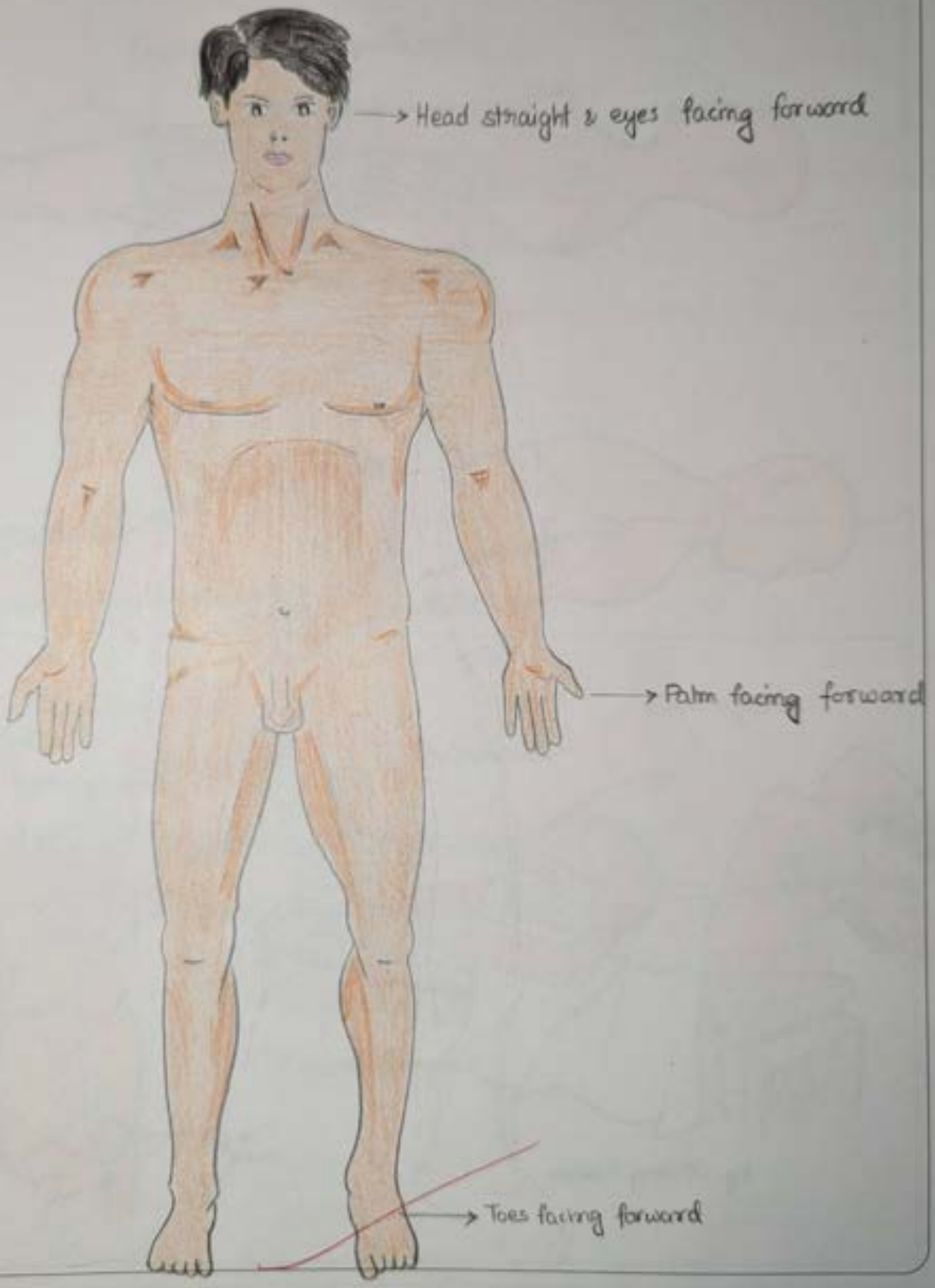
Gross Anatomy

Anish Bhukta

Anatomical Position of the Body



Various Positions and Planes of Body

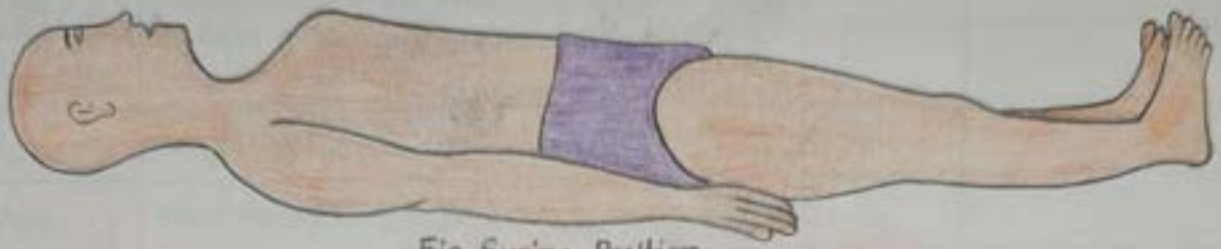


Fig. Supine Position

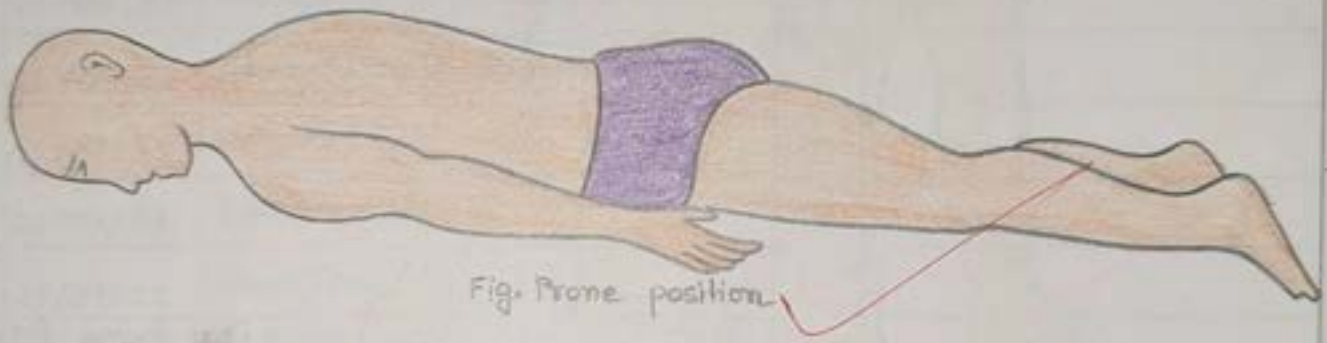
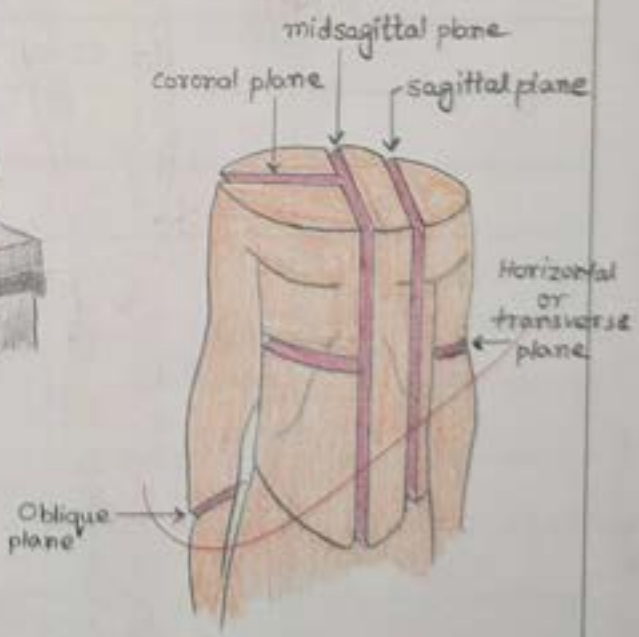
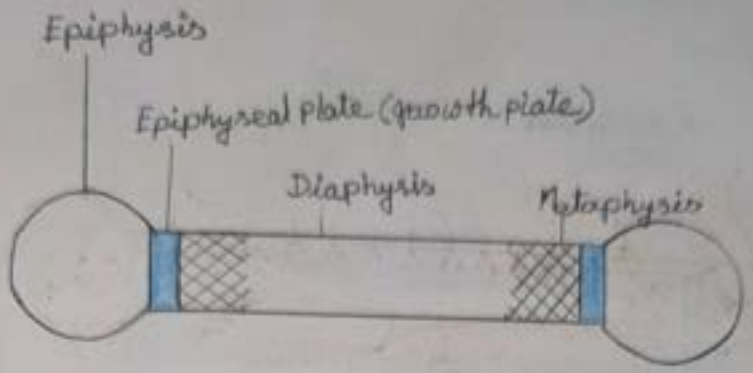


Fig. Prone position

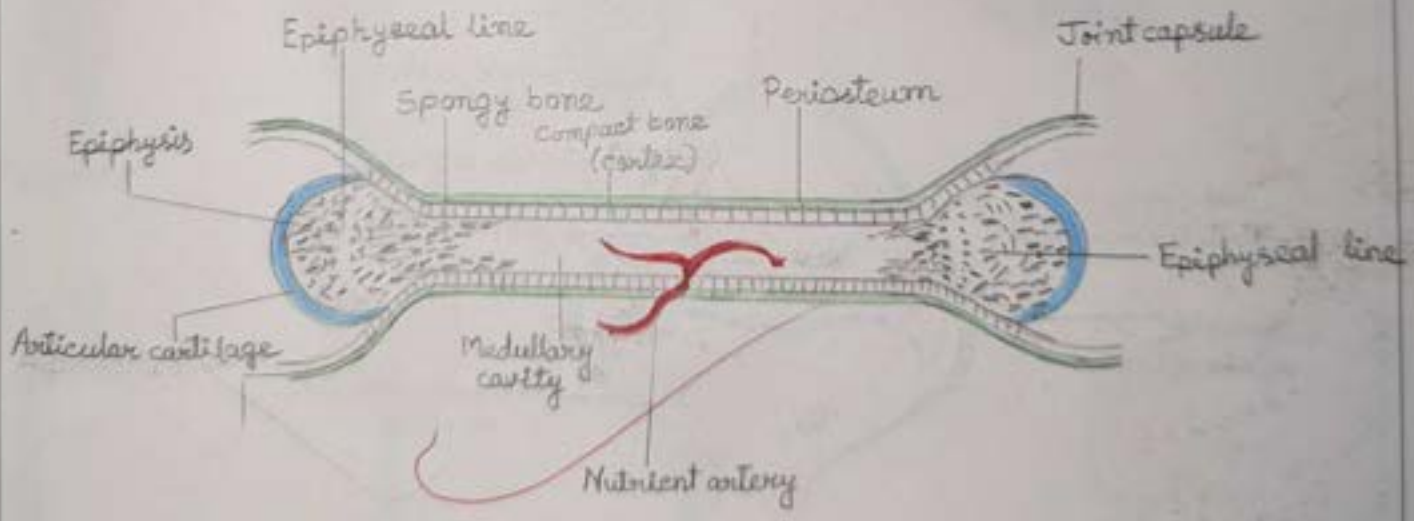
Fig. Lithotomy Position



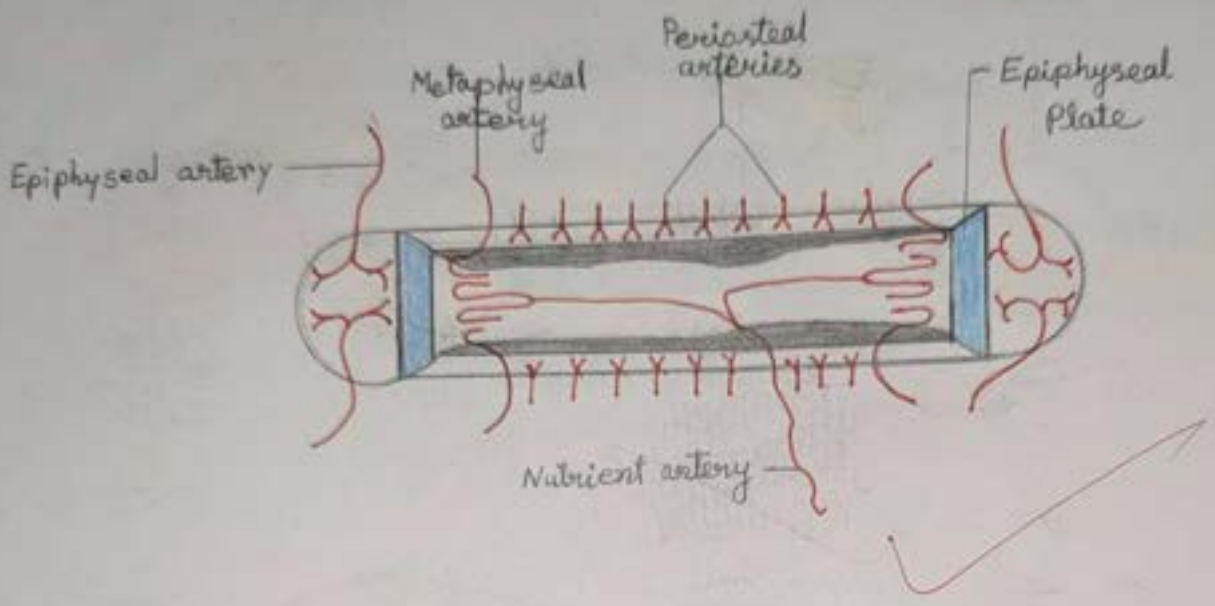
Parts of Young Bone



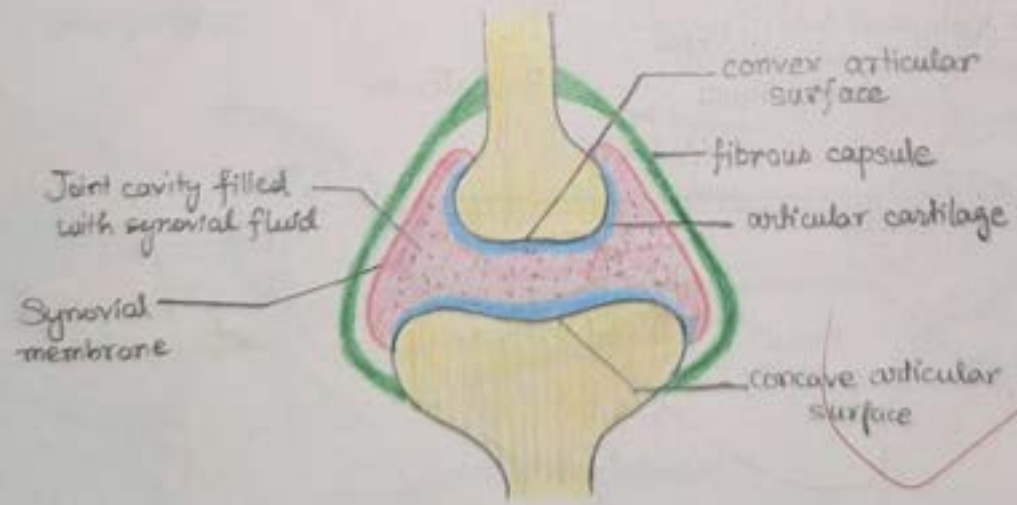
Adult Long Bone



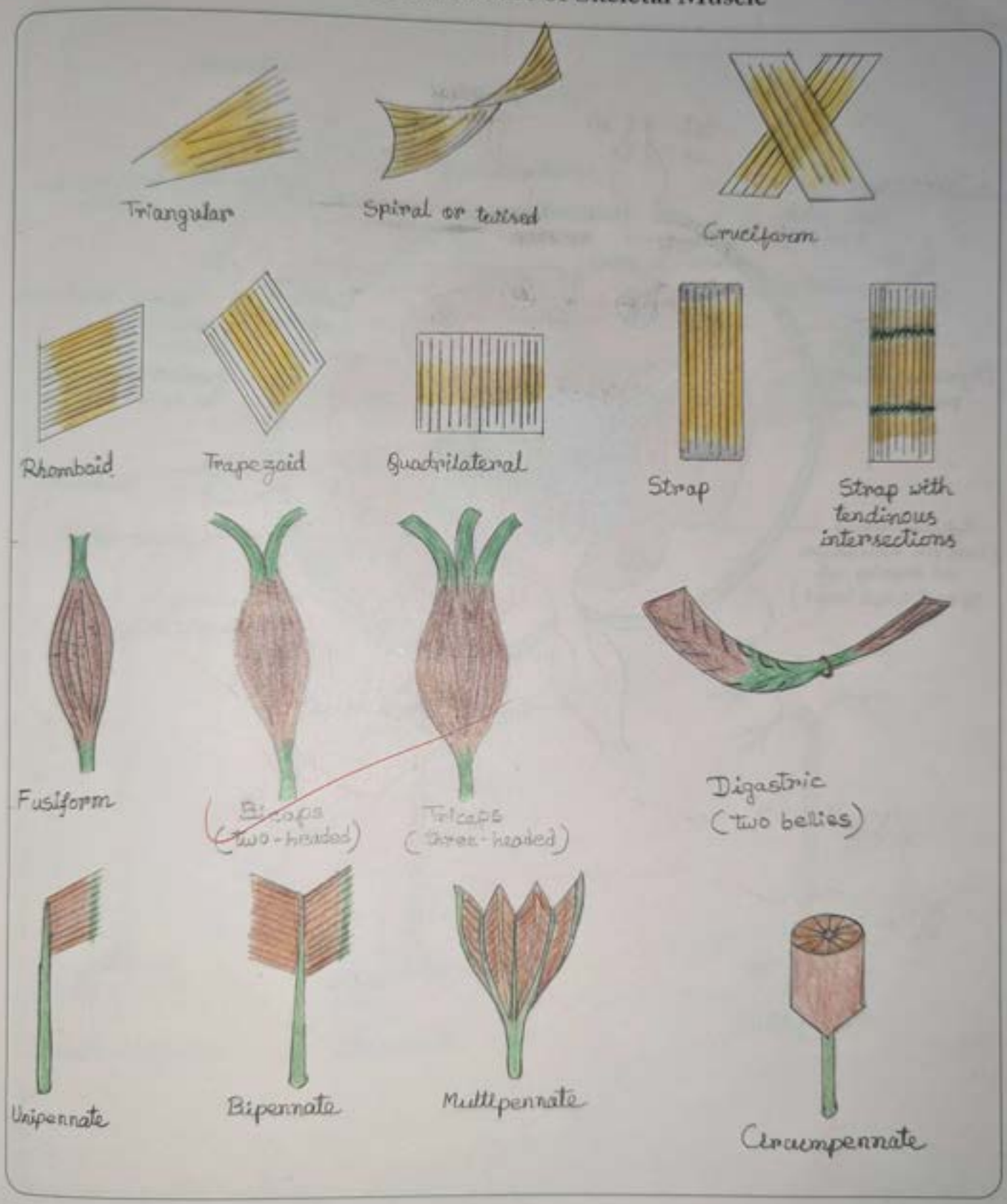
Blood Supply of Long Bone



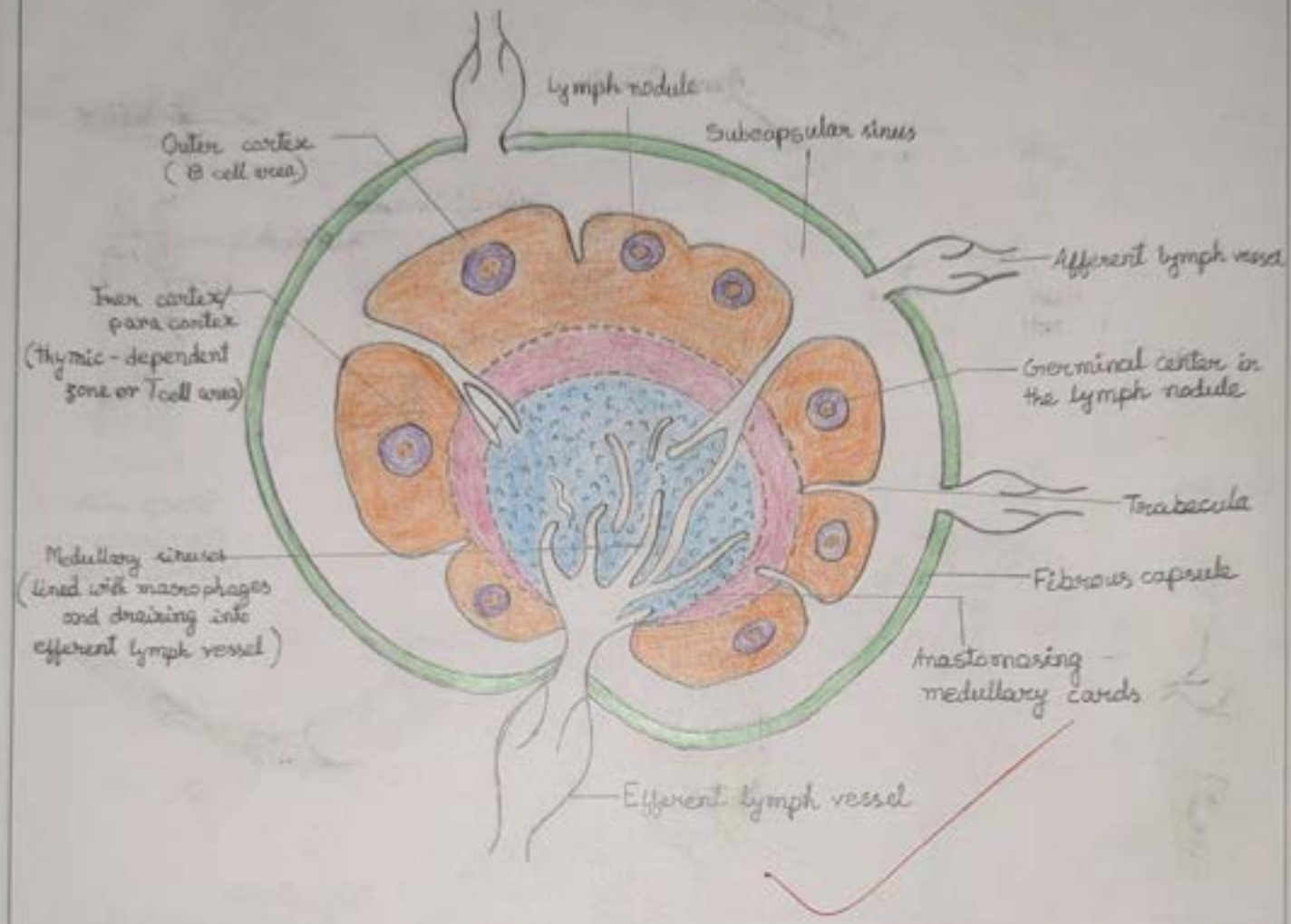
Typical Synovial Joint



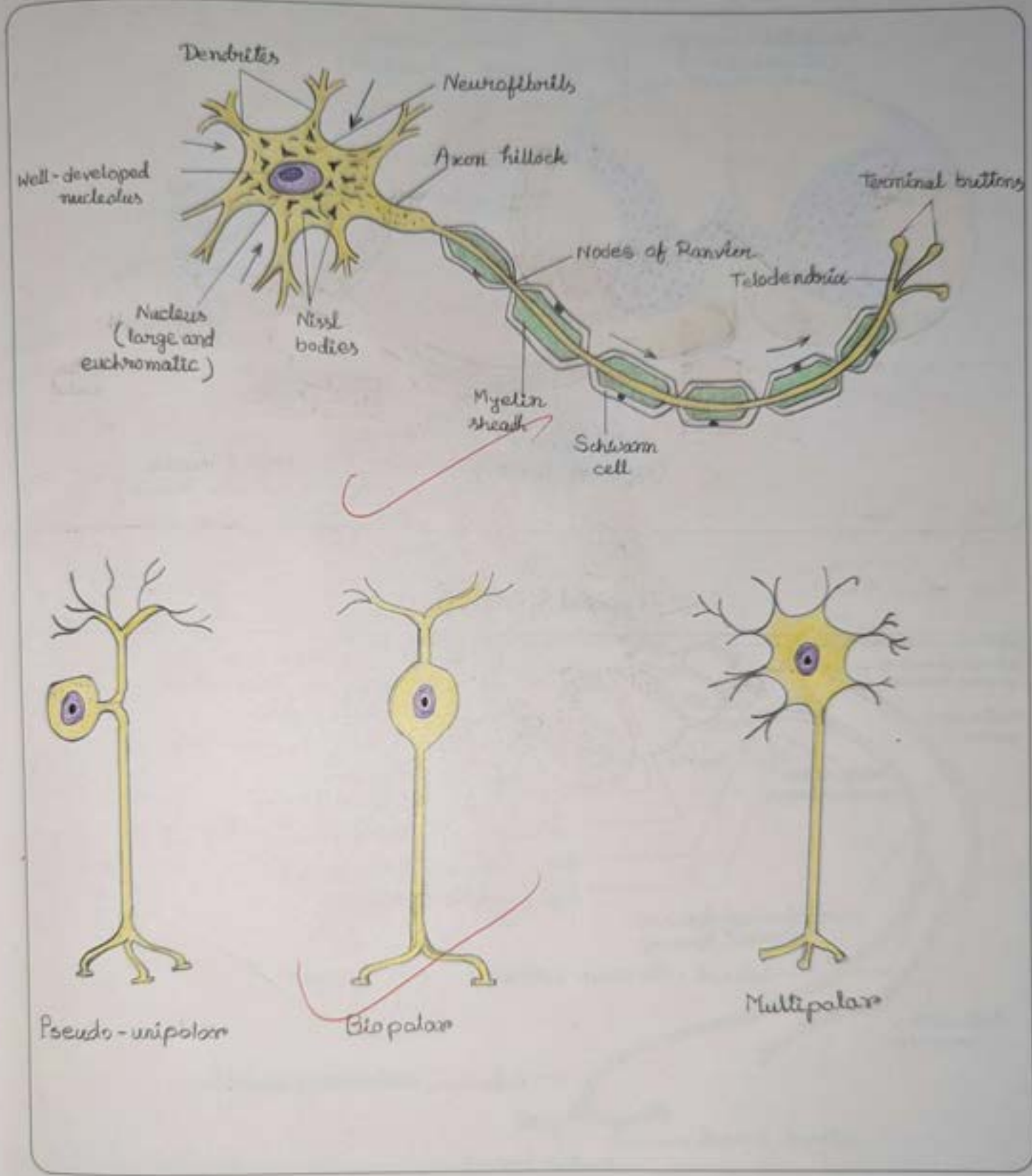
Fascicular Architecture of Skeletal Muscle



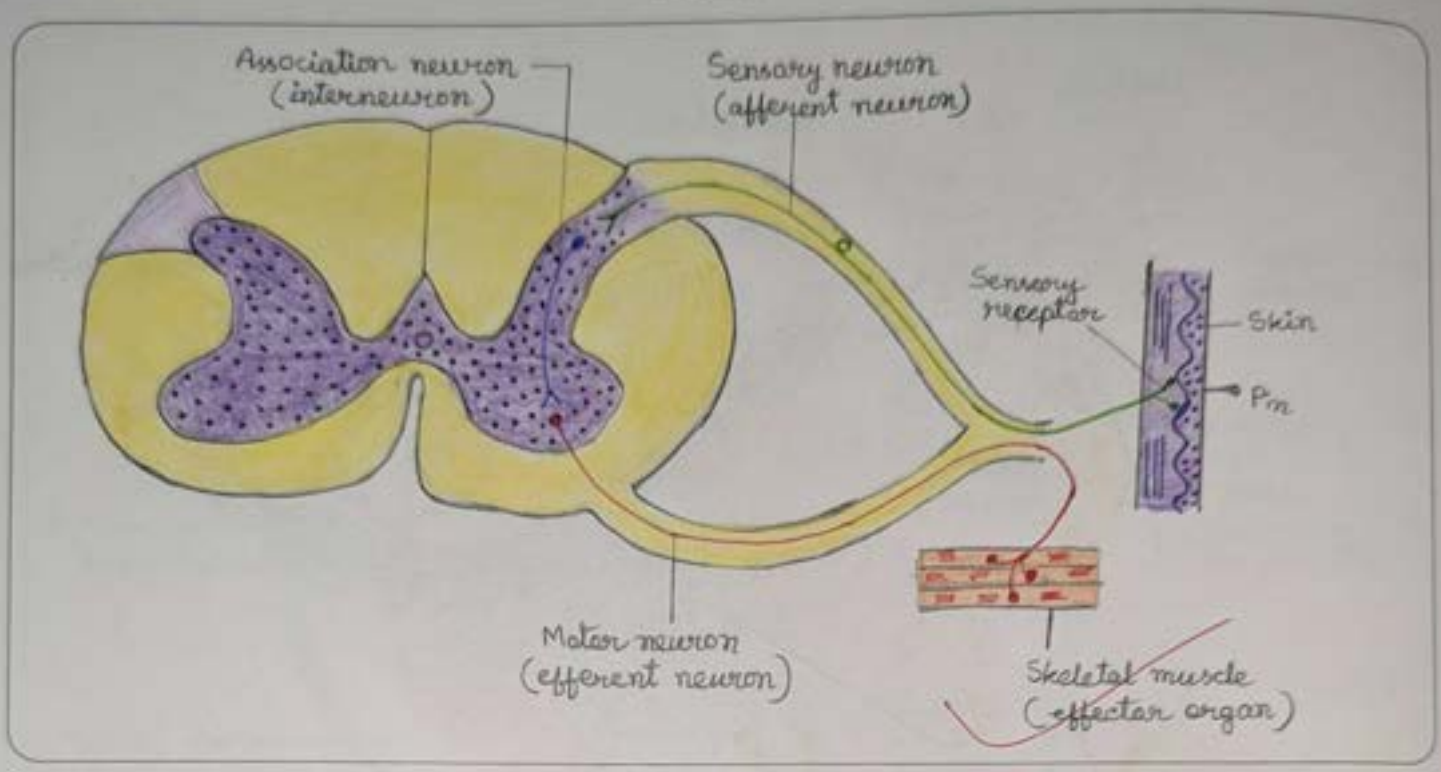
Structure of Lymph Node



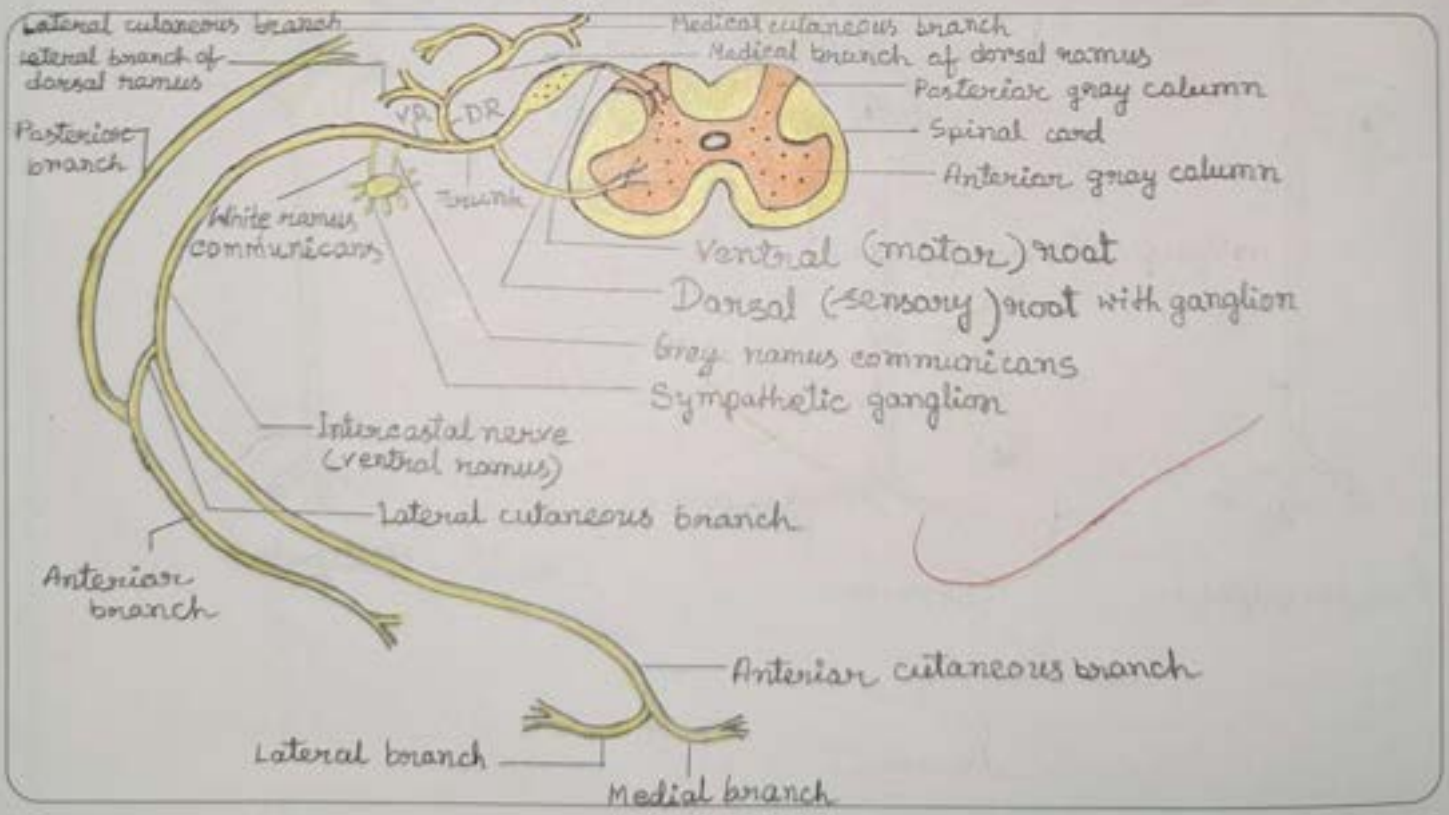
Parts and Types of Neurons



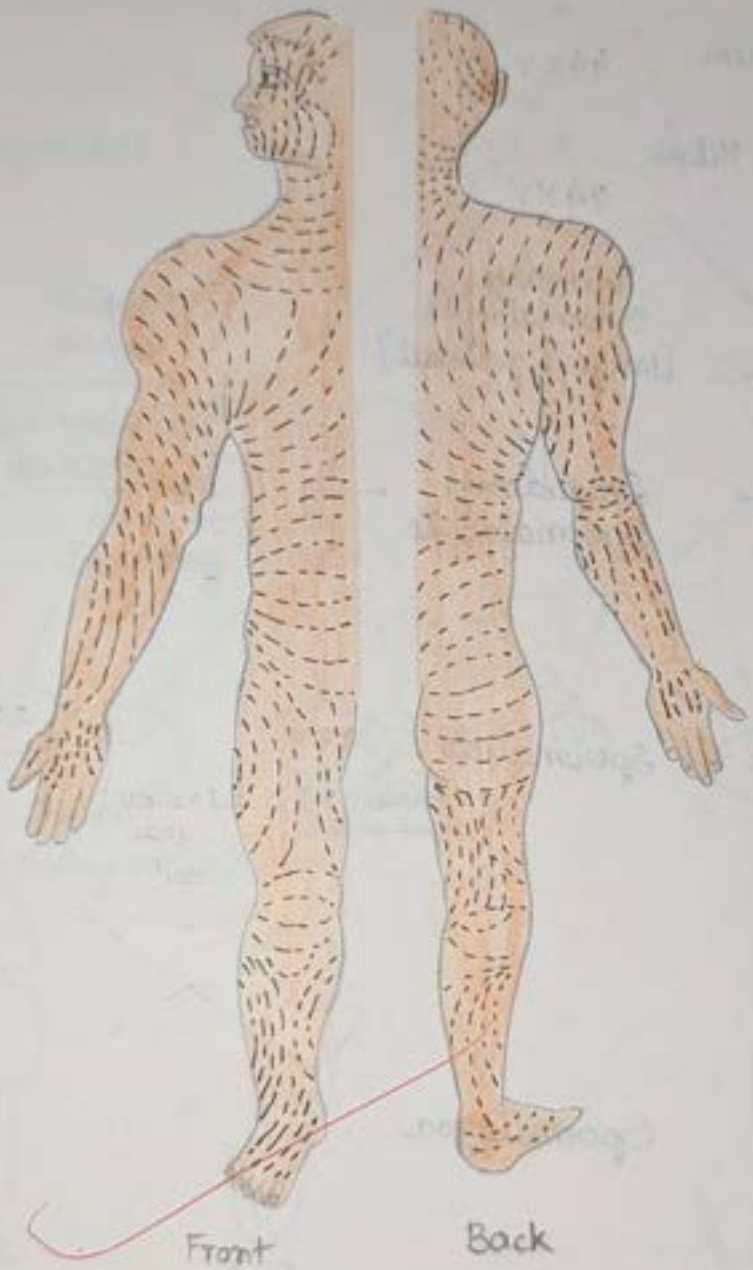
Reflex Arc



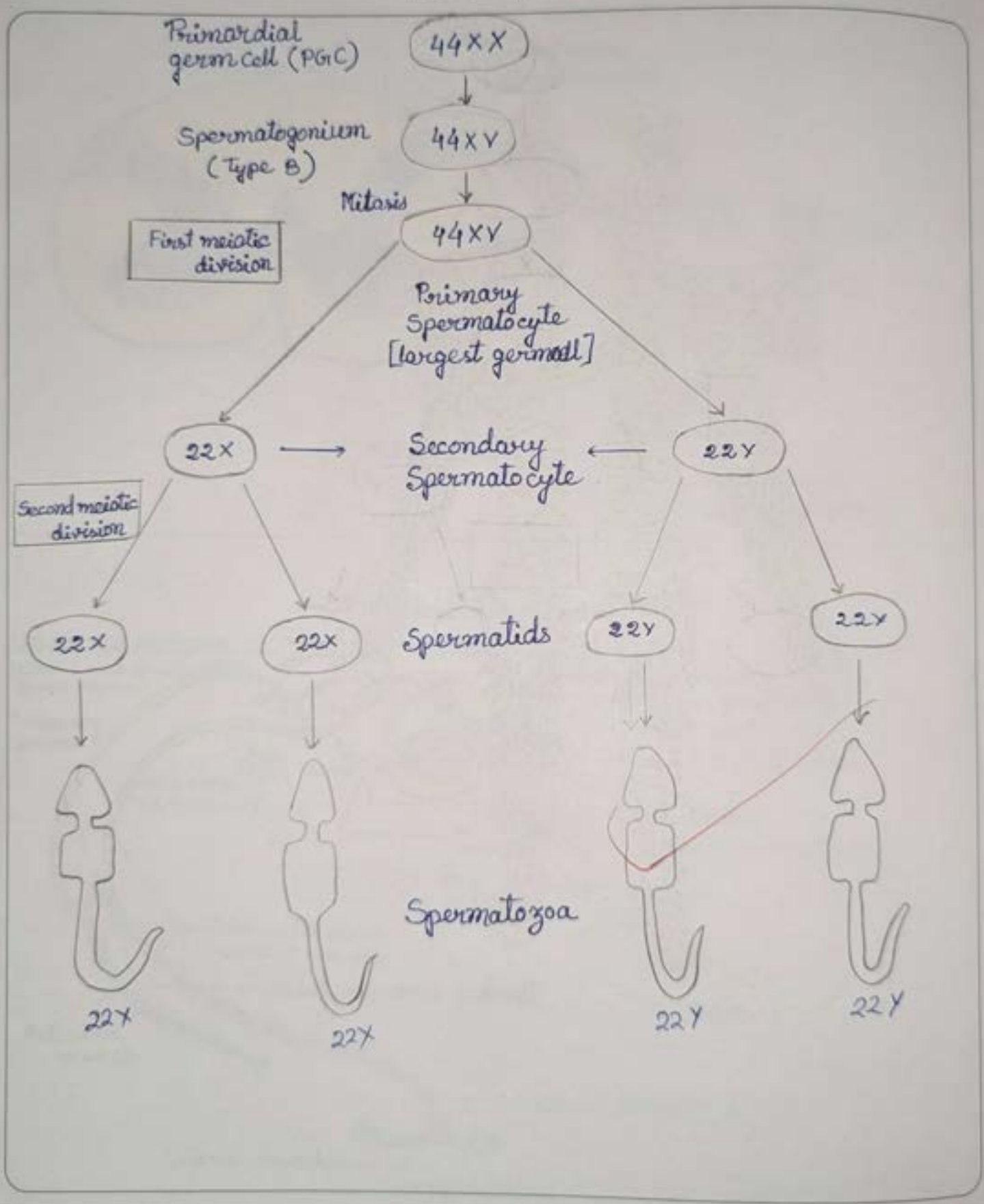
Typical Spinal Nerve



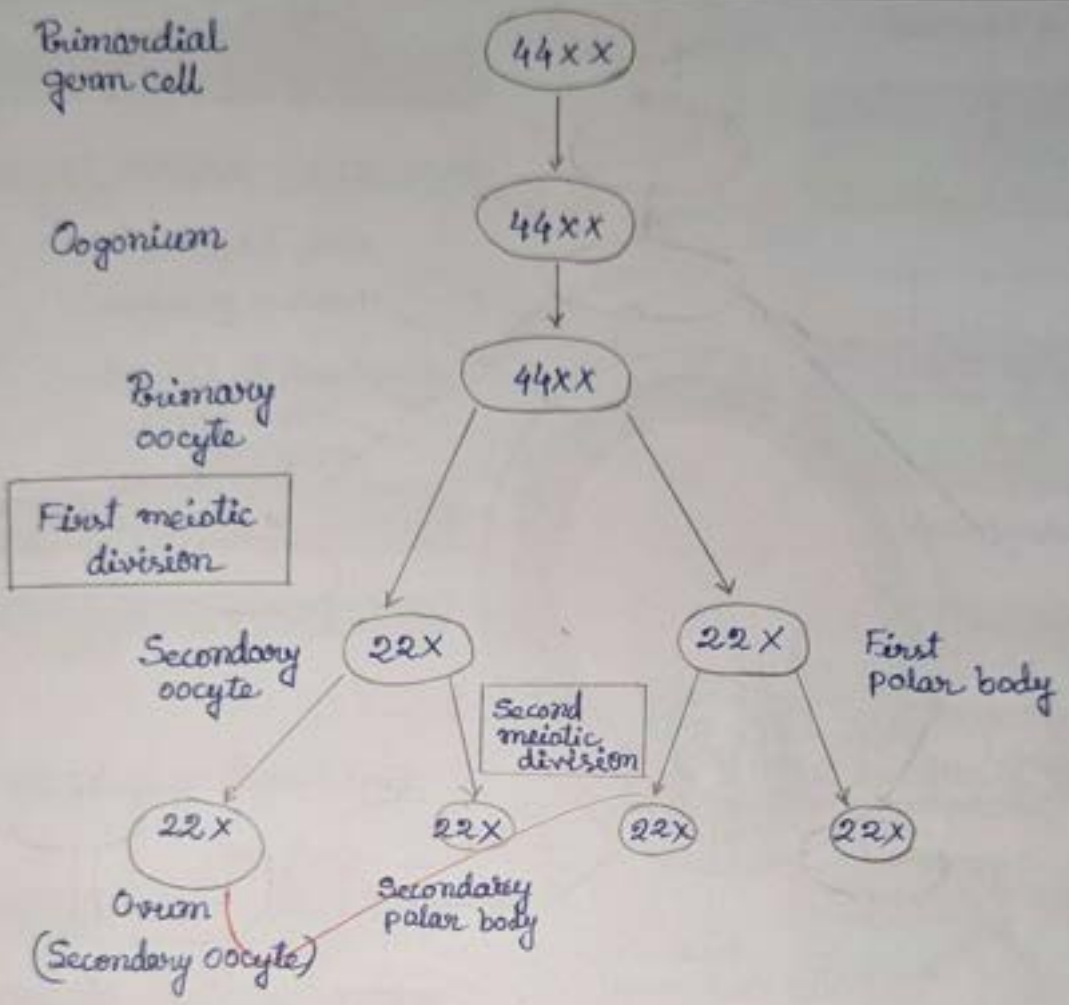
Langer Lines



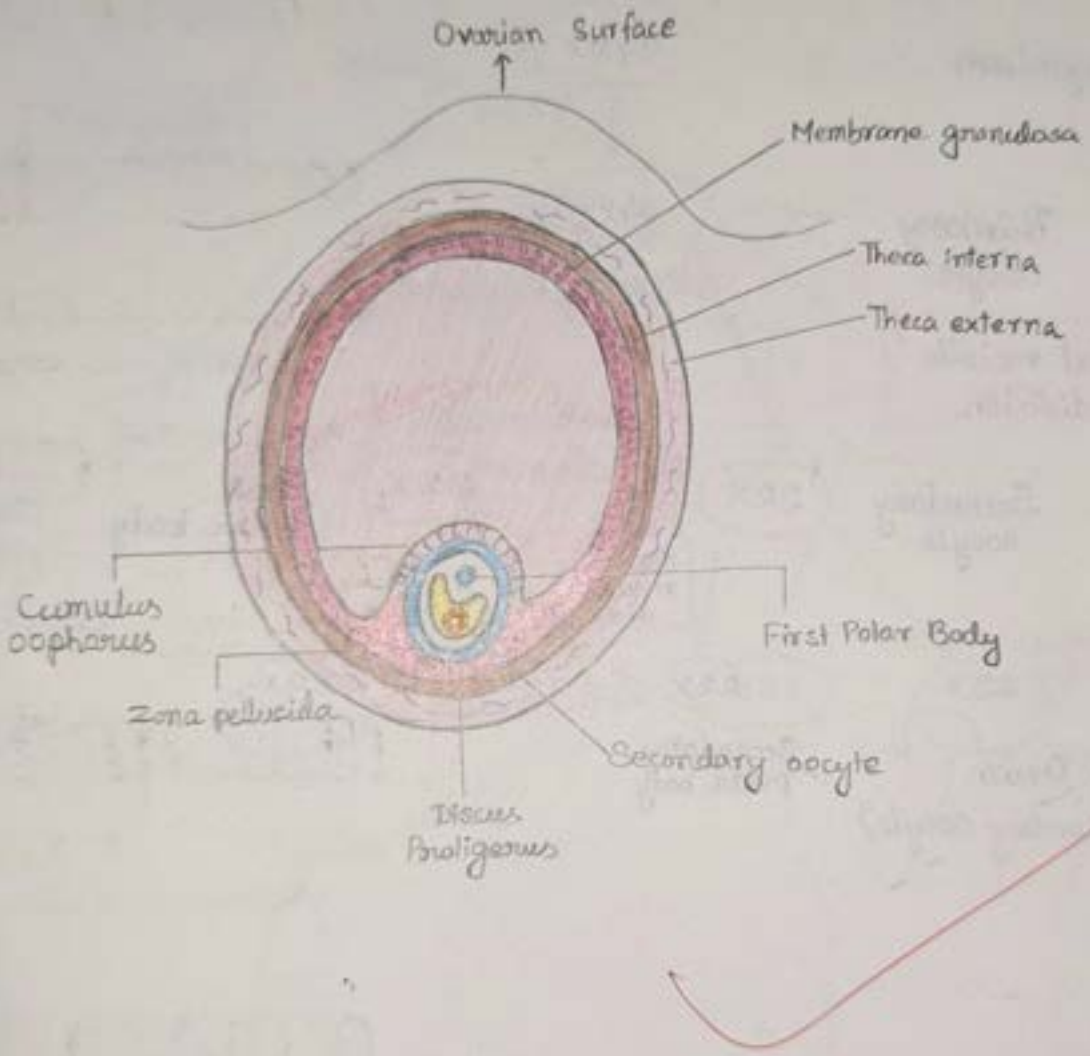
Spermatogenesis



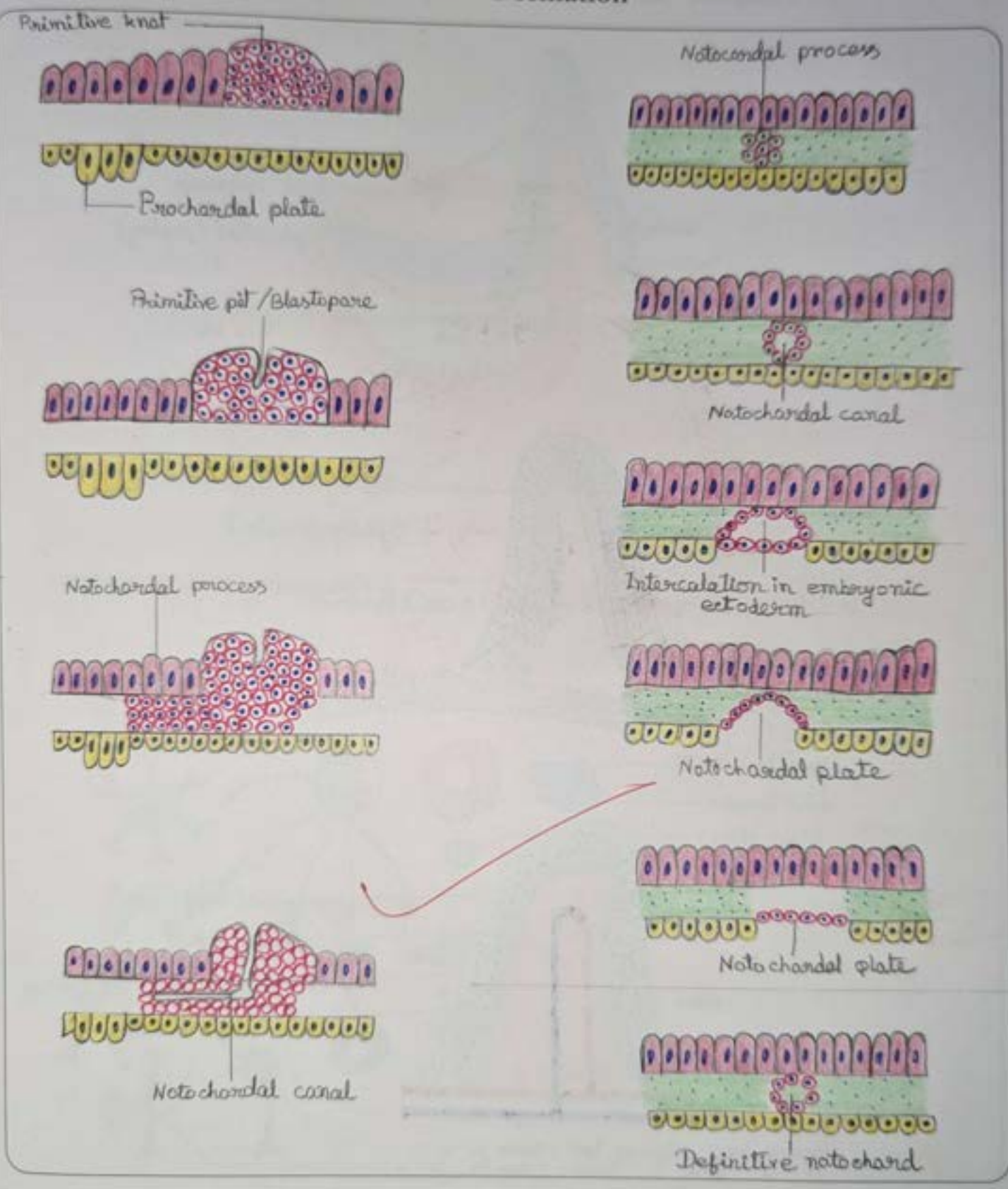
Oogenesis


Primordial germ cell
44XX
Oogonium
44XX
Primary oocyte
44XX
First meiotic division
Secondary oocyte
22X
22X
First polar body
Second meiotic division
22X
22X
22X
22X
Ovum (Secondary oocyte)
Secondary polar body

Mature Graffian Follicle

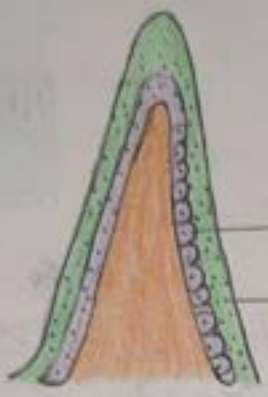


Notocord Formation

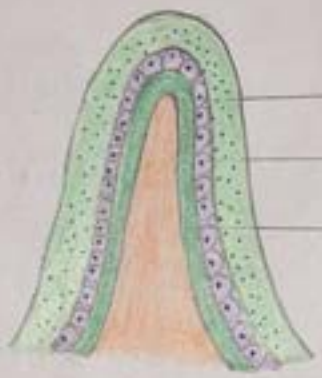


Placenta—Primary, Secondary and Tertiary Villi

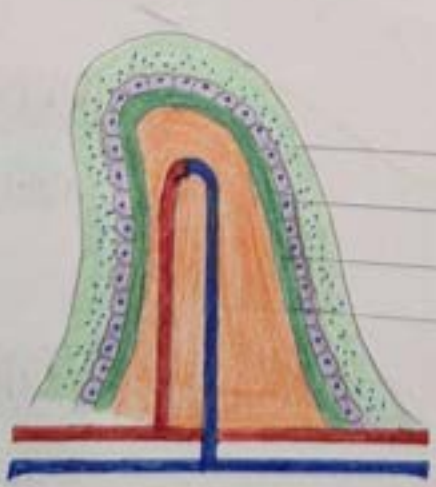
1° villus



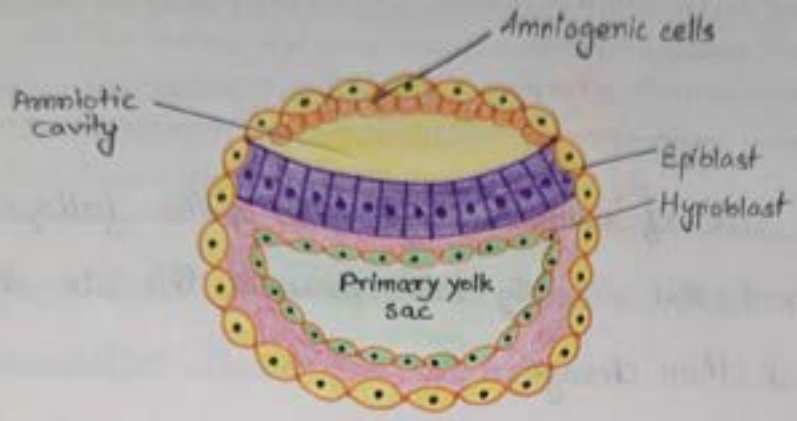
2° villus



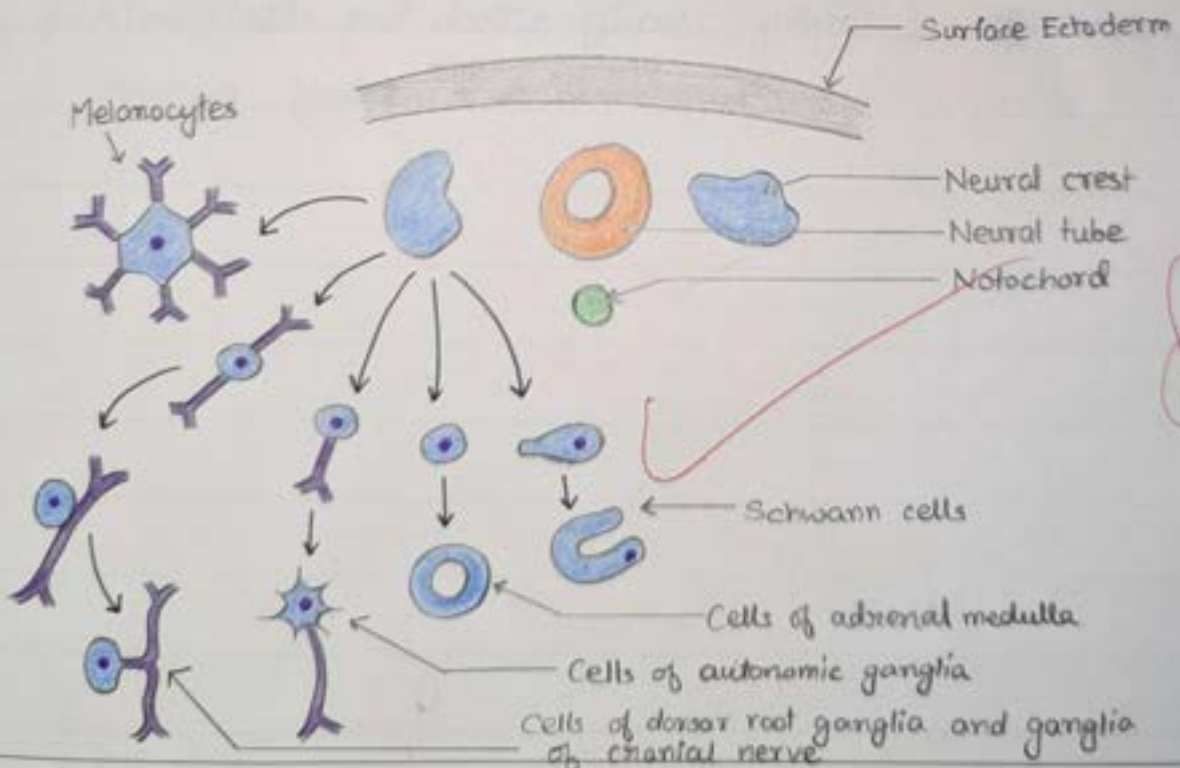
3° villus



Gastrulation—Germ Layers



Neural Crest Cell Derivatives



Clinical Case-1

A 19-year-old woman was rushed to the hospital in the midnight because she had intense lower abdominal pain. She gave history of two missed periods. Vaginal examination revealed early pregnancy and ultrasound of pelvic cavity showed empty uterus and fluid in pouch of Douglas. This is a case of ectopic pregnancy.

