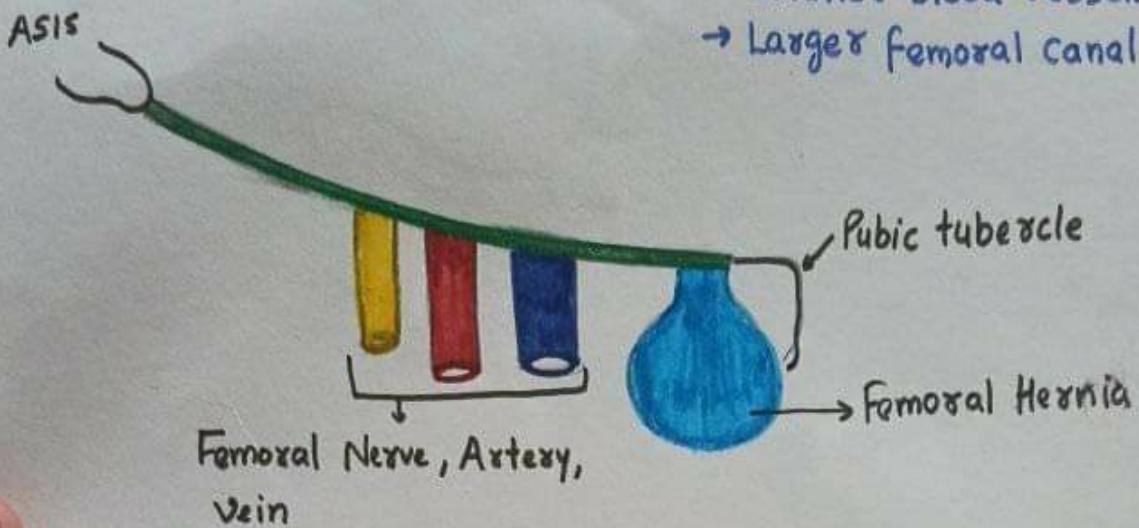
→ Disappear as infant grows

## Paraumbilical Hernia



\* FEMORAL HERNIA → More common in females because of:

- Large Pelvis
- Smaller blood vessels
- Larger femoral canal



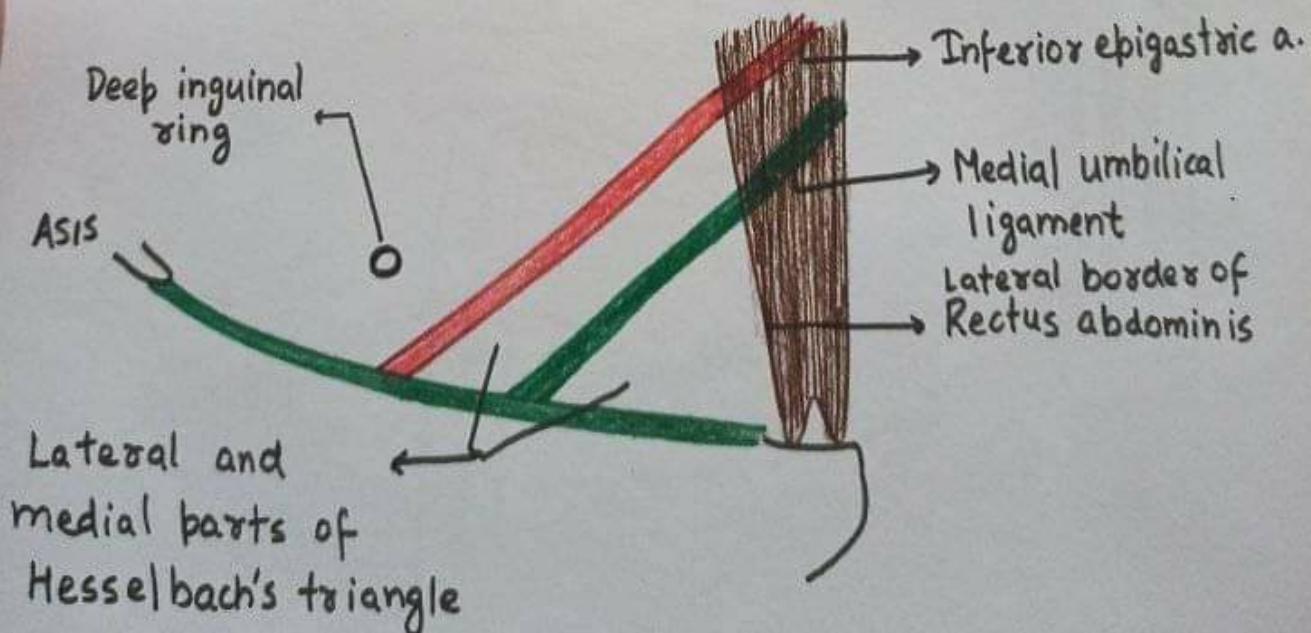
### INGUINAL HERNIA

Direct

→ Protrusion of loop of intestine  
Occurs through weak Post.  
wall of inguinal canal or  
triangle of Hesselbach

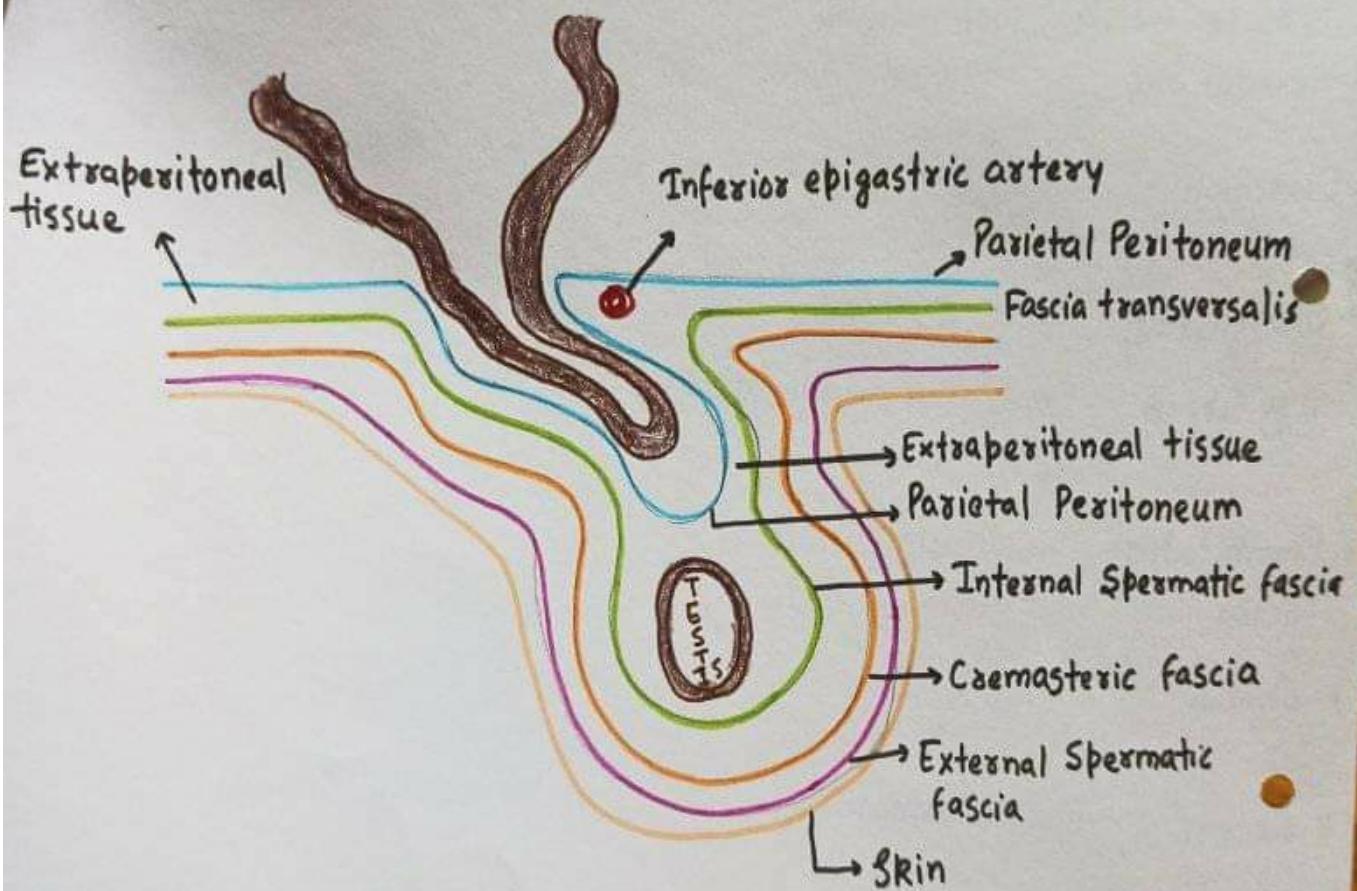
Indirect/Oblique

→ Protrusion of loop of intestine  
occurs through Deep inguinal ring,  
inguinal canal, superficial  
inguinal ring, into Scrotum.



	<u>Direct Inguinal Hernia</u>	<u>Indirect Inguinal Hernia</u>
1. Etiology (cause)	Weakness of post. wall of inguinal canal	Preformed Sac
2. Site of protrusion of hernial Sac	Post. wall of inguinal Canal	Deep inguinal ring
3. Direction	Straight	Oblique
4. Obstruction	Not Common	Common
5. Age Group	Occurs in middle and old age	Occurs in young age
6. Precipitating factor	Chronic bronchitis Enlarged Prostate	-
7. Shape	Globular	Pear
8. Extent	Rarely Scrotal	Generally Scrotal
9. Internal ring Occlusion Test	Negative	Positive

## Indirect Inguinal Hernia



Coverings are :-

Extraperitoneal Tissue  
Internal Spermatic Fascia  
Cremasteric fascia  
External Spermatic fascia  
Skin

## Direct inguinal Hernia

### Lateral direct inguinal Hernia

Extraperitoneal tissue

Fascia Transversalis

Cremasteric Fascia

External Spermatocic Fascia

Skin

Inf. epigastric a.

Deep inguinal ring

### Medial direct inguinal Hernia

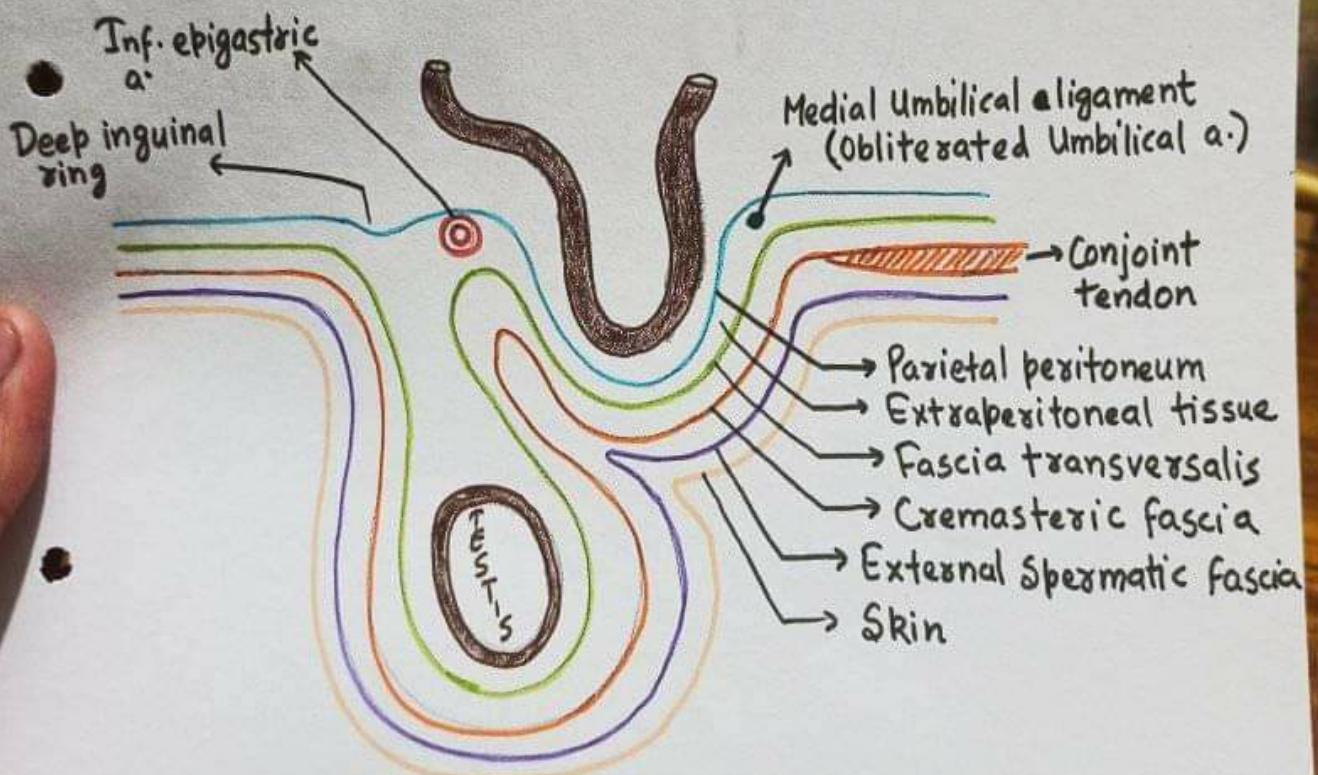
Extraperitoneal tissue

Fascia transversalis

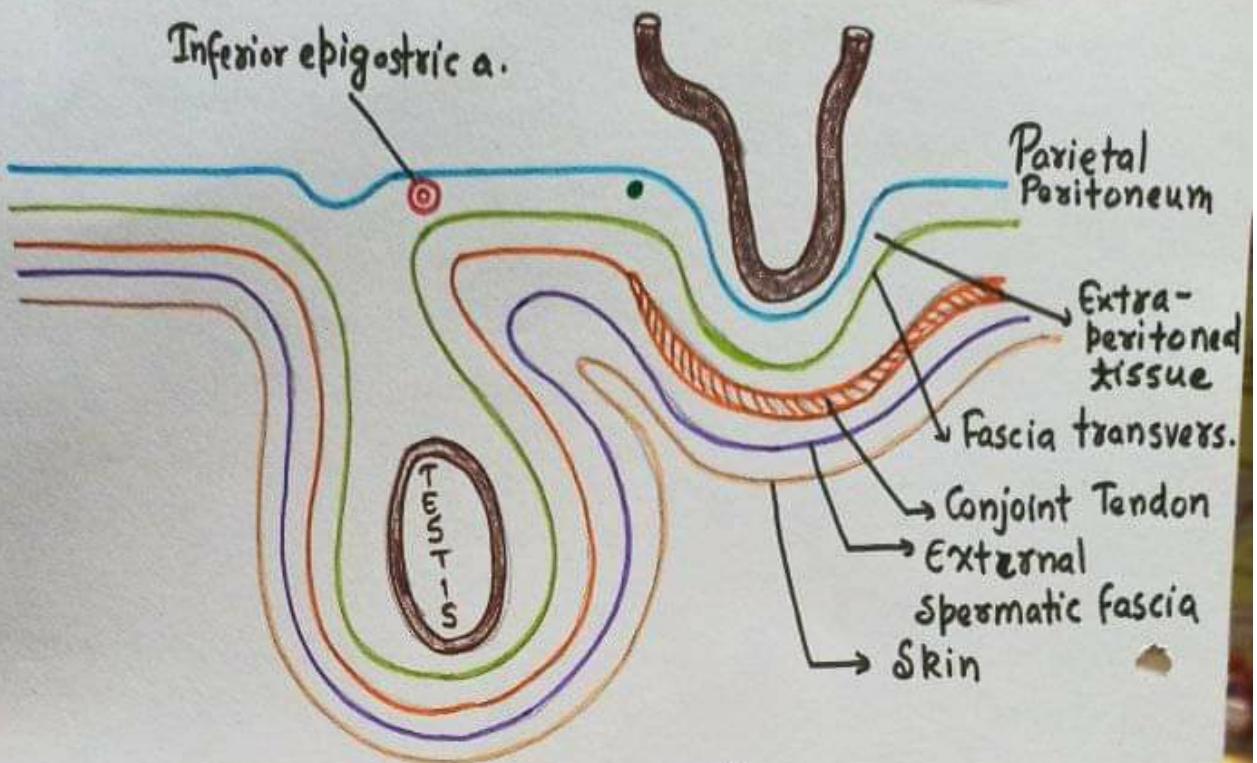
Conjoint tendon

External Spermatocic Fascia

Skin



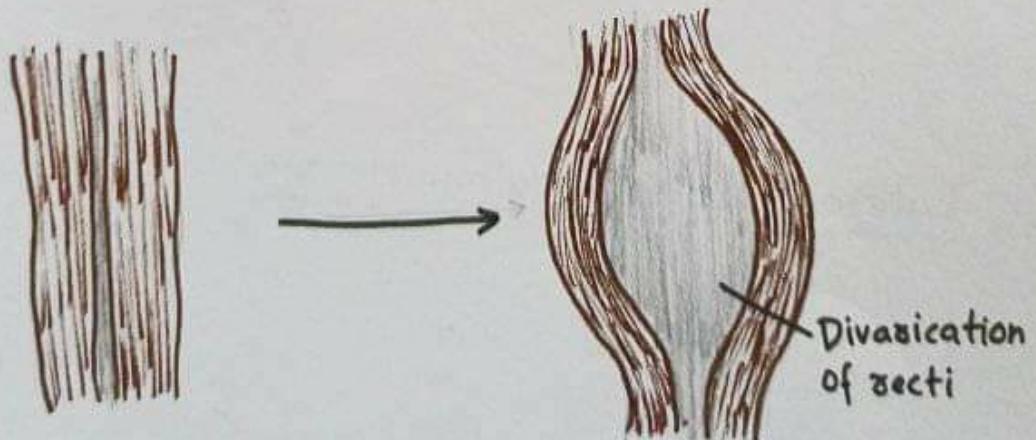
### Lateral Direct Inguinal Hernia



### Medial Direct Inguinal Hernia

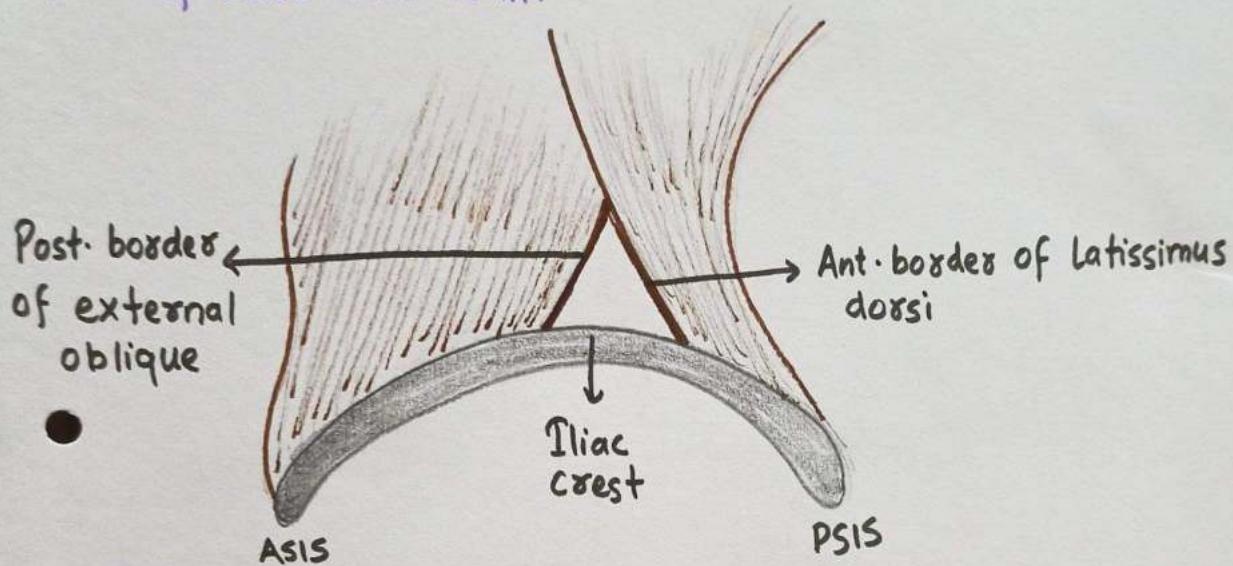
#### Divarication of Recti

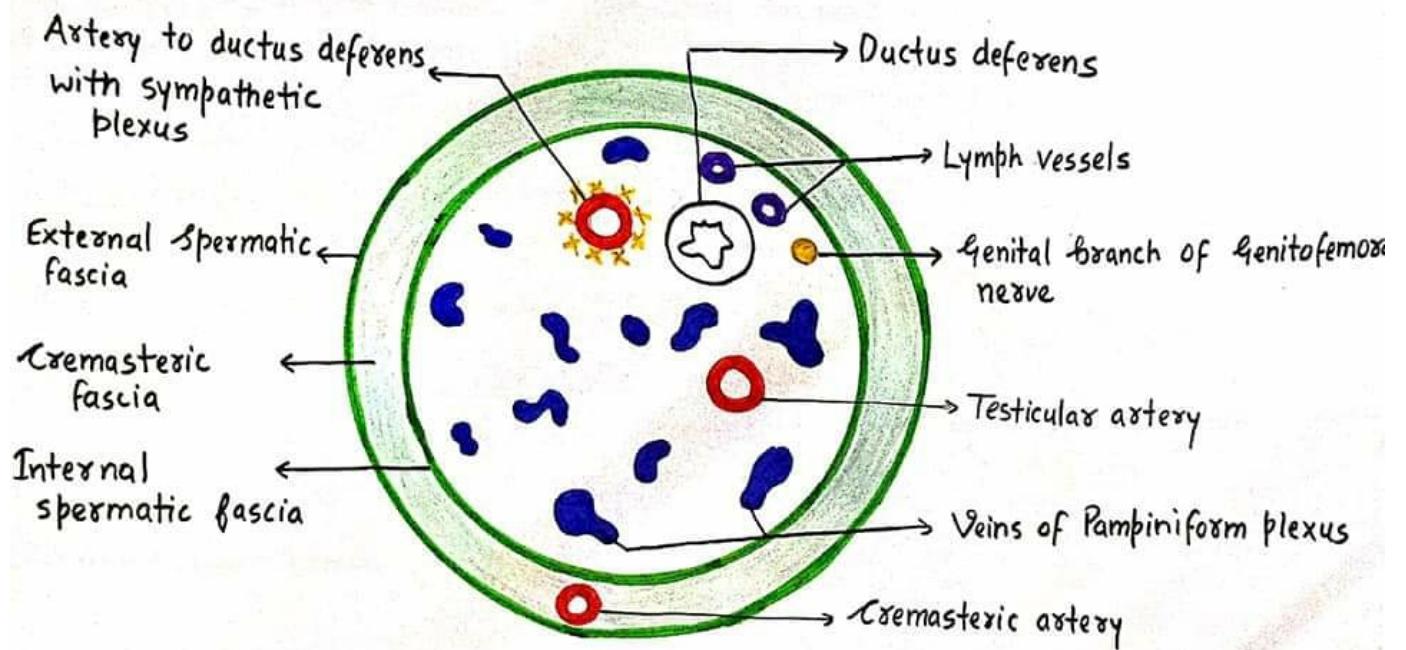
- Occurs in multiparous female with weak anterolateral abdominal muscles
- Loop of intestine protrude during coughing, but returns back



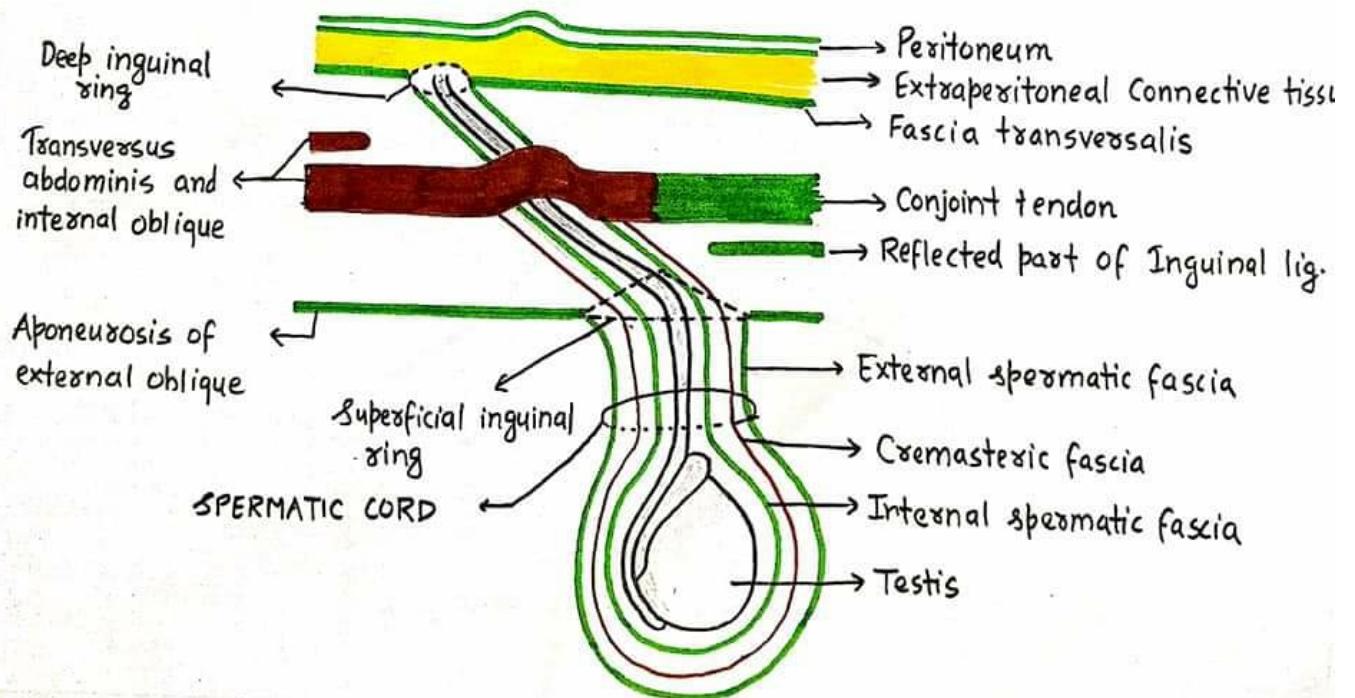
## Lumbar Hernia

→ Occurs through the lumbar triangle in the posterior ~~wall~~ part of abdominal wall.





TRANSVERSE SECTION THROUGH SPERMATIC CORD



## SPERMATIC CORD

- \* Enters the inguinal canal through deep inguinal ring & passes out through the superficial inguinal ring

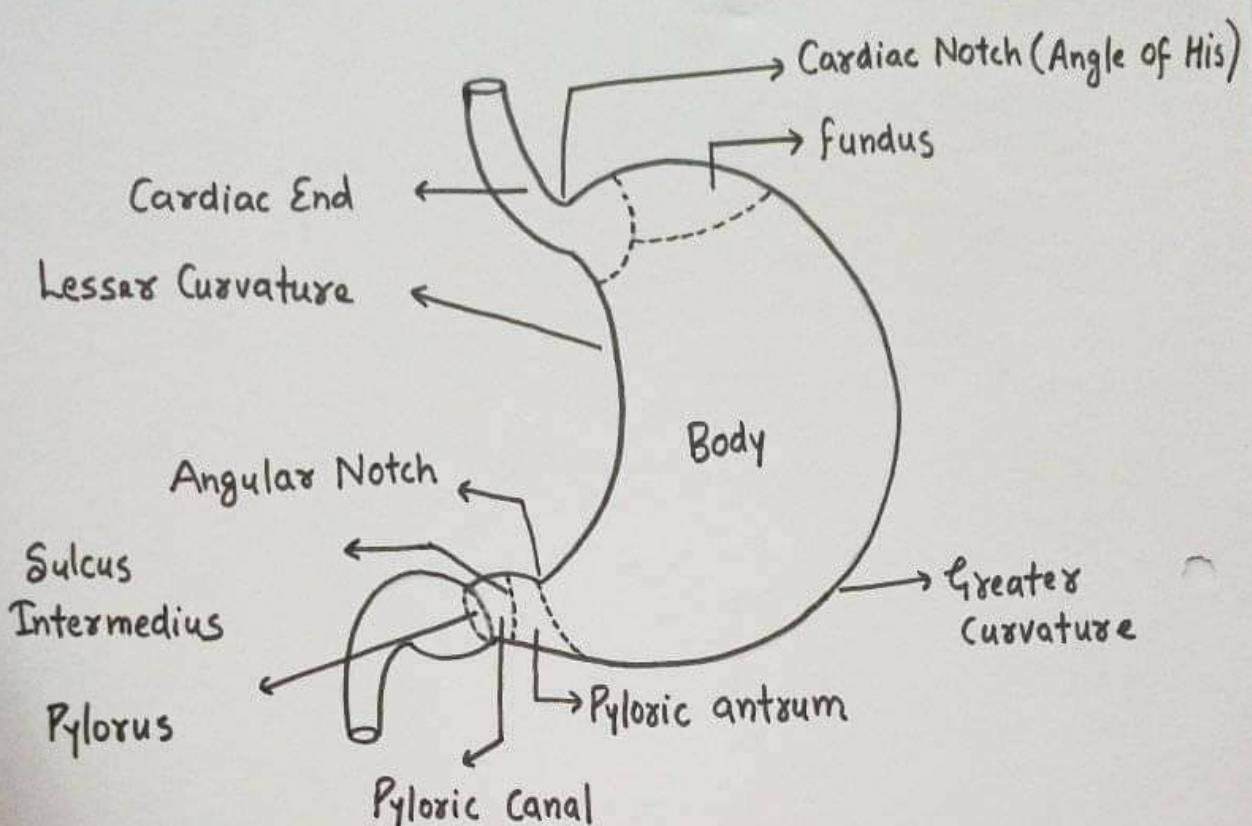
### Constituents

- Arteries
  - Testicular artery
  - Cremasteric artery
  - Artery of Ductus deferens
- Nerves
  - Genital branch of Genitofemoral nerve
  - Plexus of sympathetic nerves around artery to ductus deferens
  - Visceral afferent nerve fibres
- Pampiniform plexus of Veins
- Ductus deferens
- Lymph vessels from testis
- Remains of processus vaginalis

## Coverings

From within outwards:-

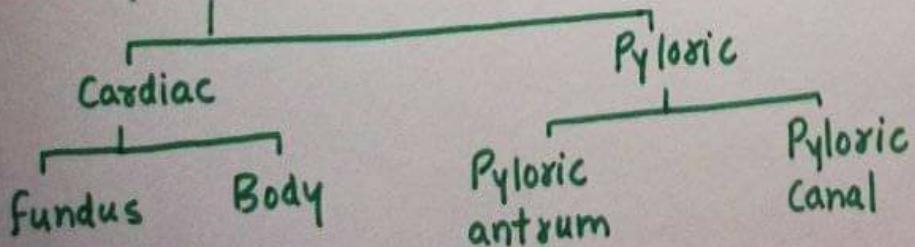
1. Internal spermatic fascia
  - Derived from Fascia transversalis
  - Covers the cord in its whole extent
2. Cremasteric fascia
  - Derived from internal oblique & transversus abdominis muscle
  - Covers the cord below the level of these muscles
3. External spermatic fascia
  - Derived from external oblique aponeurosis
  - Covers the cord below the superficial inguinal ring

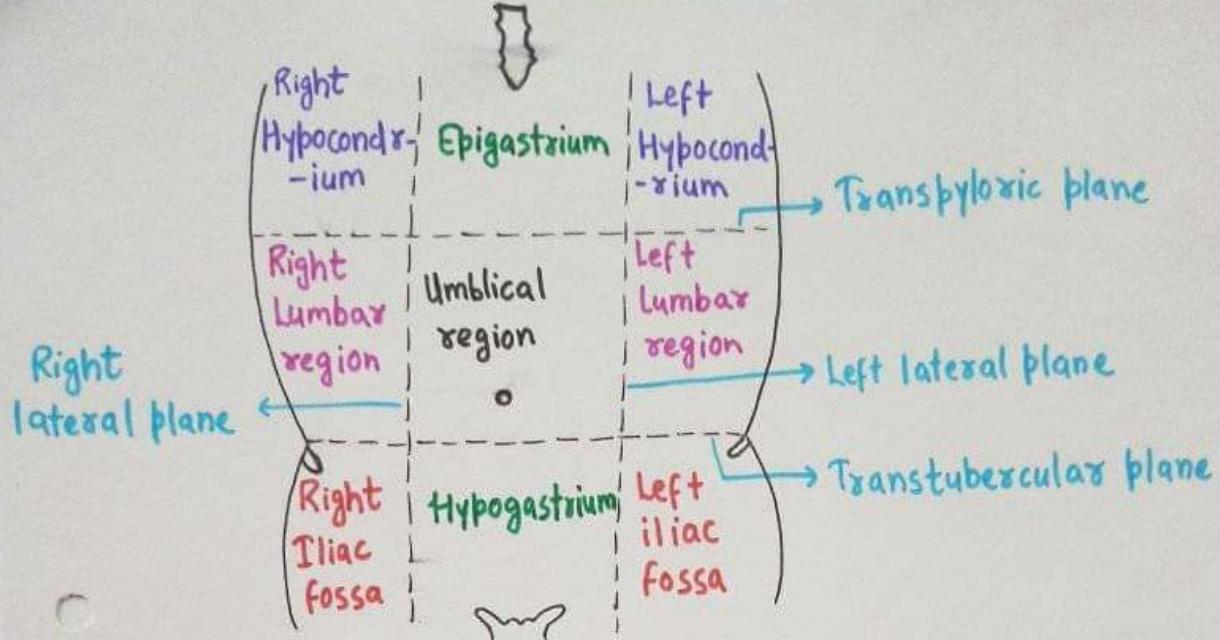


### External features of The Stomach

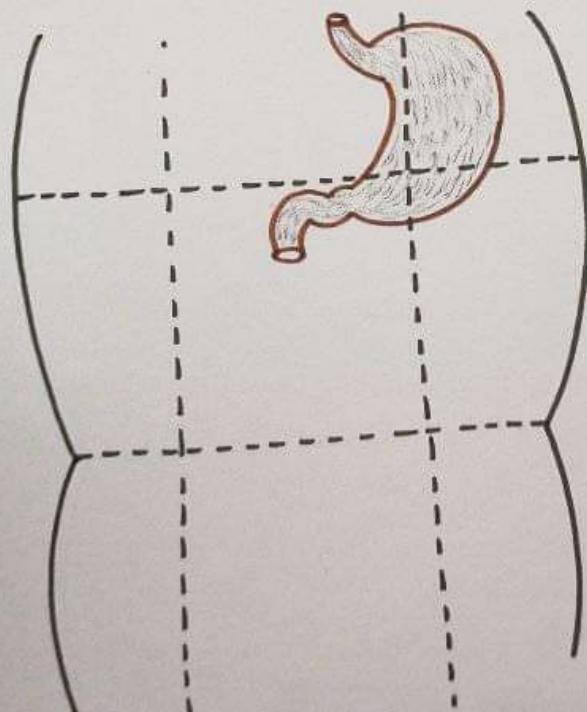
- Two Orifices :- ① Cardiac Orifice      ② Pyloric Orifice
- Two Curvatures :- ① Lesser Curvature ② Greater Curvature
- Two Surfaces :- ① Anterior or Anterosuperior Surface  
② Posterior or Posteroinferior Surface

- Two parts

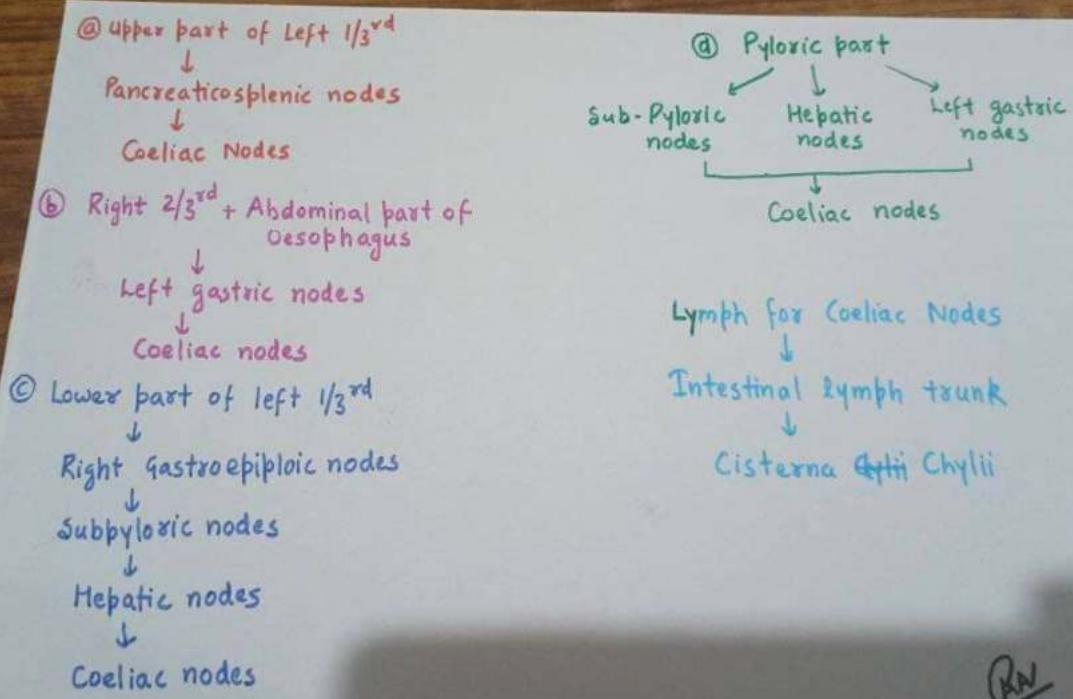


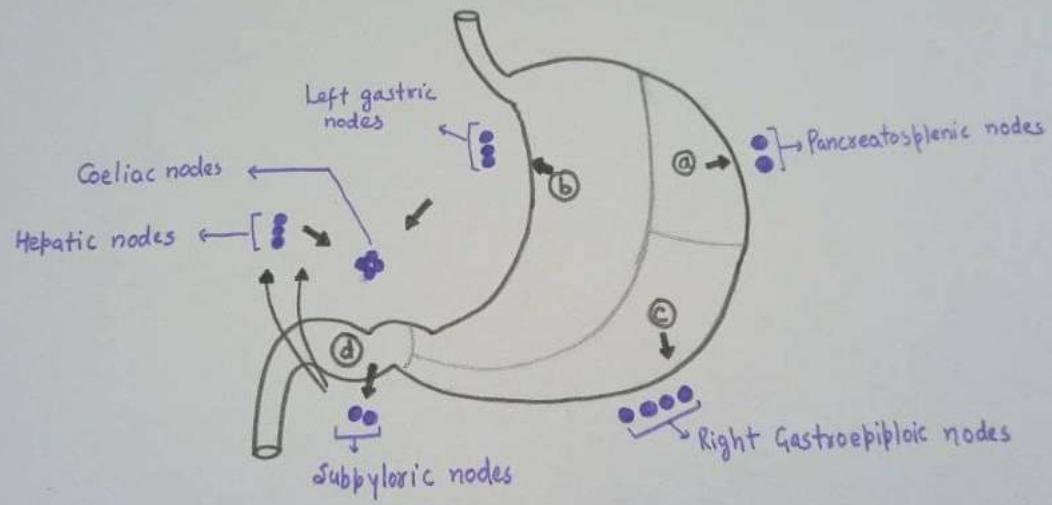


### Regions Of Abdomen



### Location of Stomach





Lymphatic Drainage Of Stomach

(RAY)

## RELATIONS OF STOMACH

Peritoneal relation

Visceral relation

### Peritoneal Relations

- Lined by peritoneum on both surfaces.
- At lesser curvature layer of peritoneum meet & become continuous with lesser omentum.
- Similarly at greater curvature, the two layers meet to form gastro greater omentum.
- Near fundus, the two layers meet to form gastrosplenic ligament.
- Near cardiac end, the peritoneum on the posterior surface is reflected on to diaphragm  
↓  
form Gastrophrenic ligament.

### Base Area of Stomach

- ① Small part of posterior surface near cardiac end of stomach is in direct contact with Diaphragm.
- ② Greater & lesser curvatures along the peritoneal reflections are also base.

## Visceral Relations

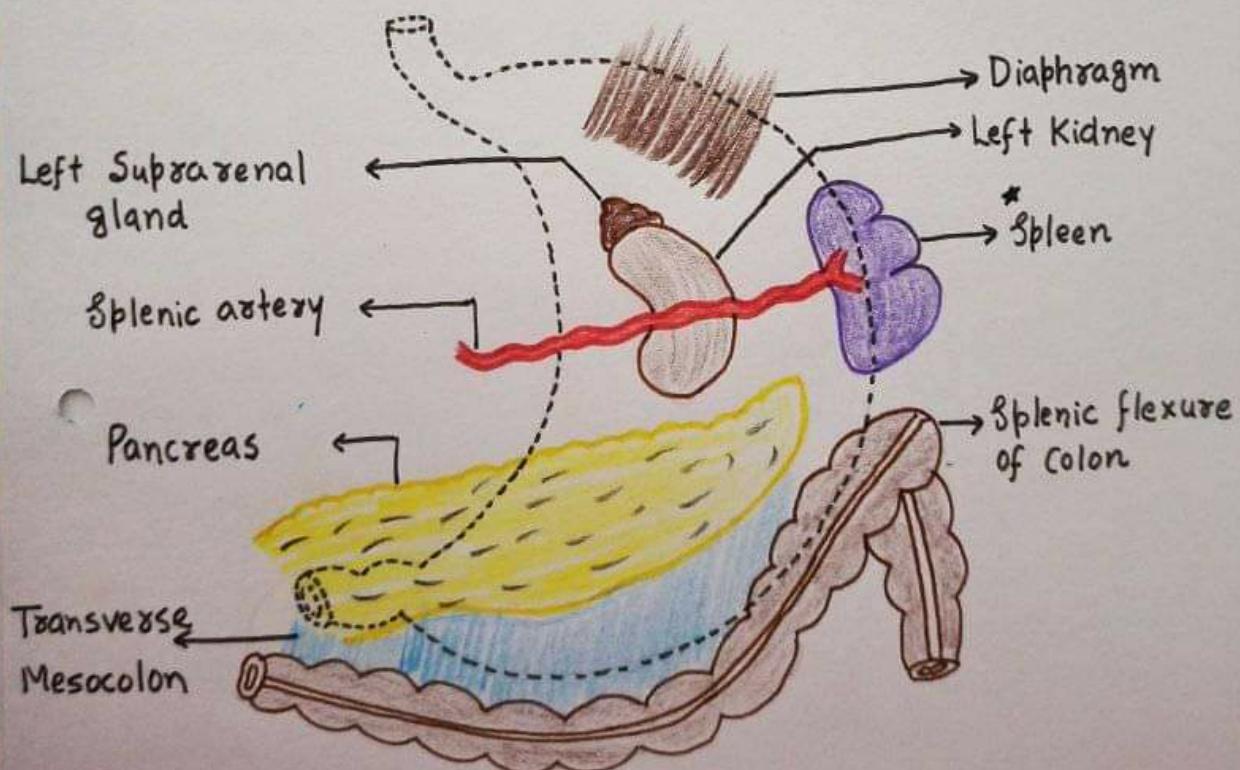
→ Anterior Surface

- Liver
- Diaphragm
- Transverse colon
- Anterior Abdominal wall

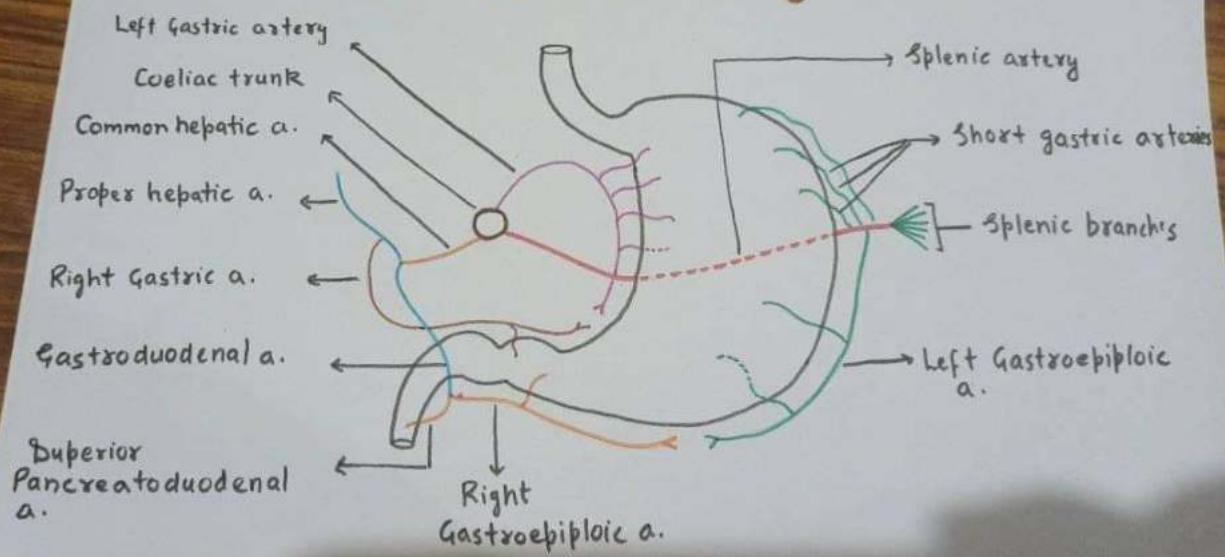
→ Diaphragm separates stomach from

- Left pleura
- Pericardium
- 6-9 ribs

→ Posterior Surface - Related to structures forming <sup>\*\*\*</sup> Stomach bed  
 Separated from Stomach by cavity of lesser sac.

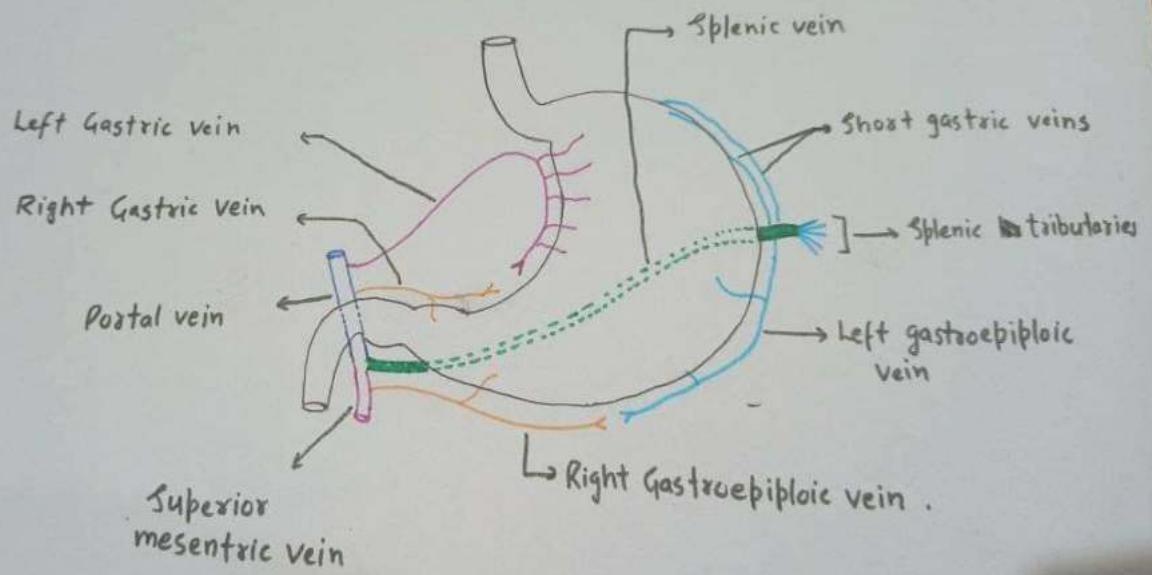


## THE STOMACH BED



Arteries Supplying The Stomach

RAN



Venous Drainage of Stomach

RAN

## Nerve Supply Of Stomach

### (a) Sympathetic Nerve Supply

- Derived from T<sub>6</sub>-T<sub>10</sub> segment of spinal cord



Greater Splanchnic Nerves



Coeliac Plexus



Hepatic Plexus



Sympathetic Supply to Stomach

- These nerves are

→ Vasomotor  
→ Motor to pyloric Sphincter but inhibitory to gastric musculature  
→ Chief pathway for Pain Sensations

### (b) Parasympathetic Nerve Supply

- Derived from Vagi

↓  
Oesophageal plexus

↓  
Gastric Nerves

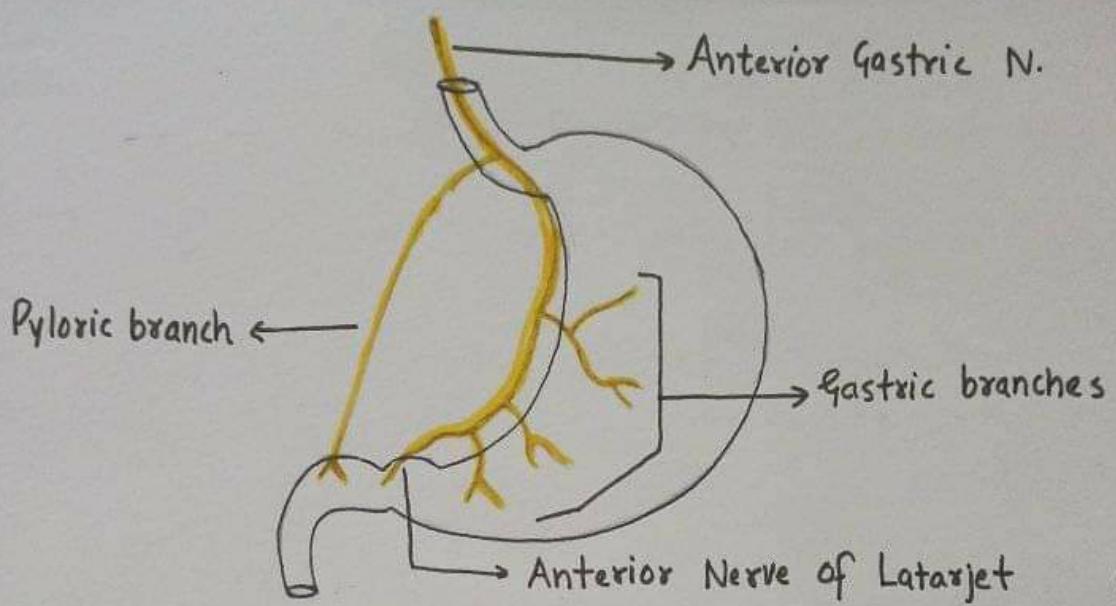
Gastric Nerves  
Anterior Gastric N.  
Gastric branches  
2 Pyloric branches

Posterior Gastric N.  
Gastric branches  
Coeliac branches

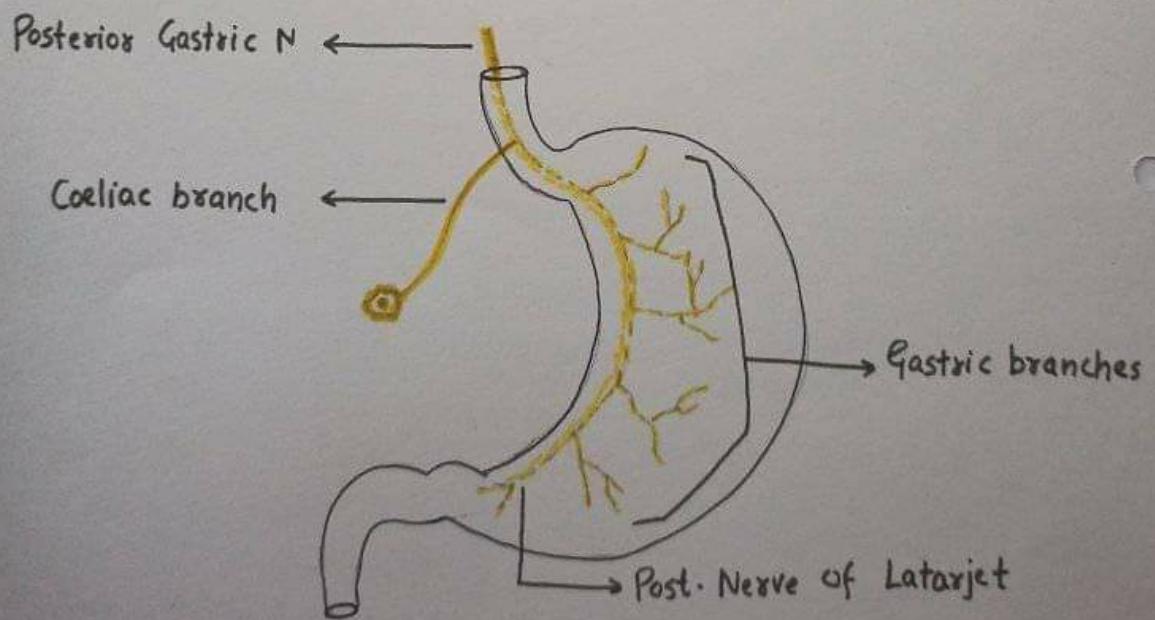
- Parasympathetic Nerves → Motor & Secretomotor to Stomach  
↓ Stimulation

↑ Motility & ↑ Acid Secretion  
& Inhibitory to pyloric Sphincter

## Nerve Supply Of Stomach



## (a) Anterior Gastric Nerve



## (b) Posterior Gastric Nerve

## VERMIFORM APPENDIX

### Origin

- Posterosomedial wall of the caecum, about 2cm below the ileocaecal orifice
- Appendicular orifice is occasionally guarded by an indistinct semilunar fold of mucous membrane, known as valve of Gerlach.

### Length

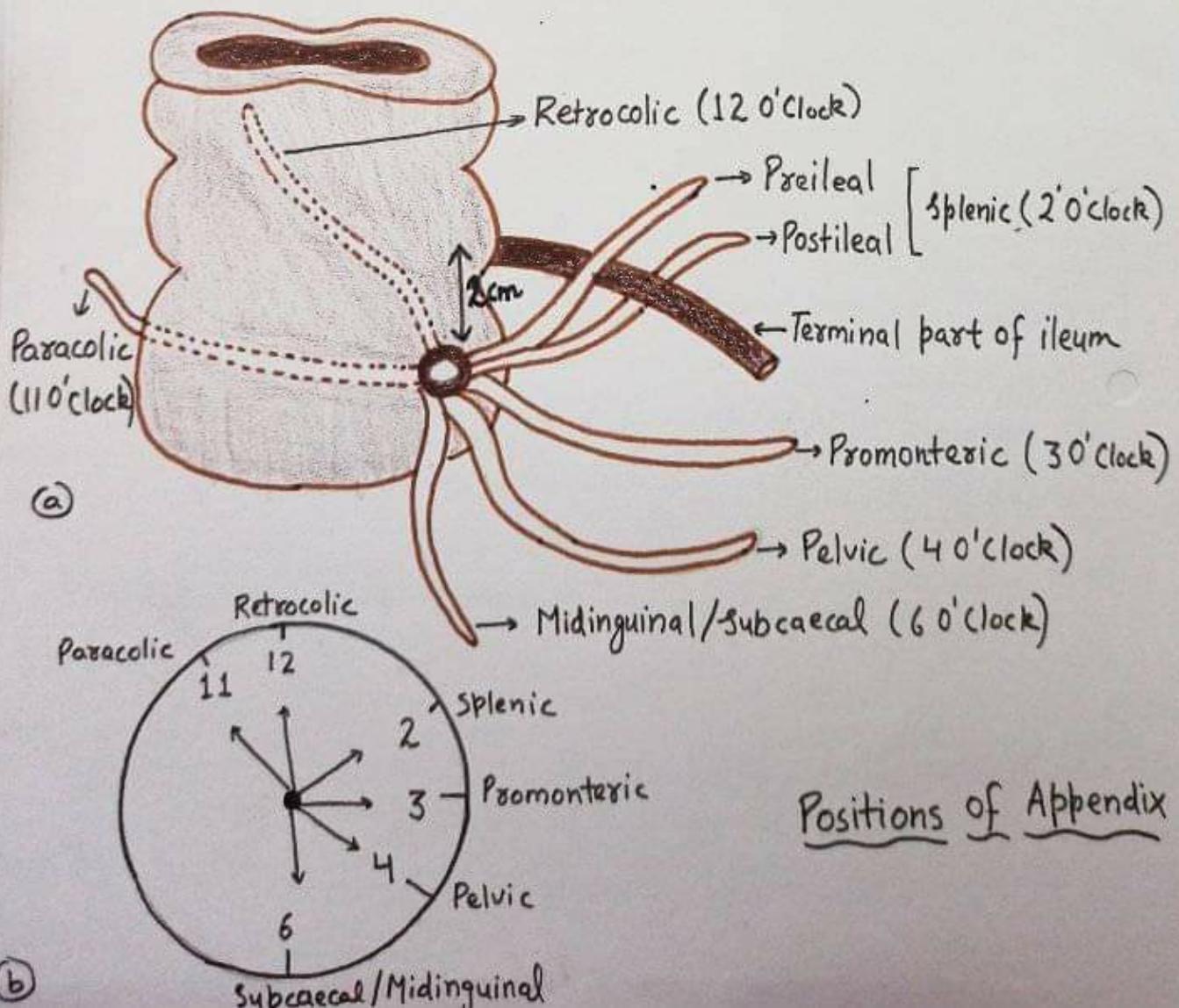
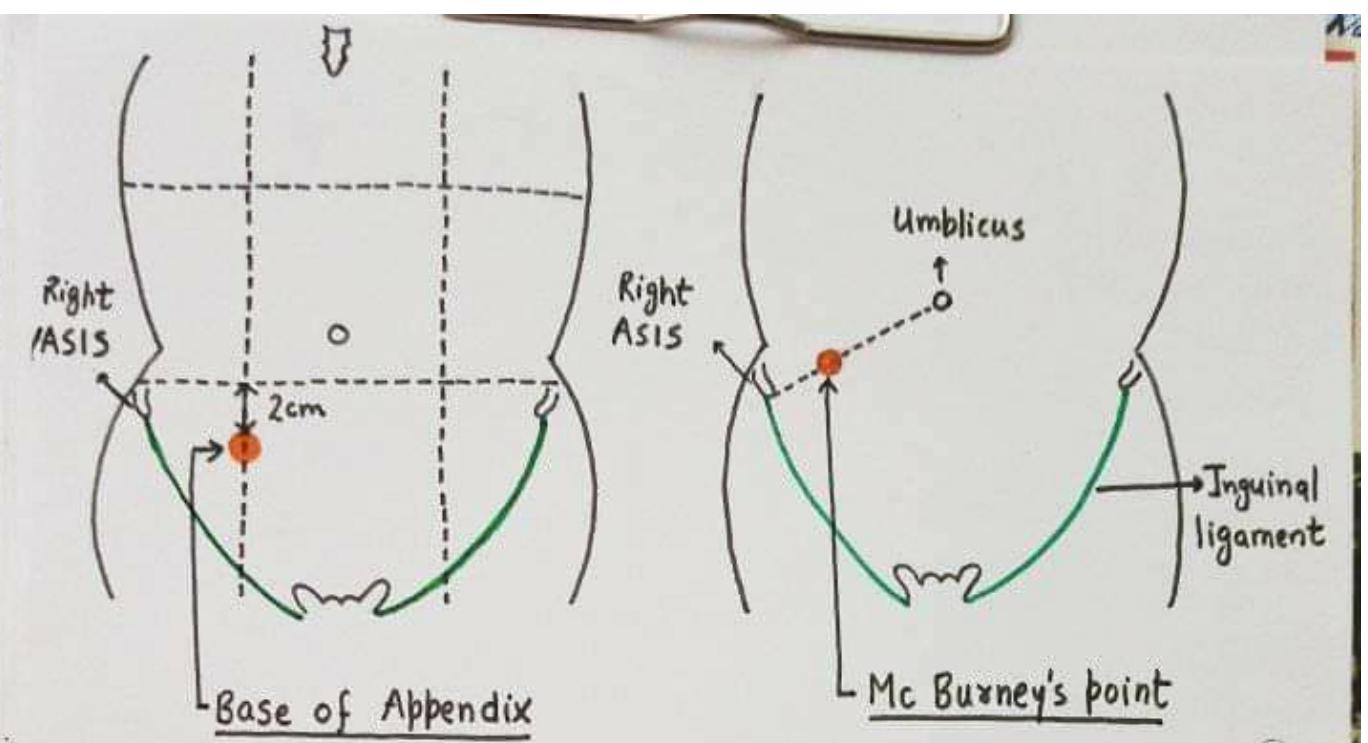
- Varies from 2 to 20 cm
- Average length is 9 cm.

### Positions

- Lies in right iliac fossa
- Base position is fixed = 2cm below the intersection of transtubercular and right lateral plane.
- Tip of appendix may point in any direction
  - These positions are often compared to those of the hour hand of a clock.
- These positions are :-
  - ① Paracolic ~2% → Upward & Right
  - ② Retrocolic ~65% → Upward
  - ③ Splenic < 1% → Upward & left, towards spleen.
  - ④ Promonteric < 1% → Horizontal & left, toward sacral promontory.
  - ⑤ Pelvic ~30% → Descend into pelvis
  - ⑥ Midinguinal/Subcaecal ~2% → Below caecum or toward inguinal ligament.

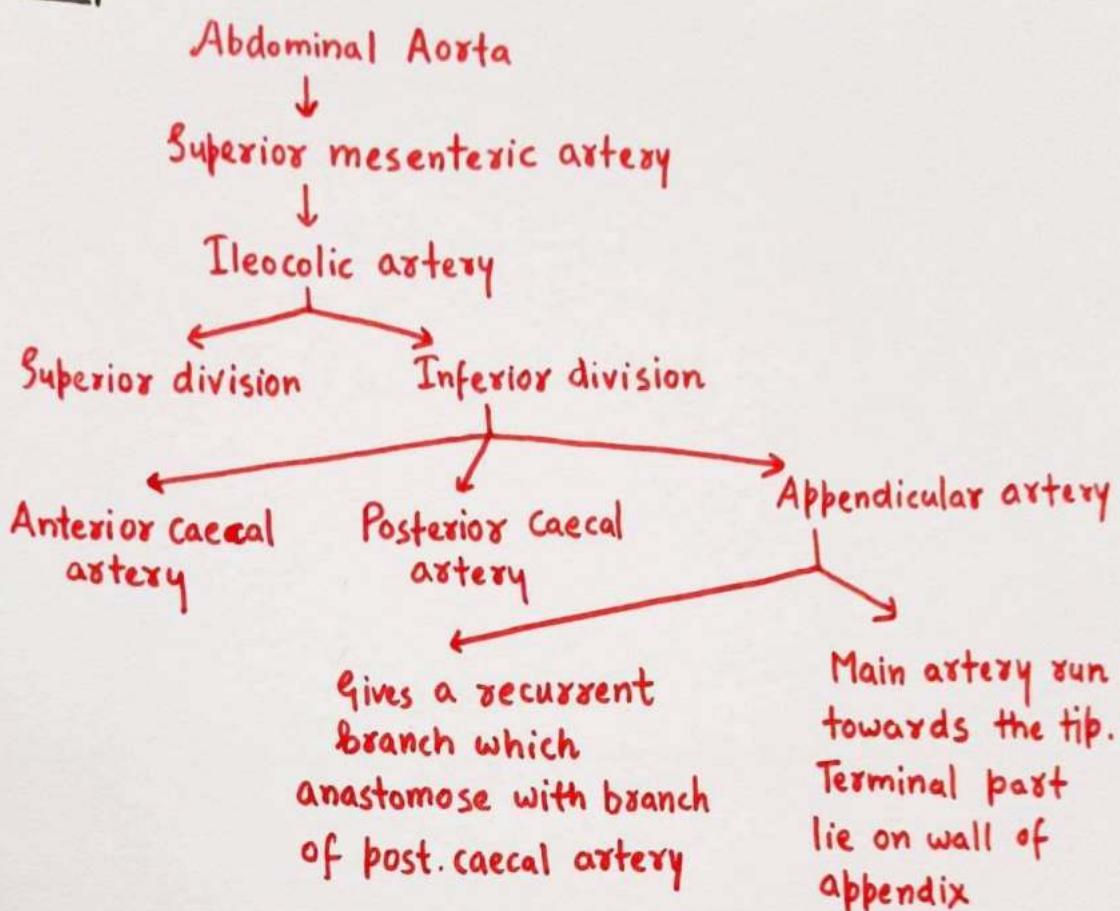
### Mc.burney point

- Junction of lateral 1/3<sup>rd</sup> & medial 2/3<sup>rd</sup> of line joining the umbilicus to right Ant. sup. iliac spine
- Site of max<sup>m</sup> tenderness in acute appendicitis.

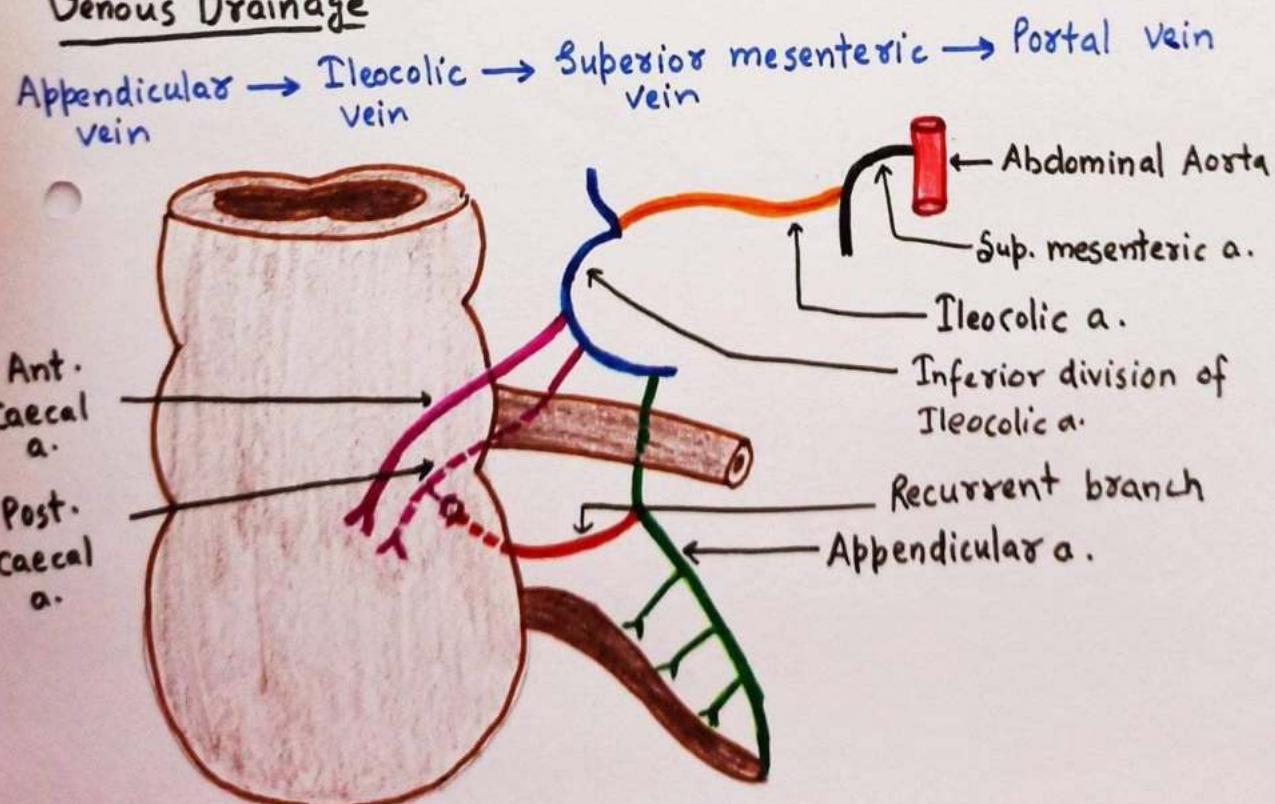


## BLOOD SUPPLY OF APPENDIX

### Arterial Supply



### Venous Drainage

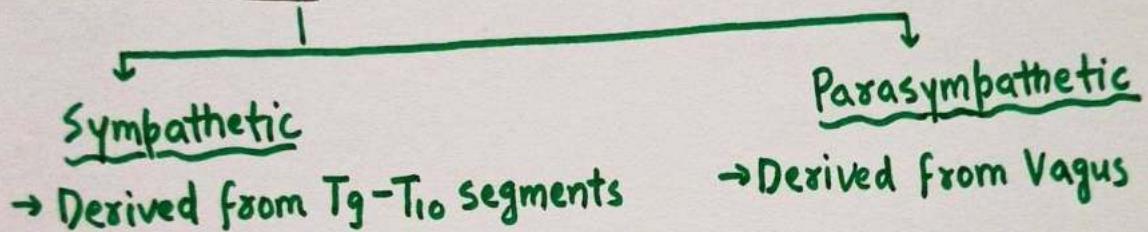


### Arterial Supply of Caecum And Appendix

## Lymphatic Drainage

- Most lymph directly drain to ileocolic nodes.
- Small amount indirectly drain through appendicular nodes.