Q.1 Name the common site of ectopic pregnancy.

Q.2 Which embryological event normally takes place at this site?

Ans.1. The common site of ectopic pregnancy is the fallopian tube.

Ans.2. Embryological event that normally takes place at this site are fertilisation and then clevage

Clinical Case-2

A six feet tall 14-year-old high school student undergoes physical fitness examination.

It is noted that the student has very long limbs, the tips of his fingers reach just below his knees, sternum is incurving (pes cavus) and his joints are very loose and flexible. It was decided to send him for cardiac and ophthalmic checkup, since the findings of physical examination were suggestive of Marfan's Syndrome.

Q.1 Enumerate the four basic tissues of the body.

Q.2 Which basic tissue is affected in Marfan's syndrome?

Q.3 Synthesis of which fibers is affected in Marfan's syndrome?

Ans. 1. The four basic tissues of the body are :

(i) Connective Tissue

(ii) Epithelial Tissue

(iii) Muscle tissue

(iv) Nervous Tissue

Ans. 2. Connective tissue is affected in Marfan's syndrome.

Ans. 3. Microfibrils and elastic fibers synthesis is affected in Marfan's syndrome.

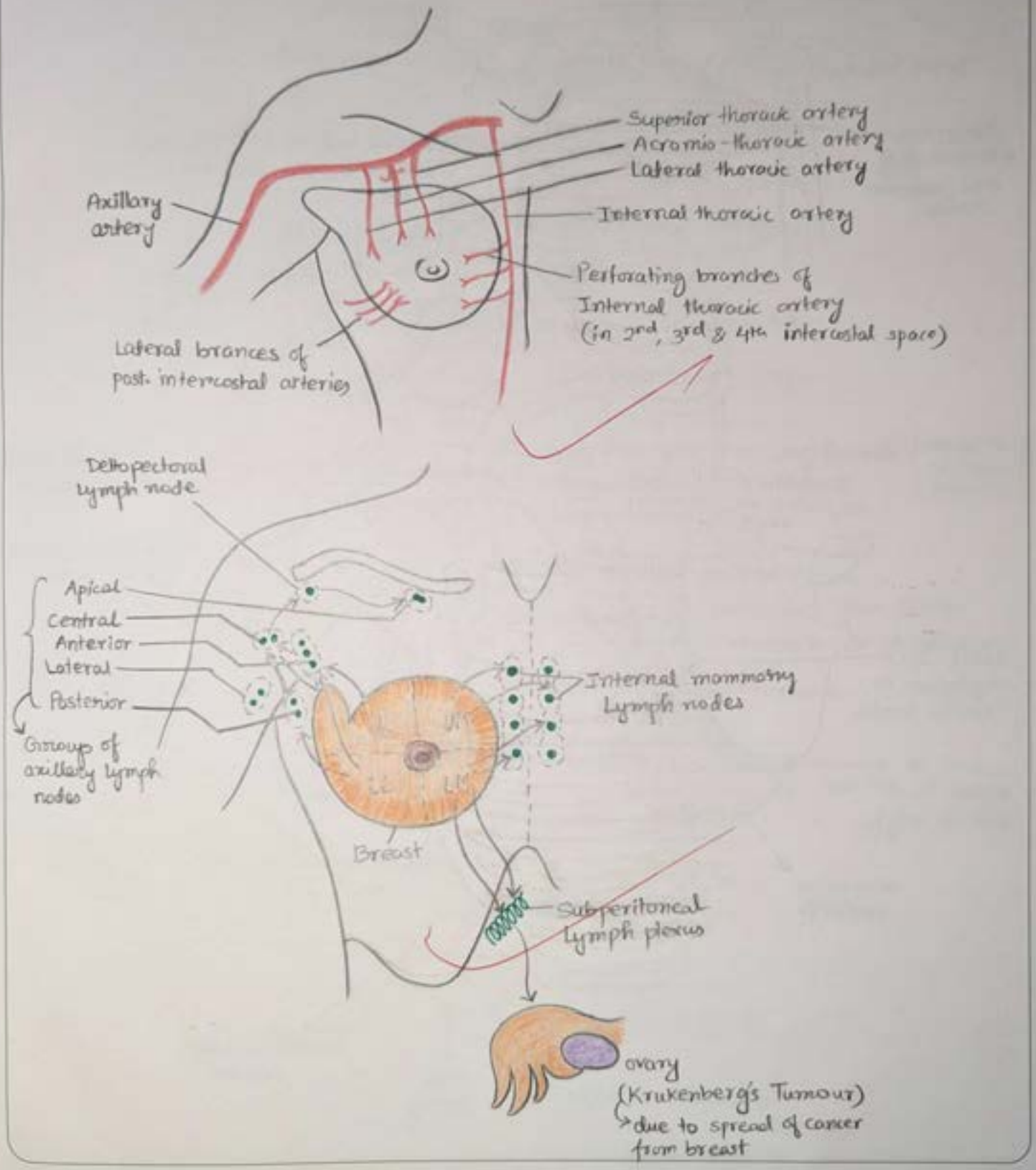
Clinical Case-3

An elderly female (37 yrs) gave birth to a baby who is examined to have a rounded face, epicanthic folds and characteristic single palmar crease (Simian Crease) on the palm.

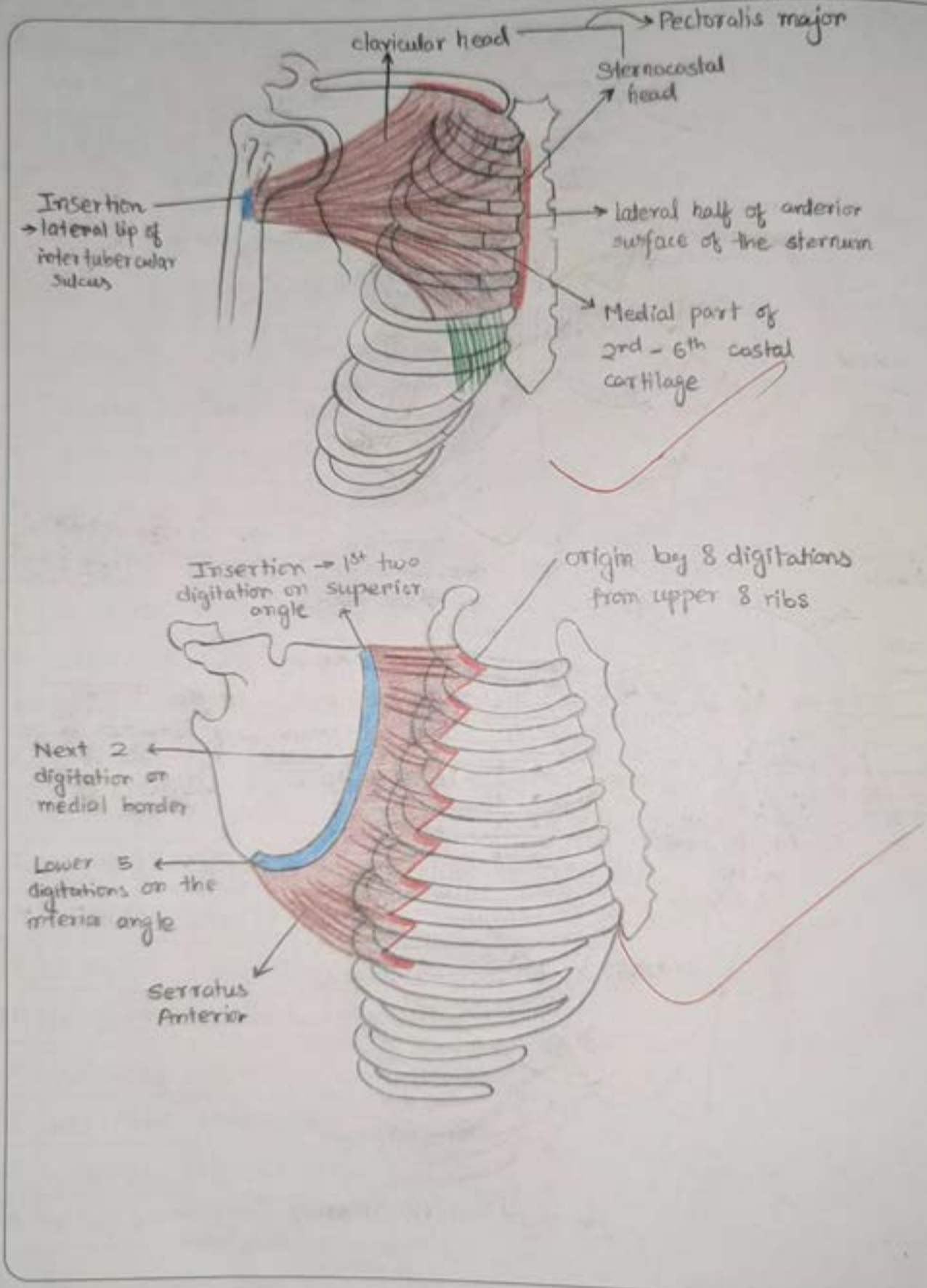
Q.1 Explain the genetic cause of the event.

Ans 1:- This is a case of Down's Syndrome. It is the most common congenital anomaly due to numerical aberration of chromosomes. The genetic cause of the event is the aneuploidy, i.e., trisomy of chromosome 21. There are 3 set copies of chromosome instead of 2 copies. The number of chromosomes is 47, i.e., 47 XX or 47 XY. Sex may be male or female. It occurs due to abnormal cell division during developement of sperm cell or egg cell. This condition is commonly seen in elderly primigravida or mother suffering from viral infection during pregnancy. In elder primigravida the reason is ageing of ovum.

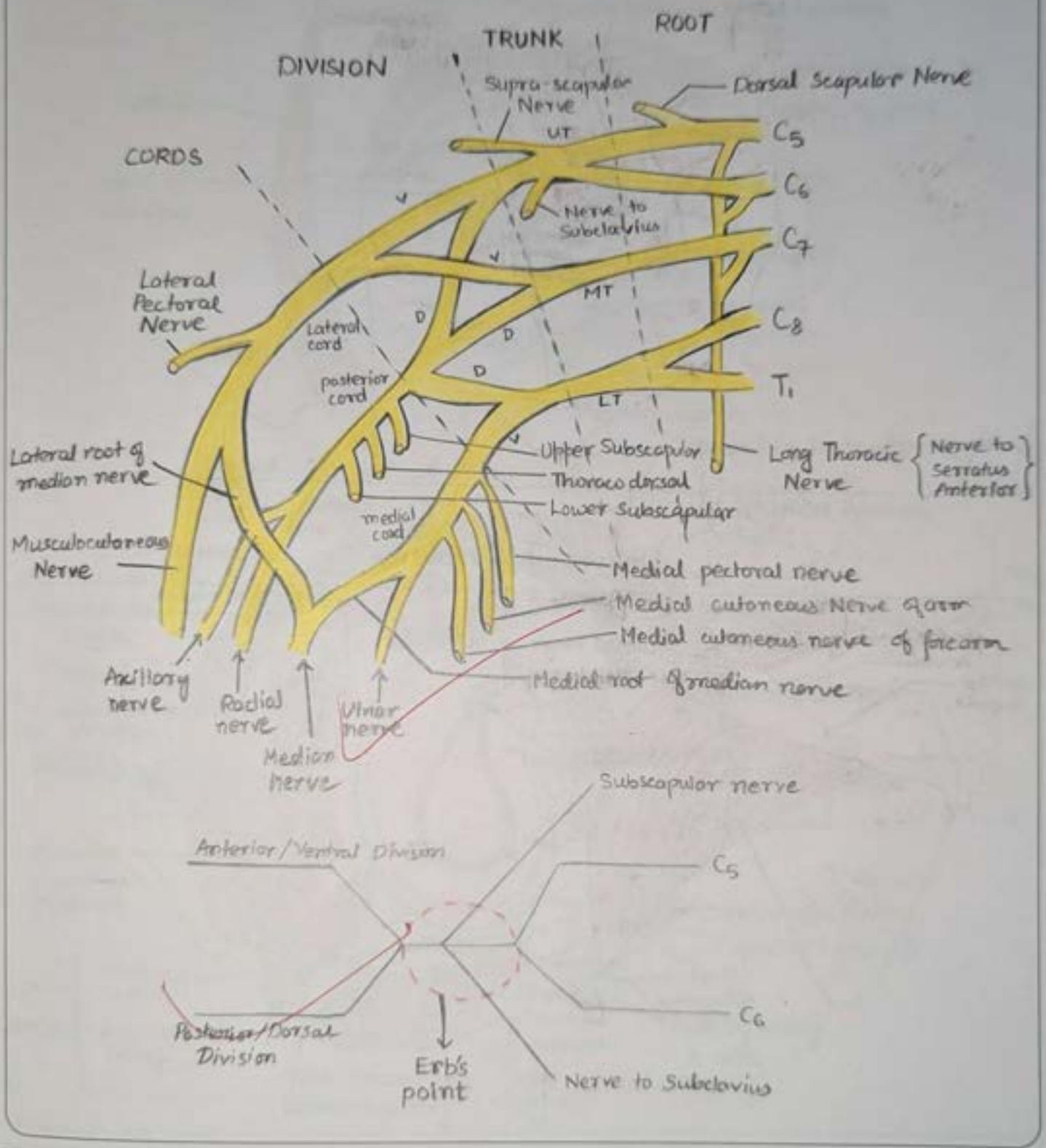
Breast—Blood Supply and Lymphatics



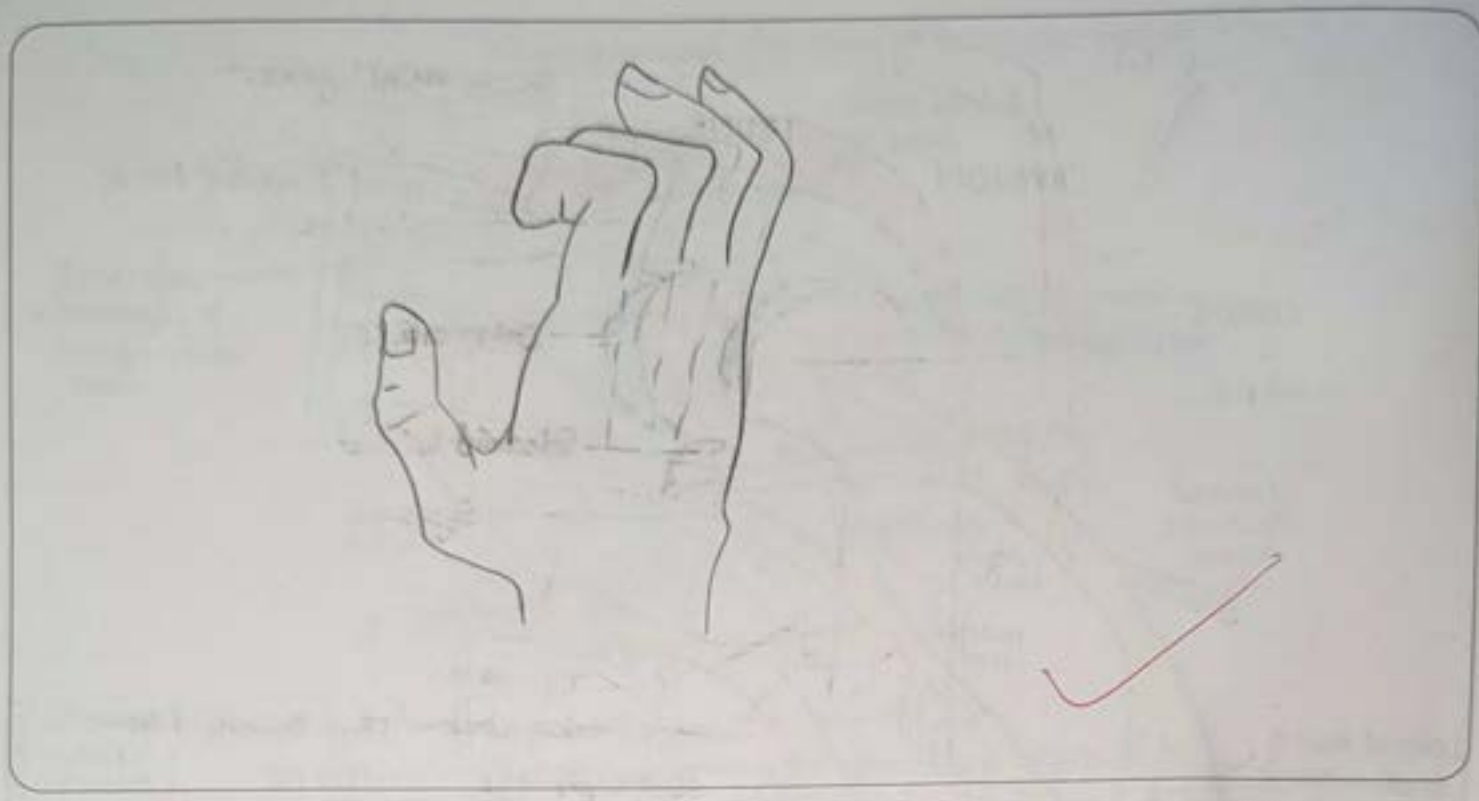
Pectoralis Major and Serratus Anterior



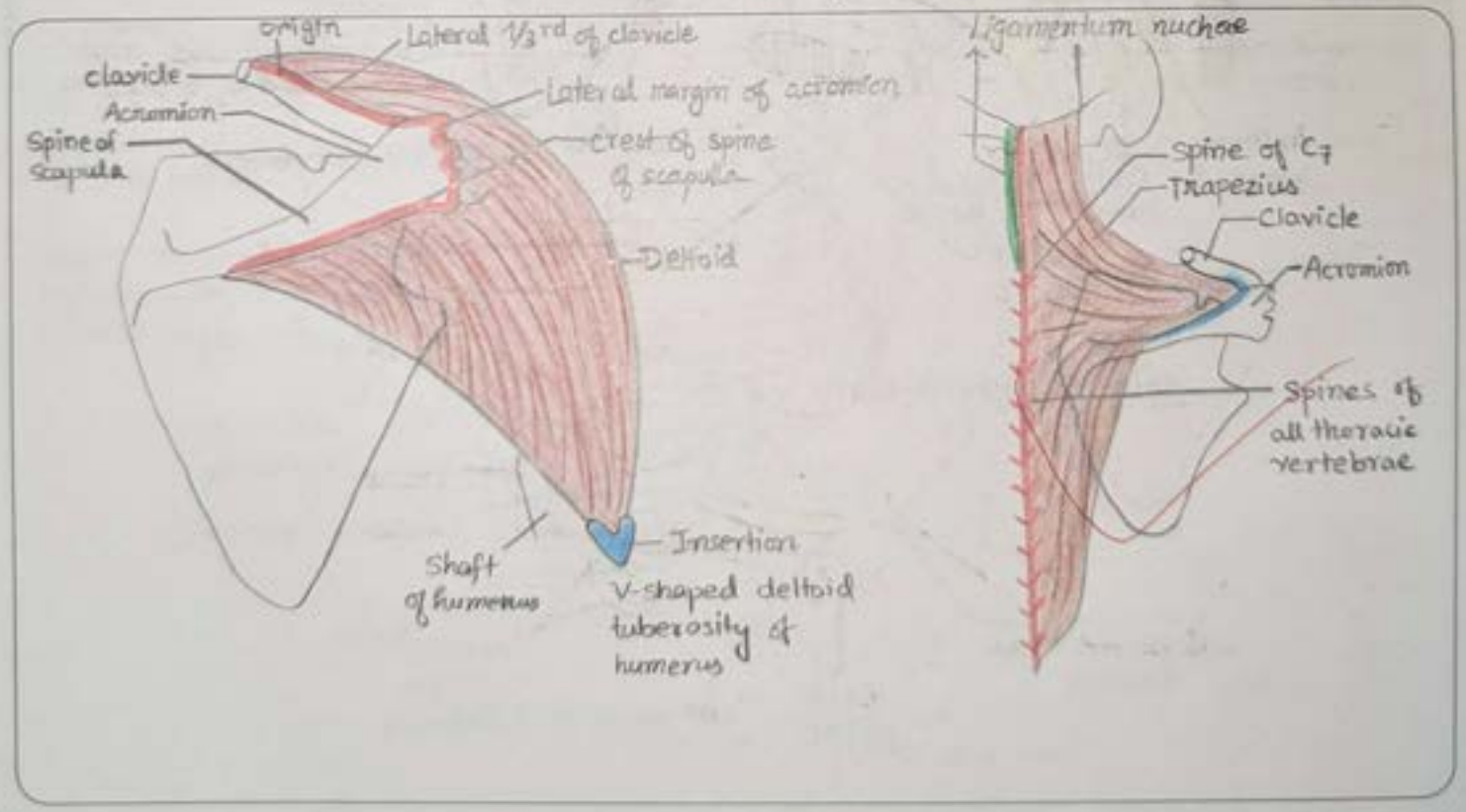
Brachial Plexus and Erb's Palsy



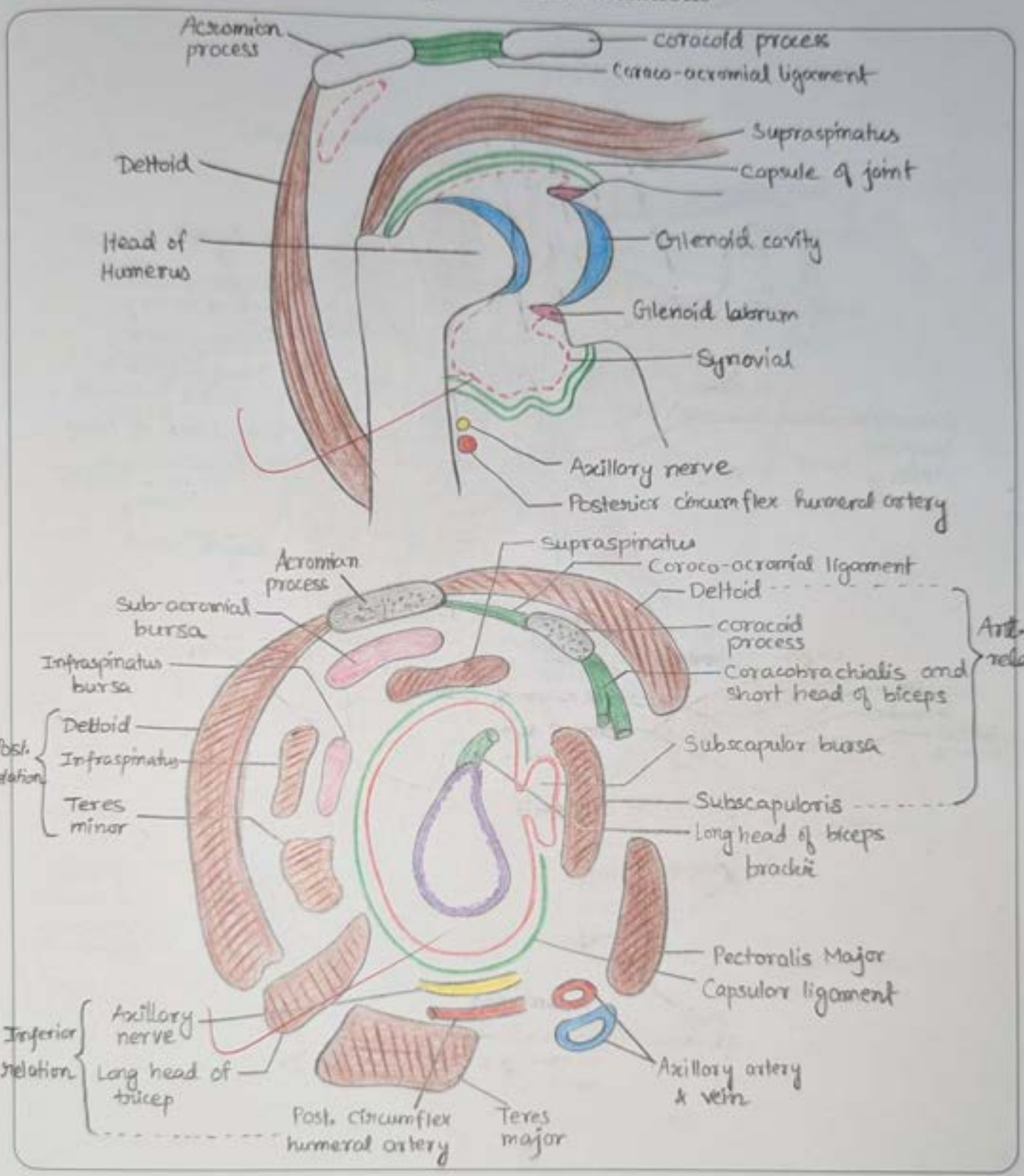
Klumpke's Paralysis



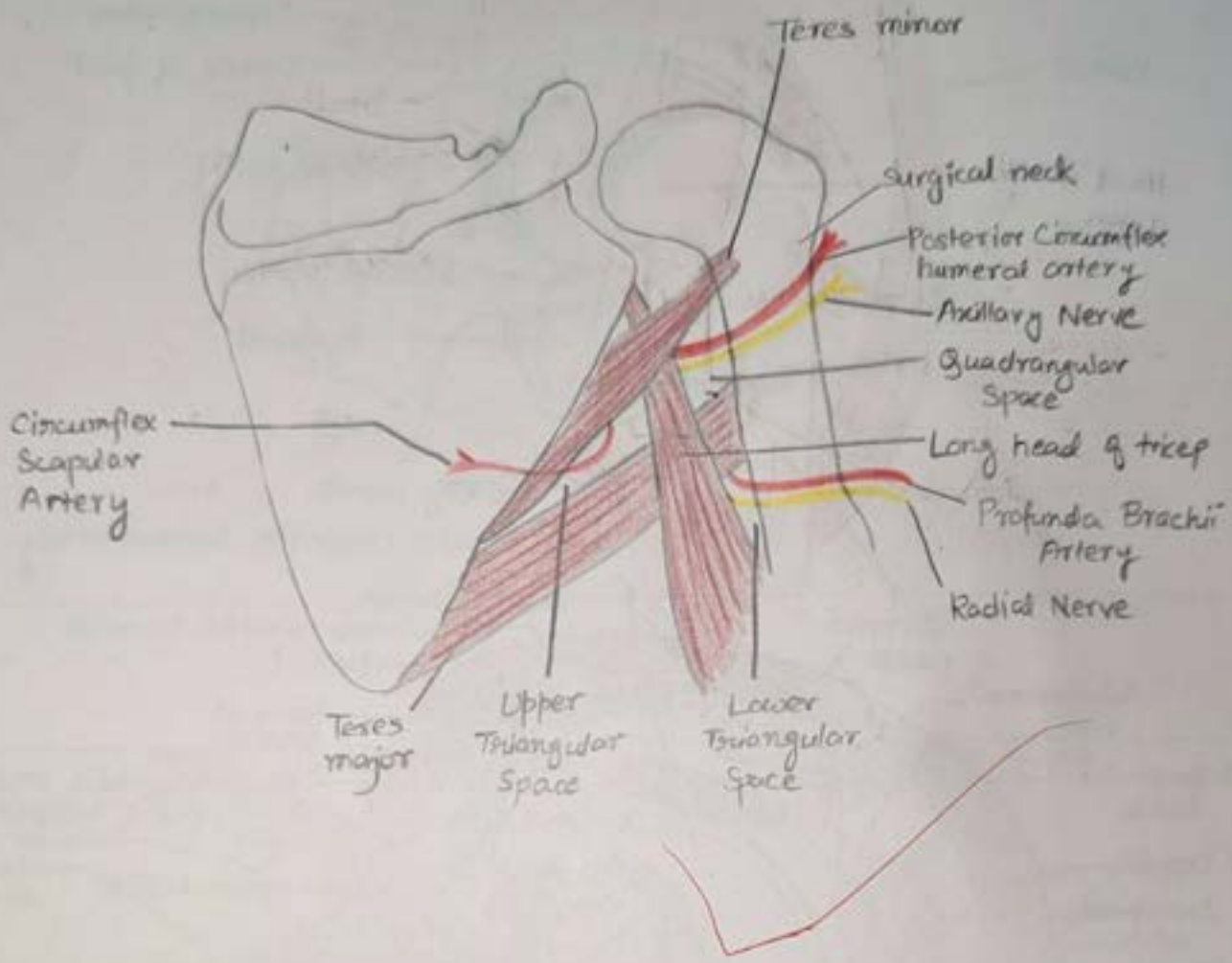
Deltoid and Trapezius



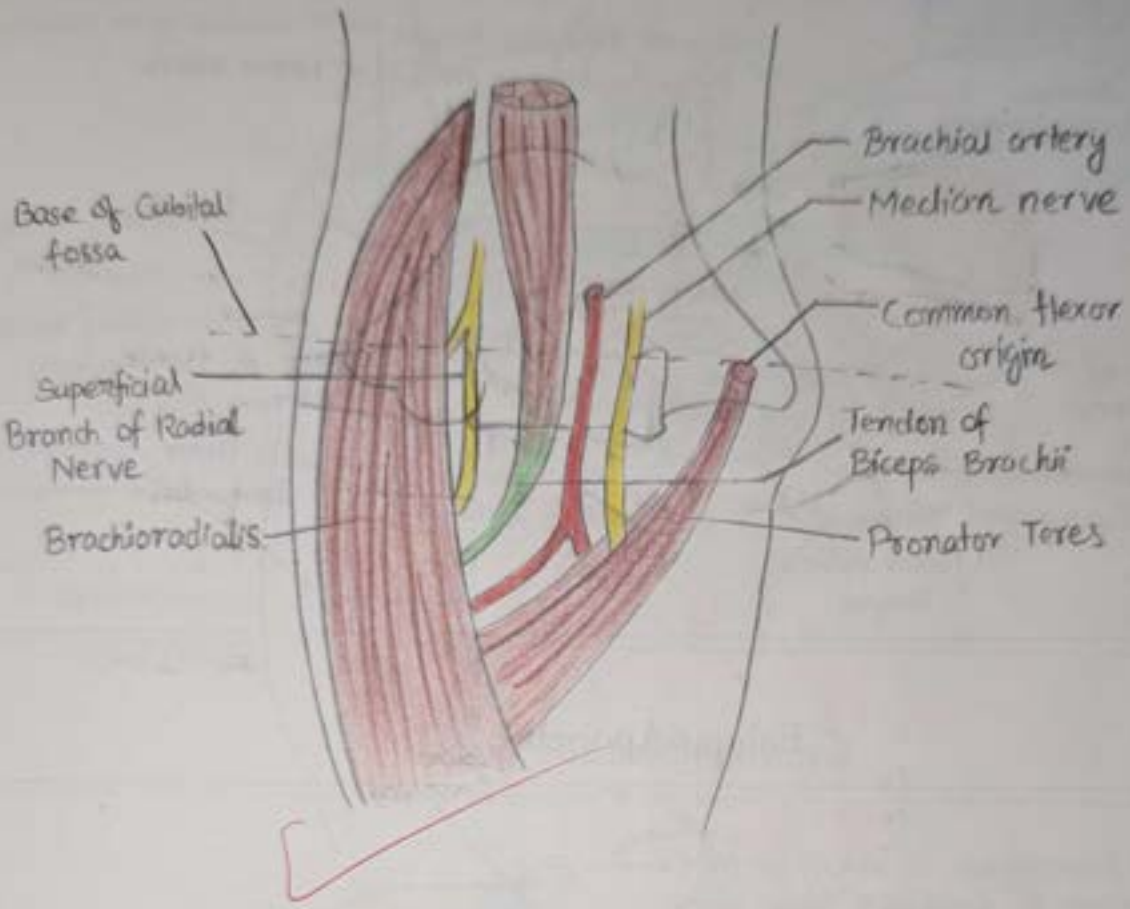
Shoulder Joint and its Relations



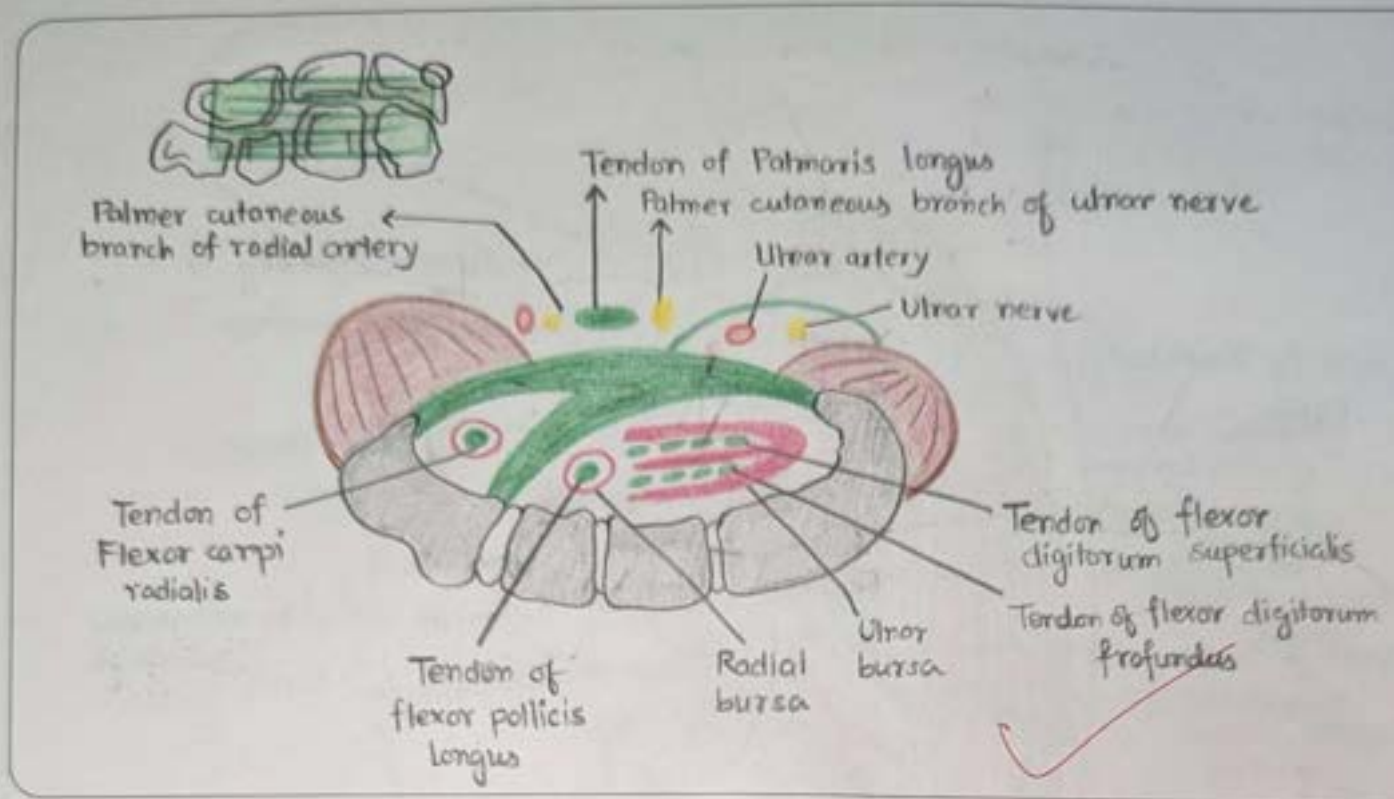
Quadrangular and Triangular Spaces



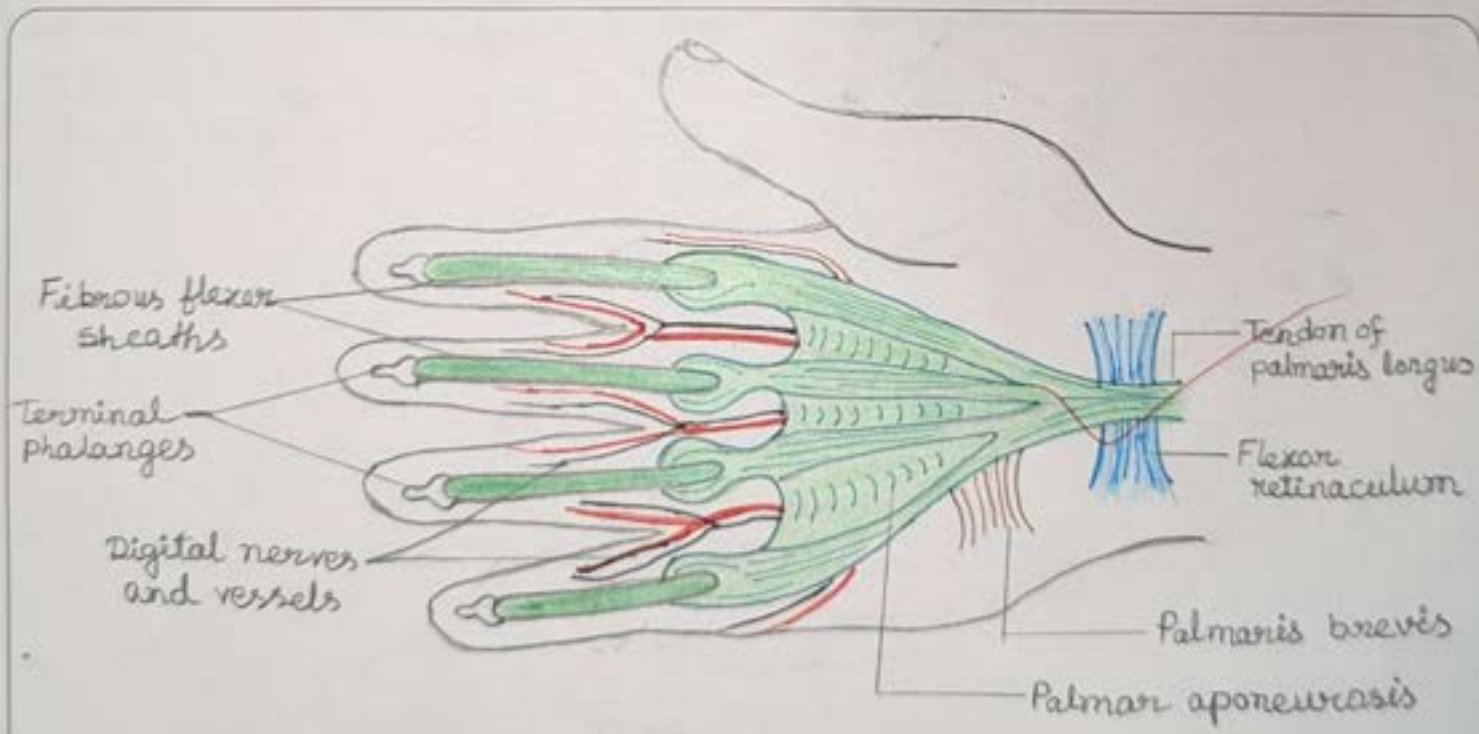
Cubital Fossa and its Contents



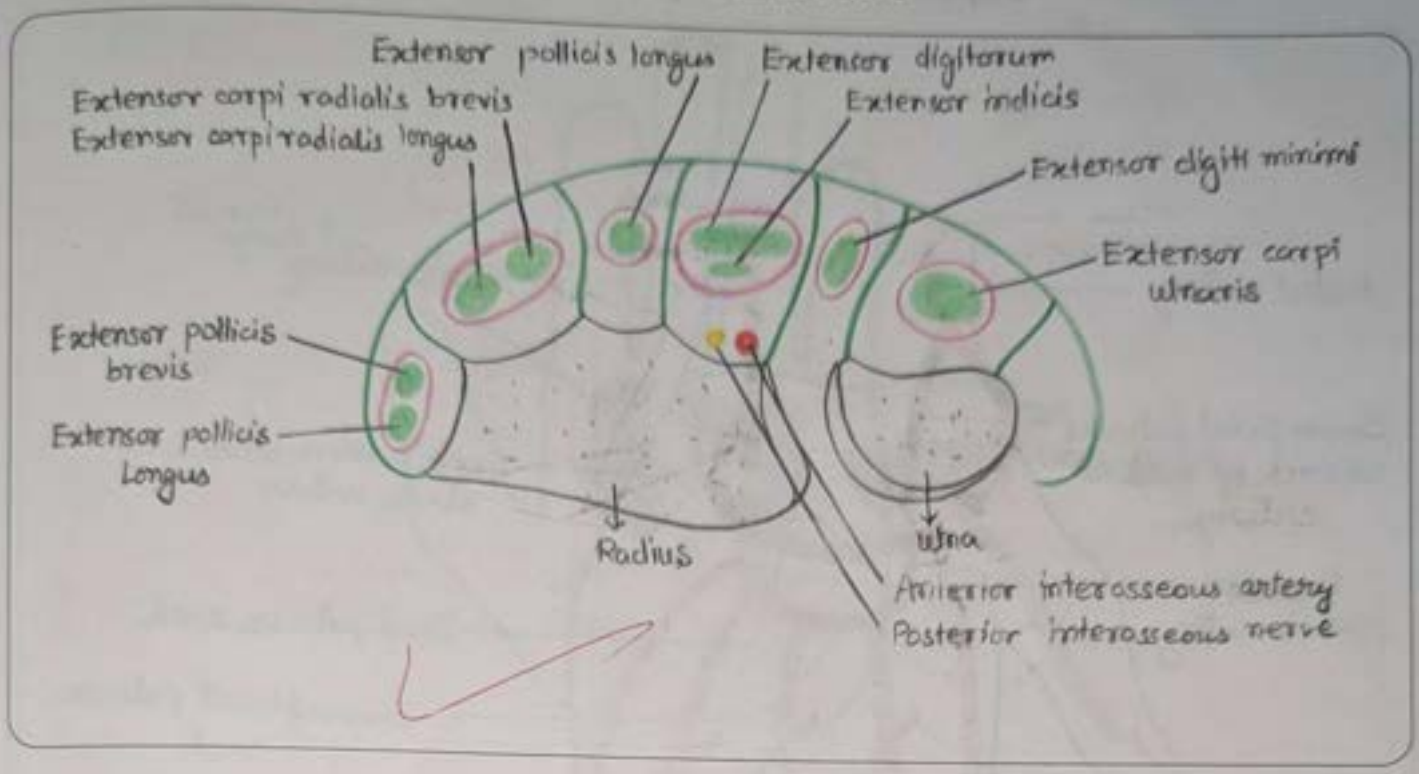
Flexor Retinaculum



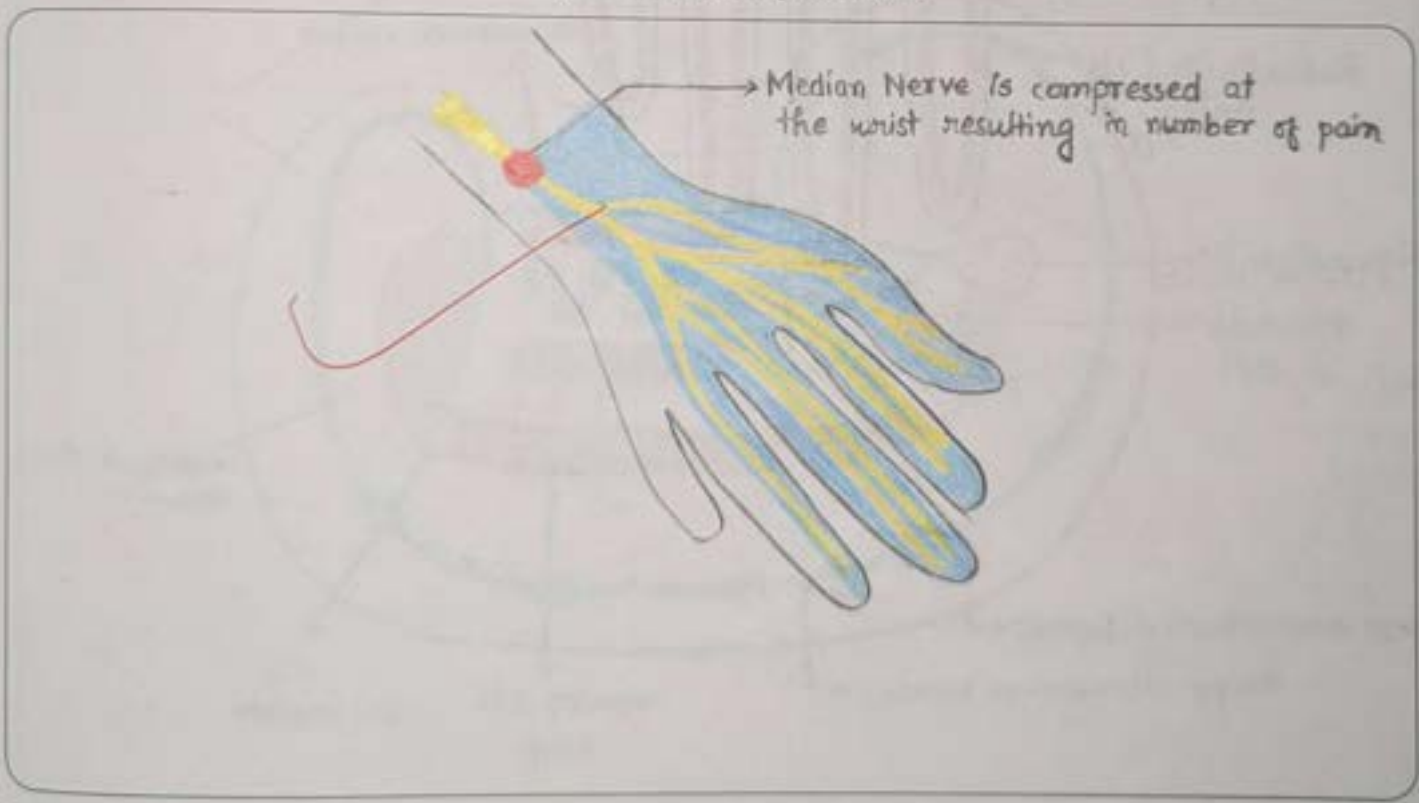
Palmar Aponeurosis



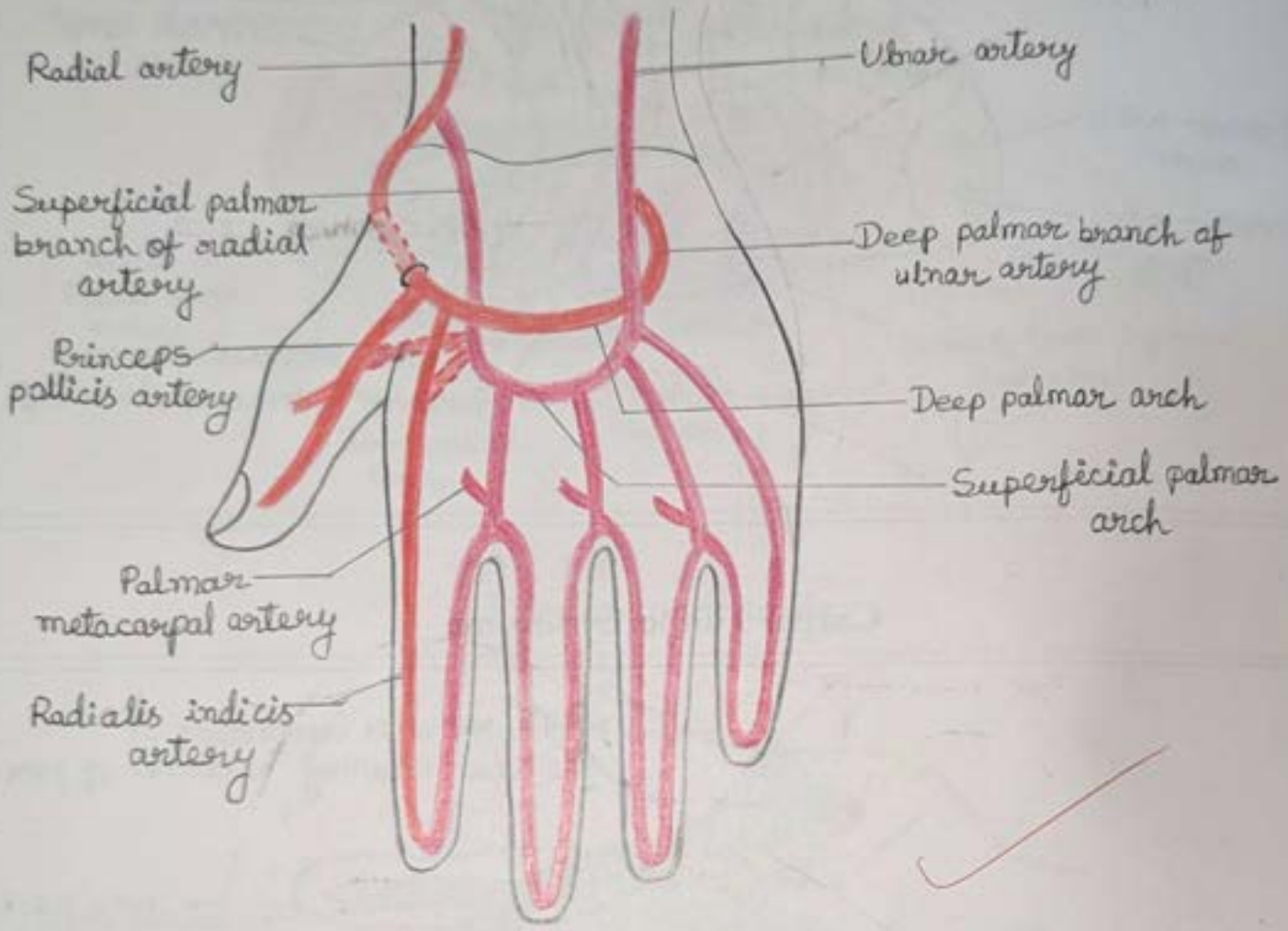
Extensor Retinaculum



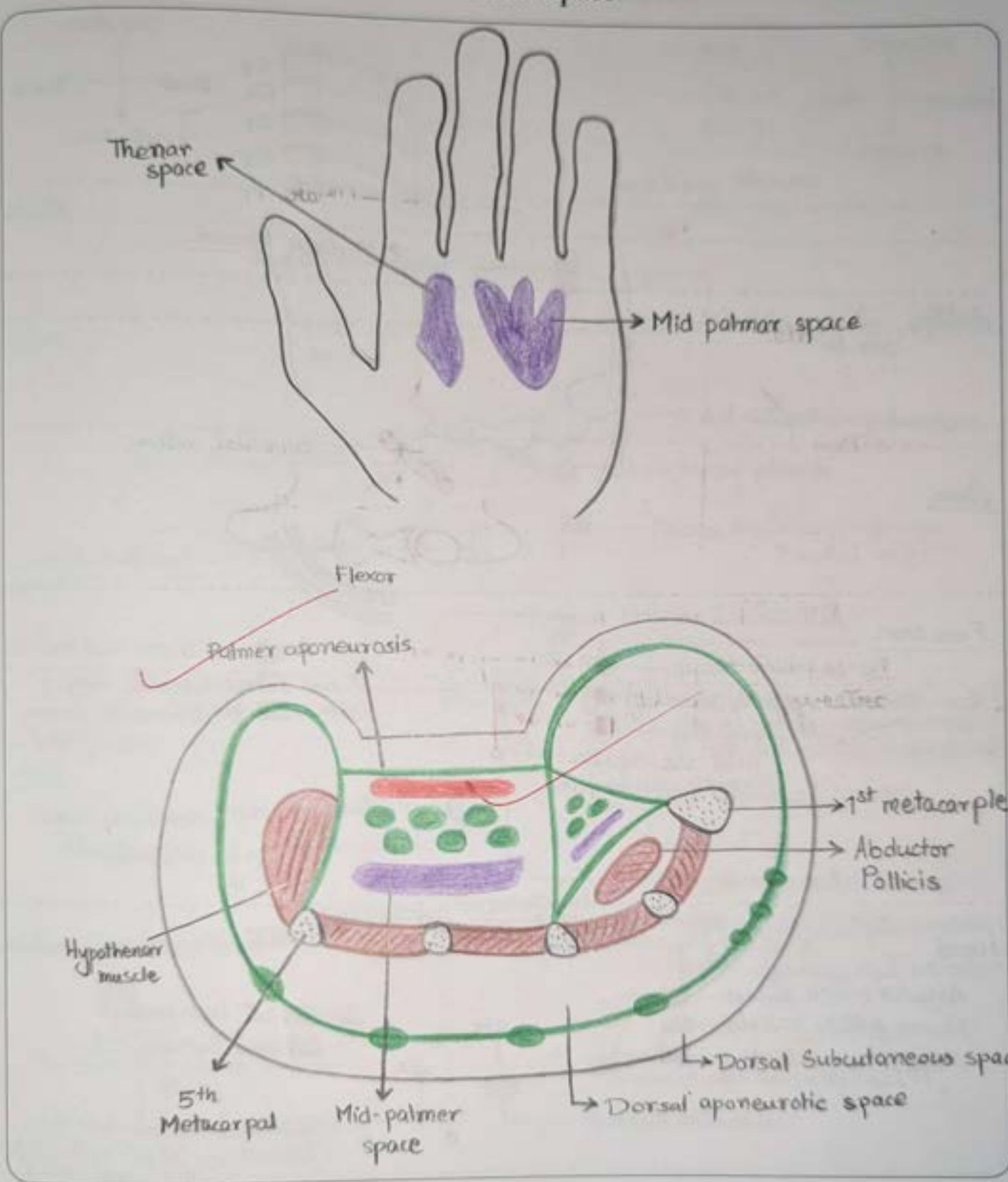
Carpal Tunnel Syndrome



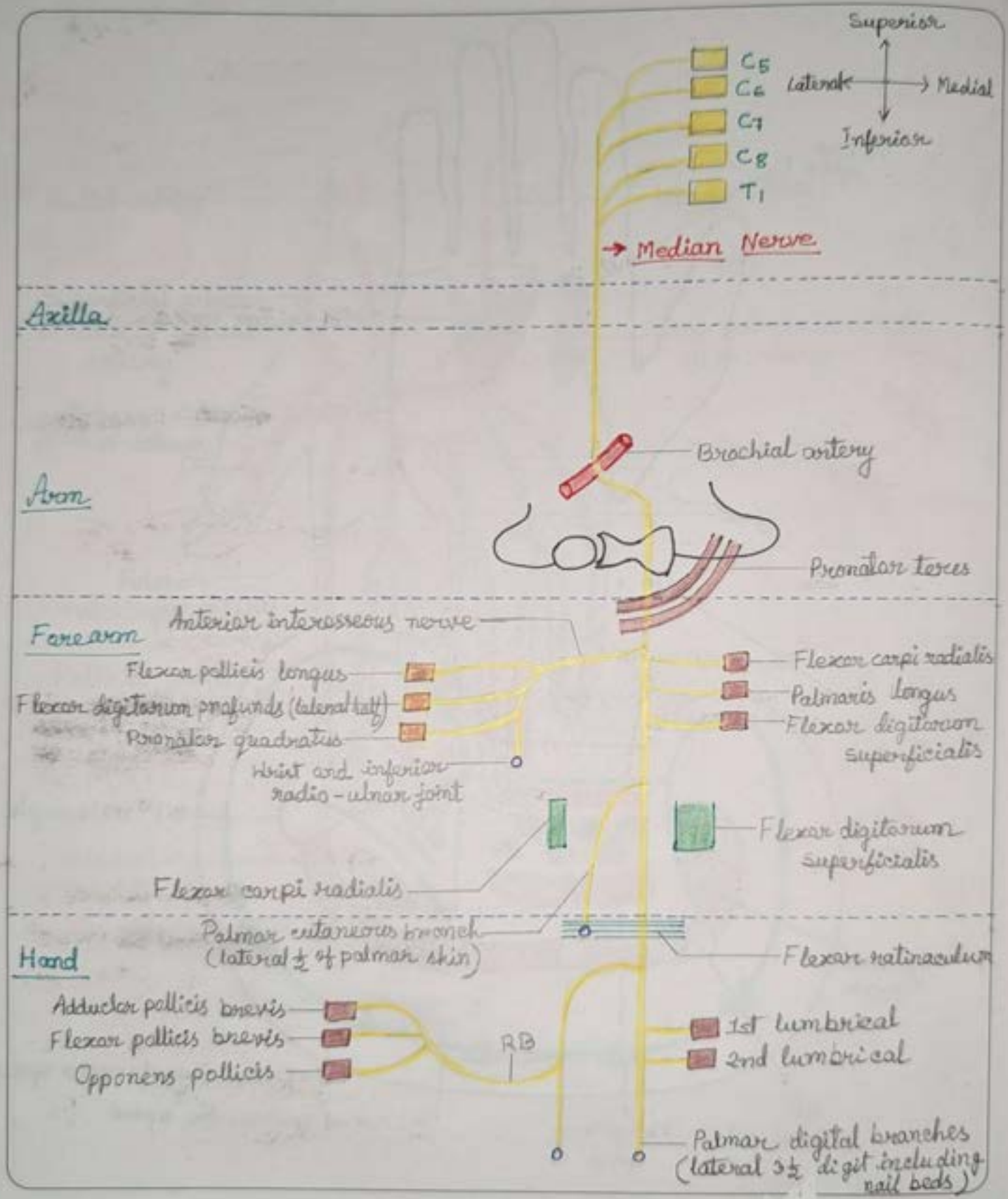
Superficial and Deep Palmar Arches



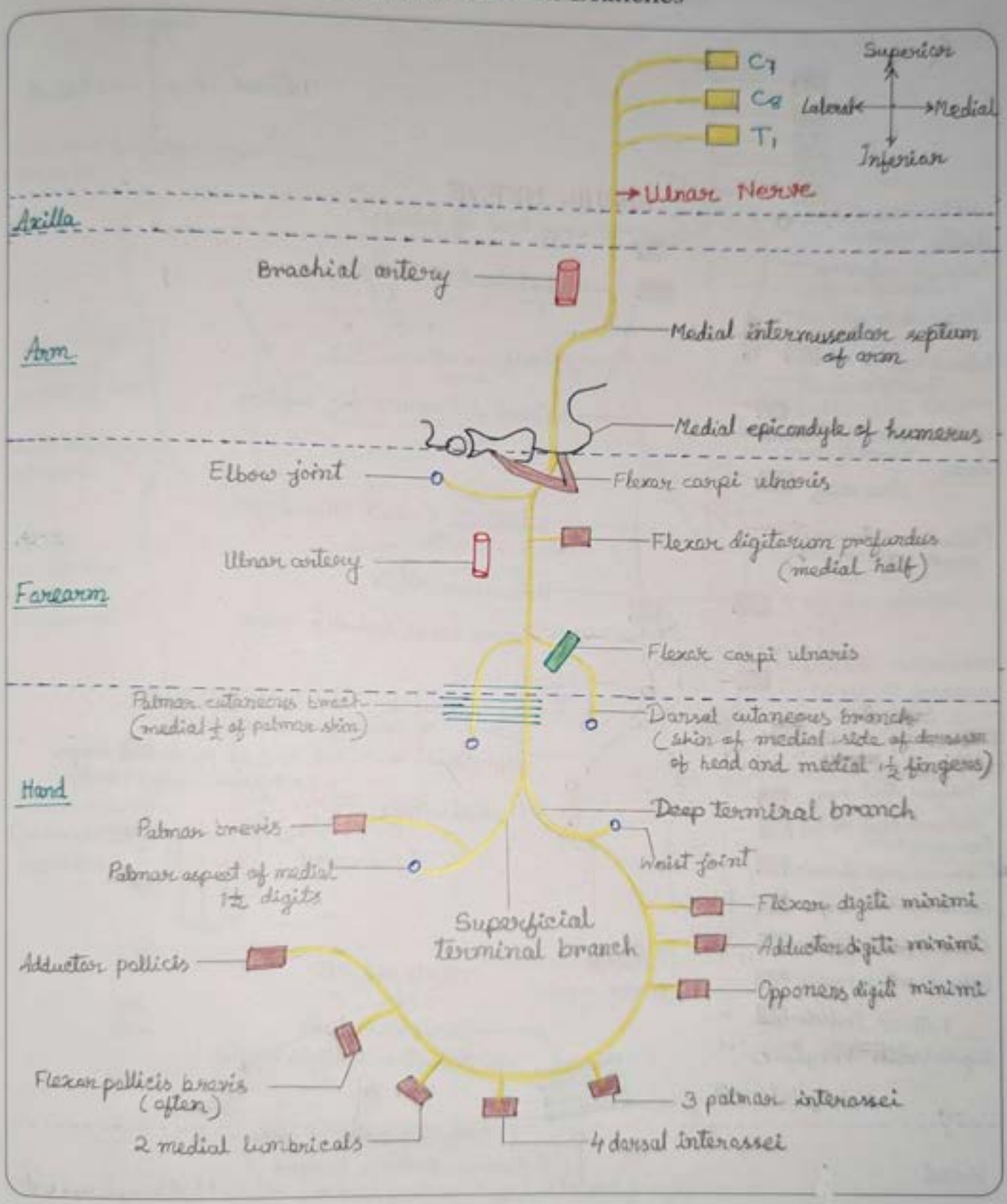
Mid Palmar Space



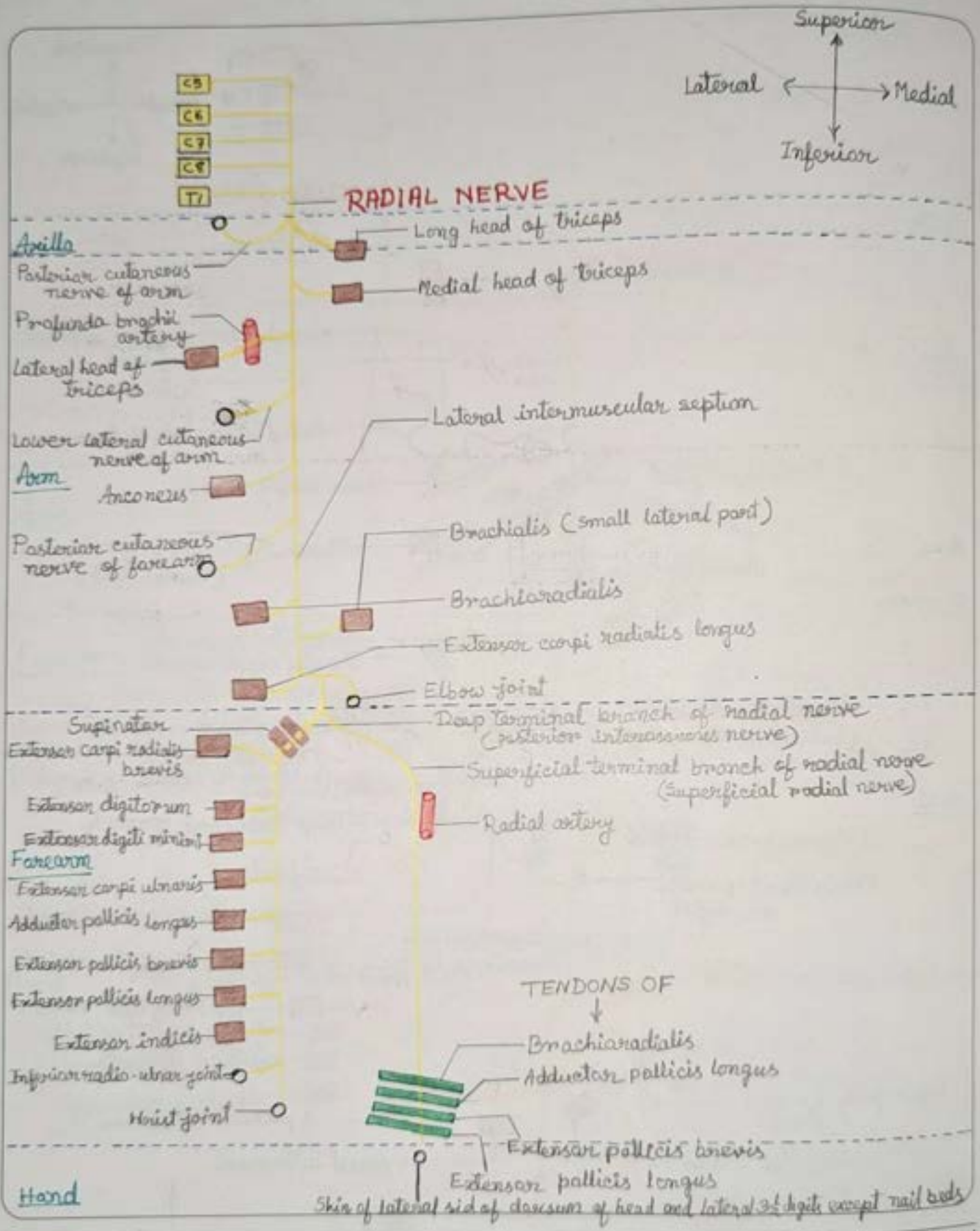
Median Nerve and its Branches



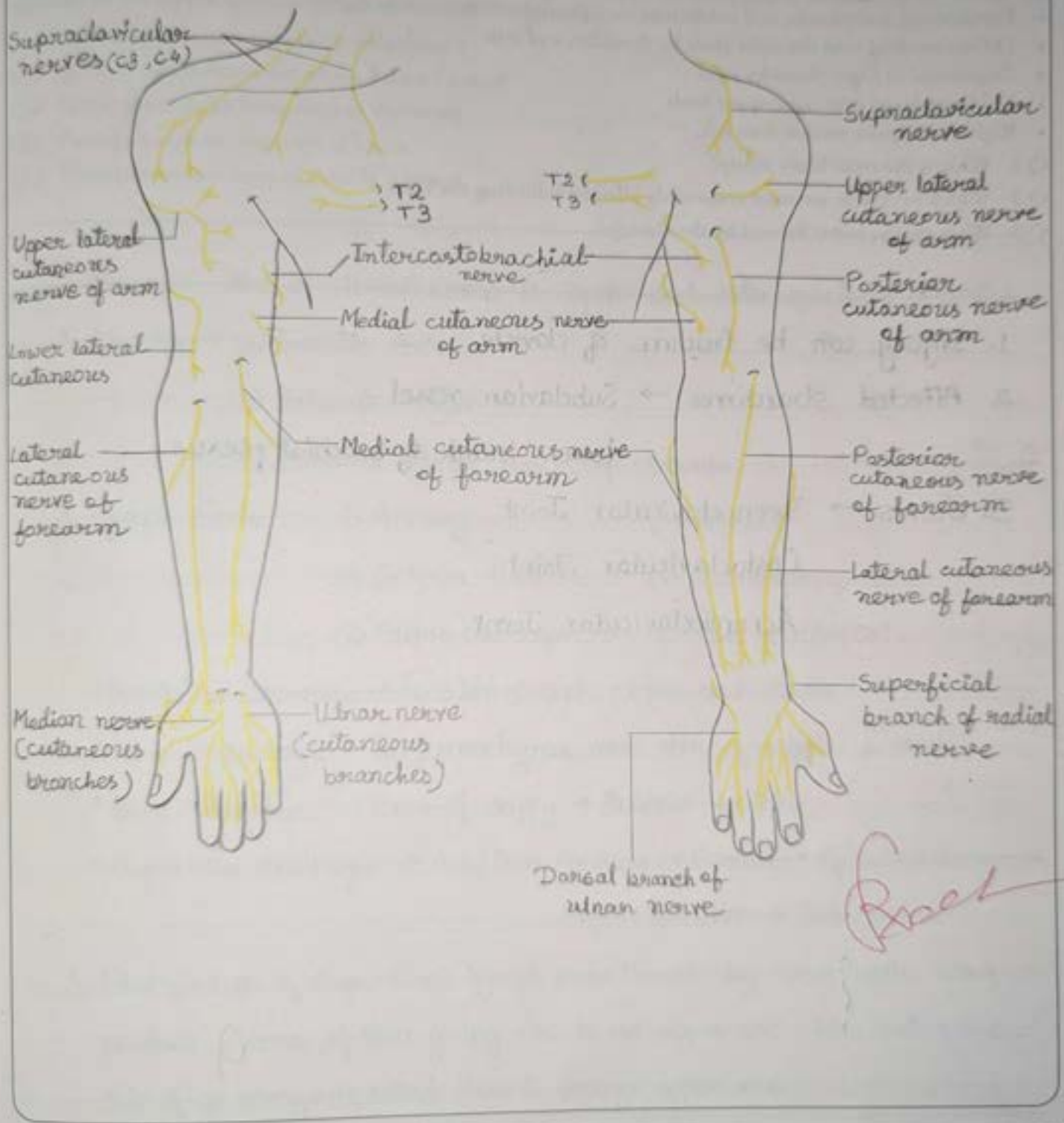
Ulnar Nerve and its Branches



Radial Nerve and its Branches



Cutaneous Supply of Upper Limb



Clinical Case-1

A 27 yr male met with road traffic accident reaches the emergency department complaining of severe pain ove his right collar bone. He uses his left hand to hold his right arm close to and across the front of his body.

- Prominence, ecchymosis, and tenderness over the right midclavicular region
- Diffuse swelling over the right clavicle, shoulder, and arm
- Depression of Right shoulder joint
- Mild numbness over right upper limb
- Right radial pulse weaker than left.

Q.1 What is the most likely injury?

Q.2 Which structures are most commonly affected following the injury?

Q.3 What are the Joints formed by the clavicle?

1. Injury can be fracture of clavicle
2. Affected structures → Subclavian vessel
   lower trunk of brachial plexus
3. Joints → Sternoclavicular Joint
   Costoclavicular Joint
   Acromioclavicular Joint

Clinical Case-2

A 47 yr old female complained to the doctor of hard painless lump in the upper and outer portion of her right breast. On examination it revealed the Peau d' orange appearance of the skin, loss of mobility of the breast and retraction of the nipple also enlargement of axillary lymph nodes.

On the above observation answer the following:

Q.1 What is the common site of the Breast Cancer?

Q.2 Name the muscles lying deep to the breast.

Q.3 Explain lymphatic drainage of breast.

Q.4 Write anatomical basis of Peau D' Orange.

1- Common site of Breast Cancer is upper and outer quadrant of breast.

2. Muscles → (a) Serratus Anterior
(b) Pectoralis Major
(c) External Oblique muscle of abdomen

3. Lymph Node — (i) Axillary (iv) Cephalic
(ii) Anterior thoracic (v) Subdiaphragmatic
(iii) Supra clavicular (vi) Sub peritoneal

- Superficial drainage → To skin except nipple and areola
- Deep drainage → To parenchyma and skin of nipple & areola
- Deep Drainage → Plexus of sappy → Anterior axillary
- Superficial drainage → Ant./Post. Axillary → Central → Apical axillary → Supra clavicular → Sub clavian

4. Obstruction of Superficial lymph node/vessels by Cancer cells may produce edema of skin giving rise to an appearance like that of the skin of an orange is called Peau D' Orange appearance.

Clinical Case-3

A motorcyclist involved in a road traffic collision sustained an injury to the brachial plexus on the right side. H
is found to have weakness of right shoulder abduction and forearm flexion, as well as some sensory loss over t
lateral aspect of his upper arm. The right biceps and brachioradialis reflexes are absent.

On the above observation answer the following:

Q.1 What is most likely Injury?

Q.2 Which muscles got affected following the above Injury?

Q.3 What are the root value of above point of Injury?

1. The injury is to Erb's point, i.e., the location where 6 nerve of upper trunk of Brachial Plexus meet, ~~namely~~ mainly C_5, C_6 namely C_5, C_6, nerve to subclavius, Supraclavicular nerve, ant. & post. division.

2. Muscle affected – Biceps brachii, Brachialis, Brachioradialis, partly supraspinatus, infraspinatus, supinator.

3. Root value → C_5 and partly C_6

Clinical Case-4

A 25 year old male came to surgery OPD following history of trauma with pain and swelling in the arm. On examination he was unable to extend the wrist. The digits were flexed at the proximal phalanges. Supination was also affected. Extension of the forearm (elbow) as well as middle and terminal phalanges were spared. There was loss of sensation from lower lateral surface of the arm as well as the posterior surface of forearm. There is no loss of sensation from posterior aspect of the arm. X-ray was done. Diagnosis of fracture was made.

Q.1 Identify the anatomical structure involved and site of lesion.

Q.2 Describe its course and branches.

Q.3 Explain the anatomical basis for the above mentioned sign and symptoms.

1. Radial nerve is injured in the Radial groove.

2. Branches

- Axilla → Post. cutaneous nerve of arm.
  - → Long head of triceps.
  - → medial head of triceps.
- Radial groove → Lateral head of triceps.
  - → post. cuta. nerve of arm.
  - → Medial head of triceps.
  - → Anconeus
  - → Brachialis & Brachioradialis
- Superficial branch (in forearm) → cutaneous branch to skin & lateral 3½ digits below nail bed.
- Deep branch (in forearm) → Supinator
  - → Extensor carpi radialis brevis & longus.
  - → Extensor digitorum indicis & minimi
  - → Extensor carpi ulnaris
  - → Abductor Pollicis longus
  - → Extensor pollicis longus & brevis

Course

Post. wall of Axilla
↓
Behind Brachial artery, it enters lower triangular space
↓
Enter Radial groove
↓
Pierces intermuscular septa
↓
Descends in lower and lateral side of front of arm between brachialis and Brachioradialis.
↓
Goes in hand

3. A little bit of extension of arm is possible as radial nerve supplies lateral & long head of bicep in the axilla which are spared. Wrist drop occurs as deep branch supplying extensors paralysed.

Clinical Case-5

A 33 yr old female visits the orthopaedic dept. of Sharda Hospital complaining of severe pain in her right wrist and hand. She reports that her right hand is weak. On examination doctor found-Numbness, paresthesia, and pain along the lateral palm and lateral 3½ fingers. Mild atrophy of the thenar muscle group, with a weak grip compared to the left hand.

On above observation answer the following:

Q.1 What is the most likely Injury?

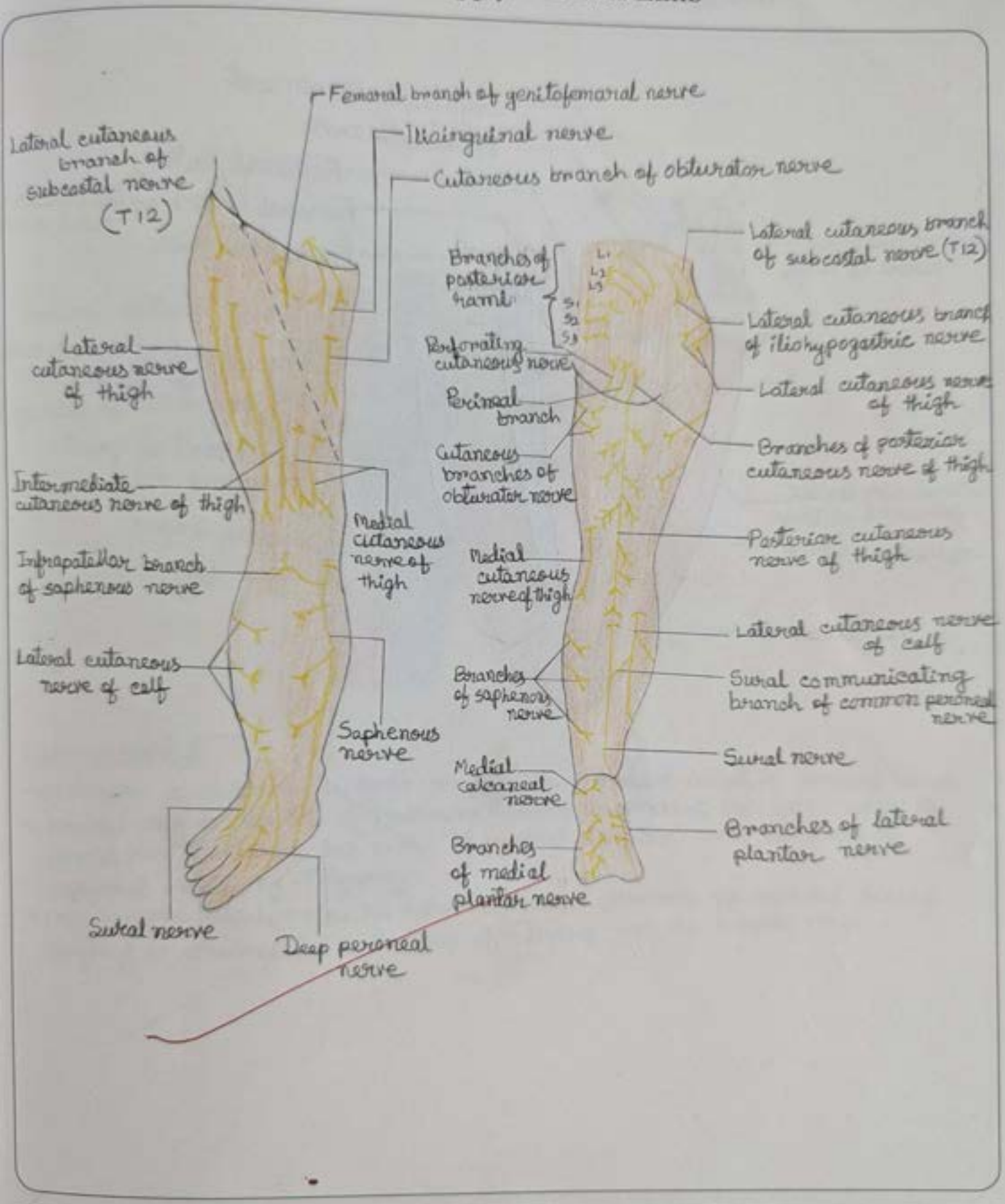
Q.2 Which structure involved in injury?

Q.3 Name the structure passes above and below the flexor retinaculum.

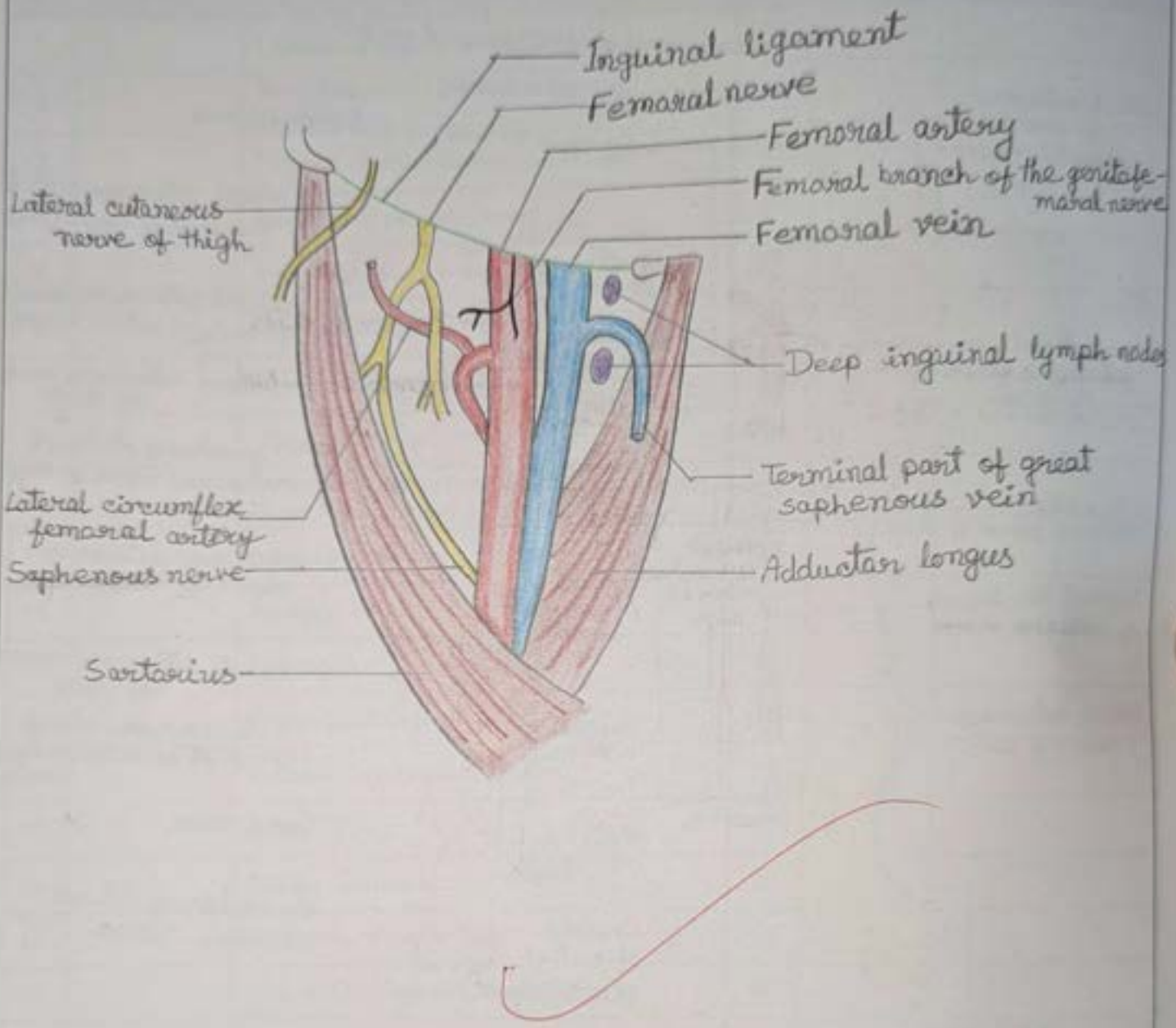
1. Clinical condition is Carpal tunnel syndrome.
2. Median nerve is involved in the injury.
3. Above flexor retinaculum → (i) Palmer cutaneous branch of median nerve
   (ii) Palmer cutaneous branch of ulnar nerve
   (iii) Tendon of palmaris longus
   (iv) Ulnar vessels
   (v) Ulnar nerve

   Below flexor retinaculum → (i) Median nerve
   (ii) 4 tendons of flexor digitorum superficialis
   (iii) 4 tendons of flexor digitorum profundus
   (iv) Tendon of flexor pollicis longus
   (v) Tendon of flexor carpi radialis

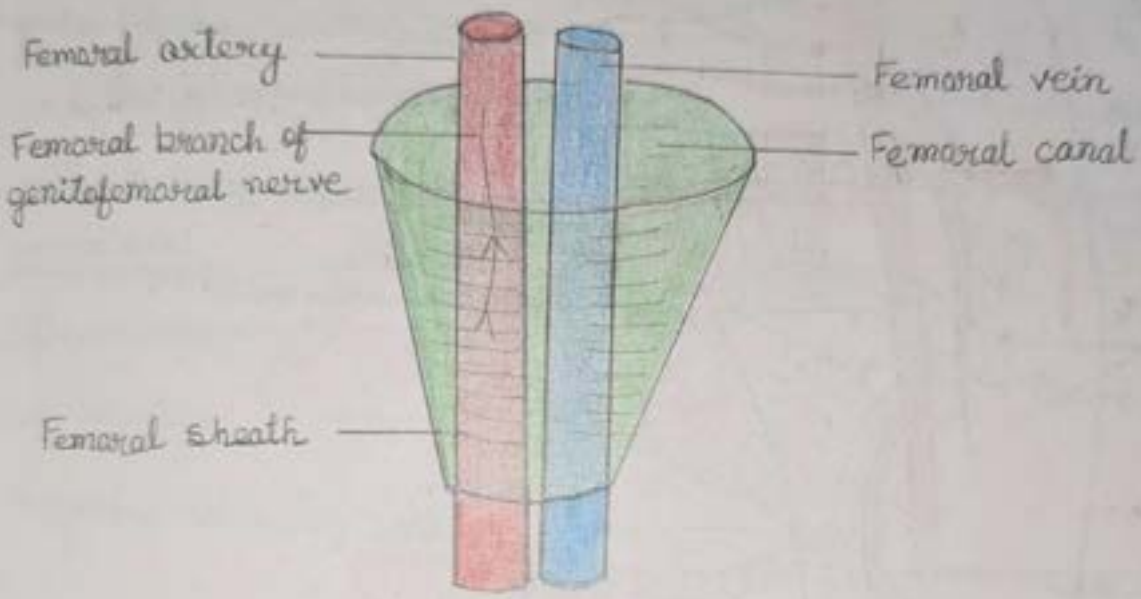
Cutaneous Supply of Lower Limb



Boundaries and Contents of Femoral Triangle



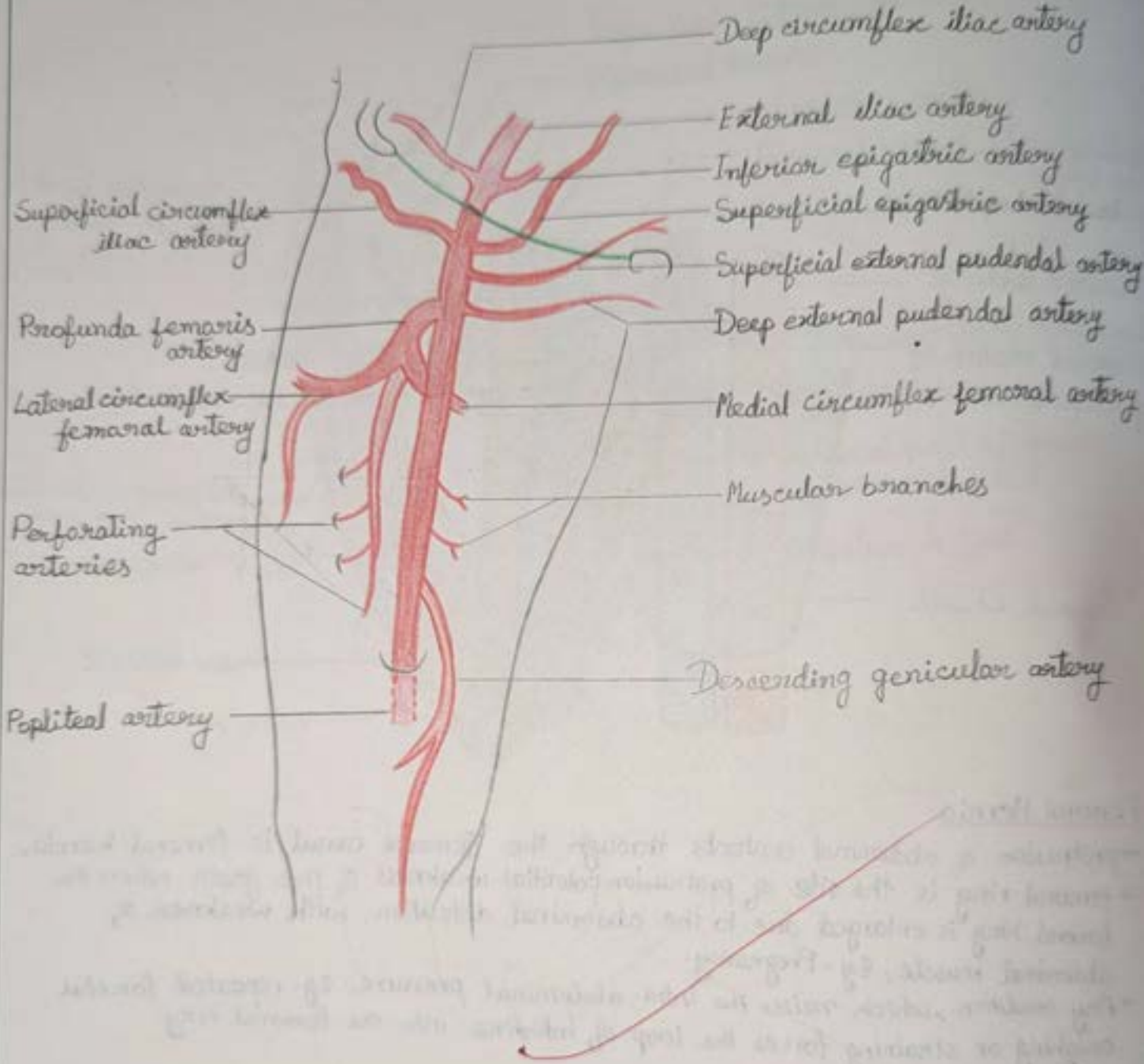
Femoral Sheath and Femoral Hernia



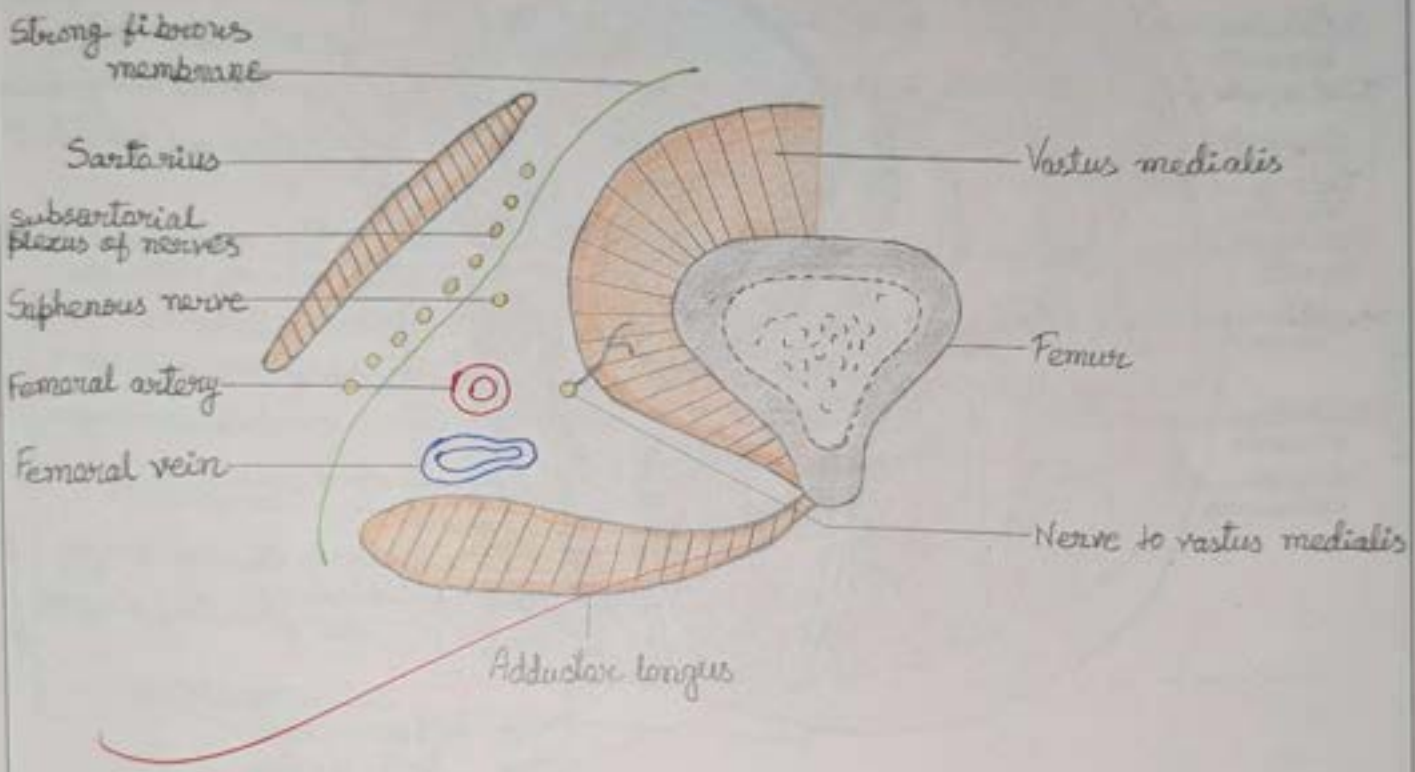
Femoral Hernia

→ protrusion of abdominal contents through the femoral canal is femoral hernia.
→ femoral ring is the site of protrusion potential weakness of the groin where the femoral ring is enlarged due to the abdominal distention with weakness of abdominal muscle, eg - Pregnancy.
→ Any condition, which raises the intra-abdominal pressure, eg. repeated forceful coughing or straining forces the loop of intestine into the femoral ring.

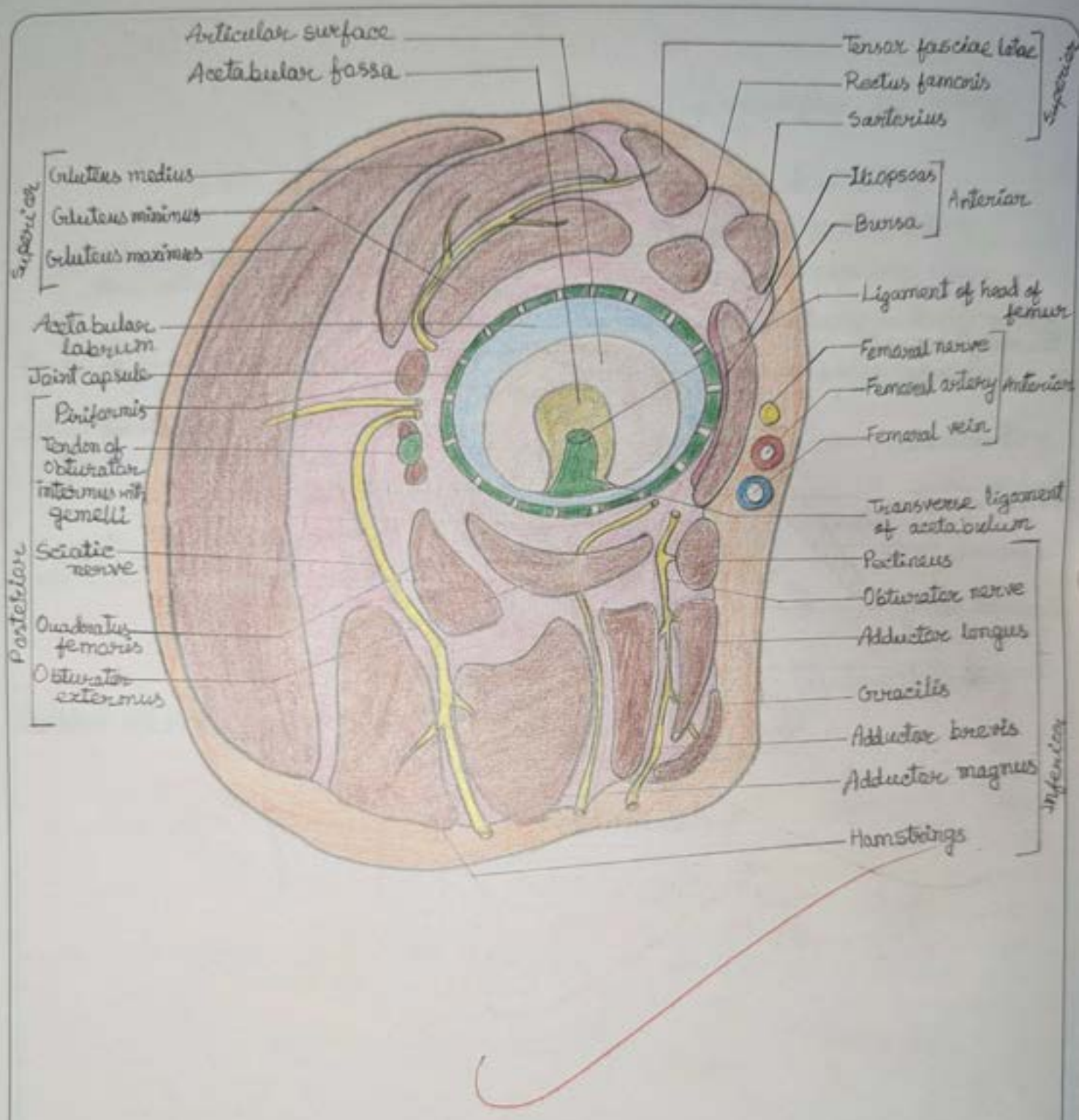
Branches of Femoral Artery



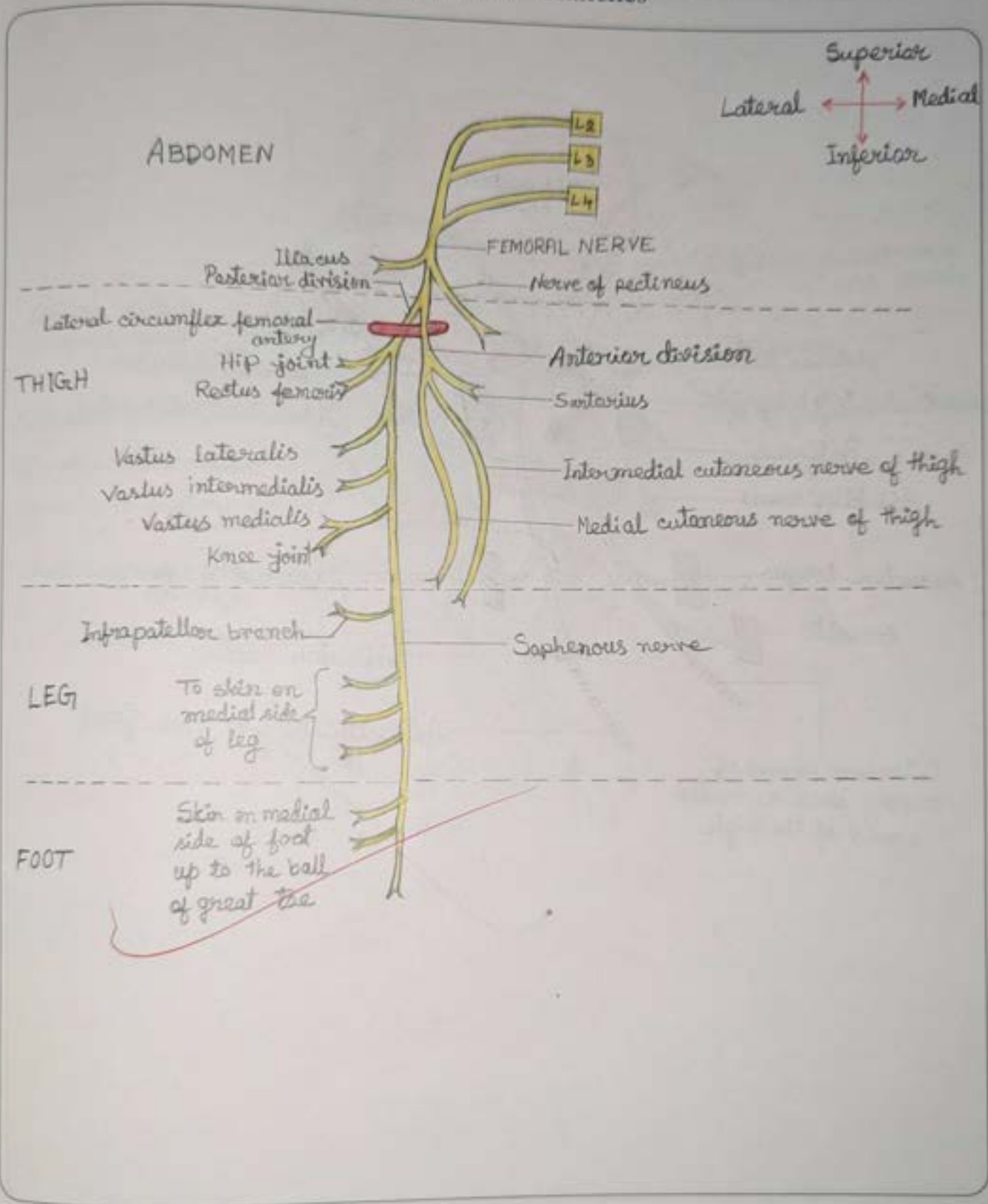
Boundaries and Contents of Adductor Canal