## Nerve Supply



→ Derived from T<sub>9</sub>-T<sub>10</sub> segments

→ Derived from Vagus

## Clinical Anatomy Of Appendix

### ✚ Appendicitis (Inflammation of Appendix)

↓  
Treatment

Appendectomy (operation for removal of appendix)

### ✚ Referred pain In Appendicitis

→ Pain of appendicitis is first felt in region of umbilicus  
    ↓ reason

Both appendix & umbilicus are supplied by Segment T10 of spinal cord

→ Then pain is felt in right iliac fossa  
    ↓ reason

Involvement of parietal peritoneum

\* Parietal peritoneum is sensitive to pain, but visceral peritoneum is not.

### ✚ Mc. Burney's point

→ Junction of lateral  $\frac{1}{3}$ rd & medial  $\frac{2}{3}$ rd of line joining the umbilicus to right ASIS.

→ Site of maximum tenderness in appendicitis

→ Hyperesthesia in right iliac fossa.

### ✚ In appendicitis, when appendix is retrocaecal

↓  
Extension of hip joint may cause pain

↓  
Appendix is disturbed by stretching of Psoas major muscle

RDL

+ In appendicitis, when appendix is in pelvic position



flexion & Medial rotation of thigh may cause pain



Appendix is disturbed by Stretching of Obturator Internus

+ Appendicular dyspepsia

Chronic appendicitis



Passage of infected lymph to Subpyloric nodes



Irritation of pylorus



Dyspepsia (Indigestion)

+ Appendicitis is common because:

(a) Appendicular artery is an end artery

(b) Lymphatic follicles in submucosa

(c) Small lumen → Obstruction by faecolith

(d) Gap in muscularis externa → fast spread of infection

RAN

## DESCENT OF TESTIS

Testes develop in relation to developing mesonephros at the level of segment T<sub>10</sub> to T<sub>12</sub>

↓  
Each testis begins to descend during the 2<sup>nd</sup> month of Intrauterine life

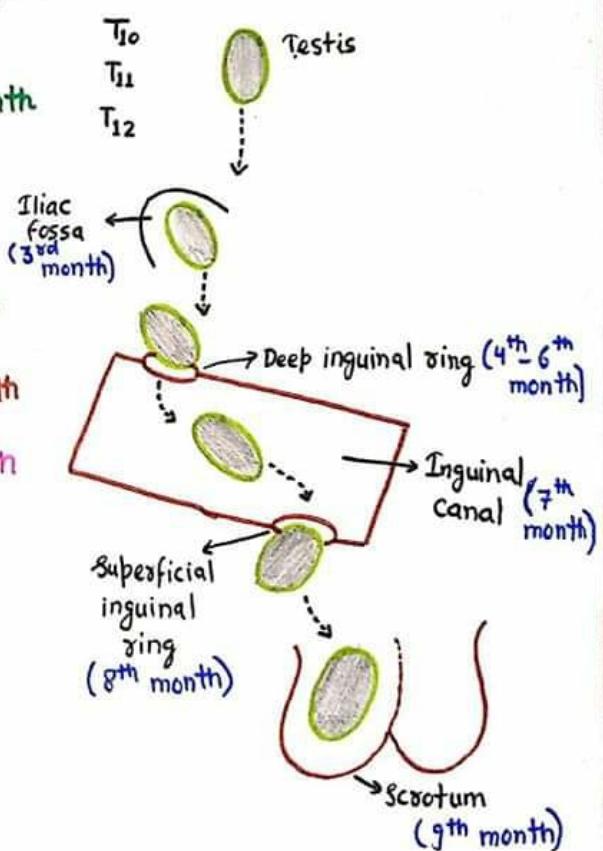
↓  
Reaches iliac fossa by 3<sup>rd</sup> month

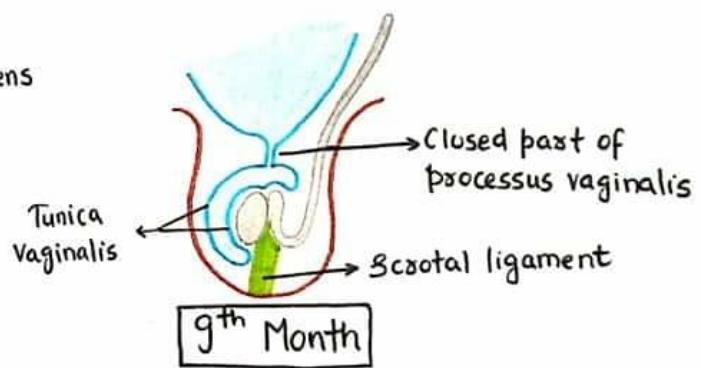
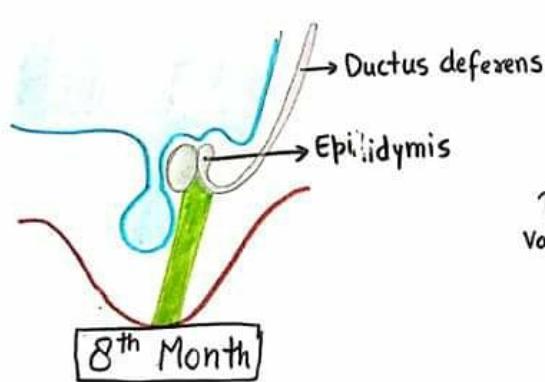
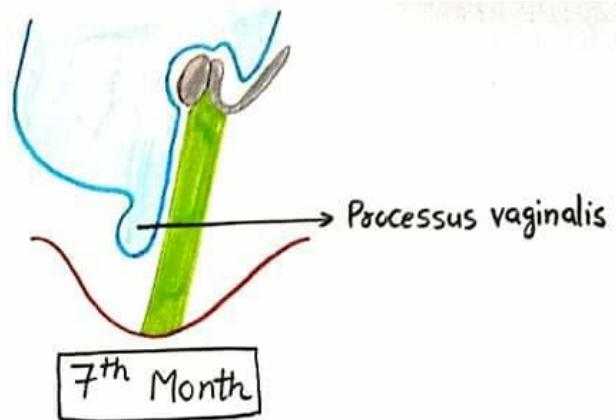
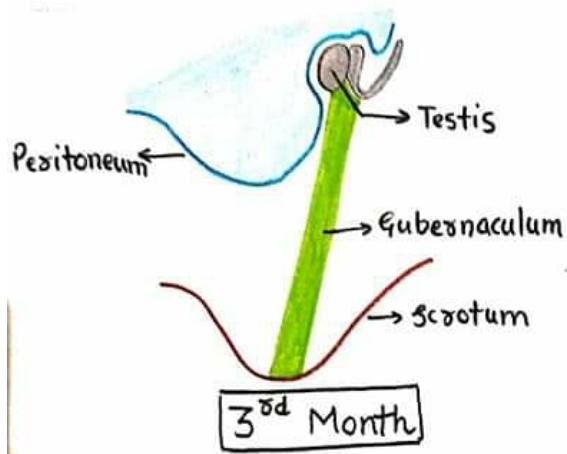
↓  
Rests at deep inguinal ring from 4<sup>th</sup> to 6<sup>th</sup> month

↓  
Traverses the inguinal canal during the 7<sup>th</sup> month

↓  
Reaches the superficial inguinal <sup>in</sup> ring by 8<sup>th</sup> month

↓  
Reach bottom of scrotum by 9<sup>th</sup> month





### STAGES OF DESCENT OF TESTIS

## Processus Vaginalis

- Extension of Peritoneal cavity
- Precedes the descent of testis into the scrotum, into which the testis invaginates
- Closes above the testis

Causes of Descent → Not well known

Expected Causes :-

- a) Hormones → Male sex hormones produced by testis  
    ↳ Maternal gonadotropins
- b) Differential growth of body wall.
- c) Formation of Gubernaculum
- d) Intra-abdominal temperature & pressure

## Gubernaculum

- Band of loose tissue extending from lower pole of testis to the scrotum
- Remaining part of Gubernaculum after the descent of testis is known as Ligament of Scrotum.

# PERITONEUM

- \* Large Serous Membrane lining the abdominal cavity.
- \* Peritoneum is composed of
  - Outer layer of Fibrous tissue
  - Inner layer of Mesothelial cells
    - ↓  
Secrete serous fluid
    - ↓  
lubricate the Surface
    - ↓  
Allow free movements of viscera

Peritoneum is divided into:

- Parietal Peritoneum
- Visceral Peritoneum
- folds of Peritoneum

## Parietal Peritoneum

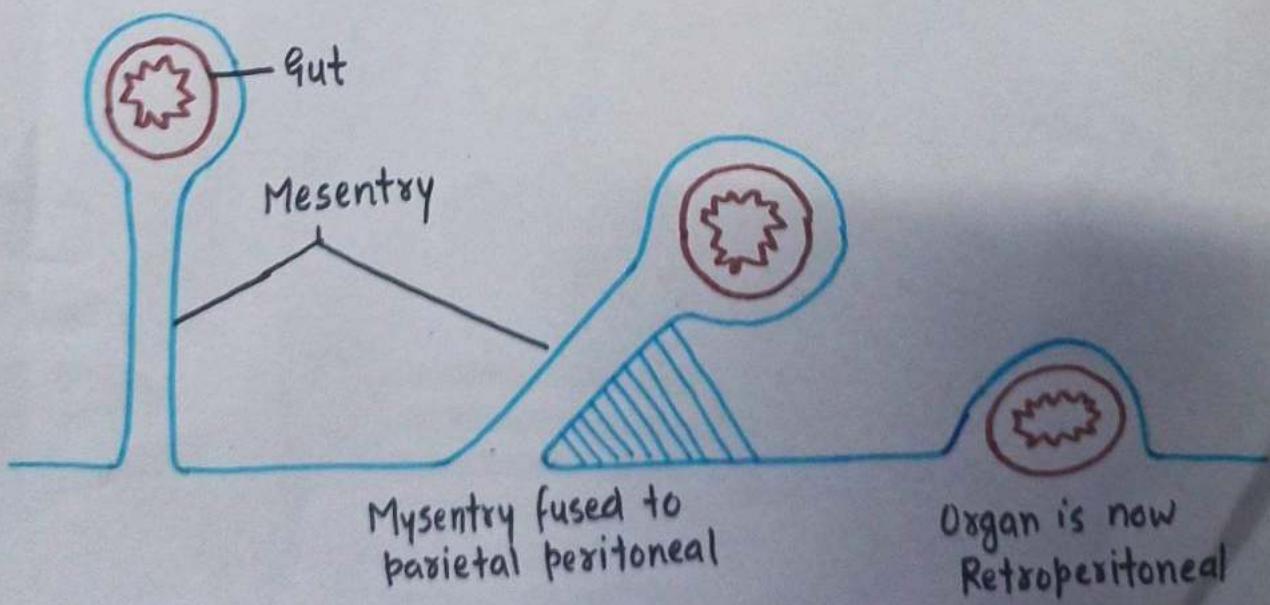
- Lines the inner surface of abdominal & Pelvic walls & lower surface of Diaphragm
- Loosely attached to walls so can <sup>be</sup> easily stripped.
- Embryologically derived from somatopleuric layer of lateral plate mesoderm
- Pain sensitive

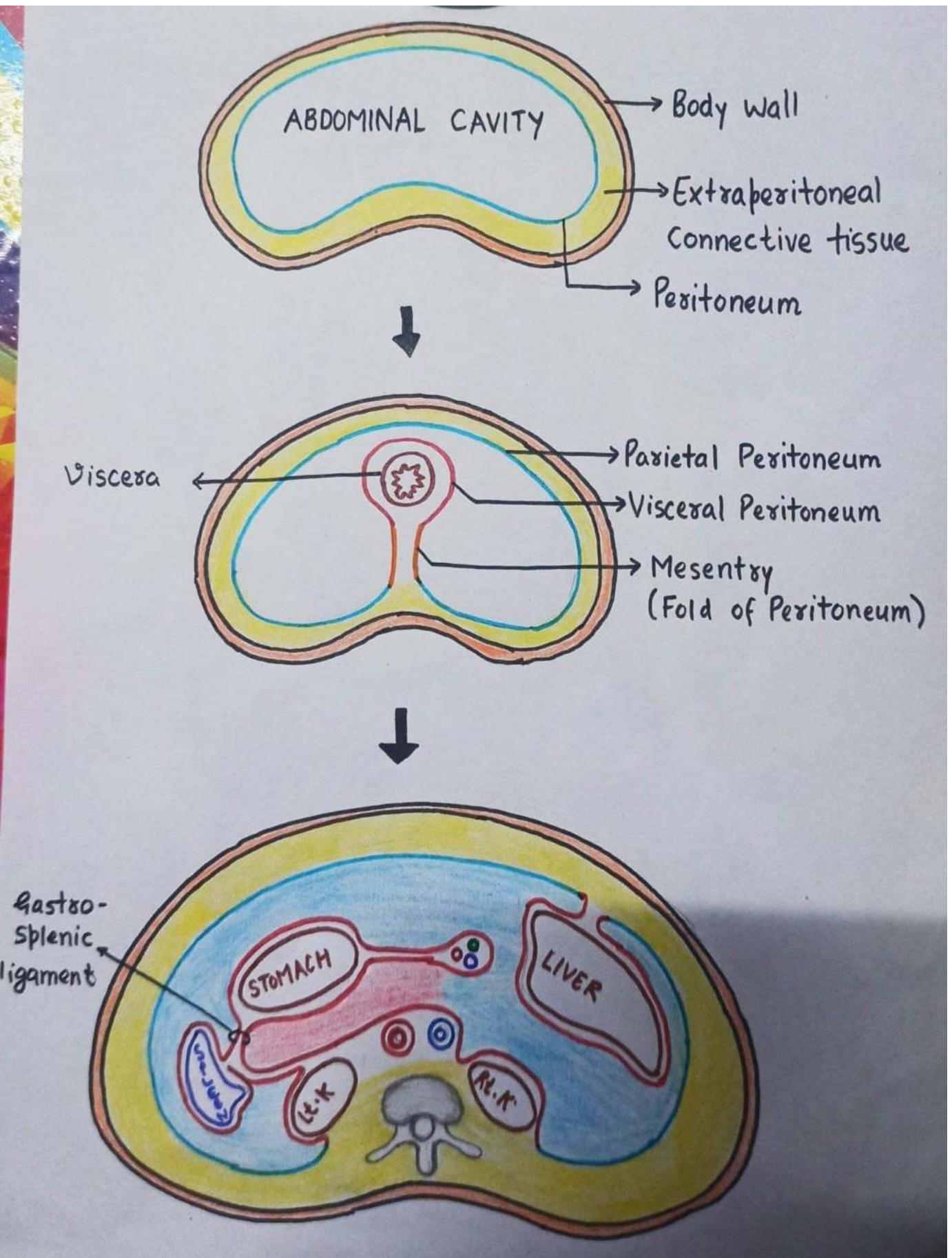
## Visceral Peritoneum

- Lines outer surface of Viscera
- Firmly adherent and can't be stripped
- Embryologically derived from splanchnopleuric layer of lateral plate mesoderm.
- Pain insensitive

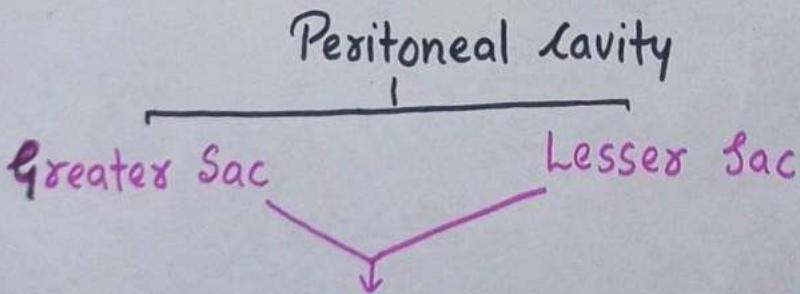
## Folds of Peritoneum

- Many Organs within abdomen are suspended by Folds of peritoneum. Such organs are mobile.
- Some organs are suspended by peritoneal folds in early embryonic life, but later become retroperitoneal. Such organs are fixed and immobile.





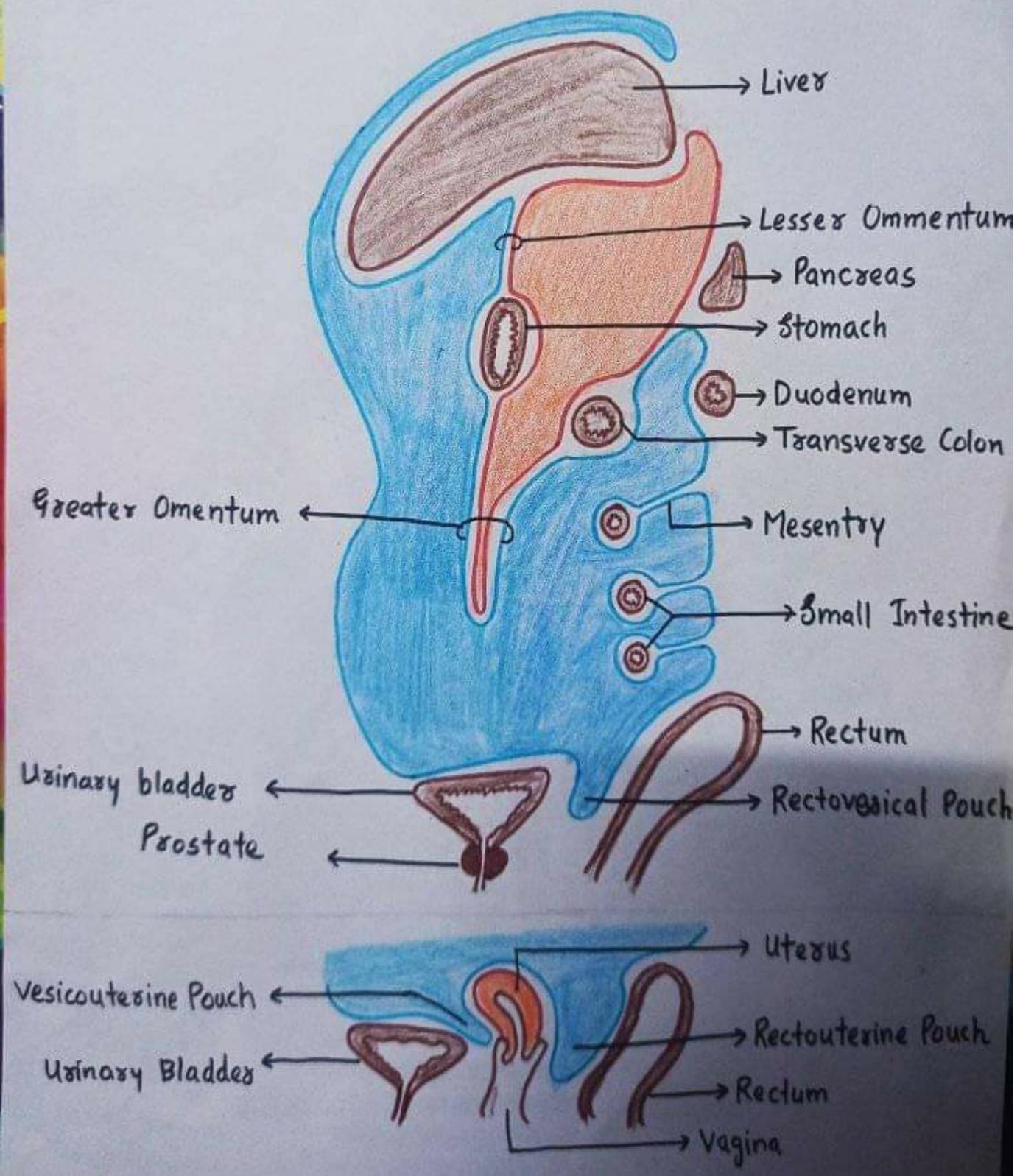
- Peritoneal folds provide pathway for passage of Vessels, nerves & lymphatics.
- Peritoneal folds are given various names
  - fold suspending small intestine → Mesentery
  - fold suspending Colon → Mesocolon
  - Folds attached to Stomach → Omenta
    - < Greater Omentum
    - < Lesser Omentum
  - In many situations, double layered folds of Peritoneum connect organs to the abdominal wall or to each other. Such folds are called Ligaments.  
e.g Gastrosplenic ligament.



Both sac communicate with each other through  
Epiploic Foramen

- Function of Peritoneum
- Movement of Visce ra
  - Protection of Visce ra
  - Healing wounds
  - Storage of Fat

Sagittal Section Through The Male Abdomen & Female Pelvis  
Showing The Peritoneal Reflections



## GREATER OMENTUM

- Large fold of Peritoneum which hangs down from greater curvature of Stomach & covers loops of Intestines
- Made up of 4 layers of Peritoneum
  - All fused to form thin Fenestrated Membrane

### ATTACHMENT

Anterior 2 layers descend from Greater Curvature of Stomach to variable extent

Fold upon themselves [Such that 1<sup>st</sup> layer become 4<sup>th</sup> layer  
                                  & 2<sup>nd</sup> layer become 3<sup>rd</sup> layer]

↓  
Form Posterior 2 layers

↓  
Ascend to the anterior surface of the head, and the anterior border of the pancreas

### NOTE

- \* In its upper part, the 4<sup>th</sup> layer is partially fused to the anterior surface of Transverse colon & Transverse mesocolon.
- \* The peritoneal cavity called lesser sac b/w the 2<sup>nd</sup> & 3<sup>rd</sup> layers gets obliterated except for about 2.5 cm below the Greater Curvature of Stomach

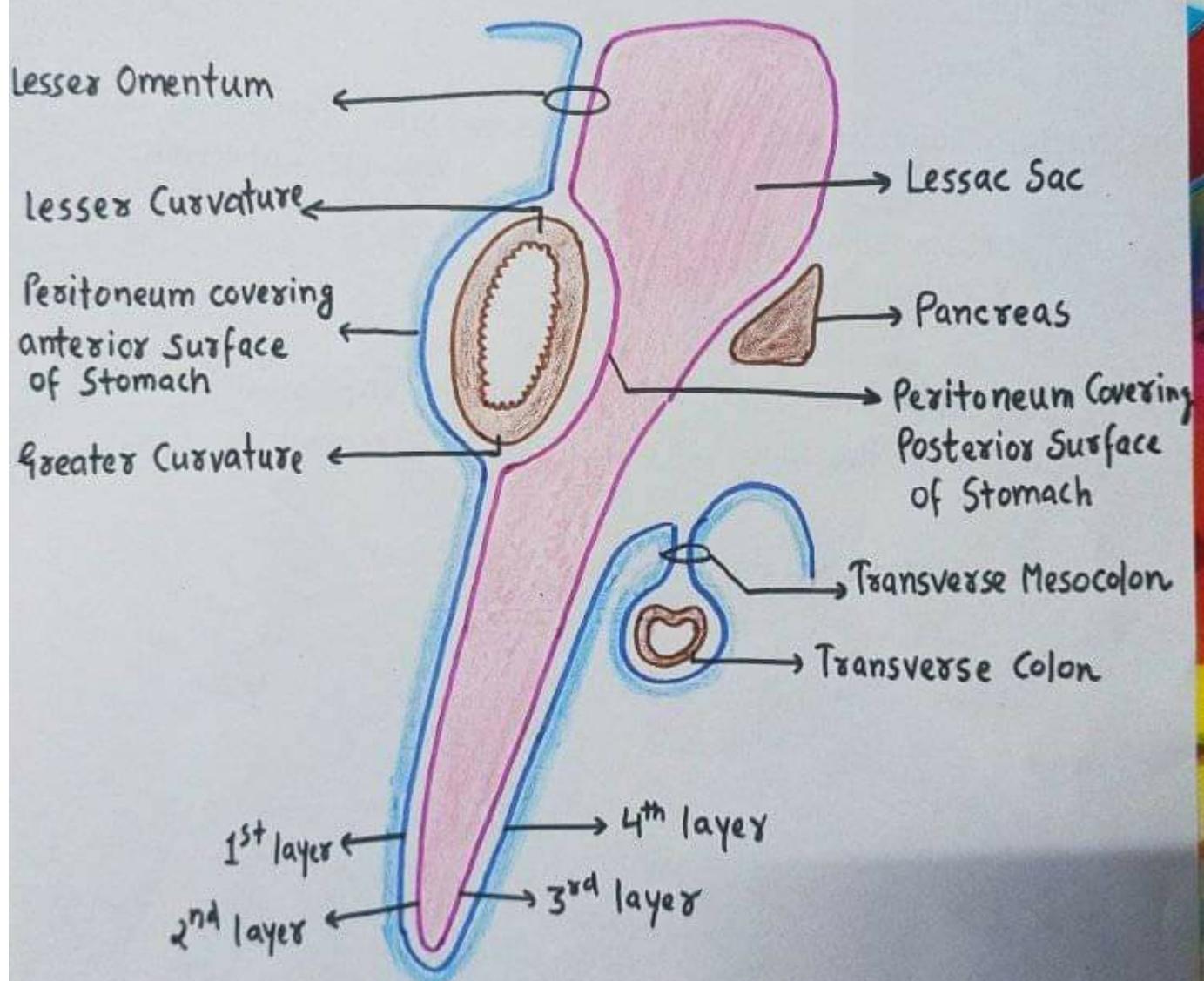
## CONTENT

- Right & left Gastroepiploic Vessels
- Laden with Fat

## FUNCTION

- Fat Storage
- Contain Collection of Macrophages → Protect Peritoneal Cavity  
Against Infection
- ↓  
Form Small, Dense Patches  
called "Milky Spots"
- Greater Omentum limit the Spread of Infection by  
Sealing off the affected area from Surrounding area
- ↓  
So called "Policeman of Abdomen"

BN



Left View Of A Sagittal Section Of The Abdomen Showing The Greater And Lesser Omenta .

## LESSER OMENTUM

- \* Fold (double layer) of Peritoneum
- \* Extends from lesser curvature of Stomach and first 2cm of Duodenum to the liver.
- \* Hepatogastric ligament → Portion of lesser omentum b/w the Stomach and the liver
- \* Hepatoduodenal ligament → Portion of lesser omentum b/w the Duodenum and the liver
- \* Lesser Omentum has a right free margin behind which there is epiploic foramen
- \* Behind the Lesser Omentum there lies a part of lesser sac.

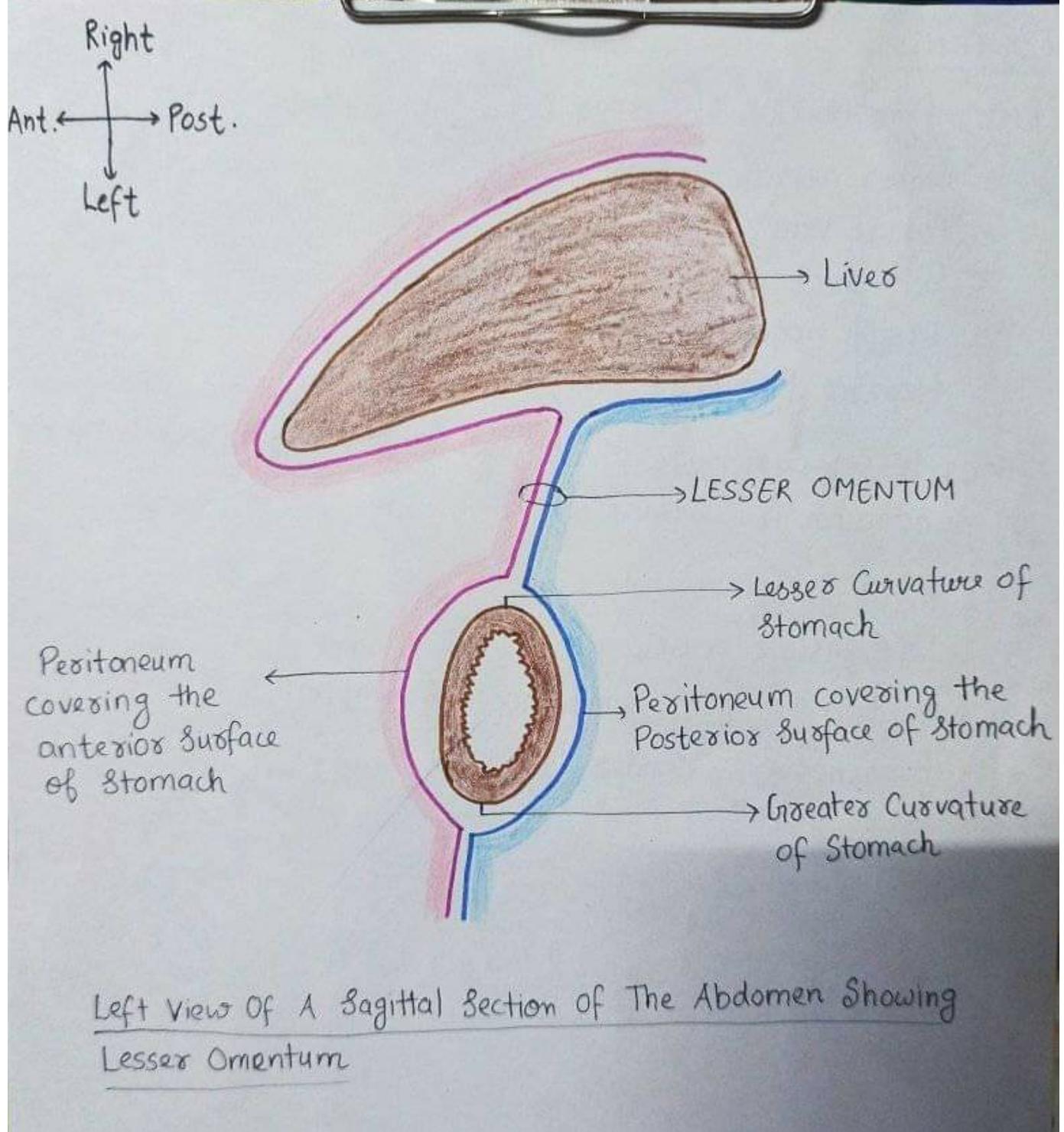
### ATTACHMENTS

Inferiorly :- Lesser Curvature of Stomach  
Upper border of first 2cm of duodenum

Superiorly :- Liver

↓

Line of Attachment being in the form of an inverted L. Vertical limb of 'L' is attached to the bottom of the fissure for the ligamentum venosum, and the horizontal limb to the margins of porta hepatis



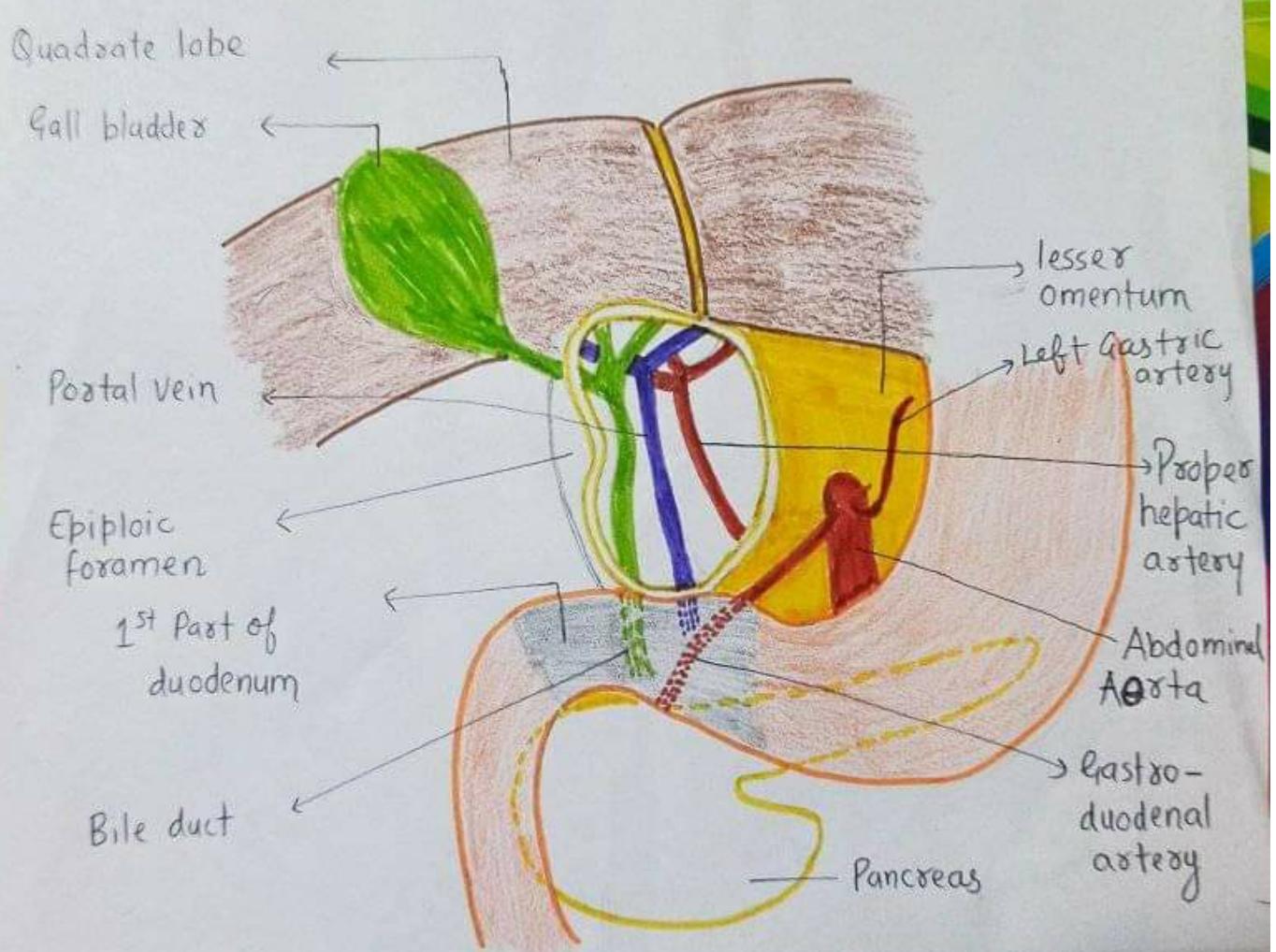
## CONTENTS

Right free Margin of lesser Omentum contains:-

1. Proper hepatic artery
2. Portal Vein
3. Bile duct
4. Lymph nodes & lymphatics
5. Hepatic Plexus of Nerves

Along lesser Curvature of Stomach and along upper border of duodenum it Contains:-

1. Right gastric vessels
2. Left gastric vessels
3. Gastric group of lymph nodes & lymphatics
4. Branches from Gastric Nerve



Visceral Relations of 1<sup>st</sup> Part of Duodenum. The liver has been turned upwards so that its posteroinferior Surface can be seen

OR

Attachments and Contents of the lesser Omentum

# EPIPLOIC FORAMEN / OMENTAL FORAMEN / FORAMEN OF WINSLOW

→ Vertical Slit like opening through which the lesser sac communicates with the greater sac.

## LOCATION:-

Situated behind the right free margin of the lesser omentum at the level of the 12<sup>th</sup> thoracic vertebra.

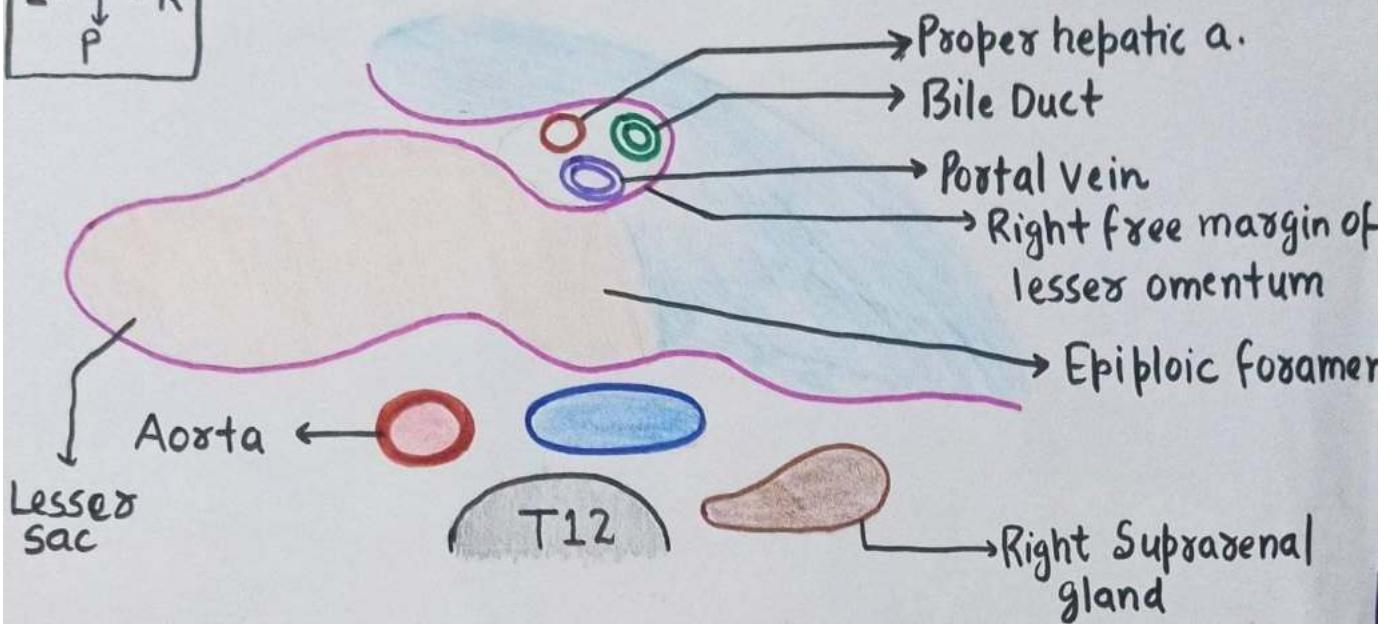
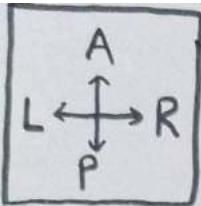
## BOUNDARIES :-

Anteriorly → Right free Margin of the lesser omentum containing the Portal Vein, Proper hepatic artery, bile duct

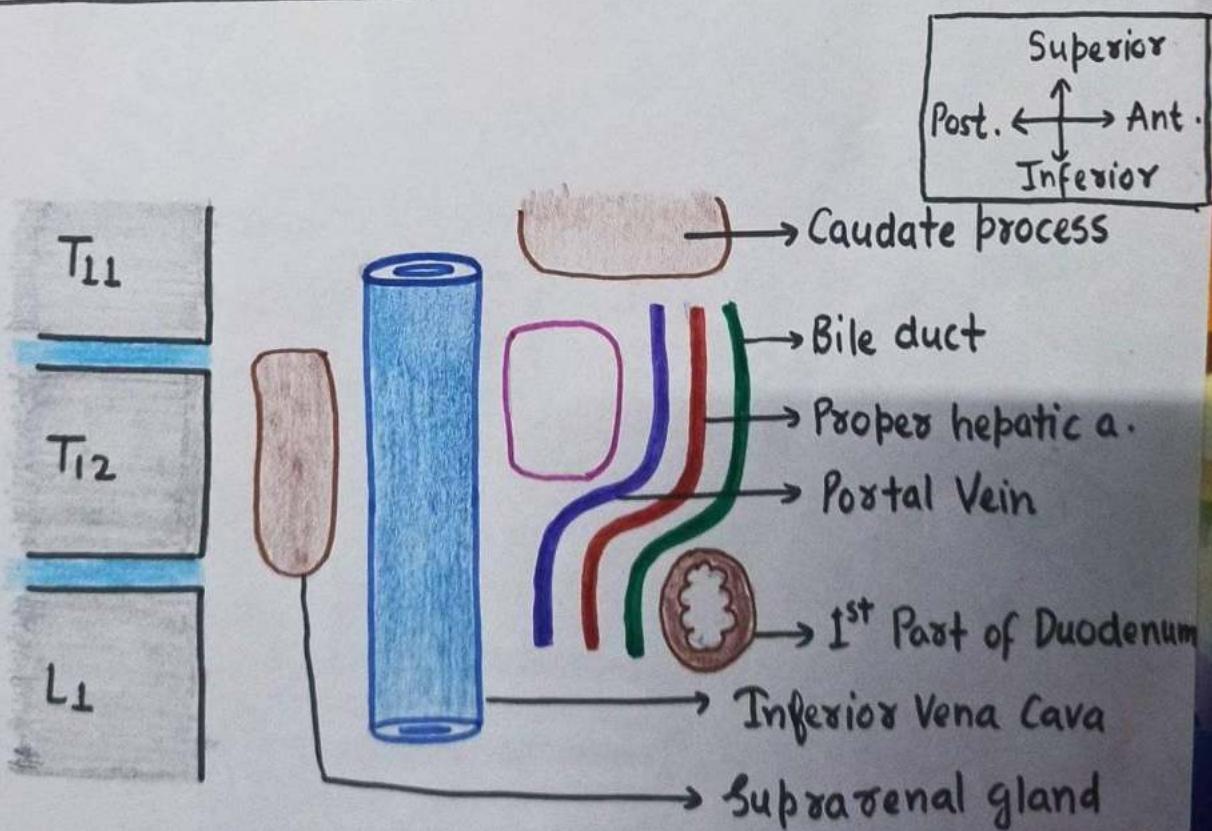
Posteriorly → Inferior Vena Cava  
Right Suprarenal Gland  
T<sub>12</sub> Vertebra

Superiorly → Caudate lobe of liver

Inferiorly → 1<sup>st</sup> Part of Duodenum  
Horizontal Part of Hepatic Artery



### EPIPLOIC FORAMEN AS SEEN IN TRANSVERSE SECTION AT THE LEVEL OF 12<sup>TH</sup> THORACIC VERTEBRA

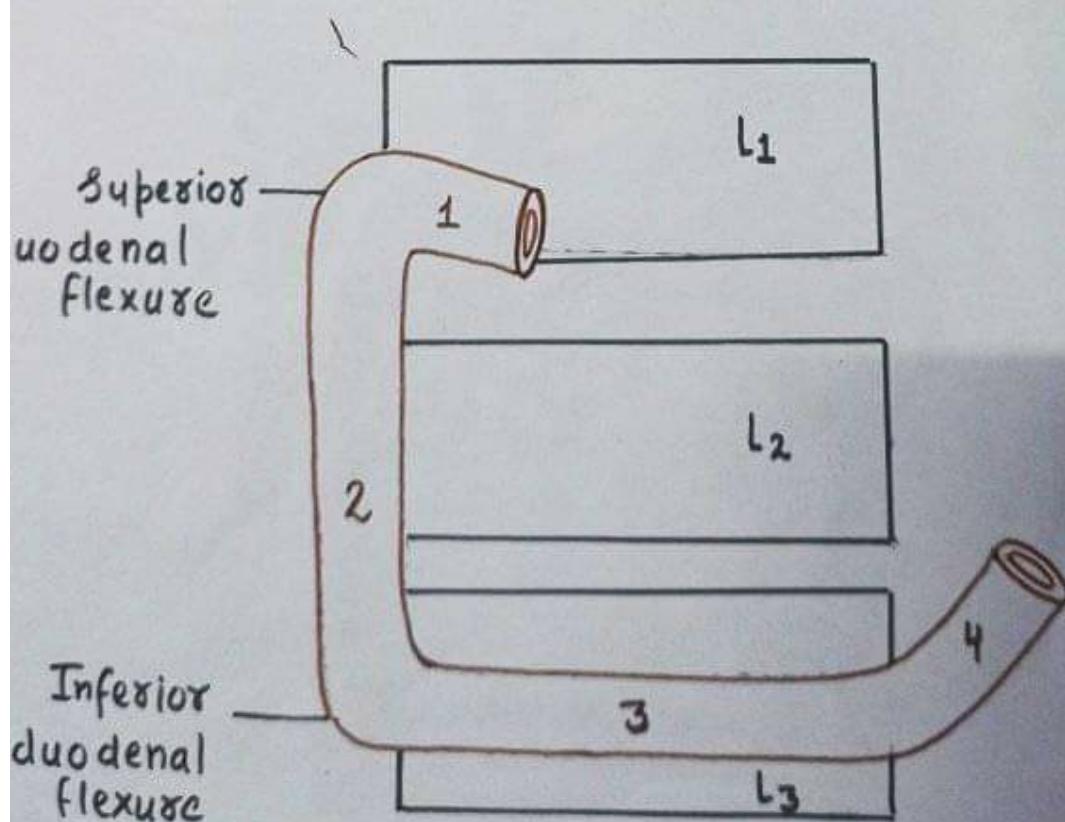
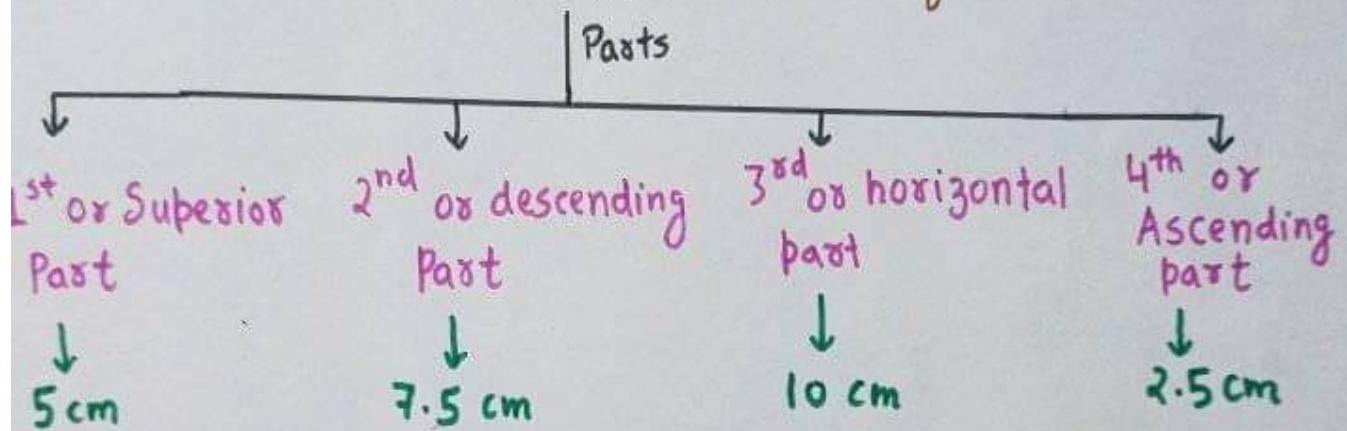


### BOUNDARIES OF EPIPLOIC FORAMEN

## DUODENUM

- Shortest, Widest & Most fixed part of Small Intestine
- Extends from Pylorus to duodenojejunal flexure

DUODENUM ( $\approx 25$  cm long in Adults)



PARTS OF DUODENUM

## FIRST OR SUPERIOR PART OF DUODENUM

COURSE:-

Begins at Pylorus  
↓

Passes backward, upward & to the right  
↓

Meet the Second Part at Superior duodenal flexure

VISCERAL RELATIONS:-

Anterior → Quadrate lobe of liver, gallbladder

Posterior → Gastroduodenal a., Bile duct, Portal Vein

Superiorly → Epiploic foramen

Inferiorly → Head & Neck of Pancreas

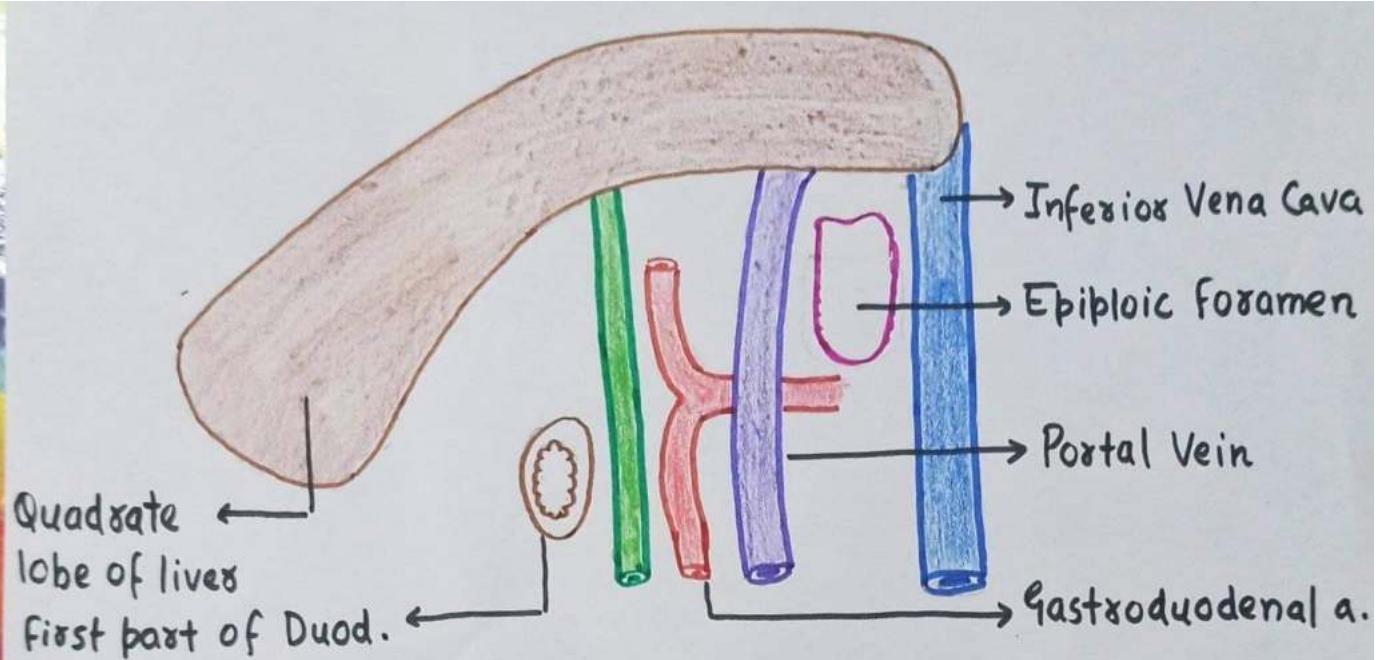
PERITONEAL RELATIONS:-

→ Proximal 2.5 cm is movable that is not retroperitoneal

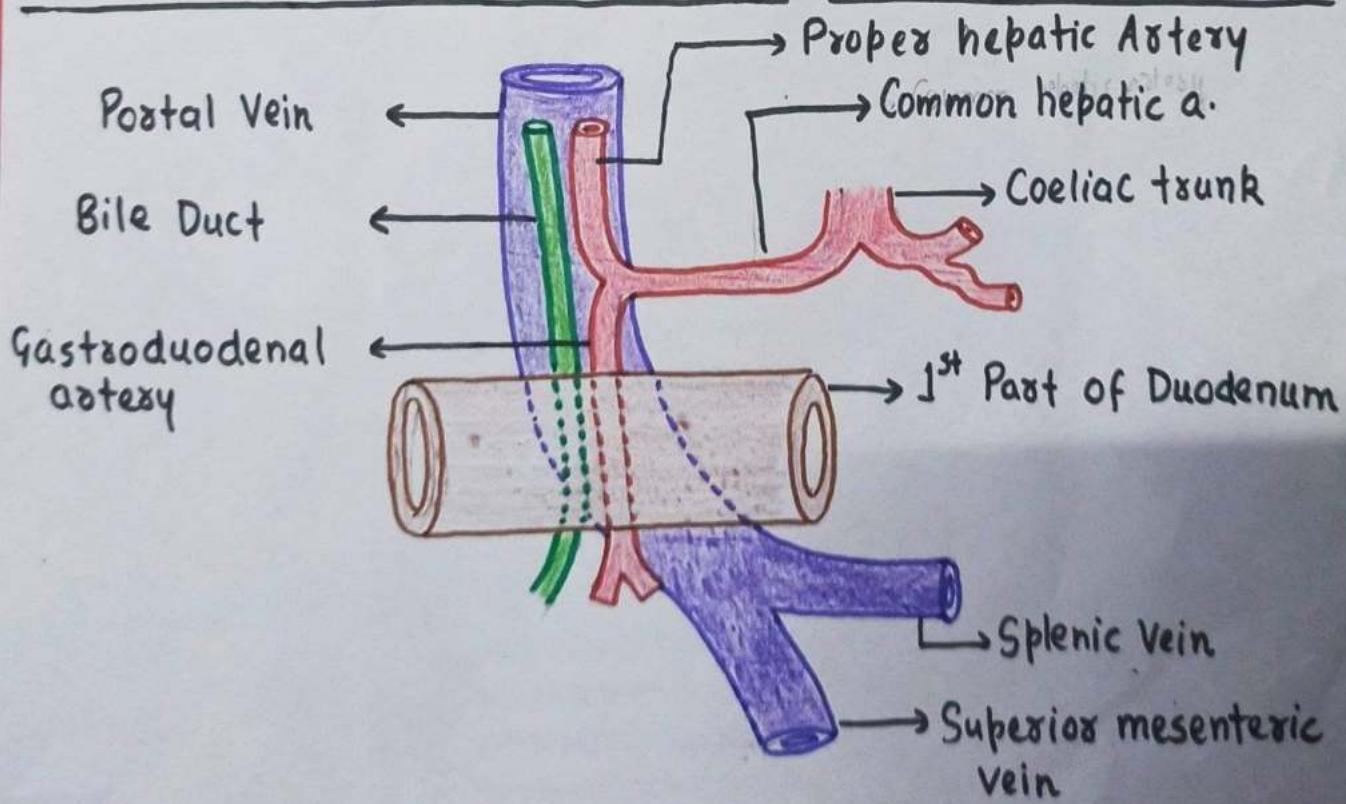
Attached to lesser omentum above & greater omentum below

→ Distal 2.5cm is retroperitoneal

i.e. covered with peritoneum only on its anterior aspect



### RELATIONS OF FIRST PART OF DUODENUM :- SAGITTAL SECTION LEFT VIEW



### FIRST PART OF DUODENUM :- POSTERIOR RELATIONS

## SECOND OR DESCENDING PART OF DUODENUM

COURSE:-

Begins at Superior Duodenal Flexure



Descends to reach the lower border of T<sub>3</sub>



Curves towards left



Meet the third part at inferior duodenal flexure

PERITONEAL RELATIONS:-

→ Retroperitoneal

→ Anterior Surface covered with Peritoneum except the area directly related to Colon

VISCERAL RELATIONS:-

Anterior — Right lobe of liver

— Transverse colon

— Root of Transverse Mesocolon

— Small Intestine

Posterior — Anterior Surface of Right Kidney (Near Medial border)

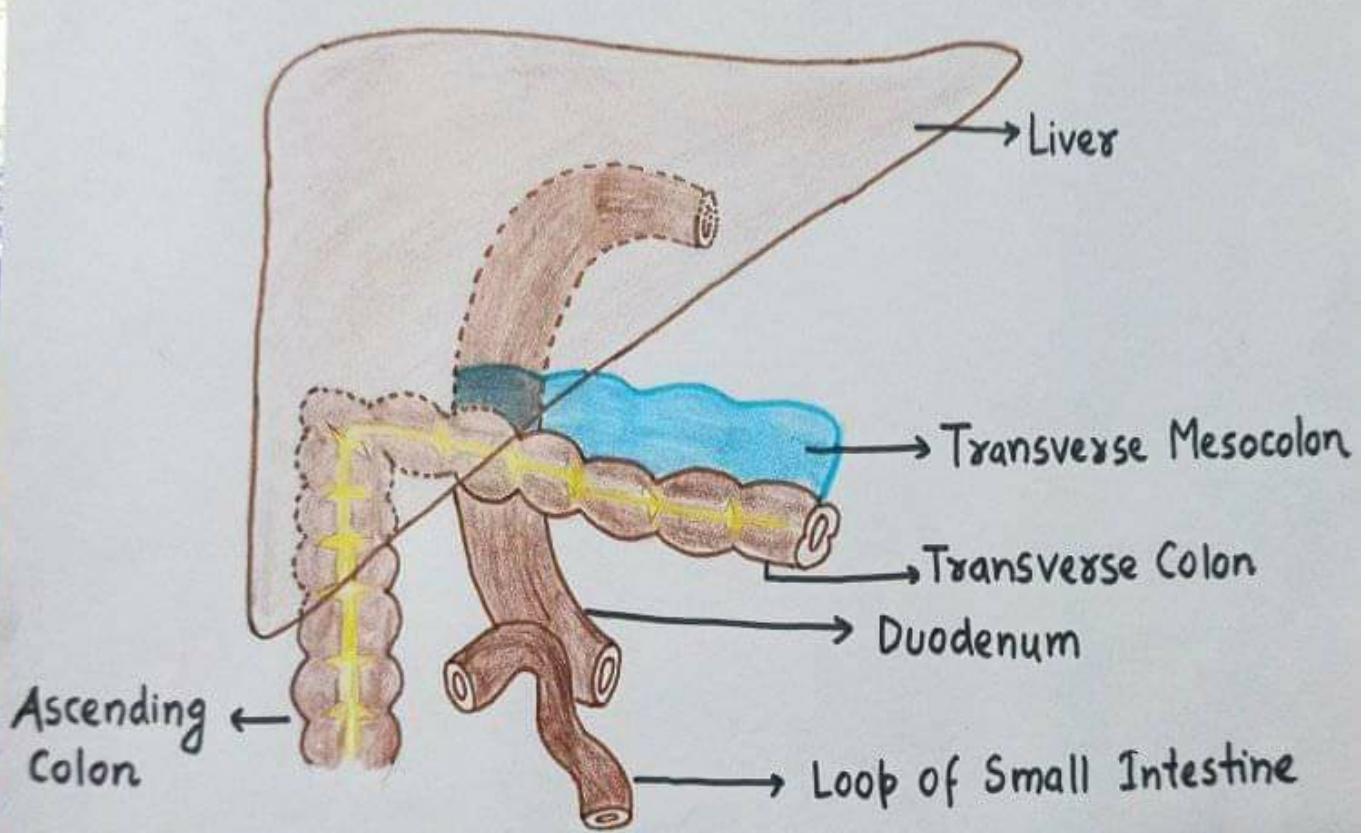
— Right renal vessels

— Right edge of Inferior Vena Cava

— Right Psoas Major

Medially — Head of Pancreas

Laterally — Right Colic Flexure

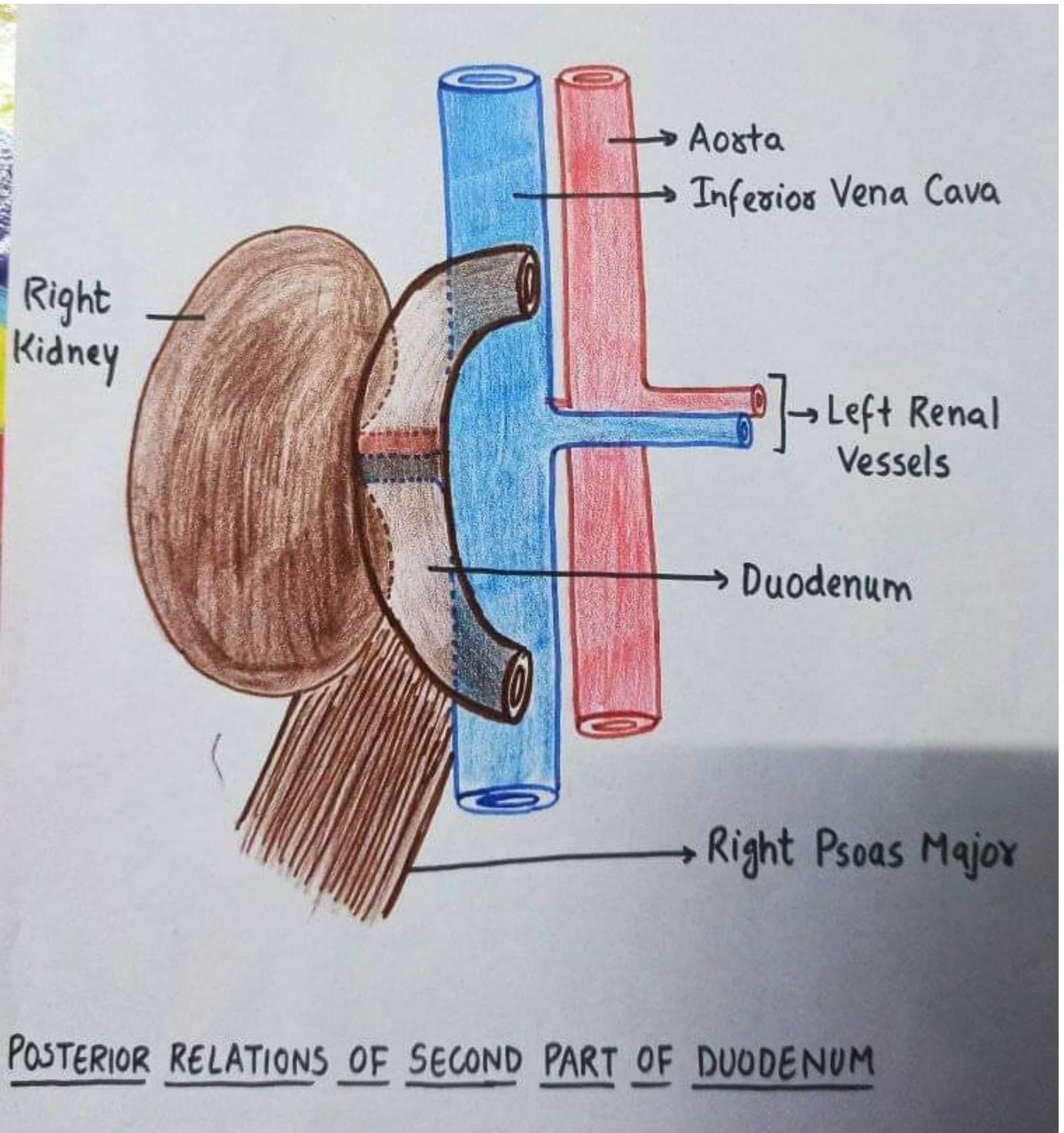


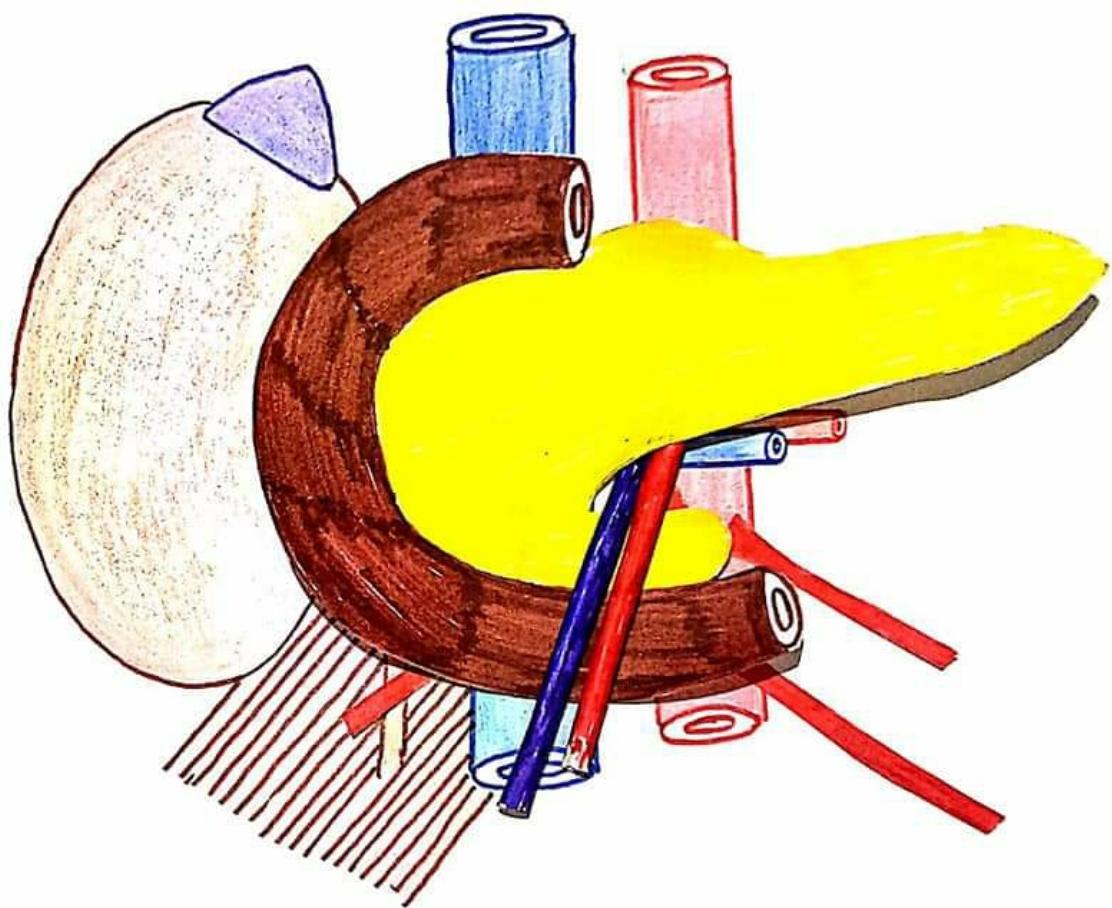
### ANTERIOR RELATIONS OF SECOND PART OF DUODENUM

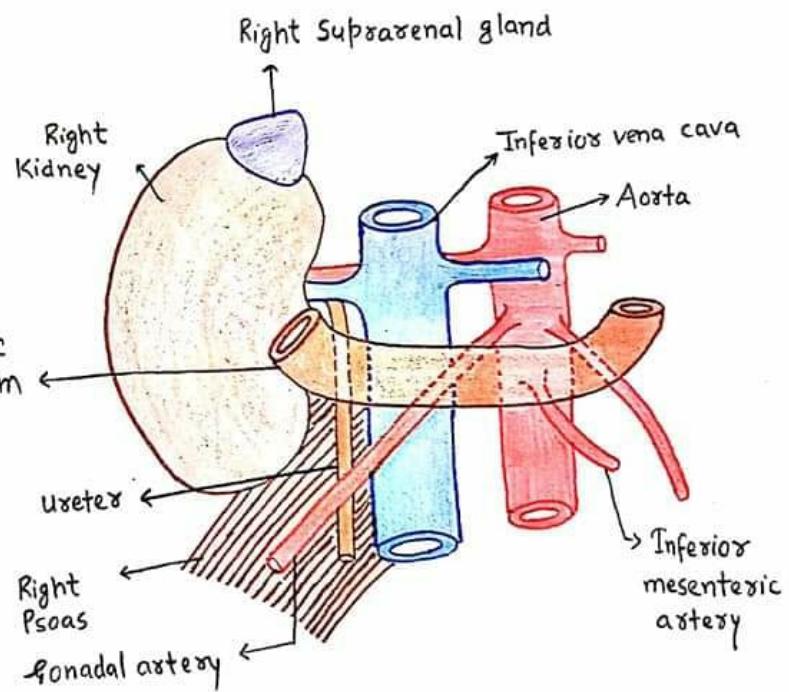
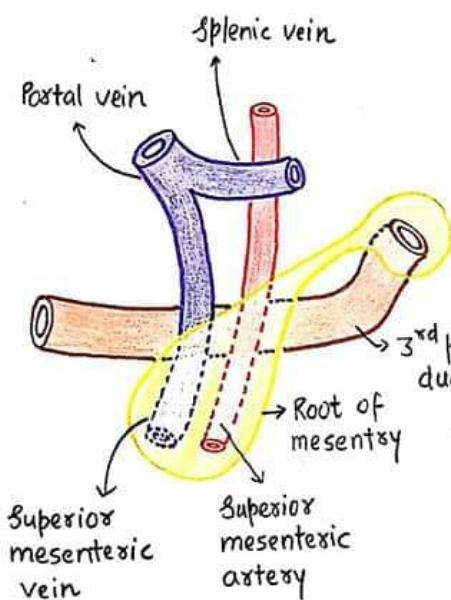
\* Transverse Mesocolon

↓

Fold of Peritoneum joining the Transverse Colon to dorsal Abdominal wall.