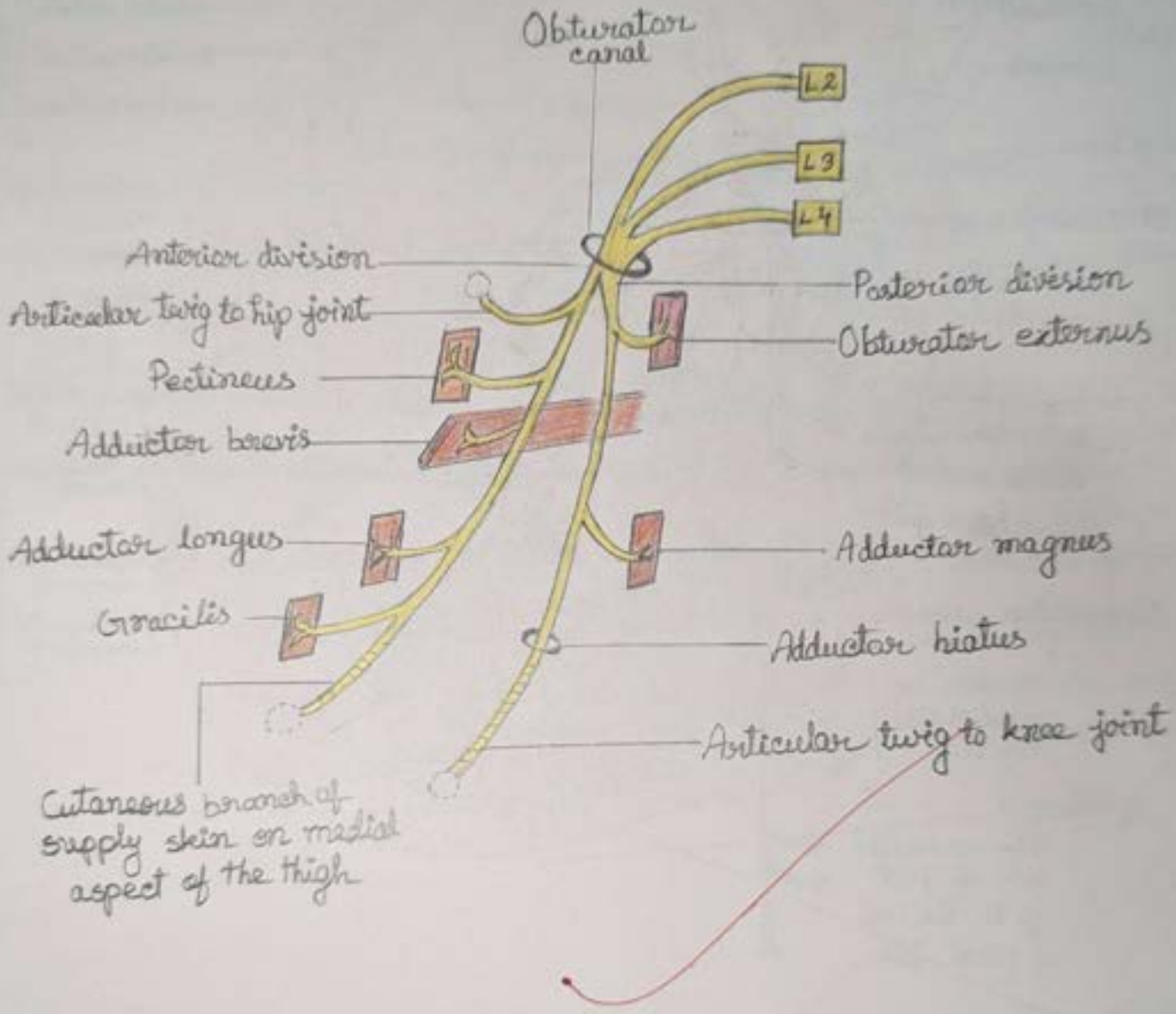
Hip Joint-Relations



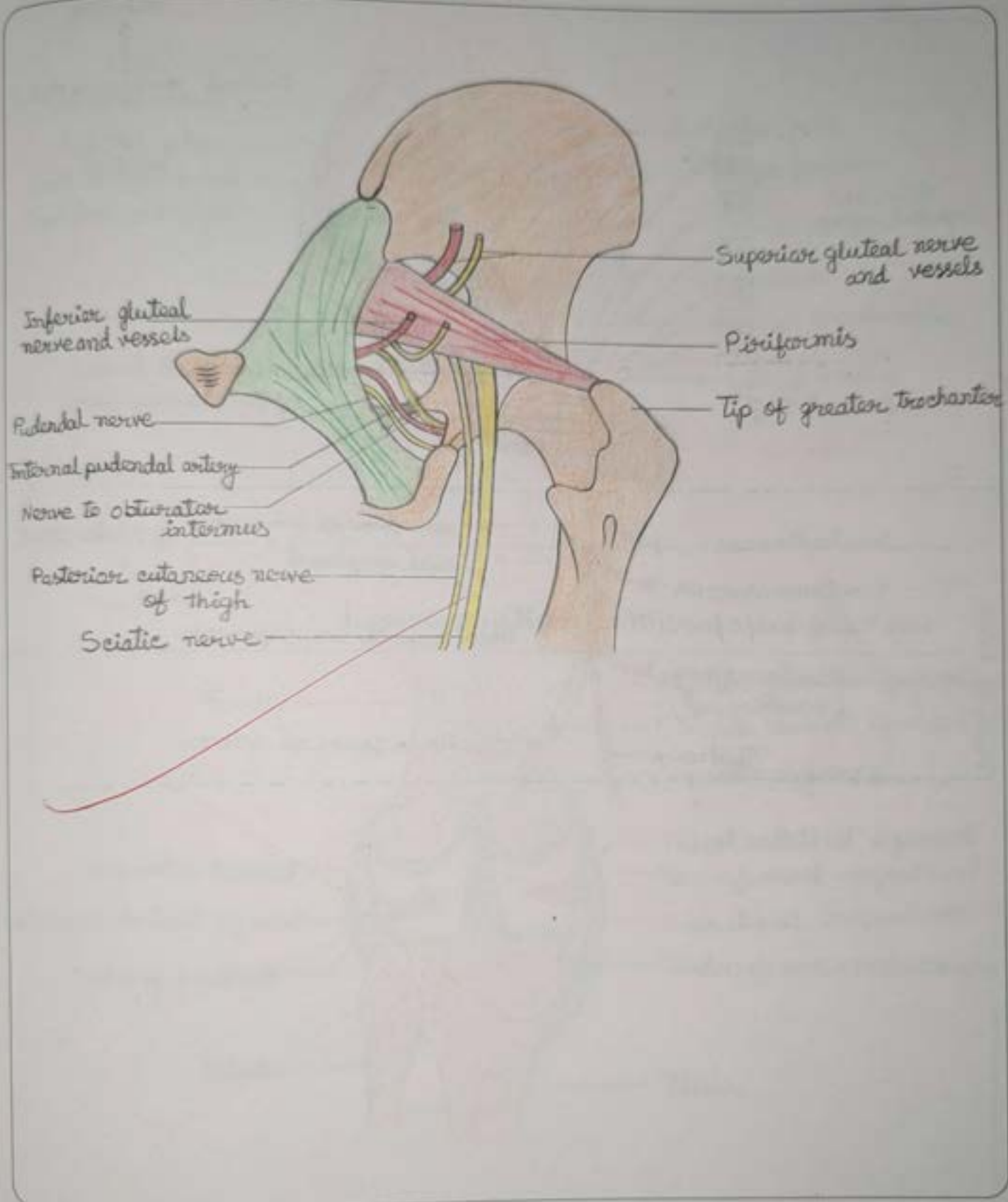
Femoral Nerve-Branches



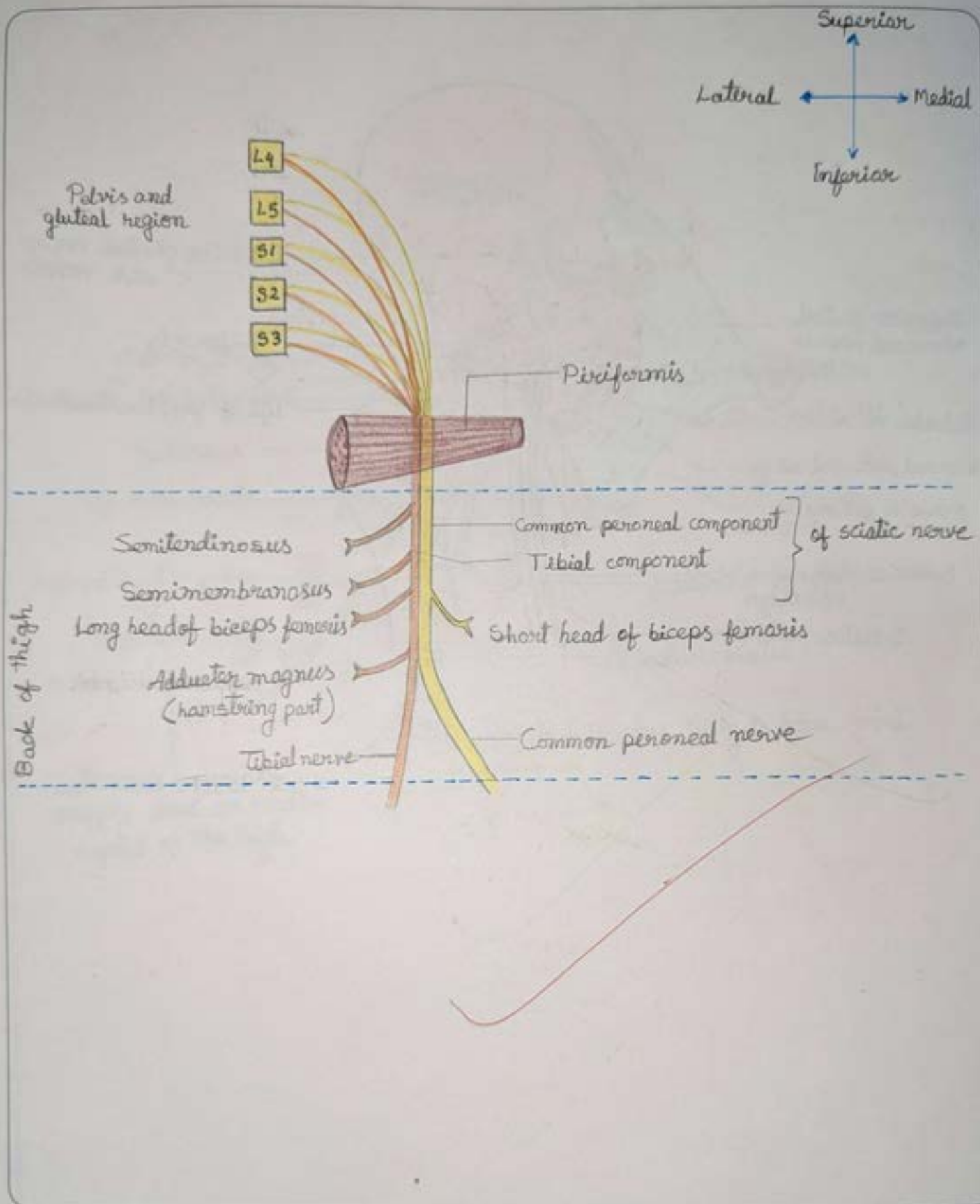
Obturator Nerve



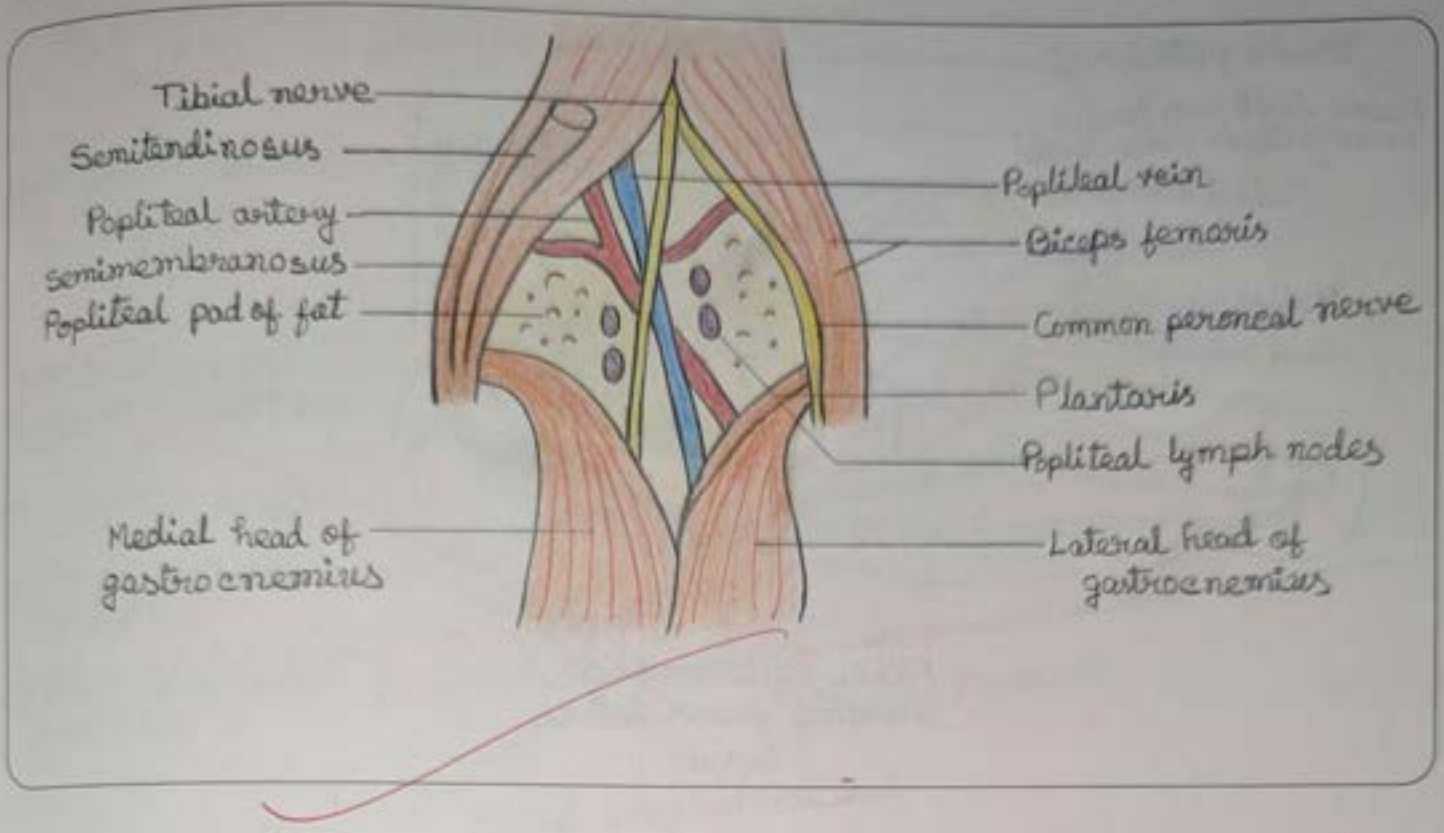
Structures Passing through the Greater and Lesser Sciatic Foramina



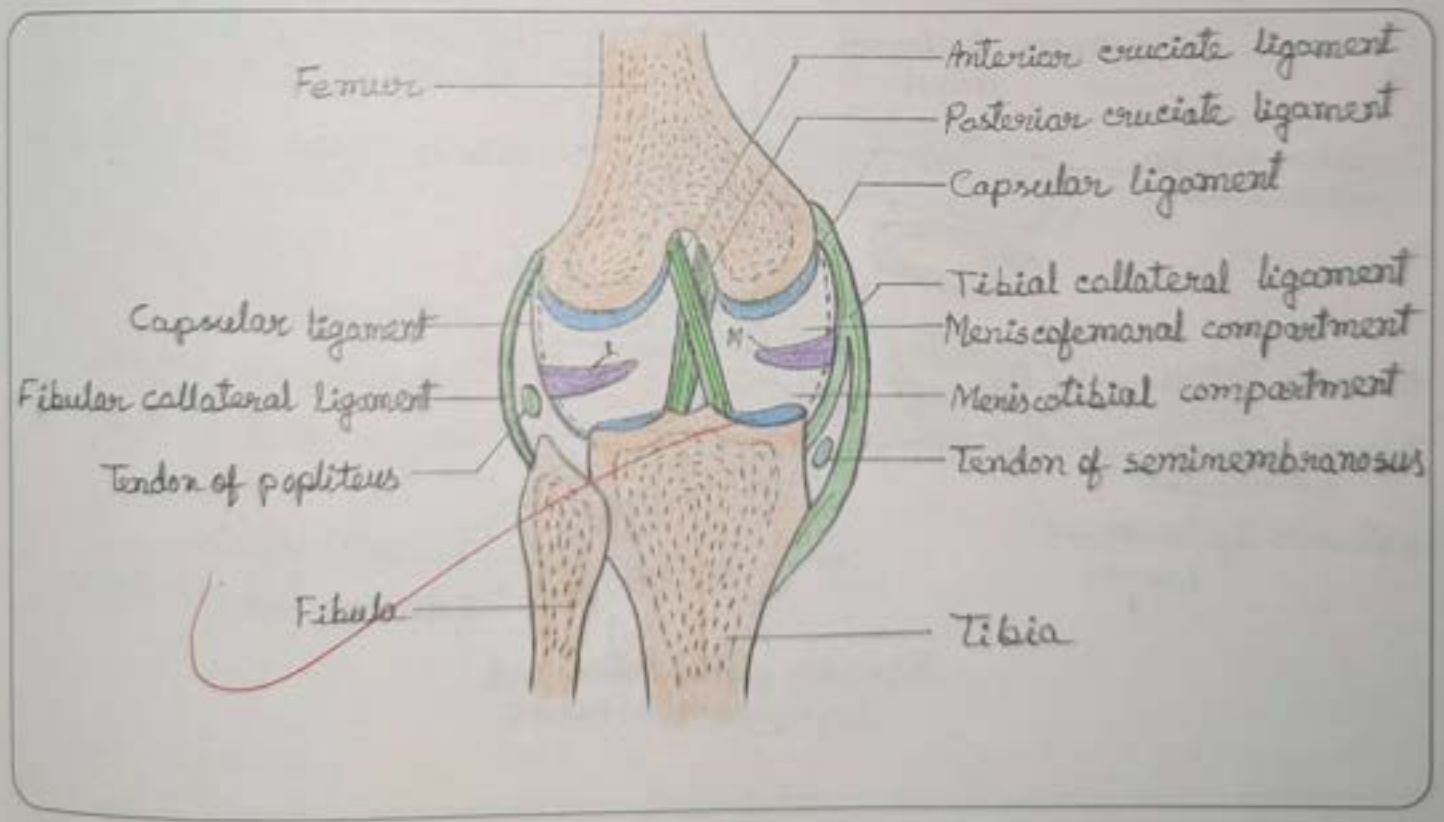
Sciatic Nerve



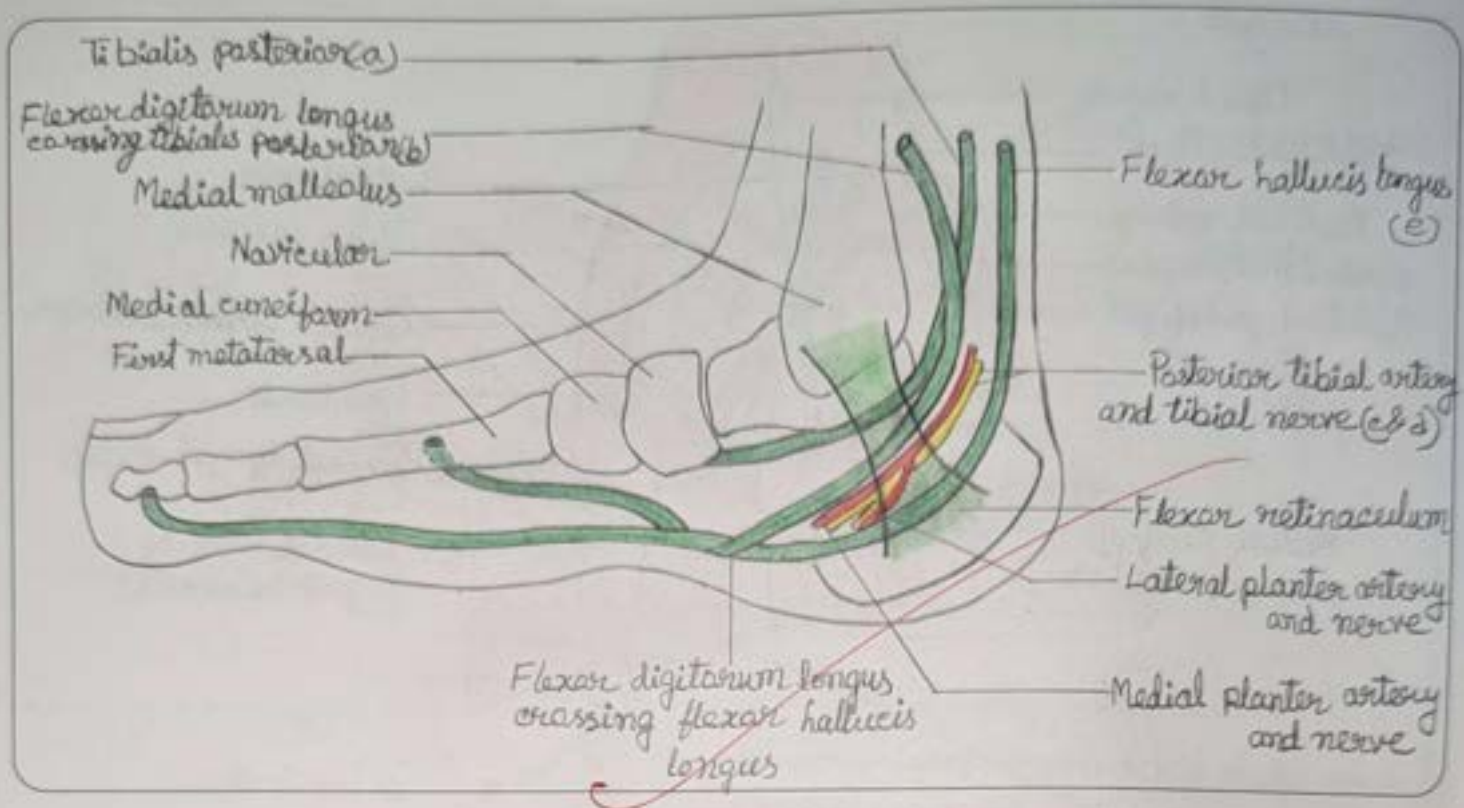
Popliteal Fossa



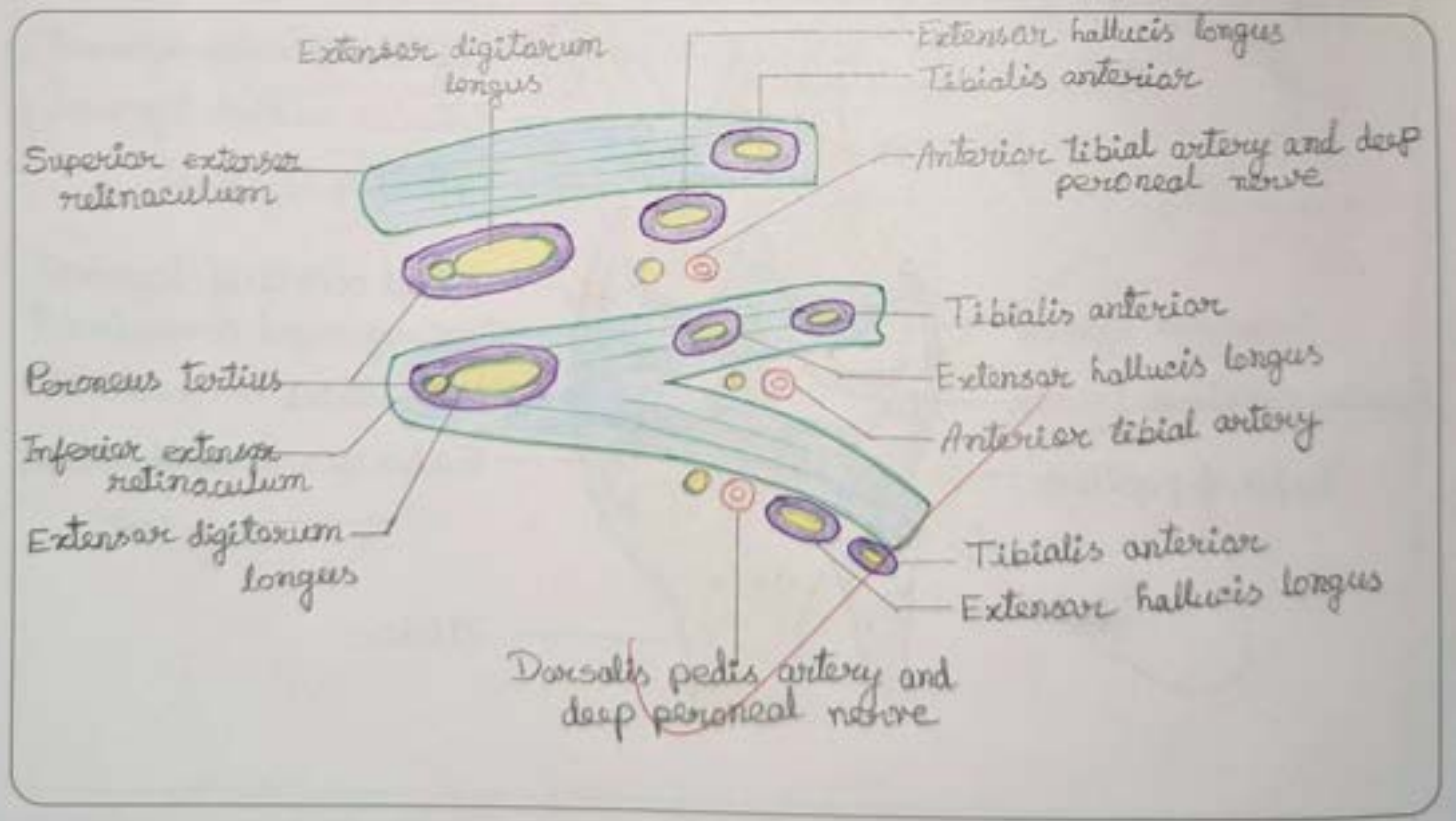
Ligaments of Knee Joint



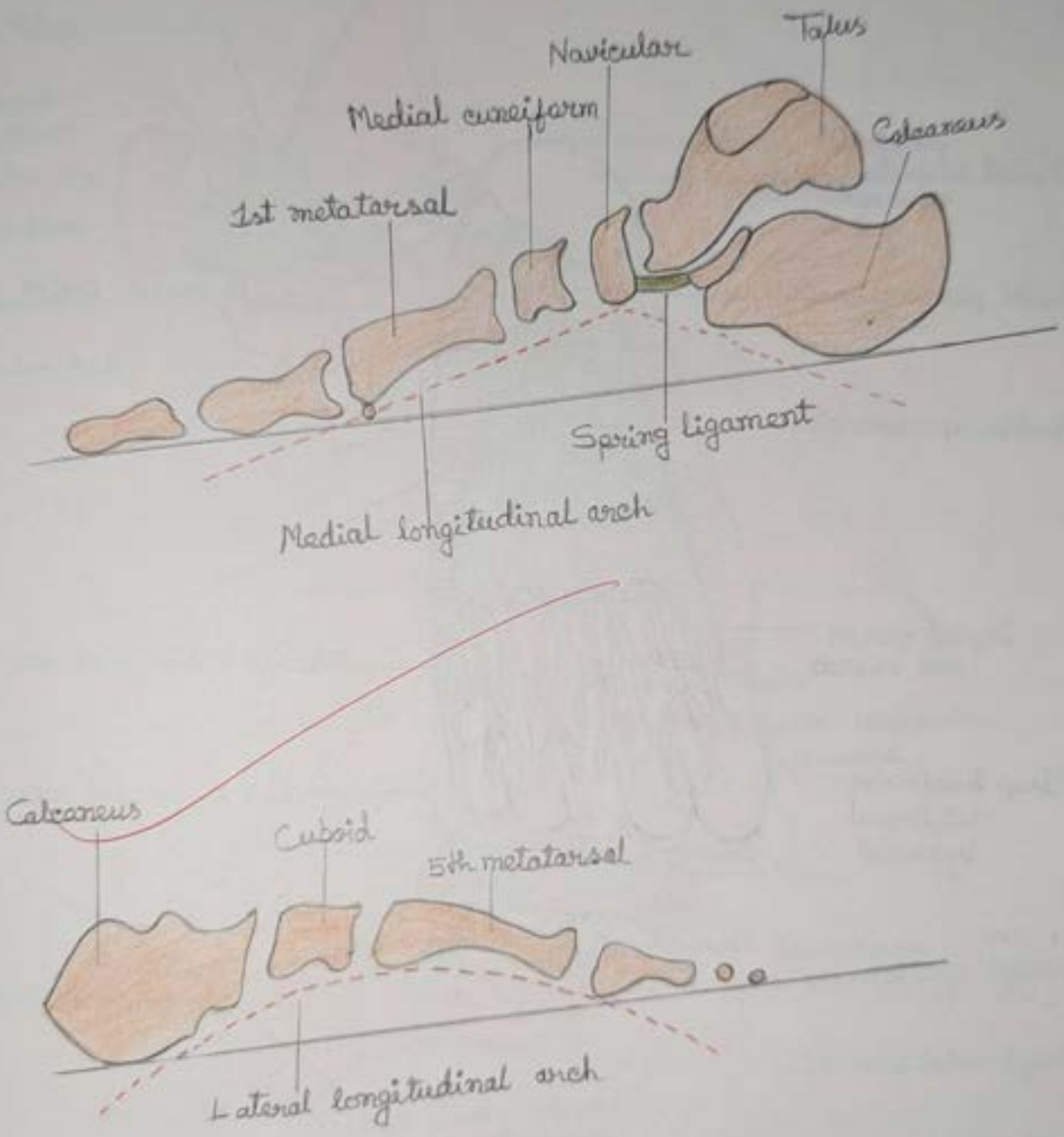
Flexor Retinaculum



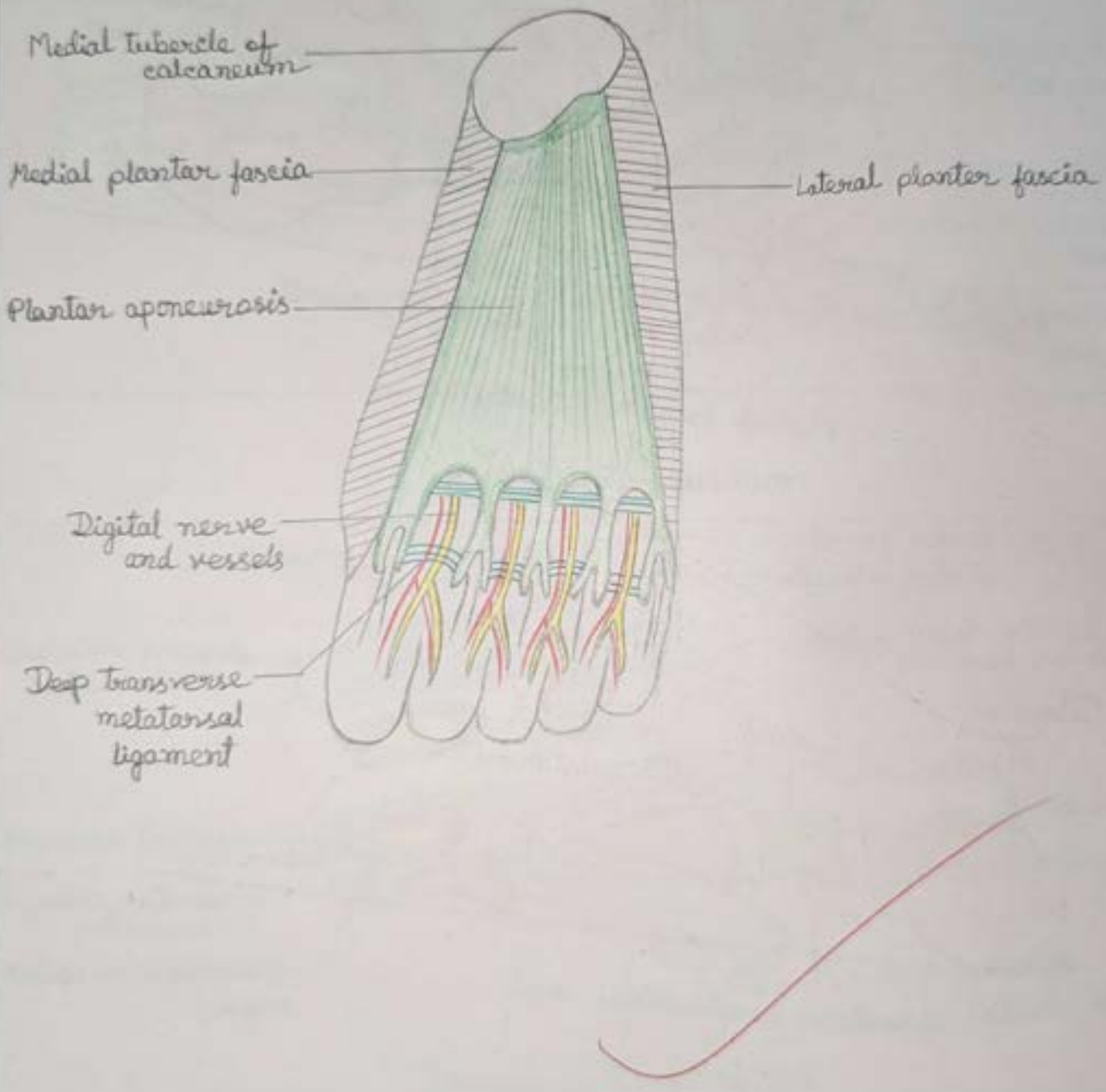
Extensor Retinaculum



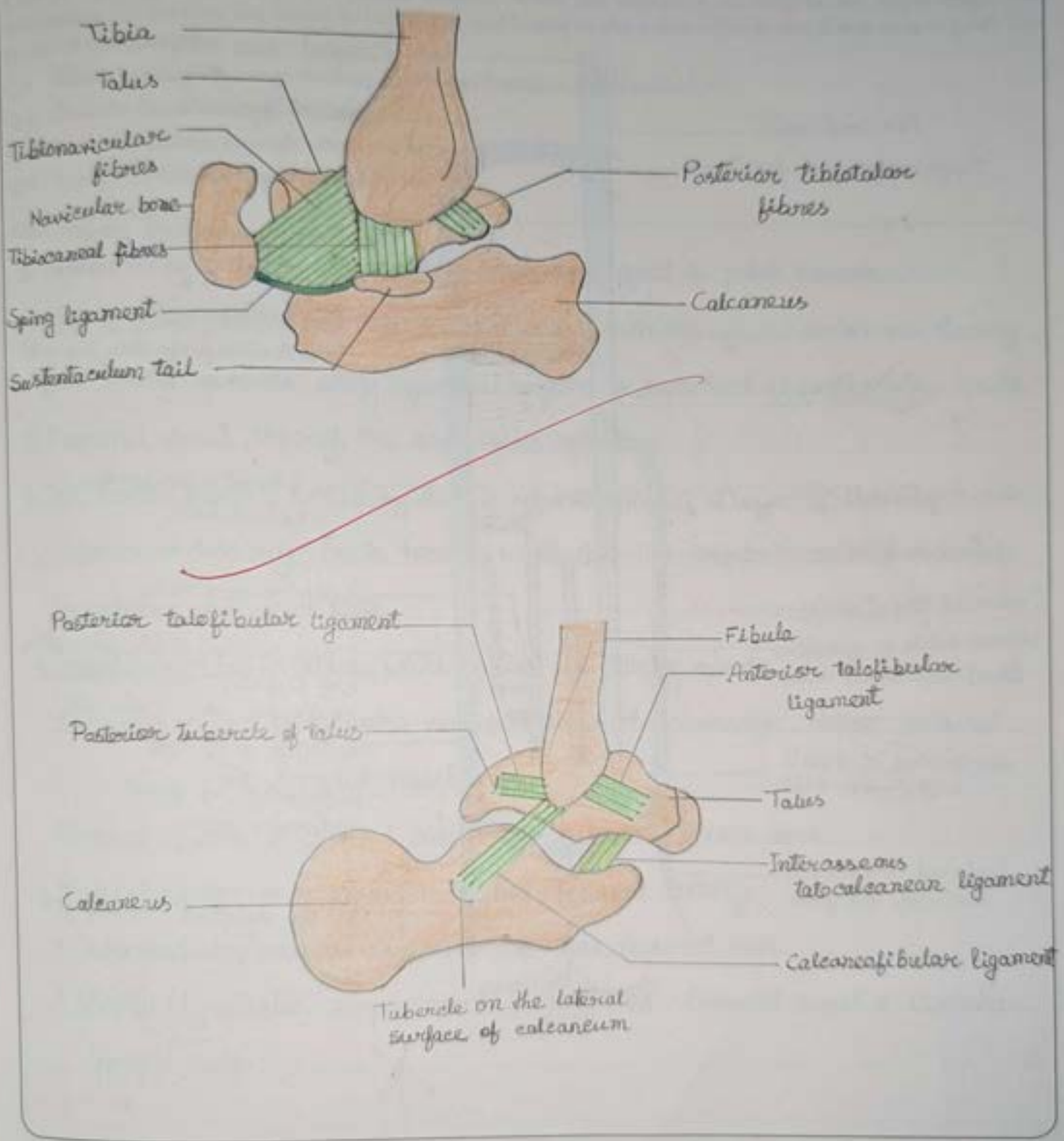
Arches of Foot



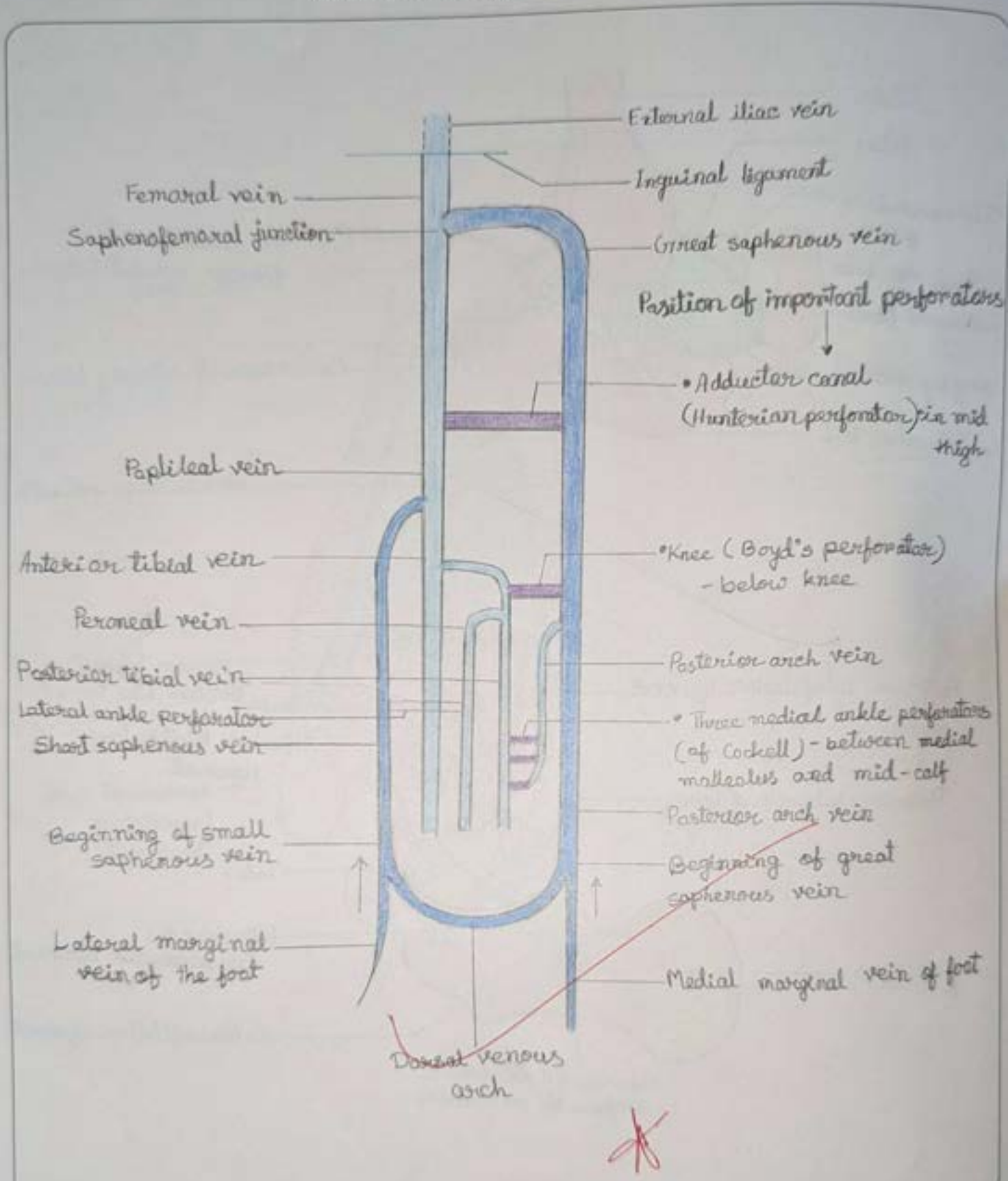
Plantar Aponeurosis



Ligaments of Ankle Joint



Venous Drainage of Lower Limb



Clinical Case-1

A 46 yr old woman rushes to the Sharda hospital, when she noticed a swelling in the upper thigh. On examination, the swelling was found to be inferior and lateral to the pubic tubercle and it was seen to push into the saphenous opening.

Q.1 Which hernia gives rise to swelling below and lateral to pubic tubercle?

Q.2 Describe the direction of the hernia.

Q.3 Name the passage through which the hernia enters the thigh.

Q.4 Explain the formation of femoral sheath.

1. Femoral hernia gives rise to swelling below and lateral to pubic tubercle.
2. First it passes downwards via femoral canal, then through the saphenous opening and finally upwards along superficial epigastric & superficial circumflex iliac vessels.
3. Femoral canal through the Saphenous opening.
4. The femoral sheath is formed by downward extension of 2 layer of fascia of abdomen → Anteriorly → Fascia transversaria that lies deep to transverse abdominis in anterior abdominal wall.

Posteriorly → Fascia iliaca, which causes the iliacus muscle.

Inferiorly → It communicates and merges with connective tissue around the femoral vessels.

Femoral Sheath is divided into 3 compartments from septa.

- lateral / anterior compartment has femoral artery
- Intermediate / venous compartment has femoral vein
- Medial / lymphatic compartment is known as femoral canal & contain lymph node.

Clinical Case-2

A 48-old security guard with a history of chronic pain in both legs came to the Sharda hospital, On examination doctor noticed dilated and tortuous veins on the medial side of his both legs. Dry, scaly and discolored skin was found over the medial malleolus.

Q.1 Name the structure involved and write the clinical condition.

Q.2 Which cutaneous nerve is related to vein?

Q.3 Write the position of vein in relation to medial malleolus?

1. Structure involved → long saphenous vein

   Clinical condition → Varicose vein

2. Saphenous ~~vein~~ nerve

3. Anterior/ in front of Medial Malleolus

Clinical Case-3

After the removal of plaster cast for fracture of the right tibia and fibula, the patient complaints of loss of sensation on the intermediate area of the dorsum of foot including toes except the lateral side of little toe.

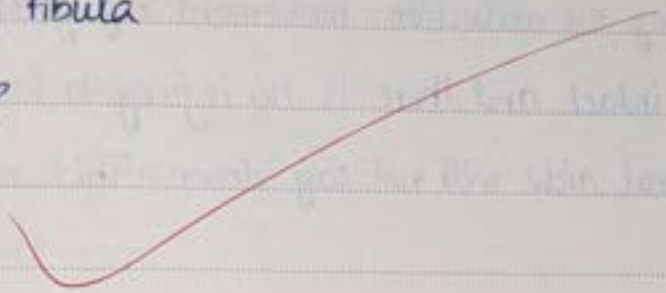
On examination, dorsiflexion and eversion of foot is lost.

Q.1 Write the structure involved due to casting of plaster?

Q.2 Write the surface marking of the structure involved?

Q.3 Mention the deformity occurred due to injury of involved.

1. Deep Peroneal Nerve
2. The nerve can be palpated against the posterolateral side of neck of fibula
3. Foot drop



Clinical Case-4

The police and robbers involved in encounter which cause a bullet injury to right gluteal region of a robber. After recovery from an injury, he developed a characteristic limp during walking. There was sagging of left hip while taking a step on right foot.

On examination, Trendelenburg sign was positive.

Q.1 Which nerve is involved in above case?

Q.2 What are the muscles supplied by nerve involved?

Q.3 What is Trendelenberg sign?

1. Superior Gluteal Nerve
2. Gluteus medius and Gluteus minimus
3. It is used for checking the abduction movement by gluteal muscle.
   If the ~~act~~ abduction is intact and there is no injury to muscle, the lower limb of contralateral side will not sag down. This is the trendelenberg sign.
   But if the muscles are injured and abduction is not proper, the lower limb of contralateral side will sag down. This is positive trendelenburg sign.

Clinical Case-5

A 42 yr old woman had hysterectomy. After surgery subsequently she developed sudden pain in her left calf. On examination, the calf was found to be swollen, tender and warm. Doctor examined and revealed its Deep Vein Thrombosis (DVT) in calf.

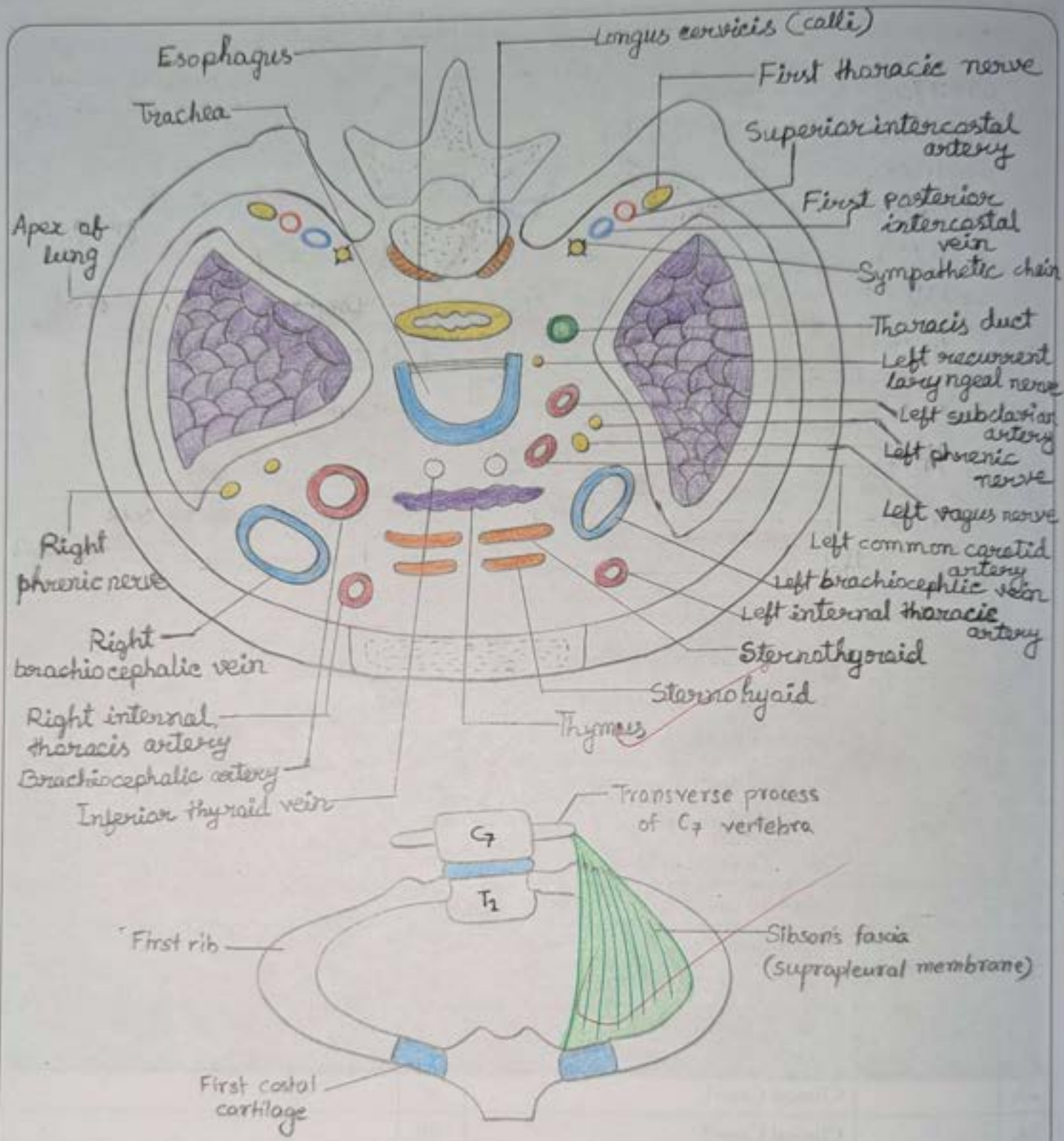
Q.1 Enumerate the deep veins of lower limb

Q.2 What is peripheral heart?

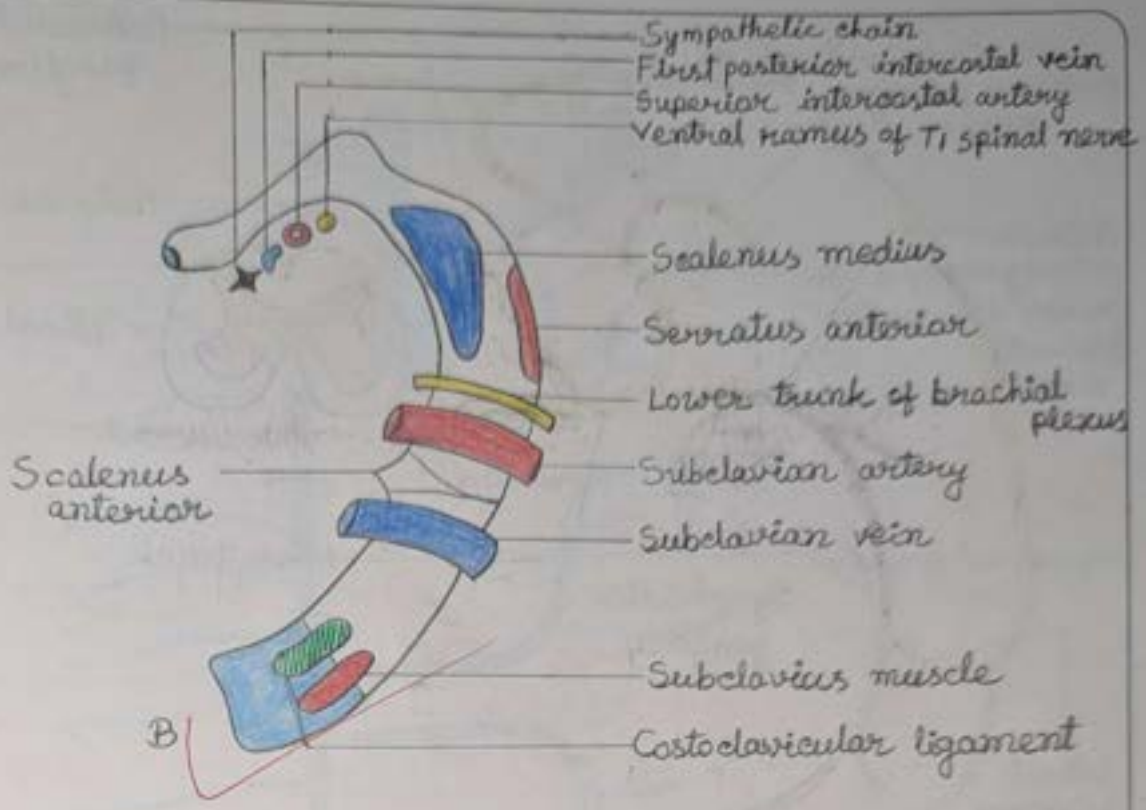
Q.3 Name the veins connecting superficial and deep veins of leg.

1. - Medial Plantar Vein
   - Lateral Plantar Vein
   - Dorsal Pedis Vein
   - Anterior & Posterior tibial vein
   - Popliteal vein
   - Peroneal vein
   - Femoral vein
2. Soleus Muscle on contraction pushes the blood flow veins towards the heart
3. Perforating veins.

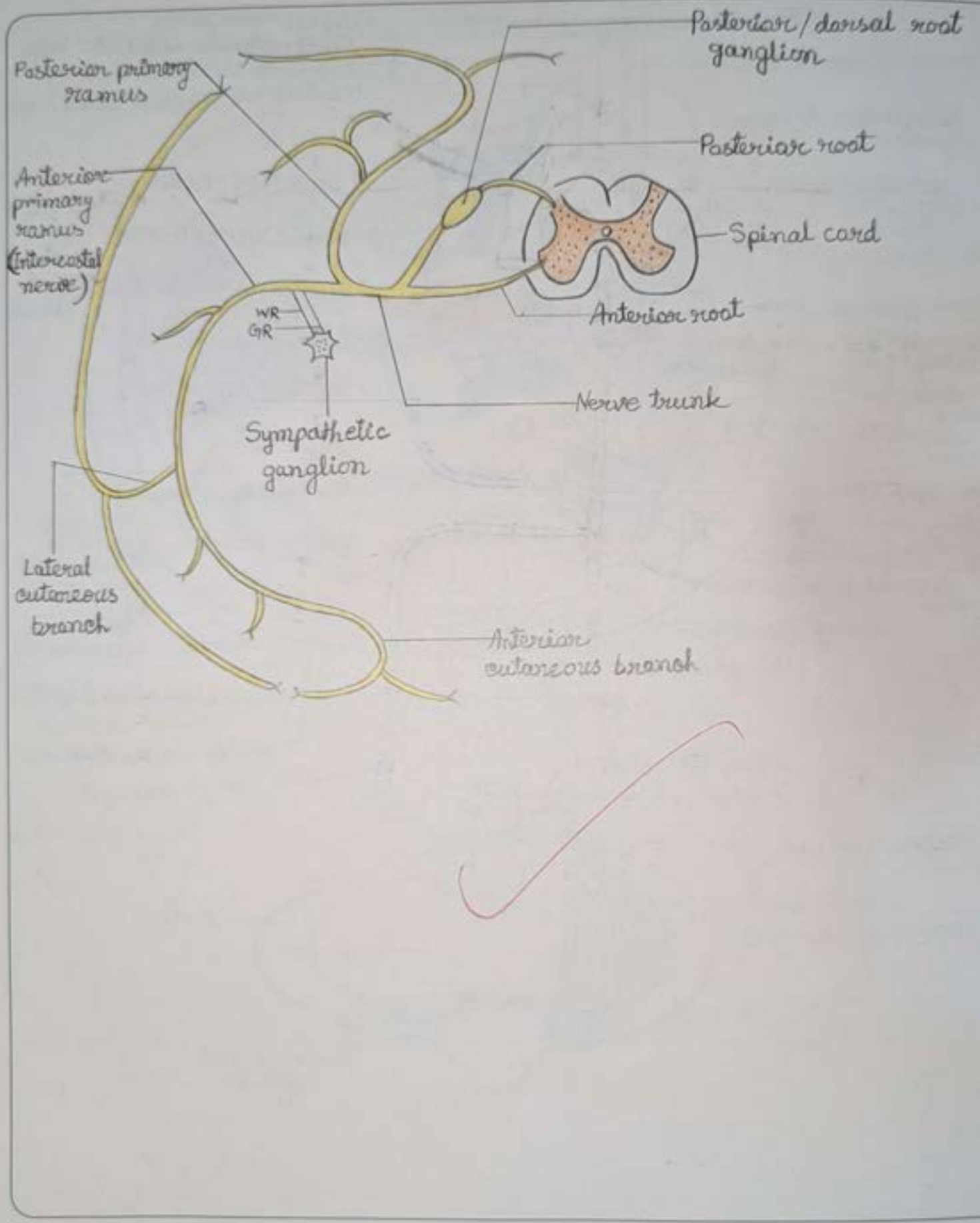
Thoracic Inlet and Sibson's Fascia



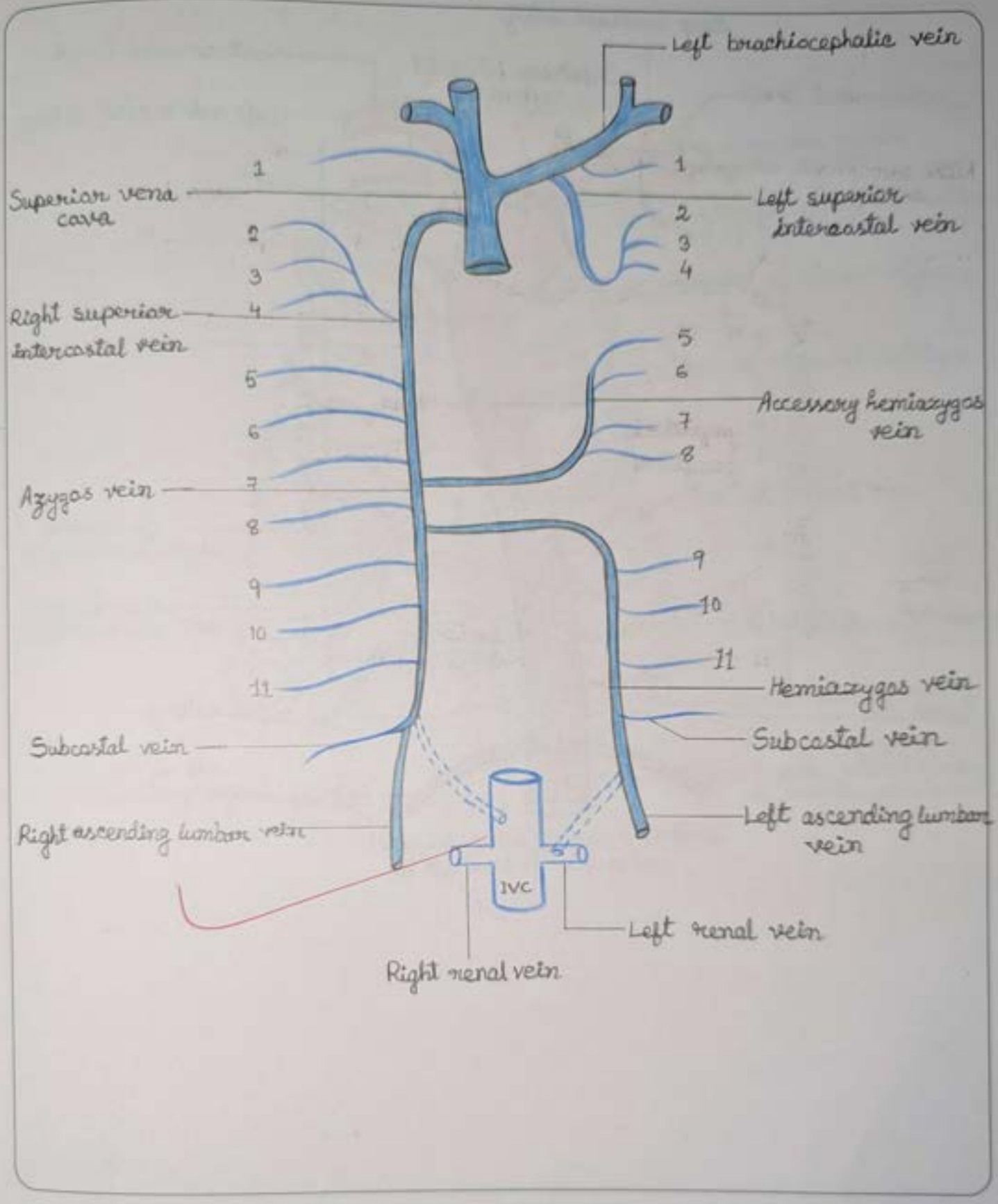
1st Rib—Relations and Attachments



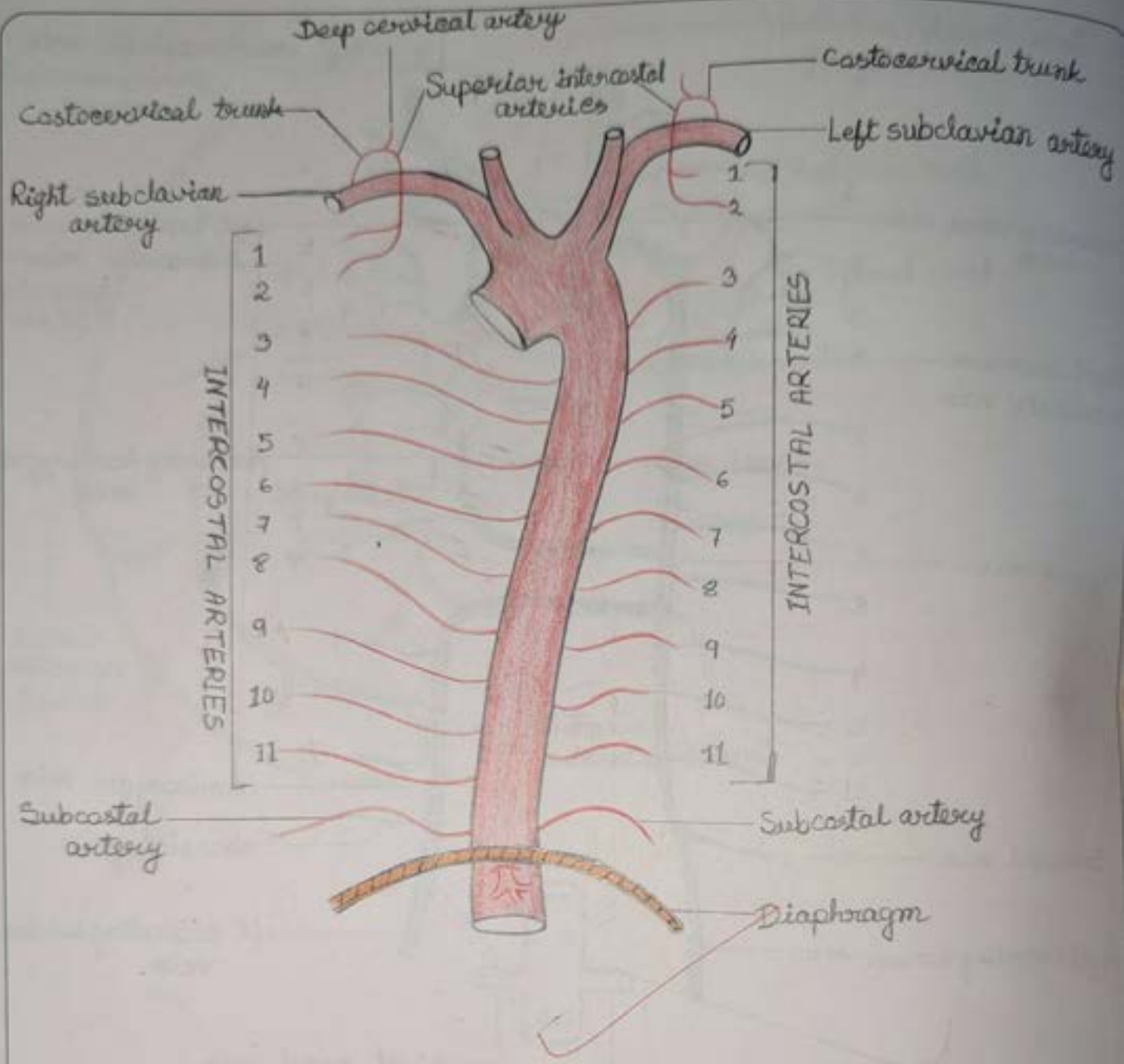
Typical Thoracic Spinal Nerve



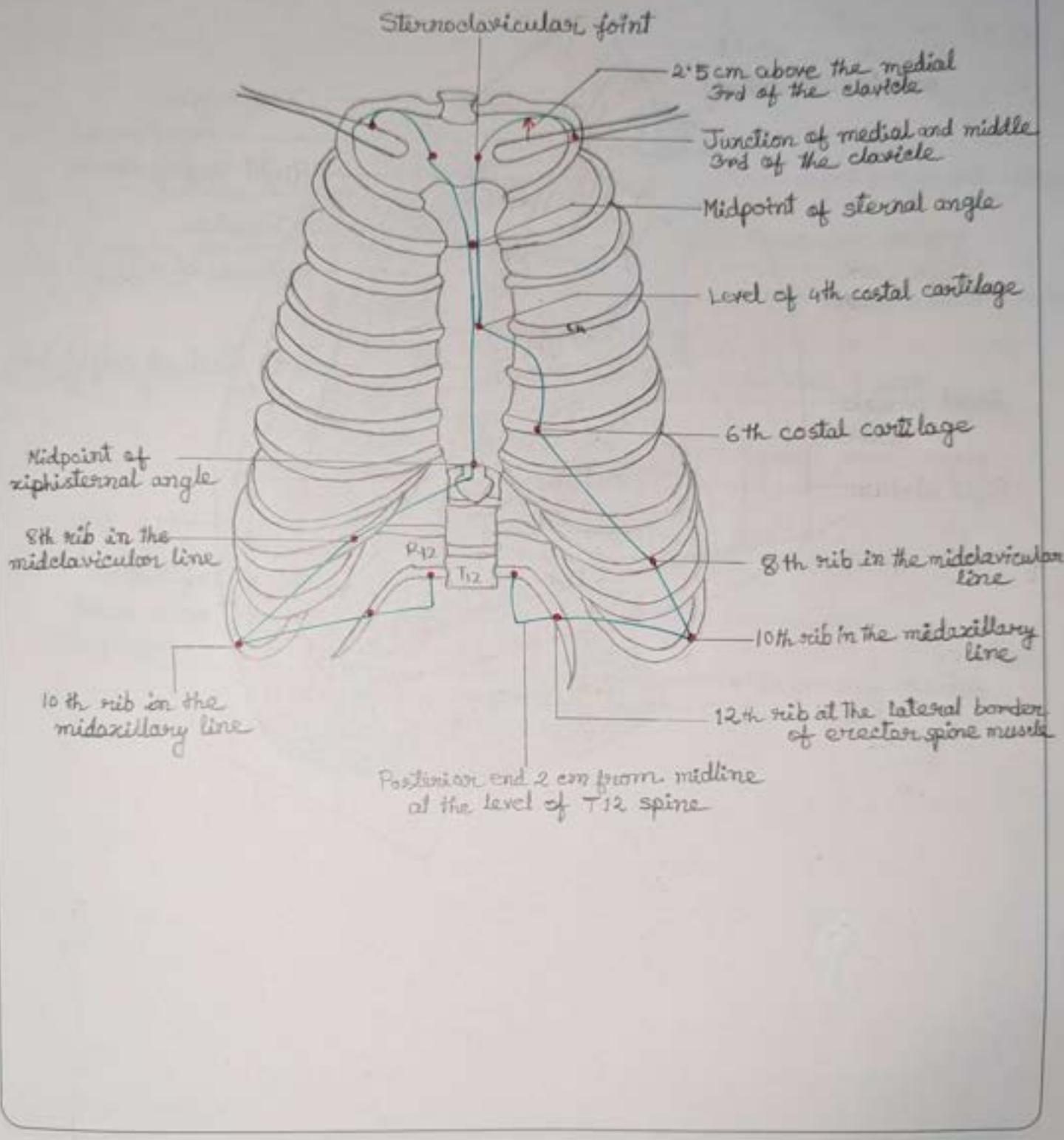
Venous Drainage of Thoracic Wall



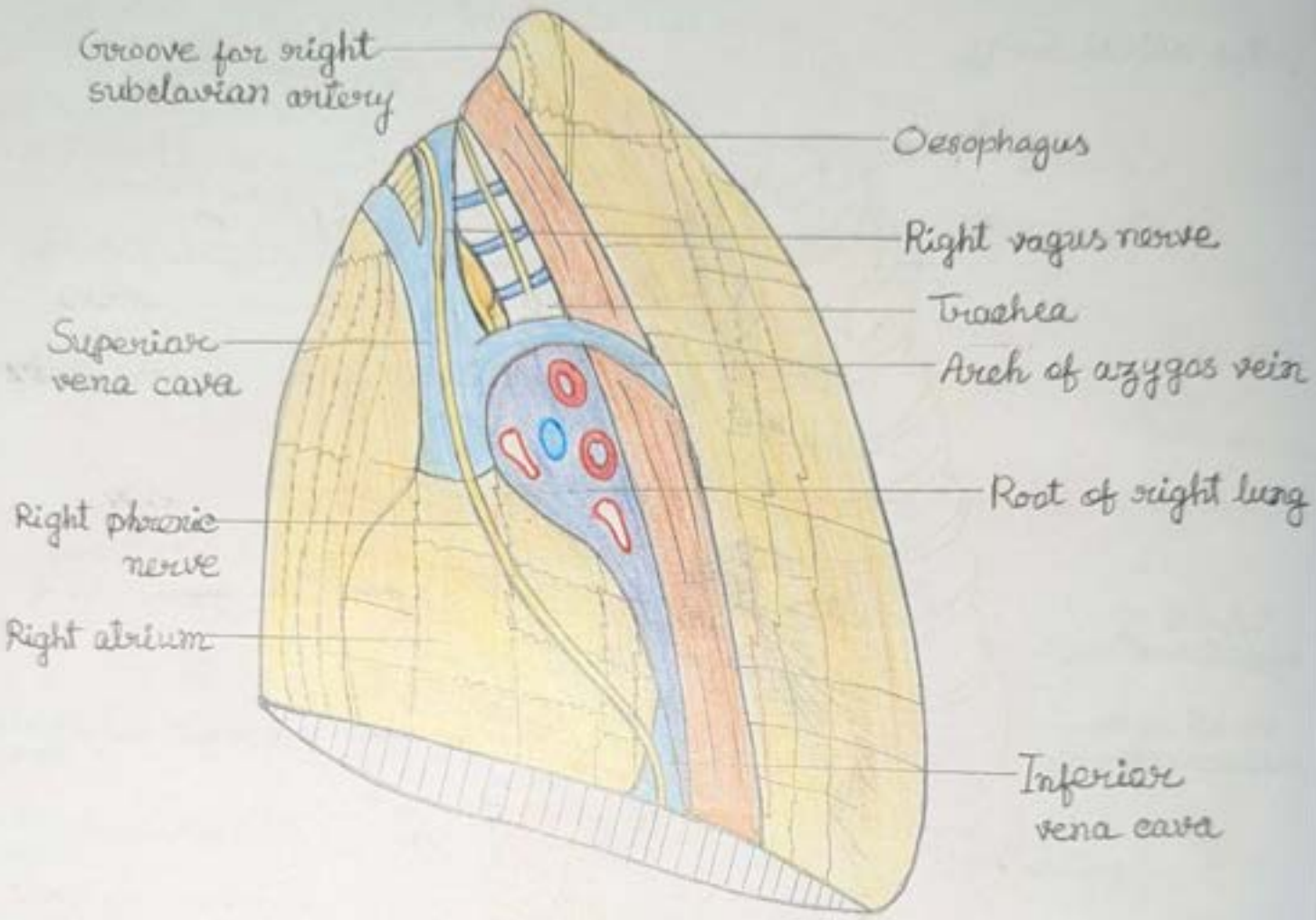
Arterial Supply of Thoracic Wall



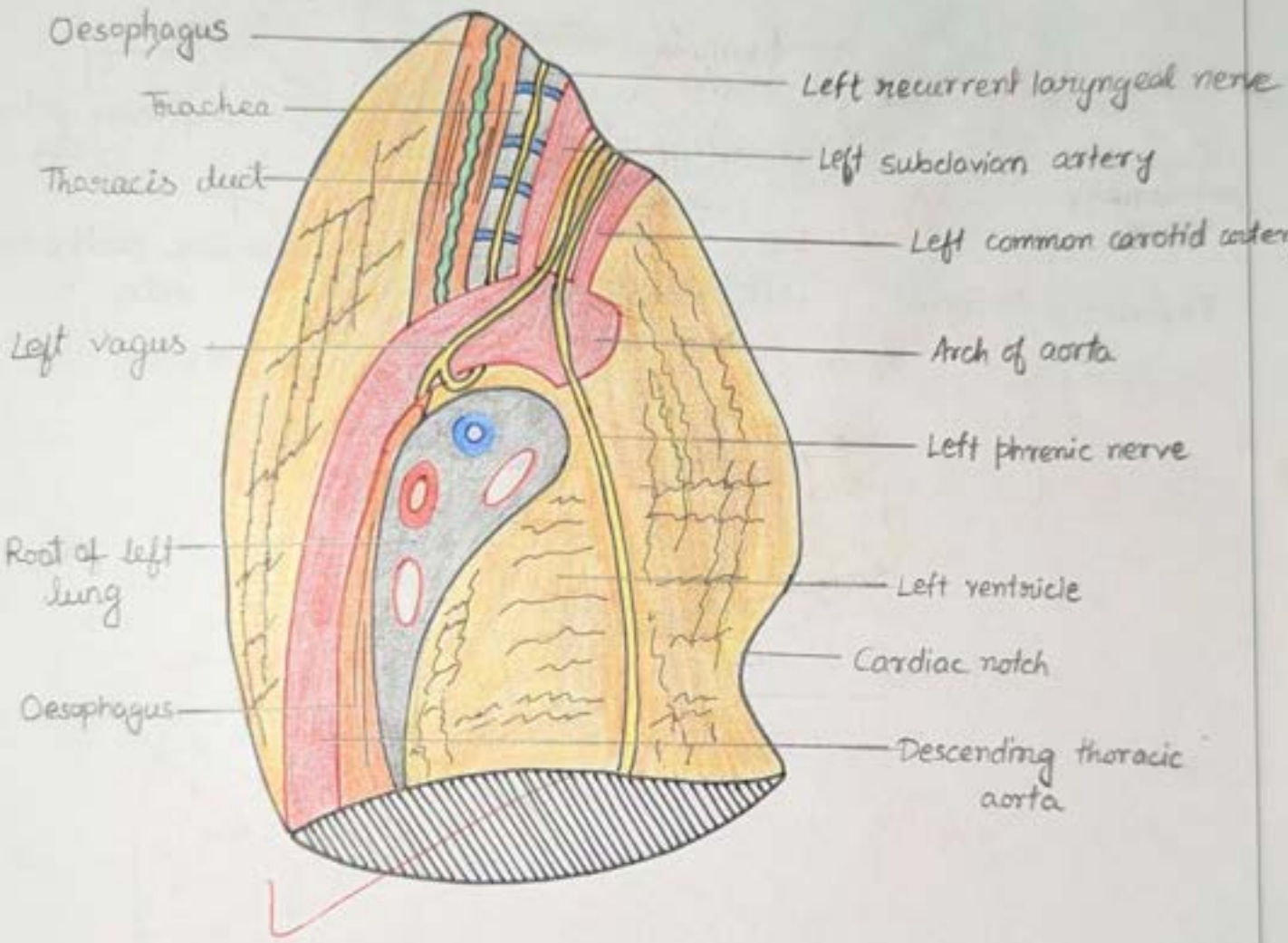
Pleural Reflection on Rib Cage



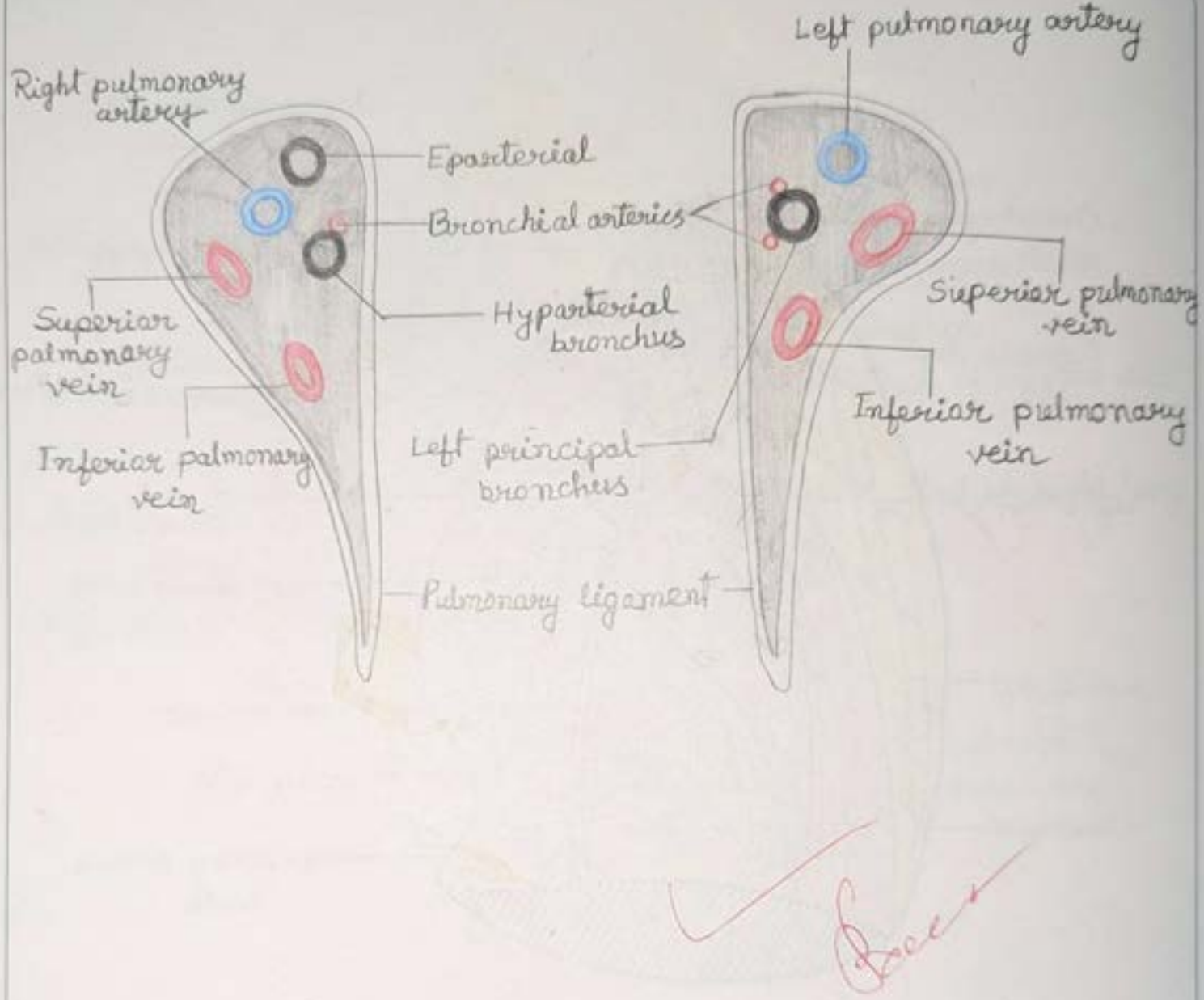
Structures related to Mediastinal Surface of Right Lung