ANTERIOR AND POSTERIOR RELATIONS OF 3<sup>RD</sup> PART OF THE DUODENUM

## THIRD PART OF DUODENUM

### Course

Begins at inferior duodenal flexure, on the right side of lower border of third lumbar vertebra



Passes almost horizontally & slightly upwards



Ends by joining 4<sup>th</sup> part in front of abdominal aorta

### Peritoneal Relations

→ Retroperitoneal & fixed

→ Anterior surface is covered with peritoneum except in median plane, where it is crossed by superior mesenteric vessels & root of mesentery

## Visceral Relations

Anterior = Superior mesenteric vessels  
Root of mesentery

Posterior = Right ureter  
Right Psoas major  
Right testicular or ovarian vessels  
Inferior vena cava  
Abdominal aorta with origin of inferior mesenteric artery

Superior = Head of Pancreas with uncinate process

Inferior = Coils of Jejunum

## Formation of Rectus Sheath

### 1. Above the Costal Margin

Anterior wall → External Oblique aponeurosis.

Posterior wall → It is deficient

→ Rectus muscle rests directly on 5<sup>th</sup>, 6<sup>th</sup> & 7<sup>th</sup> costal cartilages

### 2. Between the costal margin & arcuate line

Anterior wall → External oblique aponeurosis

→ Anterior lamina of aponeurosis of internal oblique

Posterior wall → Posterior lamina of aponeurosis of internal oblique

→ Aponeurosis of transversus muscle

### 3. Below the Arcuate line

Anterior wall → Aponeurosis of all the 3 flat muscle of abdomen

→ Aponeurosis of transversus and internal oblique are fused

Posterior wall → It is deficient

→ The rectus muscle rest on the fascia transversalis

## FOURTH PART OF DUODENUM

### Course

Runs upwards on or immediately to the left of Aorta

↓  
Upto the upper borders of second lumbar vertebra

↓  
Turns forward to continuous with jejunum at duodenojejunal flexure

### Peritoneal Relations

Retroperitoneal i.e covered with peritoneum only on its anterior aspect

## Visceral Relations

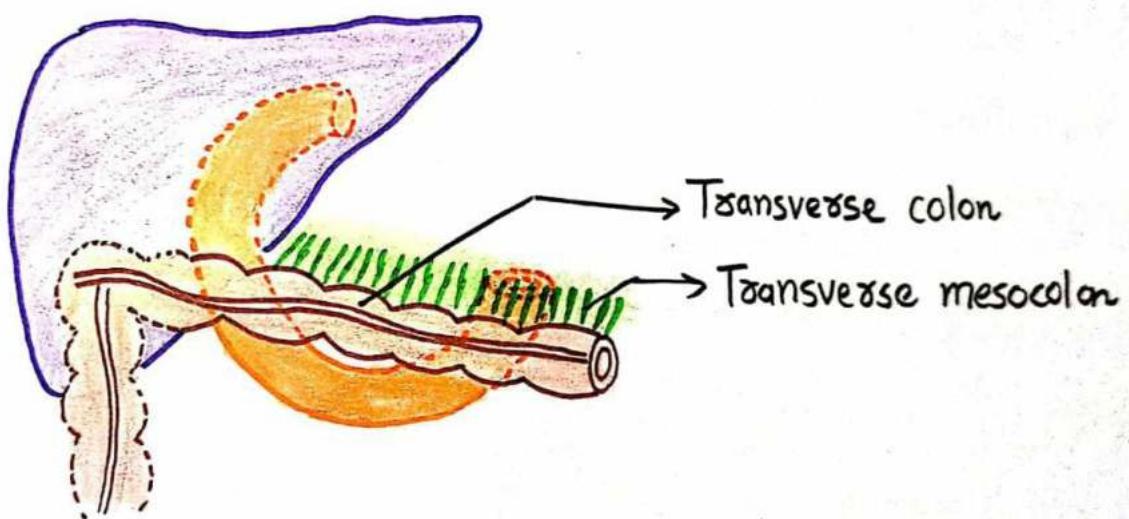
Anterior :- Transverse colon  
Transverse mesocolon  
Lesser sac  
Stomach

Posteriorly :- Left sympathetic chain  
Left Renal artery  
Left Gonadal artery  
Inferior mesenteric vein

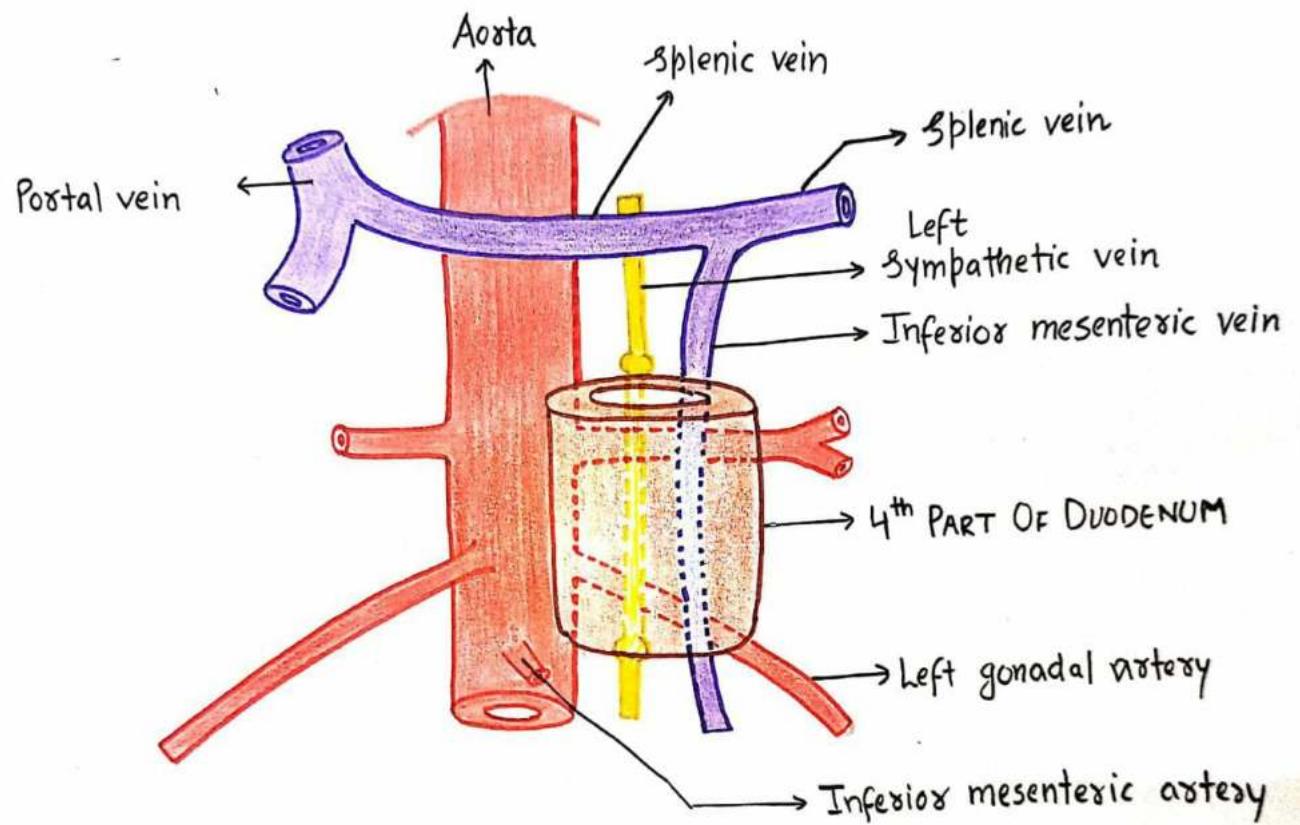
To right :- Upper part of root of mesentery

To left :- Left kidney  
Left ureter

Superiorly :- Body of Pancreas



## ANTERIOR RELATIONS

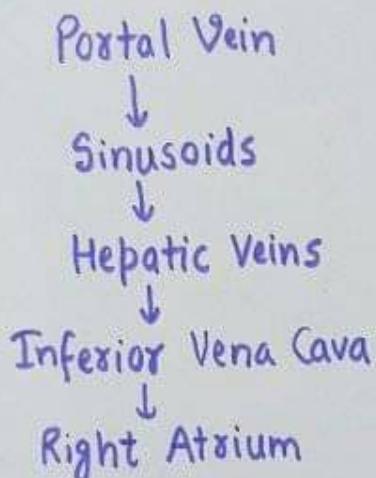


### POSTERIOR RELATIONS

## PORTAL VEIN

- \* Collect blood from Abdominal Part of Alimentary tract
  - Gallbladder
  - Pancreas
  - Spleen
- Convey it to liver

### Blood Flow



Sinusoids → Irregular tubular space for passage of blood, taking the place of capillaries & venules

### Formation

By Union of Superior Mesenteric & Splenic Veins behind the Neck of Pancreas at the level of L2 vertebra.

### Course

Runs Upward & little right

(Intraduodenal) First behind neck of Pancreas

(Retroduodenal) Next behind 1<sup>st</sup> Part of Duodenum

(Supraduodenal) Lastly in Right Free Margin of Lesser Omentum

## Termination

Ends at the right end of Porta hepatis by dividing into Right & Left branches.

## Relations

### INFRADUODENAL PART

Anterior = Neck of Pancreas

Posterior = Inferior Vena Cava

### RETRODUODENAL PART

Anterior = 1<sup>st</sup> Part of Duodenum

Bile Duct

Gastroduodenal artery

Posterior = Inferior Vena Cava

### SUPRADUODENAL PART

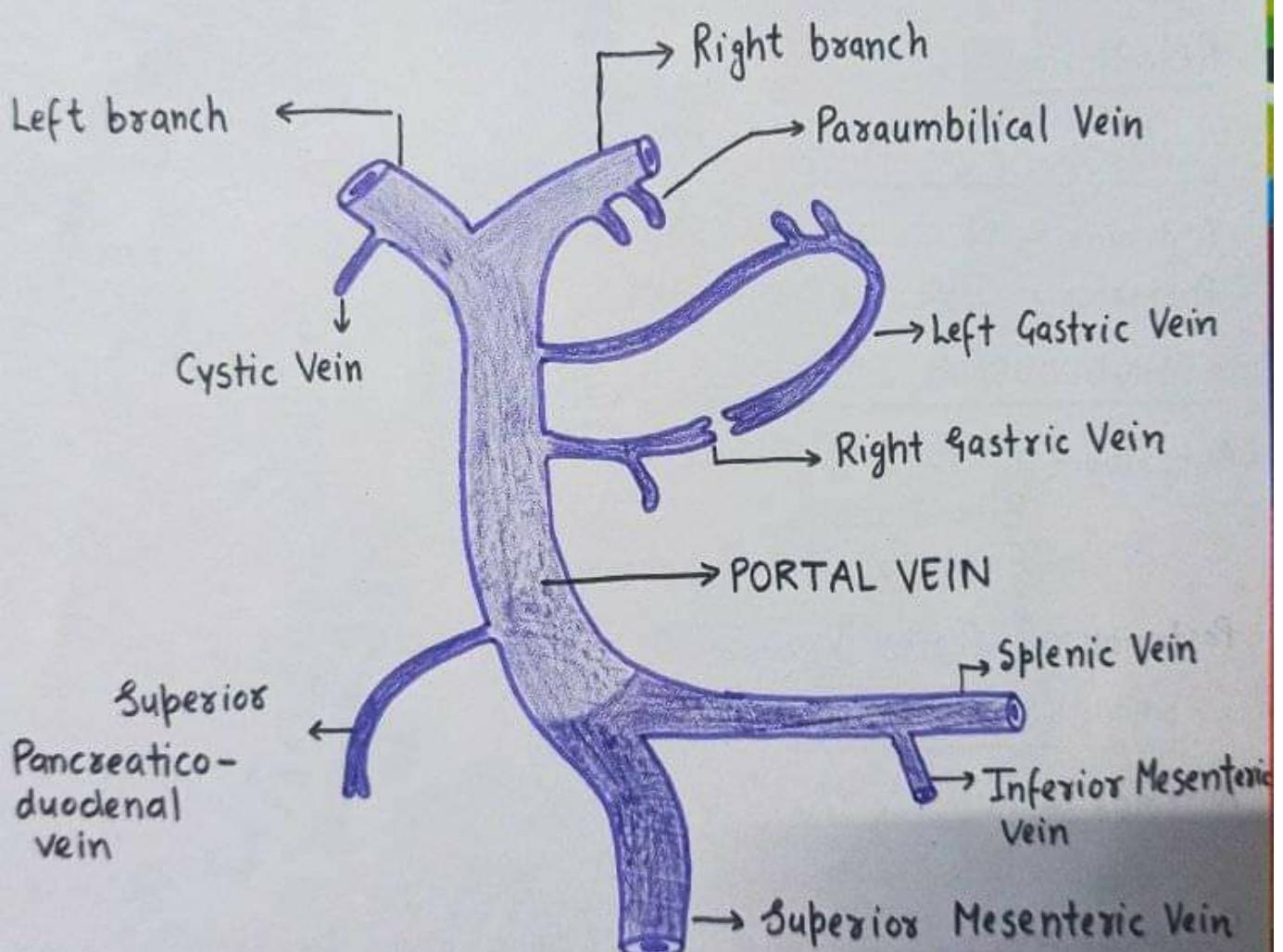
Anterior = Hepatic Artery

Bile duct

Posterior = Inferior Vena Cava (Separated by Epiploic Foramen)

## Branches

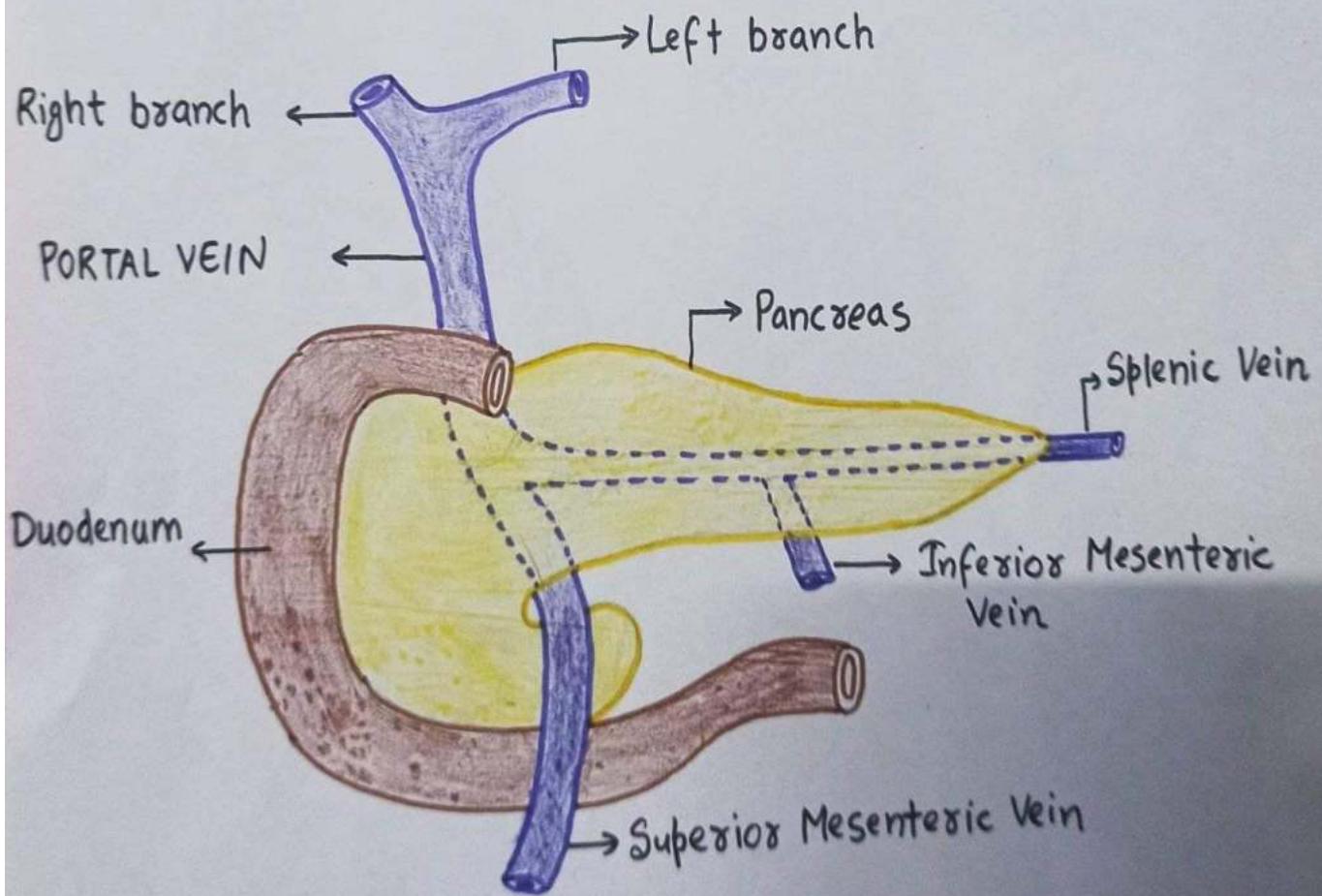
- Right Branch
- Left Branch



### BRANCHES AND TRIBUTARIES OF PORTAL VEIN

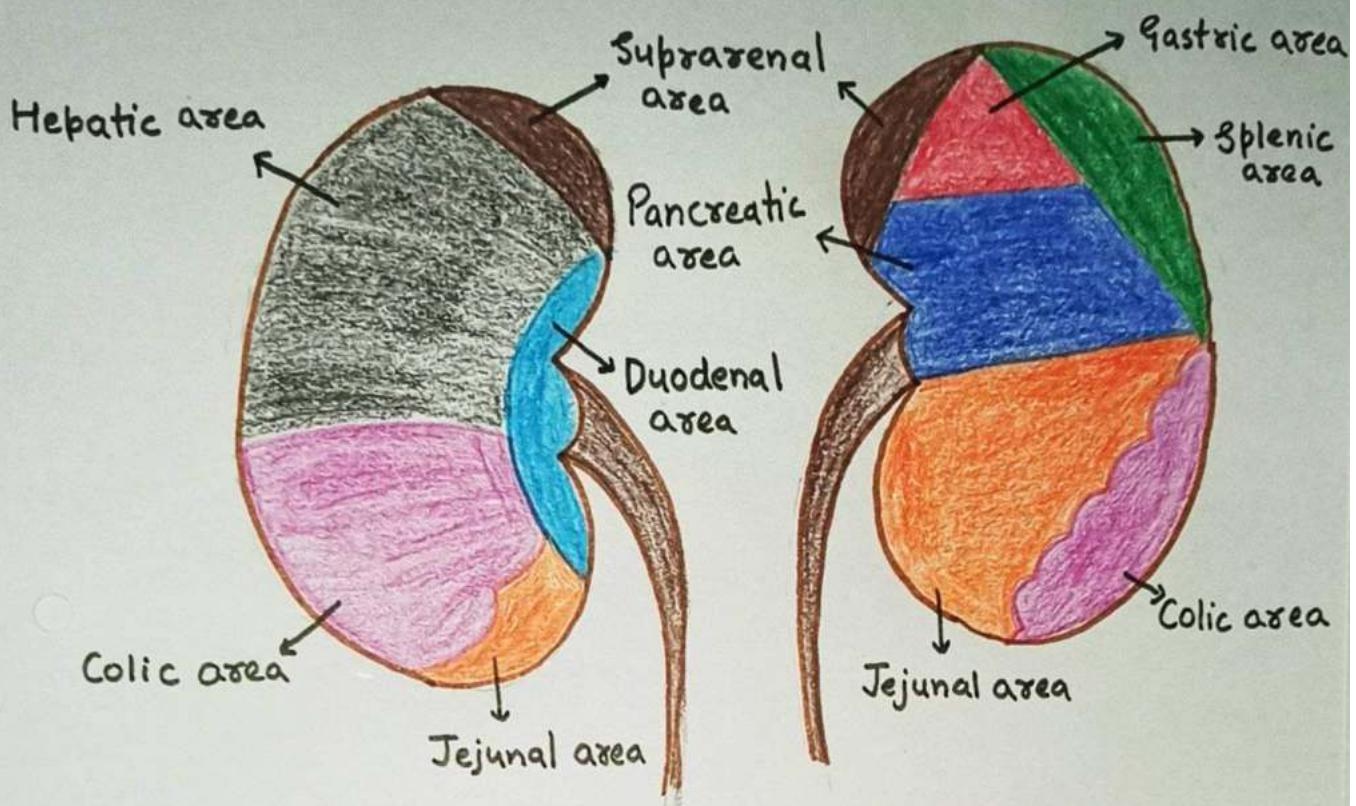
## Tributaries

1. Left Gastric Vein
2. Right Gastric Vein
3. Superior Pancreaticoduodenal Vein
4. Cystic Vein in its right branch
5. Paraumbilical Vein in its left branch



FORMATION , COURSE AND TERMINATION OF PORTAL VEIN

## ANTERIOR RELATIONS OF KIDNEYS



### Right Kidney

- Right Suprarenal gland
- Hepatic flexure of Colon
- Jejunum
- Liver
- Second part of duodenum

### Left Kidney

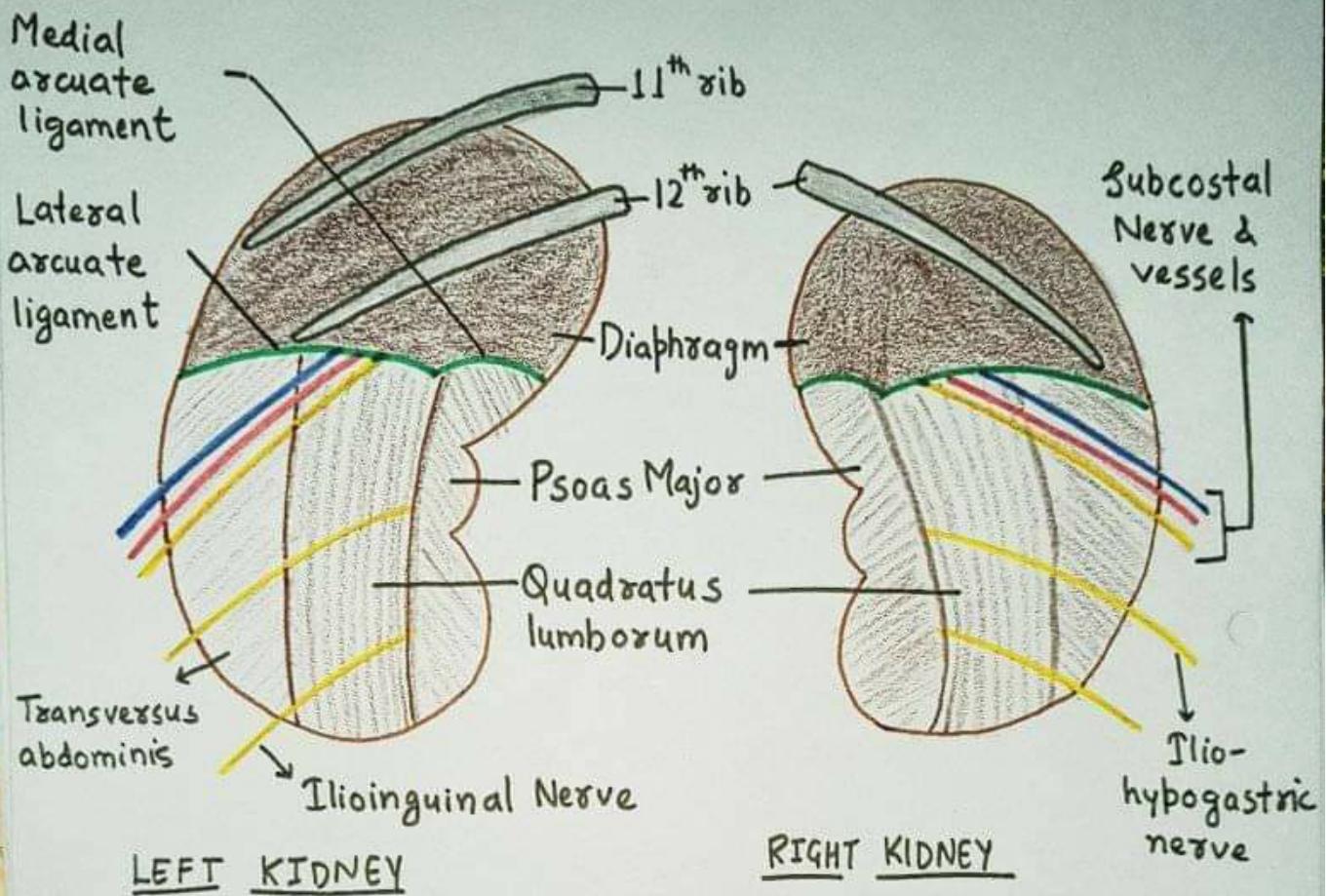
- Left Suprarenal gland
- Splenic flexure of Colon
- Jejunum
- Spleen
- Pancreas
- Stomach

#### NOTE:-

In right Kidney, hepatic and Intestinal Surface are covered by peritoneum.

while In left Kidney, gastric, splenic and jejunal surface are covered by peritoneum.

## POSTERIOR RELATIONS OF KIDNEYS



- Muscles
  - Diaphragm
  - Psoas Major
  - Quadratus lumborum
  - Transversus abdominis

- Nerves
  - Subcostal
  - Iliohypogastric
  - Ilioinguinal

- Subcostal vessels
- 12<sup>th</sup> rib in case of right Kidney  
11<sup>th</sup> & 12<sup>th</sup> rib in case of left Kidney

## CAVERNOUS SINUS

\* One of the paired Dural Venous Sinuses

- Spaces between the endosteal & meningeal layers of dura mater
- Spaces contain Venous blood

Location:

→ On either side of body of Sphenoid & sella turcica in the middle cranial fossa

Features:

- 2cm long
- 1cm wide
- Interior is divided into a no. of small spaces (caverns) by trabeculae  
    ↓  
    so called Cavernous Sinus

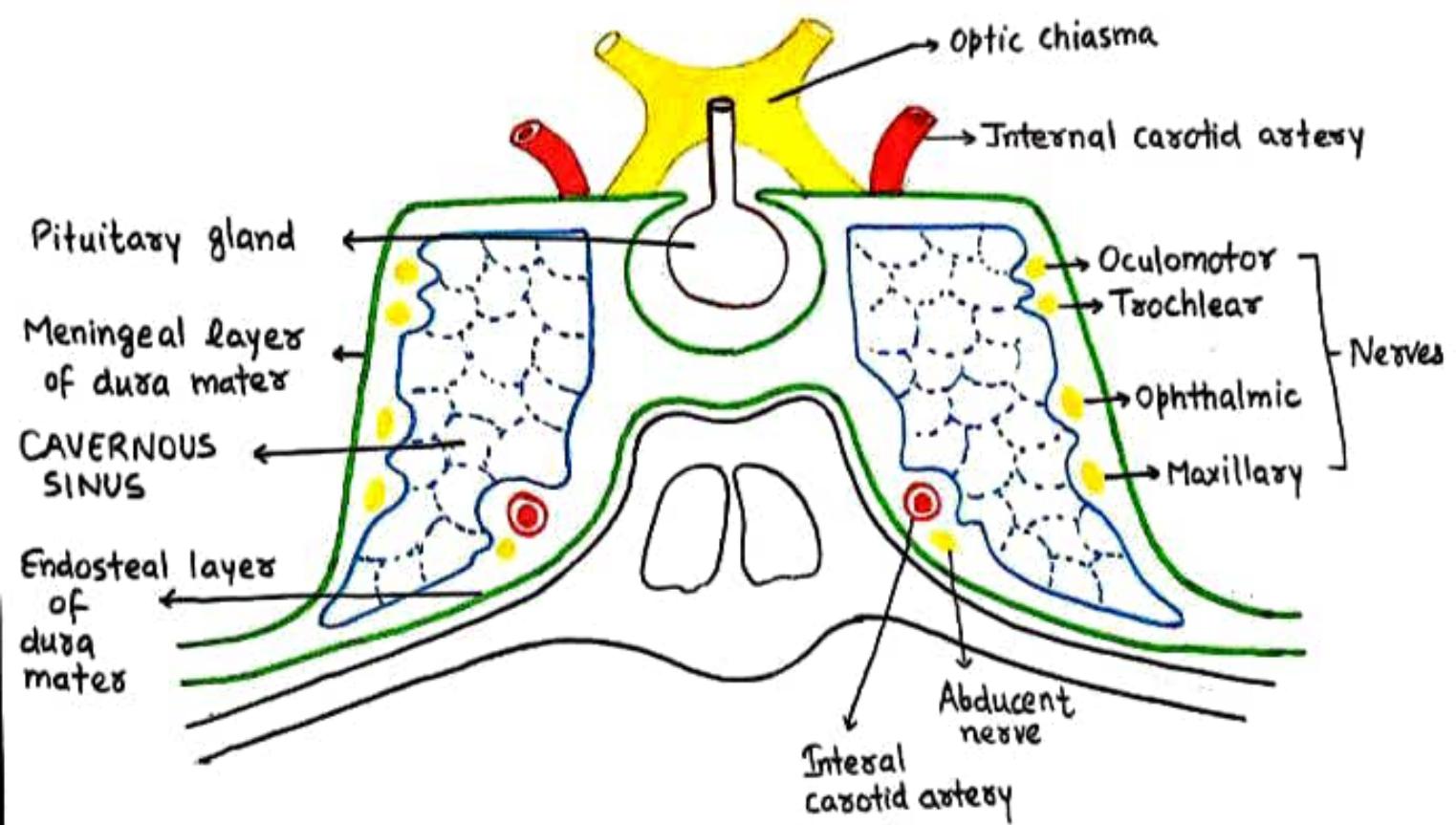
Boundaries:

- floor → Formed by Endosteal layer
  - Lateral wall
  - Medial wall
  - Roof
- } Formed by Meningeal layer

### Communications of Cavernous Sinus

Cavernous Sinus communicates with the:

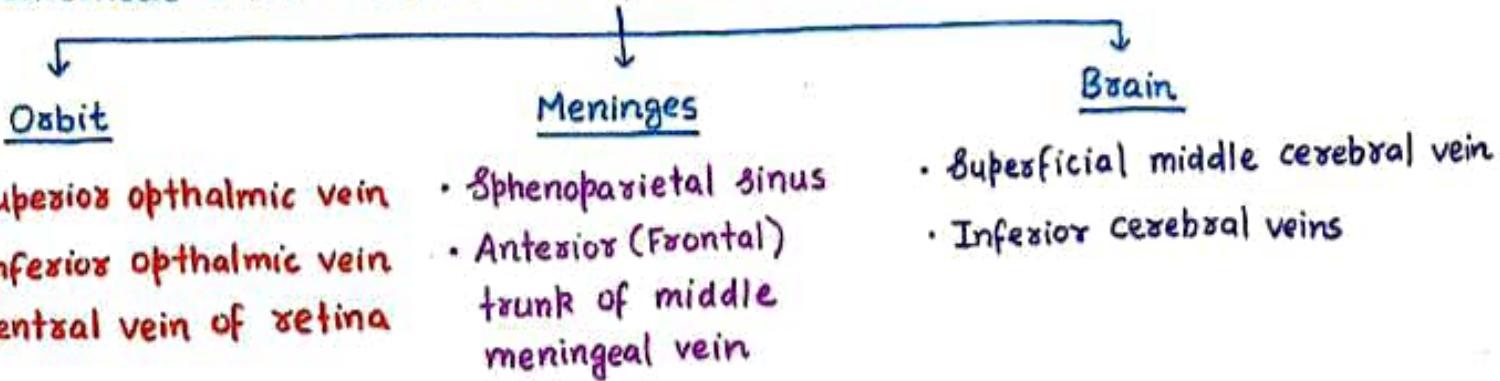
1. Transverse Sinus via Superior petrosal sinus
2. Internal jugular vein via inferior petrosal sinus
3. Pterygoid venous plexus via emissary veins
4. Facial vein via 2 routes:-
  - i) Superior ophthalmic vein → Angular vein → Facial vein
  - ii) Emissary veins → Pterygoid venous plexus → Deep facial vein → Facial vein
5. Opposite cavernous sinus via anterior & posterior intercavernous sinus.
6. Superior sagittal sinus via superficial middle cerebral vein
7. Internal vertebral venous plexus via basilar venous plexus

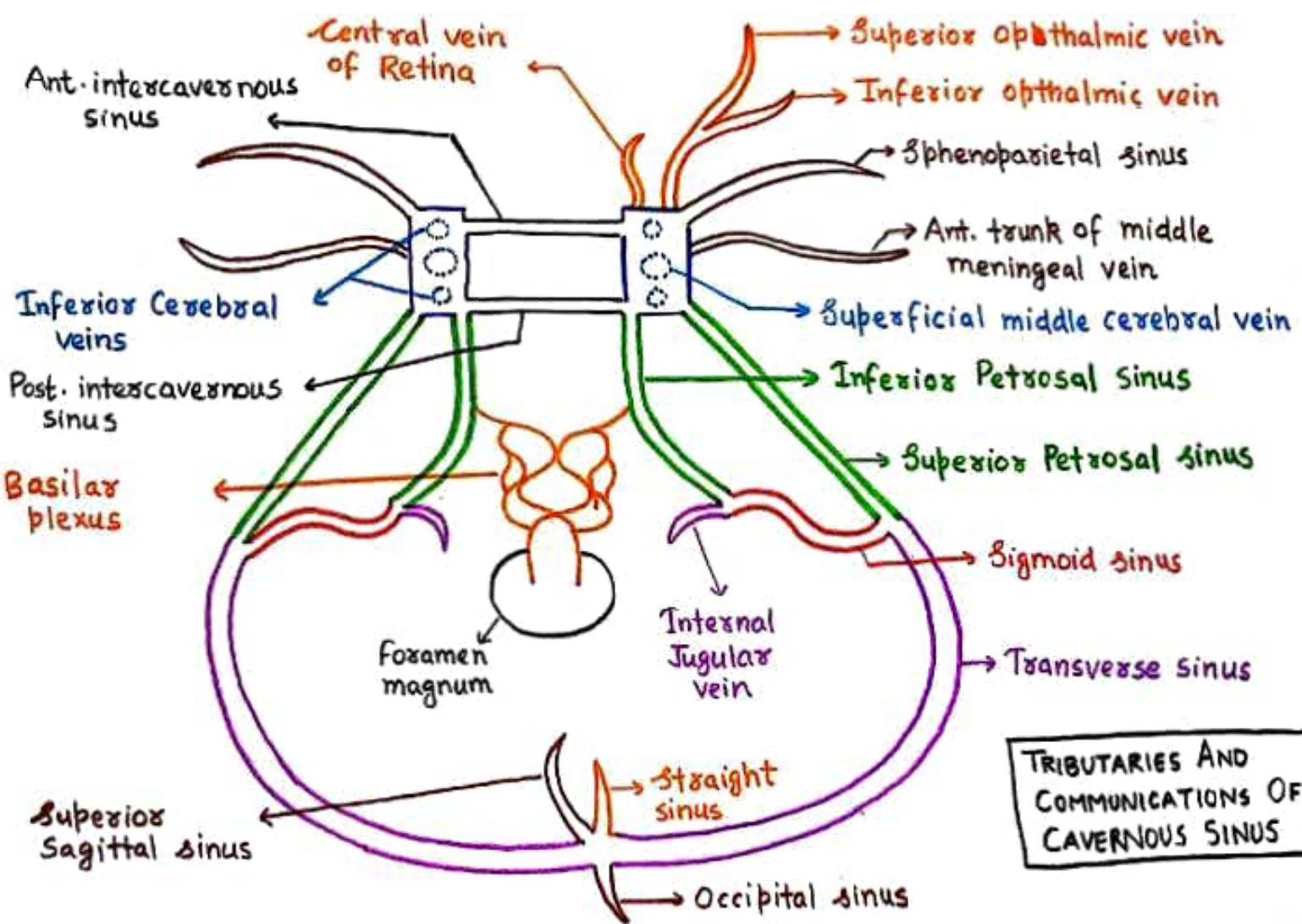


Coronal section through the middle cranial fossa showing Cavernous Sinuses

## Tributaries of the Cavernous Sinus

Cavernous Sinus receives blood from 3 sources





Extent:

- Anteriorly → upto medial end of superior orbital fissure
- Posteriorly → petrous part of temporal bone

Relations:

- Superior → Optic chiasma  
Optic tract  
Internal carotid artery
- Inferior → foramen lacerum  
Junction of body & greater wing of sphenoid
- Medial → Pituitary gland (hypophysis cerebri)  
Sphenoid air sinus
- Lateral → Temporal lobe
- Anterior → Superior orbital fissure  
Apex of the orbit
- Posterior → Petrous part of temporal bone  
Crus Cerebri of midbrain

Structures Present In The Lateral Wall of Sinus :-

Oculomotor Nerve [C.N=3]

Trochlear Nerve [C.N=4]

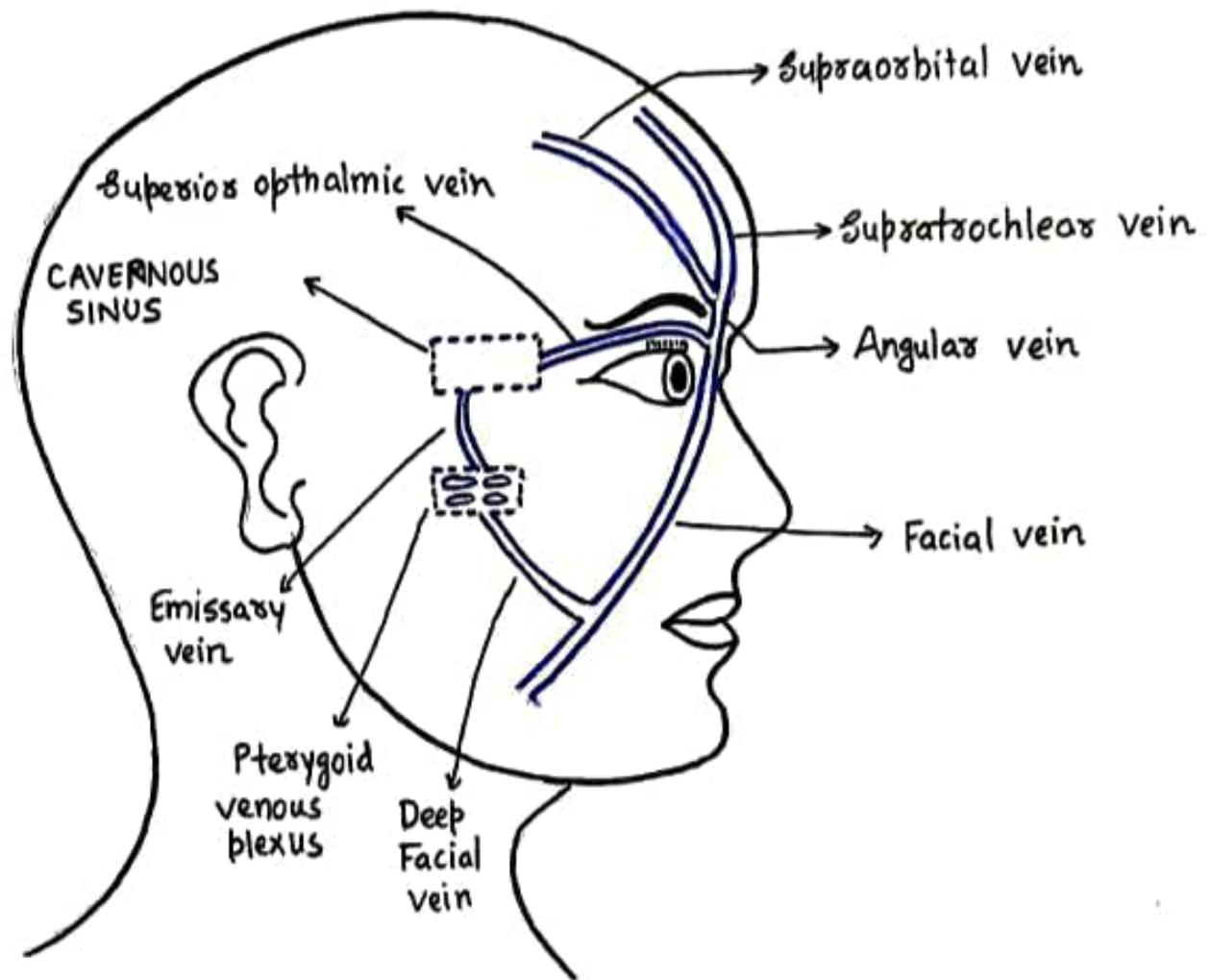
Ophthalmic Nerve [C.N=5 I]

Maxillary Nerve [C.N= 5 II]

Structures Passing Through Cavernous Sinus :-

Internal carotid artery

Abducent nerve



## NASAL SEPTUM → CLINICAL ANATOMY



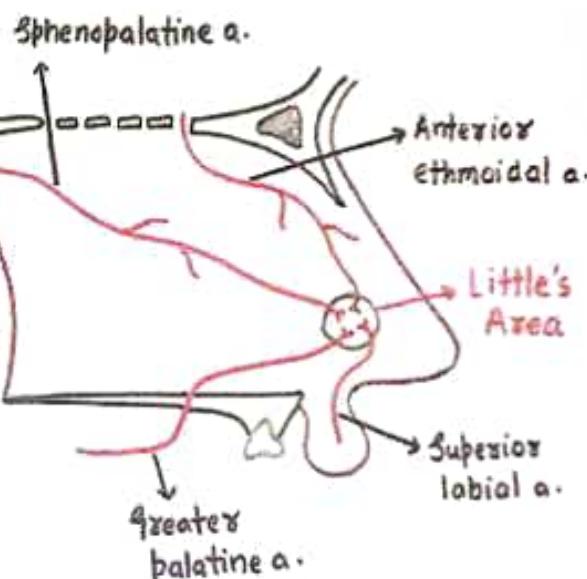
### LITTLE'S AREA

- Area in the anteroinferior part of Nasal Septum
- Highly vascular
- Here septal branches of
  - Ant. Ethmoidal a.
  - Sphenopalatine a.
  - Greater palatine a.
  - Superior labial a.

↓

Kiesselbach's plexus ←      Anastomose to form  
a vascular plexus
- Commonest site of Epistaxis (Nose bleeding)

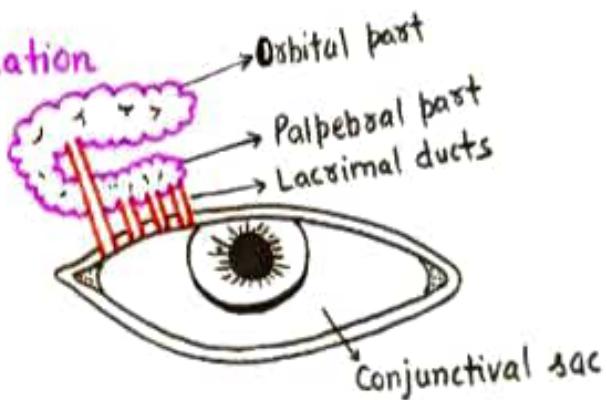
↓  
Due to finger nail trauma following  
picking of the nose



Nose Picking  
 Act of Extracting nasal mucus  
 with one's finger

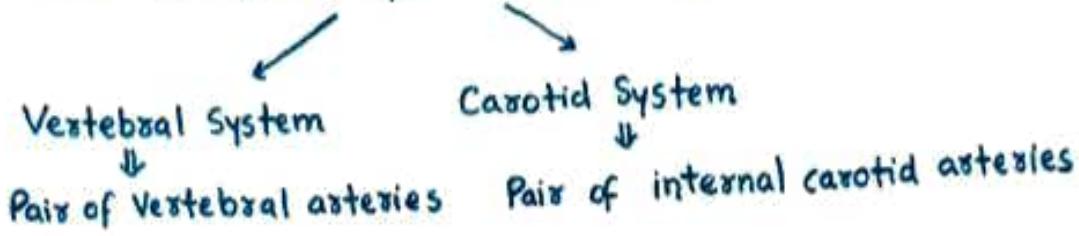
## LACRIMAL APPARATUS = CLINICAL CORRELATION

- + When lacrimal gland fails to secrete lacrimal fluid
  - ↓  
Artificial tears are instilled in the eye at regular intervals
    - ↓  
This prevent the cornea from drying & dessication
- + Removal of Palpebral part of lacrimal gland is functionally equivalent to removal of entire lacrimal gland
  - ↓  
Because ducts from orbital part traverse the palpebral part to open into conjunctival sac
- + Removal of entire lacrimal gland doesn't lead to dryness of Conjunctiva
  - ↓  
Because it is kept moist by secretions of accessory lacrimal glands.
    - 35-40 in upper eyelid
    - 6-8 in lower eyelid



## BLOOD SUPPLY OF THE BRAIN

Brain is supplied by 2 system of arteries



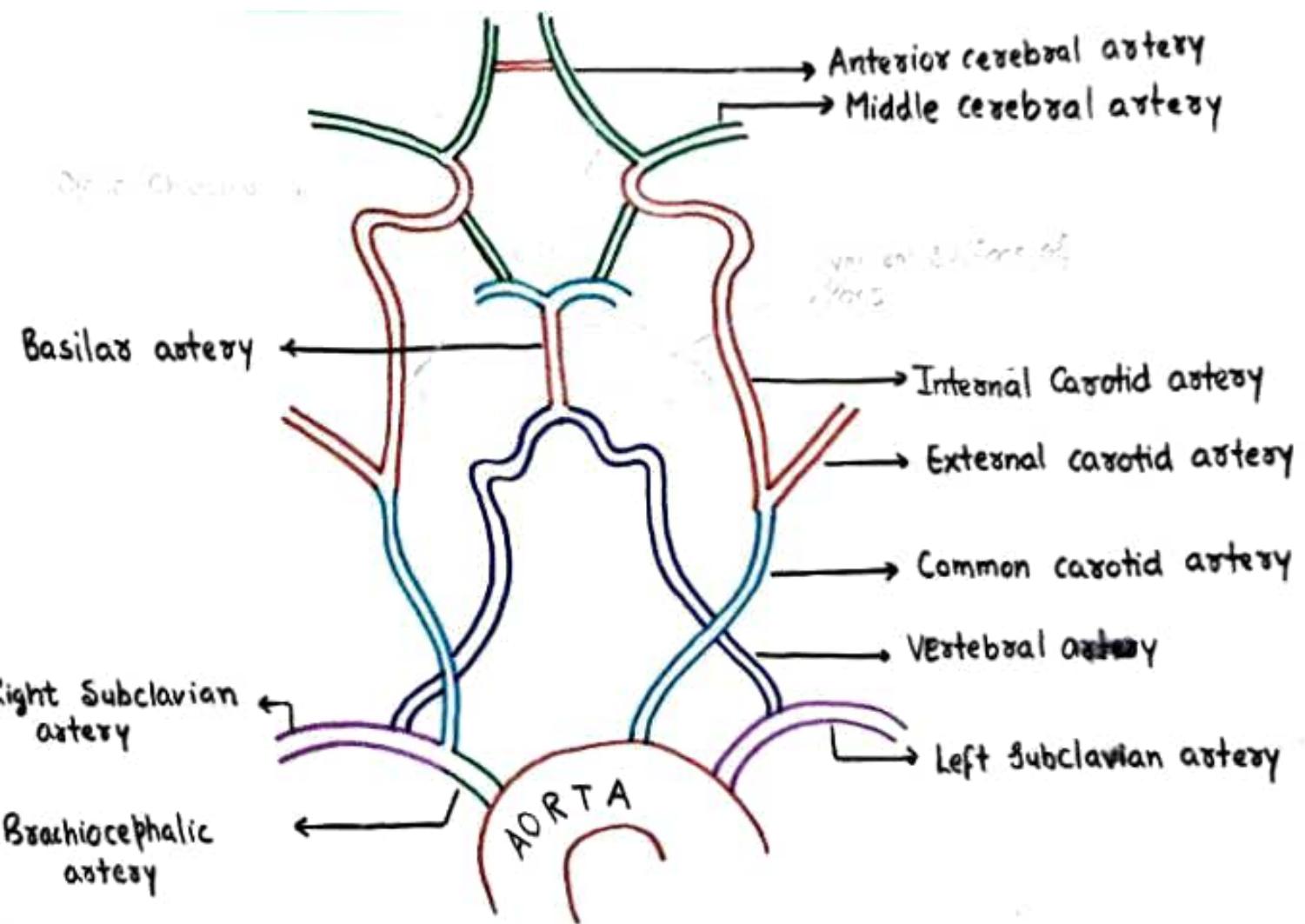
### Vertebral Arteries

- \* 2 Vertebral arteries unite at lower border of pons to form Basilar artery
  - ↓  
Basilar artery ascends in the midline on ventral surface of pons
  - ↓  
At upper border of pons terminates by dividing into right & left posterior cerebral arteries.

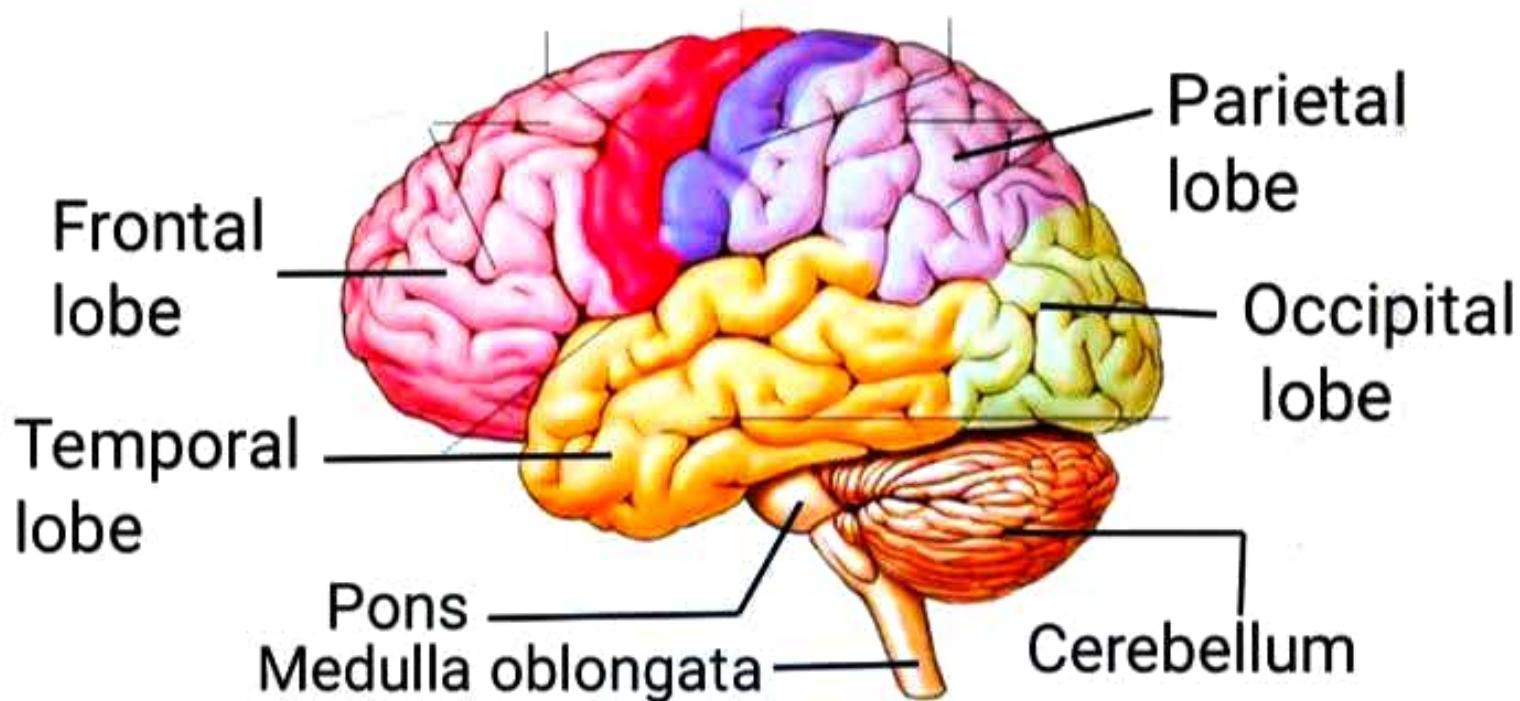
### Internal Carotid Arteries

Each <sup>internal</sup> carotid artery end in the region of anterior perforated substance

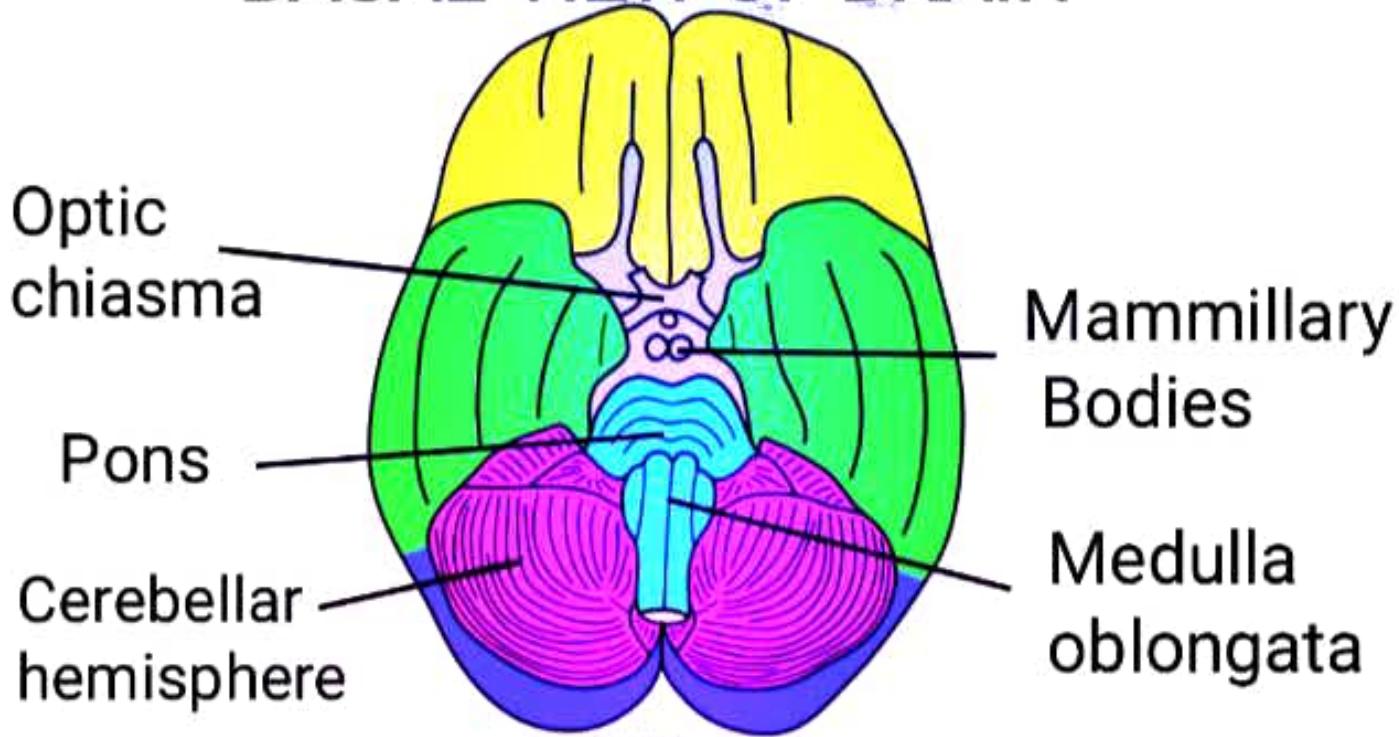
Dividing into < Middle cerebral artery  
Anterior cerebral artery



## LATERAL VIEW OF BRAIN



## BASAL VIEW OF BRAIN



## Branches Of The Main Arteries of The Brain

Cerebral part of ICA  
(Internal carotid artery)

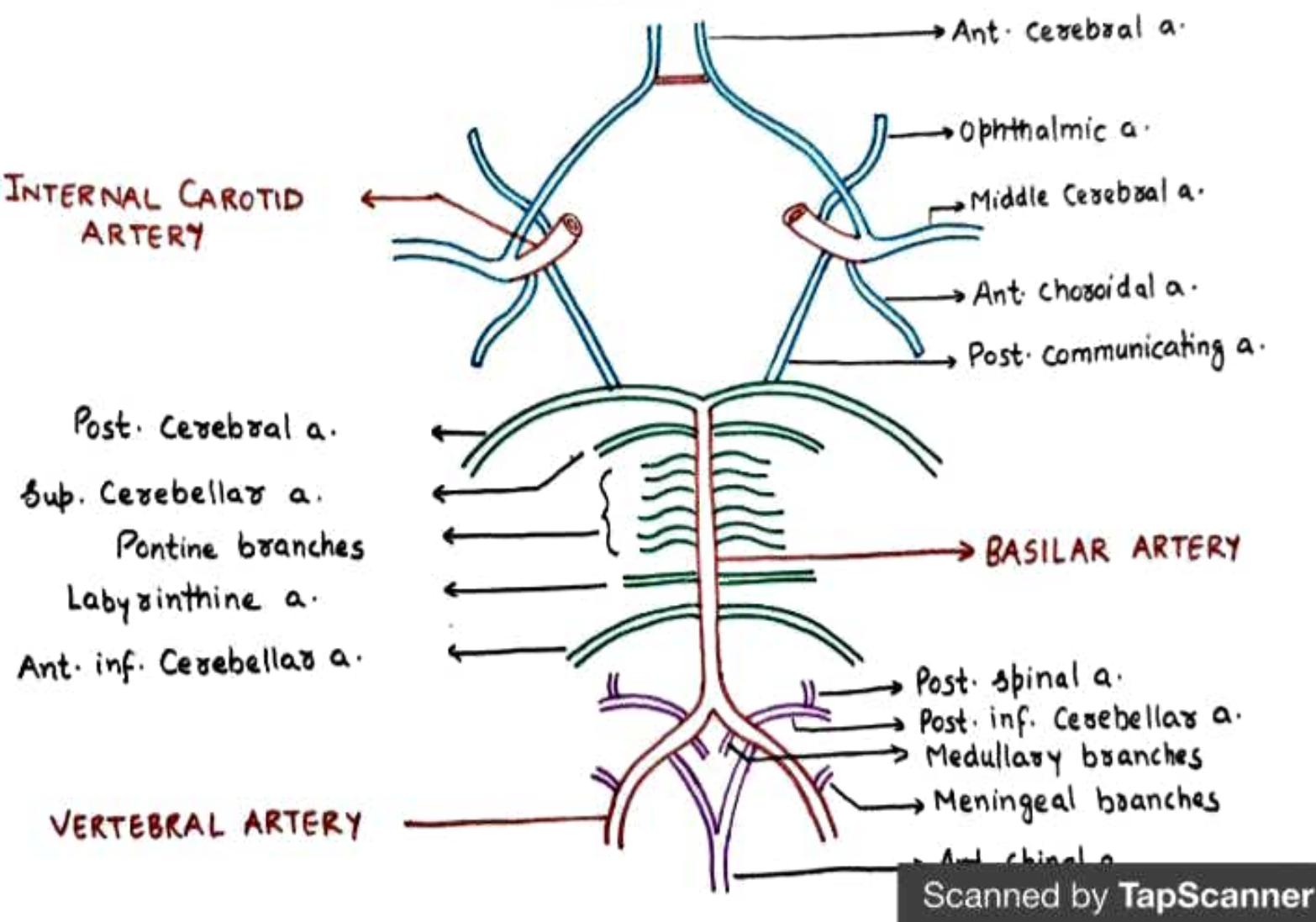
Ophthalmic artery  
Anterior cerebral a.  
Middle cerebral a.  
Posterior communicating a.  
Anterior choroidal a.

4<sup>th</sup> part of Vertebral Artery

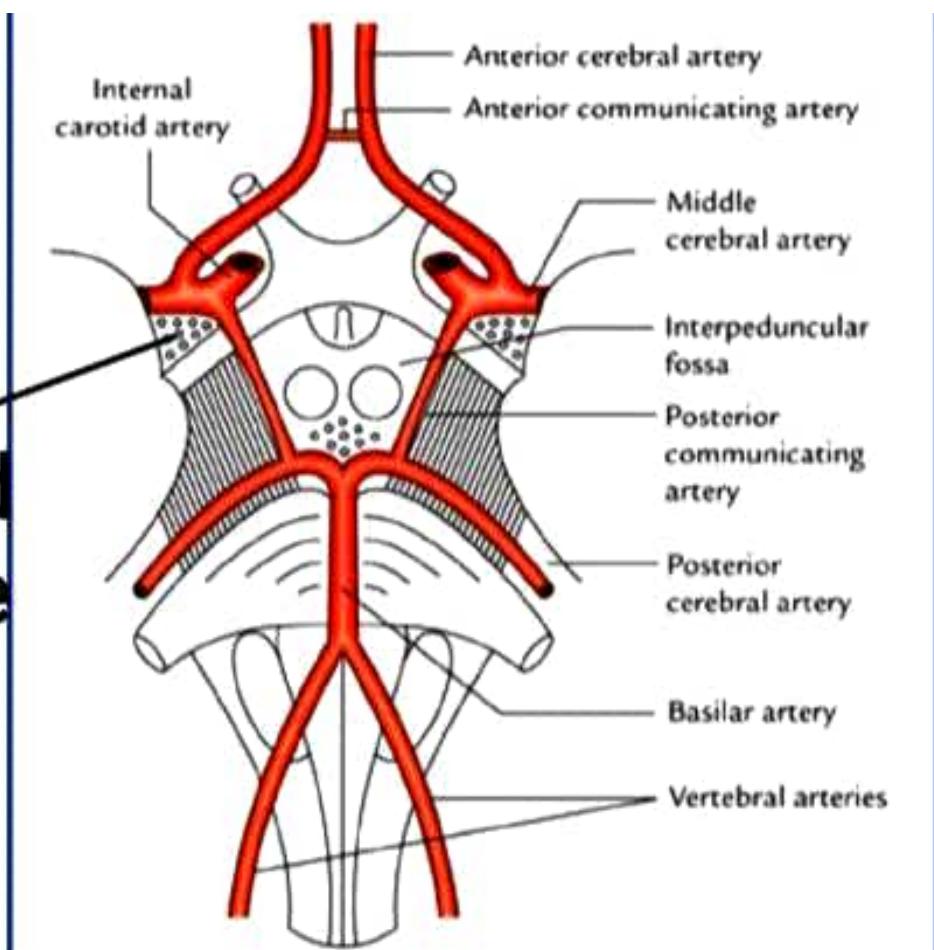
Meningeal arteries  
Anterior spinal a.  
Posterior spinal a.  
Posterior inferior cerebellar a.  
Medullary arteries

Basilar Artery

Anterior inferior cerebellar a.  
Labyrinthine a.  
Pontine arteries  
Superior cerebellar a.  
Posterior cerebral a.



# Anterior perforated substance



## Circle of Willis / Círculo Arterioso

- \* Branches of basilar & internal carotid arteries get interconnected to one another at the base of brain



Form six sided polygon of arteries called Circle of Willis or Círculo arterioso

- \* Formed around interpeduncular fossa

- \* Contributes most of arterial blood supply of brain.

- \* Formation :-

Anteriorly = By anterior communicating & anterior cerebral arteries

Posteriorly = By basilar artery dividing into 2 post. cerebral arteries

Laterally on each side = By post. communicating artery

- \* Functional Significance

If one of the major arteries forming the Circle of Willis is blocked, the circle of Willis provides the various alternative routes for collateral circulation like an arterial traffic circle.

## Circle of Willis $\Rightarrow$ Clinical Anatomy

Aneurysm

Excessive localized swelling of wall of an artery

### + Congenital Cerebral Aneurysms / Berry Aneurysms

Berry Shaped

- \* Occurs mostly at the site where 2 arteries join in the formation of circle of Willis
- \* Basic abnormality at these points is congenital deficiency of tunica media (elastic tissue) in arterial wall.

### + Subarachnoid Haemorrhage

- \* Commonly results from rupture of berry aneurysm in interpeduncular cistern
- \* Subarachnoid haemorrhage  $\rightarrow$  Sudden pain in head  $\rightarrow$  Mental confusion
- \* Death may quickly occur, or the patient may survive the first bleeding only to die few days or weeks later

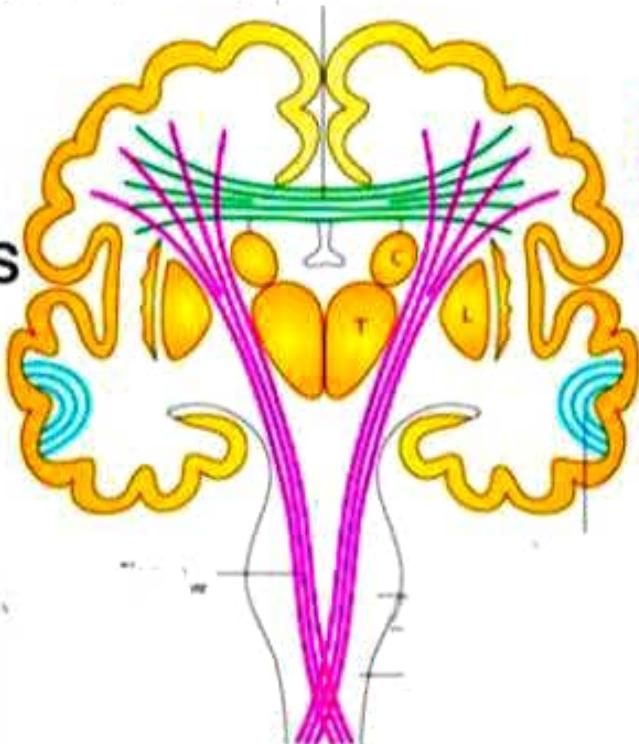
## Coronal section of Brain



Showing types  
of nerve fiber  
tracts in  
white matter  
of cerebrum

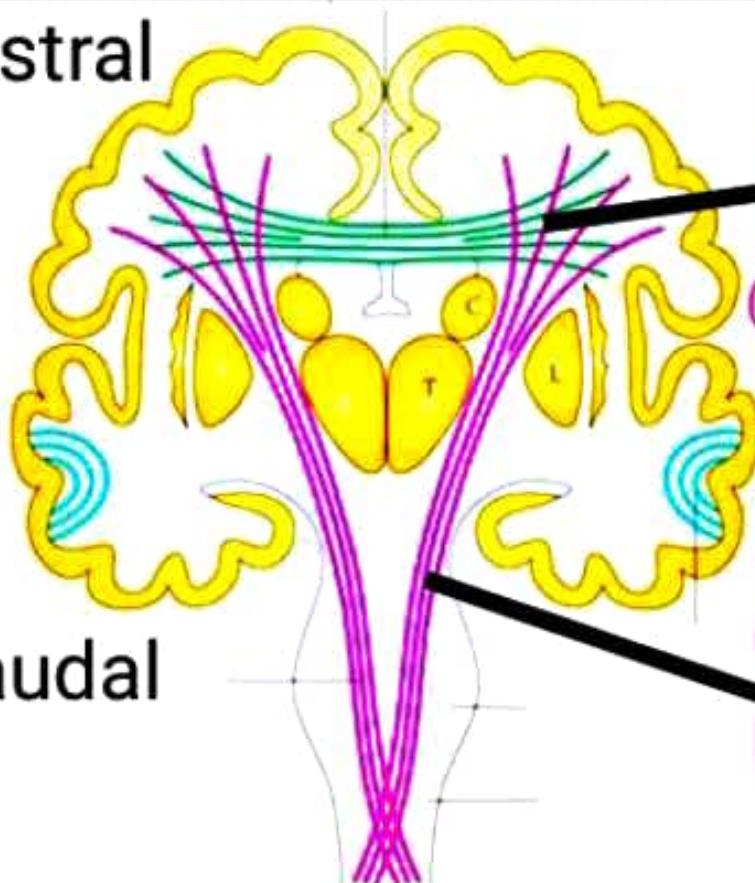
### TYPES:

Projection fibers  
Commissural f.  
Association f.



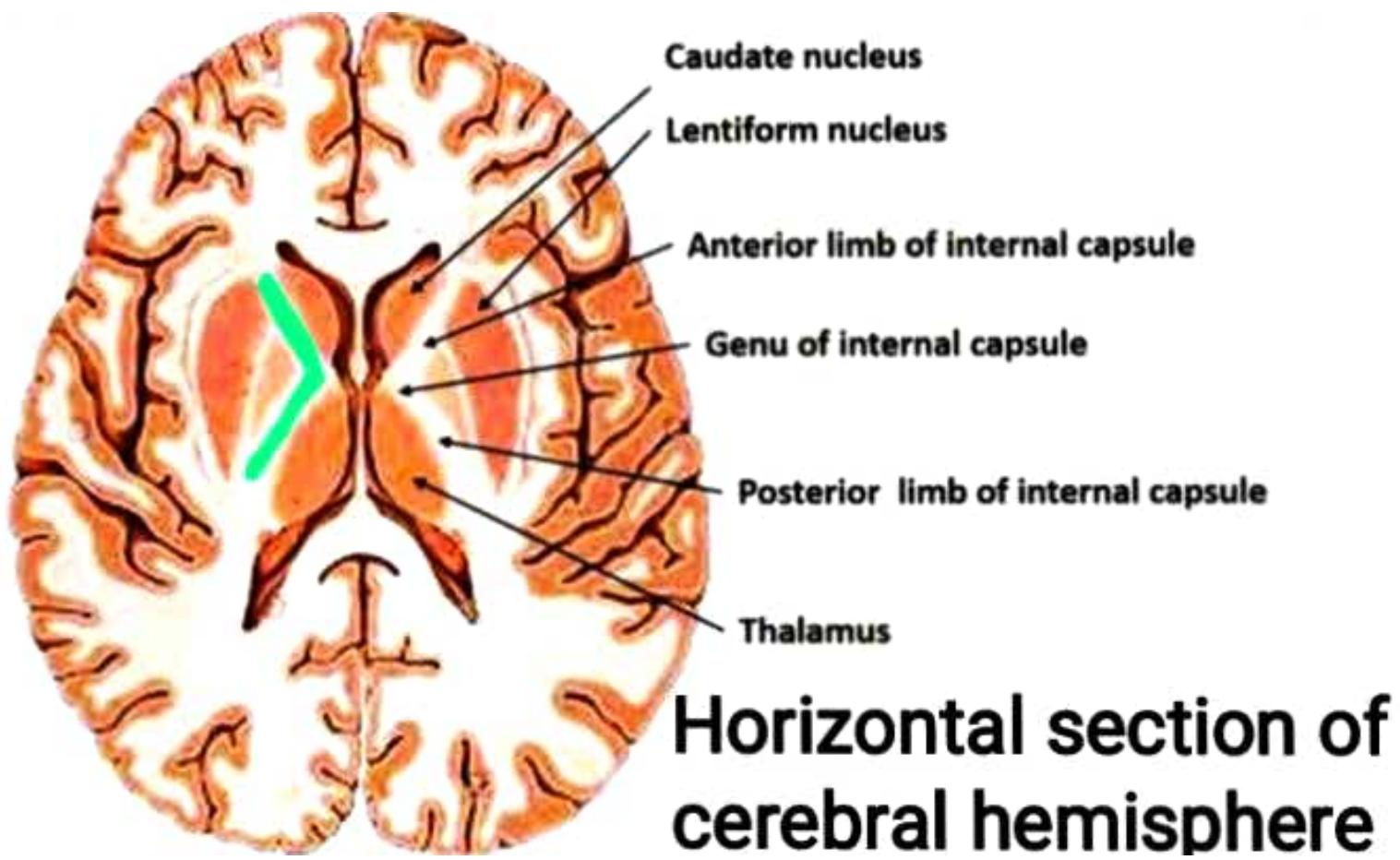
**Rostral**

**Caudal**



**Fanned  
projection f.  
(Corona radiata)**

**Condensed  
projection f.**



## Types Of Nerve Fiber Tracts In White Matter Of CEREBRUM

### 1. Projection Fibers

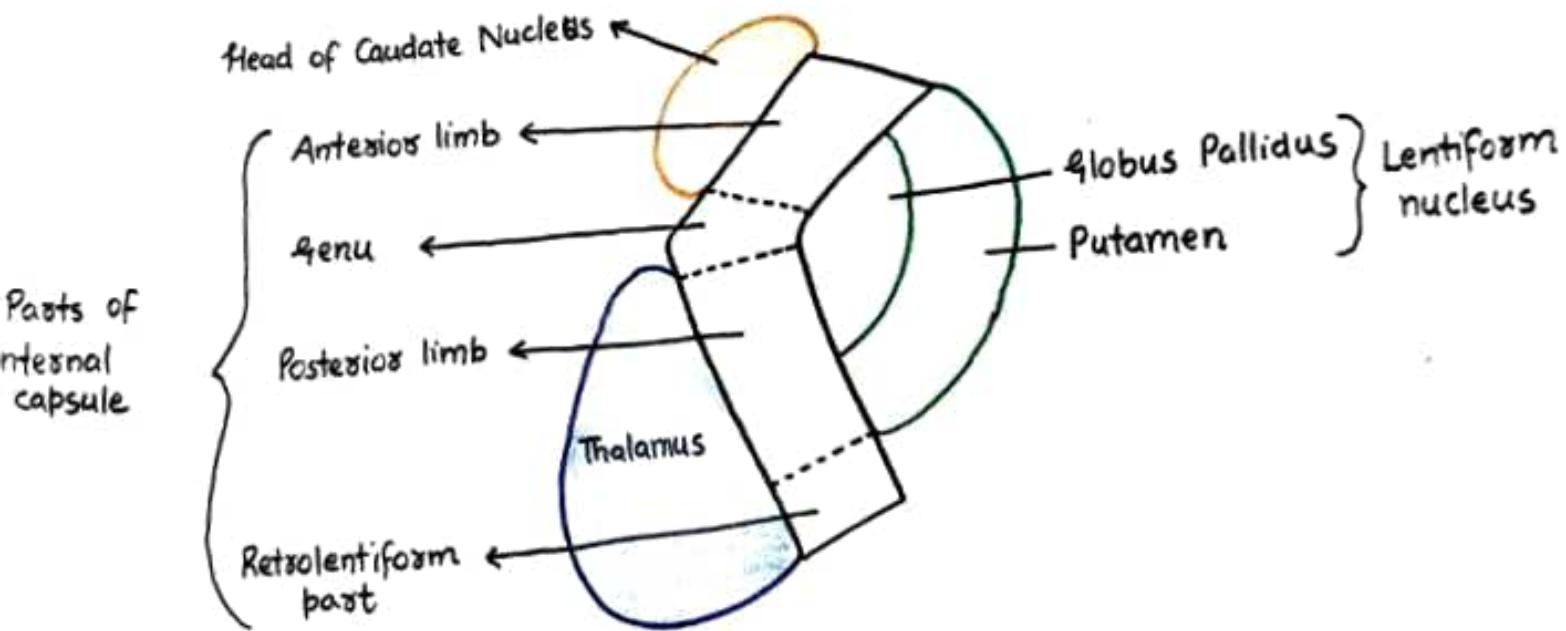
Connect cerebral cortex with other areas in CNS i.e brainstem & spinal cord.

### 2. Commissural Fibers

Connect areas of the contralateral hemisphere

### 3. Association Fibers

Connect cortical areas within the same cerebral hemisphere.



Location, Shape, Boundaries & Parts of the Internal Capsule

### INTERNAL CAPSULE

- Bundle of Projection Fibres
- Fibres of Internal capsule interconnect the cerebral cortex with brainstem & spinal cord.
- Fibres [fan out rostral to form corona radiata.  
Condense caudally to continue as crus cerebri of midbrain]
- Fibres are mainly responsible for Sensory & Motor innervation of opposite half of body

### SHAPE

In horizontal section of Cerebral hemisphere



Internal Capsule appears as a V-shaped compact bundle of white fibres

## BOUNDARIES

Medially = Head of Caudate nucleus & thalamus

Laterally = Lentiform nucleus

## PARTS

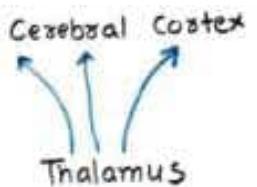
1. Anterior limb → Lies between head of Caudate nucleus medially & anterior part of lentiform nucleus laterally
2. Posterior limb → Lies between thalamus medially & posterior part of lentiform nucleus laterally
3. Genu → It is the bend between anterior & posterior part of limb with concavity facing laterally
4. Retrolentiform part → Lies behind lentiform nucleus
5. Sublentiform part → Lies below lentiform nucleus

## SENSORY FIBRES

↳ Thalamocortical fibres

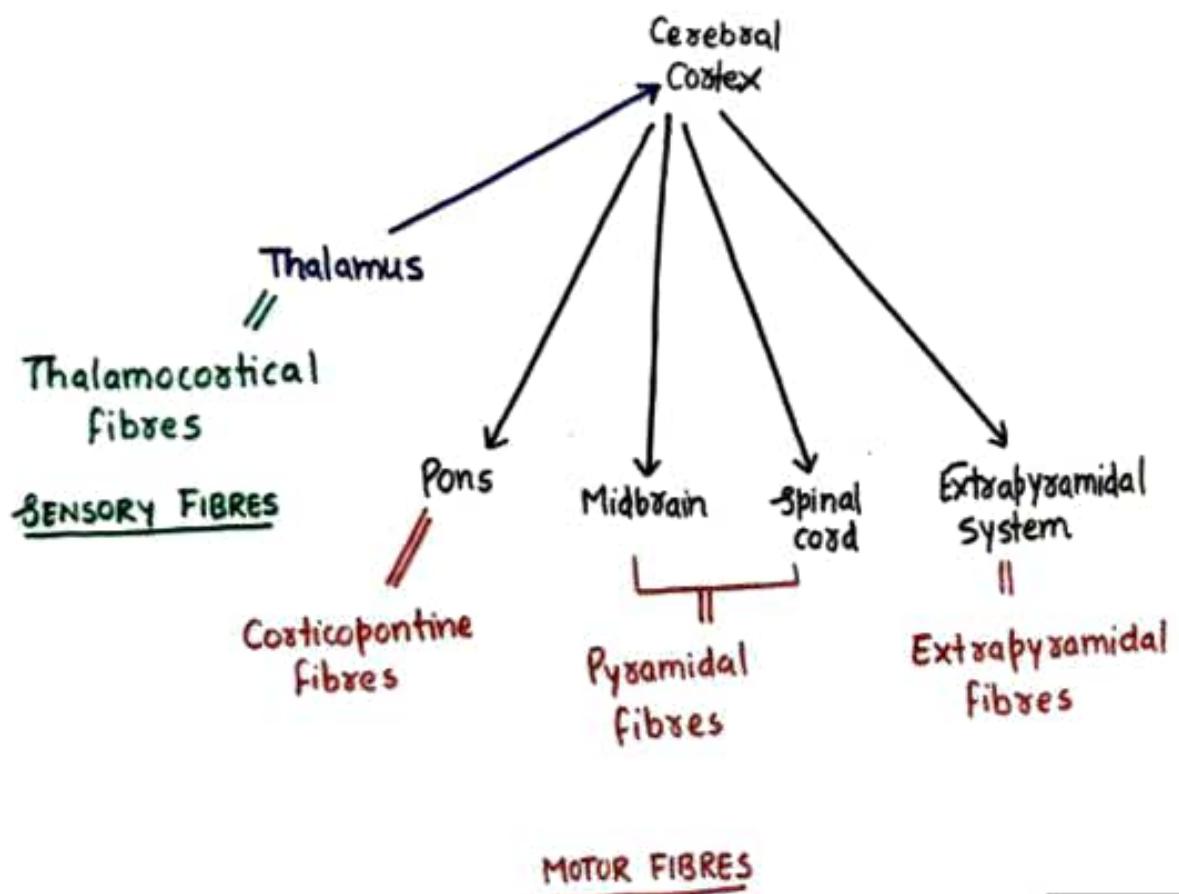
↓  
Radiate from thalamus in different directions

↓  
Reach widespread areas of cerebral cortex & constitute thalamic radiation



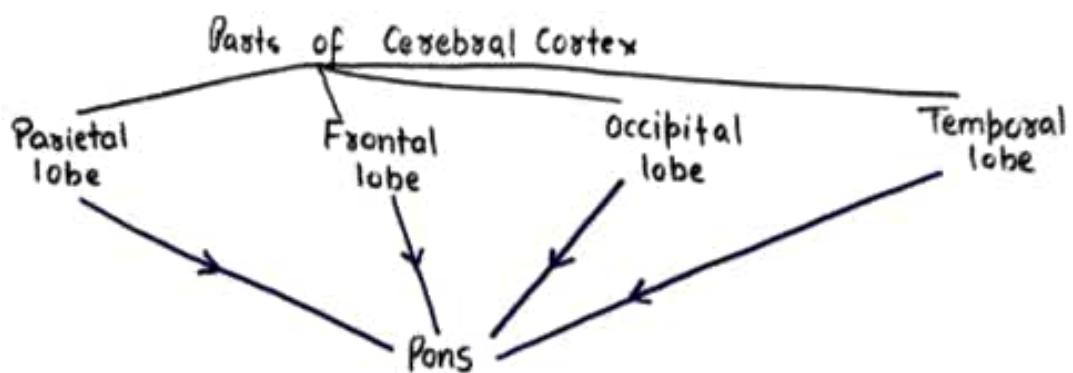
## Thalamic Radiation

- a) Anterior thalamic radiation → Connect thalamus to frontal lobe  
↳ Occupy Ant. limb of Internal capsule
- b) Superior thalamic radiation → Connect thalamus to frontal & parietal lobe  
↳ Occupy Genu, Post. limb of Internal capsule
- c) Posterior thalamic radiation (optical radiation) → Connect lateral geniculate body to 1° visual cortex (optical lobe)  
↳ Occupy Retrolentiform part
- d) Inferior thalamic radiation (auditory radiation) → Connect medial geniculate body to 1° auditory area (temporal lobe)  
↳ Occupy Sublentiform part

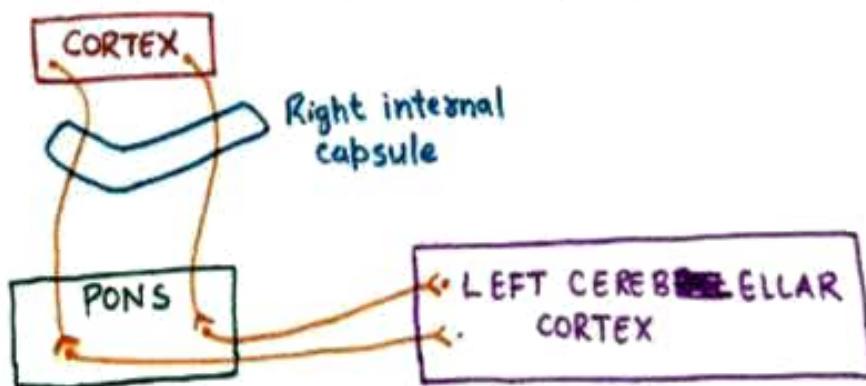


### Internal Capsule

- Introduction
- Shape
- Location
- Boundaries
- Parts
- Fibres
- Blood Supply
- Clinical



### CORTICOPONTING FIBRES



### CORTICOPOUNCEREBELLAR PATHWAY

## Fibres of Internal Capsule

- \* Motor Fibres
- \* Sensory Fibres

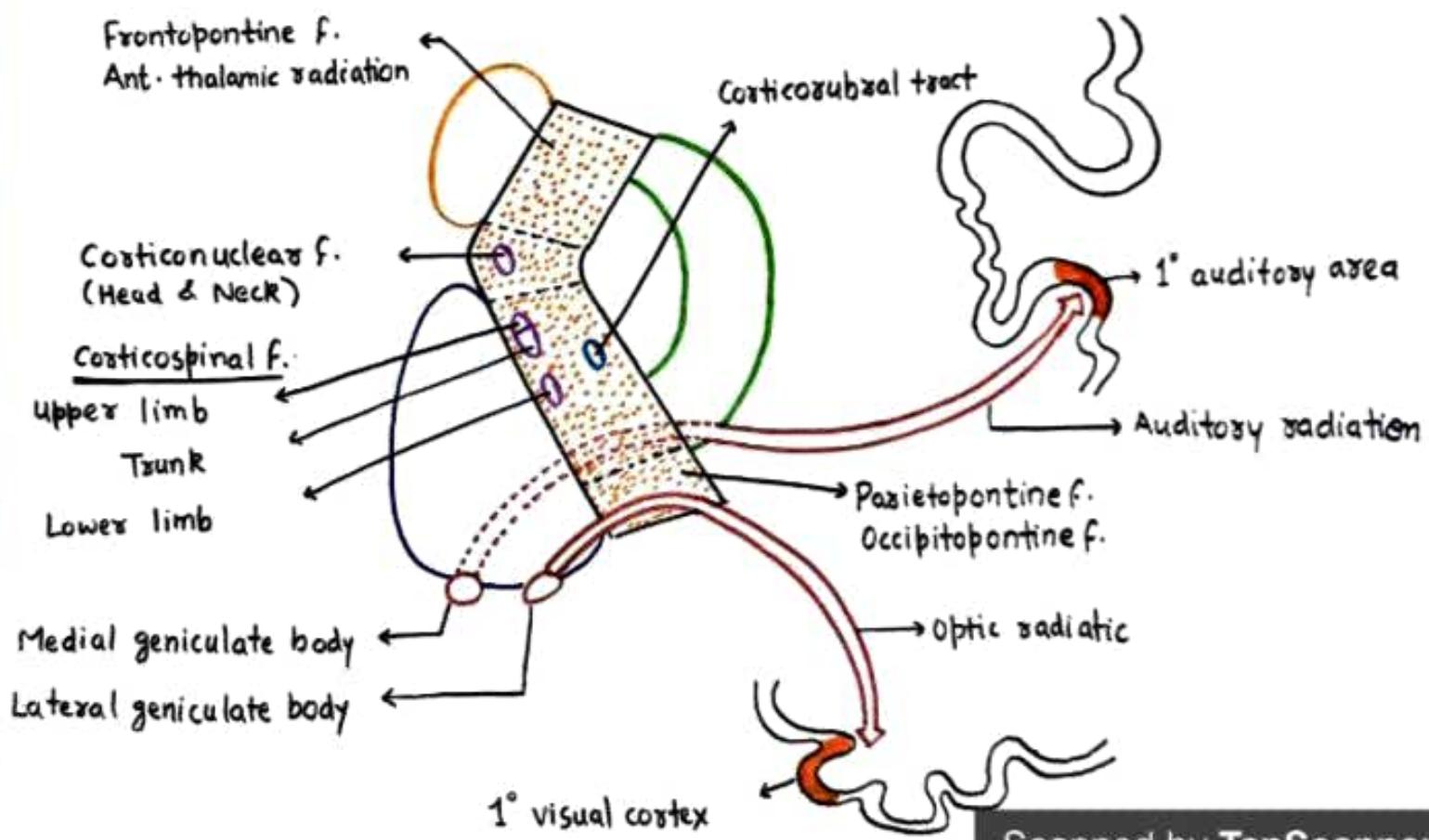
## MOTOR FIBRES

1. Corticopontine Fibres      Location in Internal Capsule  
↓  
- Frontopontine f. → Anterior limb, Genu, Post. limb  
- Parietopontine f. → Retrolentiform part  
- Occipitopontine f. → Retrolentiform part  
- Temporopontine f. → Sublentiform part

## Corticoponto-Cerebellar Pathway

- Corticopontine fibres synapse in ipsilateral pontine nuclei  
↓  
fibres arising from pontine nuclei cross the midline  
↓  
Relay in the cortex of opposite cerebellar hemisphere  
forming corticoponto-cerebellar pathway.

## FIBRES OF INTERNAL CAPSULE

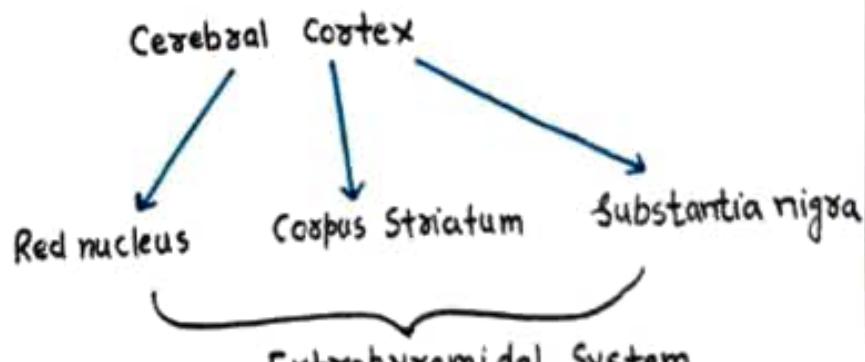


Scanned by TapScanner

2. Pyramidal fibres
- Corticonuclear f. ← occupy genu of internal capsule  
Synapse with contralateral nuclei in midbrain  
↓  
Innervate Head & Neck muscles
  - Corticospinal f. ← occupy post-limb of internal capsule  
Synapse with ant. horn cell of opposite half of spinal cord  
↓  
Innervate muscles of Upper limb, thorax, Abdomen

3. Extrapyramidal fibres → Occupy position near corticospinal fibres

- Corticorubral f.
- Corticostriate f.
- Corticonigral f.



## INTERNAL CAPSULE → Clinical Correlation

### • Contralateral Hemiplegia

• Haemorrhage / Infarction



Damage to internal capsule



Loss of sensation & spastic paralysis of opposite half of body

• Commonly occurs due to rupture of Charcot's artery of Cerebral haemorrhage

↓  
Supply Posterior limb

↓  
contain

→ Pyramidal fibres for upper limb, trunk, lower limb

→ Extrapyramidal fibres

↓  
lesion

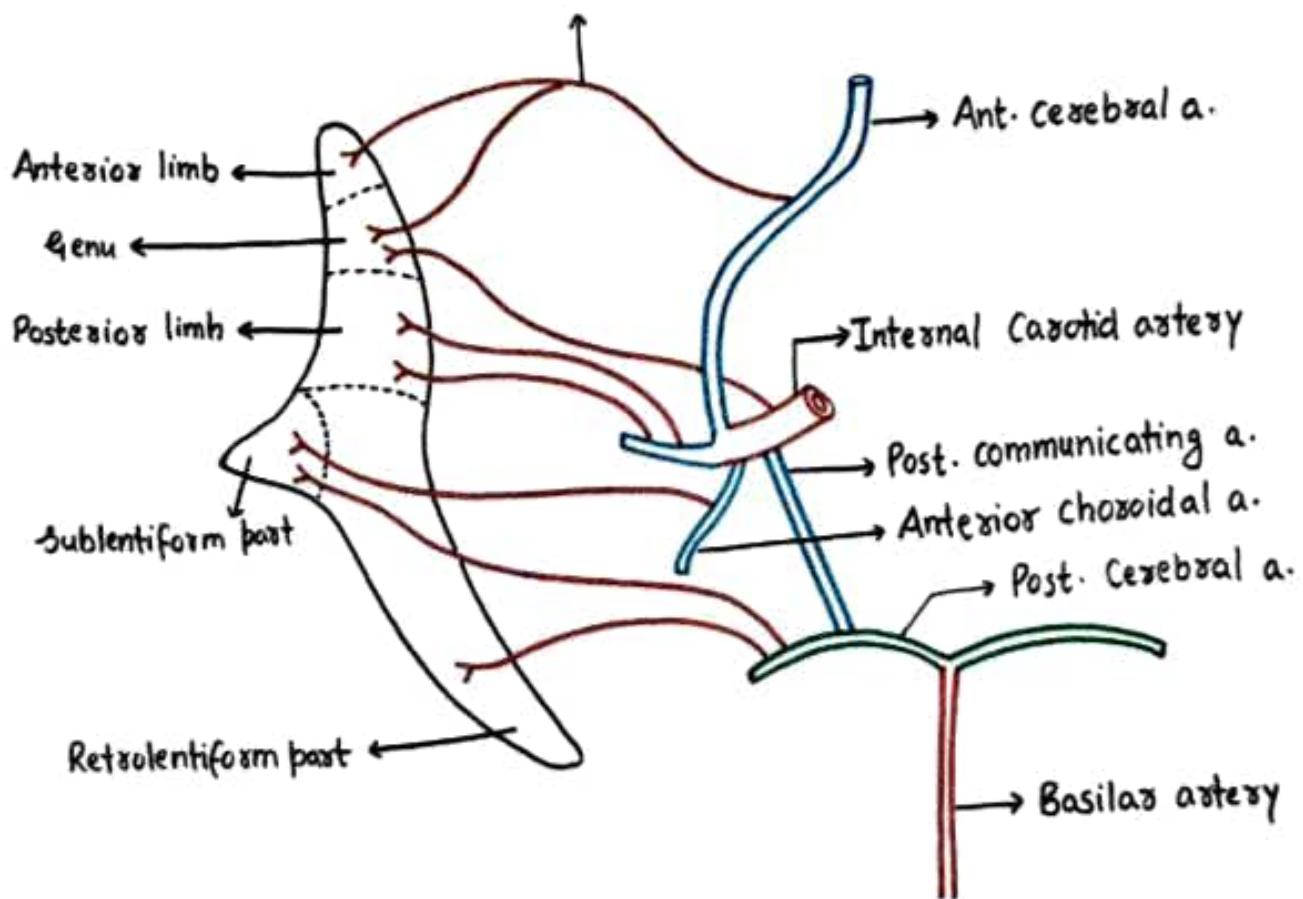
Spastic paralysis of opposite half of body

- ⊕ Thrombosis/Rupture of Recurrent artery of Huebner
- Recurrent a. of Huebner  $\xrightarrow{\text{Supply}}$  Anterior limb  $\xrightarrow{\text{contain}}$    
 genu Corticocuclear fibres  
(Head & Neck)
  - Rupture of Recurrent a. of Huebner
    - ↓  
Corticocuclear fibres
    - Adjacent pyramidal fibres for upper limb
    - ↓  
Paralysis of face & upper limb of opposite side
  - ⊕ Lesion of Post.  $1/3^{\text{rd}}$  of post. limb & Sublentiform & Retrolentiform part
    - ↓  
Visual defect (hemianopia) & Auditory defect (loss of hearing)
  - Commonly occurs due to thrombosis of Anterior Choroidal artery

## ARTERIAL SUPPLY OF INTERNAL CAPSULE

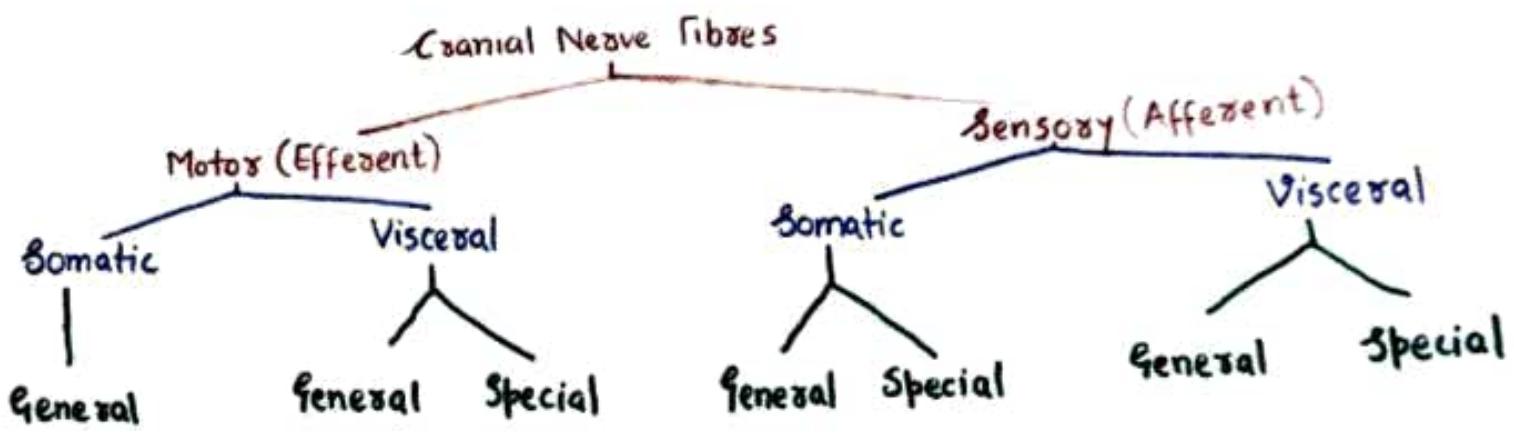
1. Medial & Lateral striate branches of Middle Cerebral artery → Supply posterior limb  
One of the lateral striate branches is larger & more frequently ruptured  
↓  
Termed "Charcot's artery of cerebral haemorrhage"
2. Striate branches of Anterior Cerebral artery → Supply genu & anterior limb  
One of these branches is larger & takes a recurrent course  
↓  
Termed "Recurrent artery of Huebner"
3. Central branches of Anterior Choroidal artery → Supply Sublentiform part
4. Central branches of Posterior Communicating artery
5. Direct branches from Internal Carotid artery → Supply Genu
6. Central branches of Posterior Cerebral artery → Supply Retrolentiform & Sublentiform part

### Recurrent a. of Huebner



ARTERIES SUPPLYING THE INTERNAL CAPSULE

Scanned by TapScanner



## Functional Component Of Cranial Nerve

Types of Motor fibres :-

- ① General Somatic Efferent (GSE) fibres
  - ↳ Supply striated muscles which develop from somites
- ② Special Visceral Efferent (SVE) fibres
  - ↳ Supply muscles which develop from mesoderm of pharyngeal arches
- ③ General Visceral Efferent (GVE) fibres
  - ↳ Supply gland, smooth muscles of viscera, vessels
  - ↳ Preganglionic parasympathetic fibres

## Functional Component of Cranial Nerve

Types of Sensory fibres :-

1. General Somatic Afferent (GSA) fibres

↳ carry general sensations of pain, touch, temperature from skin

2. General Visceral Afferent (GVA) fibres

↳ carry general sensations of distension & ischemic pain from viscera

3. Somatic Visceral Afferent (SVA) fibres

Special

↳ carry special sensation of taste from tongue

4. Special Somatic Afferent (SSA) fibres

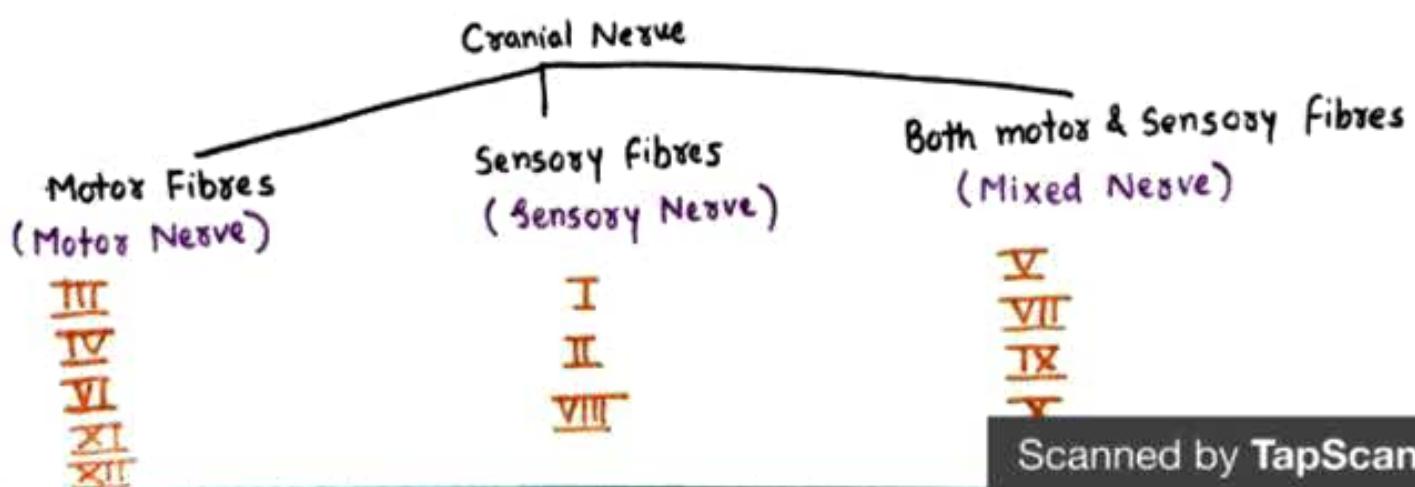
↳ carry special sensations of smell, hearing & balance

## CRANIAL NERVES

- 12 Pairs
- first 2 pairs arise from forebrain
- Next 10 pairs arise from brainstem

I Olfactory  
II Optic  
III Oculomotor  
IV Trochlear  
V Trigeminal  
VI Abducent

VII Facial  
VIII Vestibulo-cochlear  
IX Glossopharyngeal  
X Vagus  
XI Accessory  
XII Hypoglossal



## FACIAL NERVE

- 7<sup>th</sup> Cranial Nerve
- Mixed nerve

### Functional Components Of Facial Nerve

1. Special visceral efferent fibres → Supply muscles of facial expression
2. General visceral efferent fibres → Supply secretomotor fibres to lacrimal, submandibular & sublingual gland
3. Special visceral afferent fibres → Carry special sensations of taste from Anterior 2/3<sup>rd</sup> of tongue
4. General somatic afferent fibres → Carry general sensations from skin of auricle

Origin, Course, Termination

Facial Nerve roots

Motor root

Sensory root



Arise from Pontomedullary junction



Enters internal acoustic meatus



At bottom of Internal Acoustic meatus, 2 roots unite to form trunk of facial n.



Nerve runs toward medial wall of middle ear



Descends from post. wall of middle ear



Exit skull through Stylomastoid foramen



Enters Parotid gland

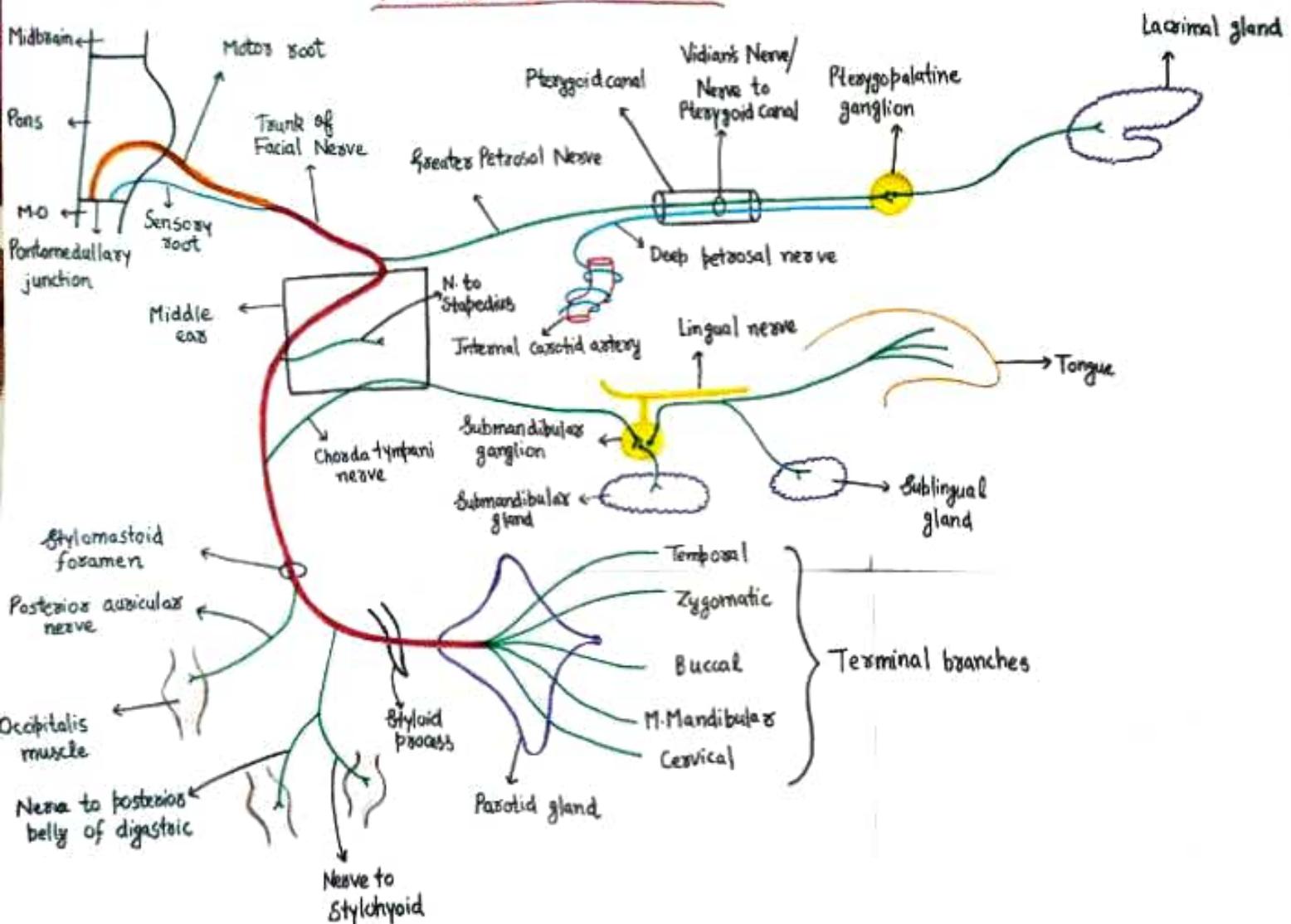


End by giving 5 terminal branches in Parotid gland

### Branches

1. Greater petrosal nerve
2. Nerve to Stapedius
3. Chorda tympani nerve
4. Posterior auricular nerve
5. Nerve to the posterior belly of digastric
6. Nerve to Stylohyoid
7. Terminal branches -  
Temporal  
Zygomatic  
Buccal  
Marginal mandibular  
Cervical

## FACIAL NERVE



## FACIAL NERVE → CLINICAL ANATOMY

### + Lesions of Facial Nerve

Site of Lesion	Signs & Symptoms
1. At or just above Stylomastoid foramen	Bell's palsy / Facial palsy
2. Above origin of Chorda tympani	C/F of lesion 1 + ↓ Salivation + loss of sensations in anterior 2/3 <sup>rd</sup> of tongue
3. Above origin of N. to Stapedius	C/F of lesion 2 + hyperacusis (enhanced sensitivity to hearing)
4. Above origin of Greater petrosal nerve	C/F of Lesion $\frac{2}{3}$ + Loss of lacrimation

### **+ Ramsay Hunt Syndrome**

- Involvement of Geniculate ganglion in Herpes zoster infection
- Signs & Symptoms
  - Cl/F of lesion 4 + Herpetic vesicles on the auricle

### **+ Crocodile Tears Syndrome**

- Lacrimation while smelling or chewing food
- Occurs after facial nerve lesion proximal to geniculate ganglion
  - ↓  
Improper regeneration of salivatory fibres which goes to lacrimal gland instead to Salivatory gland during regeneration process
  - ↓  
Abnormal lacrimation during Salivation process

## PAROTID GLAND > External Features

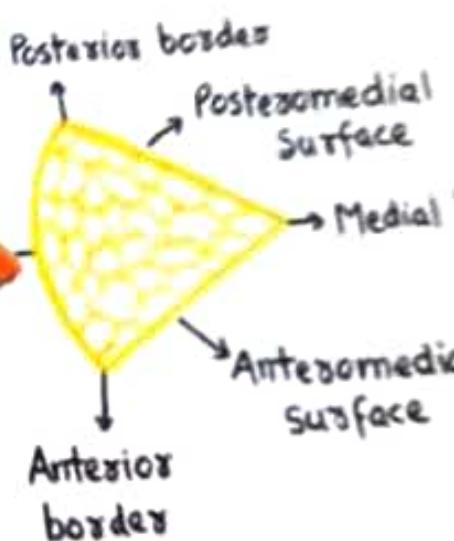
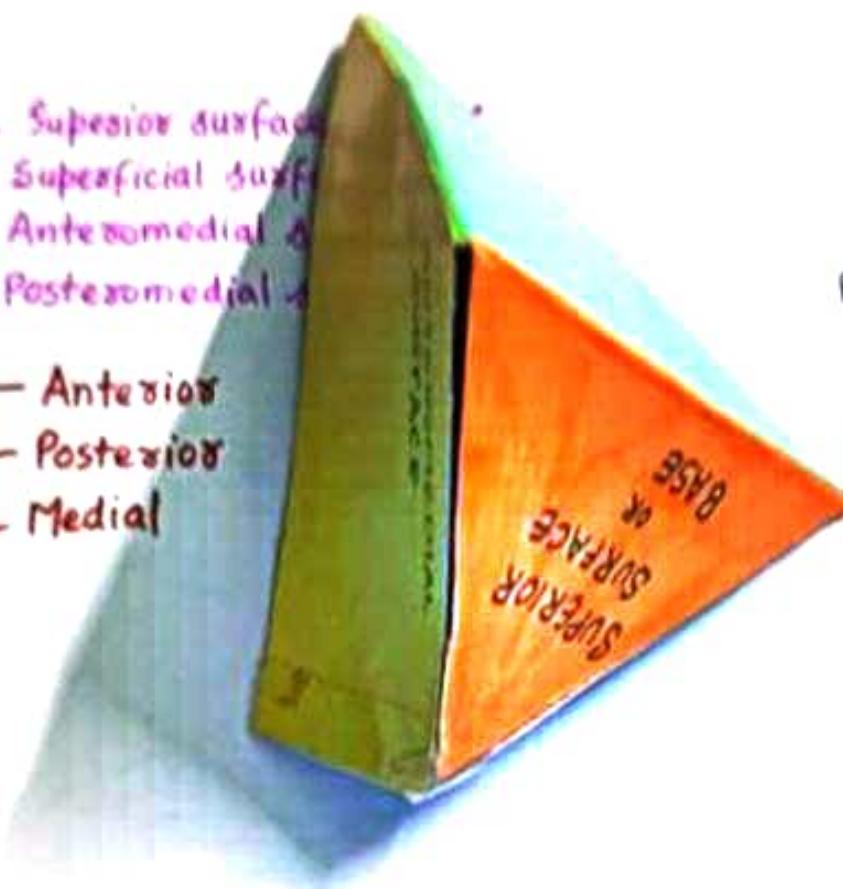
Gland resembles a three-sided pyramid with Apex directed downwards

### Features

#### Apex

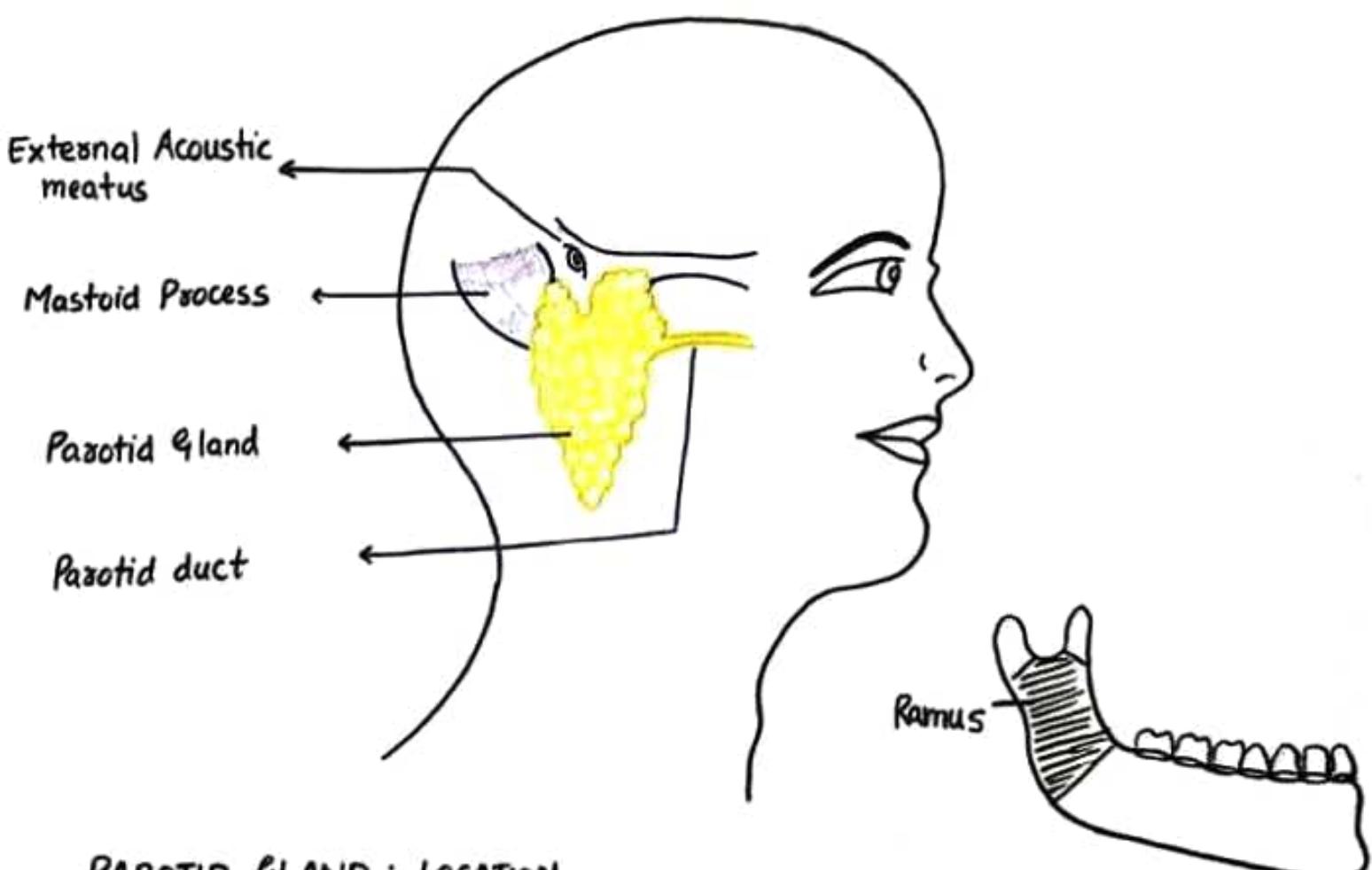
- Four surfaces
- [ Superior surface
  - [ Superficial surface
  - [ Anteromedial surface
  - [ Postero-medial surface

- Three borders
- [ Anterior border
  - [ Posterior border
  - [ Medial border

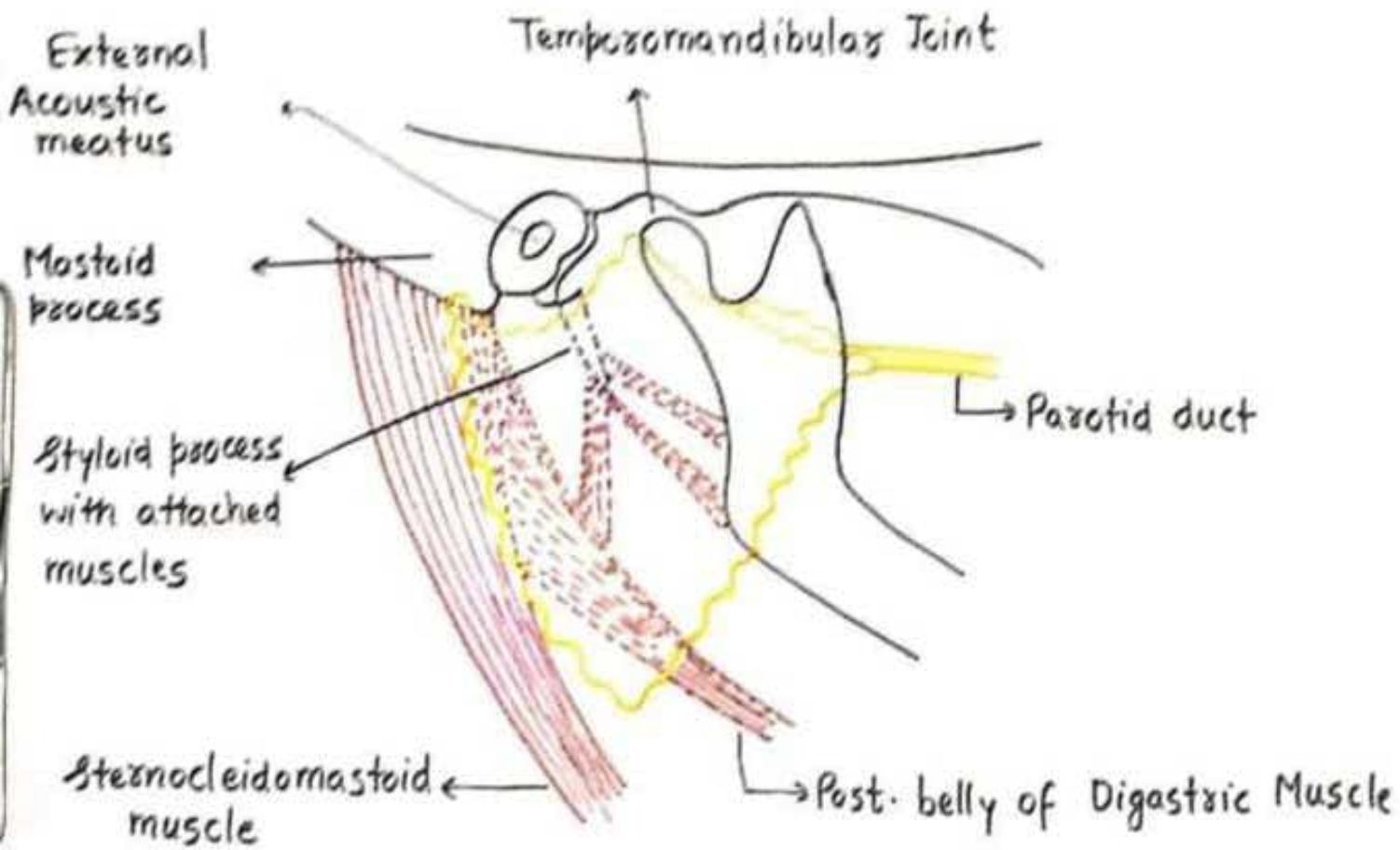


Parotid

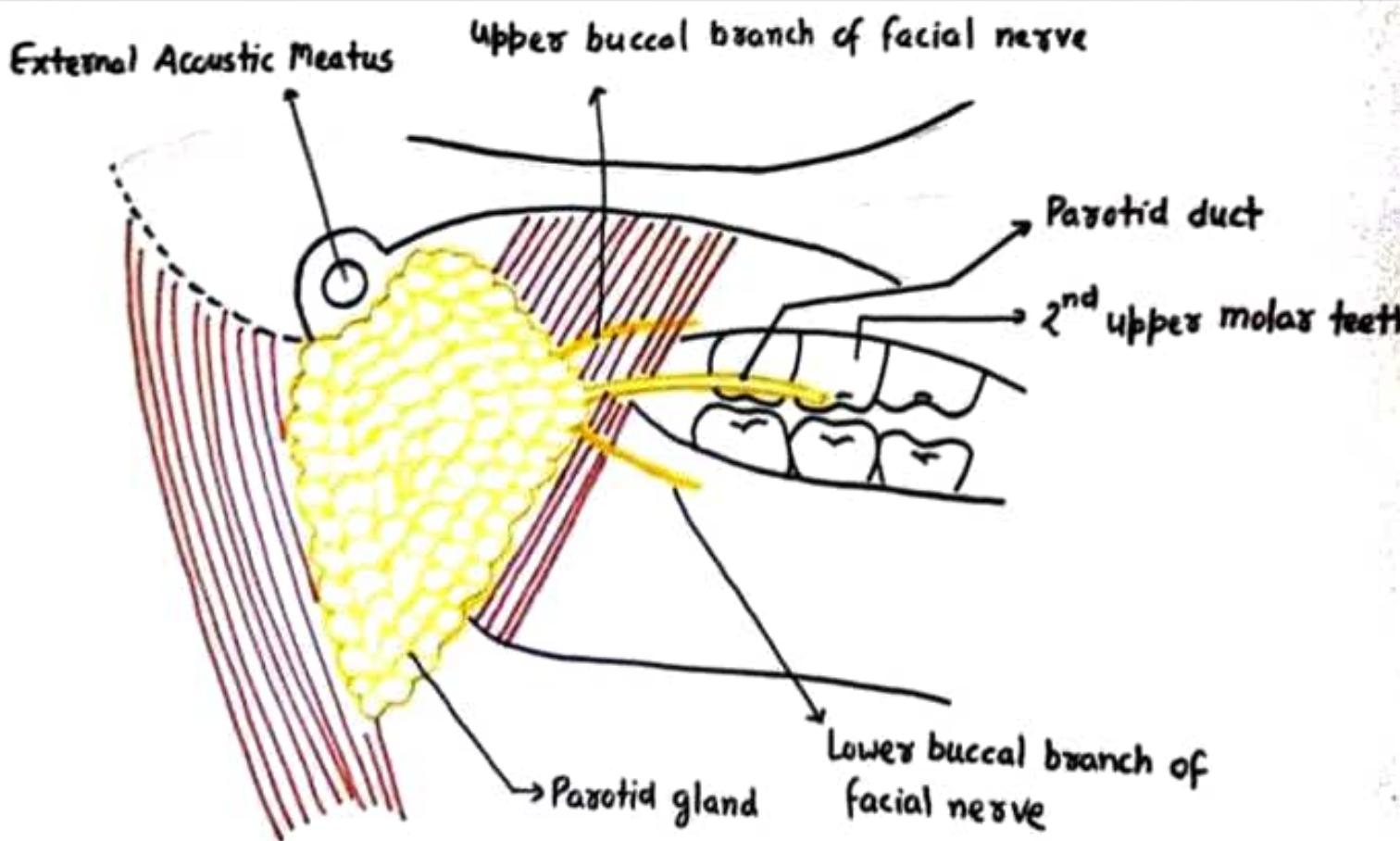
PAROTID GLAND : LOCATION



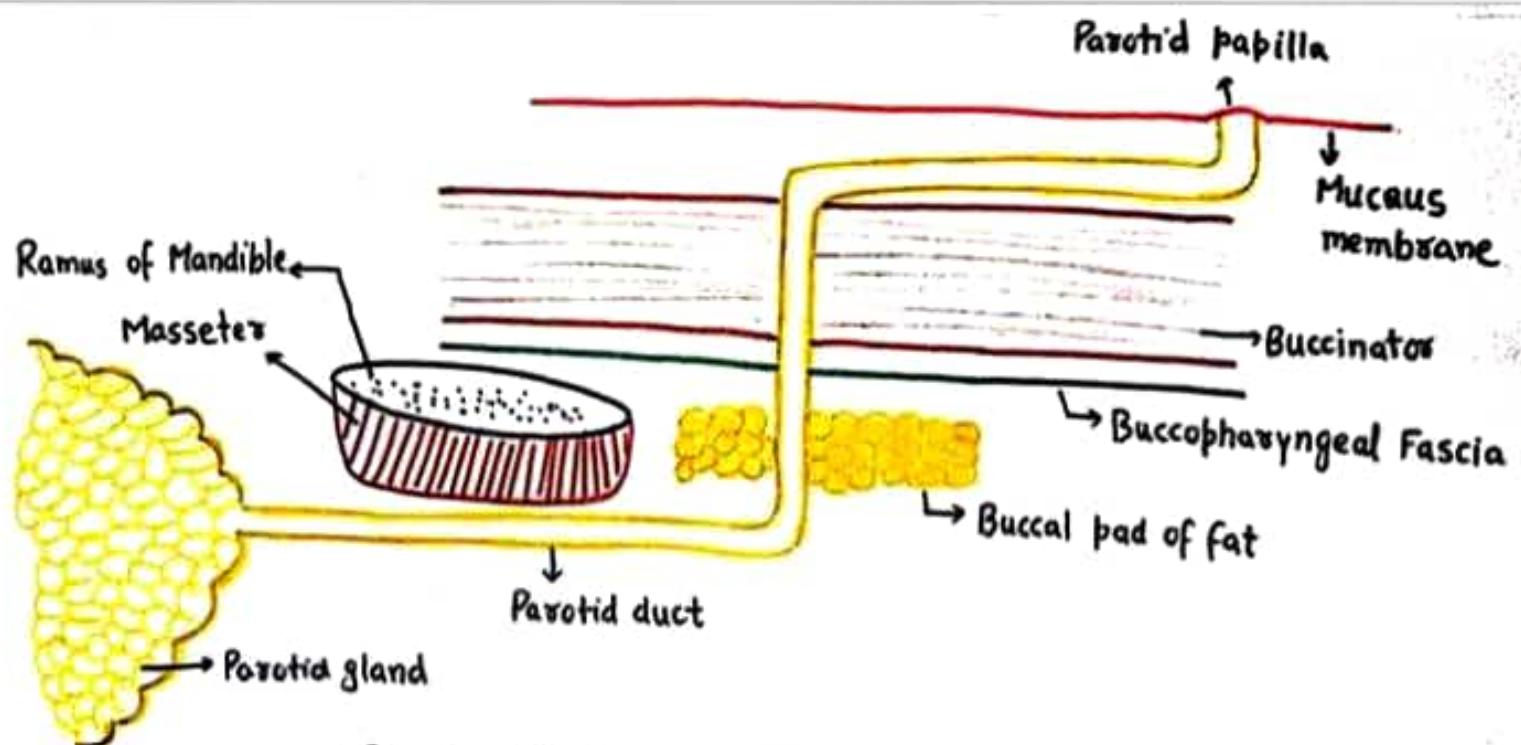
PAROTID GLAND : LOCATION



PAROTID BED = Boundaries & Muscles



Sites of Origin & Termination of Parotid duct



### COURSE OF PAROTID DUCT

\*\* This tortuous course of the duct provides a valve-like mechanism to prevent inflation of the duct system of Parotid gland during excessive blowing of the mouth as in trumpet blowing.

## PAROTID GLAND

### LOCATION

Lies in pyramidal Fossa, posterior to ramus of mandible called retromandibular fossa (Parotid bed)

### Boundaries Of Parotid Bed

Anterior = Ramus of Mandible (Post. border)

Posterior = Mastoid Process

Superior = External Acoustic Meatus  
Posterior part of Temporomandibular Joint

Medial = Styloid Process

## Muscles In Parotid Bed

Masseter (laterally)                          } cover ramus of mandible  
Medial Pterygoid (Medially)                }

Sternocleidomastoid (laterally)            } cover mastoid process  
Post. belly of Digastric (medially)        }

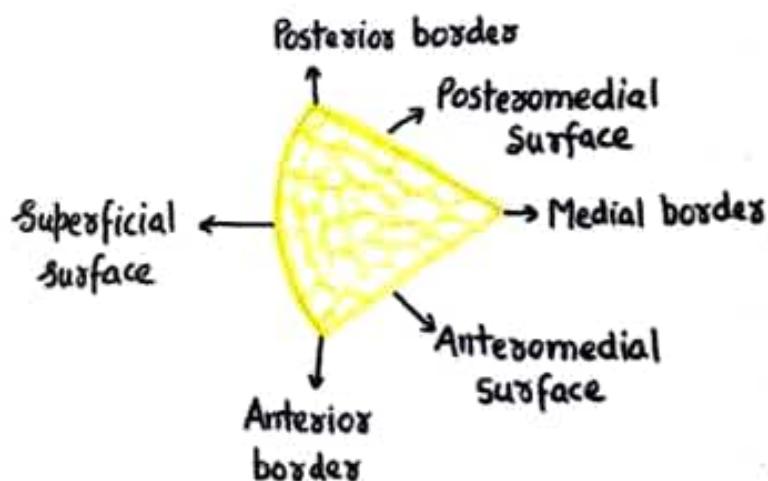
Styloglossus                                  } cover Styloid process  
Stylopharyngeus                              }  
Stylohyoid                                     }

## PAROTID GLAND :- External Features

Gland resembles a three sided pyramid with Apex directed downwards.