Structures related to Mediastinal Surface of Left Lung



Structures in the Roots of Lungs

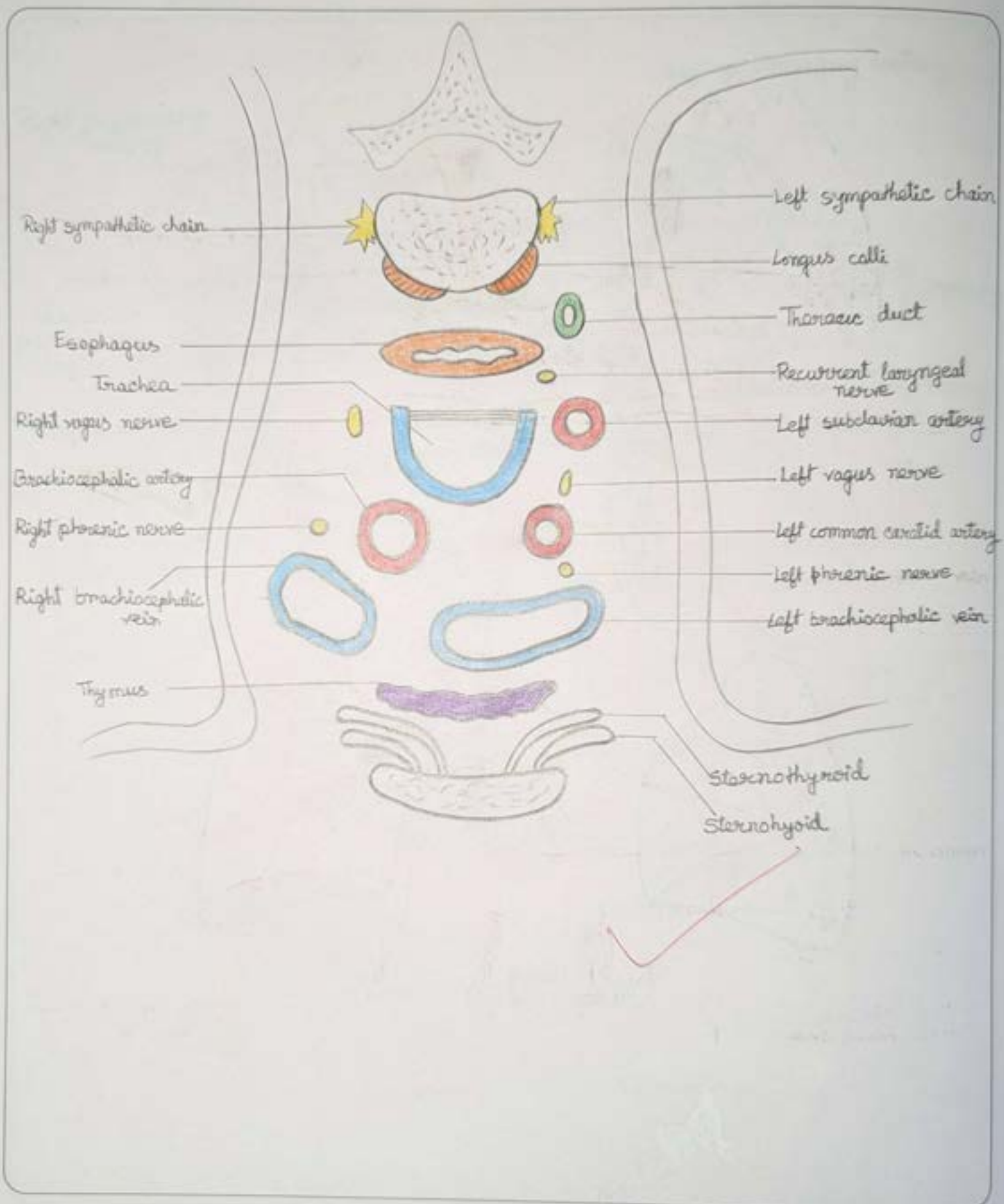


Bronchopulmonary Segments of Right and Left Lungs

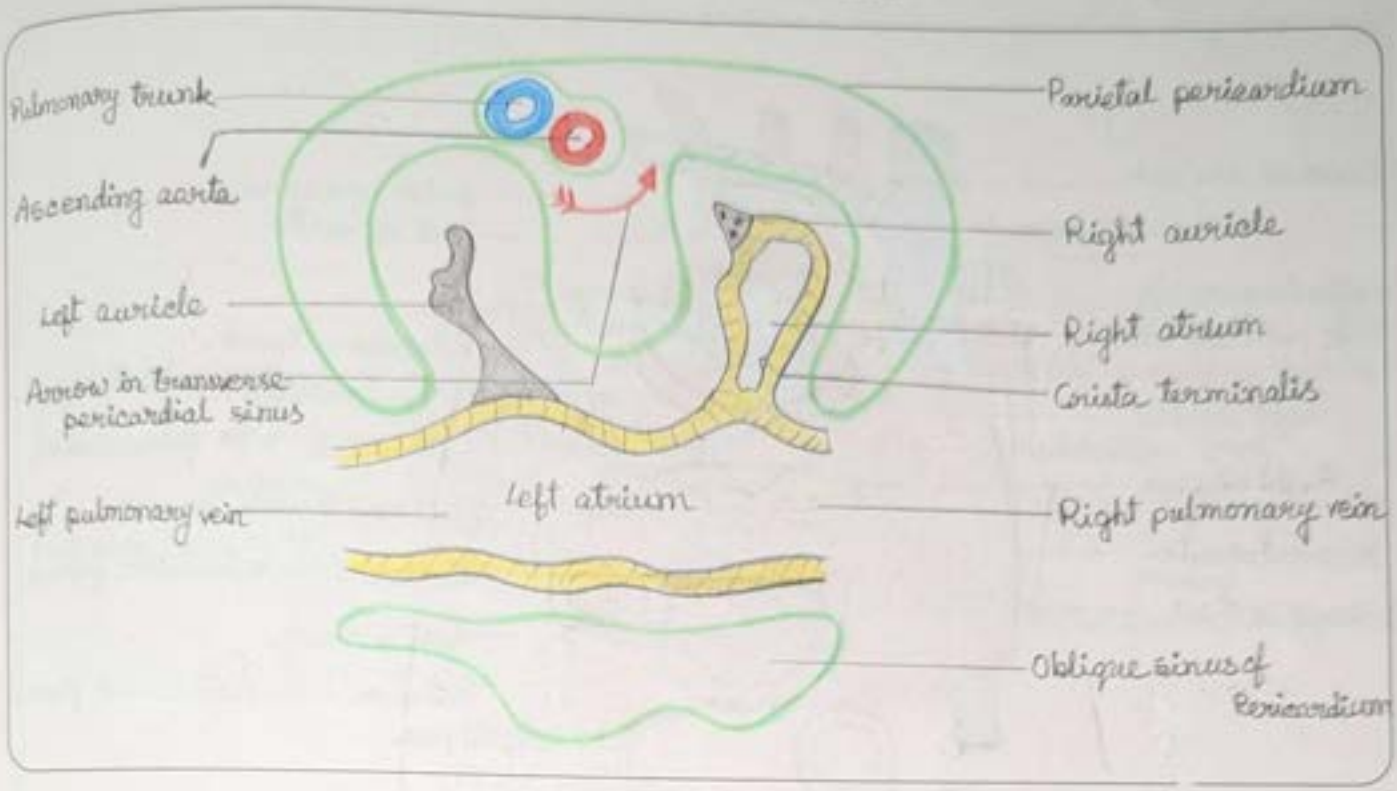
Left Lung

Right Lung

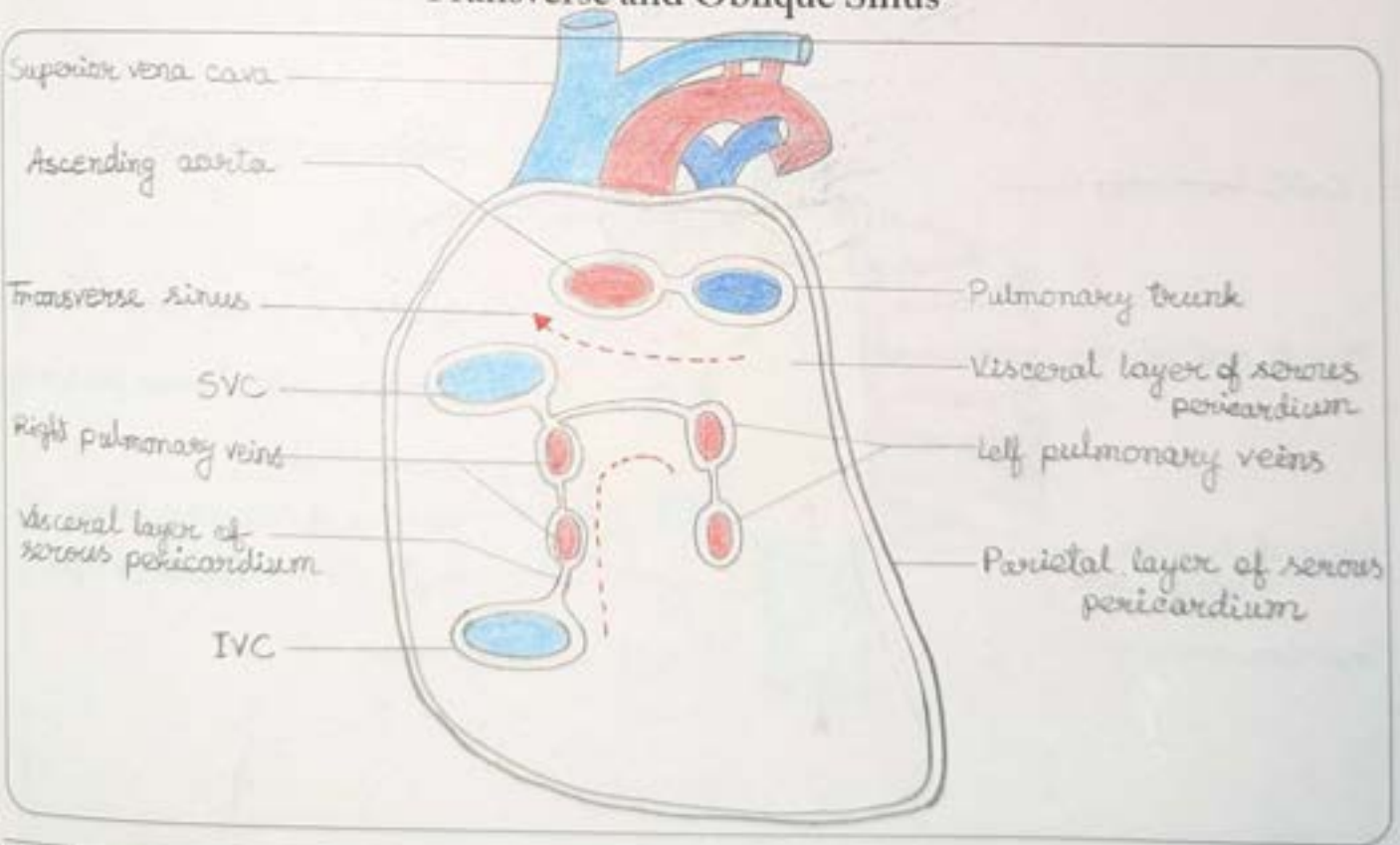
T.S. of Superior Mediastinum



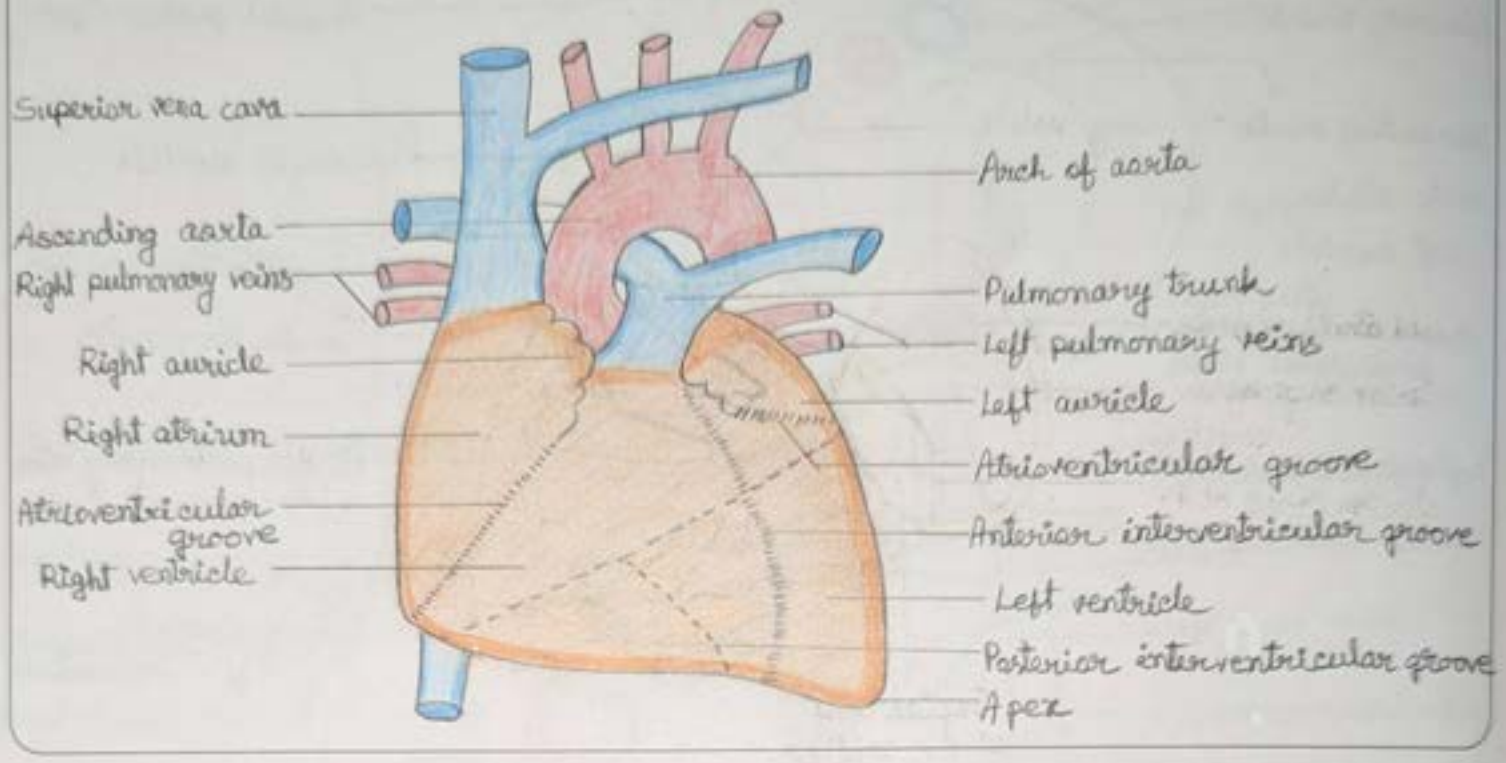
Reflection of Pericardium



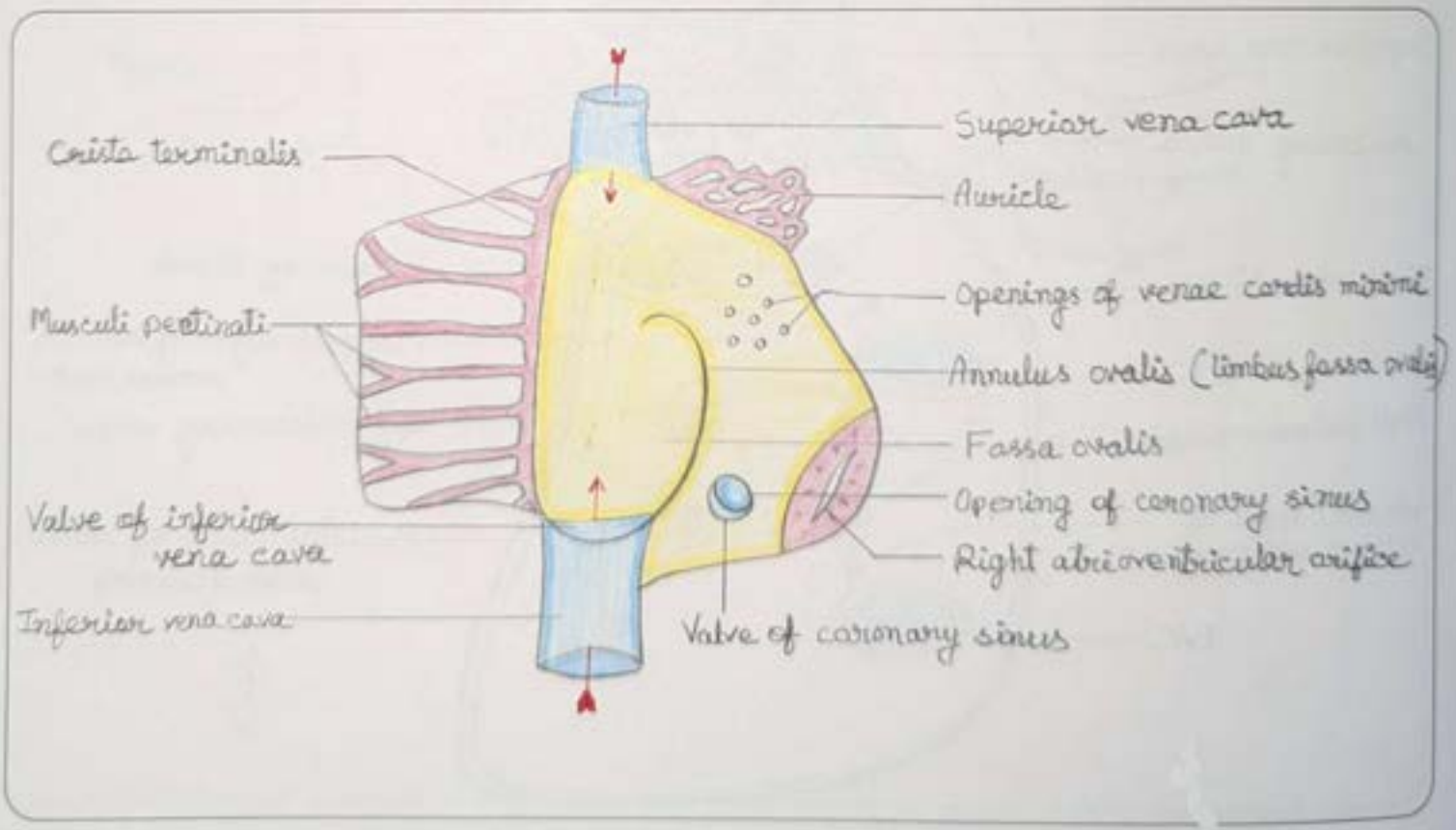
Transverse and Oblique Sinus



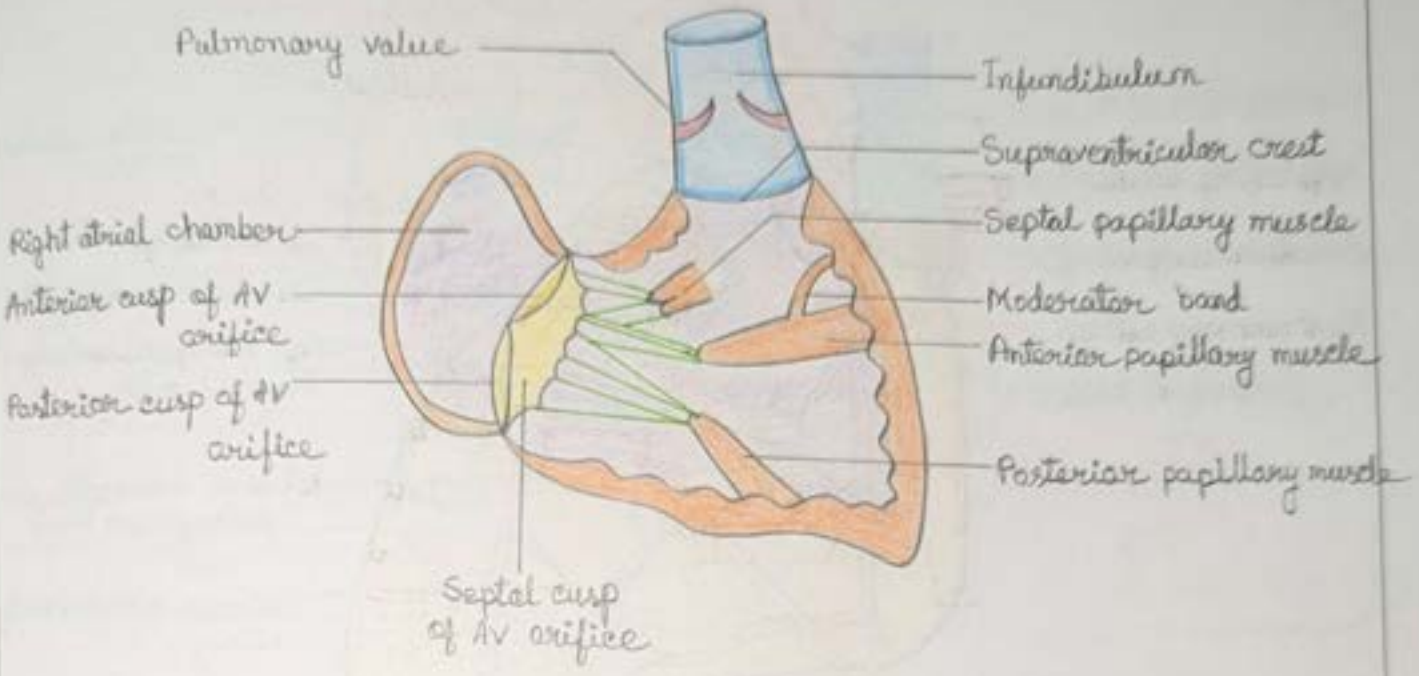
Sternocostal Surface of Heart



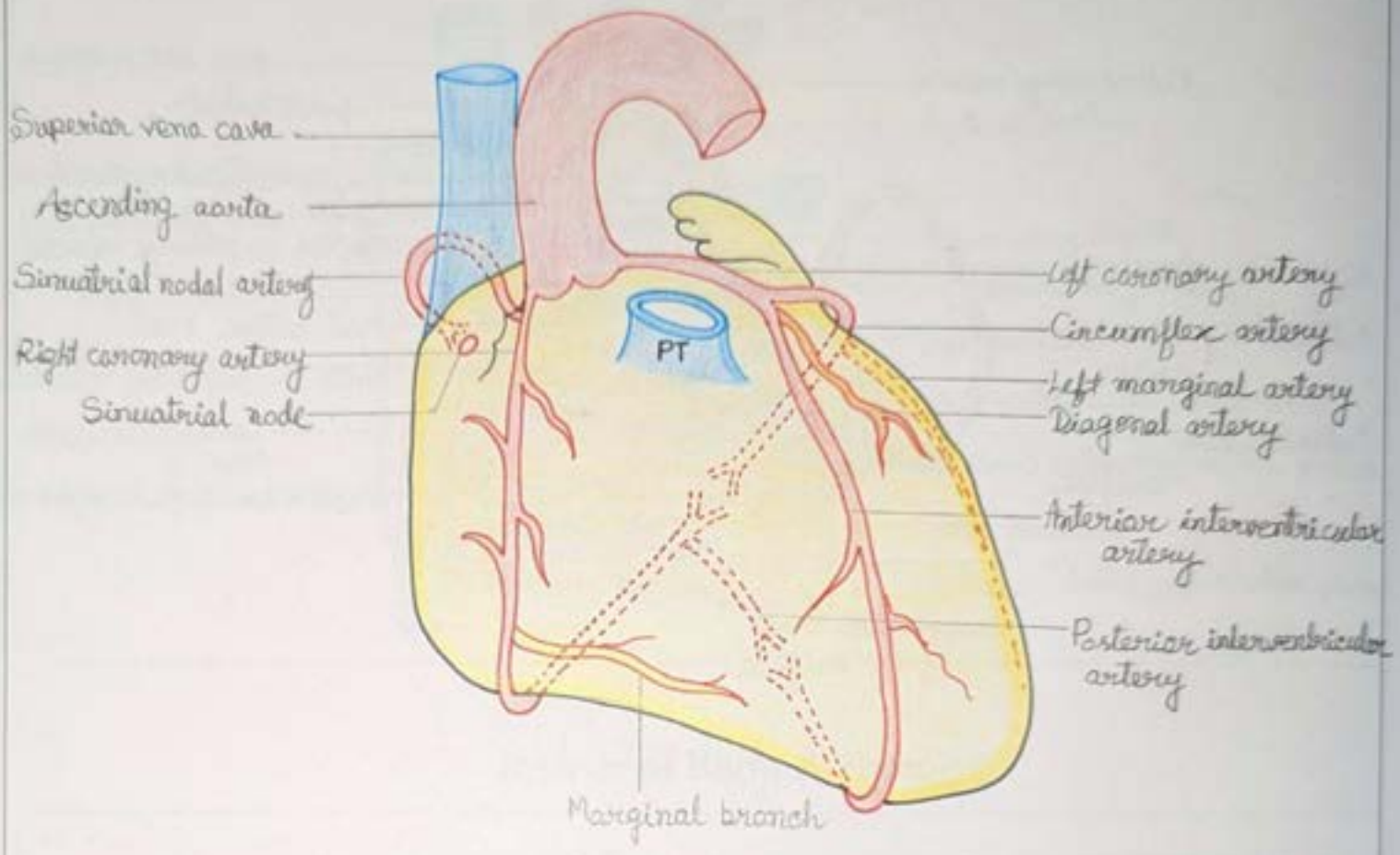
Interior of Right Atrium



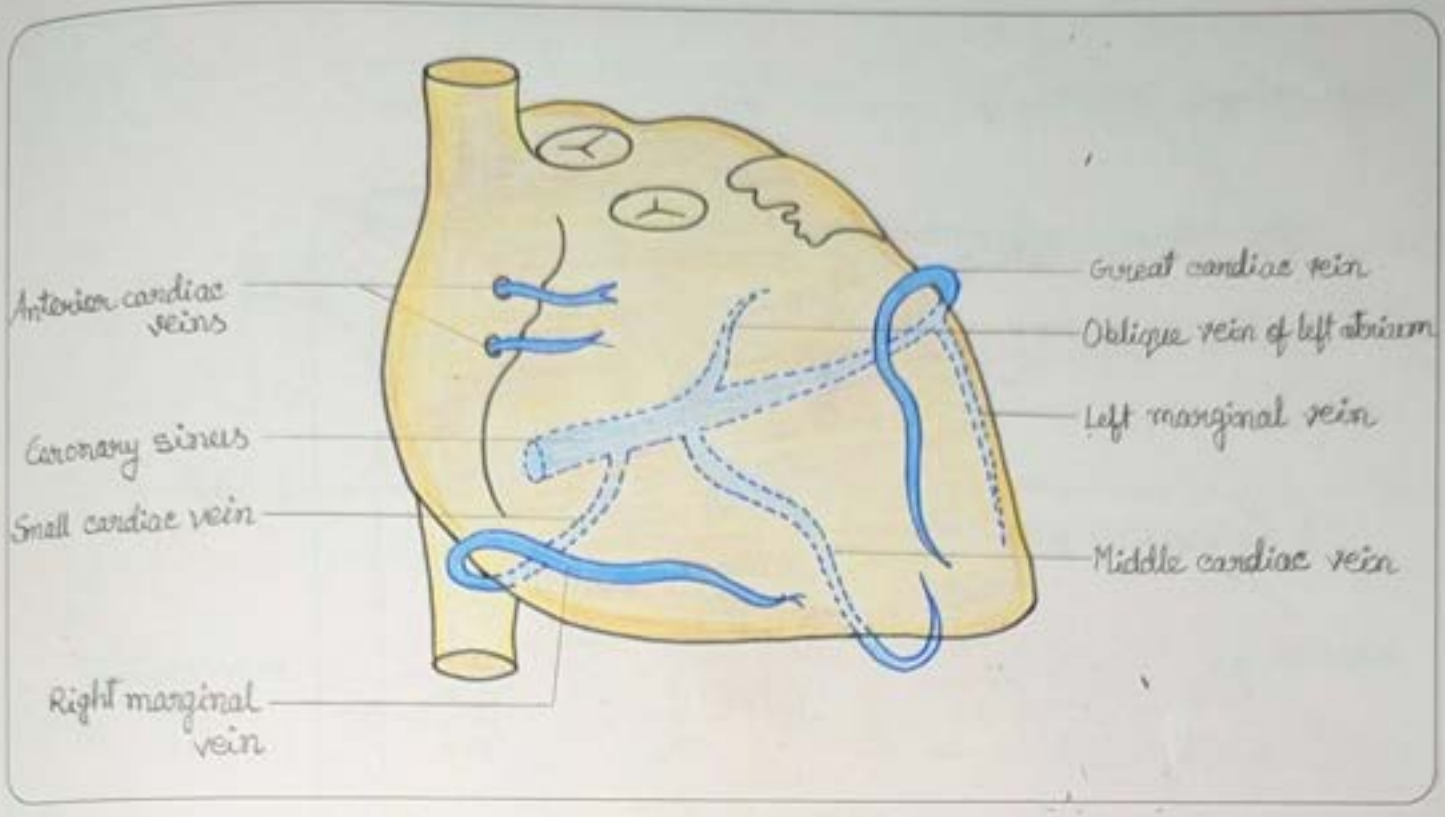
Interior of Right Ventricle



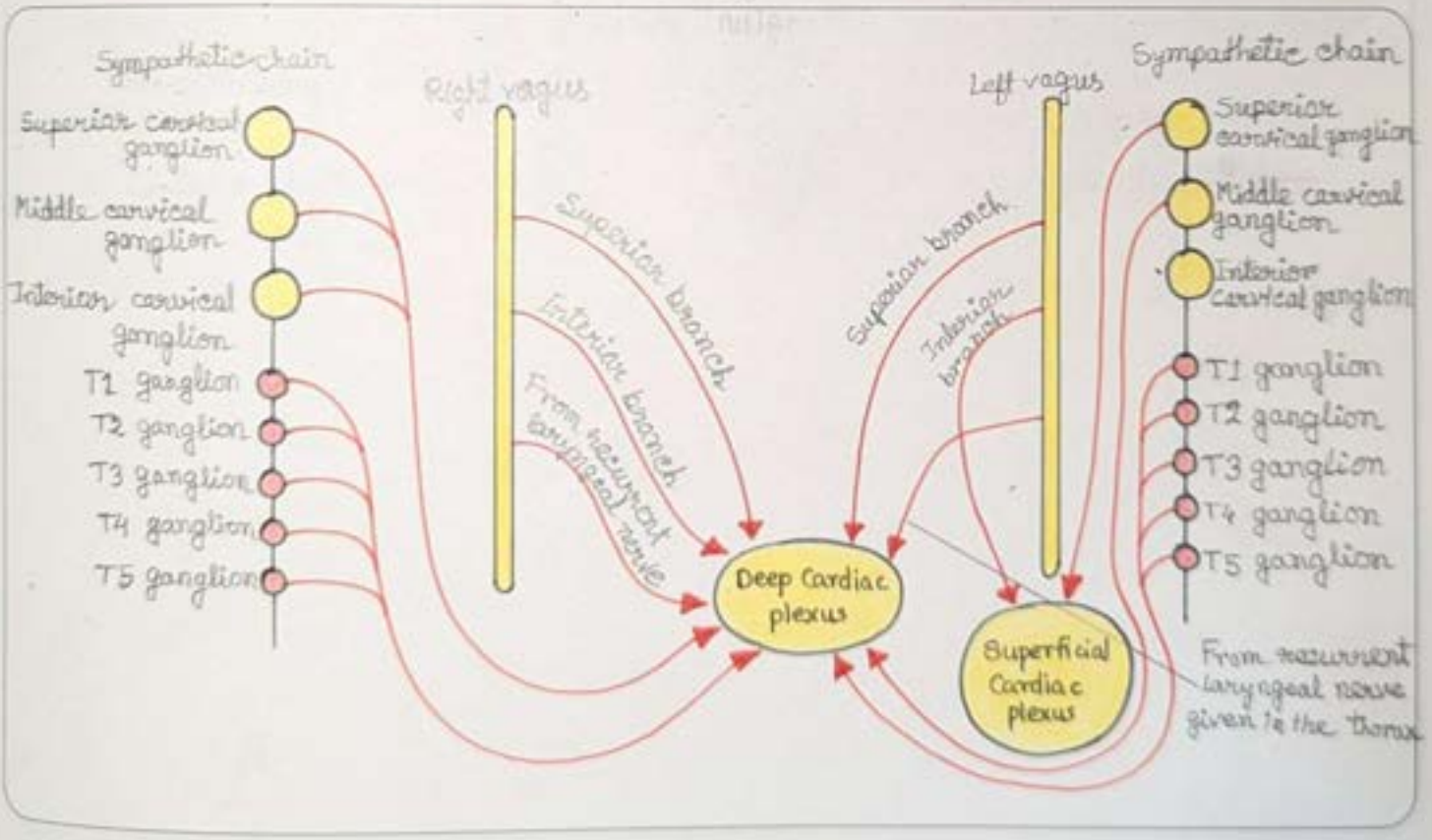
Arterial Supply of Heart



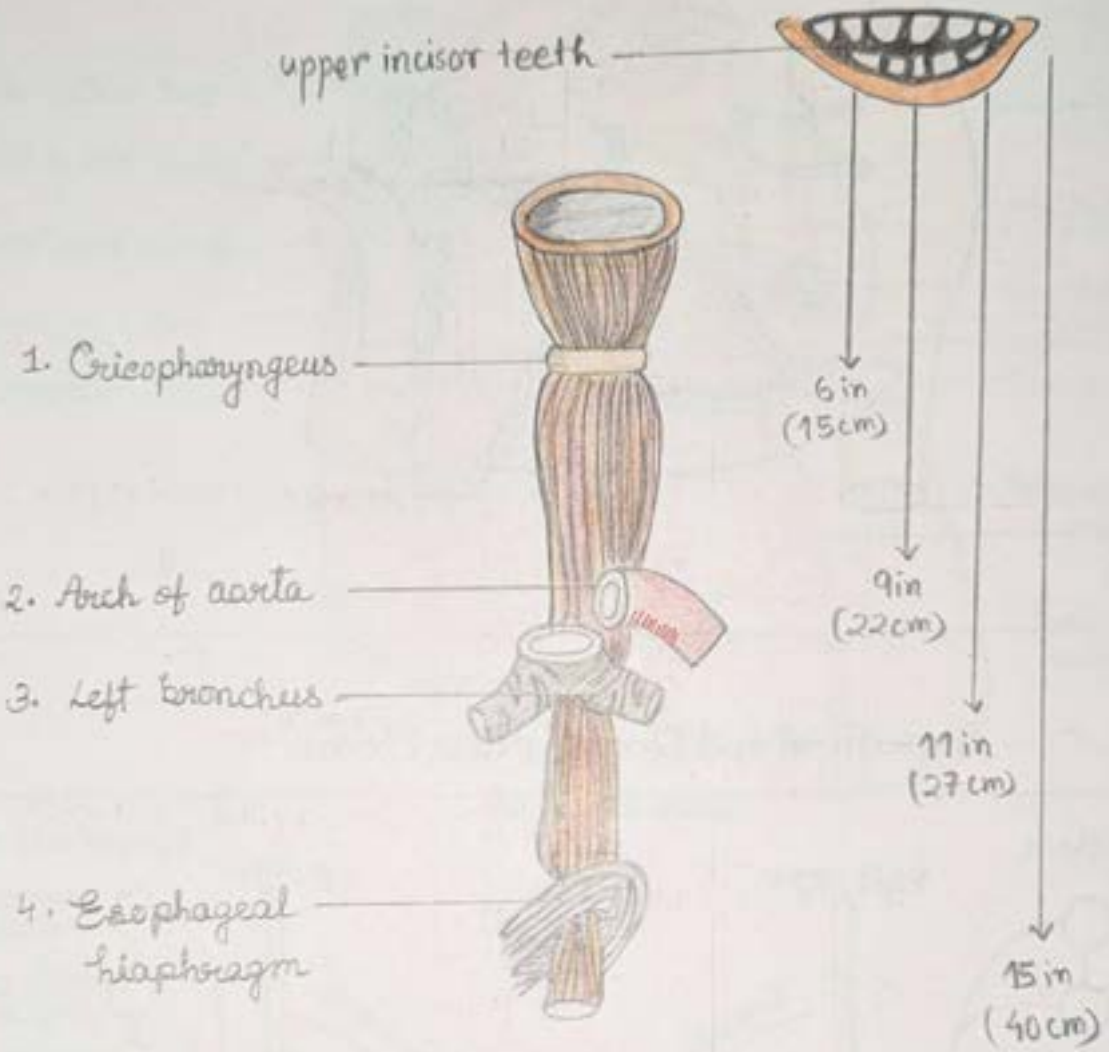
Venous Drainage of Heart



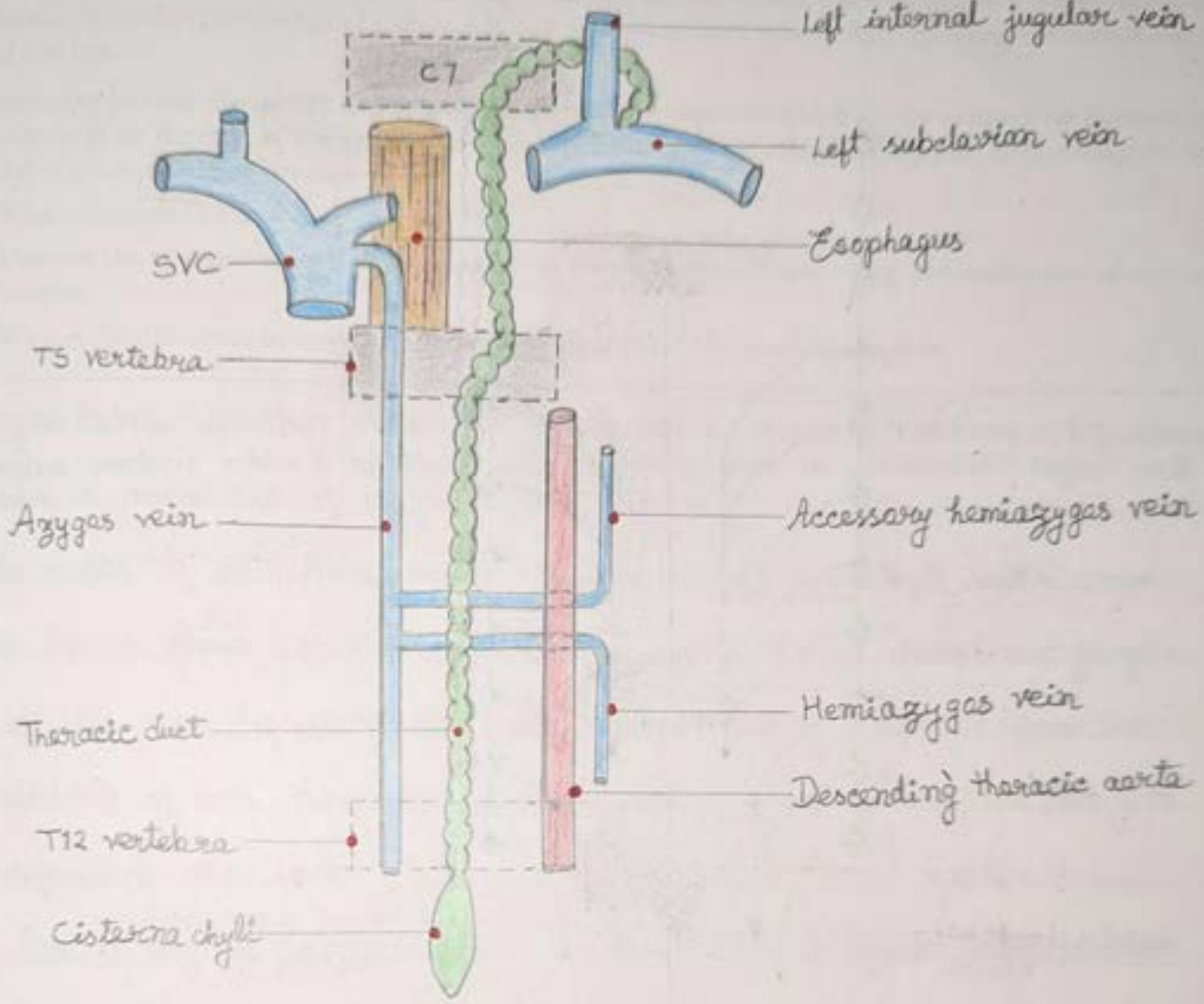
Superficial and Deep Cardiac Plexus



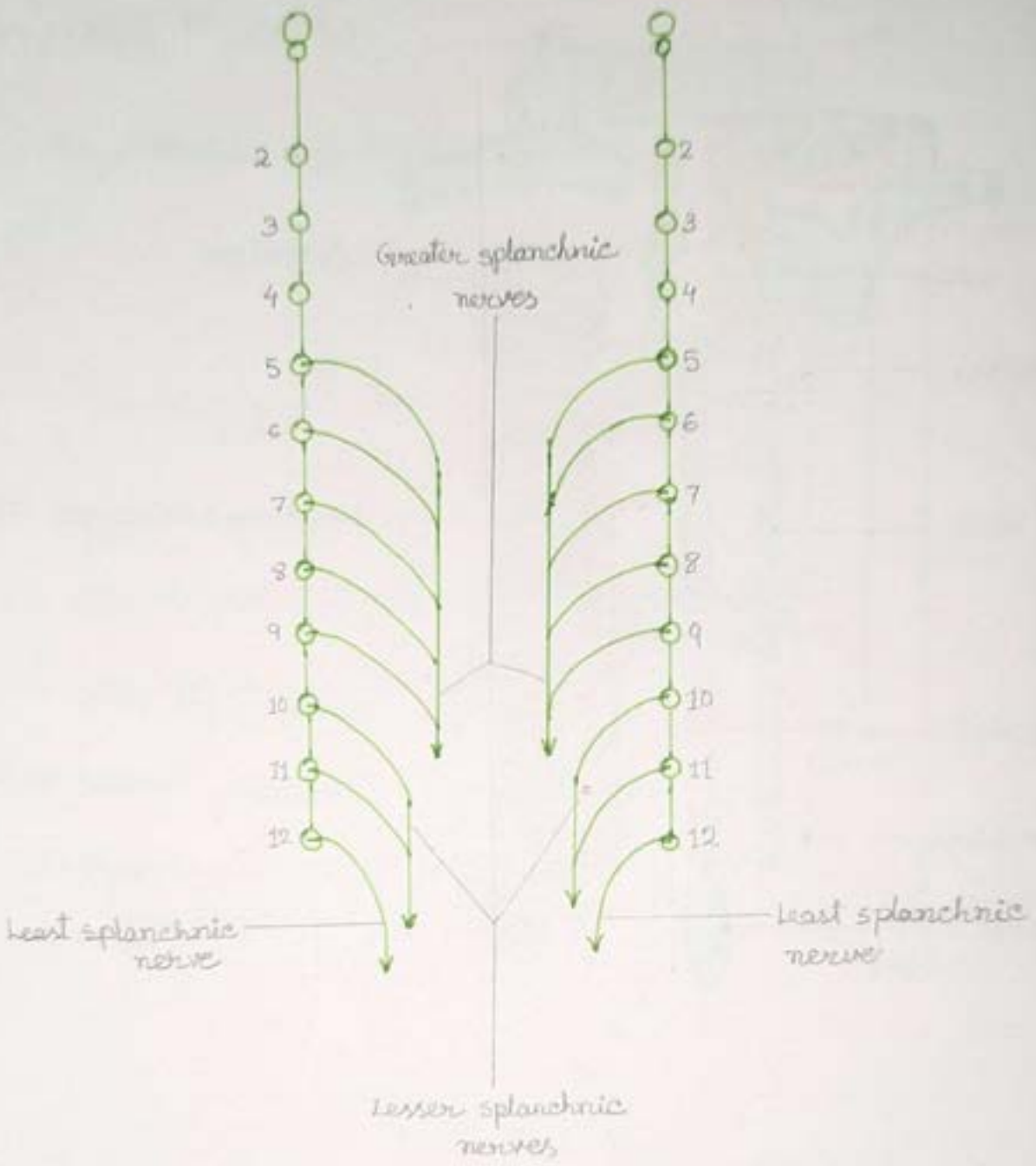
Sites of Esophageal Constrictions



Formation of Thoracic Duct



Thoracic Sympathetic Trunk and Splanchnic Nerves



Clinical Case-1

A 67 yr old man visited a cardiologist and complained that he was feeling pressure/tightness within his chest, accompanied by profuse sweating and pain in left side area above heart which radiating along the medial side of arm and forearm.

On questioning he told that earlier also he suffered from such symptoms which always occurred on exertion e.g. When climbing or digging in the garden. He also told that these symptoms disappear after resting he was diagnosed as a case of angina pectoris.

Q.1 What is Angina Pectoris?

Q.2 Mention the anatomical basis of the pain felt in the precordium/heart region and medial side of arm and forearm.

Q.3 What is the difference between Pain in angina pectoris and Myocardial Infarction.

1. Angina Pectoris - Incomplete obstruction, usually due to spasm of coronary artery causes angina pectoris which is associated with agonising pain in pericardias region and down to medial side of left arm and forearm.

2. The axons of pain fibres conveyed by the sensory sympathetic cardiac nerves reach thoracic ~~fibres~~ five segment of spinal cord mostly through dorsal root ganglia of left side since this dorsal root also recieve sensory impulse from the medial side of arm, forearm and upper part of front of chest, the pain gets ~~re~~ refered to other area.

3.

Pain in angina pectoris	Pain in myocardial infarction
- occurs on exertion and is relieved on rest.	- occurs on rest.
- Sensation of pressure or burning in chest that may last as long as 20 minutes.	- Sensation of pressure or burning in chest that lasts longer than 30 minutes.

Clinical Case-2

A 30 yr old man was brought to the casualty because of sudden onset of severe chest pain. On examination, his respiration and pulse were rapid. On auscultation, the heart sounds were faintly audible. X ray chest showed a globular enlarged shadow suggestive of fluid around heart.

Q.1 What is the most likely clinical condition?

Q.2 Name the structure where fluid is accumulated.

Q.3 What is transverse sinus and oblique sinus?

Q.4 What is area of cardiac dullness?

1. Pericarditis.

2. Fluid accumulate in pericardial cavity.

3. Transverse sinus – Horizontal gap between the arterial and venous end of heart tube. It is bounded anteriorly by ascending aorta and pulmonary trunk and posteriorly by superior vena cava and inferiorly by left atrium on each side, it opens in pericardial cavity.

Oblique sinus – It is a narrow gap between the heart tube. It is bounded anteriorly by left atrium and posteriorly by parietal pericardium and oesophagus on right and left sides → by reflection of pericardium.

4. The area of cardiac dullness is the area behind the cardiac notch of left lung which is dull on percussion.

Clinical Case-3

A 29 yr old man with history of chronic smoking reach the hospital with pain in right side of chest wall. On Auscultation there is absence of breath sound on the inferior lobe of right lung. X-ray examination reveals the presence of fluid in right pleural cavity.

Q.1 Name the clinical condition.

Q.2 Write a short note on Pleural Recesses.

Q.3 Which is the most dependent part of pleural cavity in supine and prone position.

1. Pleuritis

2. Pleural Recesses –

(A) Costomediastinal recess – It lies anteriorly behind the sternum and costal cartilage, between the costal and mediastinal pleura, particularly in relation to the cardiac notch of left lung. This recess is filled up by the anterior margin of the lung even during quite breathing. It is obvious in the region of cardiac notch of lung.

(B) Costodiaphragmatic/costovertebral recess – It lies inferiorly between the costal & diaphragmatic pleura. Vertically, it measures about 5cm and extends from the eight to tenth ribs along the mid-axillary line.

3. Most dependent part of pleural cavity is in supine & prone position is Costodiaphragmatic Recess.

Clinical Case-4

A 68 yr old chronic smoker approaches the Chest and TB department of Sharda hospital after notices blood streaks in the sputum. On history, patient informs that he has smoker cough from several years but from last 1 days cough become more productive with blood. He also indicates about weight loss. Chest X-ray reveals a mas along the left bronchus and also atelectasis in the superior lobe of left lung. Sputum analysis shows hemoptysi & malignant squamous cell.

Q.1 Name the clinical condition.

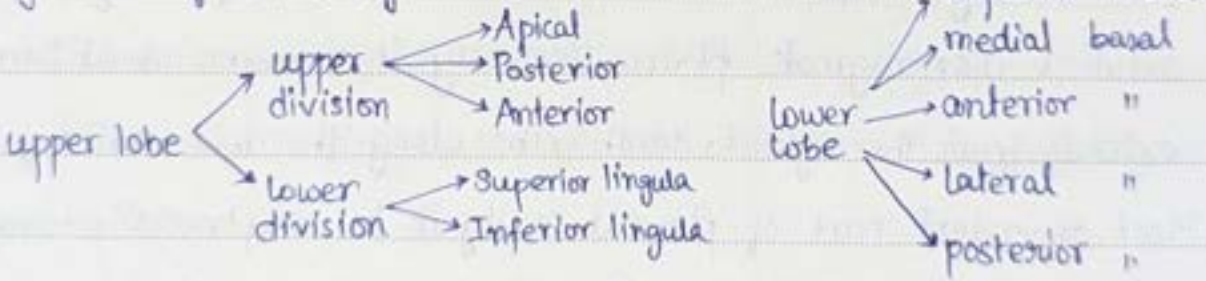
Q.2 Write a short note on bronchopulmonary segments of left lung.

Q.3 Which is the most dependent bronchopulmonary segment in supine position?

1. Lung carcinoma

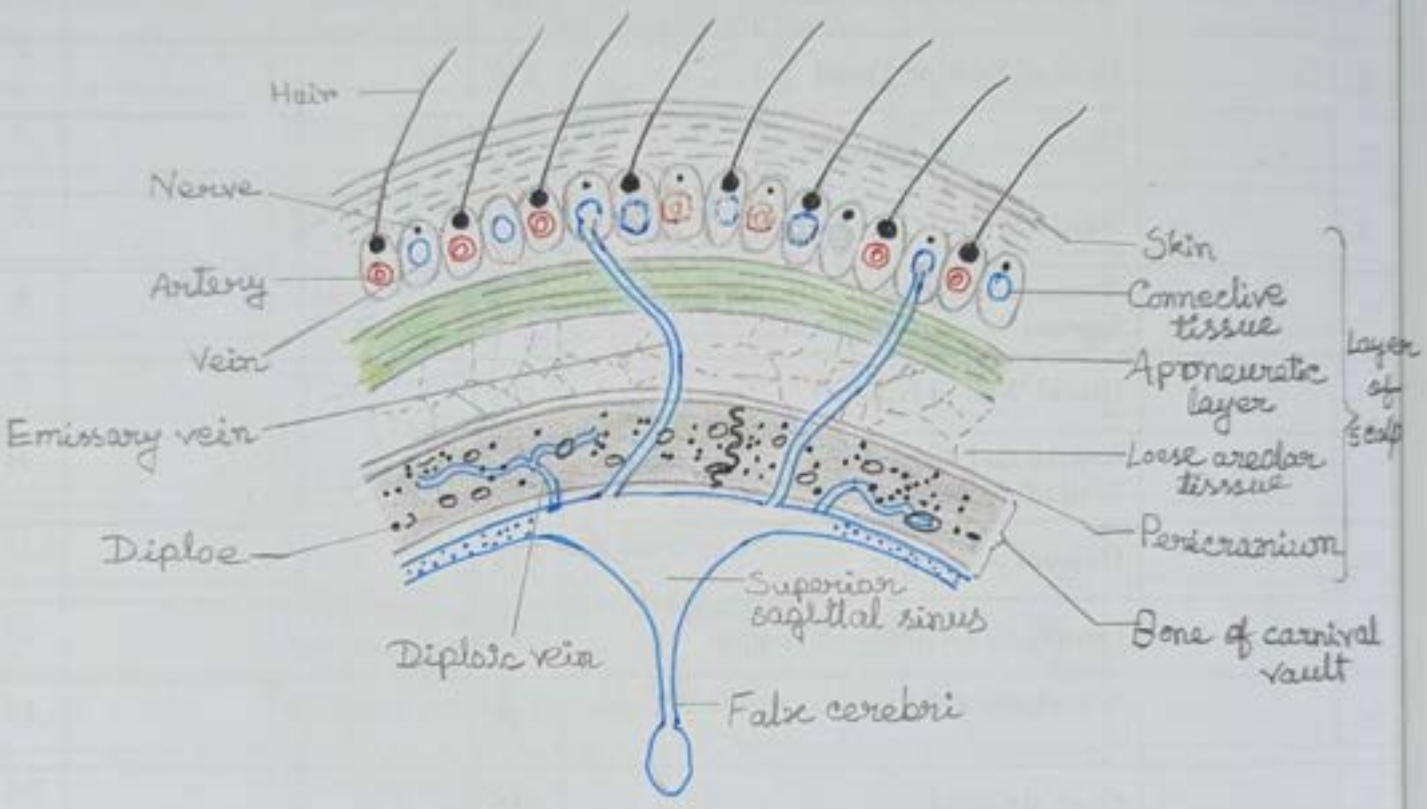
2. Bronchopulmonary segments are well defined anatomical segments aerated by tertiary bronchus. They are pyramidal in shape with apex directed towards hilum and base towards periphery having their own arterial supply but venous drainage is shared by adjacent bronchopulmonary segment.

→ Segments of left lung-



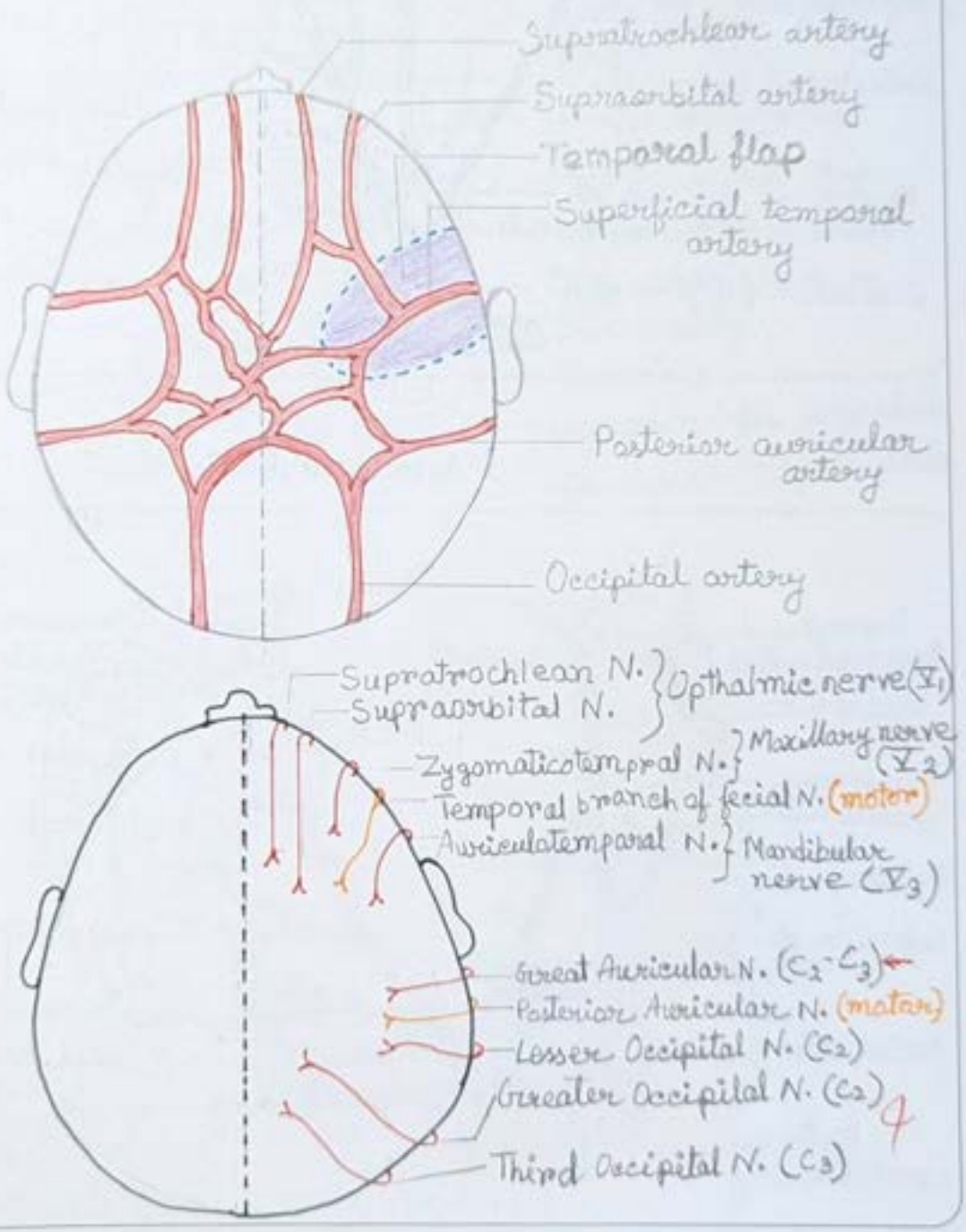
3. Most dependent bronchopulmonary segment in supine position is superior segment of lower lobe

Layers of Scalp

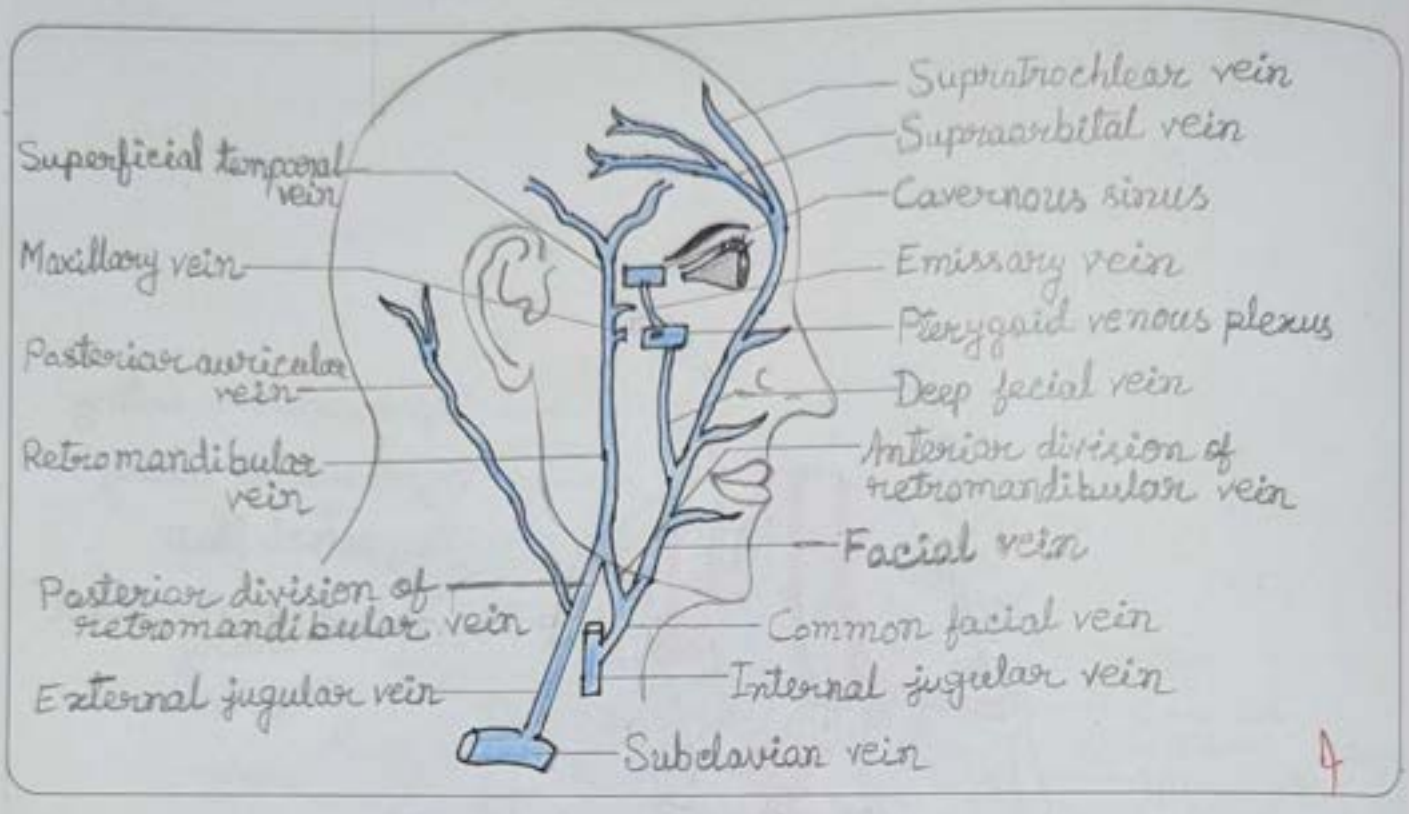


4

Arterial and Nerve Supply of Scalp



Veins of the Face and Scalp



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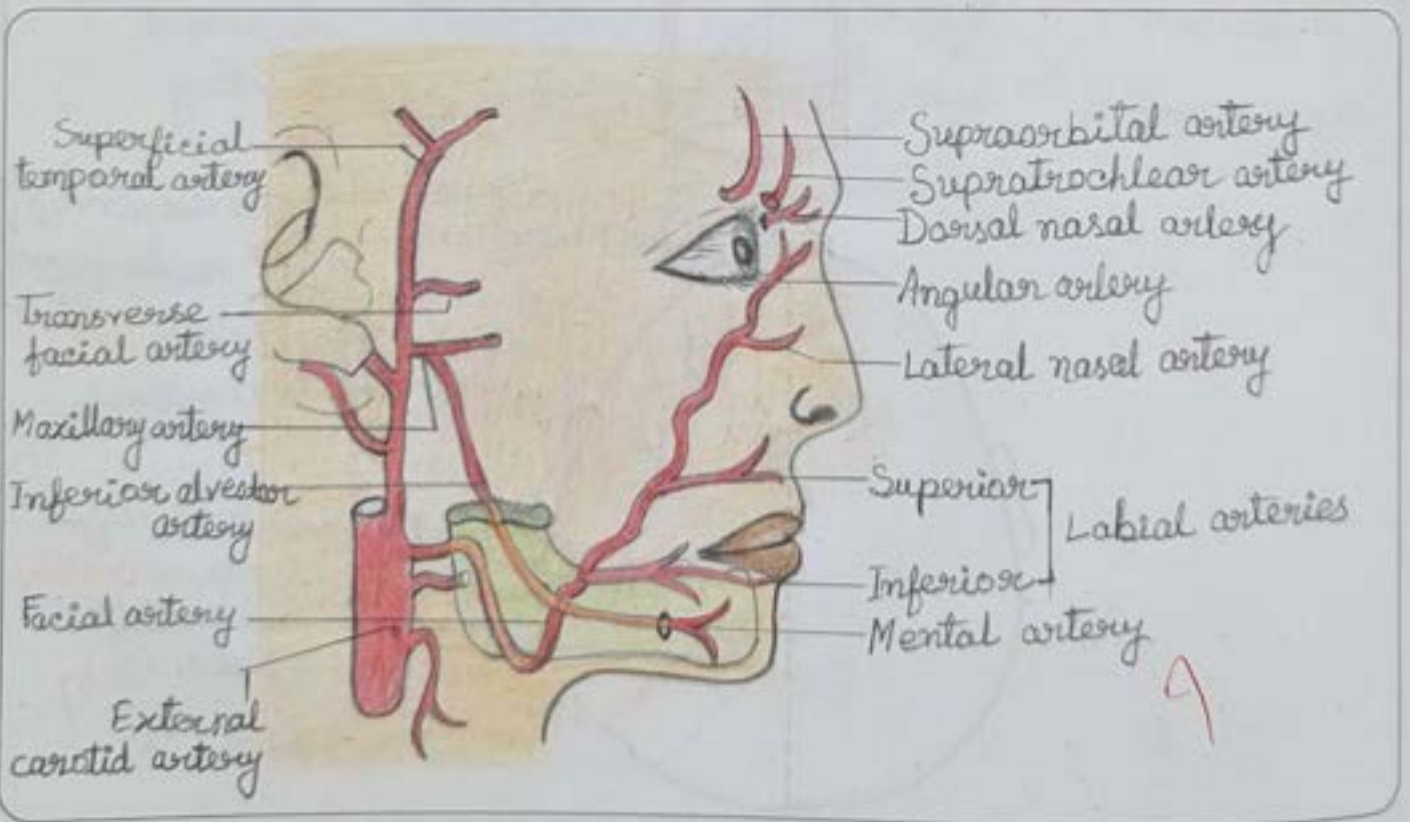
Arteries of the Face



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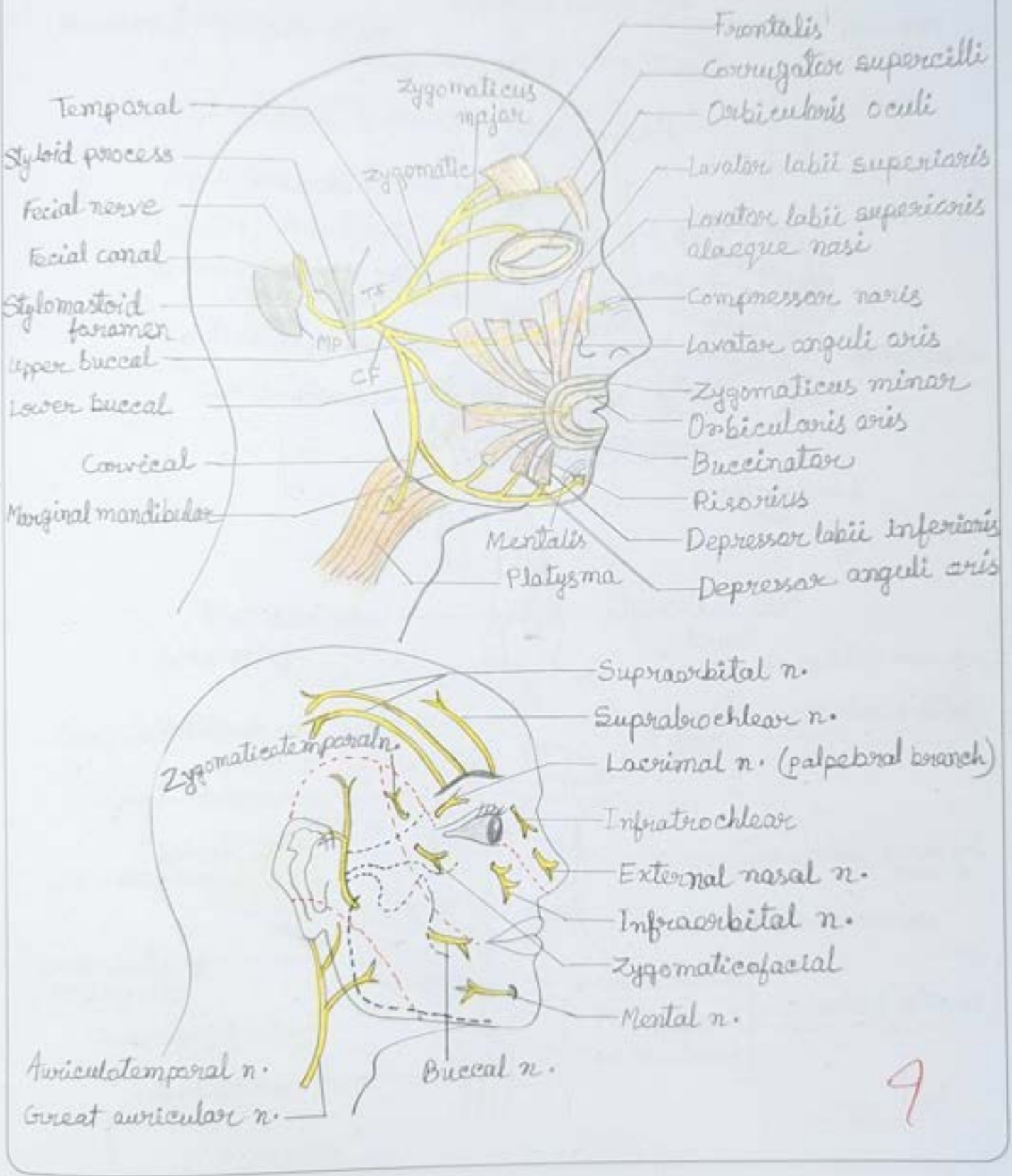
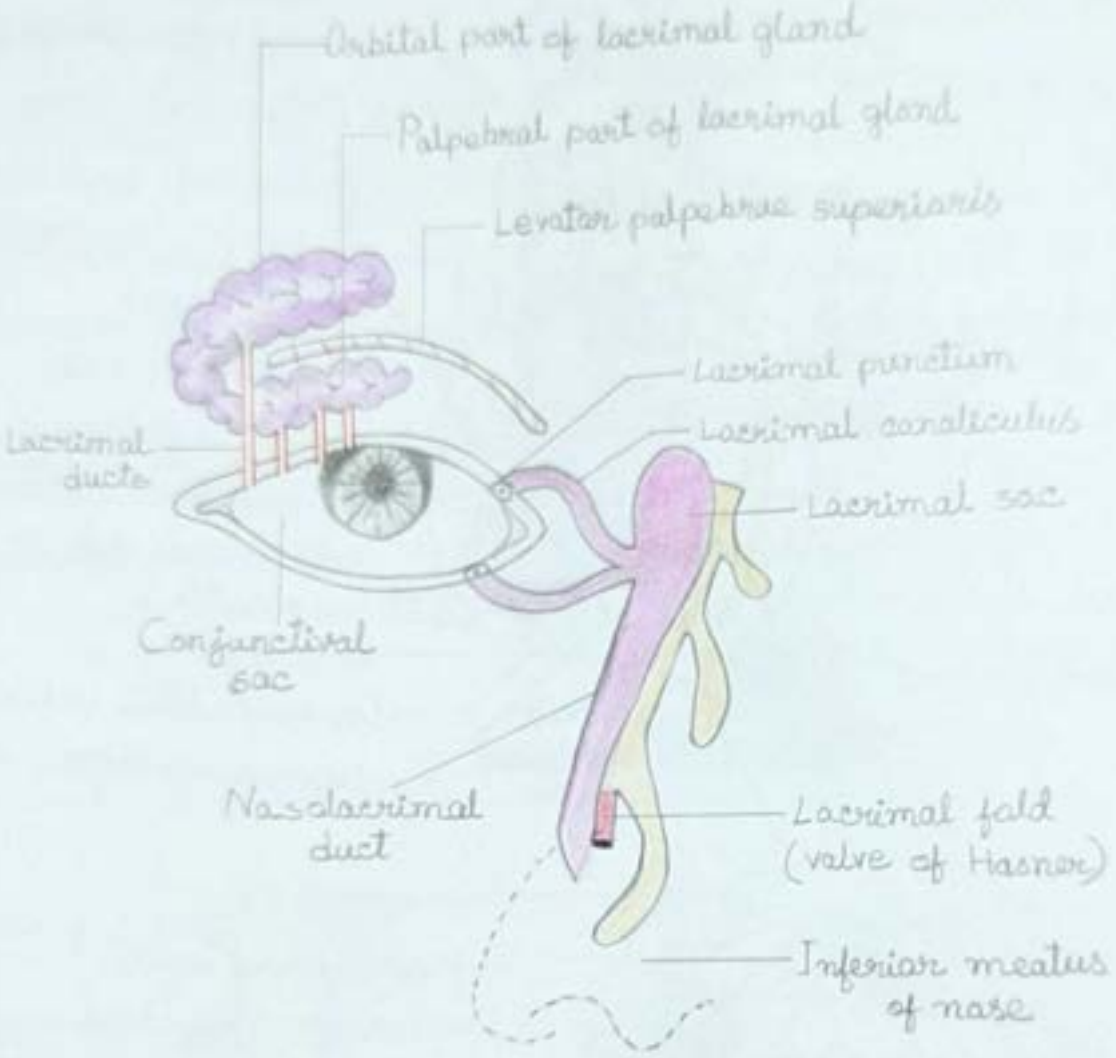
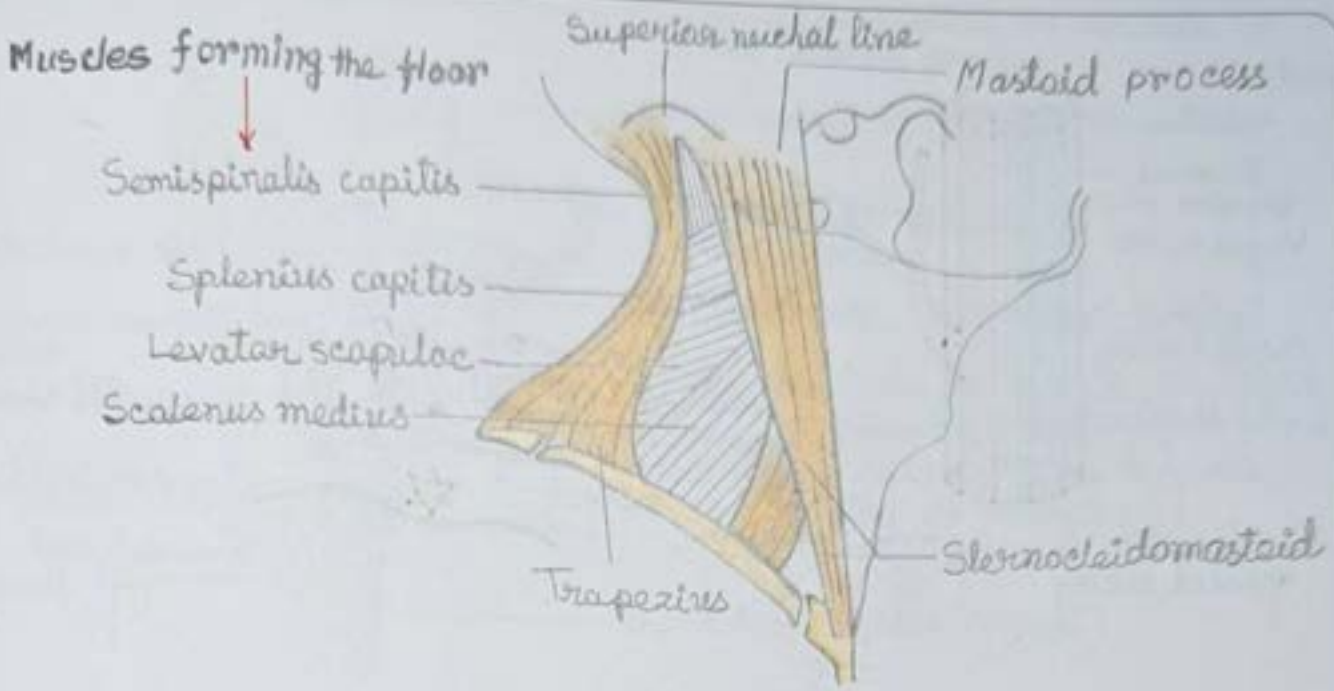
Motor and Sensory Nerve Supply of Face

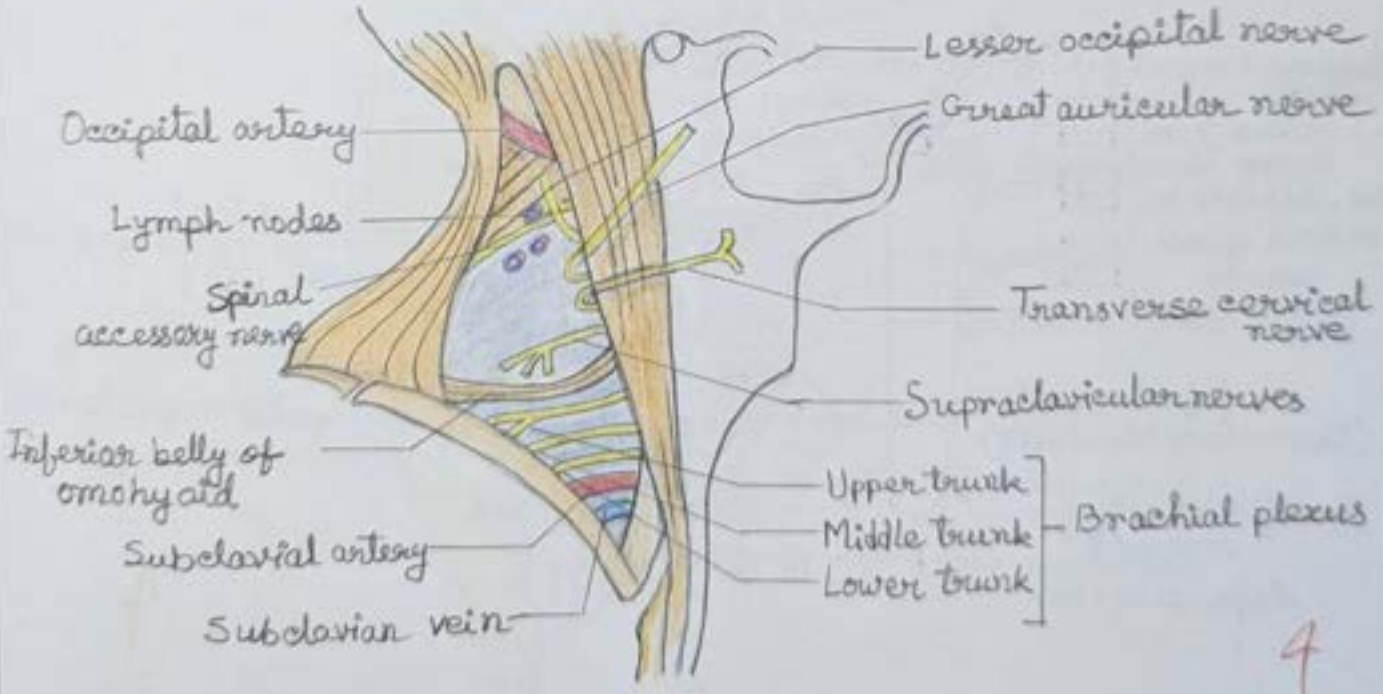


Lacrimal Apparatus



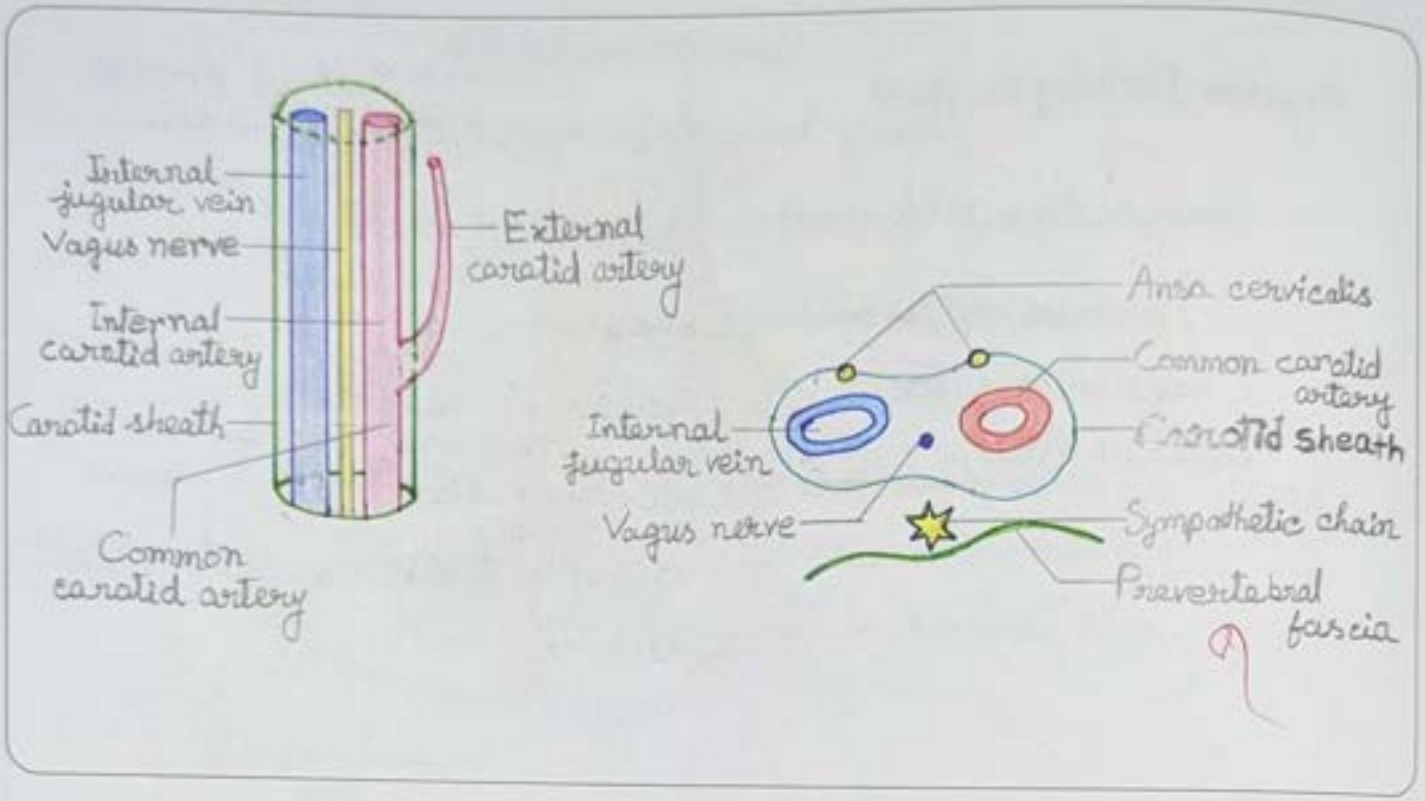
Boundaries and Contents of Posterior Triangle



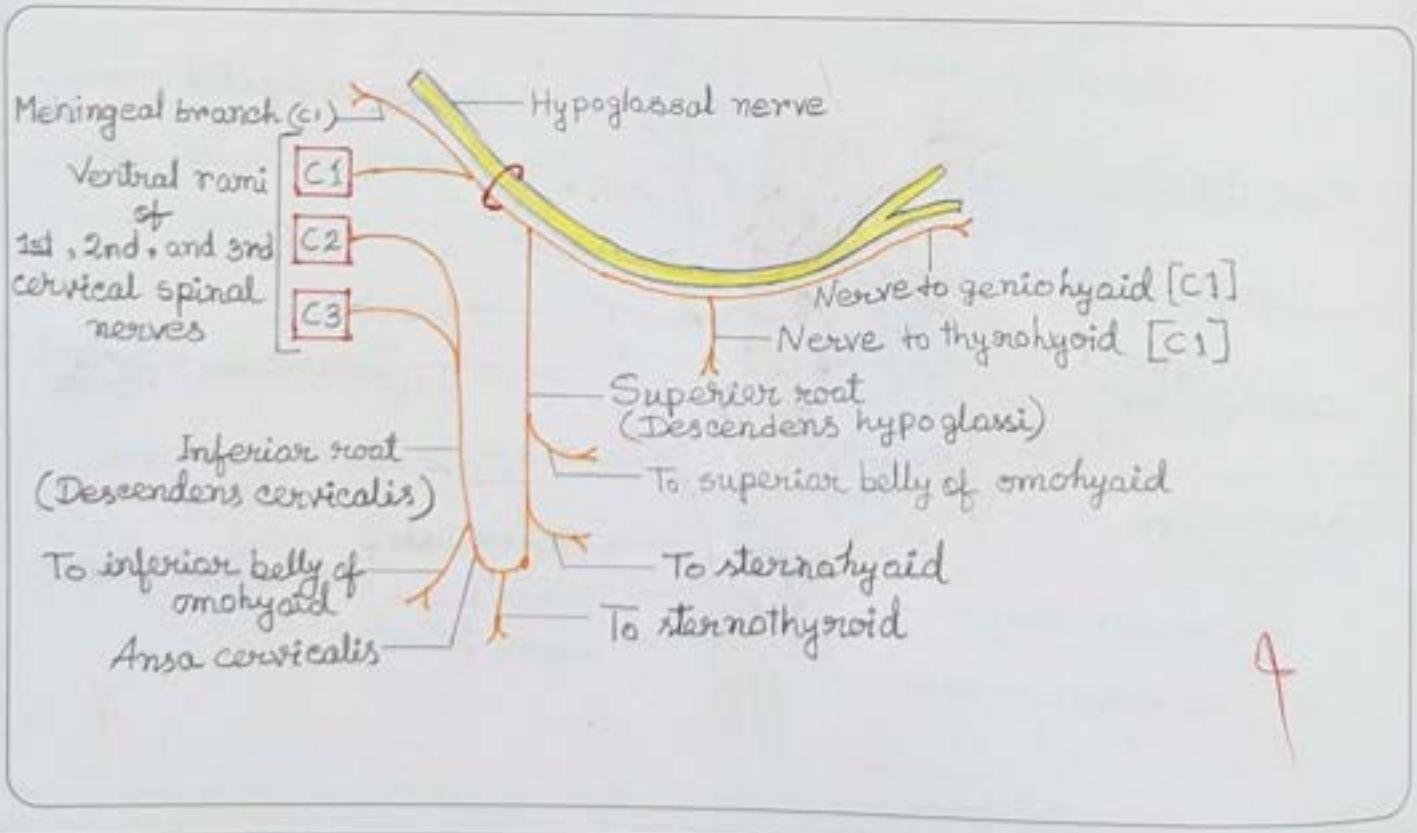


4

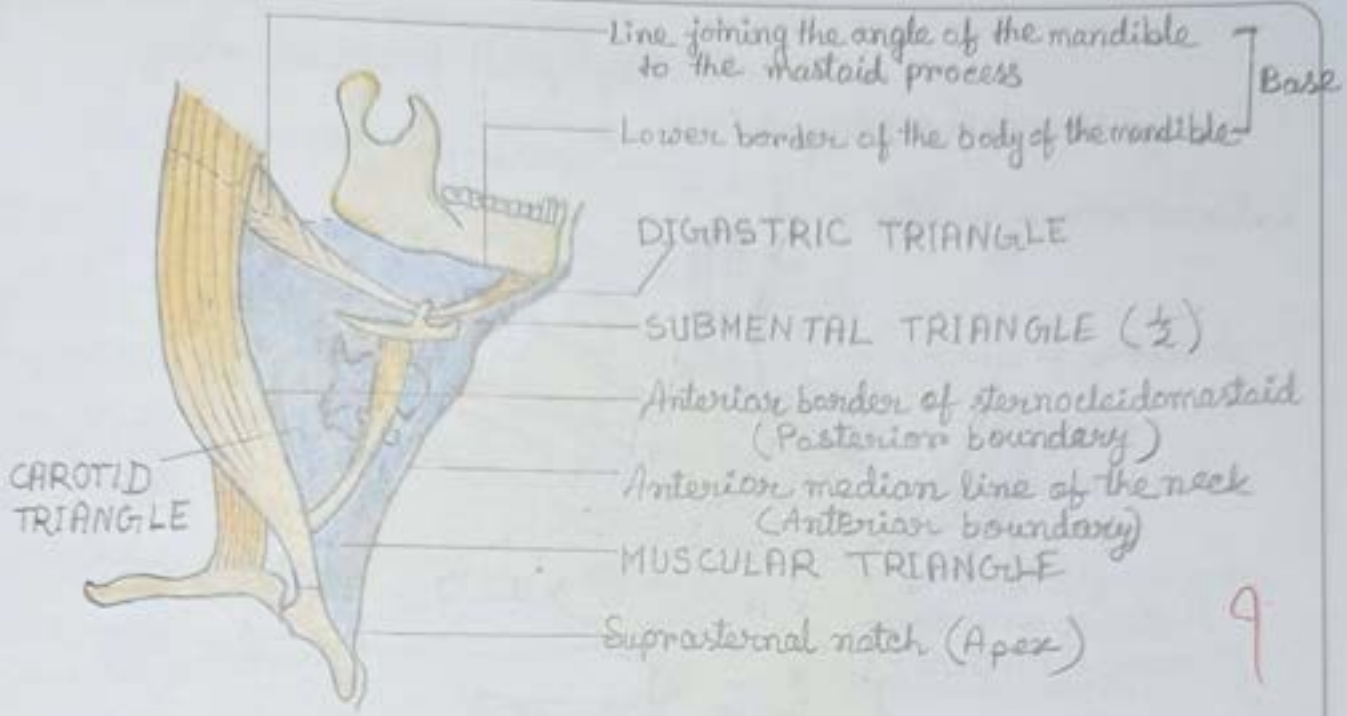
Carotid Sheath and its Contents



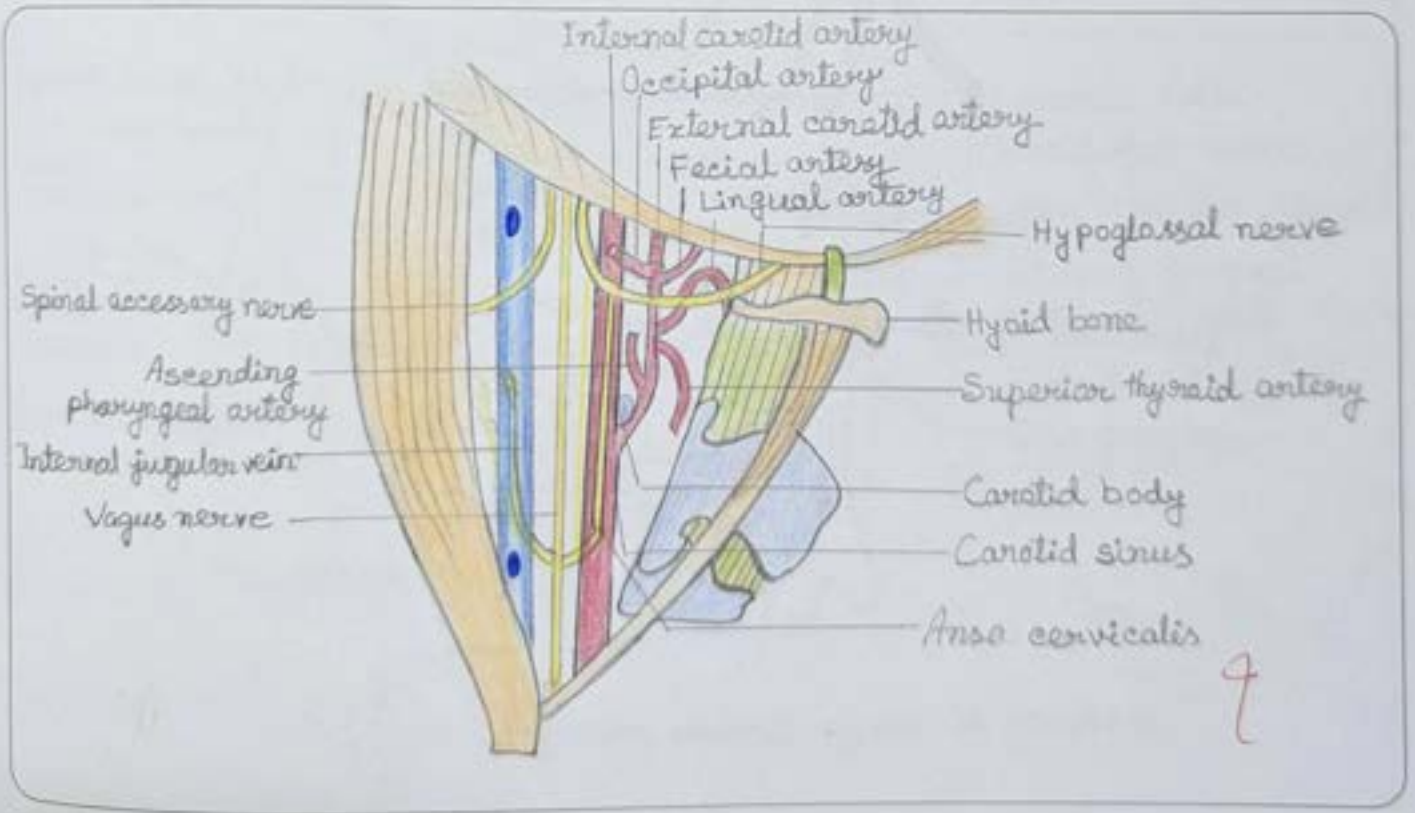
Ansa Cervicalis



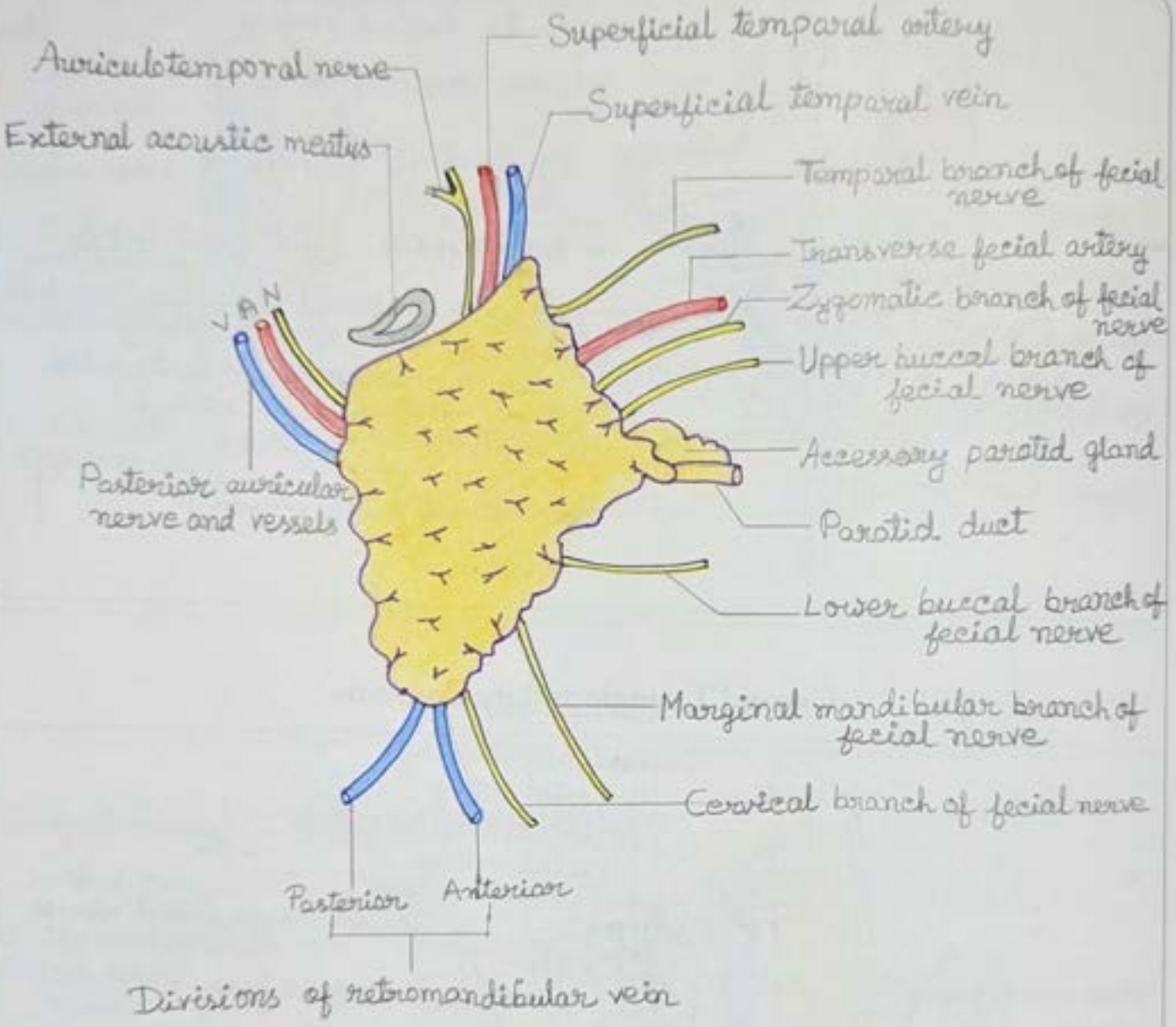
Anterior Triangle of Neck—its Subdivision



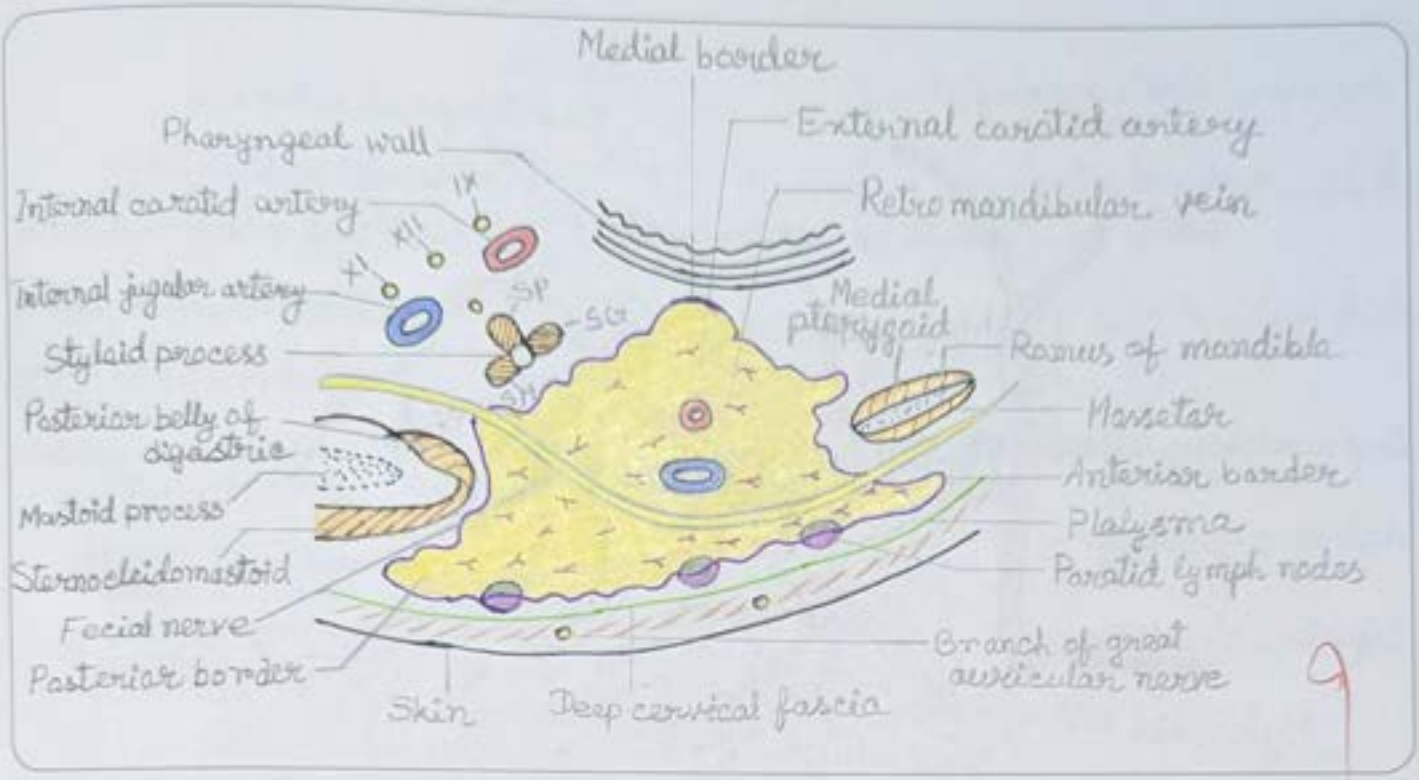
Carotid Triangle and its Contents



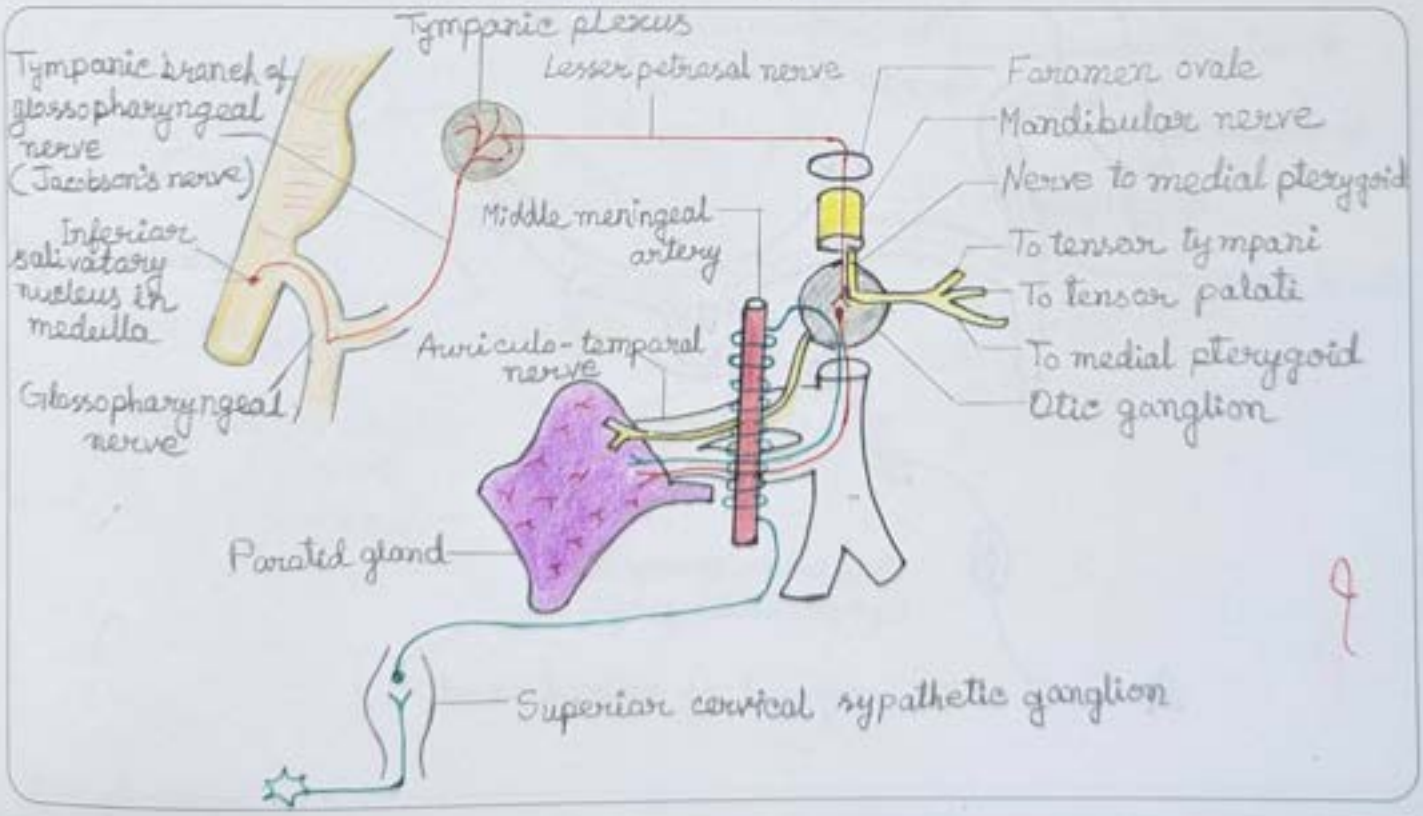
Structures Emerging at the Periphery of Parotid Gland



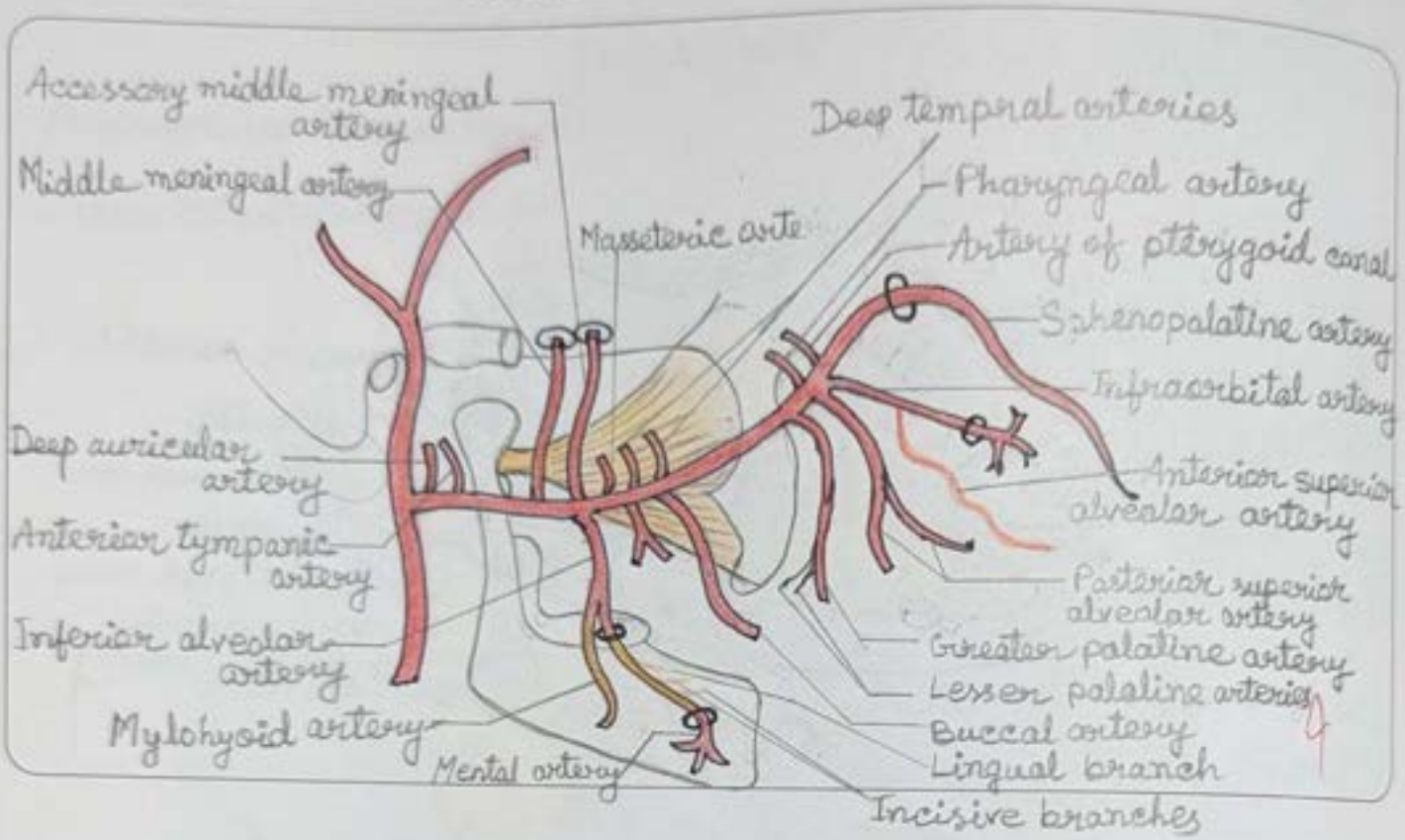
Relations of Parotid Gland



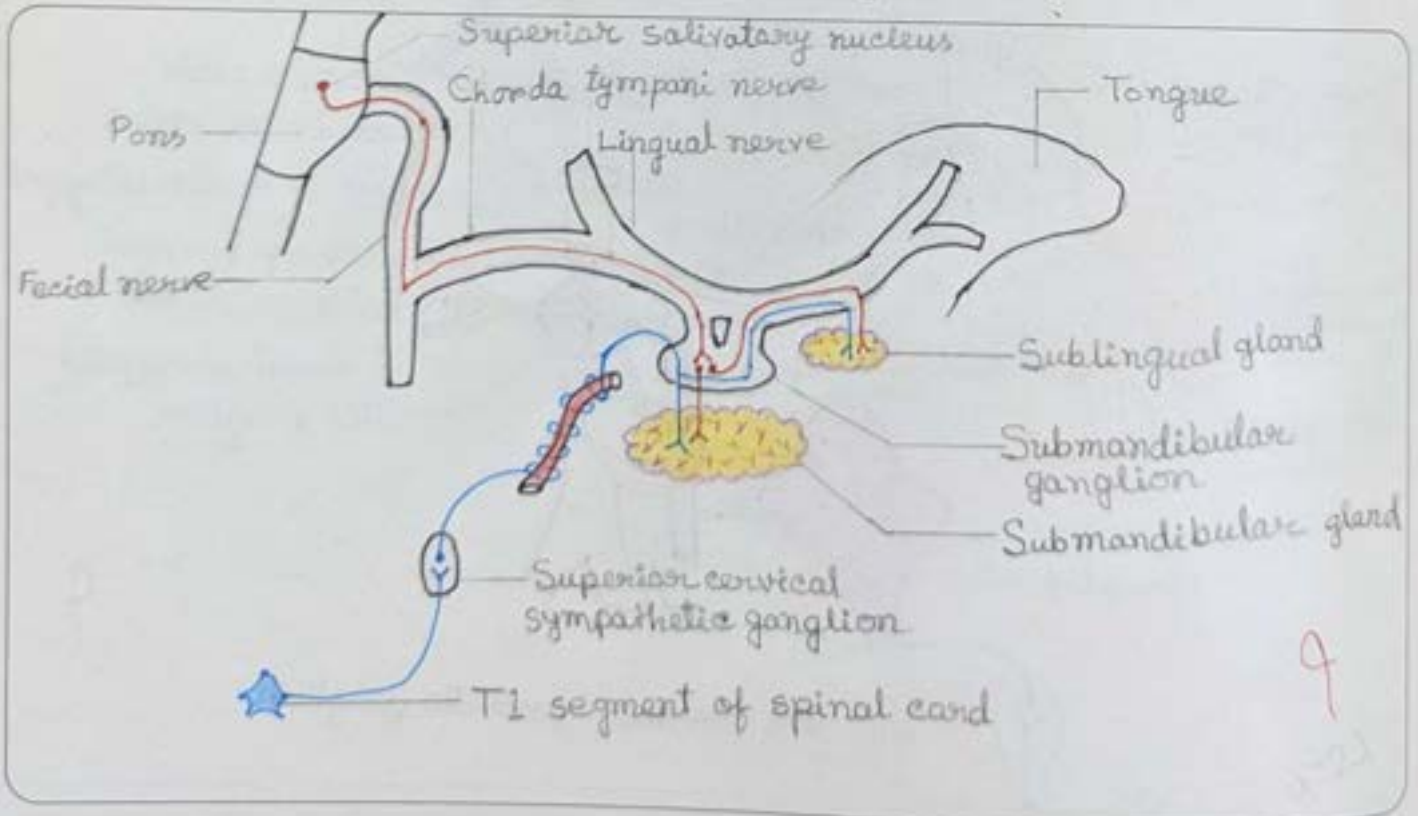
OTIC Ganglion



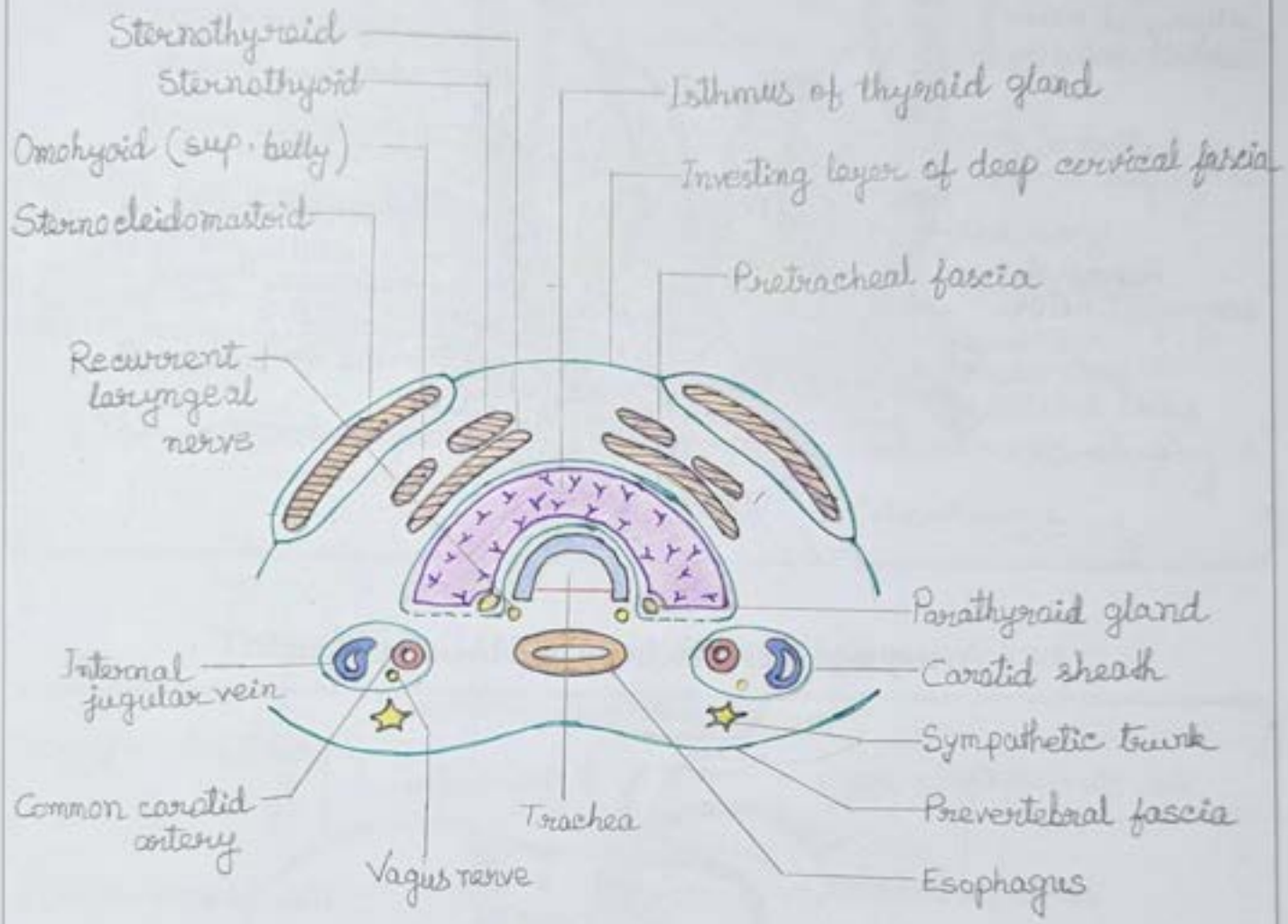
Branches of Maxillary Artery



Submandibular Ganglion



T.S. of the Neck at the Level of Thyroid Gland



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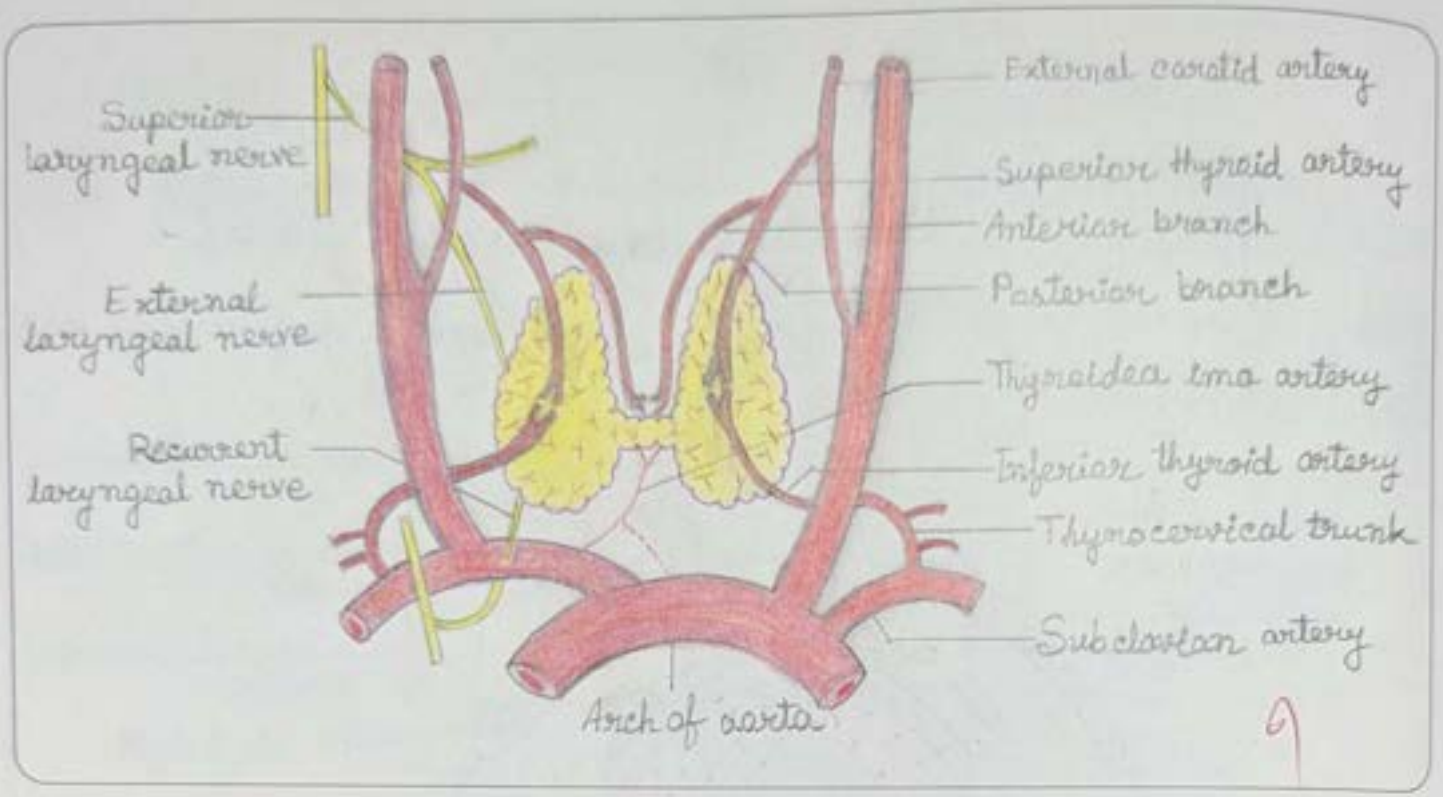
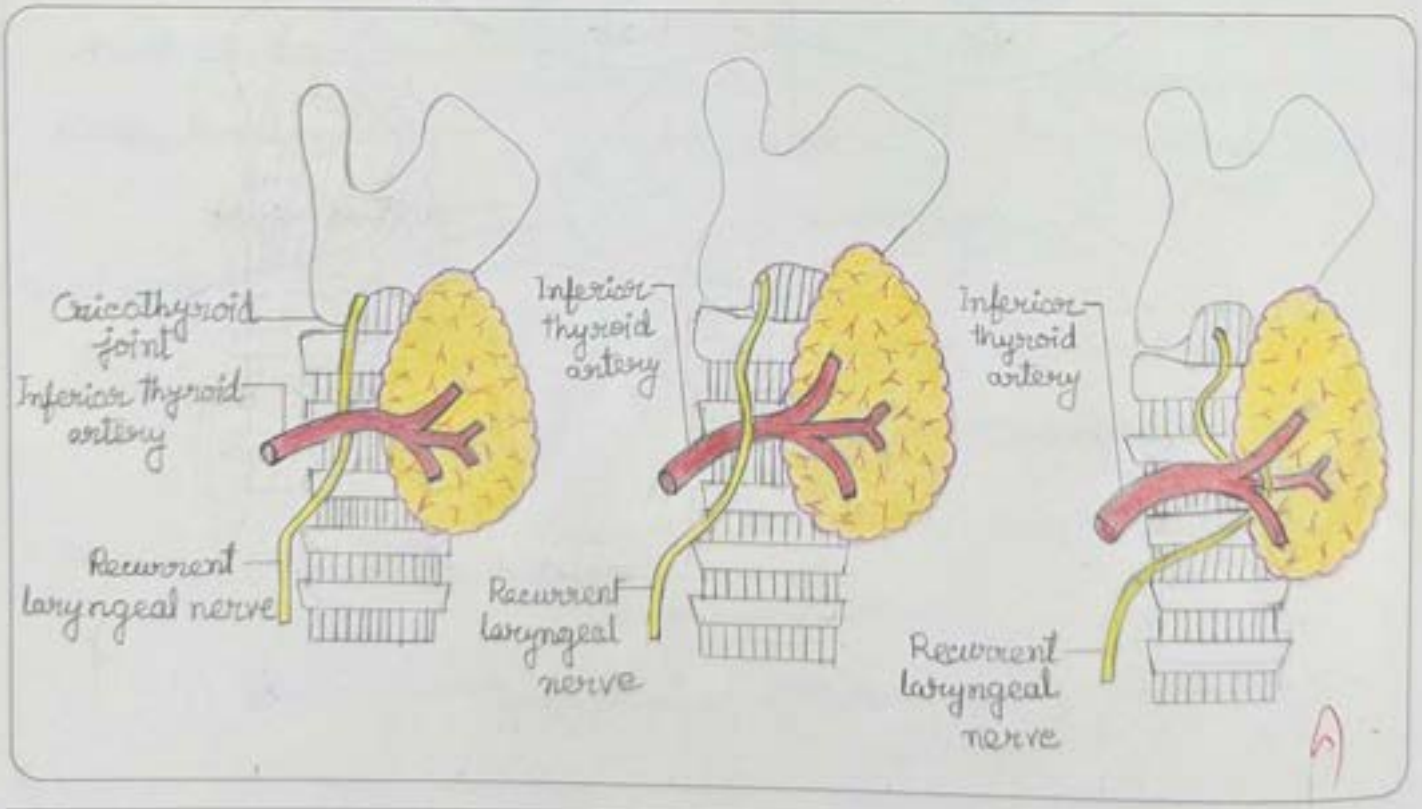
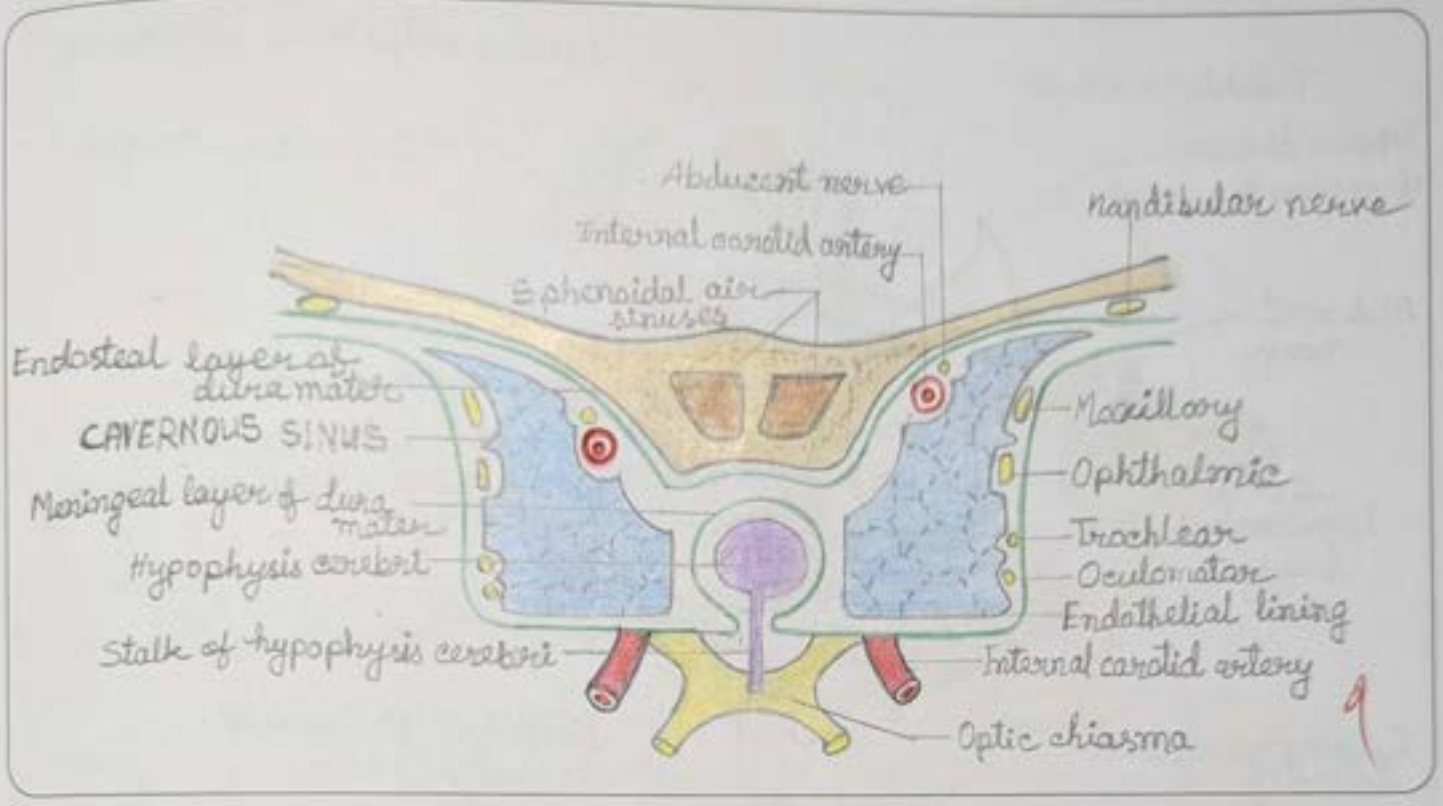
Blood Supply of Thyroid Gland



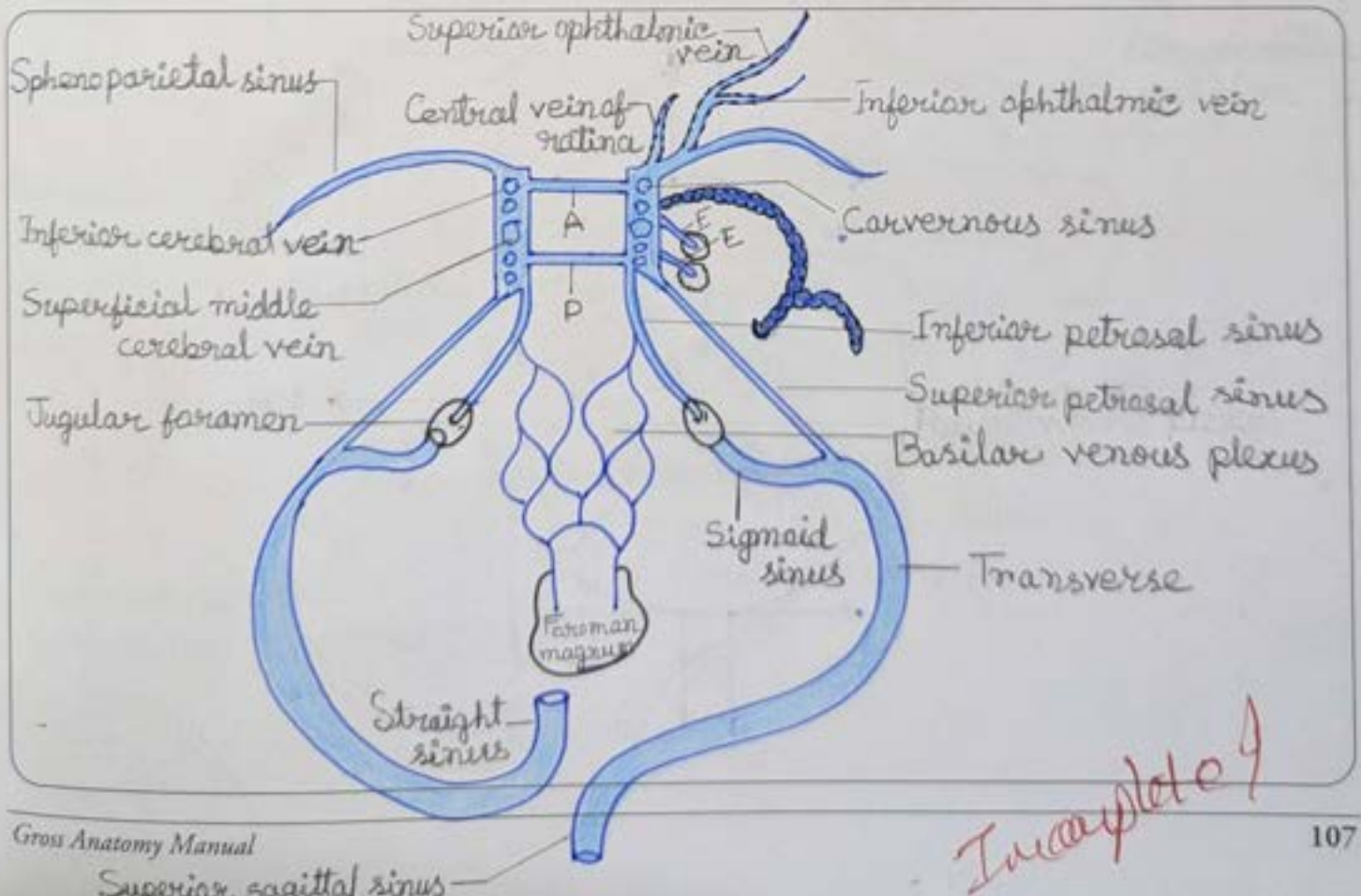
Artery and Nerve Related to Thyroid Gland



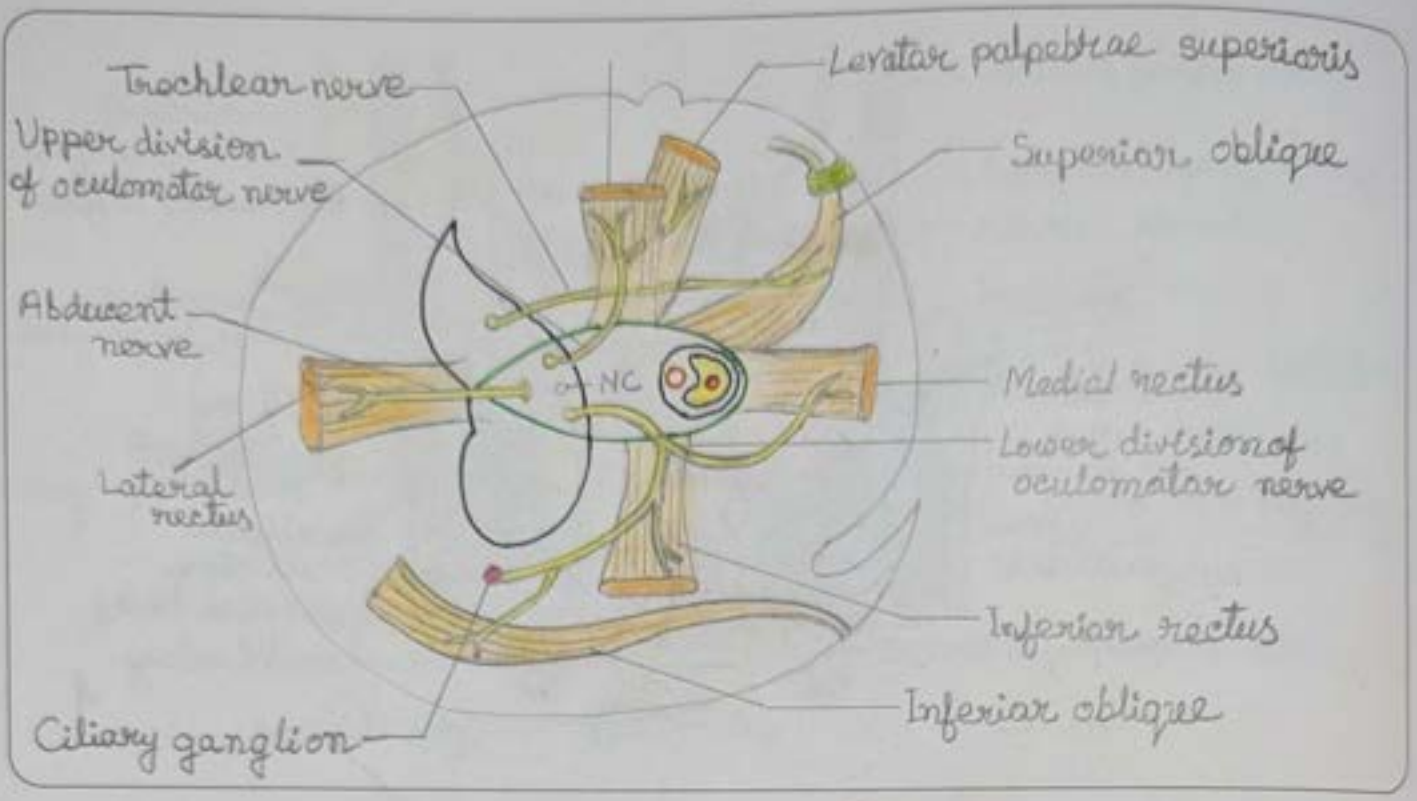
Cavernous Sinus—Relations



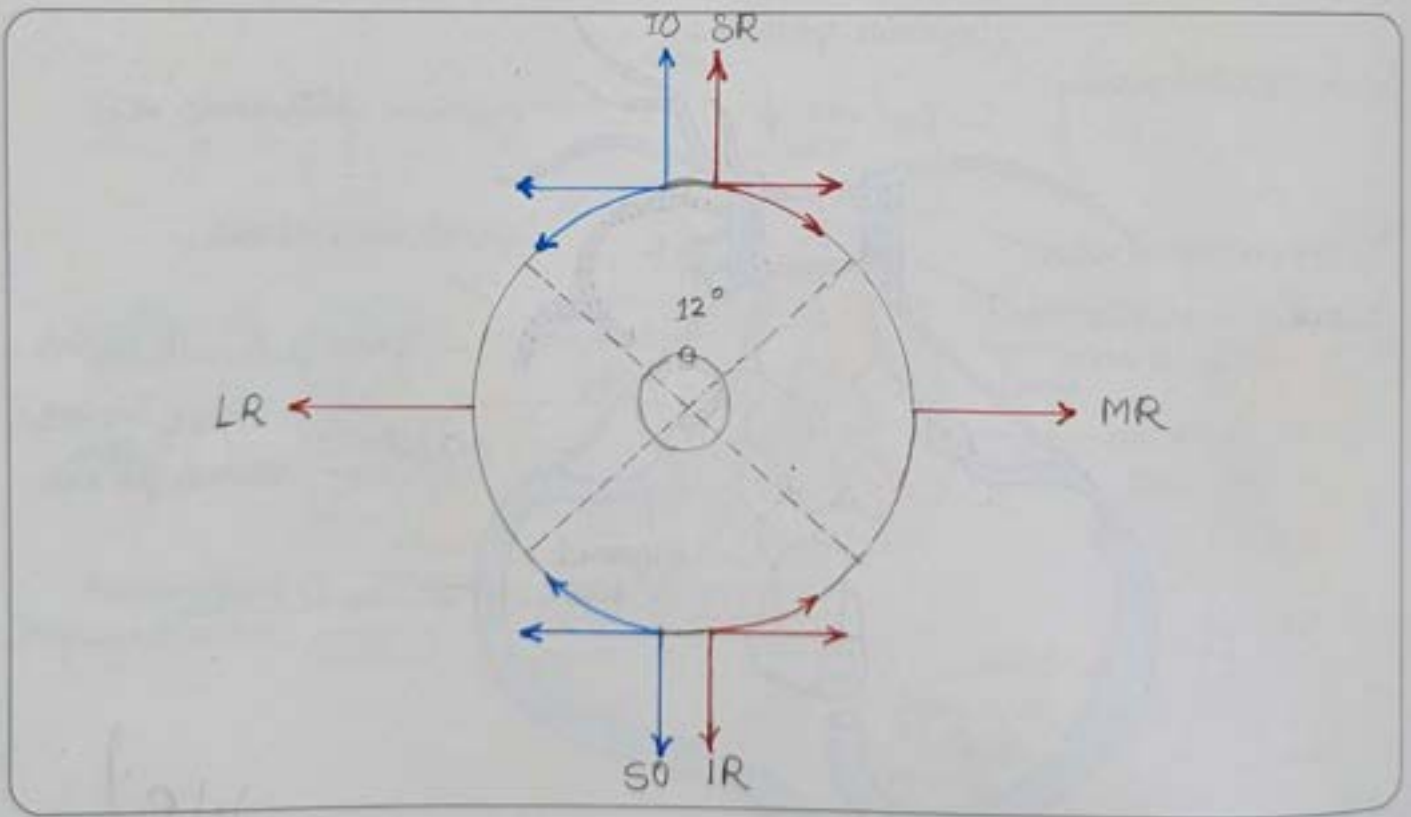
Tributaries and Communications of Cavernous Sinus



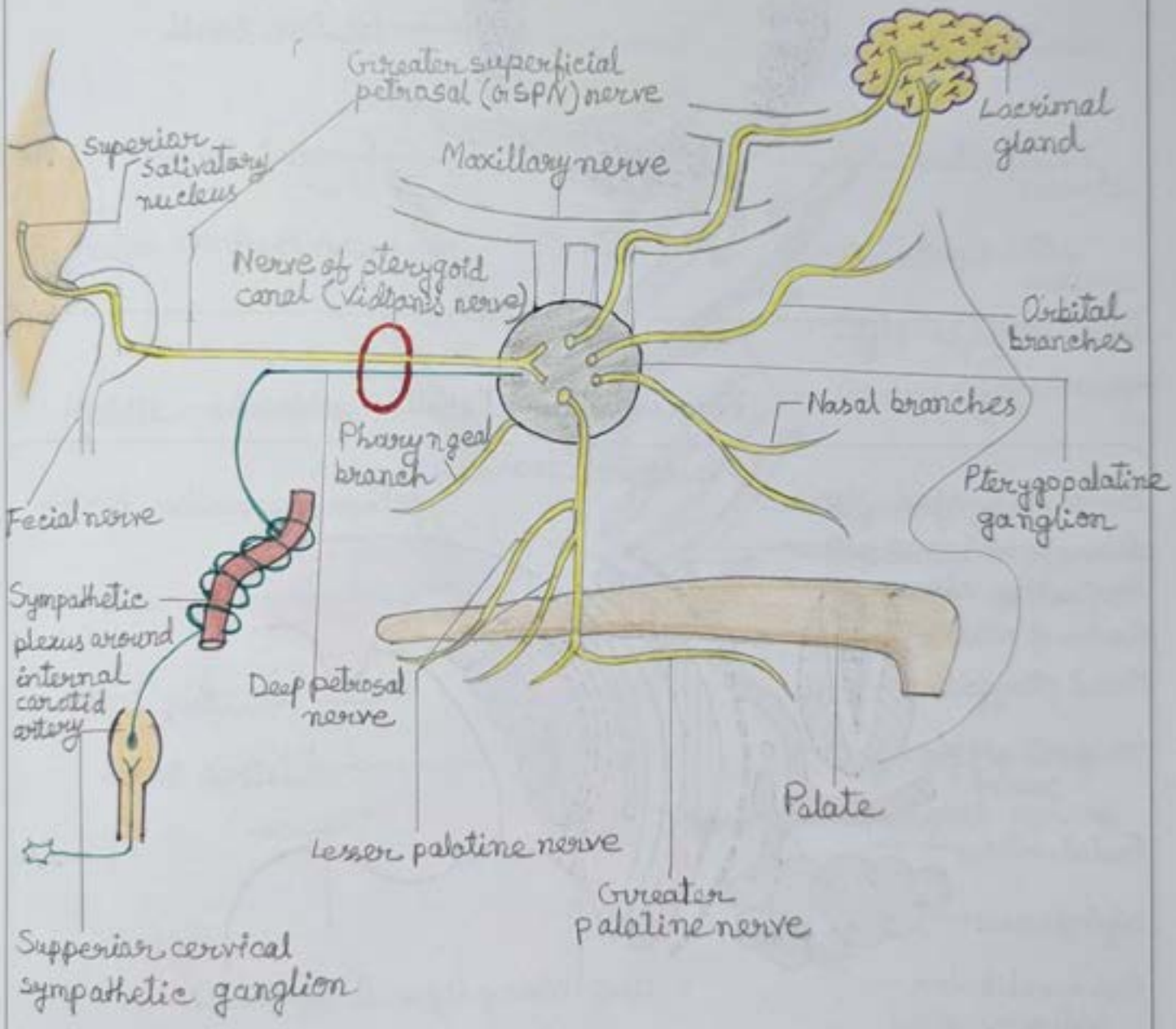
Extra Ocular Muscles—Origin from Tendinous Ring