### Features

- Apex
- Four surfaces
  - Superior surface or base
  - Superficial surface
  - Anteromedial surface
  - Posteroanterior surface
- Three borders
  - Anterior
  - Posterior
  - Medial



# PAROTID DUCT

- Also called Stenson's duct
- About 5cm long

## Origin, Course, Termination

Origin:-

Emerges from Anterior border of Gland



Runs forward over masseter between upper & lower buccal branches of facial Nerve



At anterior border of Masseter, duct turns inwards, almost at  $90^\circ$  (First Bend)



Pierces Buccal Pad of Fat



Pierces Buccopharyngeal Fascia



Pierces Buccinator Muscle



Second bend



Runs forward for about 1cm between buccinator & buccal mucosa

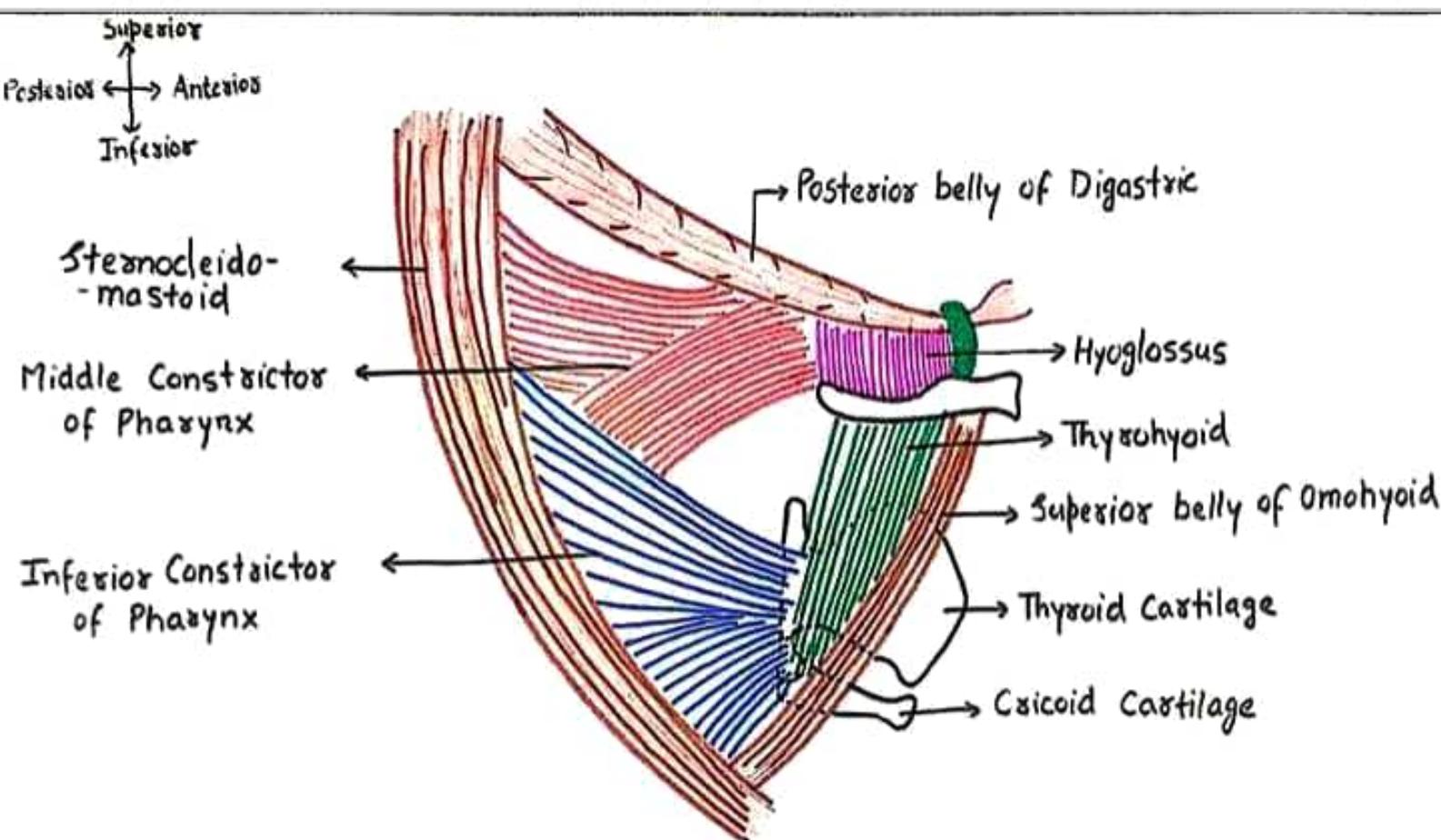


Duct turns medially (third bend)

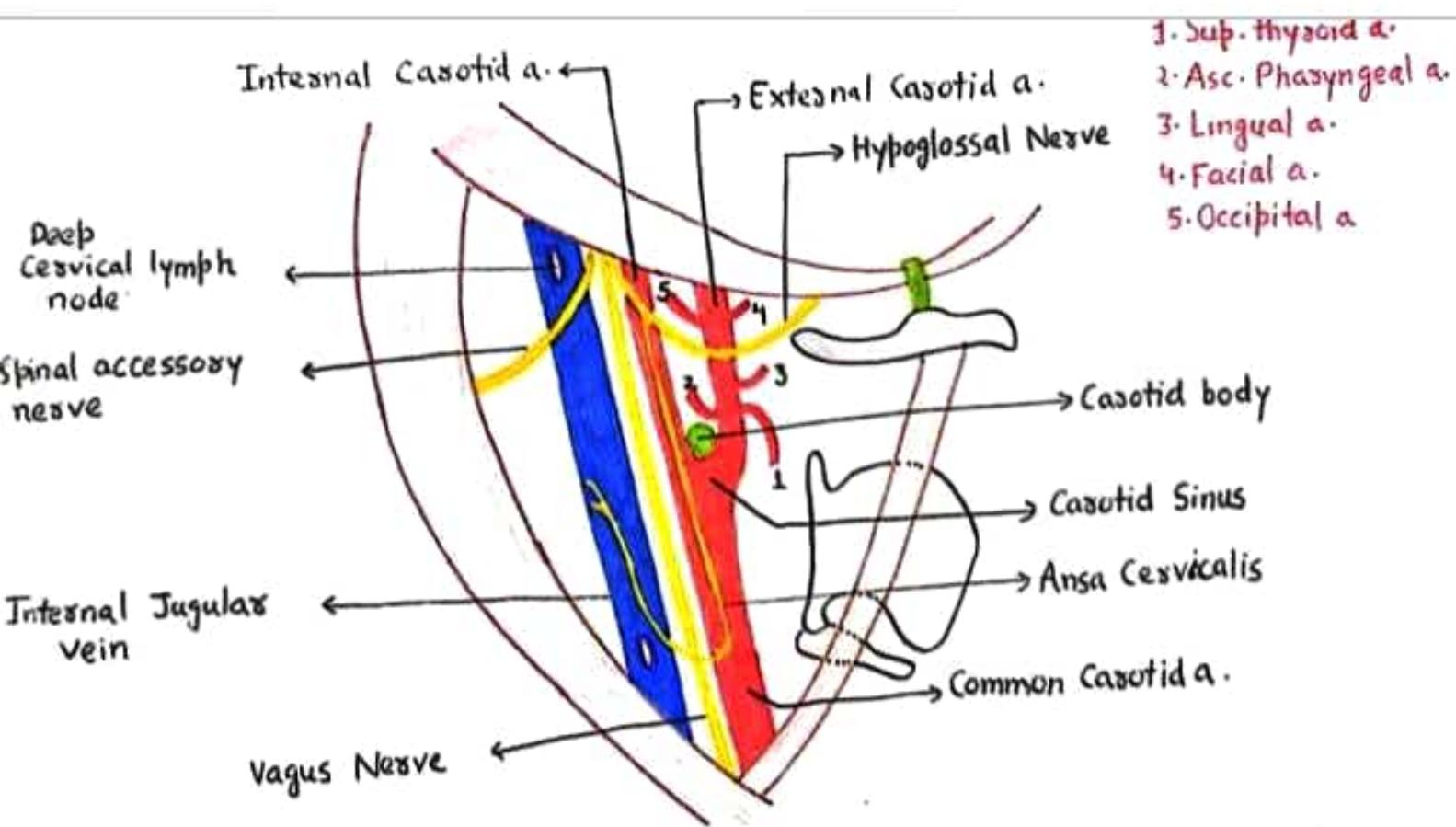


Opens into vestibule of mouth opposite the crown of upper second molar teeth

Termination:-



### BOUNDARIES & FLOOR OF CAROTID TRIANGLE



### CONTENT OF CAROTID TRIANGLE

## CAROTID TRIANGLE

→ Named so because it contains all three carotid Arteries.

### BOUNDARIES

Superiorly = Posterior belly of Digastric

Anteroinferiorly = Superior belly of Omohyoid

Posteriorly = Anterior border of Sternocleidomastoid.

### ROOF

#### Skin

Superficial Fascia

- Platysma
- Cervical branch of facial nerve
- Transverse cervical nerve

Investing layer of Deep Cervical Fascia

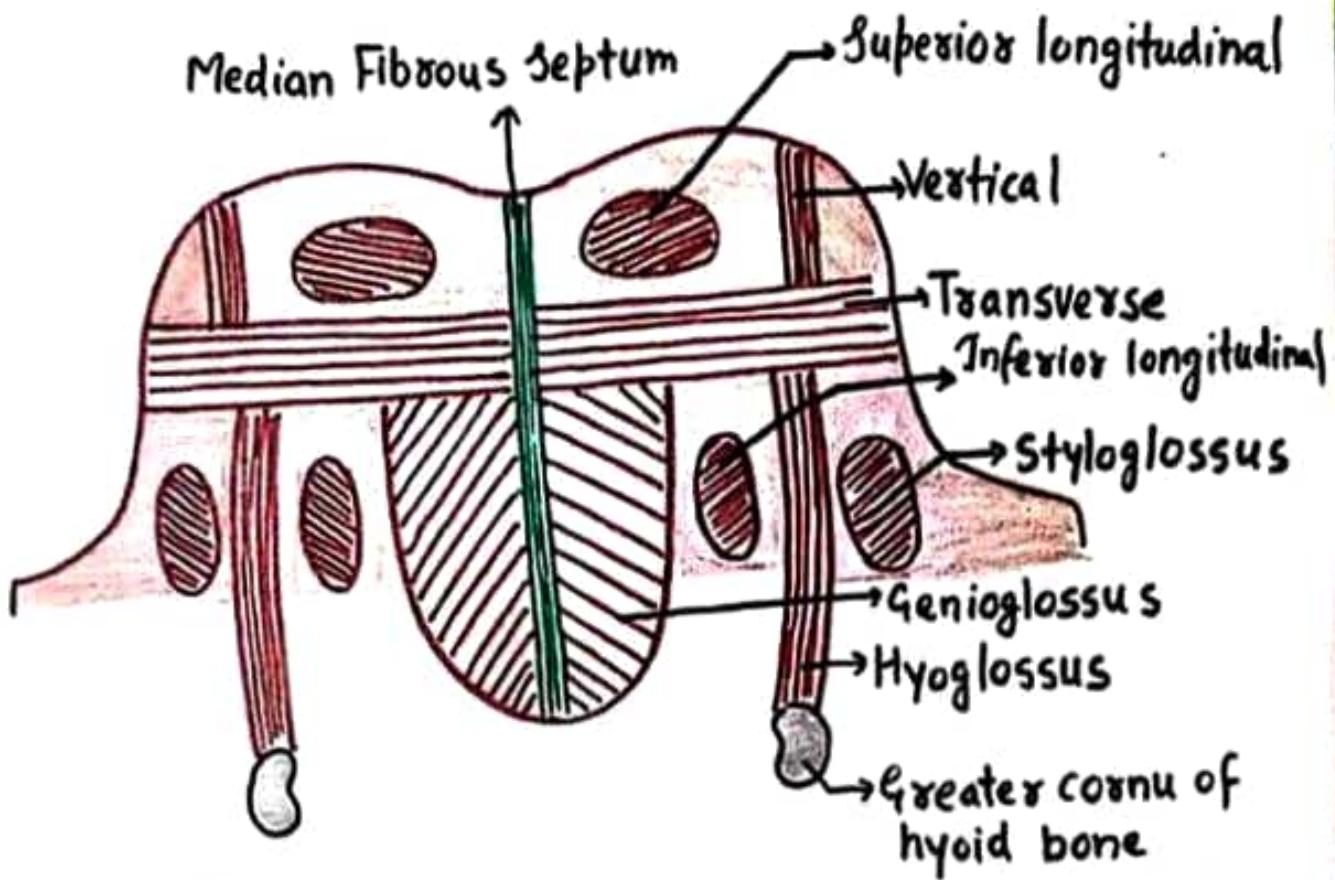
### FLOOR

- 1. Thyrohyoid
- 2. Hyoglossus

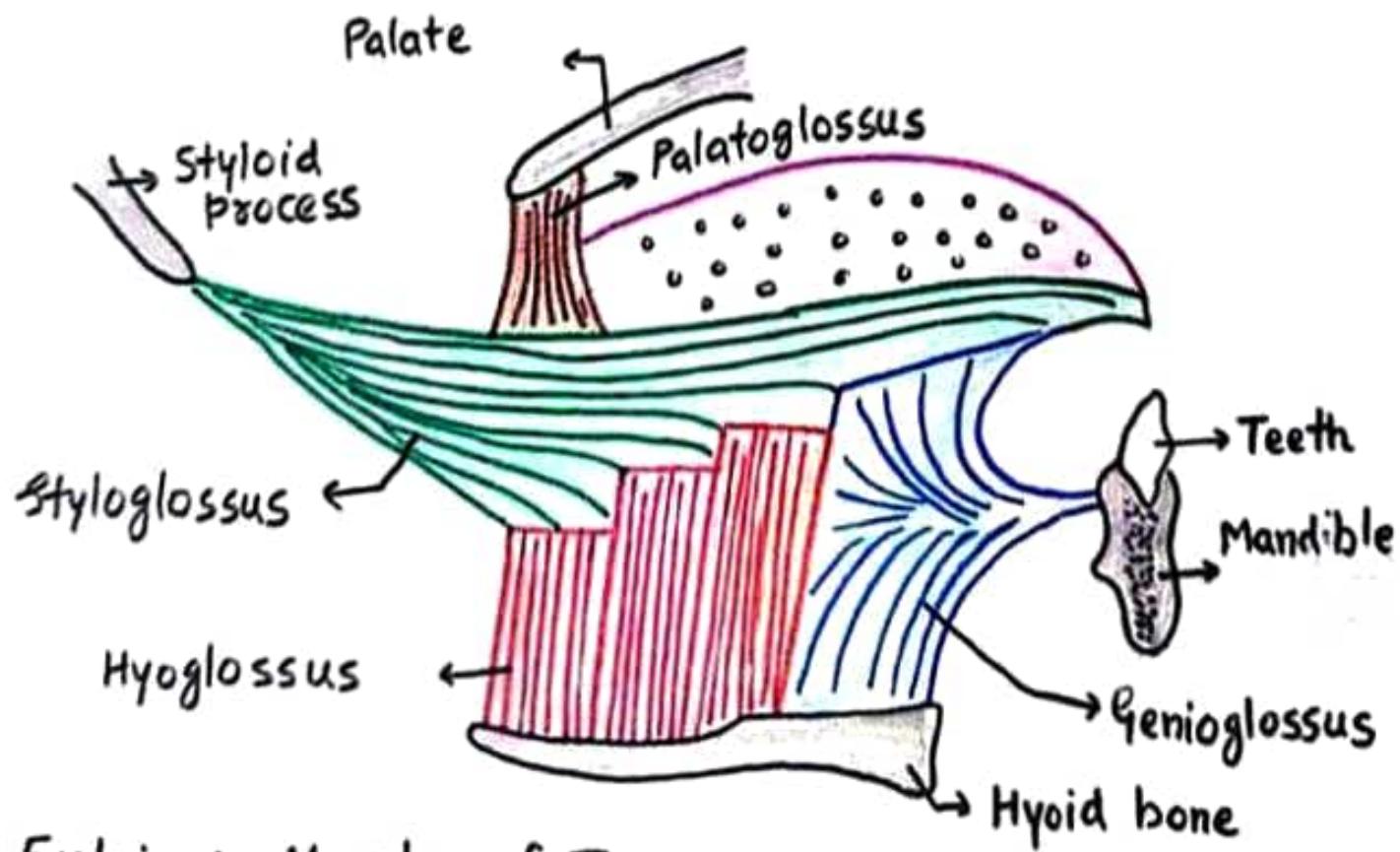
- 3. Middle Constrictor
- 4. Inferior Constrictor

## CONTENTS

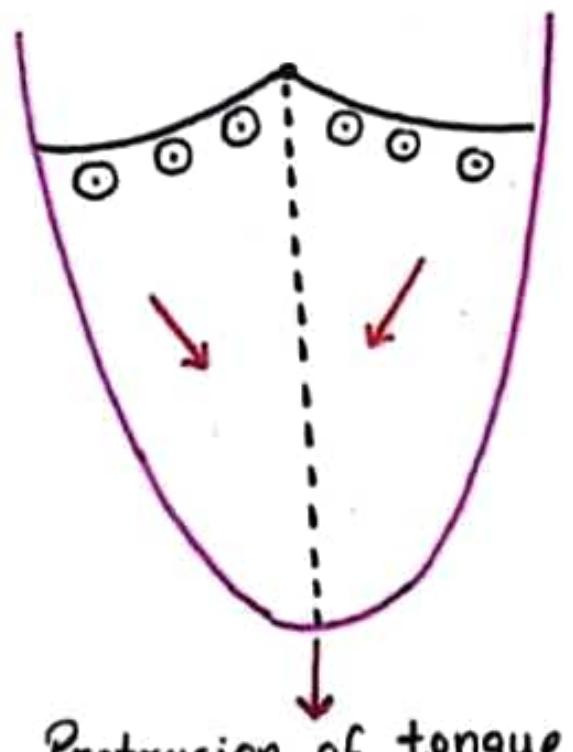
1. Carotid arteries  
    Common carotid artery  
    Internal carotid artery  
    External carotid artery & its first five branches  
        Ascending pharyngeal a.  
        Sup. thyroid a.  
        Lingual a.  
        Facial a.  
        Occipital a.
2. Carotid Sinus & Carotid body
3. Internal Jugular Vein
4. Last three Cranial nerves  
    Vagus Nerve (C.N-10)  
    Spinal accessory nerve (C.N-11)  
    Hypoglossal nerve (C.N-12)
5. Ansa Cervicalis
6. Cervical part of Sympathetic Chain
7. Carotid Sheath
8. Deep Cervical lymph nodes



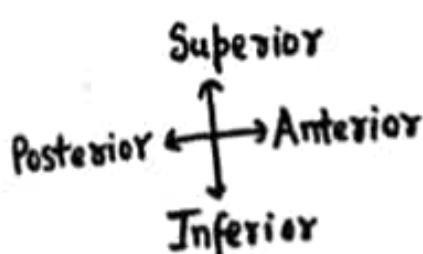
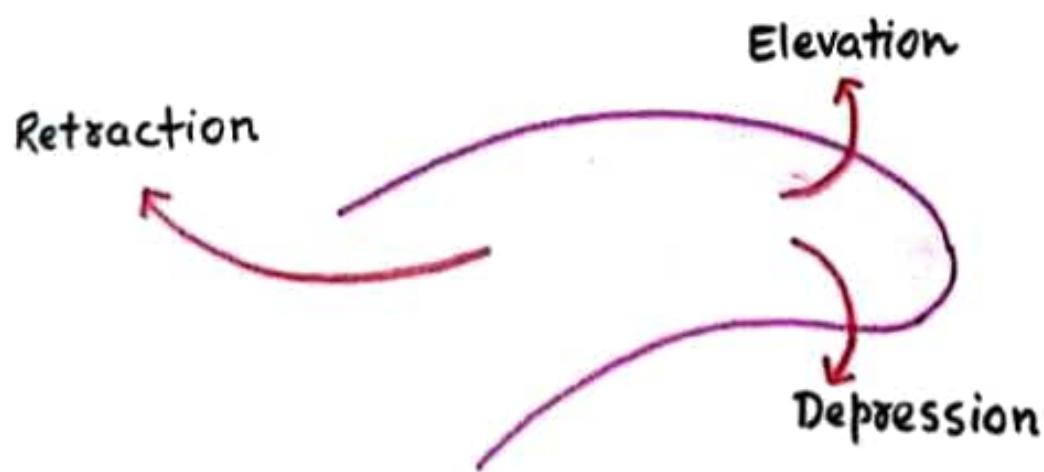
Coronal Section of The Tongue



Extrinsic Muscles of Tongue



Protrusion of tongue



MOVEMENTS OF THE TONGUE

## MUSCLES OF TONGUE

- Tongue is divided into symmetrical right & left halves by medial fibrous septum
- Each half on Tongue contain 4 intrinsic & 4 extrinsic muscles

### EXTRINSIC MUSCLES

- Muscles take origin from structures outside the tongue & enter the tongue to be inserted in it
- Move the tongue as well as alter its shape
- Name of Muscles :-
  1. Genioglossus
  2. Hyoglossus
  3. Styloglossus
  4. Palatoglossus

### INTRINSIC MUSCLES

- Muscles within the tongue and have no attachment outside the tongue
- Change shape of tongue
- Name of Muscles :-
  1. Superior longitudinal
  2. Inferior longitudinal
  3. Transverse
  4. Vertical

INTRINSIC MUSCLE	LOCATION	ACTIONS
1. Superior longitudinal	Beneath the mucous membrane	<ul style="list-style-type: none"> <li>• Shortens the tongue</li> <li>• Make the dorsum concave</li> </ul>
2. Inferior longitudinal	Between Genioglossus & Hyoglossus	<ul style="list-style-type: none"> <li>• Shortens the tongue</li> <li>• Makes the dorsum convex</li> </ul>
3. Transverse	Extend from median septum to margin	Make the tongue narrow & elongated
4. Vertical	At the border of the anterior part of tongue	Makes the tongue broad & flattened

## Extrinsic Muscles

## Actions

1. Genioglossus (Fan shaped)	Protrudes the tongue when acting together with its counterpart of opposite side
2. Hyoglossus (Flat quadrilateral muscle)	<ul style="list-style-type: none"><li>Depresses the side of the tongue</li><li>Makes the dorsal surface convex</li></ul>
3. Styloglossus	Draws the side of the tongue upwards & backwards
4. Palatoglossus	<ul style="list-style-type: none"><li>Pulls up the root of the tongue</li><li>Approximates palatoglossal arches</li></ul>

## Movements of Tongue

## Muscles

1. Protrusion	Genioglossus muscles (of both side acting together).
2. Retraction	Styloglossus muscles (of both side acting together)
3. Depression	Hyoglossus muscles (of both side acting together)
4. Elevation of post. 1/3 <sup>rd</sup>	Palatoglossus muscles (of both sides acting together)
5. Change in shape	Intrinsic muscles + Extrinsic muscles

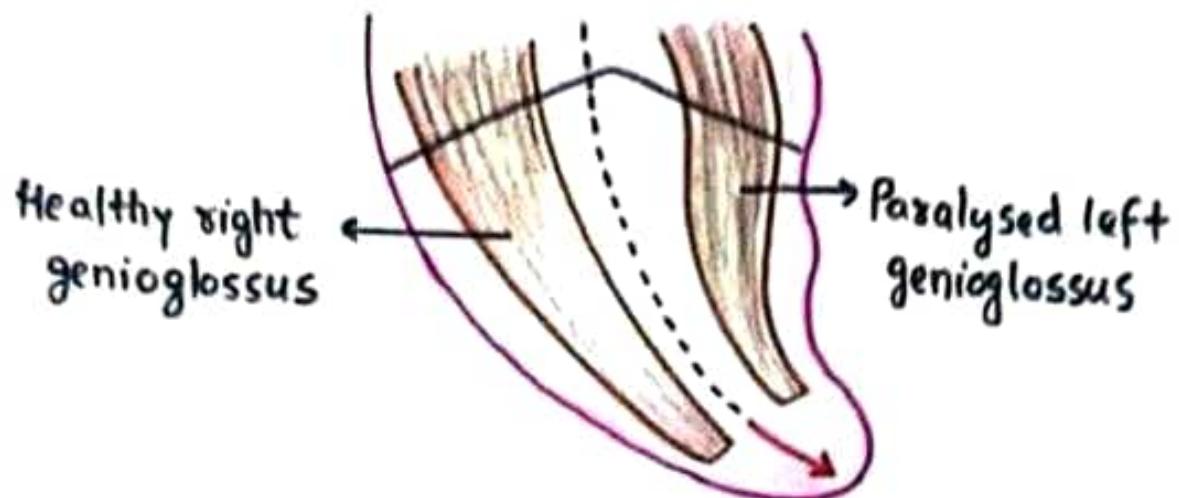
## Clinicals (Muscles & Movements of Tongue)

### **+** Safety Muscle of Tongue

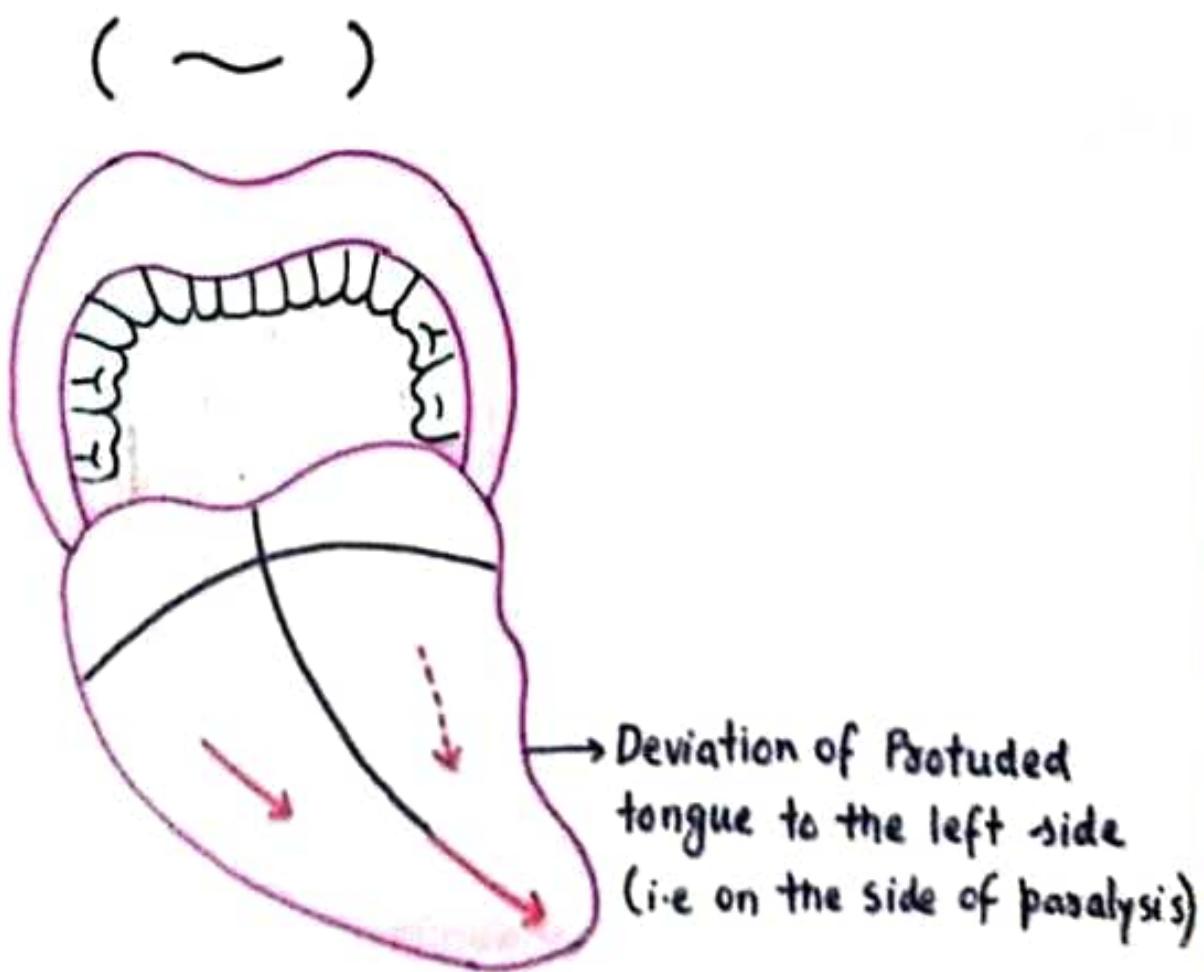
- Genioglossus is called Safety muscle of tongue
- Two genioglossi → Form bulk of tongue  
→ Responsible for Protrusion of tongue
- Paralysis of Genioglossi
  - ↓  
Tongue will fall back into the oropharynx
  - ↓  
Obstruct the air passage causing choking & death
  - ↓  
So during anesthesia, tongue is pulled forward to clear air passage

### **+** Clinical Testing of Hypoglossal Nerve

- Genioglossi are used for Clinical testing of Hypoglossal nerve
- Genioglossus of both sides acting together protrude the tongue.  
Single Genioglossus deviate the tongue to opposite side.  
So when patient is asked to protrude his/her tongue,  
the tongue deviates to the paralyzed side (side of lesion  
of Hypoglossal nerve)

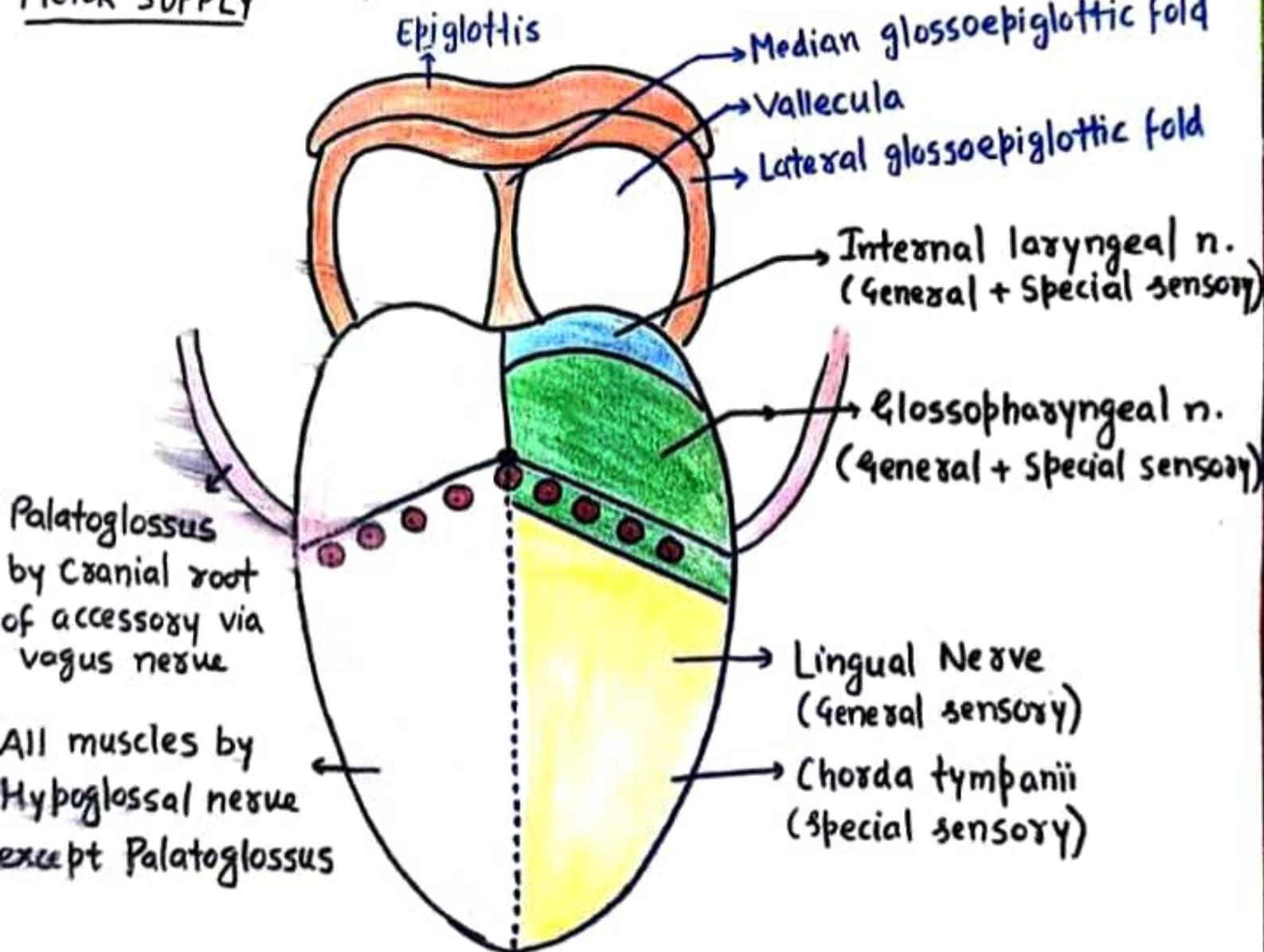


PARALYSIS OF THE GENIOGLOSSUS ON LEFT SIDE



DEVIATION OF TONGUE ON LEFT SIDE

## MOTOR SUPPLY



## SENSORY SUPPLY

## NERVE SUPPLY OF TONGUE

## NERVE SUPPLY OF TONGUE

### MOTOR Supply

- All muscles of tongue (intrinsic & extrinsic) are supplied by the Hypoglossal nerve except "Palatoglossus"
  - Supplied by Pharyngeal branch of Vagus Nerve

### Sensory Supply

Anterior 2/3<sup>rd</sup> of tongue → Lingual Nerve (general sensation)

Chorda tympani (special sensation)  
nerve

Posterior 1/3<sup>rd</sup> of tongue → Glossopharyngeal Nerve  
(both general & special sensation)

Posteriormost part → Internal laryngeal Nerve  
(Base of tongue) (both general & special sensation)

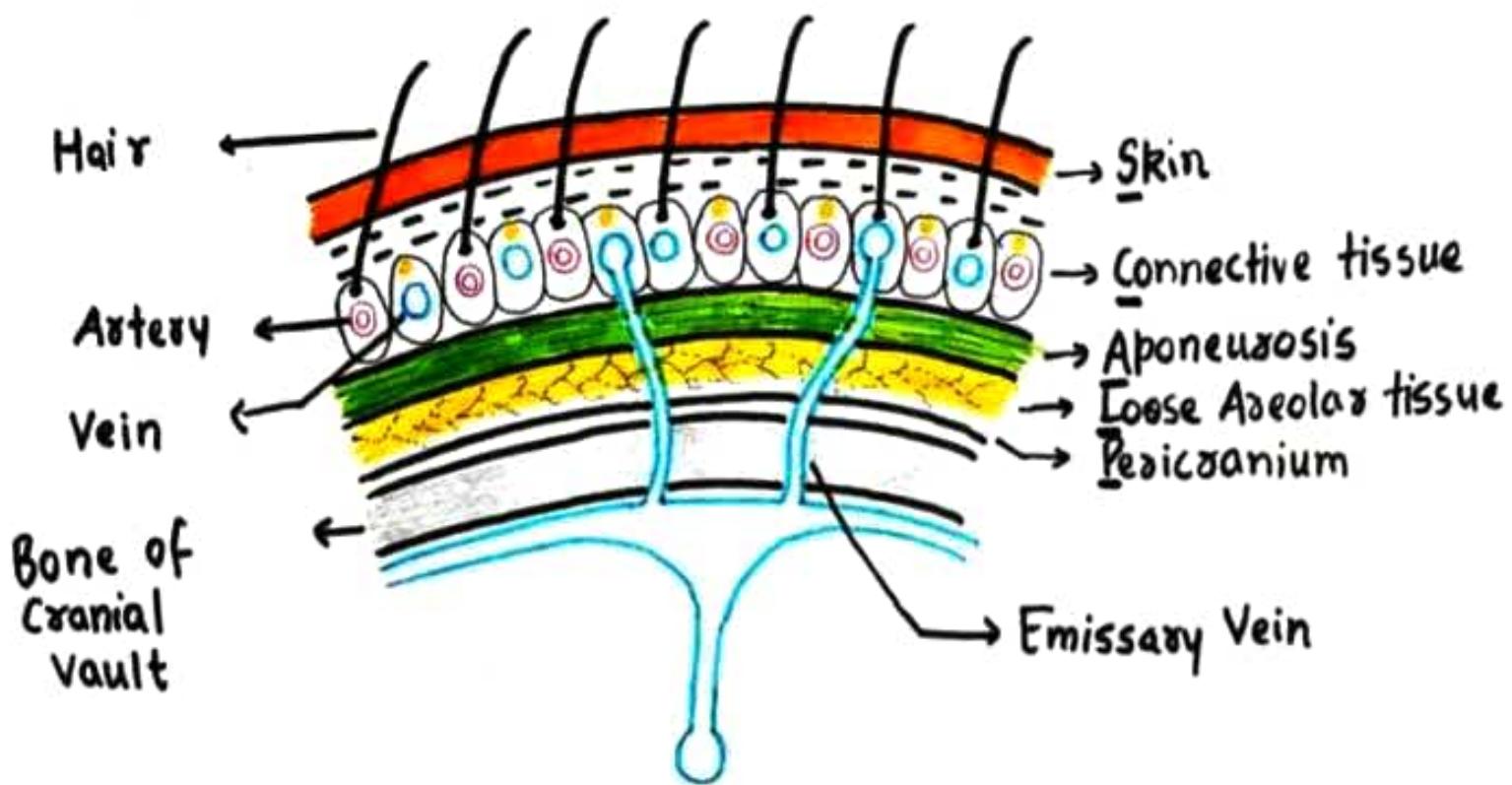
(C.N=5)

Trigeminal Nerve → Mandibular division → Lingual Nerve

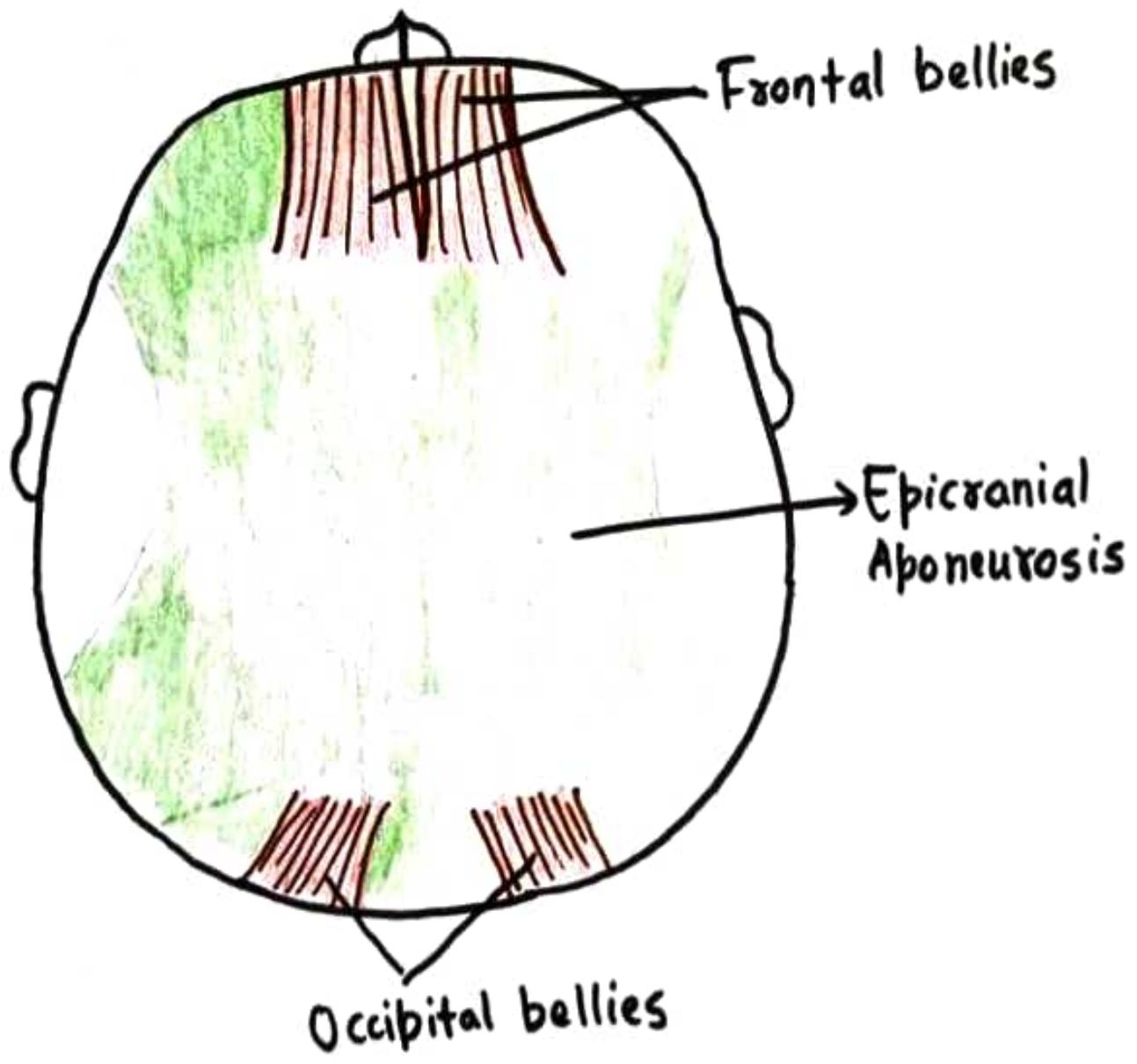
Facial Nerve (C.N=7) → Chorda tympani

Glossopharyngeal Nerve (C.N=9)

Vagus Nerve (C.N=10) → Superior laryngeal Nerve → Internal laryngeal Nerve



## LAYERS OF SCALP



## OCCIPITOFRONTALIS MUSCLE

# SCALP

→ Soft tissues covering the Skull Vault

## EXTENT

Ant. → Up to Eyebrows (Superciliary Arches)

Post. → Superior Nuchal Line

Lateral → Superior Temporal Line

## LAYERS

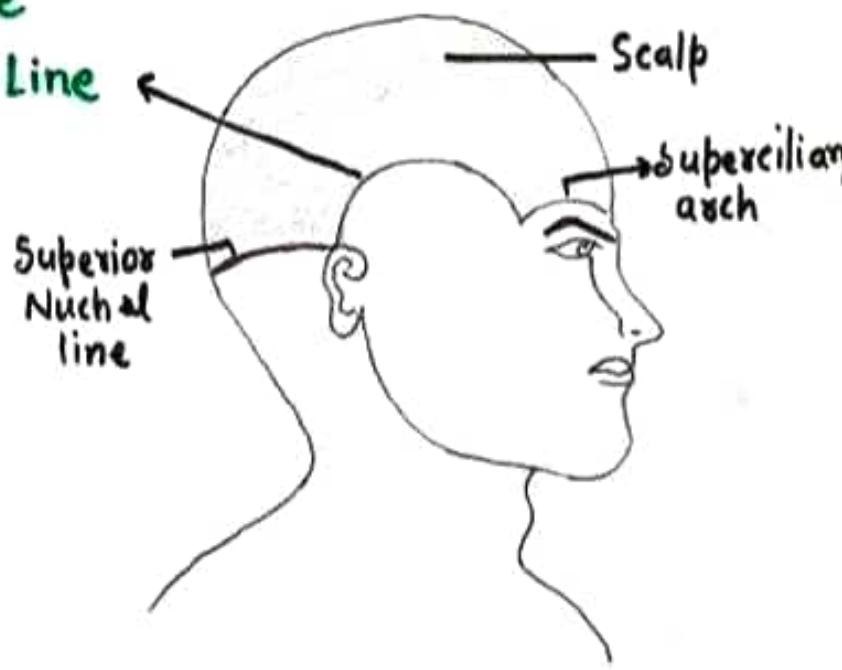
S → Skin

C → Connective Tissue

A → Aponeurosis

L → Loose Areolar tissue

P → Pericranium



### 1. SKIN

→ Thick & Hairy (except over the forehead)

+ Contain Maximum Hair Follicles and Sebaceous Gland

↓  
Commonest Site of Sebaceous Cyst

### 2. CONNECTIVE TISSUE

→ Dense Fibrous type

→ Blood Vessels and Nerves of the Scalp lie in this layer

+ Walls of Vessels are adherent to the fibrous Network

↓  
So when blood vessels are torn or cut during injury, they are unable to retract and cause Profuse Bleeding.

↓  
Bleeding can be stopped by Pressing the Underlying Bone

### 3. APONEUROSIS

- formed by Occipitofrontalis muscle & its Aponeurosis (epicranial aponeurosis or galea aponeurotica)
- greater part of this layer is formed by Aponeurosis

#### Occipitofrontalis Muscle

4 Bellies → 2 Frontal bellies  
                  → 2 Occipital bellies

- + Aponeurosis is under tension in the Anteroposterior direction by tone of Occipitofrontalis muscle



So Wounds of Scalp don't gape unless aponeurosis is cut transversely

### 4. LOOSE AREOLAR TISSUE

- This layer is traversed by Emissary Veins

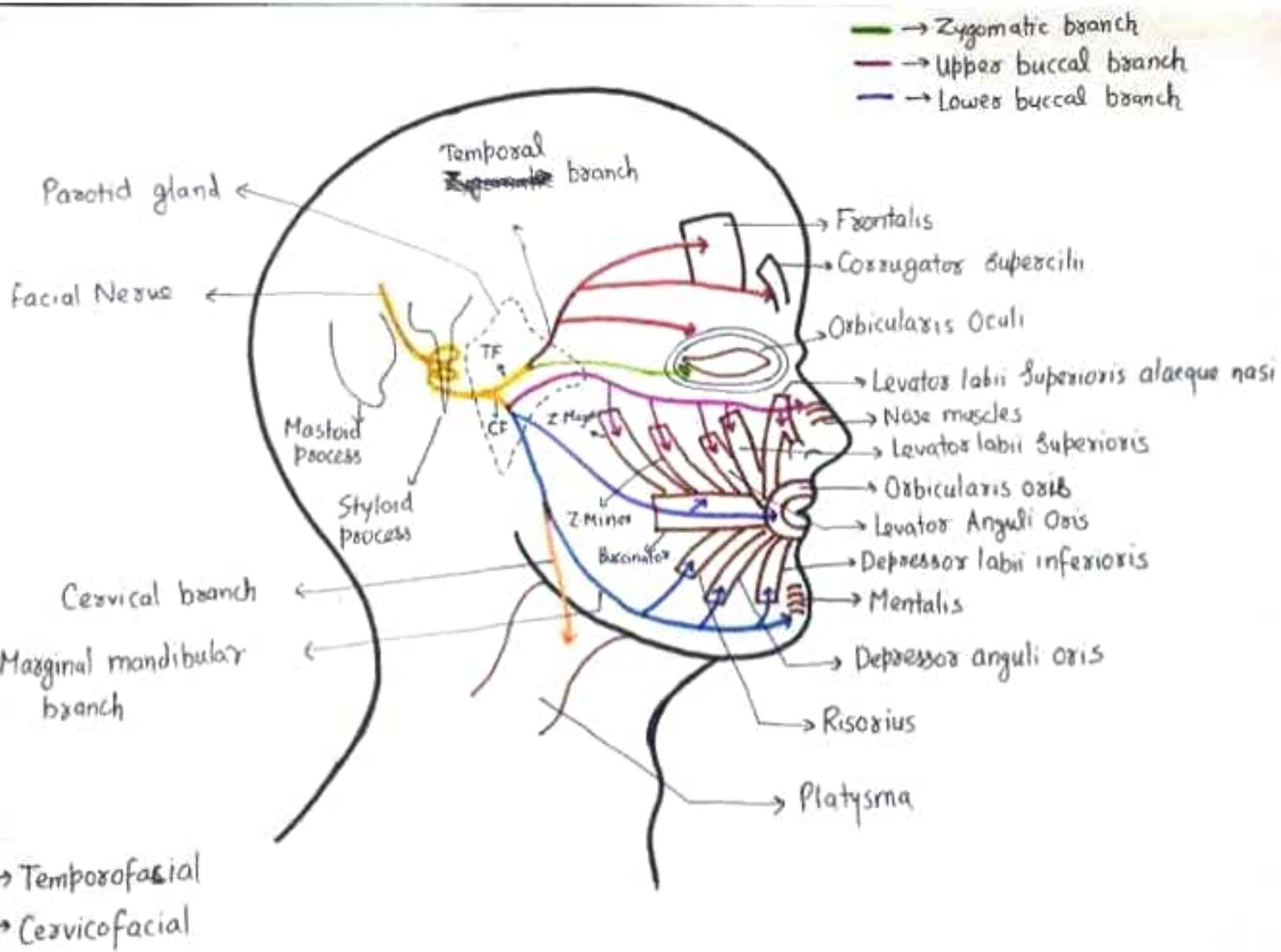
↓

Connect veins in the second layer of Scalp with intracranial dural venous sinuses.

- + Serve as Natural Plane of Cleavage during Craniotomy

### 5. PERICRANIUM

- Formed by Periosteum of bones of vault of skull
- At Sutures it is firmly attached to Sutural membrane, which in turn attaches it to endocranum (the periosteum covering inner aspect of skull bones)



## MOTOR SUPPLY OF FACE

→ Derived from Facial Nerve

### Extracranial Course of Facial Nerve

Facial Nerve Come Out of Cranial Cavity  
through Stylomastoid foramen



Wind Around the Styloid Process



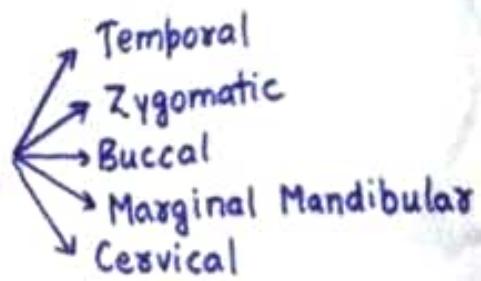
Enters the Parotid Gland



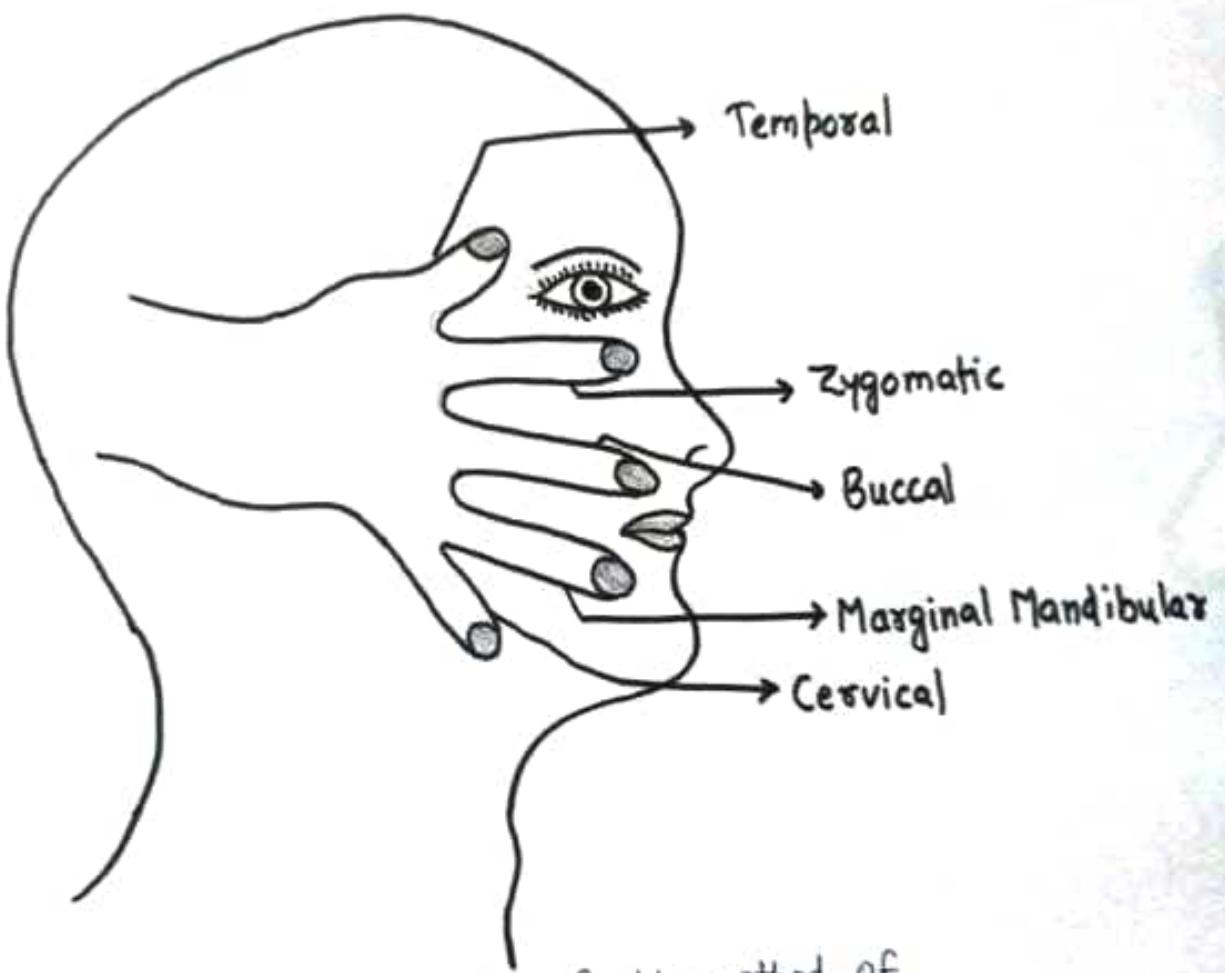
Here it divides into 5 Terminal branches



Emerge into the face radiating through the  
anterior border of <sup>parotid gland to</sup> Supply the muscles of facial Expression

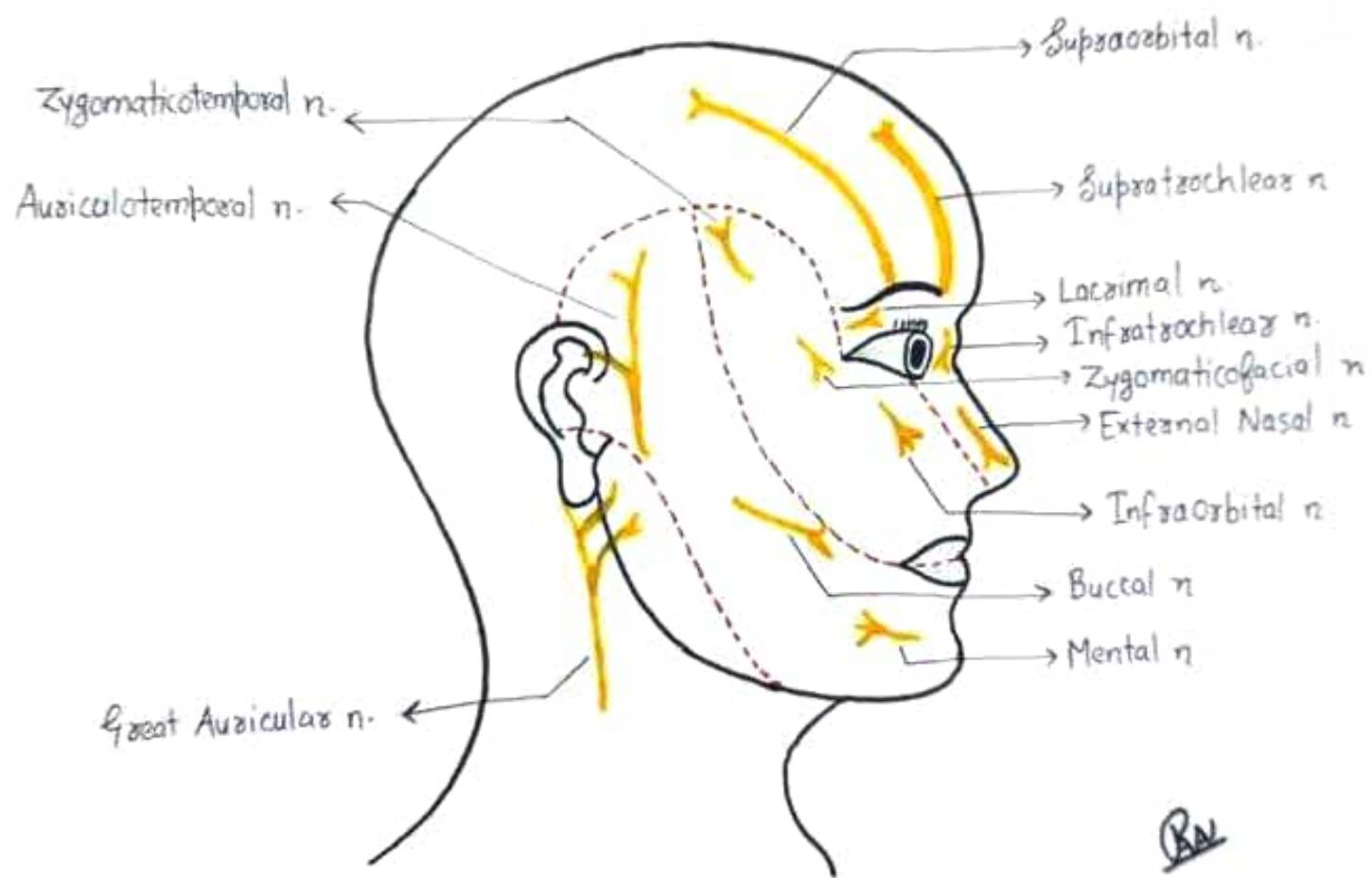


→ These terminal branches form the Goose-foot pattern on the face.

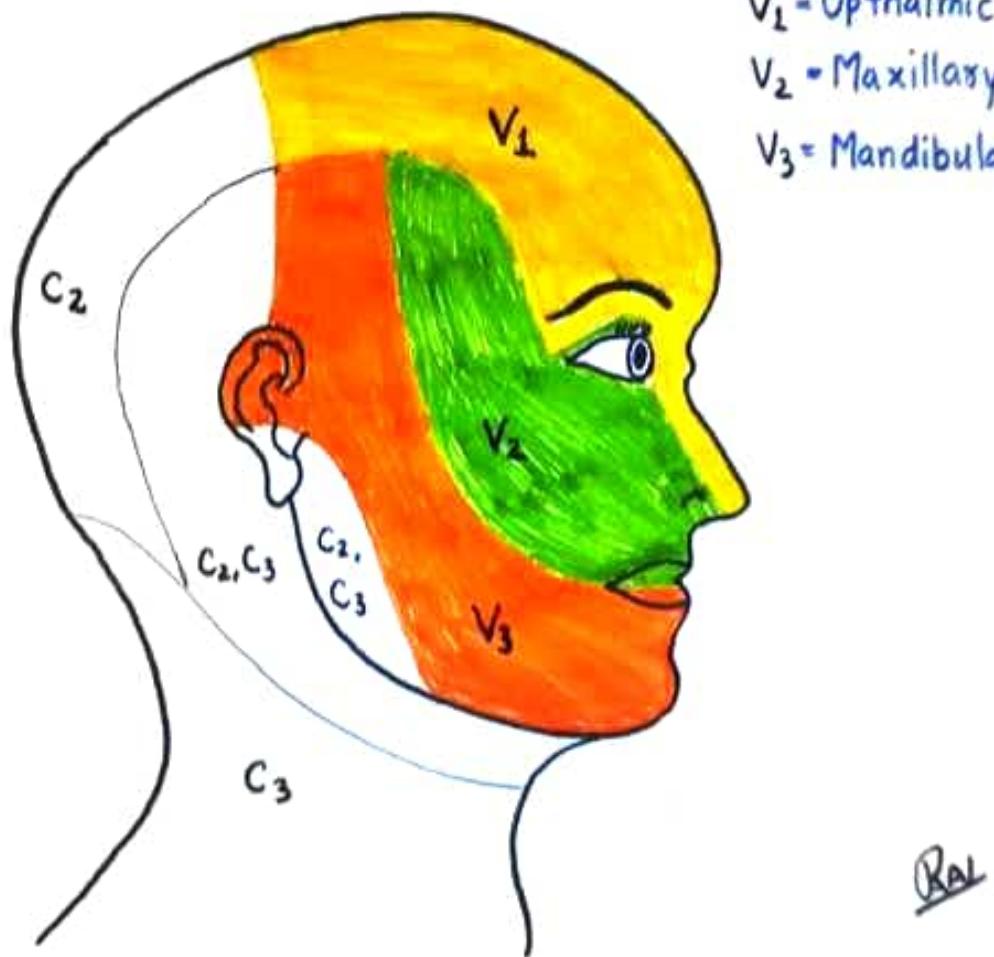


Lateral View of face illustrating the Simple method of  
remembering the terminal branches of the Facial Nerve

Terminal branches of facial Nerve	Muscles Innervated
1. Temporal branch	<ul style="list-style-type: none"> <li>• Frontalis</li> <li>• Corrugator Supercilii</li> <li>• Upper part of Orbicularis Oculi</li> </ul>
2. Zygomatic branch	<ul style="list-style-type: none"> <li>• Lower part of Orbicularis Oculi</li> </ul>
3. Buccal branches	
a) Upper buccal branch	<ul style="list-style-type: none"> <li>• Zygomaticus major &amp; minor</li> <li>• Muscles of Nose</li> <li>• Levator labii Superioris</li> <li>• Levator labii Superioris alaeque nasi</li> <li>• Levator anguli Oris</li> </ul>
b) Lower buccal branch	<ul style="list-style-type: none"> <li>• Buccinator , Orbicularis Oris</li> </ul>
4. Marginal Mandibular branch	<ul style="list-style-type: none"> <li>• Risorius , Depressor Anguli Oris , Depressor labii inferioris , Mentalis</li> </ul>
5. Cervical branch	<ul style="list-style-type: none"> <li>• Platysma</li> </ul>



## SENSORY NERVES OF THE FACE



$V_1$  = Ophthalmic division  
 $V_2$  = Maxillary division  
 $V_3$  = Mandibular division

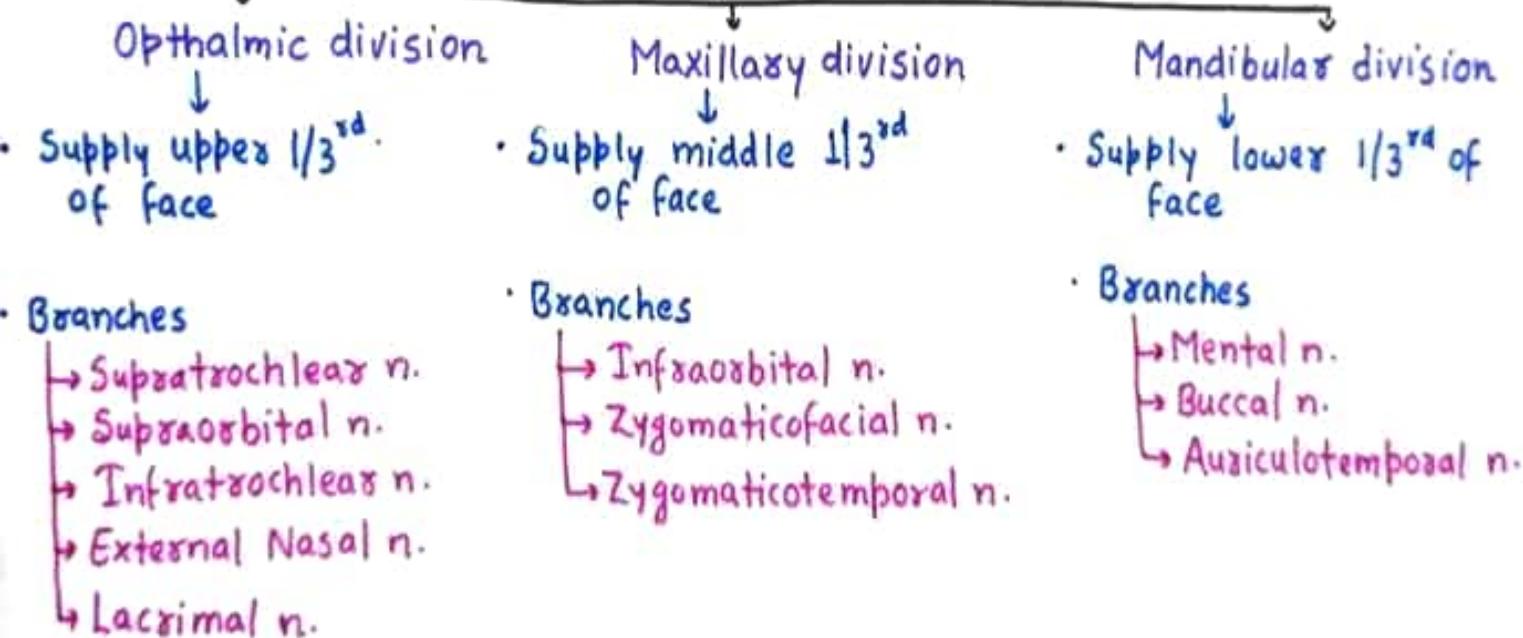
SENSORY INNERVATION OF FACE

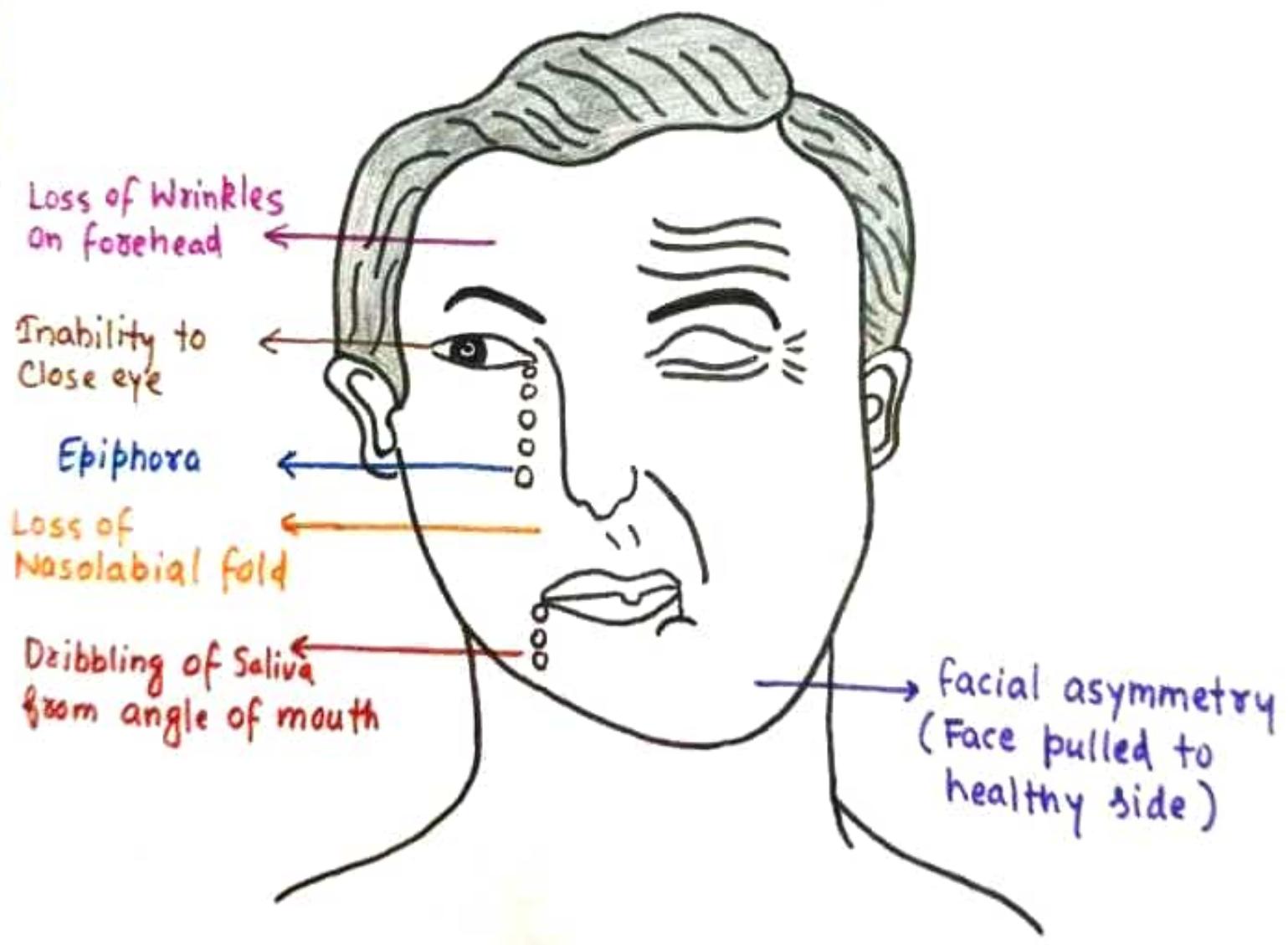
## SENSORY NERVE SUPPLY OF FACE

→ Trigeminal Nerve is the Sensory Nerve of face

↓  
Supplies whole face, except the skin over the angle of Mandible, which is supplied by Great Auricular Nerve ( $C_2, C_3$ )

### Trigeminal Nerve (5<sup>th</sup> Cranial Nerve)





BELL'S PALSY ON THE RIGHT SIDE

(BAL)

## MOTOR NERVE SUPPLY OF FACE :> CLINICAL ANATOMY

### BELL'S PALSY

Compression of Facial Nerve in facial Canal  
near Stylomastoid Foramen



Lower Motor Neuron type Paralysis of facial Muscles

→ Exact reason of Compression is not Known but probably due to viral infection.

### Characteristic feature On The Side of Paralysis

① Facial Asymmetry (affected side is drawn to healthy side)



Due to Unopposed Action of Muscles of Normal Side

② Loss of Wrinkles on Forehead



Paralysis of Occipitofrontalis Muscle

③ Widening of Palpebral fissure & inability to Close eye



Paralysis of Orbicularis Oculi (upper part)

④ Paralysis of

⑤ Tears flow down from the eye (Epiphora)



Paralysis of Orbicularis Oculi (lower part)

⑤ Angle of Mouth hang towards the affected side & inability of Angle of mouth to move upwards & laterally during laughing



Paralysis of Zygomaticus Major

⑥ Loss of Nasolabial furrow



Paralysis of levator labii Superioris Alaeque Nasi

⑦ Accumulation of food in Vestibule of Mouth



Paralysis of Buccinator muscle

⑧ Loss of Resistance when one presses cheek with inflated Vestibule and air leaks out b/t the lips



Paralysis of Buccinator Muscle

⑨ Dribbling of Saliva from Angle of Mouth



Paralysis of Orbicularis Oris

## SENSORY NERVE SUPPLY OF FACE :- CLINICAL ANATOMY

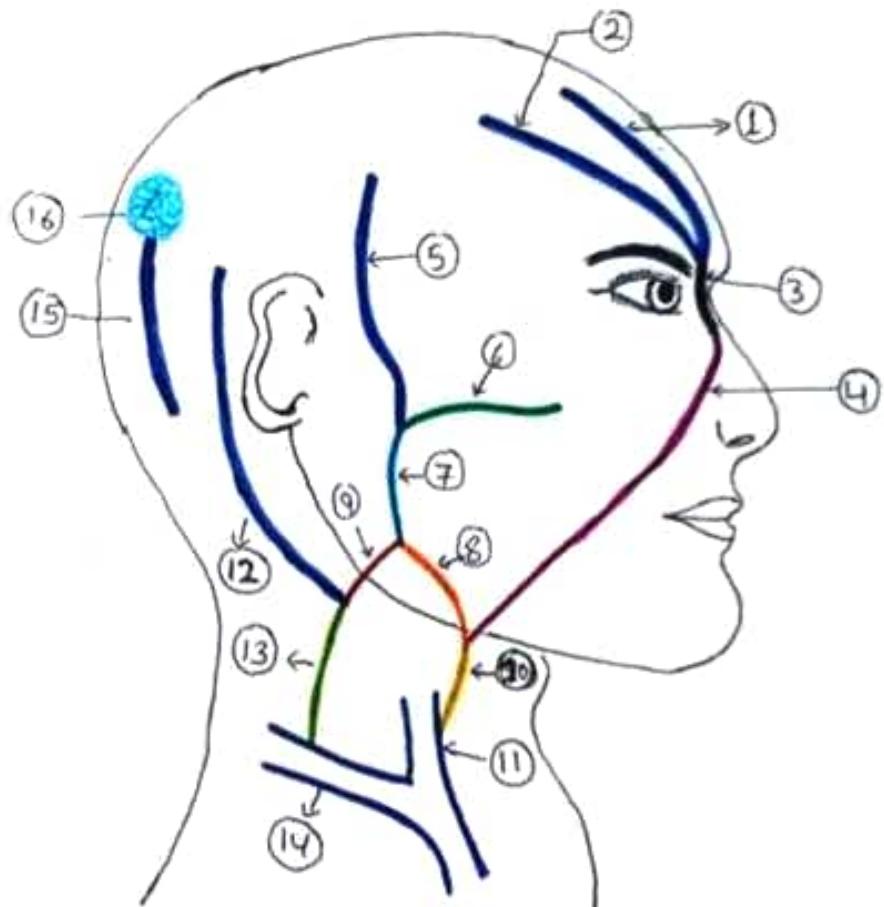
### 1. Trigeminal Neuralgia

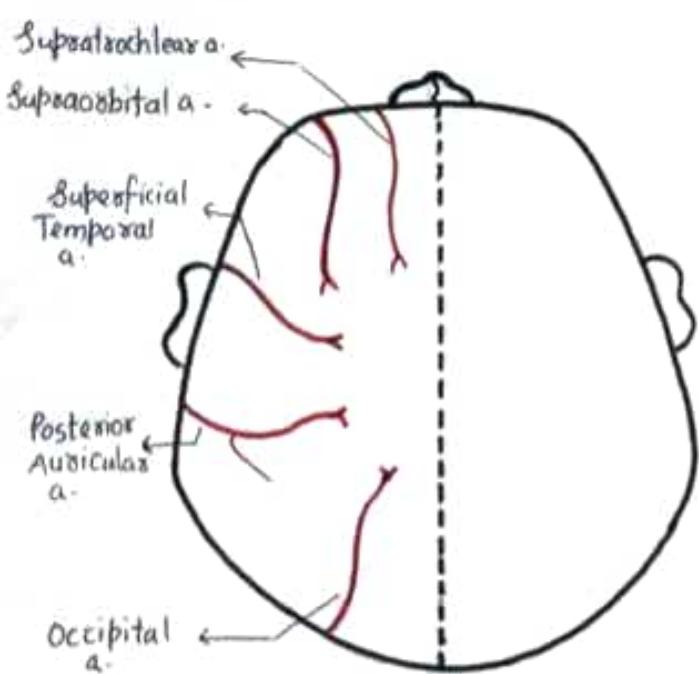
- Characterized by → Sudden Paroxysmal attacks of lancinating pain from few hours to several days
- ↳ Confined to distribution of one or more division of Trigeminal Nerve
- Common in Maxillary area
- More frequent on right side

### 2. Herpes Zoster Ophthalmicus

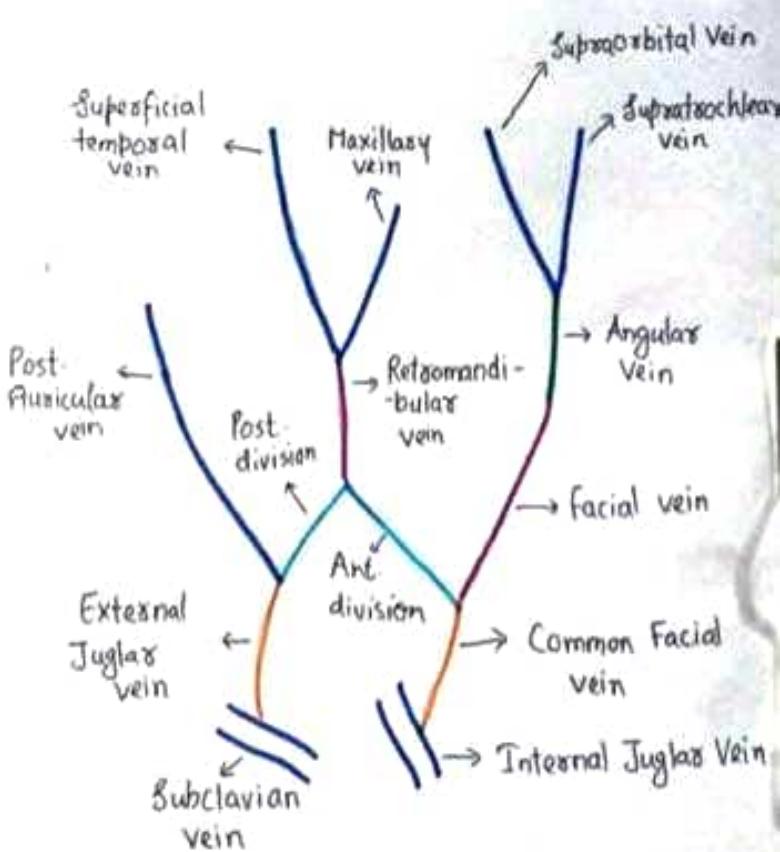
- Viral infection involving Ophthalmic Nerve
- Severe pain & edema in Ophthalmic territory
- Characterised by → Appearance of Vesicle along the Cutaneous branch of Ophthalmic Nerve

1. Supratrochlear vein
2. Supraorbital vein
3. Angular Vein
4. Facial Vein
5. Superficial temporal vein
6. Maxillary Vein
7. Retromandibular Vein
8. Ant. division of R.M.V
9. Post. division of R.M.V
10. Common Facial Vein
11. Internal Jugular Vein
12. Post. Auricular Vein
13. External Jugular Vein
14. Subclavian Vein
15. Occipital Vein
16. Occipital Plexus

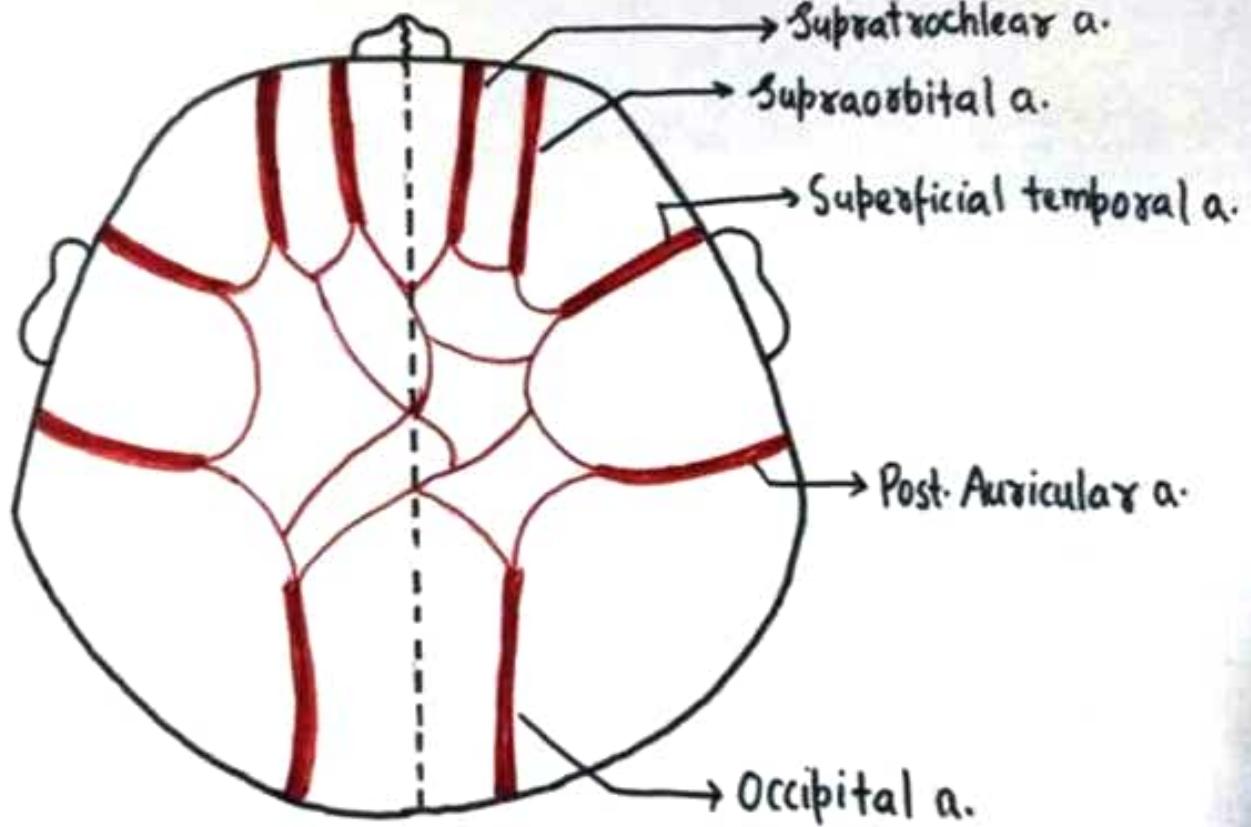




ARTERIAL SUPPLY OF SCALP



VENOUS DRAINAGE OF SCALP



## ARTERIAL SUPPLY OF SCALP

## VENOUS DRAINAGE OF SCALP

- On Each side of midline drained by Five Veins
- Veins of Scalp accompany arteries
  - Supratrochlear Vein
  - Supraorbital Vein
  - Superficial temporal Vein
  - Posterior Auricular Vein
  - Occipital Vein

### SENSORY SUPPLY

Subnasal  
Supraorbital  
Zygomaticotemporal  
Auriculotemporal  
Great Auricular (C<sub>2</sub>, C<sub>3</sub>)  
Lesser occipital (C<sub>2</sub>)  
Greater occipital (C<sub>2</sub>)  
Third occipital (C<sub>3</sub>)

### MOTOR SUPPLY

Temporal branch of facial Nerve  
Post. auricular branch of facial N.

## NERVE SUPPLY OF SCALP

Sensory Supply on each Side of Midline

Supplied by 8 Sensory Nerves

4 in front of Auricle

• Suborbital

• Supraorbital

• Zygomaticotemporal

• Auriculotemporal

4 behind the Auricle

• Great Auricular ( $C_2, C_3$ )

• Lesser Occipital ( $C_2$ )

• Greater Occipital ( $C_2$ )

• Third Occipital ( $C_3$ )

Motor Supply on each Side of Midline

Supplied by 2 Motor Nerves

1 in Front of Ear

• Temporal branch of Facial Nerve

1 Behind the Ear

• Posterior Auricular branch of facial Nerve

Ran

## FEMORAL TRIANGLE

LOCATION:→ In front of Upper 1/3<sup>rd</sup> of thigh, below inguinal ligament

BOUNDRIES:→

Lateral = Medial border of Sartorius

Medially = Medial border of adductor longus

Base = Inguinal ligament

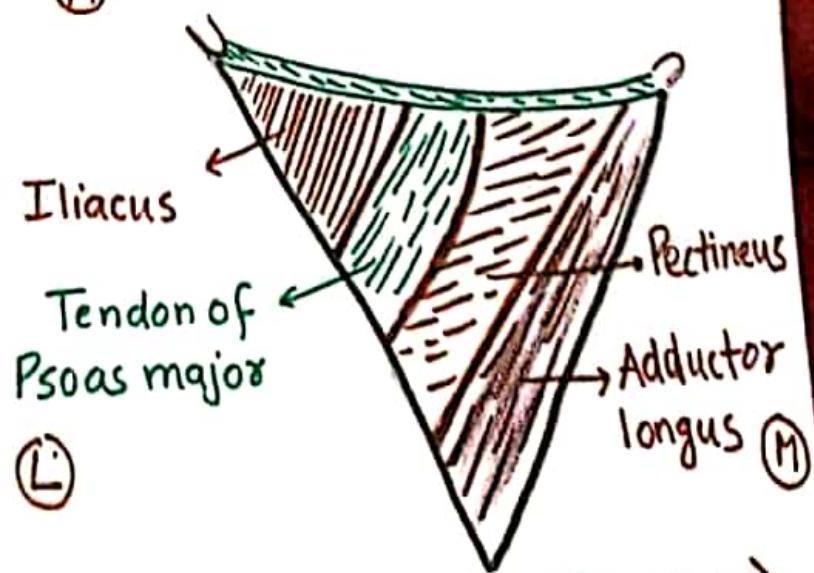
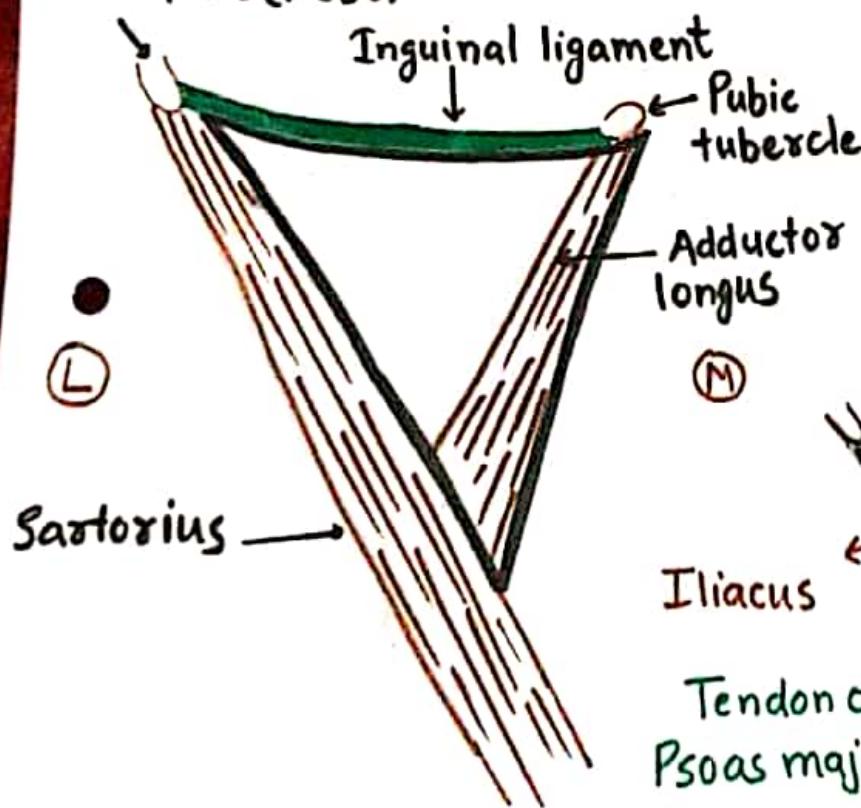
Apex = Crossing of Medial and lateral boundary

FLOOR:→

● Medially = Adductor longus & Pectineus

● Laterally = Psoas major & iliacus

Anterior Superior  
iliac spine (ASIS)

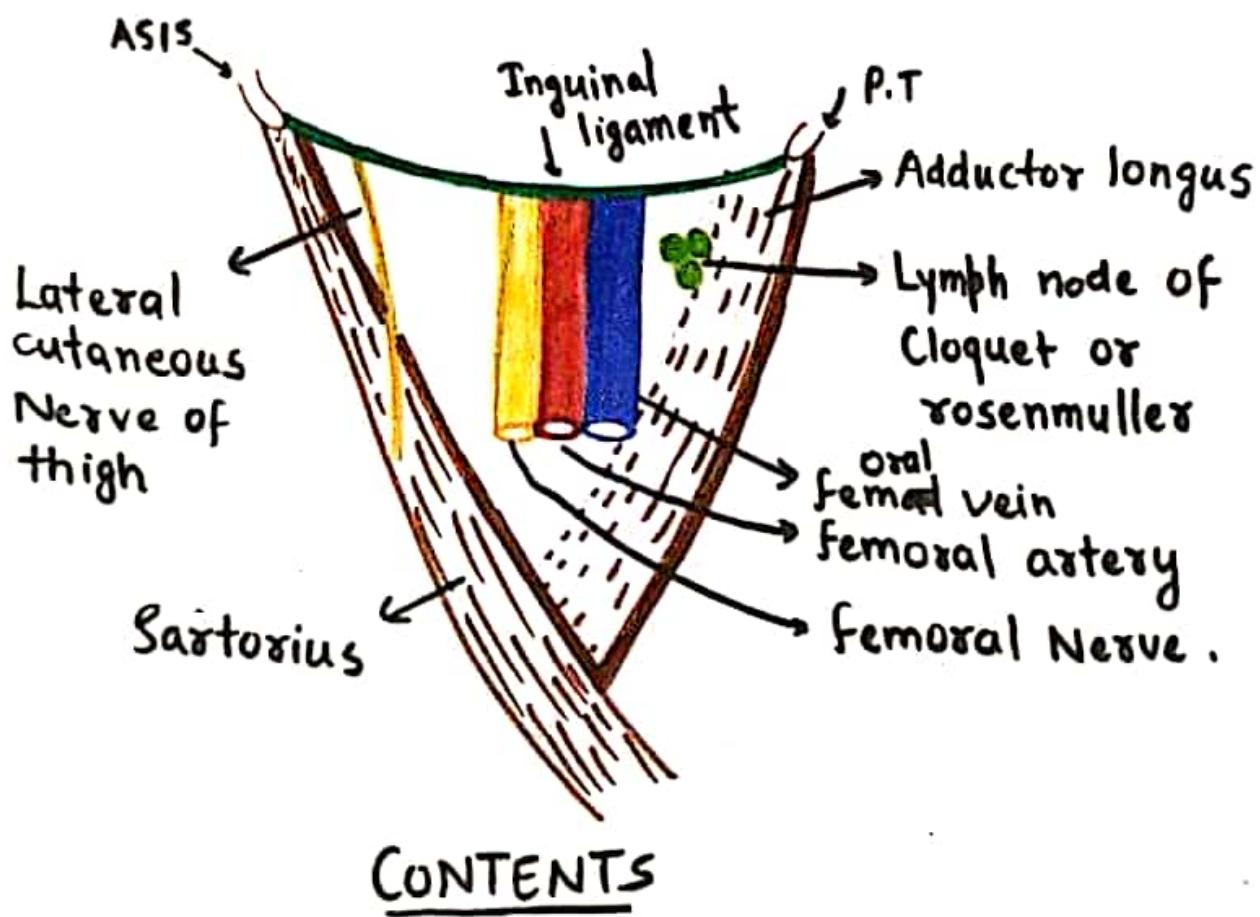


BOUNDARIES

FLOOR (Add Pea To It)

## Contents:-

- ① Femoral Nerve
- ② Femoral artery
- ③ Femoral vein
- ④ Lymph node of Cloquet or Rosenmüller
- ⑤ Lateral cutaneous Nerve of thigh
- ⑥ Femoral branch of Genitofemoral N.



## Roof:-

- Skin
- Superficial fascia
- Deep fascia including cribiform fascia.

BAL

## Femoral Canal

- Medial Compartment of femoral Sheath.
- 1.5cm long & 1.5cm wide.

## Femoral Ring

- Upper end of femoral Canal

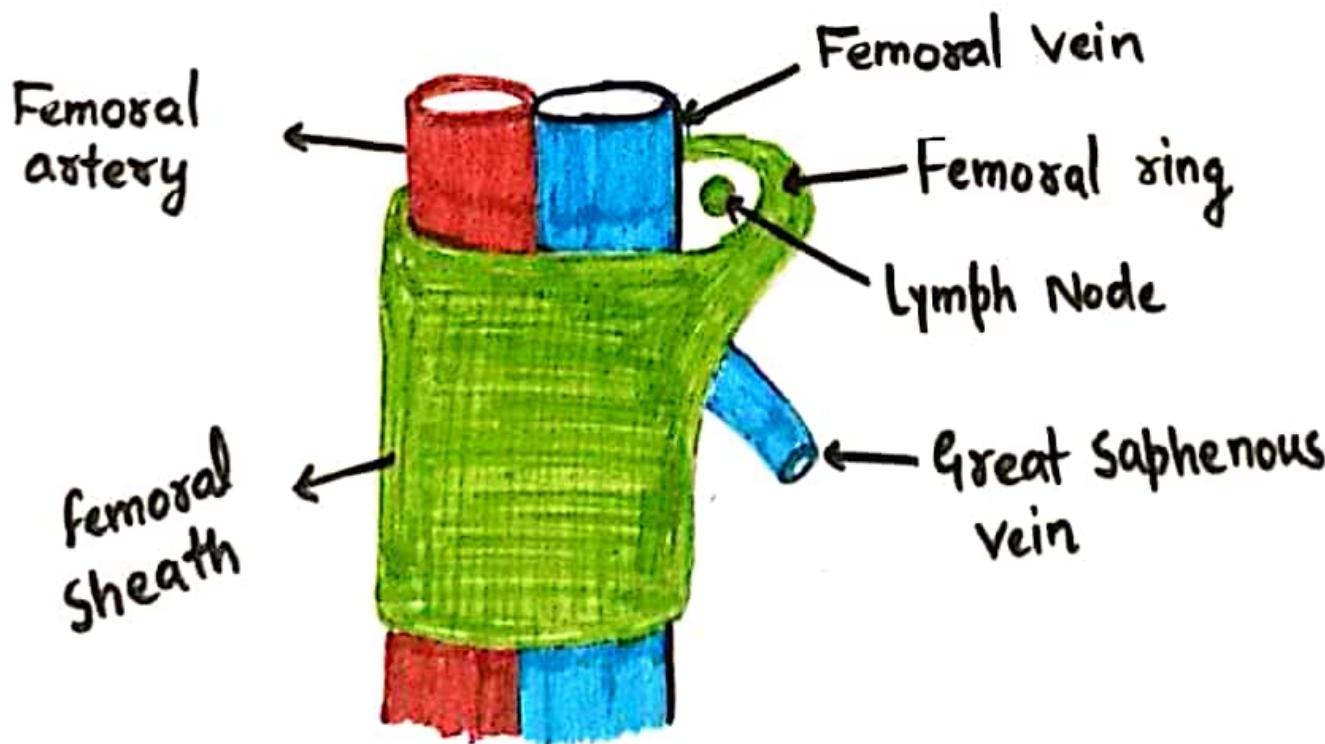
### BOUNDRIES

Medially = Lacunar Ligament

Anteriorly = ~~Pecten & its~~ fascia Inguinal Ligament

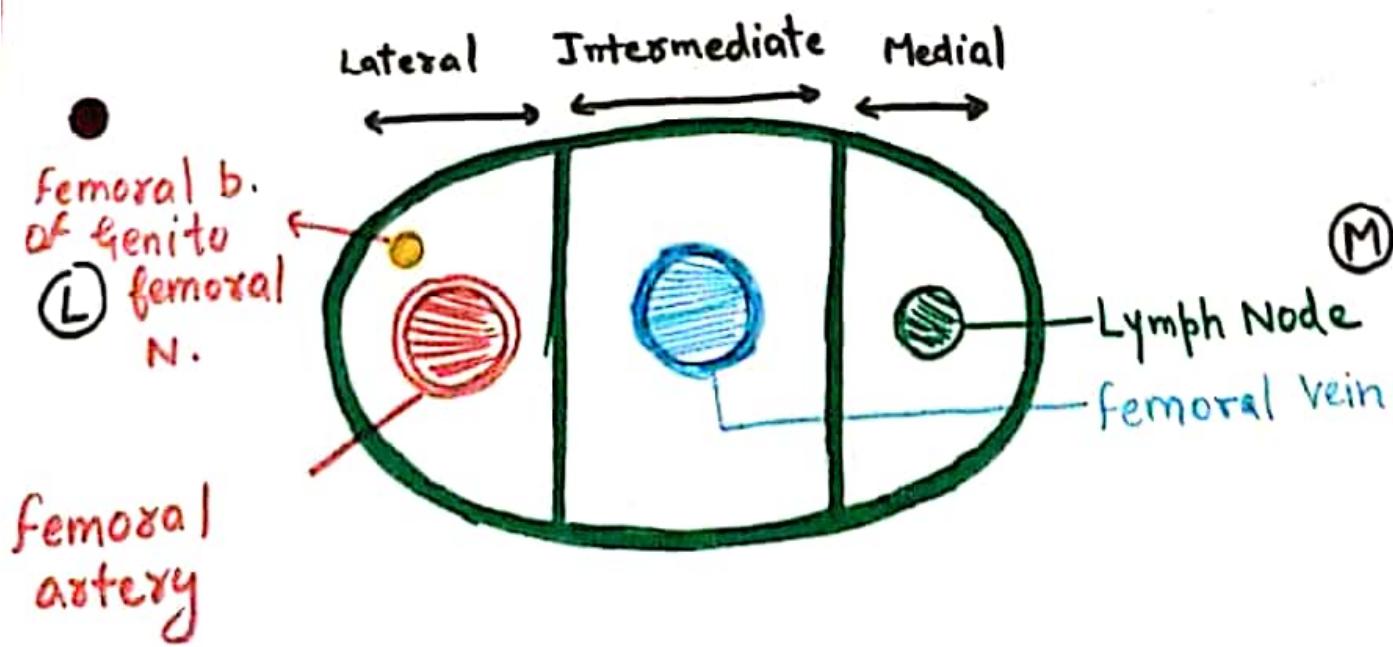
Posteriorly = Pecten & its fascia

Laterally = Septum separating it from femoral vein.



## Femoral Sheath

- \* Enclose upper 3 to 4 cm of femoral vessels.
- \* Anterior wall formed by = fascia transversalis  
Posterior wall formed by = fascia iliaca.
- \* Lateral wall is vertical  
Medial wall is oblique
- \* Sheath is divided into three compartments by septa :-
  - ① Lateral compartment contain femoral artery & femoral branch of genitofemoral N.
  - ② Intermediate Compartment contain Femoral vein
  - ③ Medial Compartment contain Lymph Node (Femoral Canal)



## Adductor's Canal / Hunter's Canal / Subsartorial Canal

→ Intermuscular space situated on the medial side of the middle one-third of thigh.

Extent:- From the apex of femoral triangle, above  
To the tendinous opening in the adductor magnus, below

Shape:- Triangular in Cross-Section

### Boundaries:-

Anterolateral = Vastus Medialis

Postezomedial = Adductor longus, above

● Adductor magnus, below

Medial / Roof = fibrous membrane joining anterolateral and postezomedial walls.

\* Roof is overlapped by the Sartorius.

\* Subsartorial plexus of nerves lies between fibrous sheet and sartorius muscle.

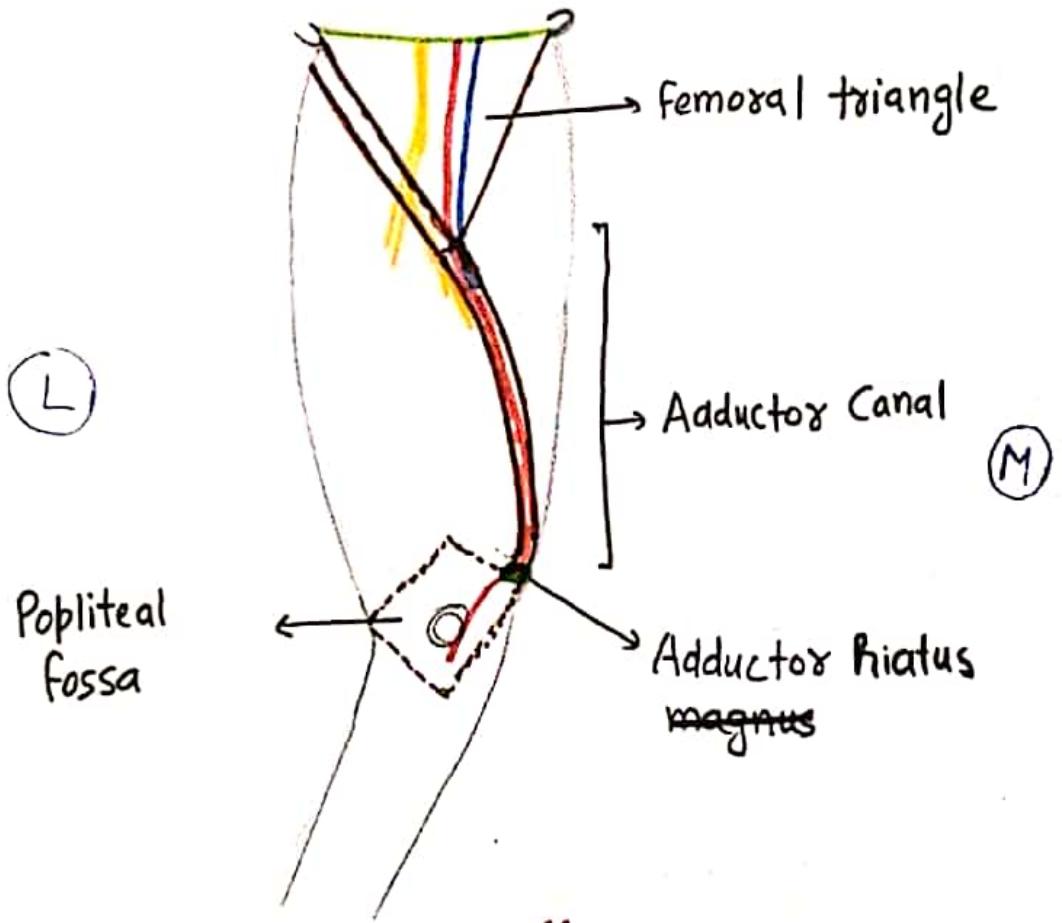
### Contents:-

- 1. Femoral artery
- 2. Femoral vein
- 3. Saphenous Nerve
- 4. Nerve to Vastus medialis
- 5. Branches of two divisions of obturator nerve.
- 6. Descending genicular artery.

### Clinical:-

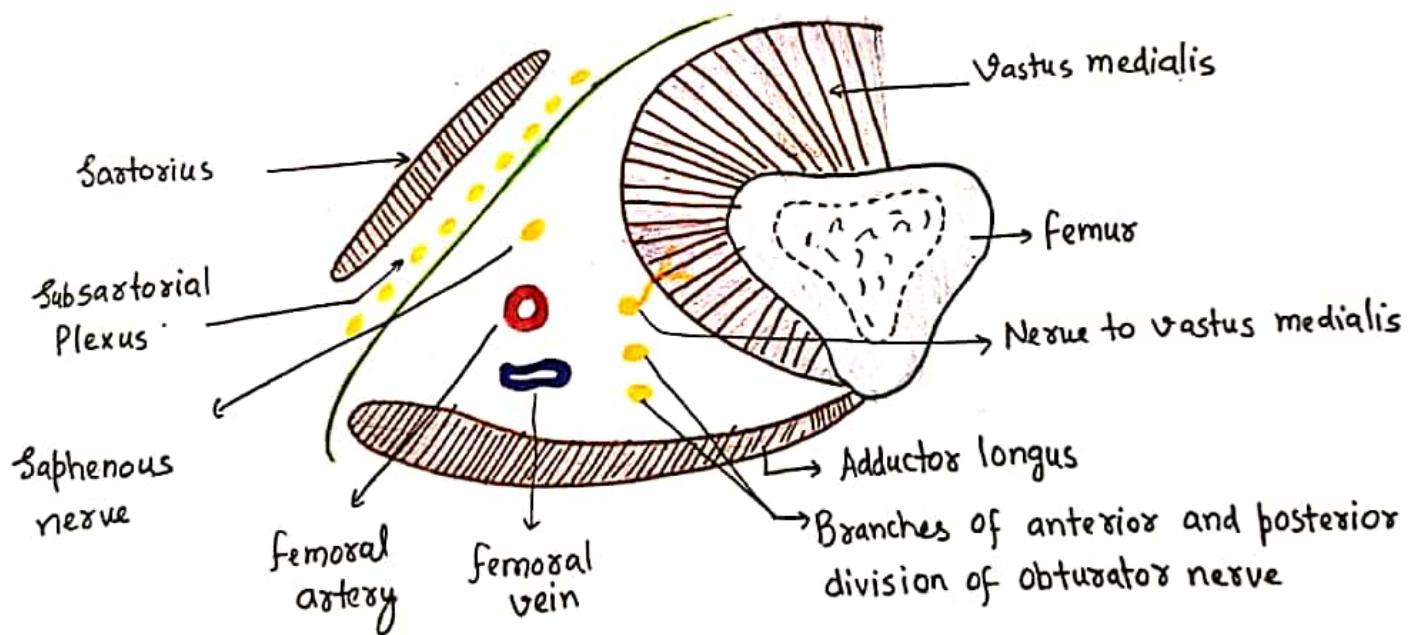
Femoral artery is ligated in adductor Canal in treatment of popliteal aneurysm.

BAL



RAV

## ADDUCTOR'S CANAL / HUNTER'S CANAL / SUBSARTORIAL CANAL



POPLITEAL FOSSA → Diamond Shaped depression  
 • lying behind the knee joint

### Superolaterally

- Biceps femoris

### Superomedially

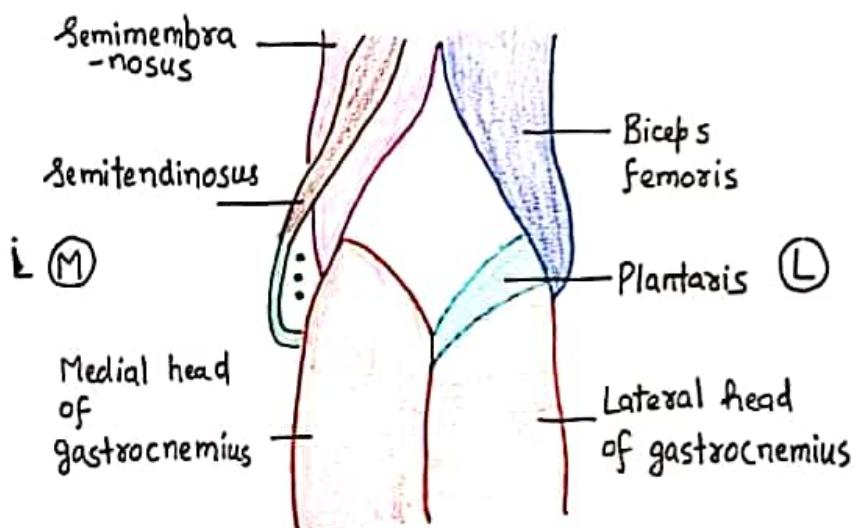
- Semitendinosus
- Semimembranosus
- Supplemented by Gracilis, Sartorius and adductor magnus.

### Inferolaterally

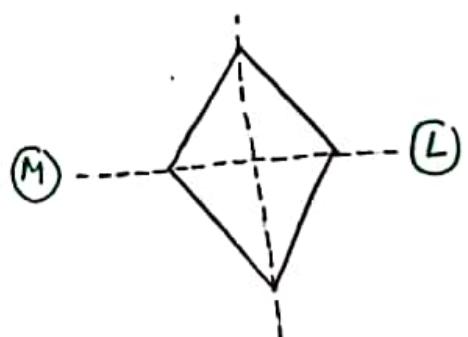
- Lateral head of Gastrocnemius
- Supplemented by Plantaris

### Inferomedially

- Medial head of Gastrocnemius.



### BOUNDARIES OF POPLITEAL FOSSA



### Roof

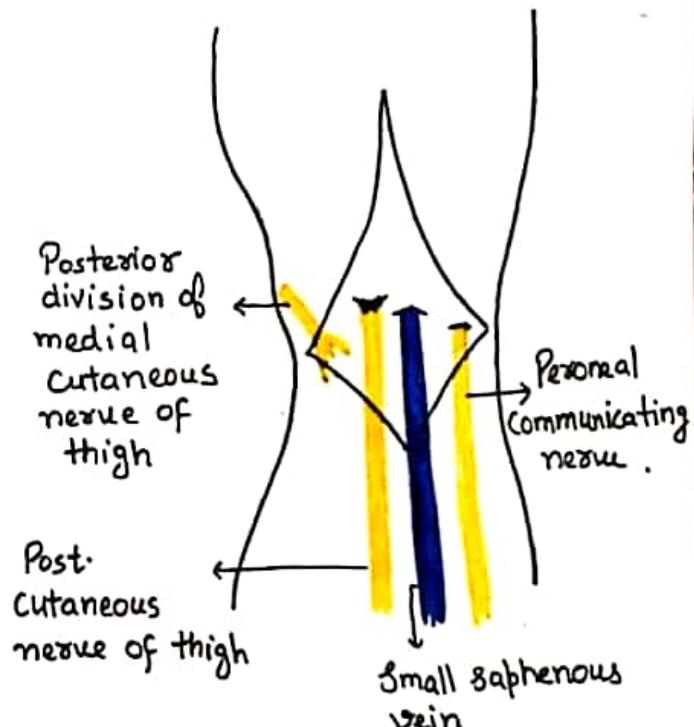
- ⇒ Skin
- ⇒ Superficial fascia
- ⇒ Deep fascia

Superficial fascia contains :-

- Small Saphenous vein draining the popliteal vein
- Post. cutaneous nerve of thigh
- Post. division of medial cutaneous nerve of thigh.
- Peroneal communicating nerve.

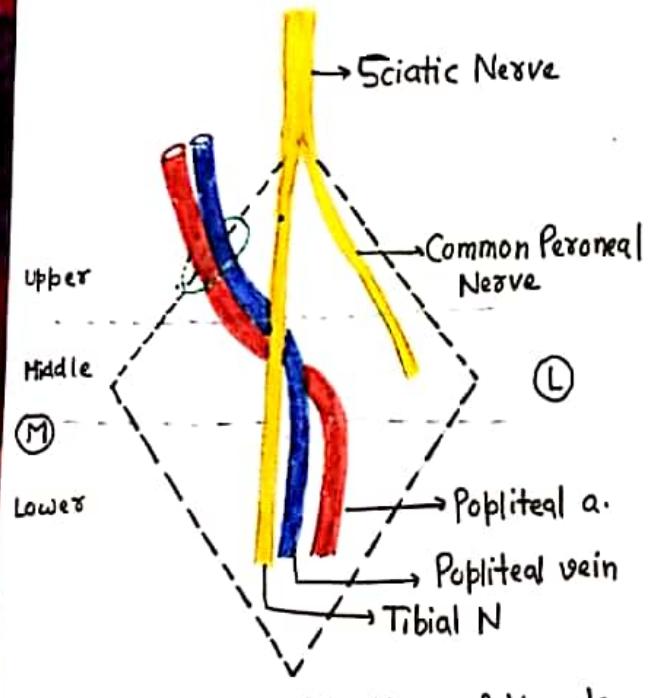
### Floor

- Popliteal Surface of femur
- Capsule of knee joint
- Oblique popliteal ligament
- Popliteal fascia.



### Structures In Roof Of Popliteal fossa

RAN



Arrangement of Main Nerves & Vessels  
in popliteal fossa

### Contents:

- (1) Popliteal a. and its branches
- (2) Popliteal vein and its tributaries
- (3) Tibial N. and its branches
- (4) Common peroneal N. and its branches
- (5) Popliteal lymph nodes
- (6) Fat

Relative Position of Popliteal a., Popliteal vein & Tibial Nerve  
in different parts of popliteal fossa.

- ① Upper part (Medial to lateral) → Artery Vein Nerve
- ② Middle part (from behind forwards) → Nerve Vein Artery
- ③ Lower part (Medial to lateral) → Nerve Vein Artery

BAI

Ascending branch of  
Medial Circumflex  
femoral artery

Inferior division  
of the deep branch  
of Superior gluteal  
a.

Ascending branch of  
Lateral Circumflex  
femoral artery

TROCHANTERIC  
ANASTOMOSES

Branch of Inferior  
gluteal a.

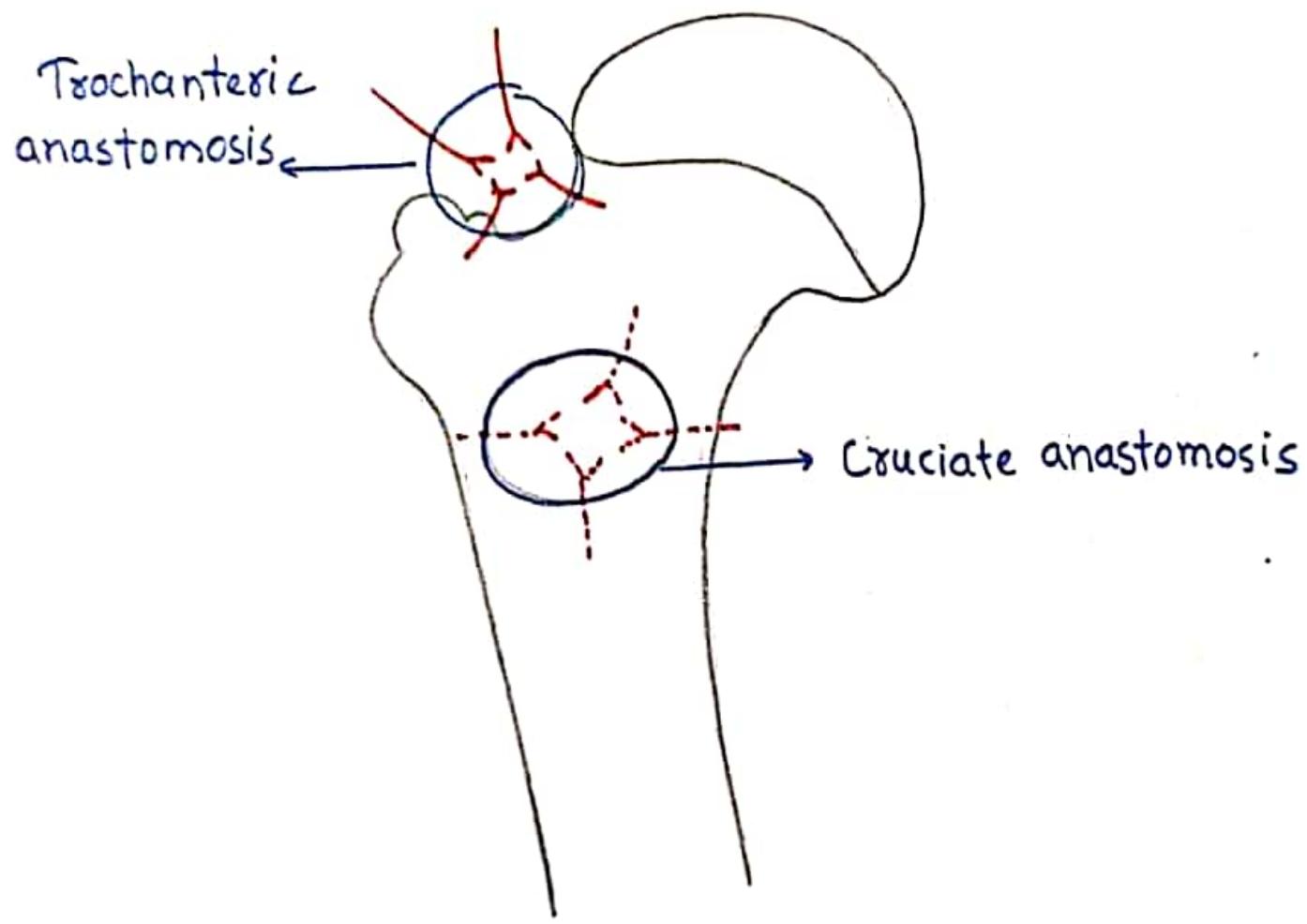
Transverse branch  
of medial circumflex  
femoral artery

Ascending branch  
of the first  
perforating  
artery.

Transverse branch of  
\* Lateral Circumflex  
femoral artery.

Anastomotic branch  
of the inferior  
gluteal a.

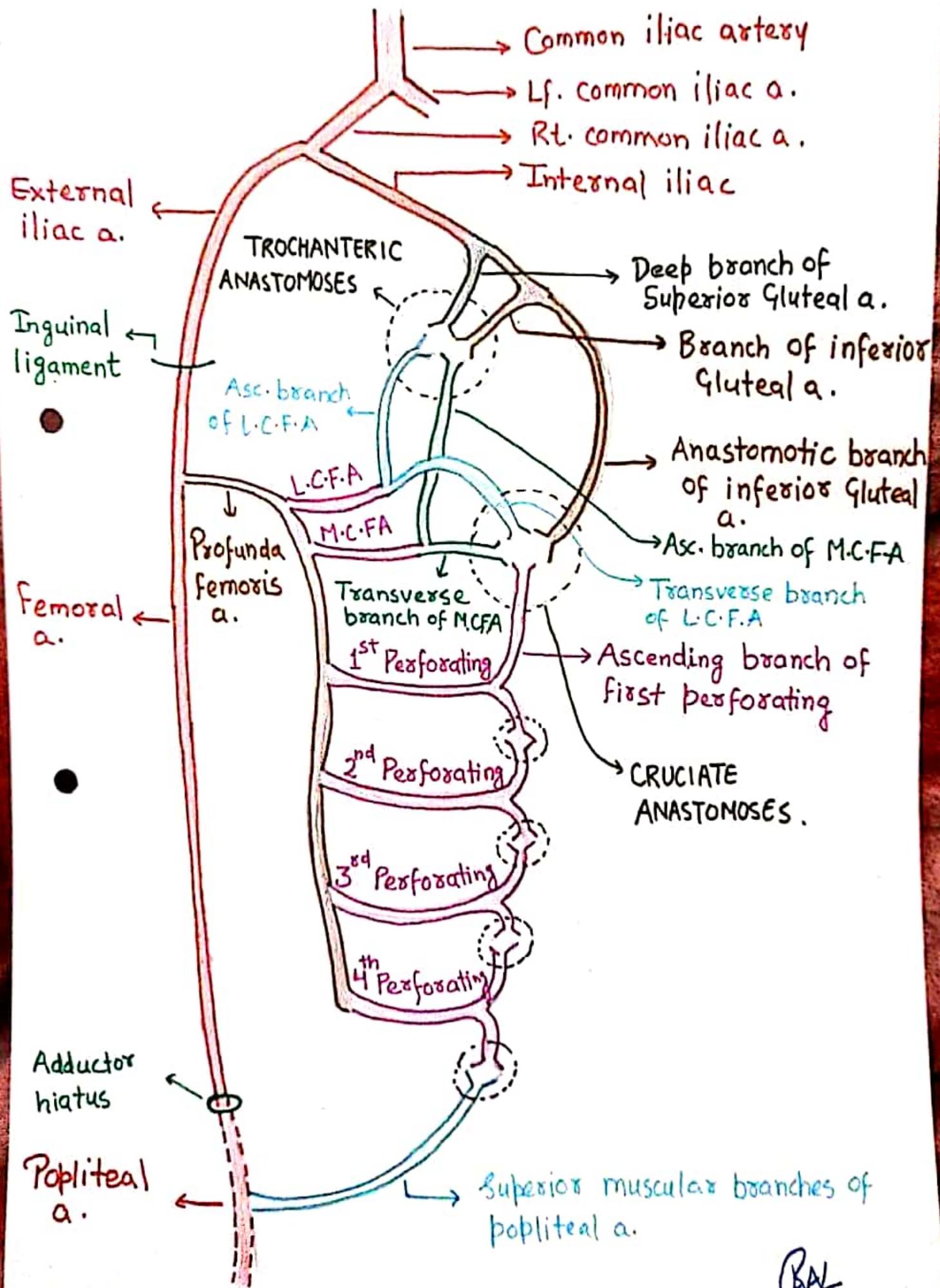
B.N

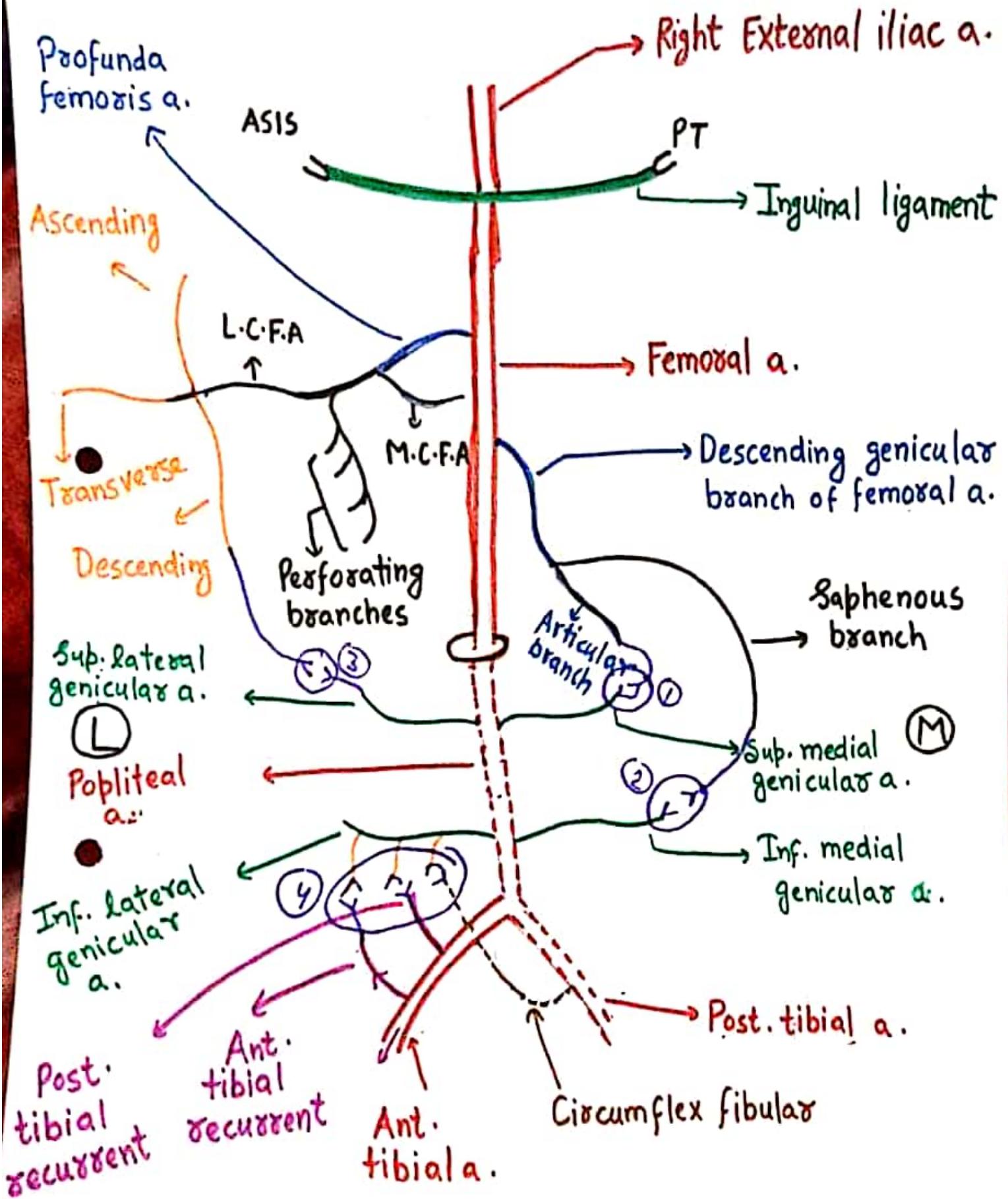


Location of Trochanteric & Cruciate Anastomoses

RAL

# TROCHANTERIC AND CRUCIATE ANASTOMOSES





## ANASTOMOSIS AROUND KNEE JOINT

3. Laterally and Above the condyle

Descending branch of  
Lateral circumflex F.A.



Superior lateral genicular a.

(L)

4. Laterally and Below the condyle

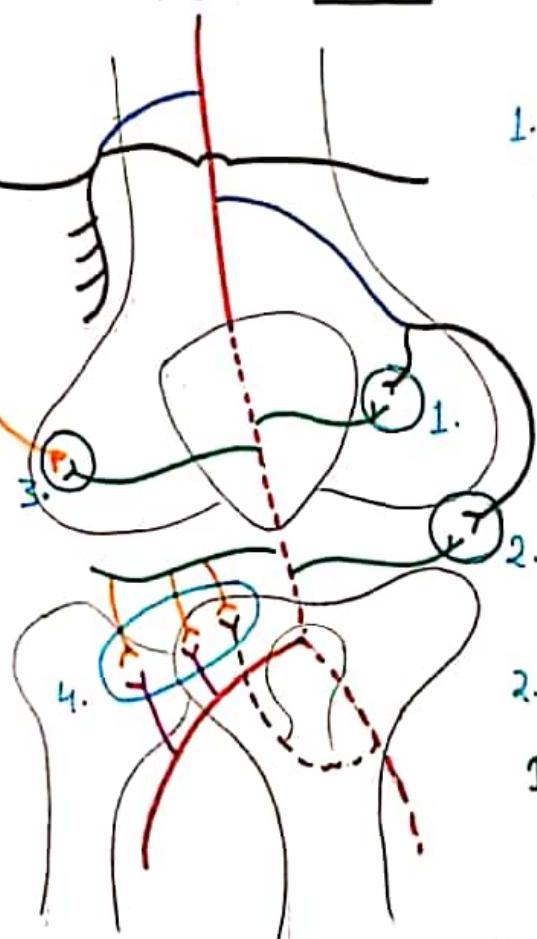
Inferior lateral genicular a.



Ant. tibial recurrent a.

Post. tibial recurrent a.

Circumflex fibular a.



1. Medially and Above the Condyle

Superior medial genicular a.



Articular branch of descending genicular a.

(M)

2. Medially and Below the Condyle

Inferior medial genicular a.



Saphenous branch of descending genicular a.



# DORSALIS PEDIS ARTERY

- \* Chief Palpable artery of dorsum of foot.
- \* Commonly Palpated in patients with vaso-occlusive diseases of Lower limb.

## Beginning, Course and Termination

Anterior tibial artery

↓  
After Crossing line joining 2 malleoli form dorsalis Pedis a.

↓  
Passes forward along medial side of dorsum of foot

● Reach Proximal end of 1<sup>st</sup> Intermetatarsal space

↓  
Dips downward b/w 2 heads of 1<sup>st</sup> dorsal interosseous m.

↓  
End in the sole by completing Plantar Arterial Arch.

## Relations

Superficial = Skin  
fasciae

Inferior extensor retinaculum

● Deep = Ligament of angle Joint

Talus

Navicular

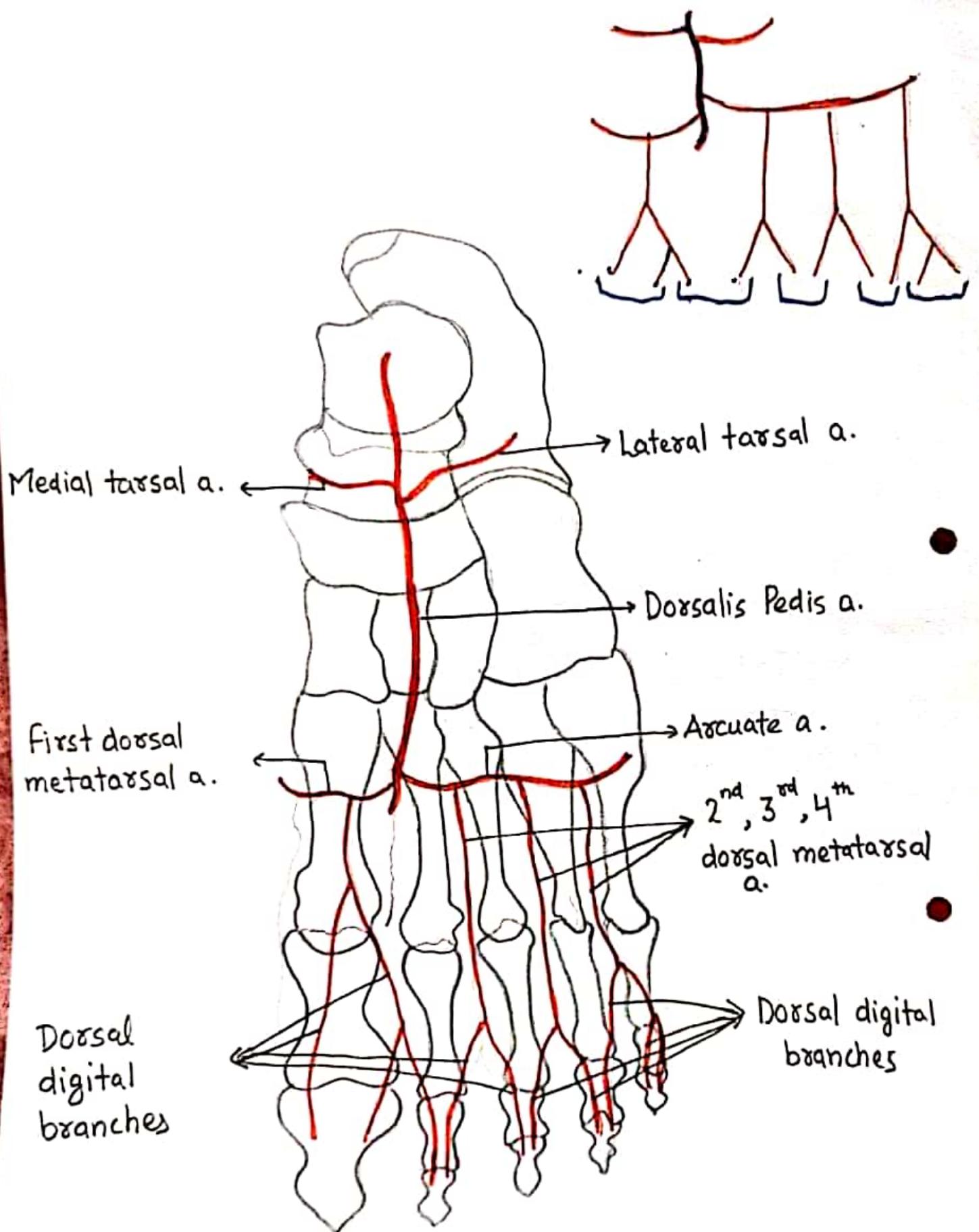
Cuneiform

Medial = Extensor hallucis longus

Lateral = 1<sup>st</sup> tendon of Extensor digitorum longus.

## Branches

- Lateral tarsal artery
- Medial tarsal branches
- Arcuate artery
- First dorsal metatarsal artery.



B.S.K

# OBTURATOR NERVE

\* Chief Nerve of medial/Adductor compartment of thigh.

\* Supplies → Muscles of Medial Compartment of thigh

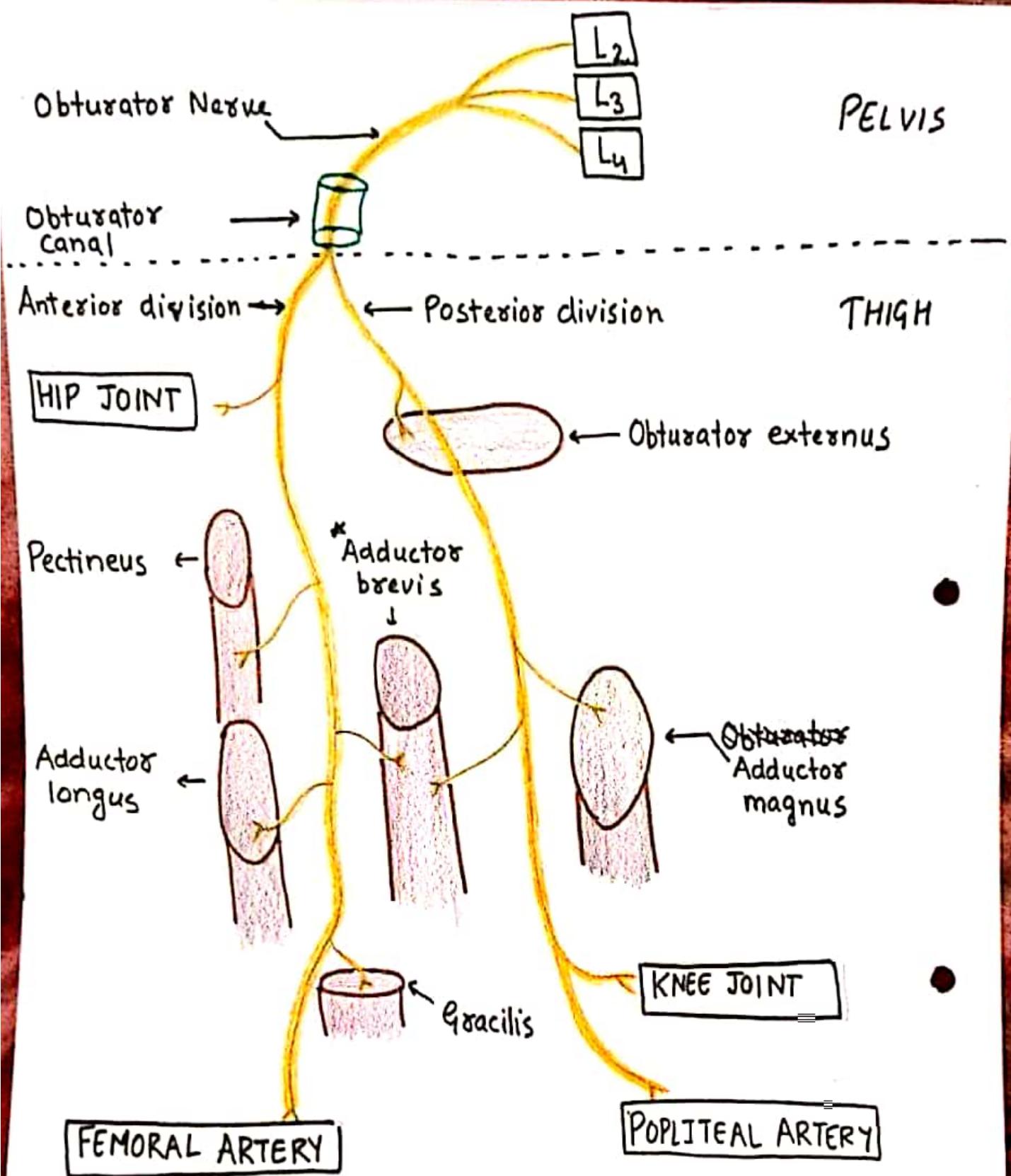
- ↓
  - Adductor longus
  - Adductor brevis
  - Adductor magnus
  - Gracilis
  - Pectineus

→ Skin of medial side of thigh

Root Value = L<sub>2</sub>, L<sub>3</sub>, L<sub>4</sub>

## ● Origin, Course, Termination

In Pelvis it arises from ventral division of anterior 1<sup>st</sup> 2<sup>nd</sup> 3<sup>rd</sup> 4<sup>th</sup> 5<sup>th</sup> 6<sup>th</sup> 7<sup>th</sup> 8<sup>th</sup> 9<sup>th</sup> 10<sup>th</sup> 11<sup>th</sup> 12<sup>th</sup> 13<sup>th</sup> 14<sup>th</sup> 15<sup>th</sup> 16<sup>th</sup> 17<sup>th</sup> 18<sup>th</sup> 19<sup>th</sup> 20<sup>th</sup> 21<sup>th</sup> 22<sup>th</sup> 23<sup>th</sup> 24<sup>th</sup> 25<sup>th</sup> 26<sup>th</sup> 27<sup>th</sup> 28<sup>th</sup> 29<sup>th</sup> 30<sup>th</sup> 31<sup>th</sup> 32<sup>th</sup> 33<sup>th</sup> 34<sup>th</sup> 35<sup>th</sup> 36<sup>th</sup> 37<sup>th</sup> 38<sup>th</sup> 39<sup>th</sup> 40<sup>th</sup> 41<sup>th</sup> 42<sup>th</sup> 43<sup>th</sup> 44<sup>th</sup> 45<sup>th</sup> 46<sup>th</sup> 47<sup>th</sup> 48<sup>th</sup> 49<sup>th</sup> 50<sup>th</sup> 51<sup>th</sup> 52<sup>th</sup> 53<sup>th</sup> 54<sup>th</sup> 55<sup>th</sup> 56<sup>th</sup> 57<sup>th</sup> 58<sup>th</sup> 59<sup>th</sup> 60<sup>th</sup> 61<sup>th</sup> 62<sup>th</sup> 63<sup>th</sup> 64<sup>th</sup> 65<sup>th</sup> 66<sup>th</sup> 67<sup>th</sup> 68<sup>th</sup> 69<sup>th</sup> 70<sup>th</sup> 71<sup>th</sup> 72<sup>th</sup> 73<sup>th</sup> 74<sup>th</sup> 75<sup>th</sup> 76<sup>th</sup> 77<sup>th</sup> 78<sup>th</sup> 79<sup>th</sup> 80<sup>th</sup> 81<sup>th</sup> 82<sup>th</sup> 83<sup>th</sup> 84<sup>th</sup> 85<sup>th</sup> 86<sup>th</sup> 87<sup>th</sup> 88<sup>th</sup> 89<sup>th</sup> 90<sup>th</sup> 91<sup>th</sup> 92<sup>th</sup> 93<sup>th</sup> 94<sup>th</sup> 95<sup>th</sup> 96<sup>th</sup> 97<sup>th</sup> 98<sup>th</sup> 99<sup>th</sup> 100<sup>th</sup> 101<sup>th</sup> 102<sup>th</sup> 103<sup>th</sup> 104<sup>th</sup> 105<sup>th</sup> 106<sup>th</sup> 107<sup>th</sup> 108<sup>th</sup> 109<sup>th</sup> 110<sup>th</sup> 111<sup>th</sup> 112<sup>th</sup> 113<sup>th</sup> 114<sup>th</sup> 115<sup>th</sup> 116<sup>th</sup> 117<sup>th</sup> 118<sup>th</sup> 119<sup>th</sup> 120<sup>th</sup> 121<sup>th</sup> 122<sup>th</sup> 123<sup>th</sup> 124<sup>th</sup> 125<sup>th</sup> 126<sup>th</sup> 127<sup>th</sup> 128<sup>th</sup> 129<sup>th</sup> 130<sup>th</sup> 131<sup>th</sup> 132<sup>th</sup> 133<sup>th</sup> 134<sup>th</sup> 135<sup>th</sup> 136<sup>th</sup> 137<sup>th</sup> 138<sup>th</sup> 139<sup>th</sup> 140<sup>th</sup> 141<sup>th</sup> 142<sup>th</sup> 143<sup>th</sup> 144<sup>th</sup> 145<sup>th</sup> 146<sup>th</sup> 147<sup>th</sup> 148<sup>th</sup> 149<sup>th</sup> 150<sup>th</sup> 151<sup>th</sup> 152<sup>th</sup> 153<sup>th</sup> 154<sup>th</sup> 155<sup>th</sup> 156<sup>th</sup> 157<sup>th</sup> 158<sup>th</sup> 159<sup>th</sup> 160<sup>th</sup> 161<sup>th</sup> 162<sup>th</sup> 163<sup>th</sup> 164<sup>th</sup> 165<sup>th</sup> 166<sup>th</sup> 167<sup>th</sup> 168<sup>th</sup> 169<sup>th</sup> 170<sup>th</sup> 171<sup>th</sup> 172<sup>th</sup> 173<sup>th</sup> 174<sup>th</sup> 175<sup>th</sup> 176<sup>th</sup> 177<sup>th</sup> 178<sup>th</sup> 179<sup>th</sup> 180<sup>th</sup> 181<sup>th</sup> 182<sup>th</sup> 183<sup>th</sup> 184<sup>th</sup> 185<sup>th</sup> 186<sup>th</sup> 187<sup>th</sup> 188<sup>th</sup> 189<sup>th</sup> 190<sup>th</sup> 191<sup>th</sup> 192<sup>th</sup> 193<sup>th</sup> 194<sup>th</sup> 195<sup>th</sup> 196<sup>th</sup> 197<sup>th</sup> 198<sup>th</sup> 199<sup>th</sup> 200<sup>th</sup> 201<sup>th</sup> 202<sup>th</sup> 203<sup>th</sup> 204<sup>th</sup> 205<sup>th</sup> 206<sup>th</sup> 207<sup>th</sup> 208<sup>th</sup> 209<sup>th</sup> 210<sup>th</sup> 211<sup>th</sup> 212<sup>th</sup> 213<sup>th</sup> 214<sup>th</sup> 215<sup>th</sup> 216<sup>th</sup> 217<sup>th</sup> 218<sup>th</sup> 219<sup>th</sup> 220<sup>th</sup> 221<sup>th</sup> 222<sup>th</sup> 223<sup>th</sup> 224<sup>th</sup> 225<sup>th</sup> 226<sup>th</sup> 227<sup>th</sup> 228<sup>th</sup> 229<sup>th</sup> 230<sup>th</sup> 231<sup>th</sup> 232<sup>th</sup> 233<sup>th</sup> 234<sup>th</sup> 235<sup>th</sup> 236<sup>th</sup> 237<sup>th</sup> 238<sup>th</sup> 239<sup>th</sup> 240<sup>th</sup> 241<sup>th</sup> 242<sup>th</sup> 243<sup>th</sup> 244<sup>th</sup> 245<sup>th</sup> 246<sup>th</sup> 247<sup>th</sup> 248<sup>th</sup> 249<sup>th</sup> 250<sup>th</sup> 251<sup>th</sup> 252<sup>th</sup> 253<sup>th</sup> 254<sup>th</sup> 255<sup>th</sup> 256<sup>th</sup> 257<sup>th</sup> 258<sup>th</sup> 259<sup>th</sup> 260<sup>th</sup> 261<sup>th</sup> 262<sup>th</sup> 263<sup>th</sup> 264<sup>th</sup> 265<sup>th</sup> 266<sup>th</sup> 267<sup>th</sup> 268<sup>th</sup> 269<sup>th</sup> 270<sup>th</sup> 271<sup>th</sup> 272<sup>th</sup> 273<sup>th</sup> 274<sup>th</sup> 275<sup>th</sup> 276<sup>th</sup> 277<sup>th</sup> 278<sup>th</sup> 279<sup>th</sup> 280<sup>th</sup> 281<sup>th</sup> 282<sup>th</sup> 283<sup>th</sup> 284<sup>th</sup> 285<sup>th</sup> 286<sup>th</sup> 287<sup>th</sup> 288<sup>th</sup> 289<sup>th</sup> 290<sup>th</sup> 291<sup>th</sup> 292<sup>th</sup> 293<sup>th</sup> 294<sup>th</sup> 295<sup>th</sup> 296<sup>th</sup> 297<sup>th</sup> 298<sup>th</sup> 299<sup>th</sup> 300<sup>th</sup> 301<sup>th</sup> 302<sup>th</sup> 303<sup>th</sup> 304<sup>th</sup> 305<sup>th</sup> 306<sup>th</sup> 307<sup>th</sup> 308<sup>th</sup> 309<sup>th</sup> 310<sup>th</sup> 311<sup>th</sup> 312<sup>th</sup> 313<sup>th</sup> 314<sup>th</sup> 315<sup>th</sup> 316<sup>th</sup> 317<sup>th</sup> 318<sup>th</sup> 319<sup>th</sup> 320<sup>th</sup> 321<sup>th</sup> 322<sup>th</sup> 323<sup>th</sup> 324<sup>th</sup> 325<sup>th</sup> 326<sup>th</sup> 327<sup>th</sup> 328<sup>th</sup> 329<sup>th</sup> 330<sup>th</sup> 331<sup>th</sup> 332<sup>th</sup> 333<sup>th</sup> 334<sup>th</sup> 335<sup>th</sup> 336<sup>th</sup> 337<sup>th</sup> 338<sup>th</sup> 339<sup>th</sup> 340<sup>th</sup> 341<sup>th</sup> 342<sup>th</sup> 343<sup>th</sup> 344<sup>th</sup> 345<sup>th</sup> 346<sup>th</sup> 347<sup>th</sup> 348<sup>th</sup> 349<sup>th</sup> 350<sup>th</sup> 351<sup>th</sup> 352<sup>th</sup> 353<sup>th</sup> 354<sup>th</sup> 355<sup>th</sup> 356<sup>th</sup> 357<sup>th</sup> 358<sup>th</sup> 359<sup>th</sup> 360<sup>th</sup> 361<sup>th</sup> 362<sup>th</sup> 363<sup>th</sup> 364<sup>th</sup> 365<sup>th</sup> 366<sup>th</sup> 367<sup>th</sup> 368<sup>th</sup> 369<sup>th</sup> 370<sup>th</sup> 371<sup>th</sup> 372<sup>th</sup> 373<sup>th</sup> 374<sup>th</sup> 375<sup>th</sup> 376<sup>th</sup> 377<sup>th</sup> 378<sup>th</sup> 379<sup>th</sup> 380<sup>th</sup> 381<sup>th</sup> 382<sup>th</sup> 383<sup>th</sup> 384<sup>th</sup> 385<sup>th</sup> 386<sup>th</sup> 387<sup>th</sup> 388<sup>th</sup> 389<sup>th</sup> 390<sup>th</sup> 391<sup>th</sup> 392<sup>th</sup> 393<sup>th</sup> 394<sup>th</sup> 395<sup>th</sup> 396<sup>th</sup> 397<sup>th</sup> 398<sup>th</sup> 399<sup>th</sup> 400<sup>th</sup> 401<sup>th</sup> 402<sup>th</sup> 403<sup>th</sup> 404<sup>th</sup> 405<sup>th</sup> 406<sup>th</sup> 407<sup>th</sup> 408<sup>th</sup> 409<sup>th</sup> 410<sup>th</sup> 411<sup>th</sup> 412<sup>th</sup> 413<sup>th</sup> 414<sup>th</sup> 415<sup>th</sup> 416<sup>th</sup> 417<sup>th</sup> 418<sup>th</sup> 419<sup>th</sup> 420<sup>th</sup> 421<sup>th</sup> 422<sup>th</sup> 423<sup>th</sup> 424<sup>th</sup> 425<sup>th</sup> 426<sup>th</sup> 427<sup>th</sup> 428<sup>th</sup> 429<sup>th</sup> 430<sup>th</sup> 431<sup>th</sup> 432<sup>th</sup> 433<sup>th</sup> 434<sup>th</sup> 435<sup>th</sup> 436<sup>th</sup> 437<sup>th</sup> 438<sup>th</sup> 439<sup>th</sup> 440<sup>th</sup> 441<sup>th</sup> 442<sup>th</sup> 443<sup>th</sup> 444<sup>th</sup> 445<sup>th</sup> 446<sup>th</sup> 447<sup>th</sup> 448<sup>th</sup> 449<sup>th</sup> 450<sup>th</sup> 451<sup>th</sup> 452<sup>th</sup> 453<sup>th</sup> 454<sup>th</sup> 455<sup>th</sup> 456<sup>th</sup> 457<sup>th</sup> 458<sup>th</sup> 459<sup>th</sup> 460<sup>th</sup> 461<sup>th</sup> 462<sup>th</sup> 463<sup>th</sup> 464<sup>th</sup> 465<sup>th</sup> 466<sup>th</sup> 467<sup>th</sup> 468<sup>th</sup> 469<sup>th</sup> 470<sup>th</sup> 471<sup>th</sup> 472<sup>th</sup> 473<sup>th</sup> 474<sup>th</sup> 475<sup>th</sup> 476<sup>th</sup> 477<sup>th</sup> 478<sup>th</sup> 479<sup>th</sup> 480<sup>th</sup> 481<sup>th</sup> 482<sup>th</sup> 483<sup>th</sup> 484<sup>th</sup> 485<sup>th</sup> 486<sup>th</sup> 487<sup>th</sup> 488<sup>th</sup> 489<sup>th</sup> 490<sup>th</sup> 491<sup>th</sup> 492<sup>th</sup> 493<sup>th</sup> 494<sup>th</sup> 495<sup>th</sup> 496<sup>th</sup> 497<sup>th</sup> 498<sup>th</sup> 499<sup>th</sup> 500<sup>th</sup> 501<sup>th</sup> 502<sup>th</sup> 503<sup>th</sup> 504<sup>th</sup> 505<sup>th</sup> 506<sup>th</sup> 507<sup>th</sup> 508<sup>th</sup> 509<sup>th</sup> 510<sup>th</sup> 511<sup>th</sup> 512<sup>th</sup> 513<sup>th</sup> 514<sup>th</sup> 515<sup>th</sup> 516<sup>th</sup> 517<sup>th</sup> 518<sup>th</sup> 519<sup>th</sup> 520<sup>th</sup> 521<sup>th</sup> 522<sup>th</sup> 523<sup>th</sup> 524<sup>th</sup> 525<sup>th</sup> 526<sup>th</sup> 527<sup>th</sup> 528<sup>th</sup> 529<sup>th</sup> 530<sup>th</sup> 531<sup>th</sup> 532<sup>th</sup> 533<sup>th</sup> 534<sup>th</sup> 535<sup>th</sup> 536<sup>th</sup> 537<sup>th</sup> 538<sup>th</sup> 539<sup>th</sup> 540<sup>th</sup> 541<sup>th</sup> 542<sup>th</sup> 543<sup>th</sup> 544<sup>th</sup> 545<sup>th</sup> 546<sup>th</sup> 547<sup>th</sup> 548<sup>th</sup> 549<sup>th</sup> 550<sup>th</sup> 551<sup>th</sup> 552<sup>th</sup> 553<sup>th</sup> 554<sup>th</sup> 555<sup>th</sup> 556<sup>th</sup> 557<sup>th</sup> 558<sup>th</sup> 559<sup>th</sup> 560<sup>th</sup> 561<sup>th</sup> 562<sup>th</sup> 563<sup>th</sup> 564<sup>th</sup> 565<sup>th</sup> 566<sup>th</sup> 567<sup>th</sup> 568<sup>th</sup> 569<sup>th</sup> 570<sup>th</sup> 571<sup>th</sup> 572<sup>th</sup> 573<sup>th</sup> 574<sup>th</sup> 575<sup>th</sup> 576<sup>th</sup> 577<sup>th</sup> 578<sup>th</sup> 579<sup>th</sup> 580<sup>th</sup> 581<sup>th</sup> 582<sup>th</sup> 583<sup>th</sup> 584<sup>th</sup> 585<sup>th</sup> 586<sup>th</sup> 587<sup>th</sup> 588<sup>th</sup> 589<sup>th</sup> 590<sup>th</sup> 591<sup>th</sup> 592<sup>th</sup> 593<sup>th</sup> 594<sup>th</sup> 595<sup>th</sup> 596<sup>th</sup> 597<sup>th</sup> 598<sup>th</sup> 599<sup>th</sup> 600<sup>th</sup> 601<sup>th</sup> 602<sup>th</sup> 603<sup>th</sup> 604<sup>th</sup> 605<sup>th</sup> 606<sup>th</sup> 607<sup>th</sup> 608<sup>th</sup> 609<sup>th</sup> 610<sup>th</sup> 611<sup>th</sup> 612<sup>th</sup> 613<sup>th</sup> 614<sup>th</sup> 615<sup>th</sup> 616<sup>th</sup> 617<sup>th</sup> 618<sup>th</sup> 619<sup>th</sup> 620<sup>th</sup> 621<sup>th</sup> 622<sup>th</sup> 623<sup>th</sup> 624<sup>th</sup> 625<sup>th</sup> 626<sup>th</sup> 627<sup>th</sup> 628<sup>th</sup> 629<sup>th</sup> 630<sup>th</sup> 631<sup>th</sup> 632<sup>th</sup> 633<sup>th</sup> 634<sup>th</sup> 635<sup>th</sup> 636<sup>th</sup> 637<sup>th</sup> 638<sup>th</sup> 639<sup>th</sup> 640<sup>th</sup> 641<sup>th</sup> 642<sup>th</sup> 643<sup>th</sup> 644<sup>th</sup> 645<sup>th</sup> 646<sup>th</sup> 647<sup>th</sup> 648<sup>th</sup> 649<sup>th</sup> 650<sup>th</sup> 651<sup>th</sup> 652<sup>th</sup> 653<sup>th</sup> 654<sup>th</sup> 655<sup>th</sup> 656<sup>th</sup> 657<sup>th</sup> 658<sup>th</sup> 659<sup>th</sup> 660<sup>th</sup> 661<sup>th</sup> 662<sup>th</sup> 663<sup>th</sup> 664<sup>th</sup> 665<sup>th</sup> 666<sup>th</sup> 667<sup>th</sup> 668<sup>th</sup> 669<sup>th</sup> 670<sup>th</sup> 671<sup>th</sup> 672<sup>th</sup> 673<sup>th</sup> 674<sup>th</sup> 675<sup>th</sup> 676<sup>th</sup> 677<sup>th</sup> 678<sup>th</sup> 679<sup>th</sup> 680<sup>th</sup> 681<sup>th</sup> 682<sup>th</sup> 683<sup>th</sup> 684<sup>th</sup> 685<sup>th</sup> 686<sup>th</sup> 687<sup>th</sup> 688<sup>th</sup> 689<sup>th</sup> 690<sup>th</sup> 691<sup>th</sup> 692<sup>th</sup> 693<sup>th</sup> 694<sup>th</sup> 695<sup>th</sup> 696<sup>th</sup> 697<sup>th</sup> 698<sup>th</sup> 699<sup>th</sup> 700<sup>th</sup> 701<sup>th</sup> 702<sup>th</sup> 703<sup>th</sup> 704<sup>th</sup> 705<sup>th</sup> 706<sup>th</sup> 707<sup>th</sup> 708<sup>th</sup> 709<sup>th</sup> 710<sup>th</sup> 711<sup>th</sup> 712<sup>th</sup> 713<sup>th</sup> 714<sup>th</sup> 715<sup>th</sup> 716<sup>th</sup> 717<sup>th</sup> 718<sup>th</sup> 719<sup>th</sup> 720<sup>th</sup> 721<sup>th</sup> 722<sup>th</sup> 723<sup>th</sup> 724<sup>th</sup> 725<sup>th</sup> 726<sup>th</sup> 727<sup>th</sup> 728<sup>th</sup> 729<sup>th</sup> 730<sup>th</sup> 731<sup>th</sup> 732<sup>th</sup> 733<sup>th</sup> 734<sup>th</sup> 735<sup>th</sup> 736<sup>th</sup> 737<sup>th</sup> 738<sup>th</sup> 739<sup>th</sup> 740<sup>th</sup> 741<sup>th</sup> 742<sup>th</sup> 743<sup>th</sup> 744<sup>th</sup> 745<sup>th</sup> 746<sup>th</sup> 747<sup>th</sup> 748<sup>th</sup> 749<sup>th</sup> 750<sup>th</sup> 751<sup>th</sup> 752<sup>th</sup> 753<sup>th</sup> 754<sup>th</sup> 755<sup>th</sup> 756<sup>th</sup> 757<sup>th</sup> 758<sup>th</sup> 759<sup>th</sup> 760<sup>th</sup> 761<sup>th</sup> 762<sup>th</sup> 763<sup>th</sup> 764<sup>th</sup> 765<sup>th</sup> 766<sup>th</sup> 767<sup>th</sup> 768<sup>th</sup> 769<sup>th</sup> 770<sup>th</sup> 771<sup>th</sup> 772<sup>th</sup> 773<sup>th</sup> 774<sup>th</sup> 775<sup>th</sup> 776<sup>th</sup> 777<sup>th</sup> 778<sup>th</sup> 779<sup>th</sup> 780<sup>th</sup> 781<sup>th</sup> 782<sup>th</sup> 783<sup>th</sup> 784<sup>th</sup> 785<sup>th</sup> 786<sup>th</sup> 787<sup>th</sup> 788<sup>th</sup> 789<sup>th</sup> 790<sup>th</sup> 791<sup>th</sup> 792<sup>th</sup> 793<sup>th</sup> 794<sup>th</sup> 795<sup>th</sup> 796<sup>th</sup> 797<sup>th</sup> 798<sup>th</sup> 799<sup>th</sup> 800<sup>th</sup> 801<sup>th</sup> 802<sup>th</sup> 803<sup>th</sup> 804<sup>th</sup> 805<sup>th</sup> 806<sup>th</sup> 807<sup>th</sup> 808<sup>th</sup> 809<sup>th</sup> 810<sup>th</sup> 811<sup>th</sup> 812<sup>th</sup> 813<sup>th</sup> 814<sup>th</sup> 815<sup>th</sup> 816<sup>th</sup> 817<sup>th</sup> 818<sup>th</sup> 819<sup>th</sup> 820<sup>th</sup> 821<sup>th</sup> 822<sup>th</sup> 823<sup>th</sup> 824<sup>th</sup> 825<sup>th</sup> 826<sup>th</sup> 827<sup>th</sup> 828<sup>th</sup> 829<sup>th</sup> 830<sup>th</sup> 831<sup>th</sup> 832<sup>th</sup> 833<sup>th</sup> 834<sup>th</sup> 835<sup>th</sup> 836<sup>th</sup> 837<sup>th</sup> 838<sup>th</sup> 839<sup>th</sup> 840<sup>th</sup> 841<sup>th</sup> 842<sup>th</sup> 843<sup>th</sup> 844<sup>th</sup> 845<sup>th</sup> 846<sup>th</sup> 847<sup>th</sup> 848<sup>th</sup> 849<sup>th</sup> 850<sup>th</sup> 851<sup>th</sup> 852<sup>th</sup> 853<sup>th</sup> 854<sup>th</sup> 855<sup>th</sup> 856<sup>th</sup> 857<sup>th</sup> 858<sup>th</sup> 859<sup>th</sup> 860<sup>th</sup> 861<sup>th</sup> 862<sup>th</sup> 863<sup>th</sup> 864<sup>th</sup> 865<sup>th</sup> 866<sup>th</sup> 867<sup>th</sup> 868<sup>th</sup> 869<sup>th</sup> 870<sup>th</sup> 871<sup>th</sup> 872<sup>th</sup> 873<sup>th</sup> 874<sup>th</sup> 875<sup>th</sup> 876<sup>th</sup> 877<sup>th</sup> 878<sup>th</sup> 879<sup>th</sup> 880<sup>th</sup> 881<sup>th</sup> 882<sup>th</sup> 883<sup>th</sup> 884<sup>th</sup> 885<sup>th</sup> 886<sup>th</sup> 887<sup>th</sup> 888<sup>th</sup> 889<sup>th</sup> 890<sup>th</sup> 891<sup>th</sup> 892<sup>th</sup> 893<sup>th</sup> 894<sup>th</sup> 895<sup>th</sup> 896<sup>th</sup> 897<sup>th</sup> 898<sup>th</sup> 899<sup>th</sup> 900<sup>th</sup> 901<sup>th</sup> 902<sup>th</sup> 903<sup>th</sup> 904<sup>th</sup> 905<sup>th</sup> 906<sup>th</sup> 907<sup>th</sup> 908<sup>th</sup> 909<sup>th</sup> 910<sup>th</sup> 911<sup>th</sup> 912<sup>th</sup> 913<sup>th</sup> 914<sup>th</sup> 915<sup>th</sup> 916<sup>th</sup> 917<sup>th</sup> 918<sup>th</sup> 919<sup>th</sup> 920<sup>th</sup> 921<sup>th</sup> 922<sup>th</sup> 923<sup>th</sup> 924<sup>th</sup> 925<sup>th</sup> 926<sup>th</sup> 927<sup>th</sup> 928<sup>th</sup> 929<sup>th</sup> 930<sup>th</sup> 931<sup>th</sup> 932<sup>th</sup> 933<sup>th</sup> 934<sup>th</sup> 935<sup>th</sup> 936<sup>th</sup> 937<sup>th</sup> 938<sup>th</sup> 939<sup>th</sup> 940<sup>th</sup> 941<sup>th</sup> 942<sup>th</sup> 943<sup>th</sup> 944<sup>th</sup> 945<sup>th</sup> 946<sup>th</sup> 947<sup>th</sup> 948<sup>th</sup> 949<sup>th</sup> 950<sup>th</sup> 951<sup>th</sup> 952<sup>th</sup> 953<sup>th</sup> 954<sup>th</sup> 955<sup>th</sup> 956<sup>th</sup> 957<sup>th</sup> 958<sup>th</sup> 959<sup>th</sup> 960<sup>th</sup> 961<sup>th</sup> 962<sup>th</sup> 963<sup>th</sup> 964<sup>th</sup> 965<sup>th</sup> 966<sup>th</sup> 967<sup>th</sup> 968<sup>th</sup> 969<sup>th</sup> 970<sup>th</sup> 971<sup>th</sup> 972<sup>th</sup> 973<sup>th</sup> 974<sup>th</sup> 975<sup>th</sup> 976<sup>th</sup> 977<sup>th</sup> 978<sup>th</sup> 979<sup>th</sup> 980<sup>th</sup> 981<sup>th</sup> 982<sup>th</sup> 983<sup>th</sup> 984<sup>th</sup> 985<sup>th</sup> 986<sup>th</sup> 987<sup>th</sup> 988



### DISTRIBUTION OF OBTURATOR NERVE

- \* In a person, Adductor brevis is supplied either by Anterior division or ~~or~~ posterior division of Obturator Nerve.

BAL

## Extensor Retinacula of foot

- 2 Thickened Band of deep fascia to hold tendon in place.
- Superior Extensor retinaculum
  - Inferior Extensor retinaculum

### Superior Extensor Retinaculum

#### Attachment

Medially = Anterior border of tibia

Laterally = Anterior border of fibula

### Inferior Extensor Retinaculum

→ Y shaped

→ Stem of Y lies laterally

→ Upper and lower band lies medially

#### Attachment

Stem = Anterior part of Calcaneum (upper Surface)

Upper band = Medial Malleolus

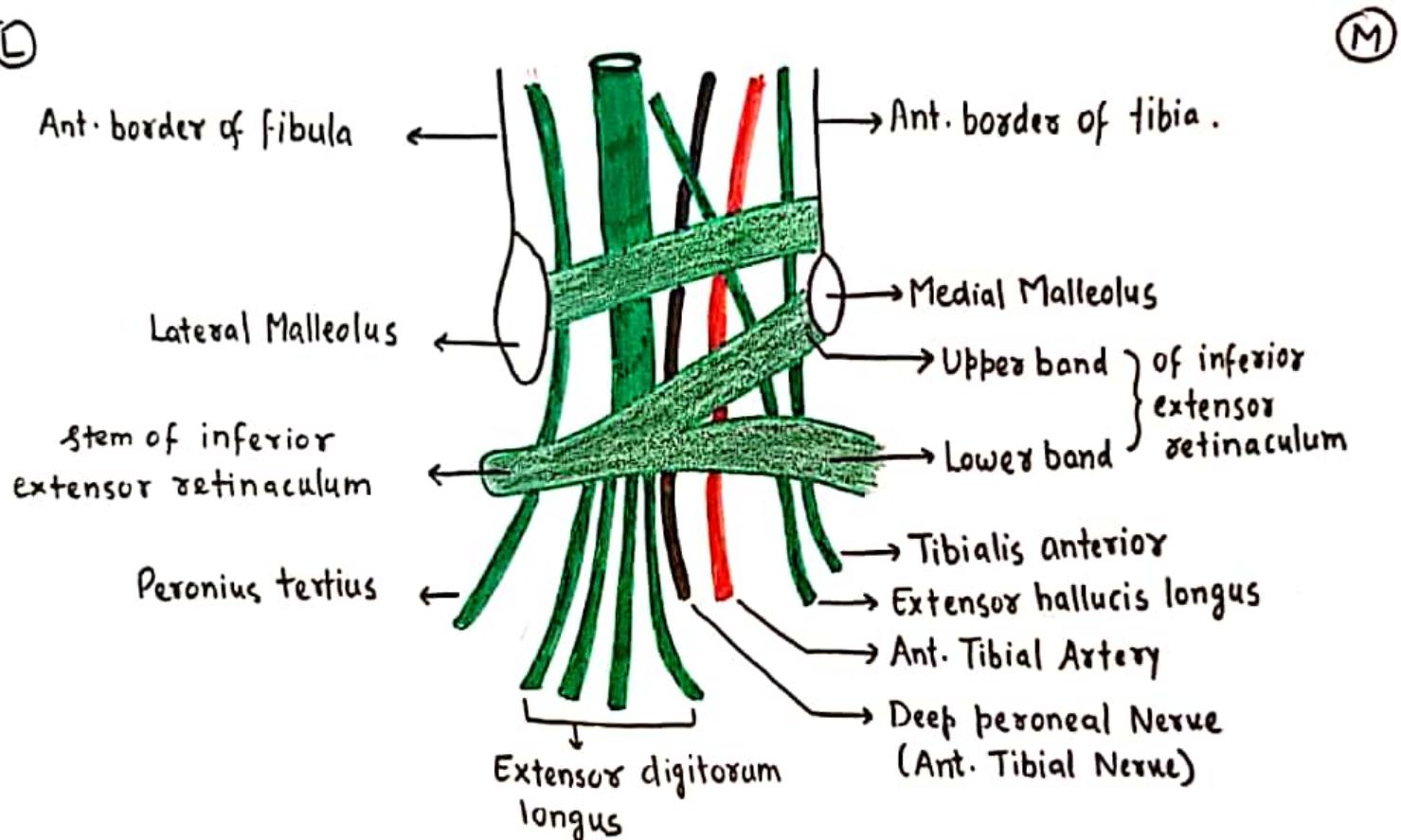
Lower band = Plantar aponeurosis (Deep fascia of Sole)

### Structures Passing Deep To Extensor Retinacula

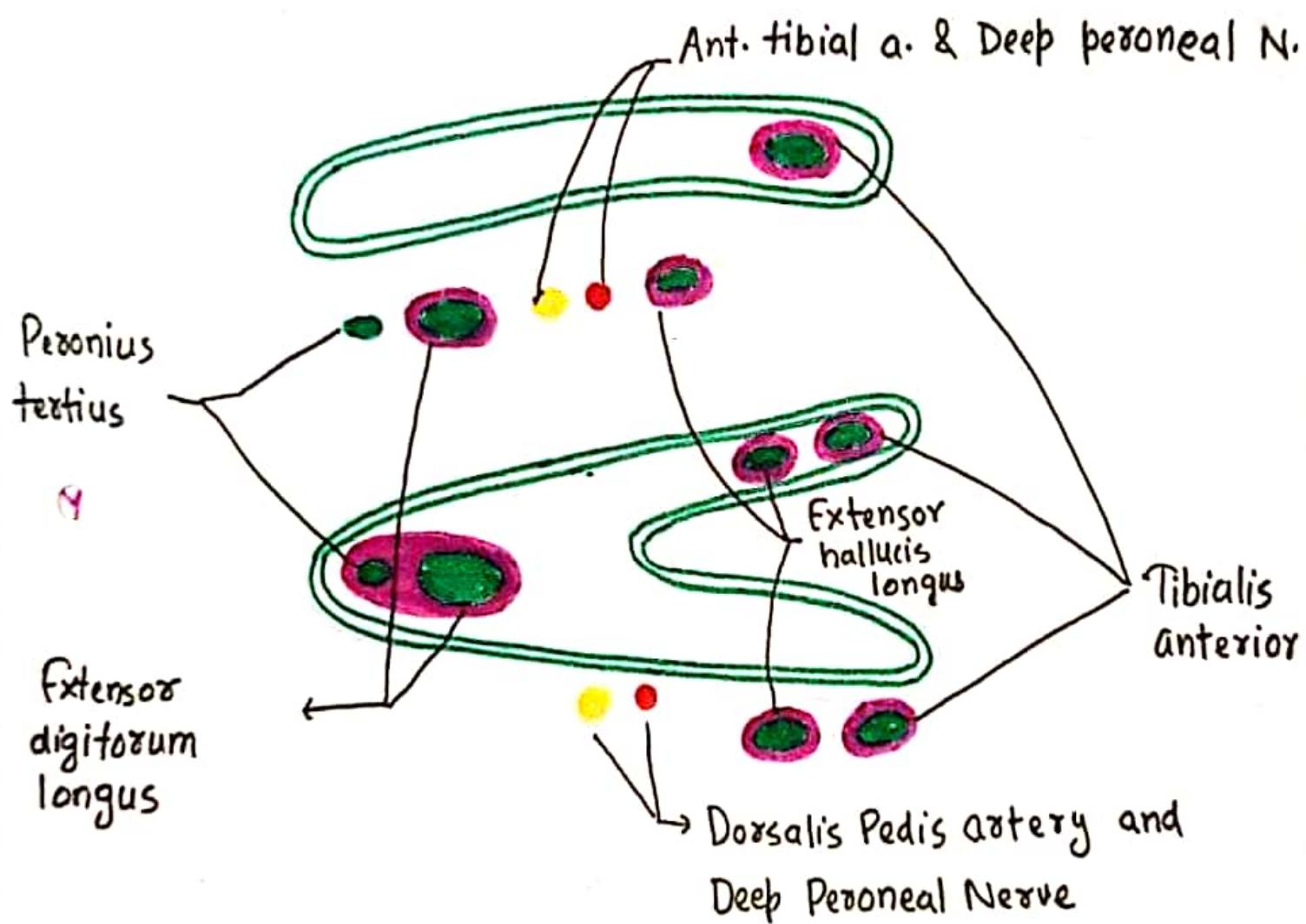
From medial to lateral these are:

- Tibialis anterior
  - Extensor hallucis longus
  - Ant. tibial artery
  - Deep Peroneal Nerve
  - Extensor digitorum longus
  - Peroneus tertius
- Muscles of ant. compartment of leg .

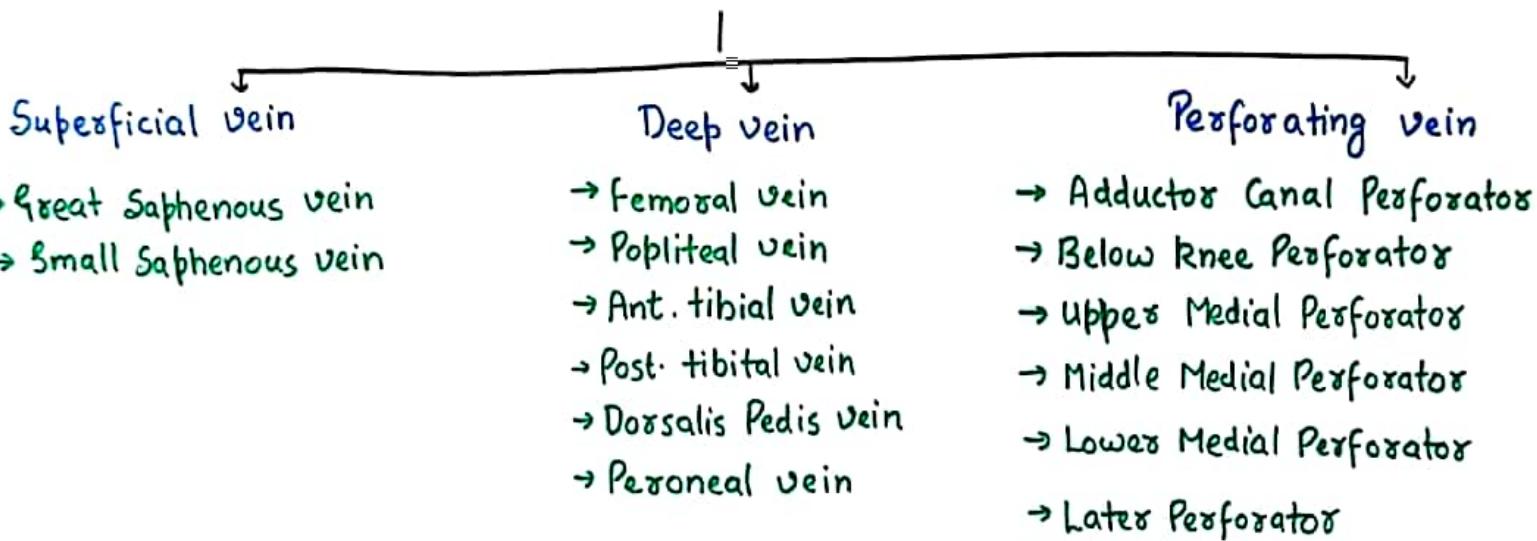
Mnemonic: The Himalayas Are Not Dry Places .



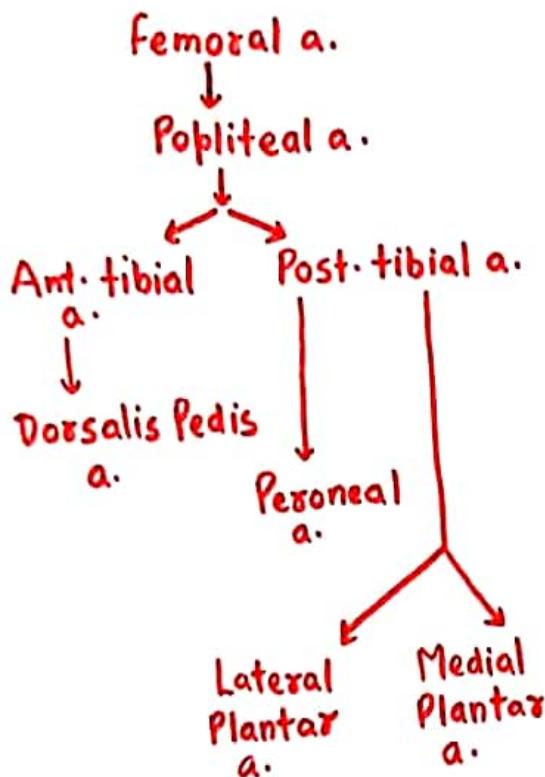
## Relation of Superior & Inferior Extensor Retinacula



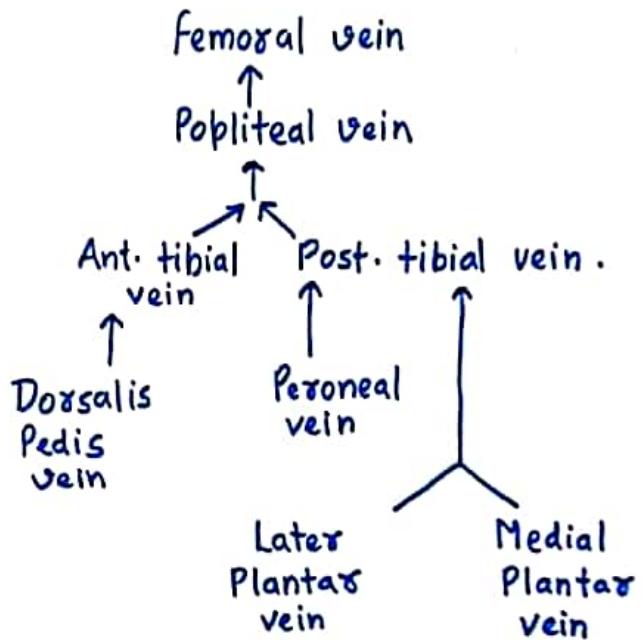
## Veins of Lower Limb

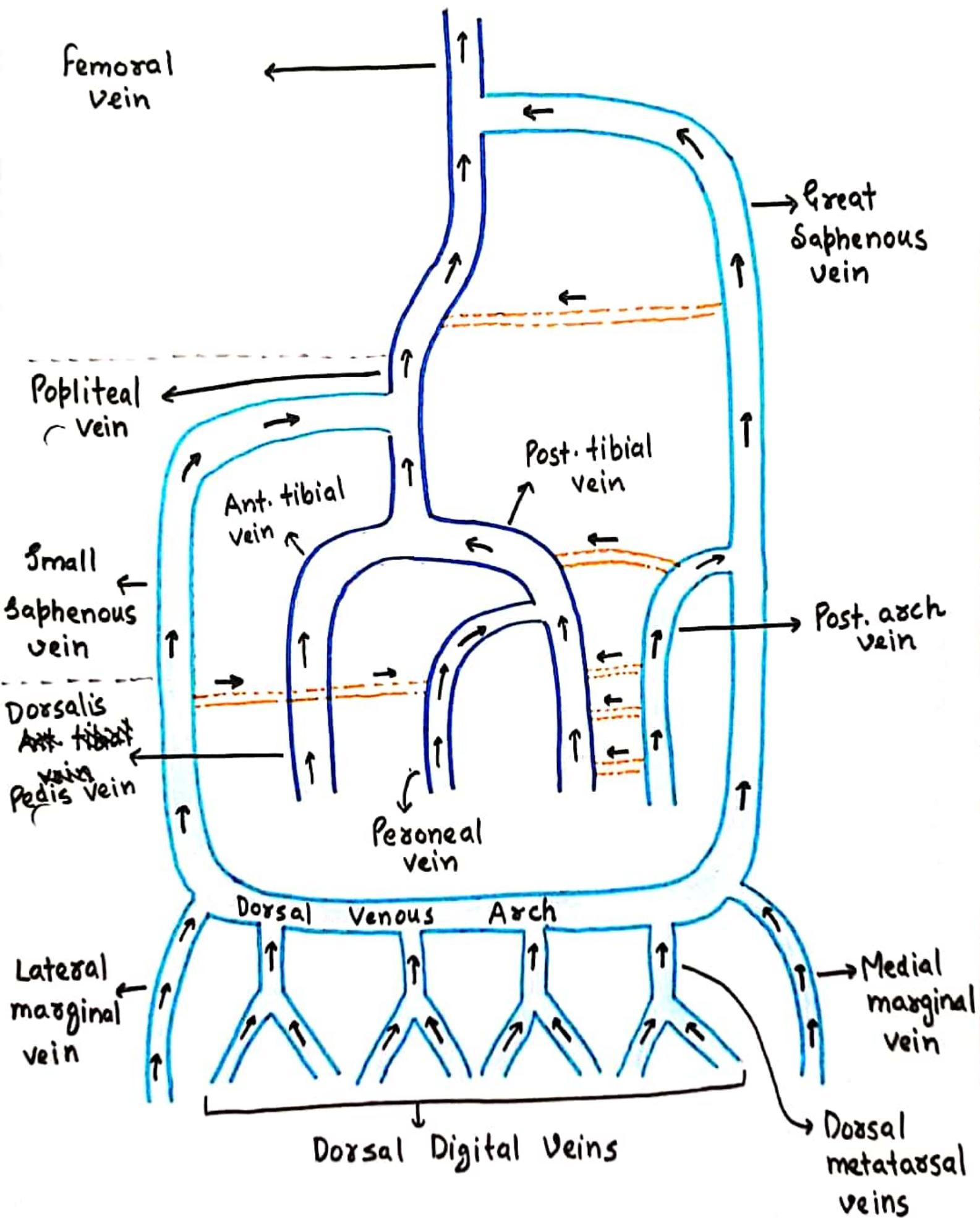


Direction of Blood flow In  
Lower Limb Arteries



Direction of Blood flow In  
Lower Limb Veins

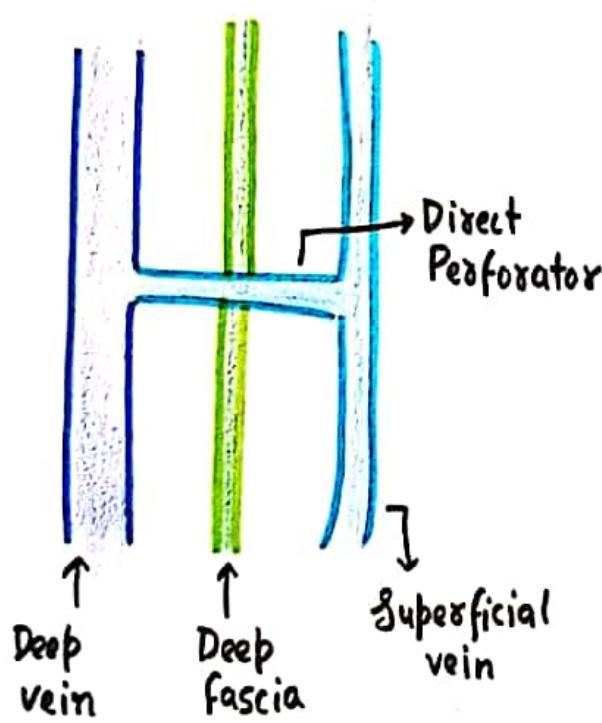




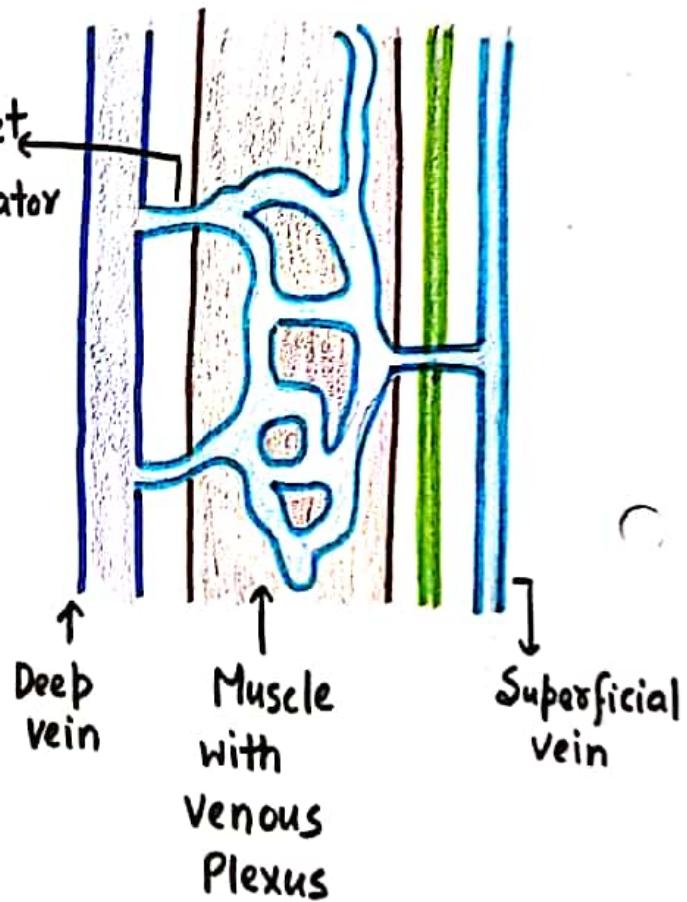
## Perforating Vein

Direct Perforator

Indirect Perforator



Indirect  
Perforator



## GREAT SAPHENOUS VEIN / LONG SAPHENOUS VEIN

### Origin, Course, Termination

formed by Union of Dorsal venous arch with  
Medial Marginal Vein



Passes Upward In front of Medial Malleolus



Crosses the lower  $\frac{1}{3}$ rd of the medial Surface of  
tibia obliquely



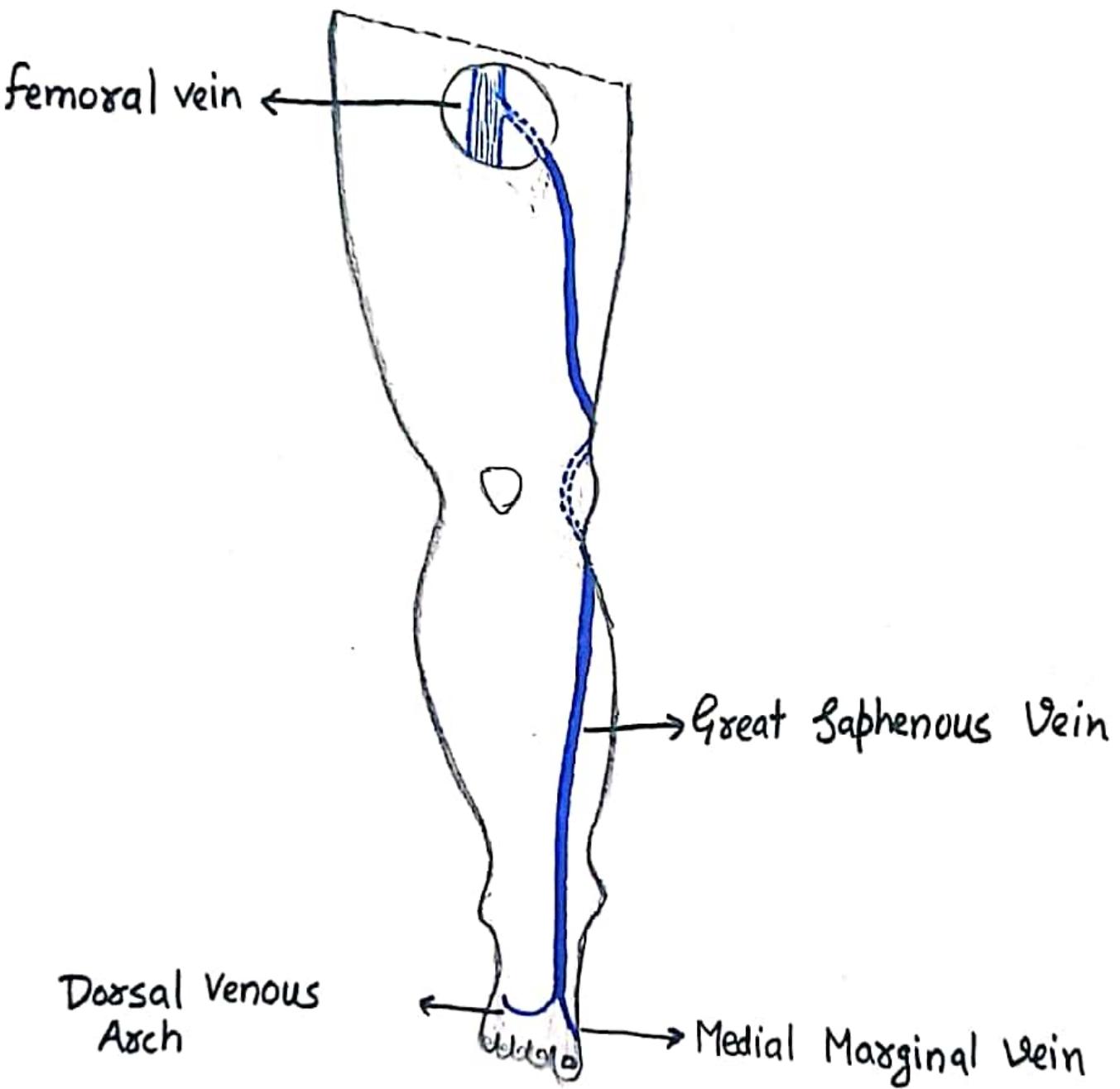
Runs along medial borders of tibia to reach the  
back of the Knee



In the thigh, inclines forward to reach the  
Saphenous opening



Pierces the Cribiform fascia and opens into  
the Femoral Vein



ORIGIN, COURSE, TERMINATION OF LONG SAPHENOUS VEIN

## Perforators that Connect Great Saphenous Vein with Deep Vein

- Adductor Canal Perforator
- Below Knee Perforator
- Upper Medial Perforator
- Middle Medial Perforator
- Lower Medial Perforator

## Tributaries of Great Saphenous Vein

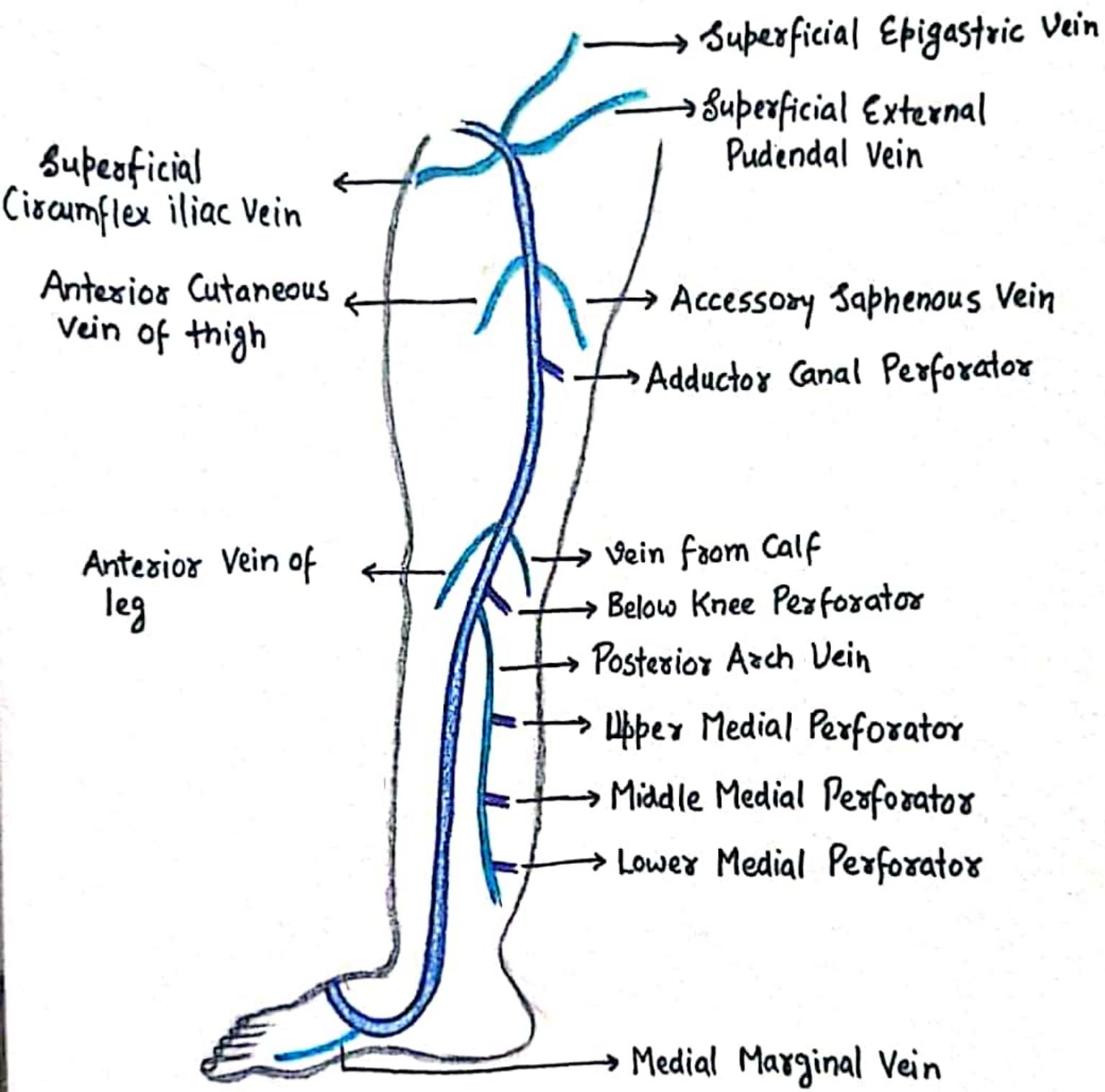
At the Commencement (beginning) = Medial Marginal Vein

Just below the Knee = Vein from Calf  
Anterior Vein of Leg  
Posterior Arch Vein

In The Thigh = Accessory Saphenous Vein  
Anterior Cutaneous Vein of Thigh

Just before piercing = Superficial Epigastric Vein  
Cervical fascia Superficial Circumflex Iliac Vein  
Superficial External Pudendal Vein

Just before Termination = Deep External Pudendal Vein

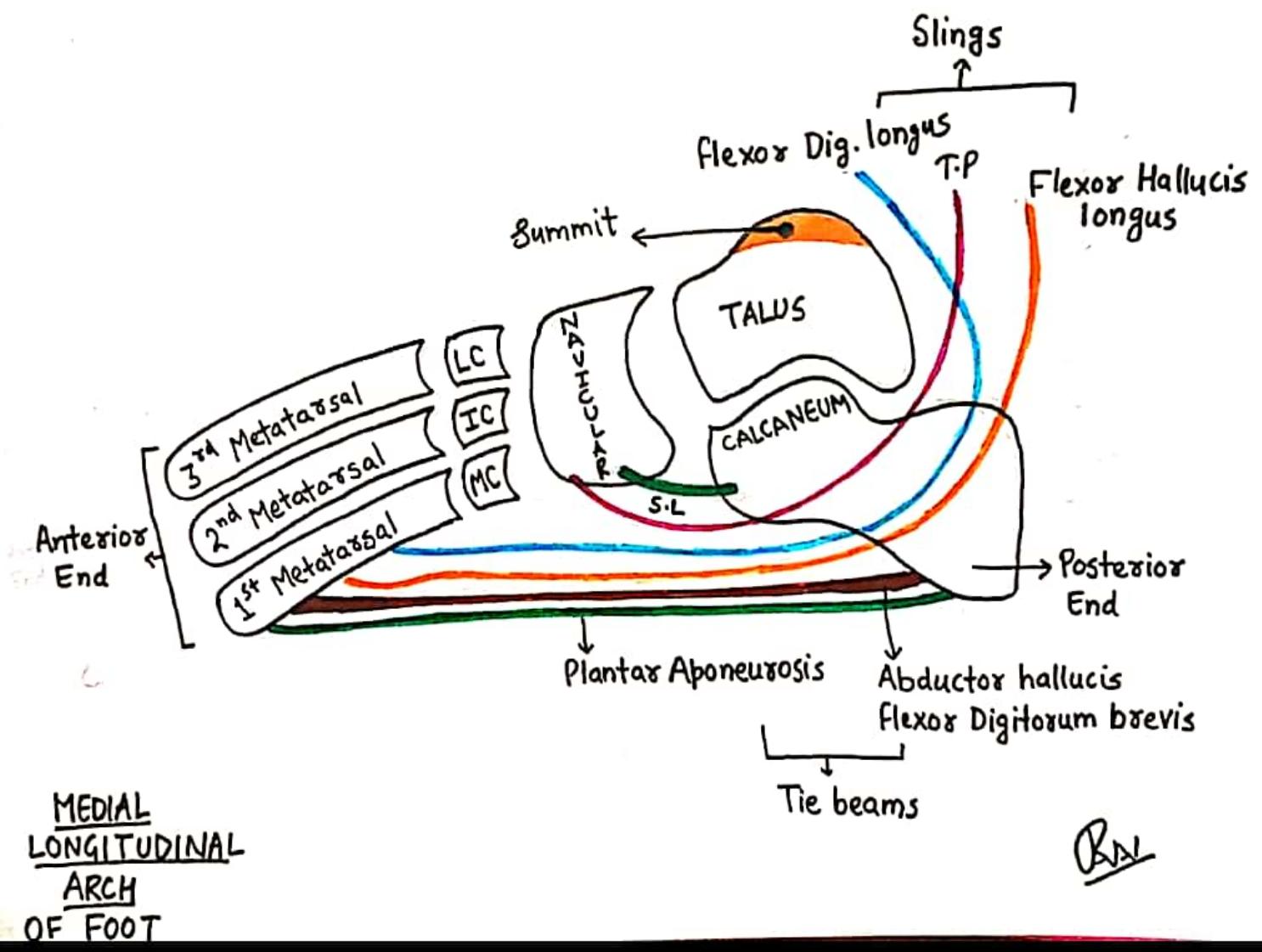


Tributaries And Perforating Veins Of Great Saphenous Vein

RN

## MEDIAL LONGITUDINAL ARCH

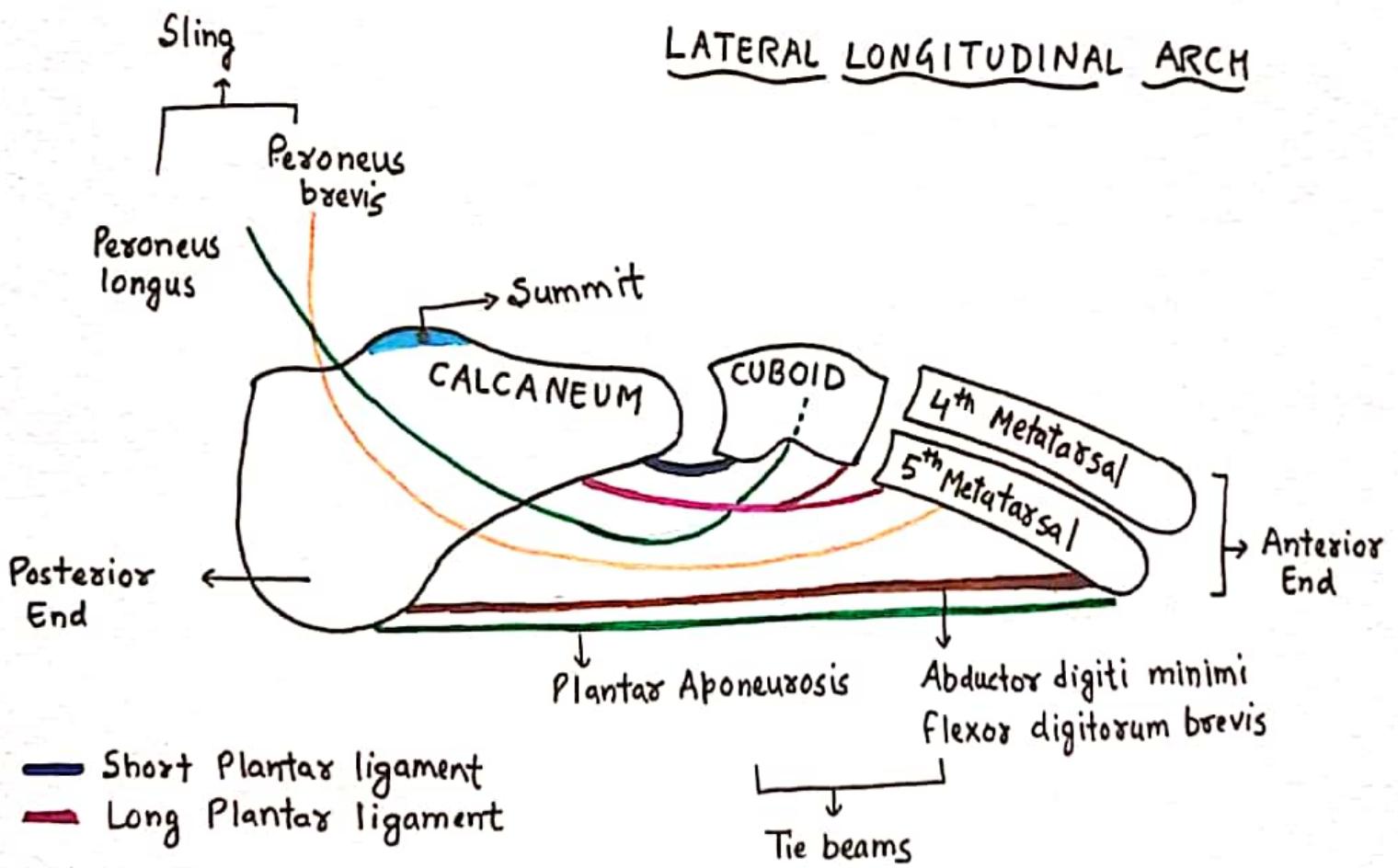
1. Features → Higher, more mobile, resilient & shock absorber
2. Anterior End → Head of 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup> metatarsal bones
3. Posterior End → Medial Tuberole of Calcaneum
4. Summit → Superior Articular Surface of Talus
5. Anterior Pillar → 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup> metatarsal; 3 Cuneiforms; Navicular; Talus
6. Posterior Pillar → Medial half of Calcaneum
7. Main Joint → Talocalcaneonavicular Joint
8. Bony factor → Wedge-Shaped
9. Intersegmental ties → Spring ligament
10. Tie beams → Plantar Aponeurosis (Medial Part)  
Abductor hallucis  
Flexor Digitorum Brevis (Medial Part)
11. Slings → Tibialis Posterior  
Slings → Flexor Hallucis longus  
Flexor Digitorum longus
12. Suspension → Slings formed by Tibialis Anterior &  
Peroneus longus



## LATERAL LONGITUDINAL ARCH

1. Features → Lower, limited mobility, Rigid
2. Anterior End → Heads of 4<sup>th</sup>, 5<sup>th</sup> metatarsals
3. Posterior End → Lateral Tubercl<sup>e</sup> of Calcaneum
4. Summit → Articular facet on Superior Surface of Calcaneum
5. Anterior Pillar → Cuboid and 4<sup>th</sup>, 5<sup>th</sup> Metatarsals
6. Posterior Pillar → Lateral half of Calcaneum
7. Main Joint → Calcaneocuboid Joint
8. Bony factor → Wedge-Shaped
9. Intersegmental ties → Long Plantar ligament  
Short Plantar ligament
10. Tie beams → Plantar Aponeurosis (lateral part)  
~~A~~ductor Digiti Minimi  
Flexor digitorum brevis (lateral part)
11. Slings → Peroneus longus  
Peroneus brevis
12. Suspension → Sling formed by tibialis anterior and  
peroneus longus

## LATERAL LONGITUDINAL ARCH



# ARCHES OF FOOT - CLINICAL ANATOMY

+ Absence of Arch

↓ lead to

Flat Foot

↓ effects

a) Loss of Spring → Shuffling gait

b) Loss of Shock Absorbing power → Liable to trauma

c) Loss of Concavity of Sole → Compression of Nerve & Vessel

+ Contracture at Transverse Tarsal Joint

↓

Exaggeration of longitudinal Arch

↓

Pes Cavus

+ Contracture at Transverse Tarsal Joint

+

Dorsiflexion of Metatarsophalangeal Joint

+

Plantar flexion of Interphalangeal Joint

↓

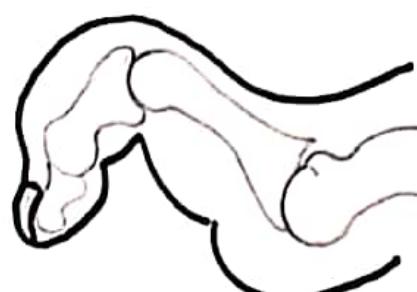
Claw foot



Normal Foot



Flat Foot



Claw Foot



Pes Cavus

**+ Talipes equinus**



Patient Walk on toes,  
with heel raised



**Talipes Calcaneus**



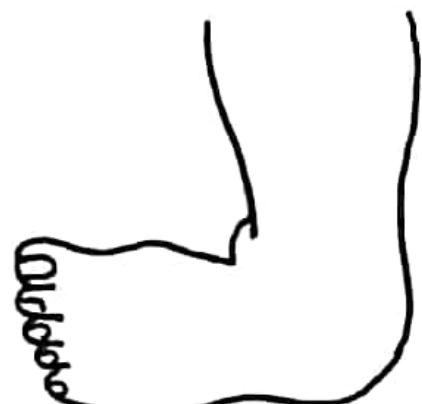
Patient walk on heel,  
with forefoot raised



**+ Talipes Varus**



Patient walk on outer border  
of foot which is inverted & adducted.



**Talipes Valgus**



Patient walk on inner border  
of foot which is everted & Abducted



**+ Talipes Equinovarus [commonest deformity]  
(Club foot)**



Foot is inverted, adducted  
& Plantar flexed



## INTERNAL CAPSULE → Clinical Correlation

### • Contralateral Hemiplegia

• Haemorrhage / Infarction



Damage to internal capsule



Loss of sensation & spastic paralysis of opposite half of body

• Commonly occurs due to rupture of Charcot's artery of Cerebral haemorrhage

Supply Posterior limb

↓  
contain

→ Pyramidal fibres for upper limb, trunk, lower limb

→ Extrapyramidal fibres

↓  
lesion

Spastic paralysis of opposite half of body

- ⊕ Thrombosis/Rupture of Recurrent artery of Huebner
  - Recurrent a. of Huebner  $\xrightarrow{\text{Supply}}$  Anterior limb  $\xrightarrow{\text{contain}}$  Corticonuclear fibres (Head & Neck)
  - Rupture of Recurrent a. of Huebner
    - $\downarrow$  lesion
    - Corticonuclear fibres
    - Adjacent pyramidal fibres for upper limb
    - $\downarrow$
    - Paralysis of face & upper limb of opposite side
- ⊕ Lesion of Post.  $1/3^{\text{rd}}$  of post. limb & Sublentiform & Retrolentiform part
  - $\downarrow$
  - Visual defect (hemianopia) & Auditory defect (loss of hearing)
- Commonly occurs due to thrombosis of Anterior Choroidal artery

## Circle of Willis → Clinical Anatomy

### ⊕ Congenital Cerebral Aneurysms / Berry Aneurysms

Berry Shaped

Aneurysm  
Excessive localized swelling  
of wall of an artery

- \* Occurs mostly at the site where 2 arteries join in the formation of circle of Willis
- \* Basic abnormality at these points is congenital deficiency of tunica media (elastic tissue) in arterial wall.

### ⊕ Subarachnoid Haemorrhage

- \* Commonly results from rupture of berry aneurysm in interpeduncular cistern
- \* Subarachnoid haemorrhage → Sudden pain in head → Mental confusion
- \* Death may quickly occur, or the patient may survive the first bleeding only to die few days or weeks later

## FACIAL NERVE → CLINICAL ANATOMY

### + Lesions of Facial Nerve

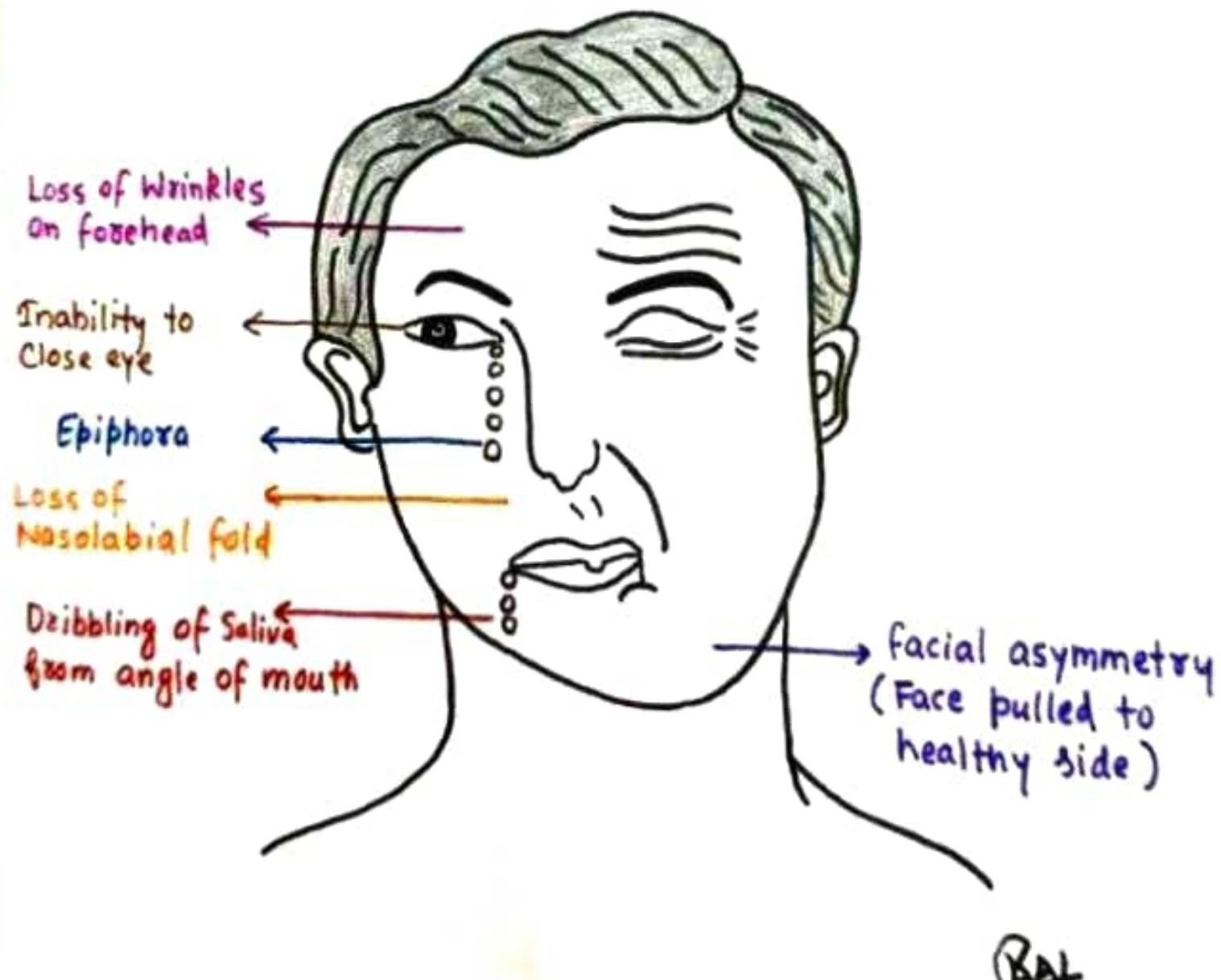
Site of Lesion	Signs & Symptoms
1. At or just above Stylomastoid foramen	Bell's palsy / Facial palsy
2. Above origin of Chorda tympani	C/F of lesion 1 + ↓ Salivation + loss of sensations in anterior 2/3 <sup>rd</sup> of tongue
3. Above origin of N. to Stapedius	C/F of lesion 2 + hyperacusis (enhanced sensitivity to hearing)
4. Above origin of Greater petrosal nerve	C/F of lesion $\frac{2}{3}$ + Loss of lacrimation

★ Ramsay Hunt Syndrome

- Involvement of Geniculate ganglion in Herpes zoster infection.
- Signs & Symptoms
  - ↳ C/F of lesion 4 + Herpetic vesicles on the auricle

★ Crocodile Tears Syndrome

- Lacrimation while Smelling or chewing food
- Occurs after facial nerve lesion proximal to geniculate ganglion
  - ↓  
Improper regeneration of Salivatory fibres which goes to lacrimal gland instead to Salivatory gland during regeneration process
  - ↓  
Abnormal lacrimation during Salivation process



BELL'S PALSY ON THE RIGHT SIDE

BELL

## MOTOR NERVE SUPPLY OF FACE :- CLINICAL ANATOMY

### BELL'S PALSY

Compression of facial Nerve in facial Canal  
near Stylo-mastoid Foramen



Lower Motor Neuron type Paralysis of facial Muscles

→ Exact reason of Compression is not Known but probably due to viral infection.

### Characteristic feature On The Side of Paralysis

① Facial Asymmetry (affected side is drawn to healthy side)



Due to unopposed Action of Muscles of Normal Side

② Loss of Wrinkles on Forehead



Paralysis of Occipitofrontalis Muscle

③ Widening of Palpebral fissure & inability to Close eye



Paralysis of Orbicularis Oculi (upper part)

④ Paralysis of

⑤ Tears flow down from the eye (Epiphora)



Paralysis of Orbicularis Oculi (lower part)

⑤ Angle of Mouth hang towards the affected side & inability of Angle of mouth to move upwards & laterally during laughing



Paralysis of Zygomaticus Major

⑥ Loss of Nasolabial furrow



Paralysis of levator labii Superioris Alaeque Nasi

⑦ Accumulation of food in Vestibule of Mouth



Paralysis of Buccinator muscle

⑧ Loss of Resistance when one presses cheek with inflated Vestibule and air leaks out b/t the lips



Paralysis of Buccinator Muscle

⑨ Dribbling of Saliva from Angle of Mouth



Paralysis of Orbicularis Oris

## SENSORY NERVE SUPPLY OF FACE :- CLINICAL ANATOMY

### 1. Trigeminal Neuralgia

- Characterized by
  - Sudden Paroxysmal attacks of lancinating pain from few hours to several days
  - Confined to distribution of one or more division of Trigeminal Nerve
- Common in Maxillary area
- More frequent on right side

### 2. Herpes Zoster Ophthalmicus

- Viral infection involving ophthalmic Nerve
- Severe pain & edema in Ophthalmic territory
- Characterised by → Appearance of Vesicle along the Cutaneous branch of Ophthalmic Nerve

## ARCHES OF FOOT - CLINICAL ANATOMY

+ Absence of Arch

↓ lead to

Flat Foot

↓ effects

a) Loss of Spring → Shuffling gait

b) Loss of Shock Absorbing power → Liable to trauma

c) Loss of Concavity of Sole → Compression of Nerve & Vessel

+ Contracture at Transverse Tarsal Joint

↓

Exaggeration of longitudinal Arch

↓

Pes Cavus

Contracture at Transverse Tarsal Joint

+

Dorsiflexion of Metatarsophalangeal Joint

+

Plantar flexion of Interphalangeal Joint

↓

Claw foot



Normal Foot



Flat Foot



Claw Foot



Pes Cavus

**+ Talipes equinus**



Patient Walk on toes,  
with heel raised



**+ Talipes Calcaneus**



Patient Walk on heel,  
with forefoot raised



**+ Talipes Varus**



Patient Walk on Outer border  
of foot which is inverted & adducted.



**+ Talipes Valgus**



Patient Walk on Inner border  
of foot which is everted & Abducted



**+ Talipes Equinovarus [commonest deformity]  
(Club foot)**



Foot is inverted, adducted  
& Plantar flexed



# HERNIA

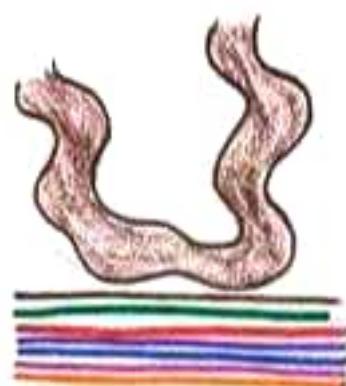
## Internal Hernia

↓  
Protrusion of abdomen Contents  
into the "No entry" Zone within  
the abdominal cavity

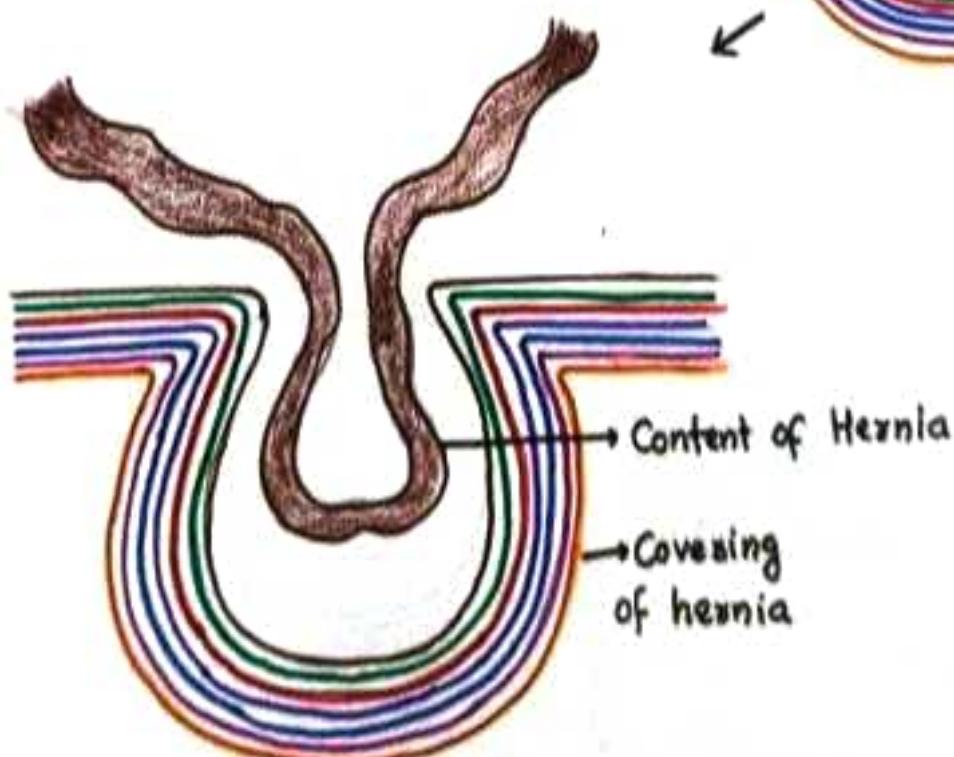
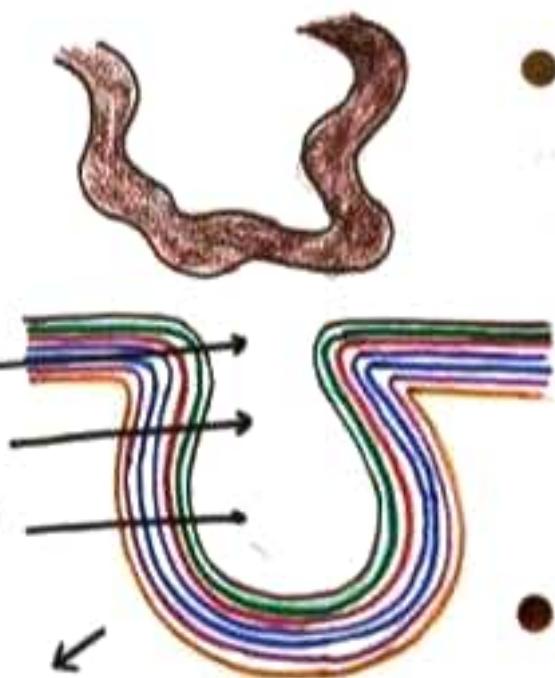
e.g. Hernia in epiploic foramen

## External Hernia

↓  
Protrusion of Abdomen contents  
through Abdominal walls.



Sac {  
    Neck  
    Body  
    Bigger Part



External Hernia

Hernia Consist of:

- Sac
- Content
- Covering

### Complications

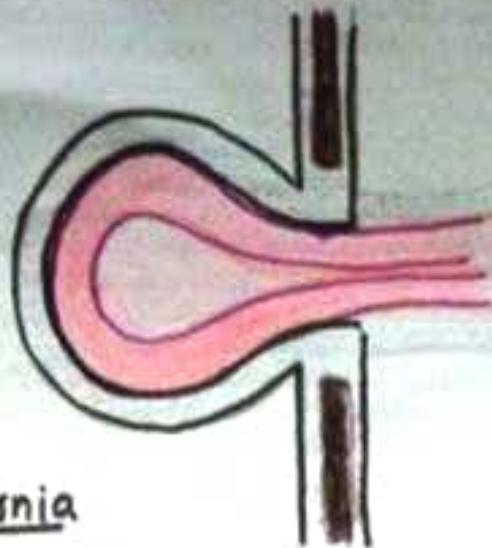
- ① Irreducibility :- Loop of Intestine goes out but doesn't return leading to irreducible hernia.
- ② Obstructions :- Loop may get narrowed in part
  - contents ↓ of loop can't move forward
  - ↓  
Obstruction
- ③ Strangulation :- Arterial Supply is blocked
  - ↓  
Loop get Necrosed

### EXTERNAL HERNIA

- Umbilical
  - Paraumbilical
  - Femoral
  - Inguinal
  - Epigastric
  - Divarication of recti
  - Incisional
  - Lumbar
- Congenital Umbilical hernia  
Acquired infantile hernia

## Congenital Umbilical Hernia

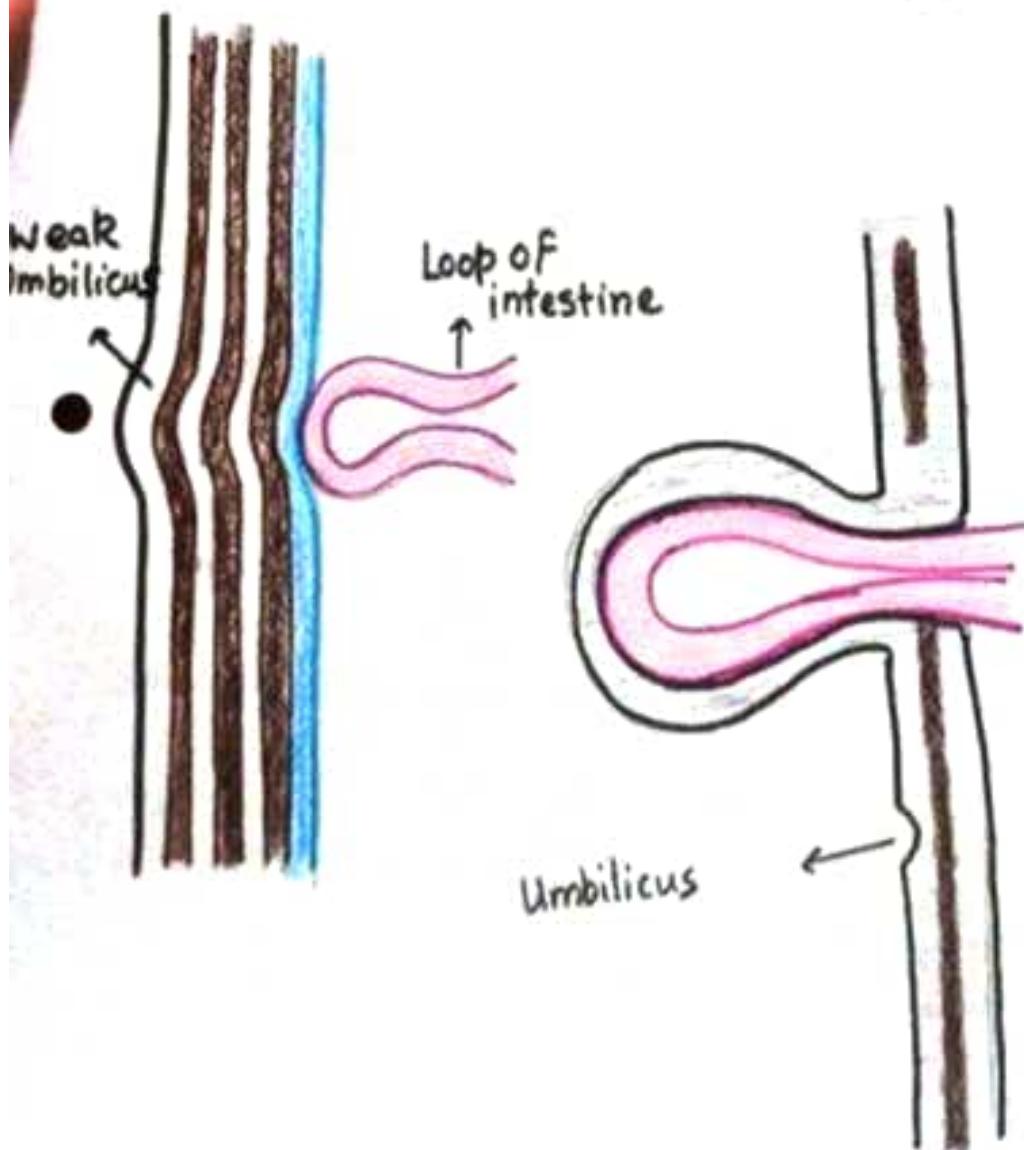
- Due to non-return of midgut loop



## Acquired Infantile Umbilical Hernia

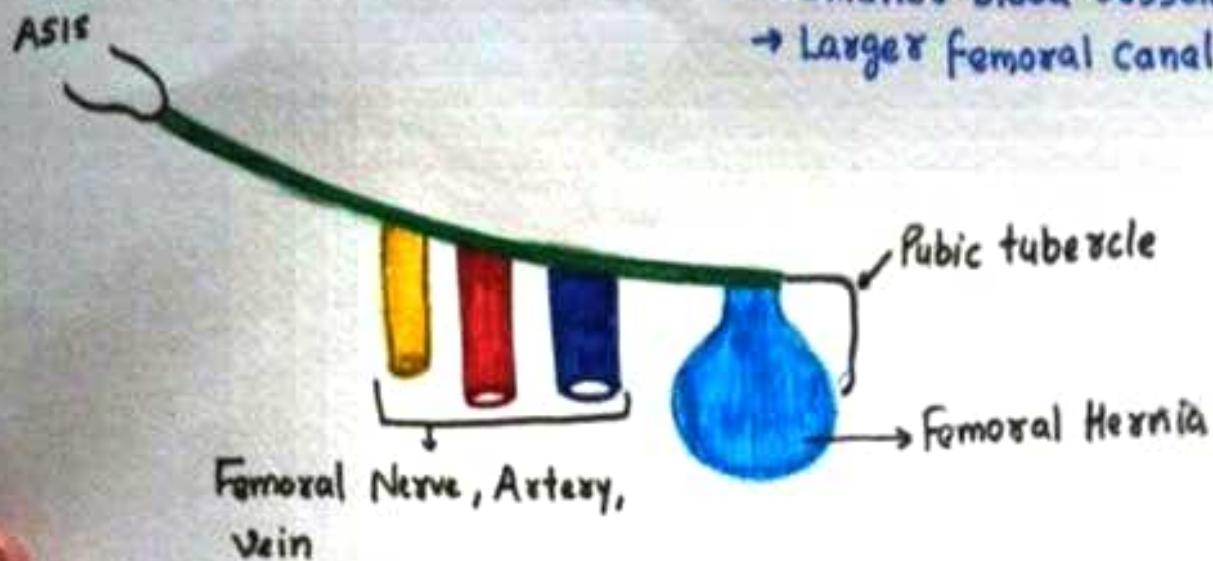
- Due to weakness of Umbilical scar
- Disappear as infant grows

## Paraumbilical Hernia



## \* FEMORAL HERNIA → More common in females because of:

- Large Pelvis
- Smaller blood vessels
- Larger femoral canal



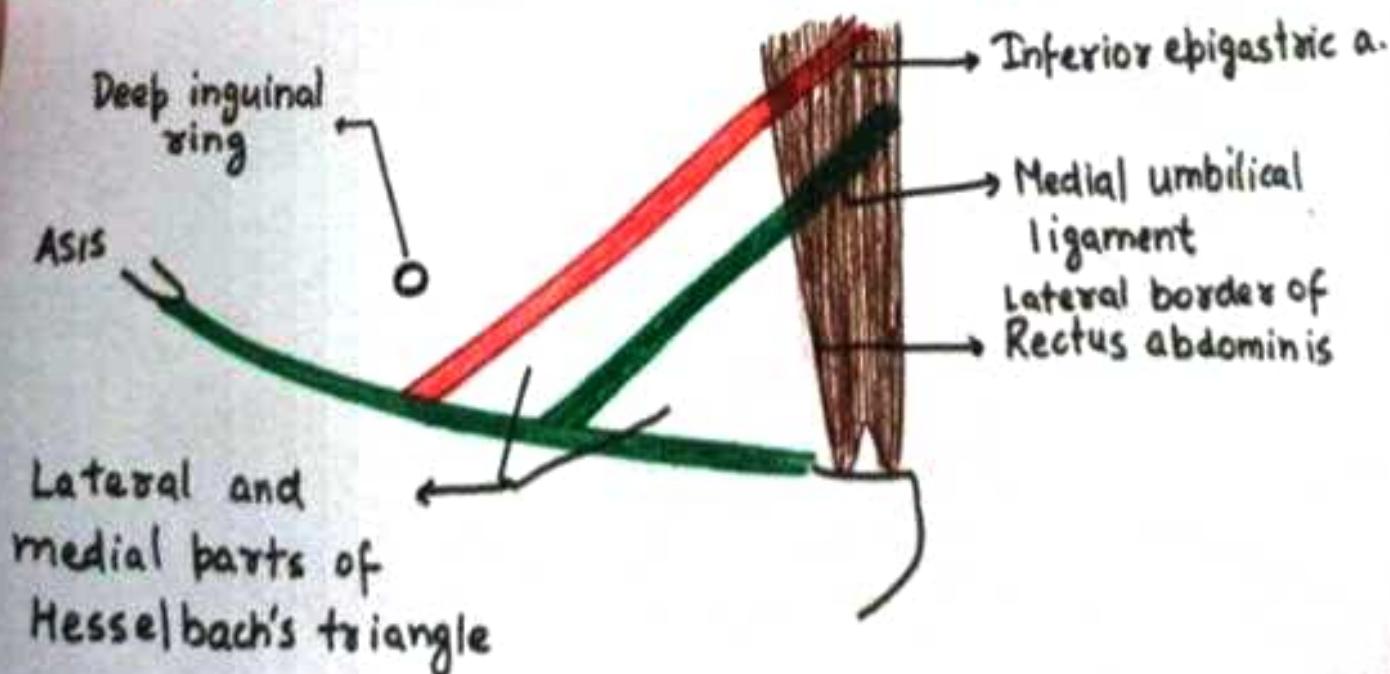
## INGUINAL HERNIA

Direct

→ Protrusion of loop of intestine  
Occurs through weak Post.  
Wall of inguinal canal or  
triangle of Hesselbach

Indirect/Obllique

→ Protrusion of loop of intestine  
occurs through Deep inguinal ring,  
inguinal canal, superficial  
inguinal ring, into Scrotum.



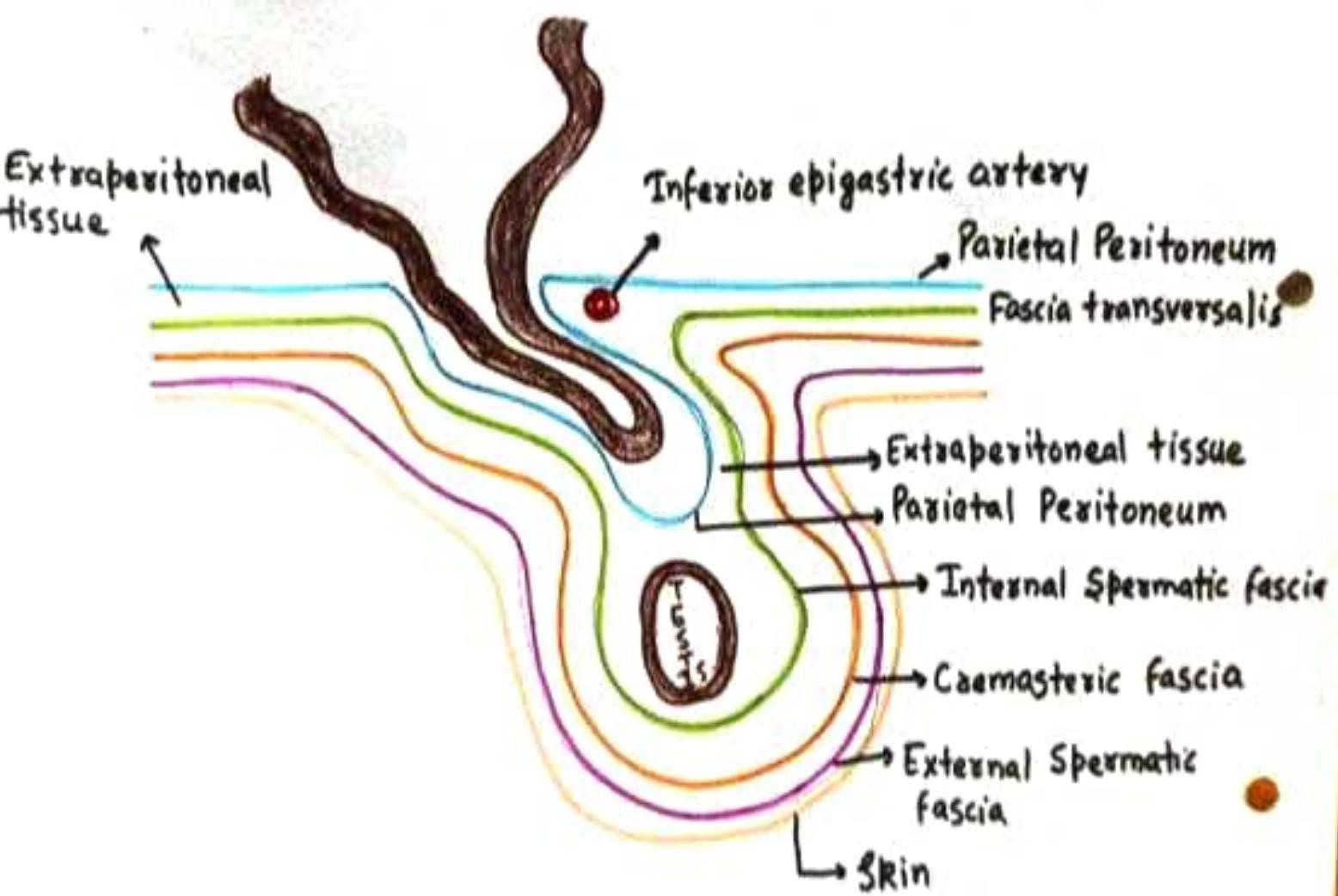
### Direct Inguinal Hernia

1. Etiology (cause) Weakness of post. wall of inguinal canal
2. Site of protrusion of hernial Sac Post. wall of inguinal Canal
3. Direction Straight
4. Obstruction Not Common
5. Age Group Occurs in middle and old age
6. Precipitating factor Chronic bronchitis  
Enlarged Prostate
7. Shape Globular
8. Extent Rarely Scrotal
9. Internal ring Occlusion Test Negative

### Indirect Inguinal Hernia

- Preformed Sac
- Deep inguinal ring
- Oblique
- Common
- Occurs in young age
- 
- Pear
- Generally Scrotal
- Positive

## Indirect Inguinal Hernia



Coverings are :-

- Extraperitoneal Tissue
- Internal Spermatic Fascia
- Cremasteric fascia
- External Spermatic fascia
- SKin

## Direct inguinal Hernia

### Lateral direct inguinal Hernia

Extraperitoneal tissue

Fascia Transversalis

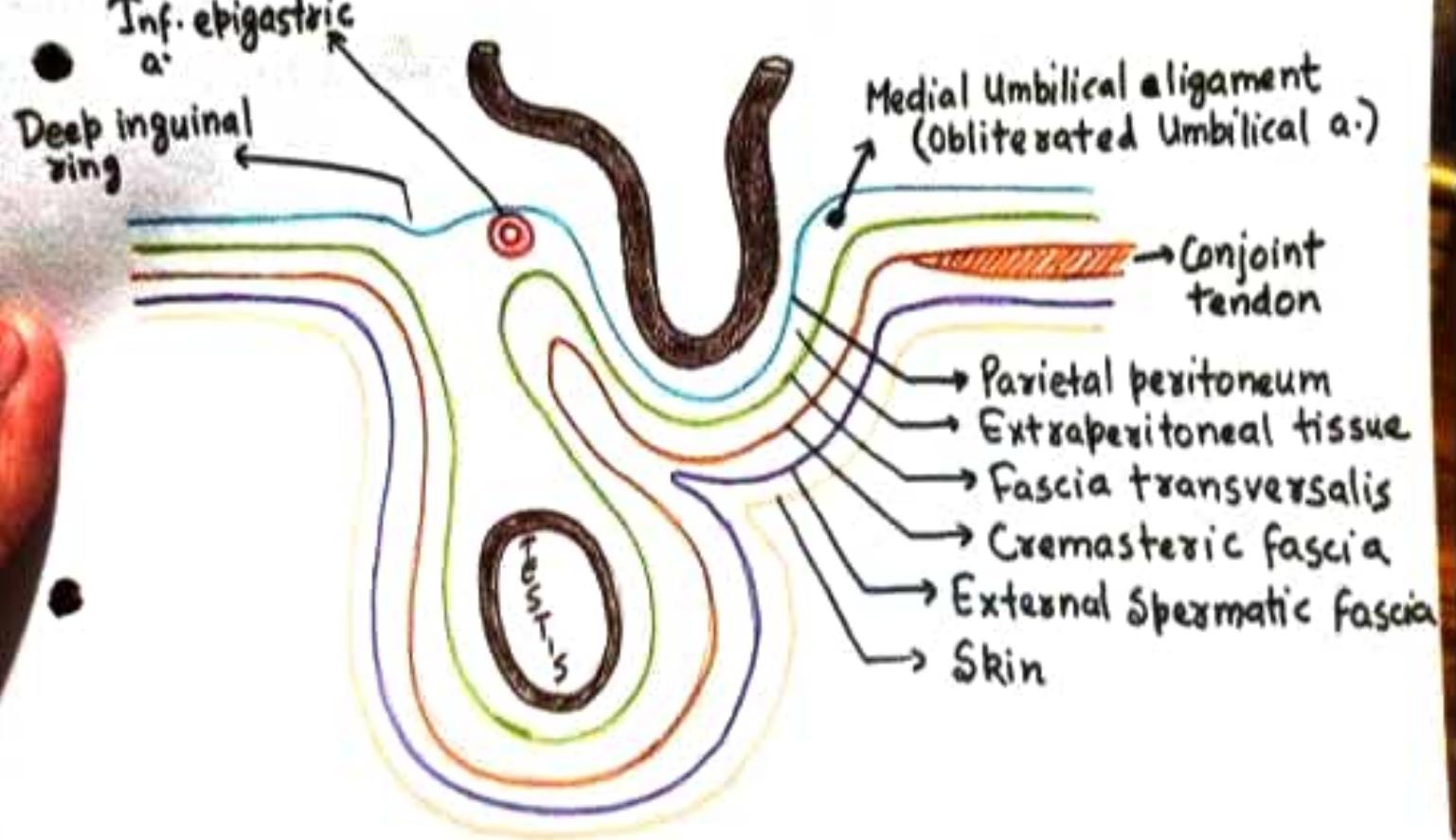
Cremasteric Fascia

External Spermatic Fascia

Skin

Inf. epigastric  
a.

Deep inguinal  
ring



### Lateral Direct Inguinal Hernia

### Medial direct inguinal Hernia

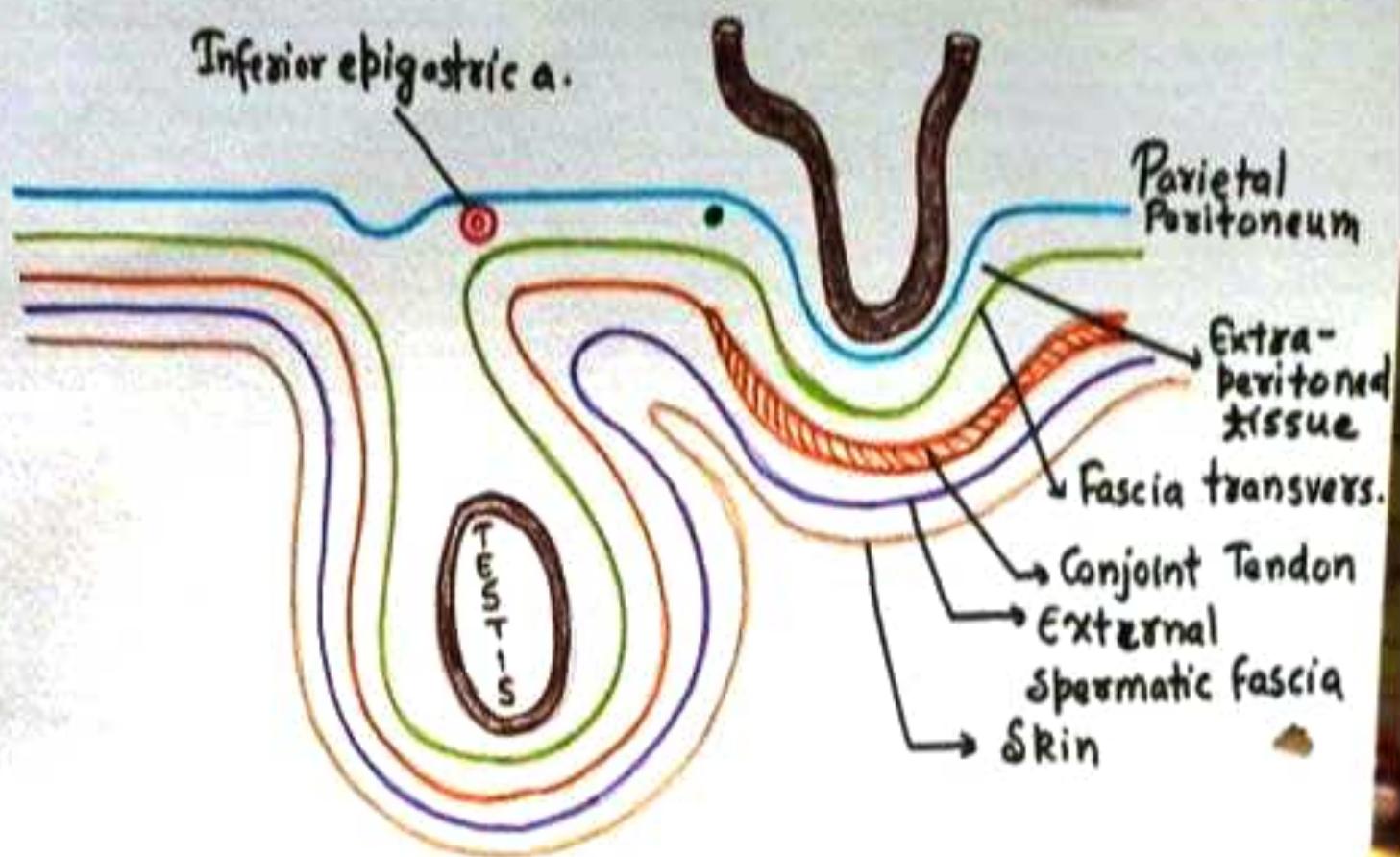
Extraperitoneal tissue

Fascia transversalis

Conjoint tendon

External Spermatic Fascia

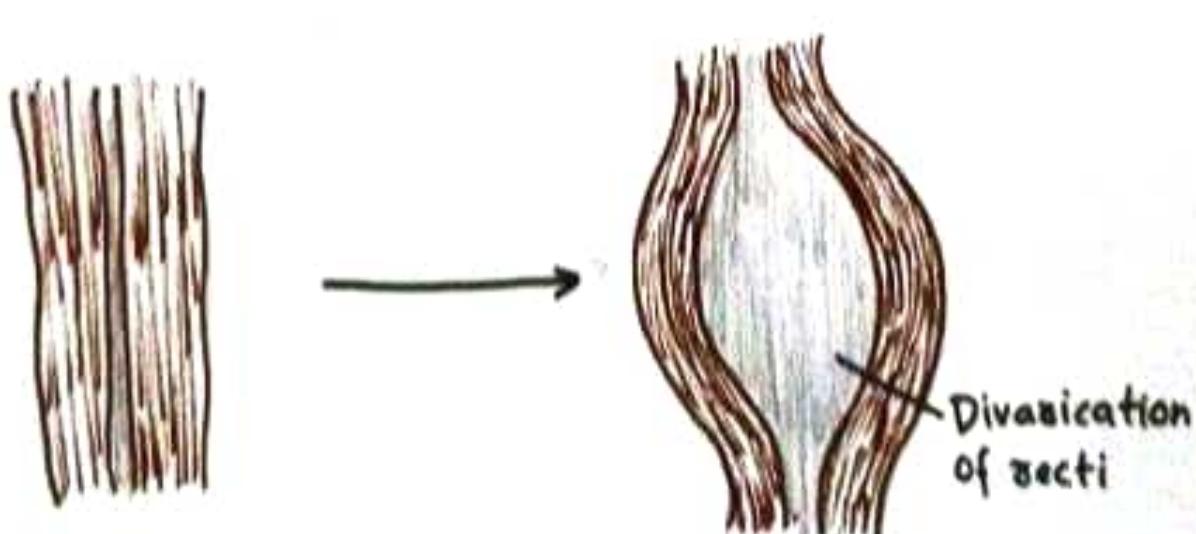
Skin



### Medial Direct Inguinal Hernia

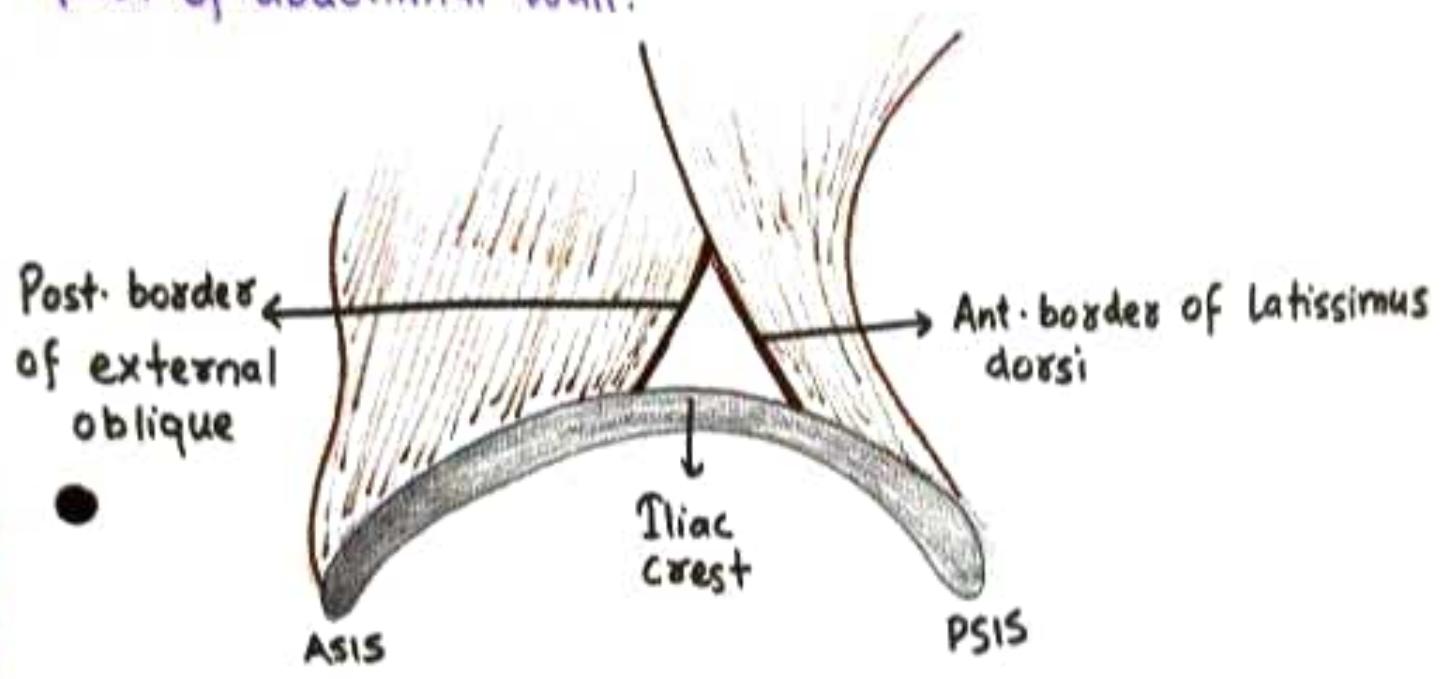
#### Divarication of Recti

- Occurs in multiparous female with weak anterolateral abdominal muscles
- Loop of intestine protrude during coughing, but returns back



## Lumbar Hernia

→ Occurs through the lumbar triangle in the posterior ~~wall~~ part of abdominal wall.



## Clinical Anatomy Of Appendix

### ✚ Appendicitis (Inflammation of Appendix)

↓ Treatment

Appendectomy (operation for removal of appendix)

### ✚ Referred pain In Appendicitis

→ Pain of appendicitis is first felt in region of umbilicus

↓ reason

Both appendix & umbilicus are supplied by Segment T10 of spinal cord

→ Then pain is felt in right iliac fossa

↓ reason

Involvement of parietal peritoneum

\* Parietal peritoneum is sensitive to pain, but visceral peritoneum is not.

### ✚ Mc-Burney's point

→ Junction of lateral  $\frac{1}{3}$ rd & medial  $\frac{2}{3}$ rd of line joining the umbilicus to right ASIS.

→ Site of maximum tenderness in appendicitis

→ Hyperaesthesia in right iliac fossa.

### ✚ In appendicitis, when appendix is retrocaecal

↓ Extension of hip joint may cause pain

↓ Appendix is disturbed by stretching of Psoas major muscle

R.D.

★ In appendicitis, when appendix is in pelvic position



flexion & Medial rotation of thigh may cause pain



Appendix is disturbed by stretching of Obturator Internus

★ Appendicular dyspepsia

Chronic appendicitis



Passage of infected lymph to Subpyloric nodes



Irritation of pylorus



Dyspepsia (Indigestion)

★ Appendicitis is common because:

(a) Appendicular artery is an end artery

(b) Lymphatic follicles in submucosa

(c) Small lumen → obstruction by faecalith

(d) Gap in muscularis externa → fast spread of infection

BAL

## CLINICAL ANATOMY OF BLOOD SUPPLY OF HEART

+ Thrombosis of Coronary Artery

↓ lead to

Myocardial Infarction

+ Incomplete obstruction of Coronary Artery

↓ lead to

Angina Pectoris

+ Coronary Angiography (Procedure that uses a special dye & X-ray to see blood flow through arteries in your heart)

↓

Determines site of Narrowing or occlusion of Coronary Arteries

+ Angioplasty (Procedure used to Widen blocked or Narrowed Coronary Artery)

↓

Done using small Stent or Small inflated balloon through a catheter passed upwards through

Femoral artery → Aorta → Coronary Artery

+ Coronary Artery Bypass Graft (CABG)

↓

Done using Great Saphenous Vein/Internal Thoracic Artery

BAV

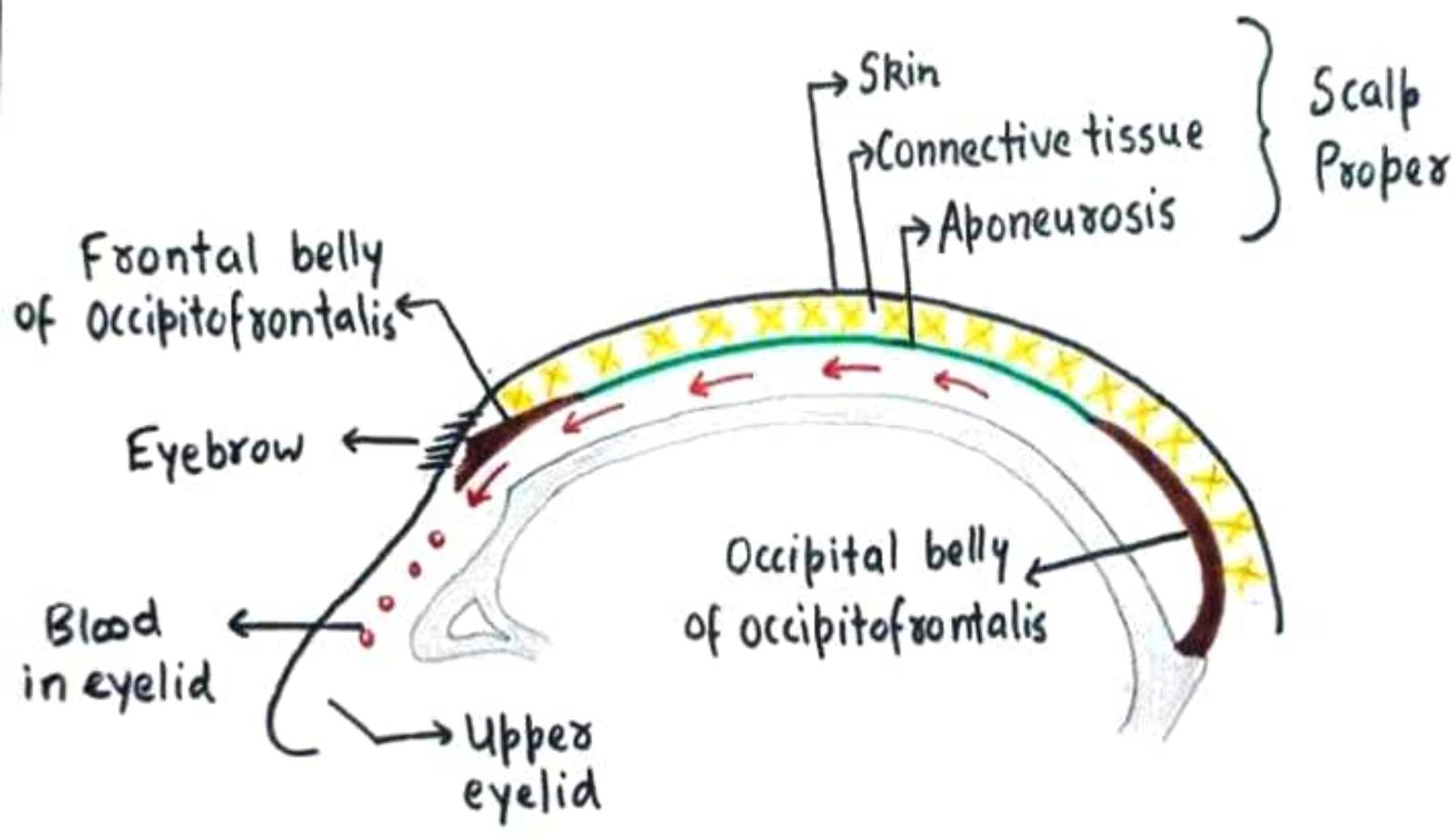
## Important Points

- Venaec Cordis Minimae / Smallest Cardiac Veins are more numerous on the right side of the heart than on left.  
This may be one reason why left Sided infarcts are more common.
- In 40% cases SA nodal artery arises from left Coronary Artery
- Cardiac Dominance

In 10% cases Post. Interventricular artery arises from left Coronary artery  
↓

In this case heart is said to be left Dominant

BAL



Sagittal Section of The Skull Cap Showing  
Migration of Blood from 4<sup>th</sup> layer of Scalp into  
Eyelids

## SCALP : CLINICAL ANATOMY

### ✚ Surgical layers of Scalp

- First 3 layers of Scalp are firmly adhered to each other and can't be separated from each other

↓

So these layers are called Surgical layer of scalp & form Scalp proper

- When hairs are caught in machinery, the Scalp proper is avulsed

↓

Best treatment for Scalp avulsion is immediate replantation of the avulsed tissue

### ✚ Dangerous Area of Scalp

- Layer of Loose Areolar tissue is called Dangerous Area of Scalp

Blow on Head

↓

Blood & Pus freely tend to collect in this layer

↓

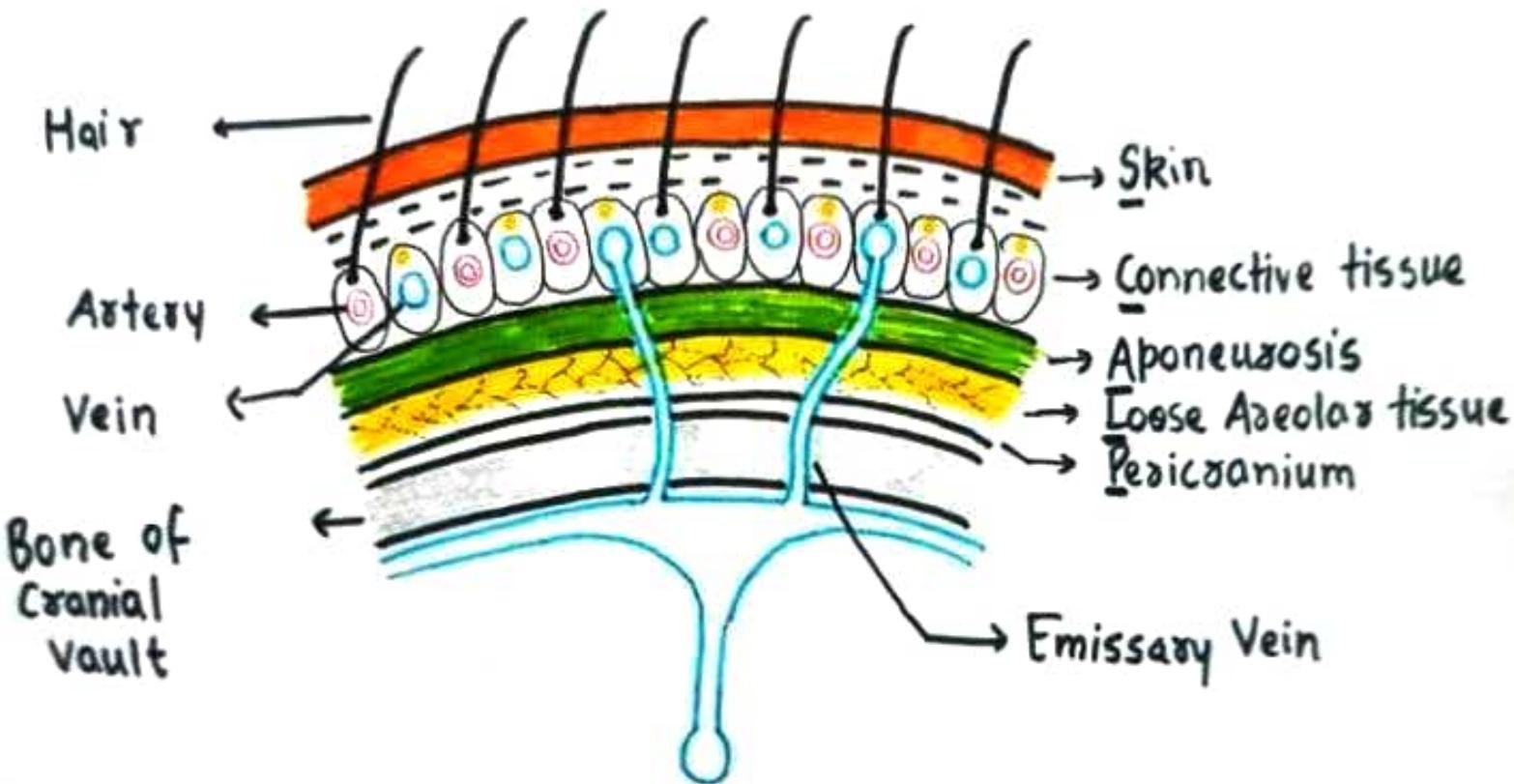
Infection may travel along emissary veins into the intracranial dural venous sinuses

↓

Leading to thrombosis

↓

May Result in Death



## LAYERS OF SCALP

## Black Eye

Blow on head



Blood & fluid collect in layer of loose areolar tissue



Blood can't pass into either occipital or temple region because of bony attachment of Occipitofrontalis



Blood & fluid can however track into the eyelids because Occipitofrontalis has no bony attachment anteriorly



Lead to formation of Hematoma few hours after a head injury or cranial operation causing black discolouration of skin around the eyes



Condition is called Black Eye

## CLINICAL OF BRACHIAL PLEXUS

## 1. Erb's Paralysis

- a) Site of Injury :- Erb's Point

b) Cause of Injury :- Undue Separation of head from Shoulder  
 ↳ Birth injury  
 ↳ fall on Shoulder

c) Roots Involved :- C5 and C6

d) Muscles Paralysed :-

Mainly	Partly
Biceps Brachii	Infraspinatus
Brachialis	Supraspinatus
Brachioradialis	Supinator
Deltoid	

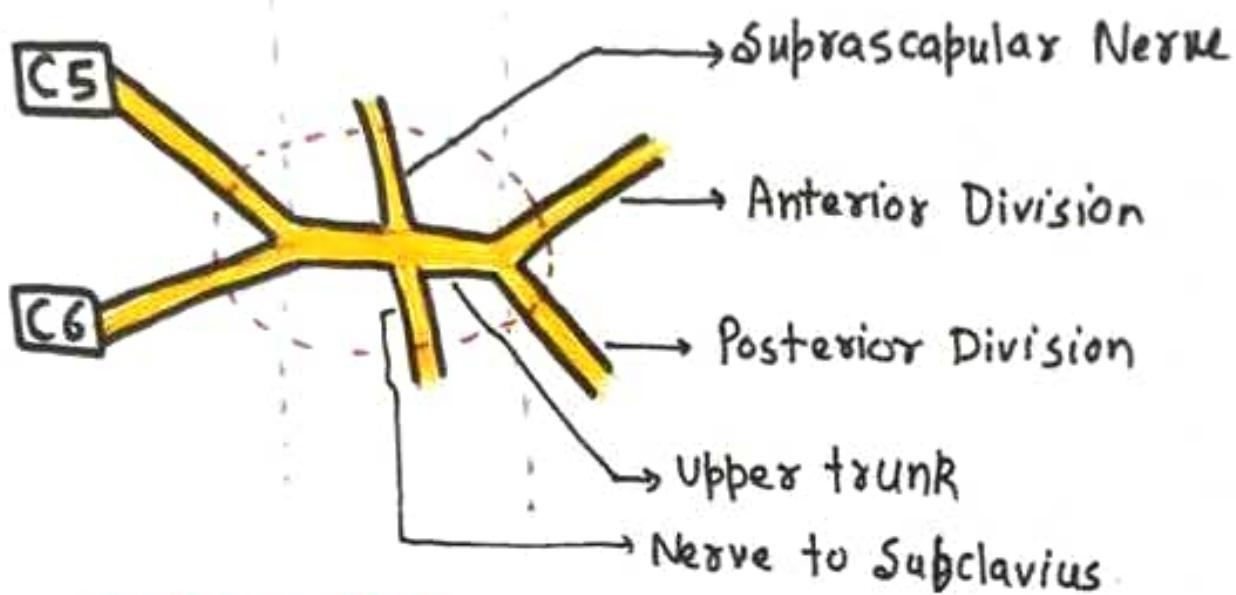
e) Deformity :-  
 Arm :- Adducted and medially rotated  
 Forearm :- Extended and Pronated

f) Disability :-  
 • Arm :- Abduction and Lateral rotation  
 • Forearm :- Flexion and Supination  
 • Biceps and Supinator JERKS are lost.

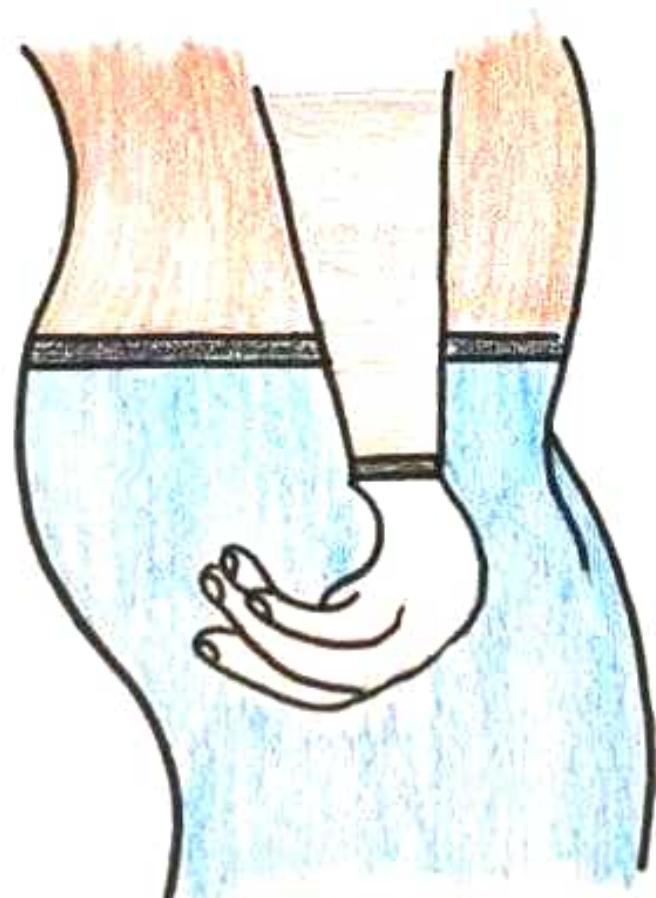
## 2. Klumpke's Paralysis

- a) Site of Injury:- Lower trunk
- b) Cause of Injury:- Undue abduction of arm
  - Birth injury
  - Fall from height
- c) Roots involved:-  $T_1$  and  $C_8$
- d) Muscles Paralysed:-
  - Intrinsic muscles of hand ( $T_1$ )
  - Ulnar flexors of wrist and fingers ( $C_8$ )
- e) Deformity:- Claw hand
  - Extension at Metacarpophalangeal Joint
  - Flexion at Interphalangeal Joint
- f) Disability:-
  - Flexion at Metacarpophalangeal Joint
  - Extension at Interphalangeal Joint
  - Biceps & Supinator Jerks are lost.

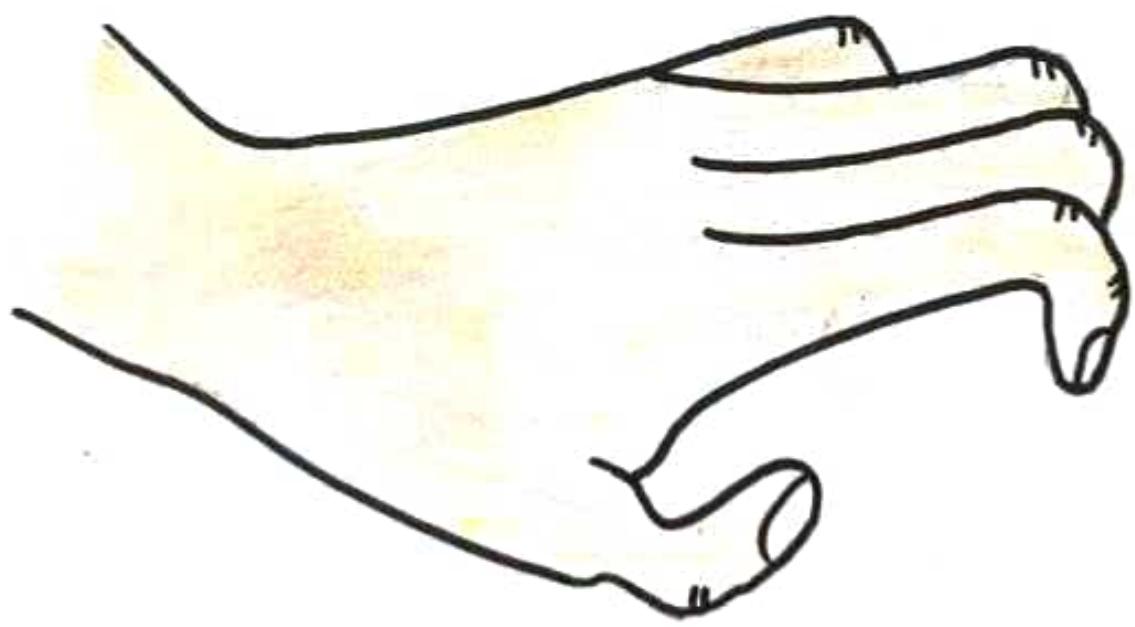
Root Trunk Division



○ Erb's Point



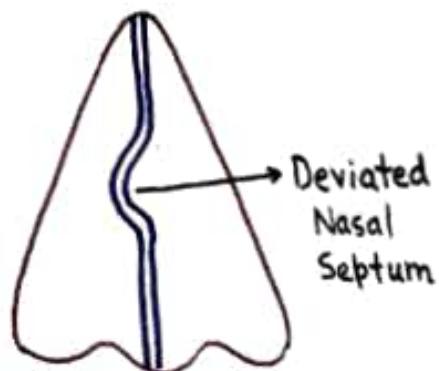
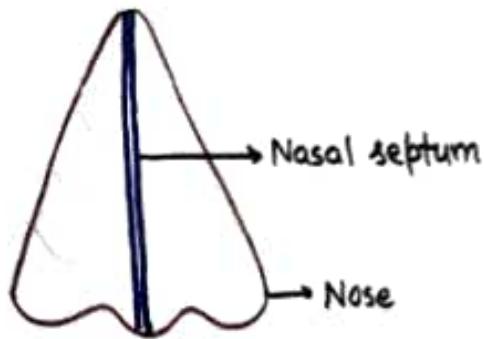
- Policeman's tip hand.
- Waiter's tip hand.
- Porter's tip hand.



Complete Claw hand

## DEVIATED NASAL SEPTUM

- \* Common cause of Nasal obstruction
- \* Males more affected than females
- \* More common on right side
- \* Occurs due to → Developmental error  
or  
Trauma
- \* Severe DNS → Mechanical obstruction  
↓ lead to
  - Difficulty in breathing
  - Sinusitis
  - Headache
  - Snoring
- \* Corrected by ↗ Submucous resection (SMR)  
↗ Septoplasty



## NASAL SEPTUM → CLINICAL ANATOMY



### LITTLE'S AREA

- Area in the anteroinferior part of Nasal septum
- Highly vascular
- Here septal branches of
  - Ant. Ethmoidal a.
  - Sphenopalatine a.
  - Greater palatine a.
  - Superior labial a.

↓

Kiesselbach's plexus ←      Anastomose to form  
a vascular plexus
- Commonest site of Epistaxis (Nose bleeding)

↓  
Due to finger nail trauma following  
picking of the nose.

Sphenopalatine a.

Anterior ethmoidal a.

Little's Area

Superior labial a.

Greater palatine a.

Nose Picking

Act of Extracting nasal mucus  
with one's finger

## LACRIMAL APPARATUS → CLINICAL ANATOMY

### + EPIPHORA

→ Overflow of tears from conjunctival sac over the cheeks

Reasons:

a) Hyperlacrimation (excessive secretion of tears)

↓  
Following intake of spicy food or emotional outbreak

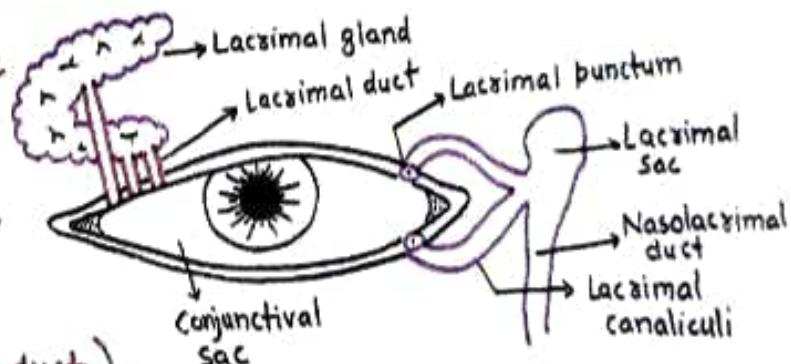
b) Obstruction of lacrimal passage

(Lacrimal gland → lacrimal duct  
↓

Lacrimal puncta ← conjunctival sac  
↓

Lacrimal canaliculi → lacrimal sac  
↓

Nasolacrimal duct)

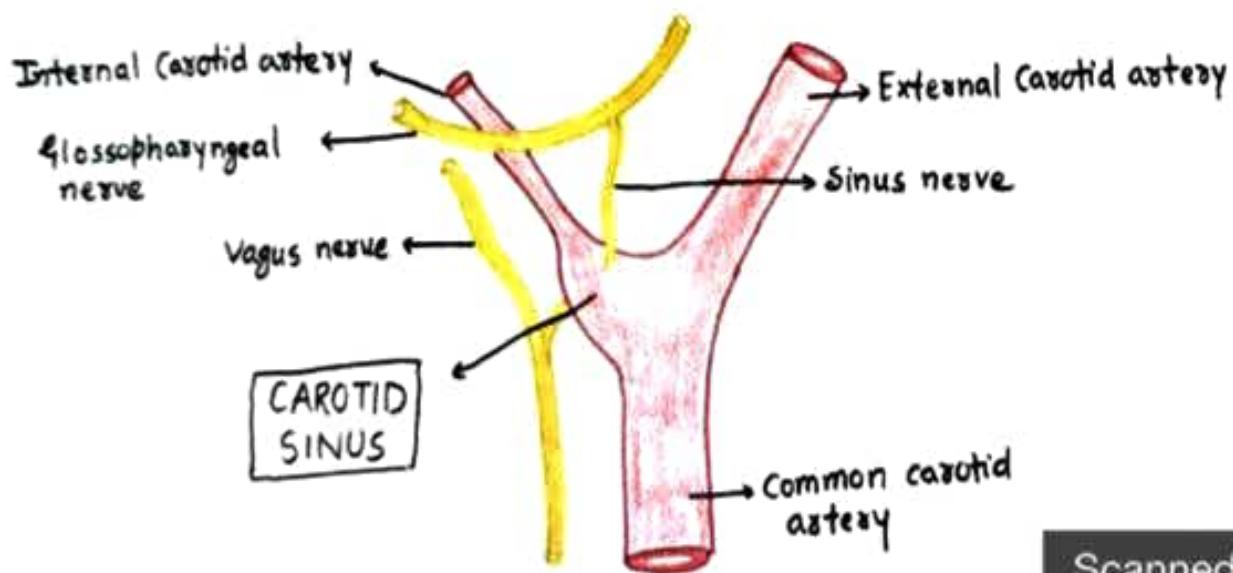


c) Eversion of lower eyelid (Ectropion) due to laxity or paralysis of orbicularis oculi

↓  
Eversion of lacrimal punctum → Epiphora

## CAROTID SINUS

- Dilated area at the base of internal carotid artery or at the terminal end of common carotid artery
- Nerve Supply = glossopharyngeal nerve  
Vagus nerve
- Act as baroreceptor (pressure receptor) & regulates B.P in cerebral arteries



Scanned by TapScanner

## CAROTID SINUS SYNDROME

\* Carotid Sinus hypersensitivity



Pressure on carotid sinus



↓ Heart rate

↓ Blood Pressure

Cerebral ischemia



Syncope (Fainting)

\* Such individuals when wear shirt with tight collar or tie with tight knot



Rotate head



Sudden attack of Syncope

\* Symptoms can be relieved by periarterial neurectomy

## STERNOCLÉIDOMASTOID → CLINICAL ANATOMY

### **+ TORTICOLLIS OR WRY NECK**

→ Head is bent to one side & Chin points to opposite side

→ Occurs due to spasm of Sternocleidomastoid & Trapezius muscle

↓  
Supplied by spinal accessory nerve

Types

Spasmodic torticollis

Reflex torticollis

Congenital torticollis

- Repeated painful contractions of trapezius & Sternocleido. muscles on one side.
- Caused by exposure to cold & maladjustment of pillow during sleep.
- Due to irritation of spinal accessory nerve
- Caused by inflamed lymph nodes
- Due to birth injury to muscle