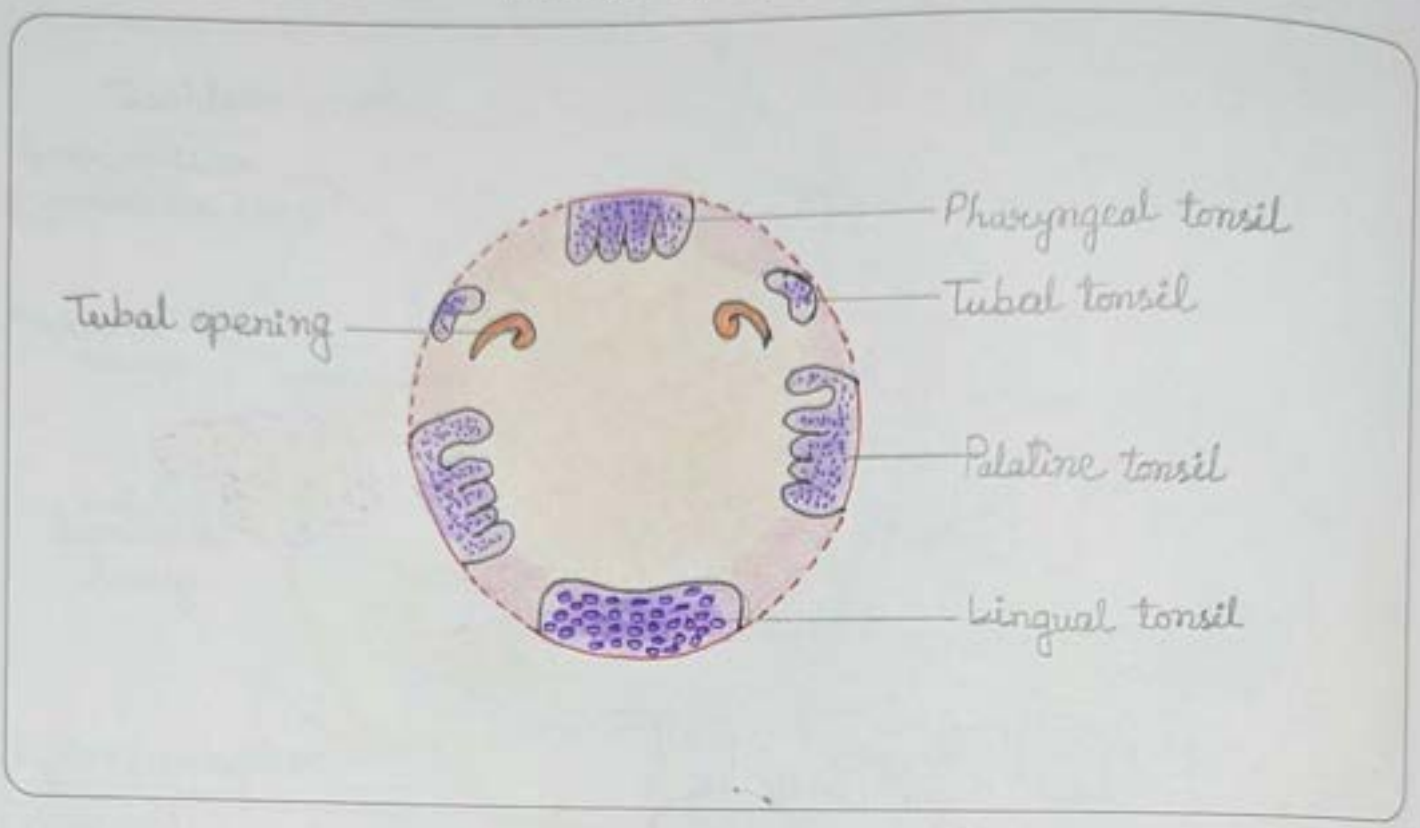
Movements of Extraocular Muscles



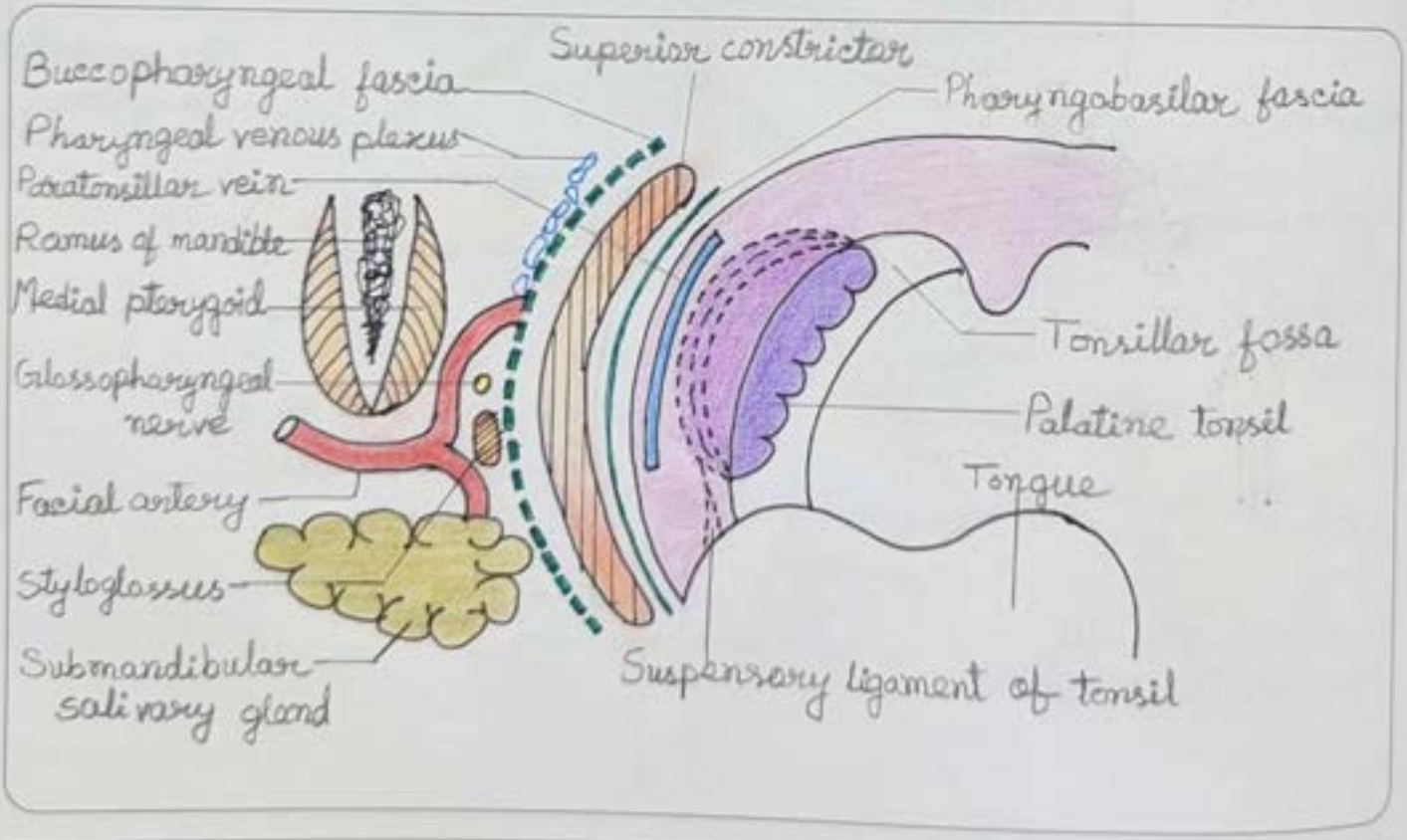
Pterygopalatine Ganglion



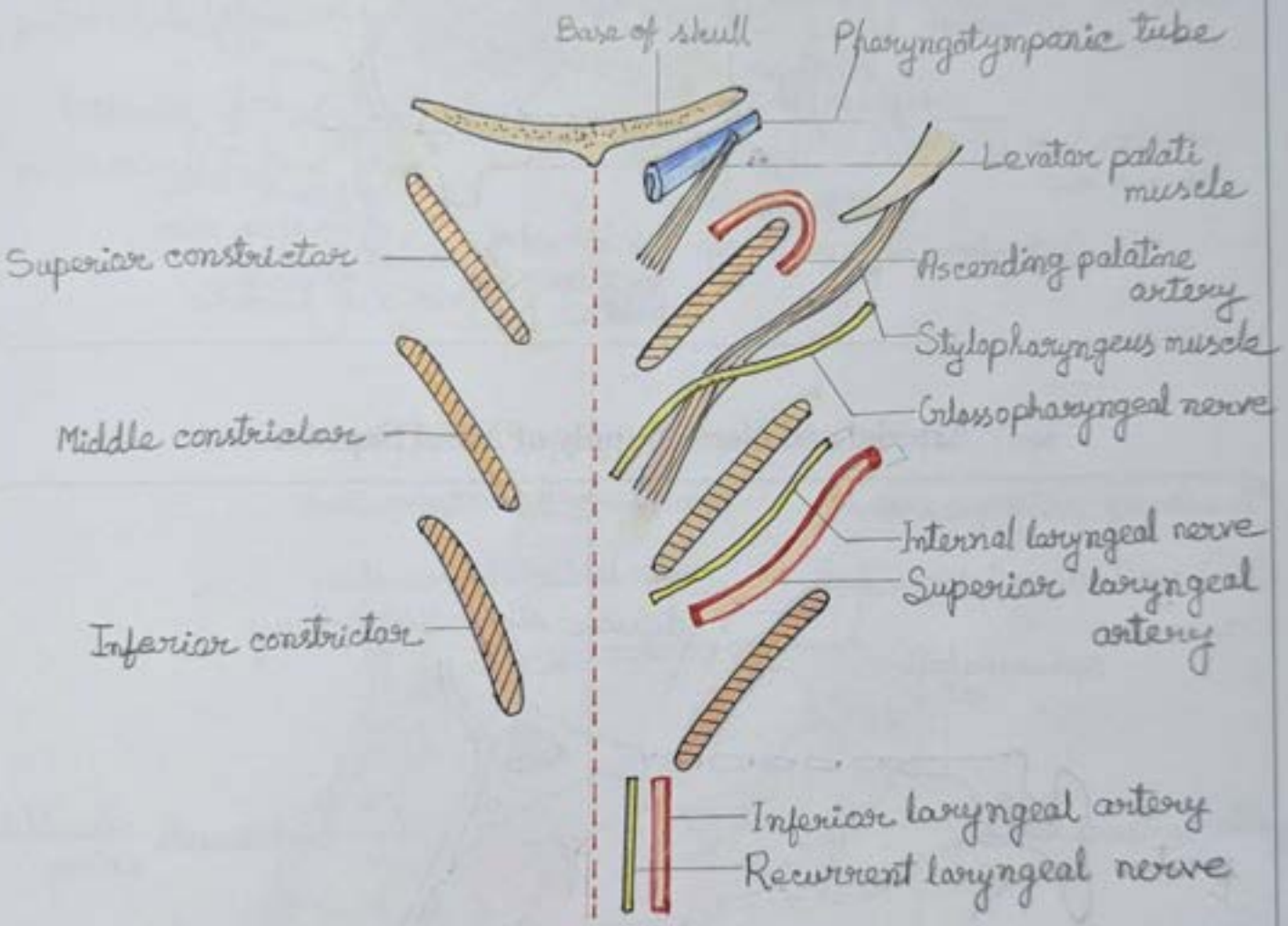
Waldeyer Lymphatic Ring



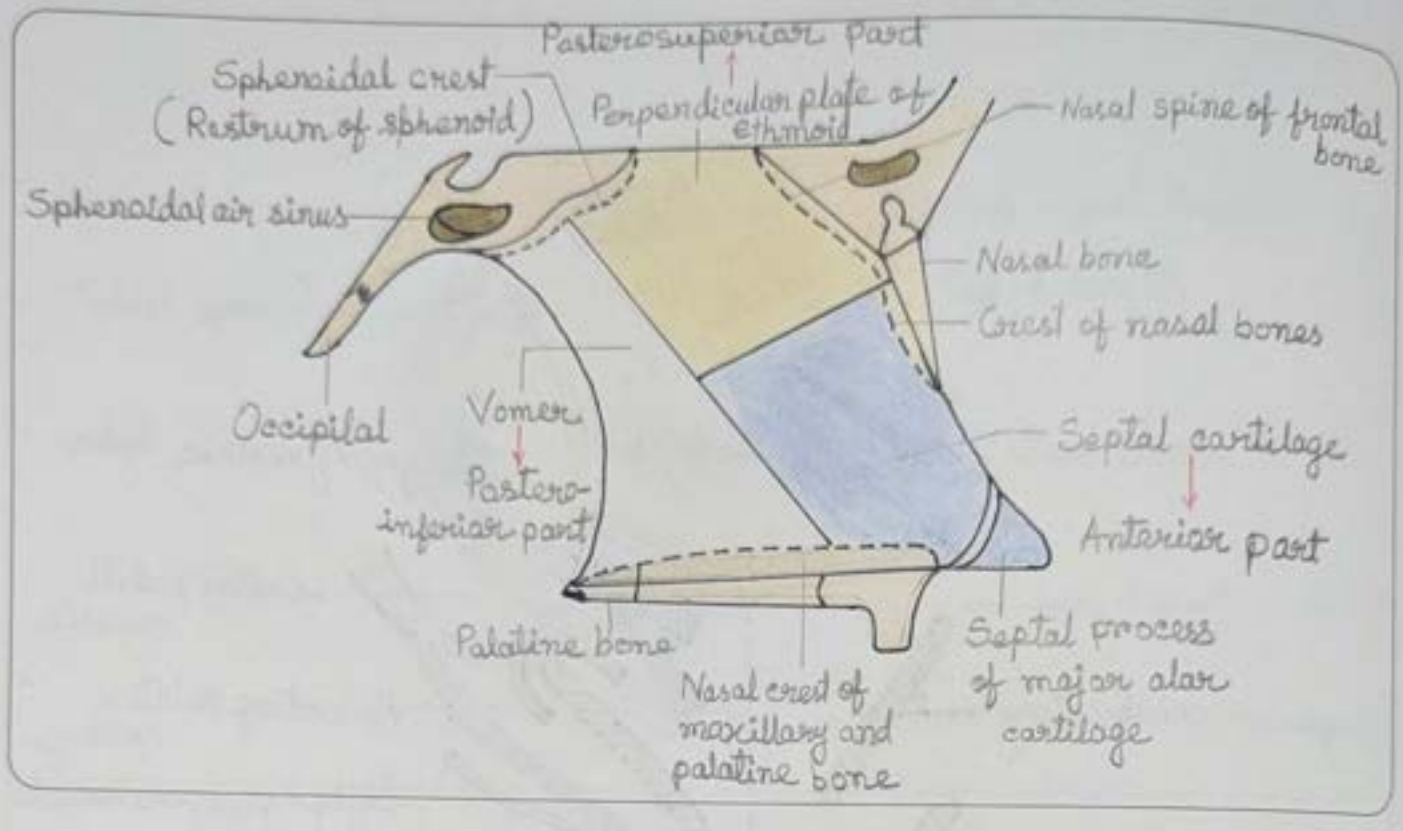
Floor of Palatine Tonsil



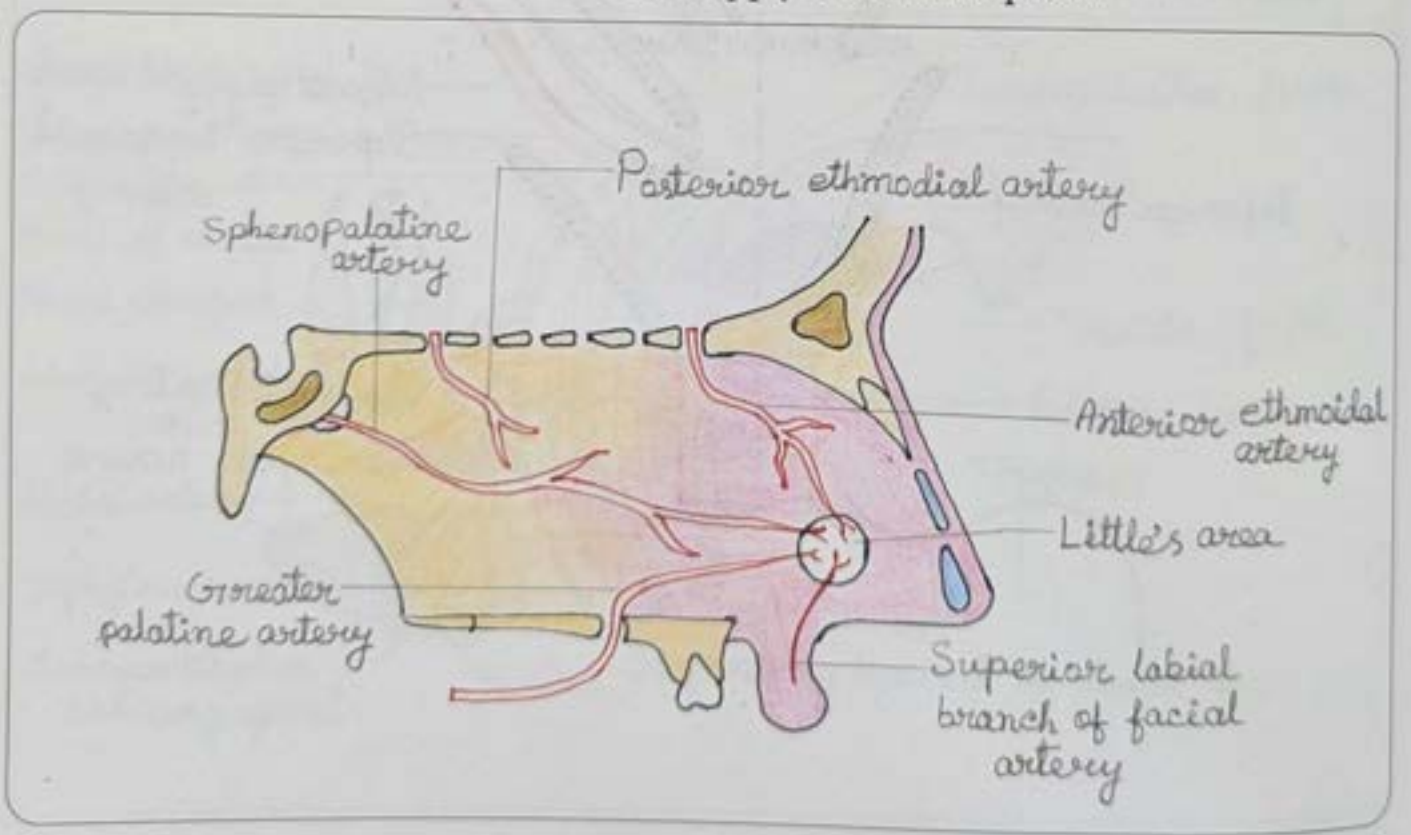
Constrictors of Pharynx



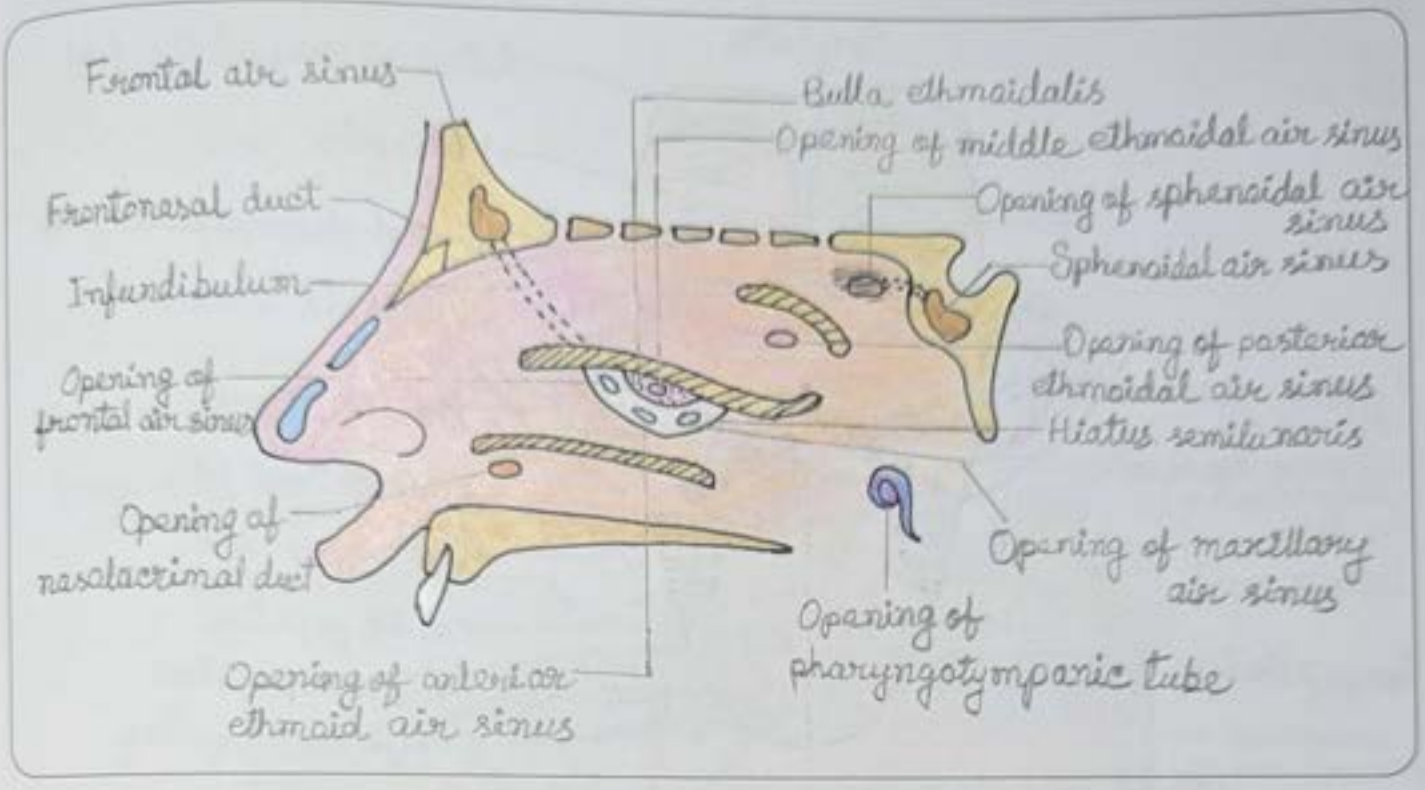
Nasal Septum



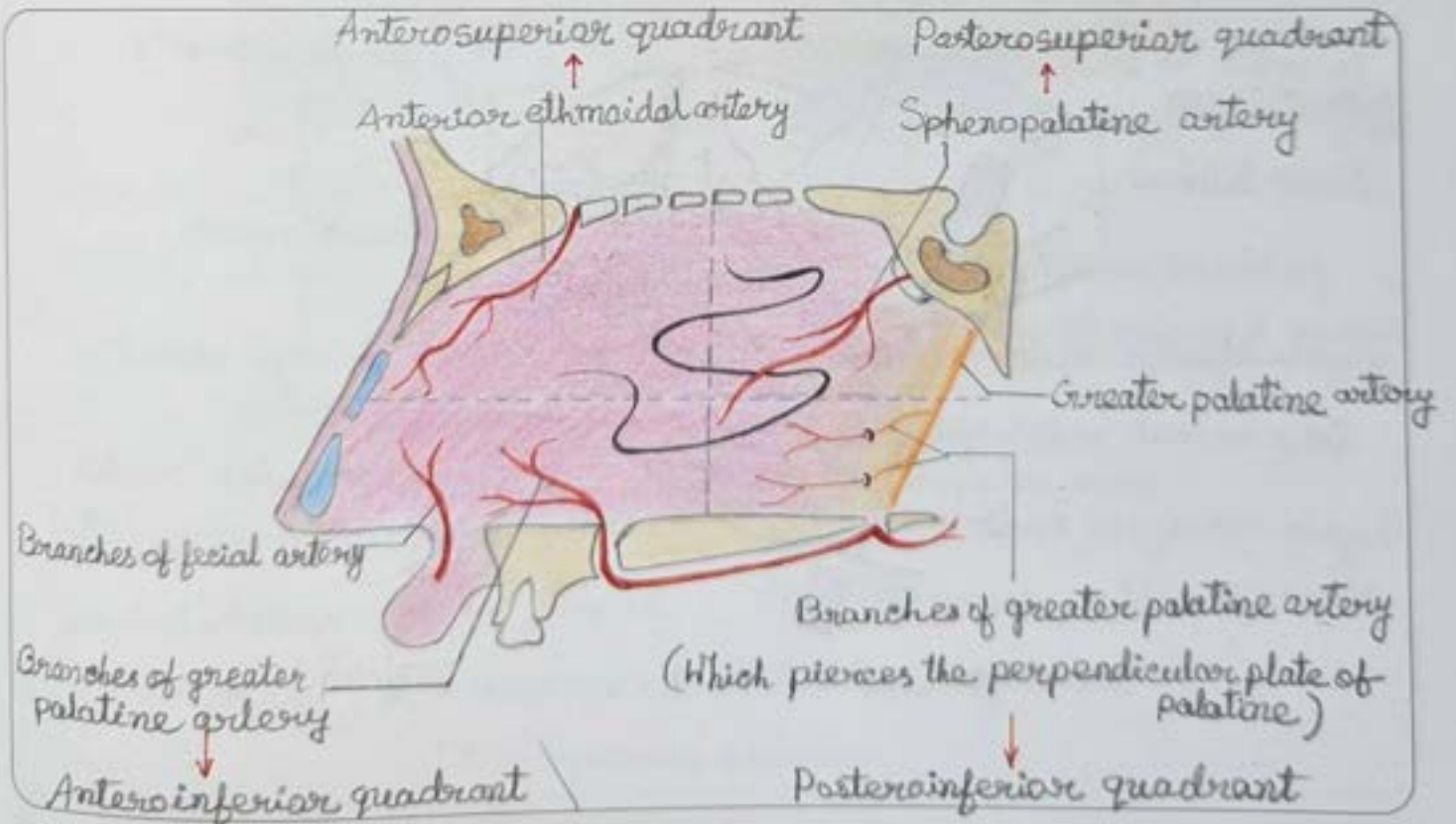
Arterial and Nerve Supply of Nasal Septum



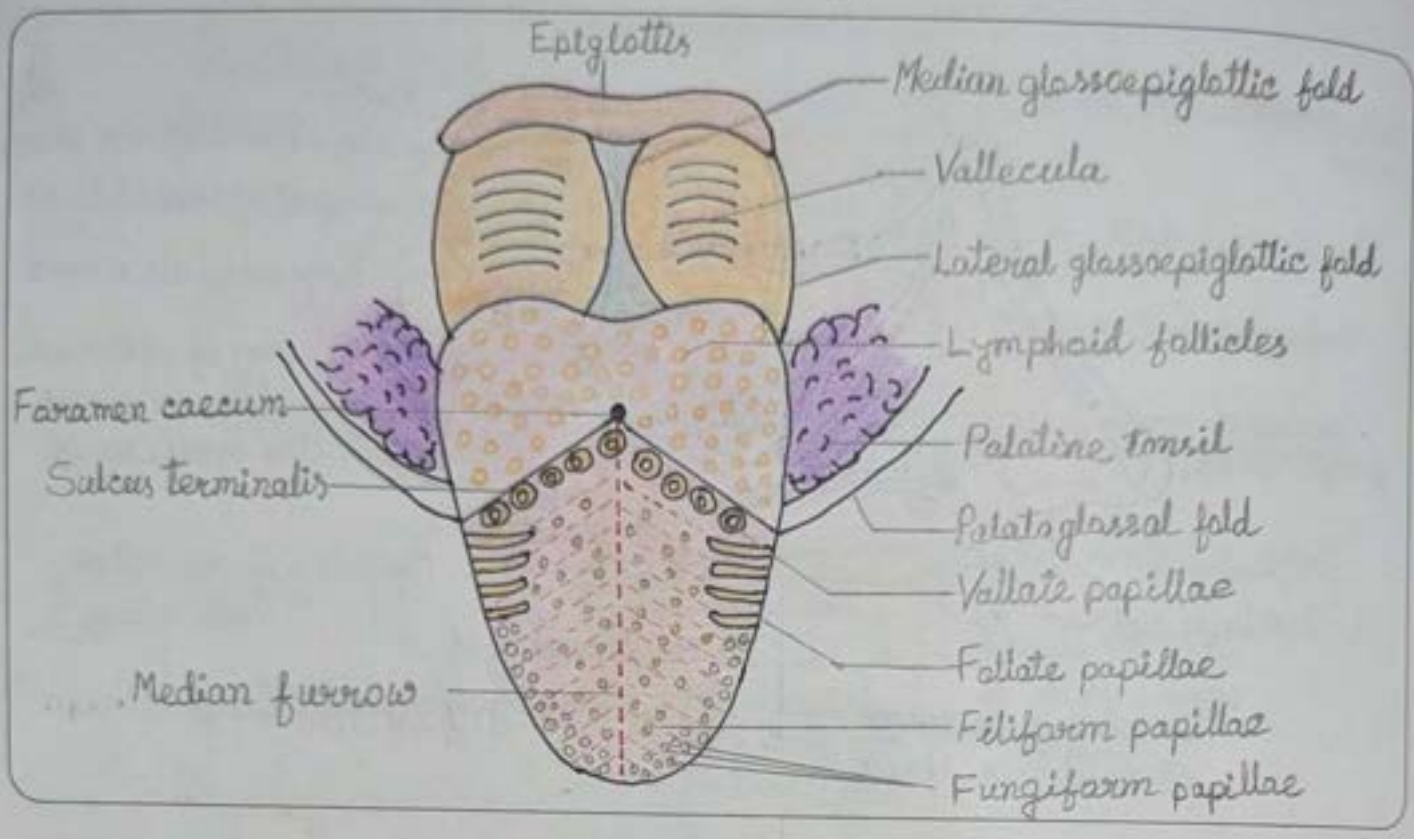
Lateral Wall of Nose



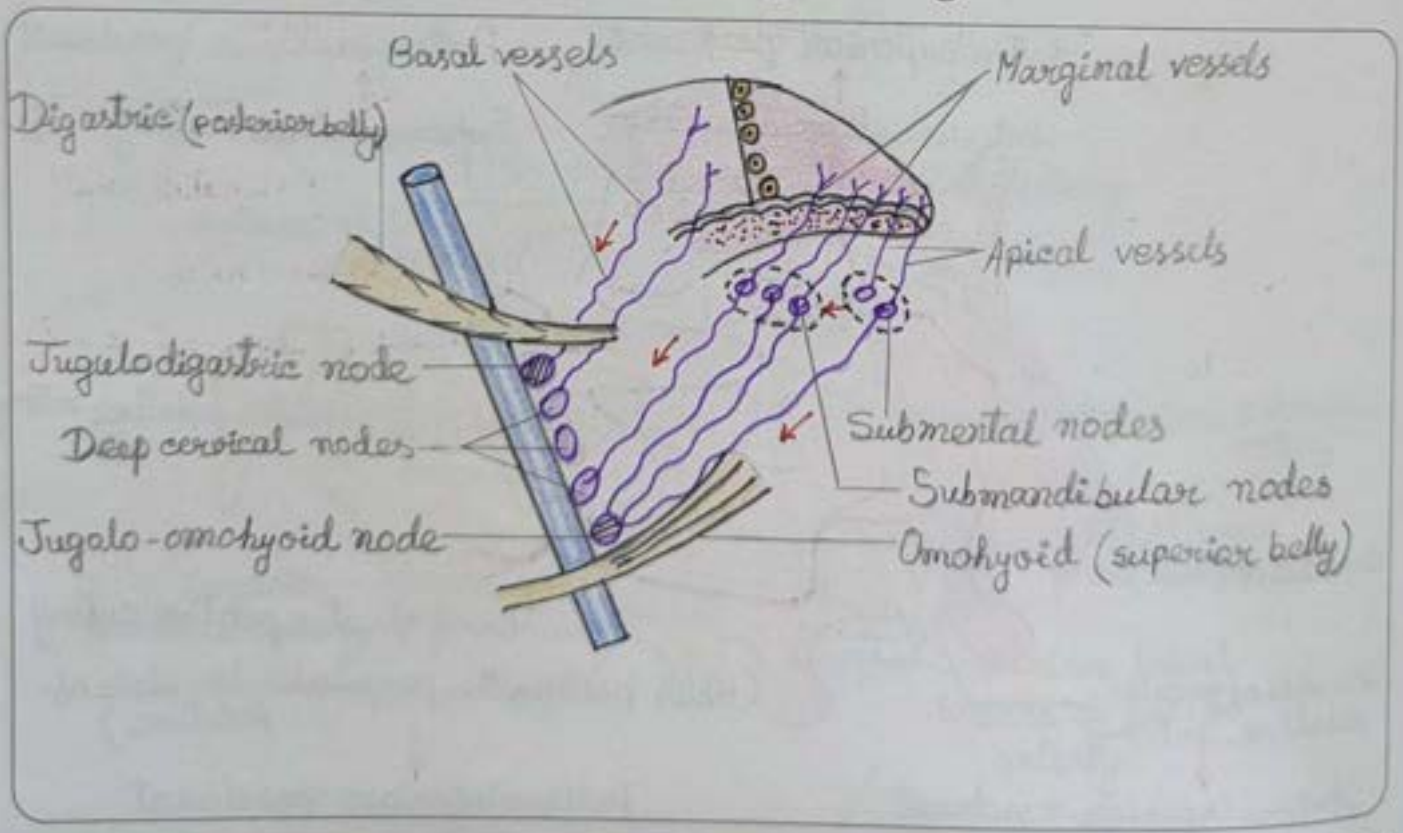
Arterial and Nerve Supply of Lateral Wall of the Nose



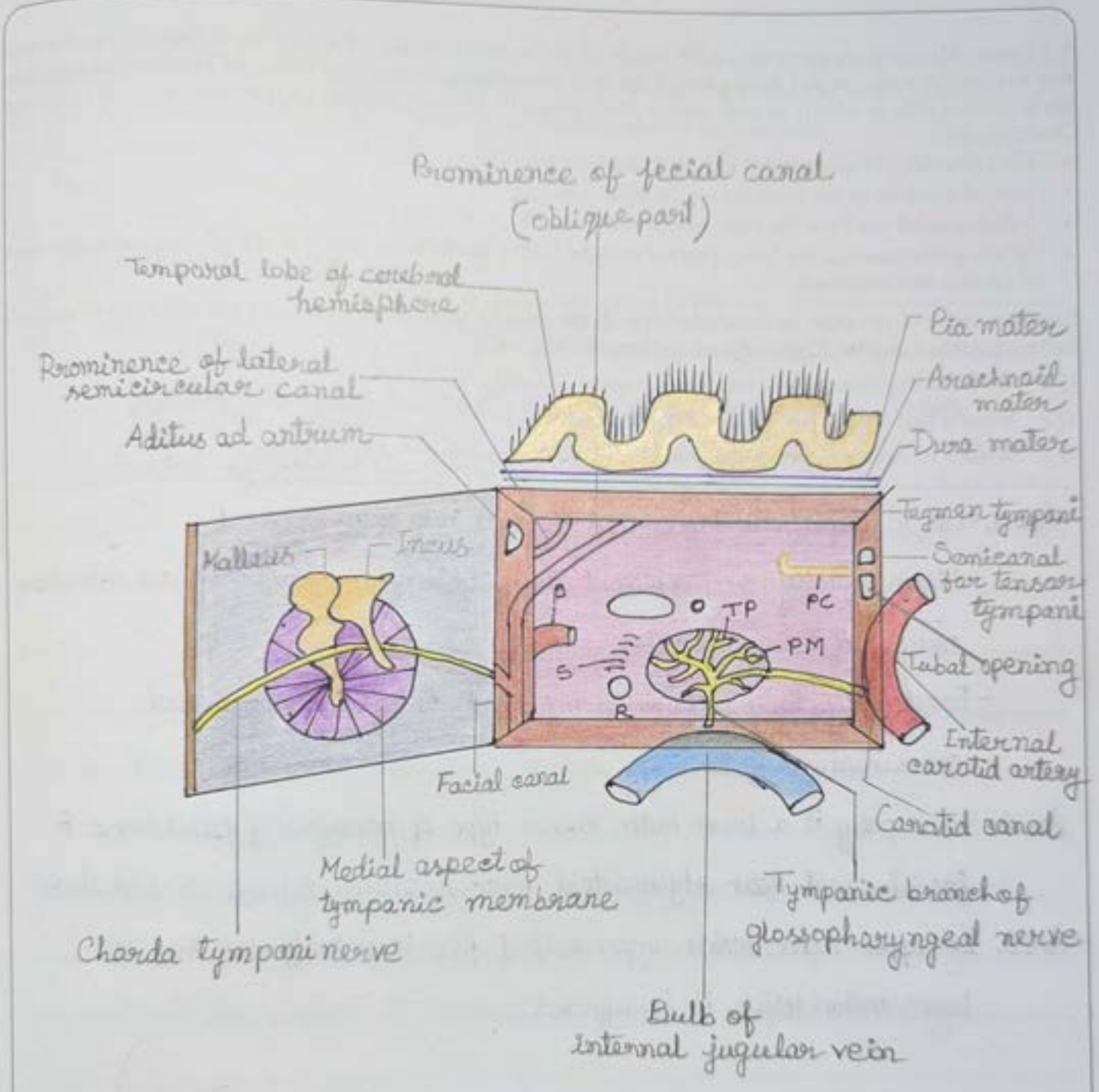
Dorsum of Tongue



Lymphatic Drainage of Tongue



Boundaries and Contents of Middle Ear



O = Oval window , P = Pyramid , PC = Processus cochleariformis,
PM = Promontary , R = round window , S = Sinus tympani,
TP = Tympanic plexus .

Clinical Case-1

A 55-year-old school teacher went to his family physician and complained that since morning he has not been able to close his right eye and during eating the food accumulates between the teeth and cheek on the right side. He is also not able to whistle or puff out his cheek properly. On examination, the physician made the following Observations:

- The right side of face appeared flattened and expressionless.
- Loss of wrinkles on the forehead on the right side.
- Saliva drooled out from the right corner of the mouth.
- When patient smiled, the lower portion of right half of the face was pulled to the left side and right corner of the face was not raised.

Based on above observation he concluded that all the muscles of facial expression on the right side of teacher's face are paralysed and he diagnosed him as a case of Bell's palsy

Q.1 What are the characteristic features of muscles of facial expression.

Q.2 What is Bell's palsy? Mention its most common cause.

Q.3 What is difference between upper and lower motor neuron type of facial palsies.

Ans 1.- Lie in superficial fascia and inserted into skin.

- Morphologically, they represent the specialized membrane of sub-cutaneous muscle of lower animals
- Functionally, they perform all important function of non-verbal communication

Ans 2. Bell's palsy is a lower motor neuron type of paralysis of facial nerve in fascial canal near stylomastoid foramen cause idiopathic or cold shock

Ans 3. In upper motor lesion, upper part of face is not affected but in lower motor lesion, it is affected

Clinical Case-2

A 17 yr boy met with an accident and suffered injury on the forehead of left side. Since there was severe bleeding the boy was brought to the casualty of Sharda hospital, where the wound was sutured to control bleeding.

After third day, the boy was brought back to the hospital because his left eye was black.

Q.1 Explain the clinical condition?

Q.2 Enumerate the layers of Scalp.

Q.3 Where is neurovascular plane in scalp?

Q.4 Why bleeding in scalp is profusely?

Ans 1. Black eye :- Blood collection in the layer of loose areolar tissue following a blow on head tracks freely under the scalp.

Ans 2. Layers of scalp :- 1. Skin

2. Connective Tissue (dense)

3 Aponeurosis

4. Loose Areolar Tissue

5. Pericranium

Ans 3. Connective tissue/superficial fascia layer of scalp has neurovascular bundle.

Ans 4. The walls of the vessels are adherent to the fibrous network. hence when blood vessels are torn or cut during an injury, they are unable to retract and cause profuse bleeding.

Clinical Case-3

A 21 yr old goalkeeper hit his head against the goal post accidentally while trying to reach for the ball. He was immediately taken to the Sharda Hospital. The doctor in Emergency noticed a swelling on the forehead, bleeding and watery discharge from the nose. CT scan of the head showed fracture of cribriform plate of Ethmoid bone.

Q.1 Why the plate known as Cribriform?

Q.2 Why there was bleeding and watery discharge from the nose?

Q.3 Why Anosmia common in fracture of cribriform plate?

Ans 1. Crib Cribriform refers to porous or sieve like structure

Ans 2. Cibriform plate is located near ethmoid sinuses, which contains numerous blood vessels and CSF. In fracture of cribriform plate, these vessels rupture leading to bleeding and watery discharge is due to leakage of CSF

~~Ans 3. Cibriform plate is located near ethmoid si~~

Ans-3. Fracture of cibriform plate of ethmoid with tearing of the meninges may tear the olfactory nerve rootlets. In such cases CSF may drip from nasal cavity (CSF rhinorrhoea), thus leading to anosmia.

Clinical Case-4

A 52 yrs. old female is admitted to the emergency department complaining of right upper limb pain and weakness of her right hand. She has headache, and notes that her right eyelid droops. Her voice has become hoarse.

On examination doctor finds ptosis, miosis, anhidrosis,pain at medial aspect of right upper arm, weak right radial pulse.

Q.1 Explain the clinical condition?

Q.2 Write its anatomical basis?

Ans-1. Patient is suffering from Horner's Syndrome.

- in eye disorder caused by damaged of cervical sympathetic nerve
- Symptoms :- the symptoms of horner's syndrome appear on the affected side
  (i) Ptosis (drooping of eye lid)
  (ii) Miosis (abnormal constriction of pupil)
  (iii) Pain at medial aspect of right upper arm.

Ans-2. Involvement of descending hypothalamic fibres innervating pre-ganglionic sympathetic neurons in T_1 through T_4 cords segment.

Clinical Case-5

A 35 year chronic smoker came to the ENT consultant with complaints of recurrent sinusitis, weight loss and severe pain in upper teeth and right cheek. On examination, it was noted that his right cheek was swollen and there was proptosis of right eye.

CT scan reveals the presence of growth in the paranasal air sinus.

Q.1 Enumerate the paranasal sinus.

Q.2 Which sinus is most susceptible to infection?

Q.3 Enumerate the openings into middle meatus.

Ans-1:- Paranasal sinuses are divided into two groups :-

(i) Anterior group :- Frontal, anterior and middle ethmoidal and maxillary sinus

(ii) Posterior group :- Both Posterior ethmoidal and sphenoidal air sinuses.

Ans-2:- Maxillary sinus is most susceptible to infections.

Ans-3:- (i) Opening of middle ethmoidal air sinuses

(ii) Opening of frontal air sinuses

(iii) Opening of anterior ethmoidal air sinuses

(iv) Opening of maxillary air sinuses

Clinical Case-6

A 40 yr old man brought to the emergency of Sharda Hospital for head injury after head on collision of his bike with car. Doctor noticed a large soft swelling on temporal region. He told the doctor that he had become unconscious for few minutes but now he feels well and want to go home. Doctor counseled the patient and got his CT scan which revealed an extradural hemorrhage.

Q.1 What is extradural hemorrhage.

Q.2 Which artery is commonly involved in extradural hemorrhage.

Q.3 Which is the commonest site of extradural hemorrhage.

Q.4 Name the bones unites to form the Pterion.

Ans-1:- Bleeding between skull and outer layer of brain's protective covering is called dura mater due to injury to head is extradural hemorrhage.

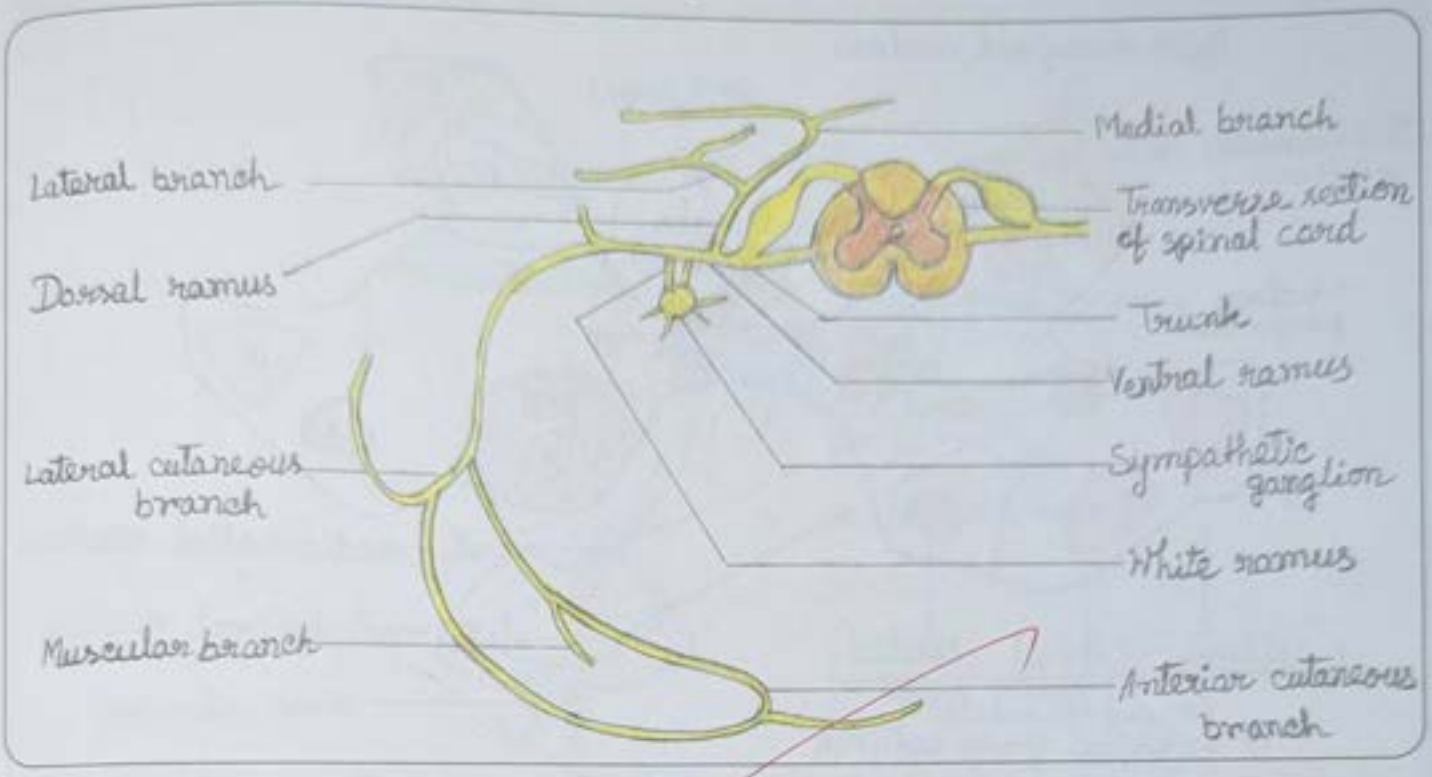
Ans-2:- There is rupture of anterior division of middle meningeal artery.

Ans-3:- Commonest site is pterion site of anterolateral frontalle.

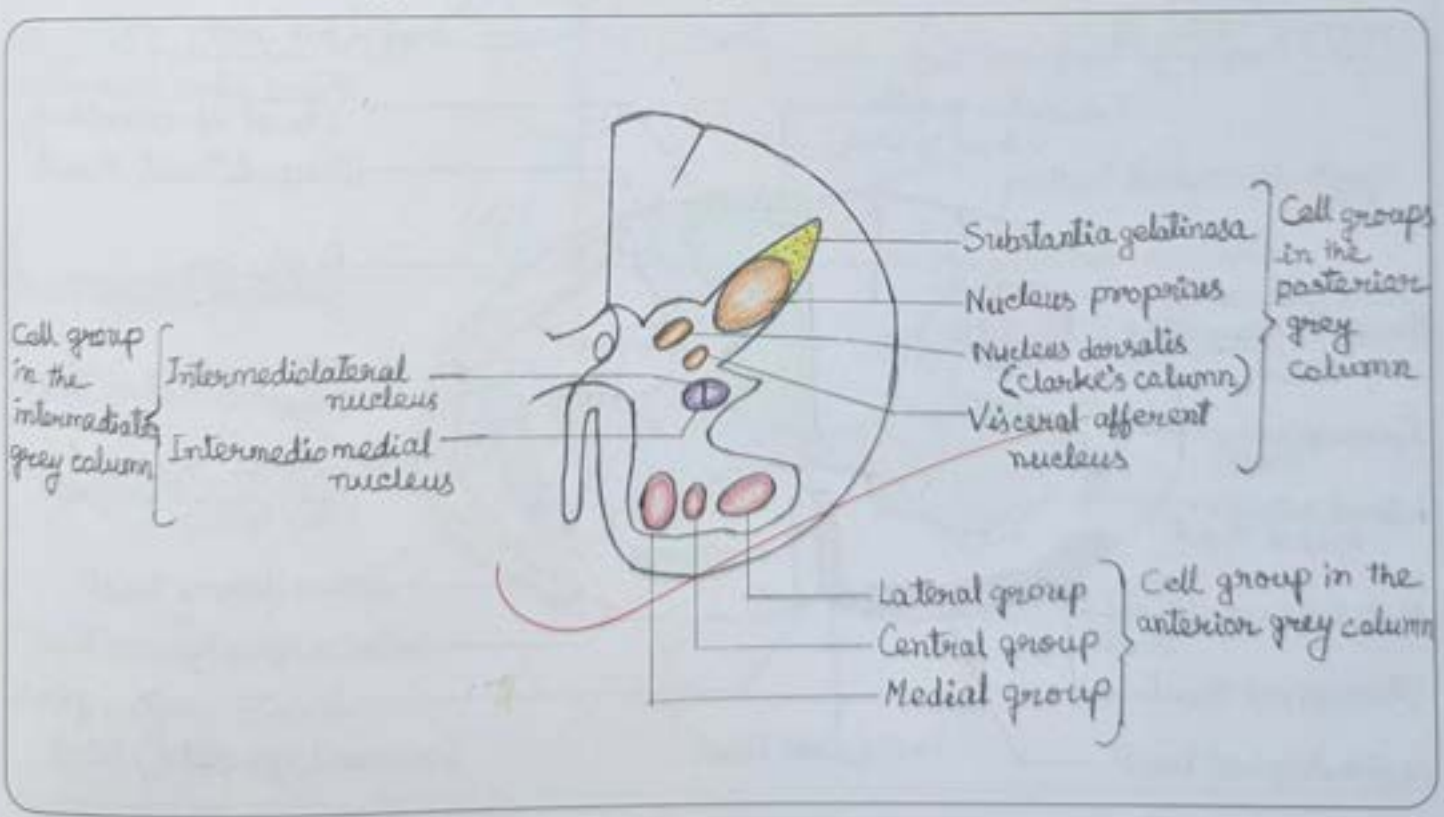
Ans-4:- Bones forming pterion:-

- Frontal bone
- Parietal bone
- Temporal bone
- Sphenoid bone

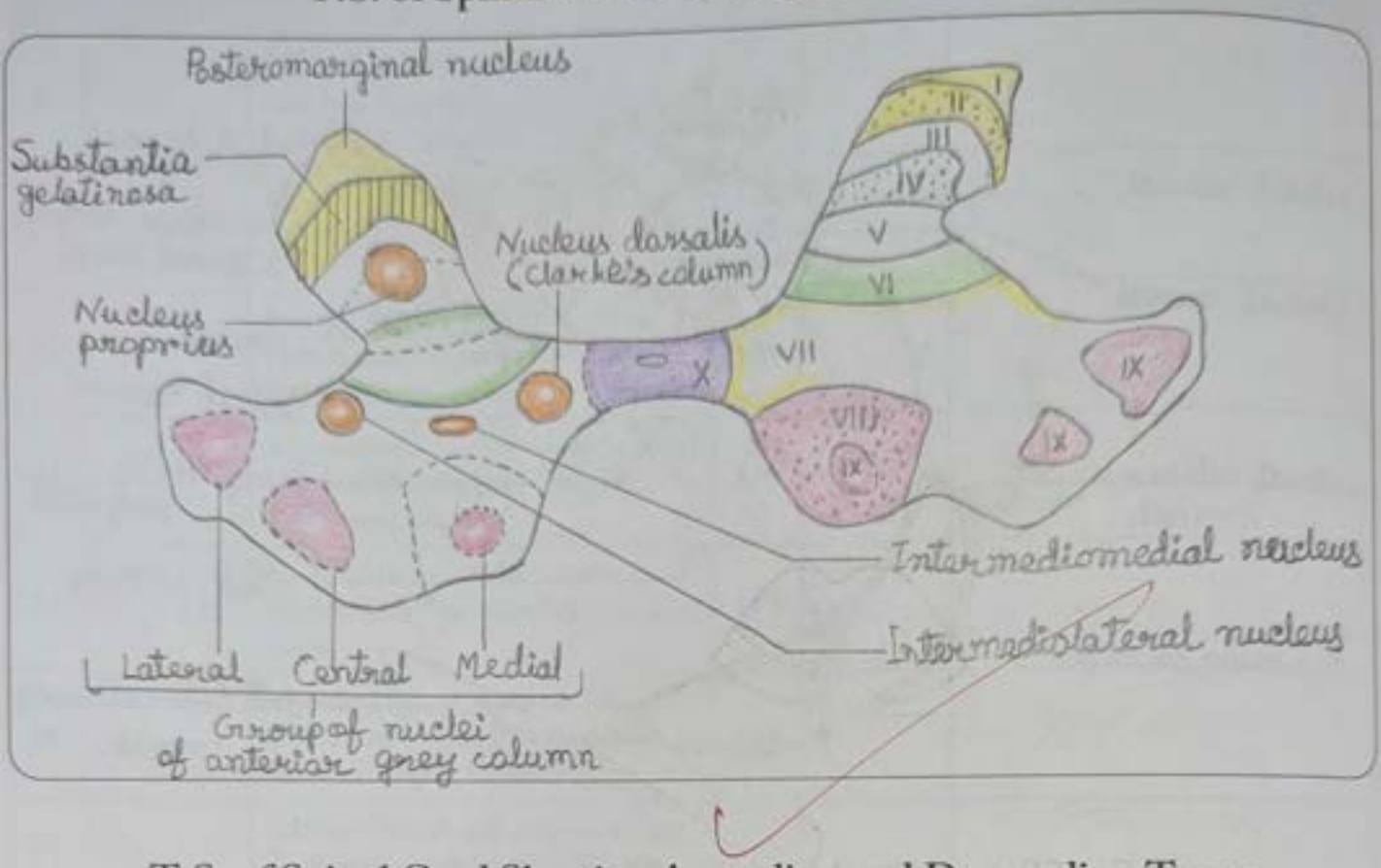
Typical Spinal Nerve



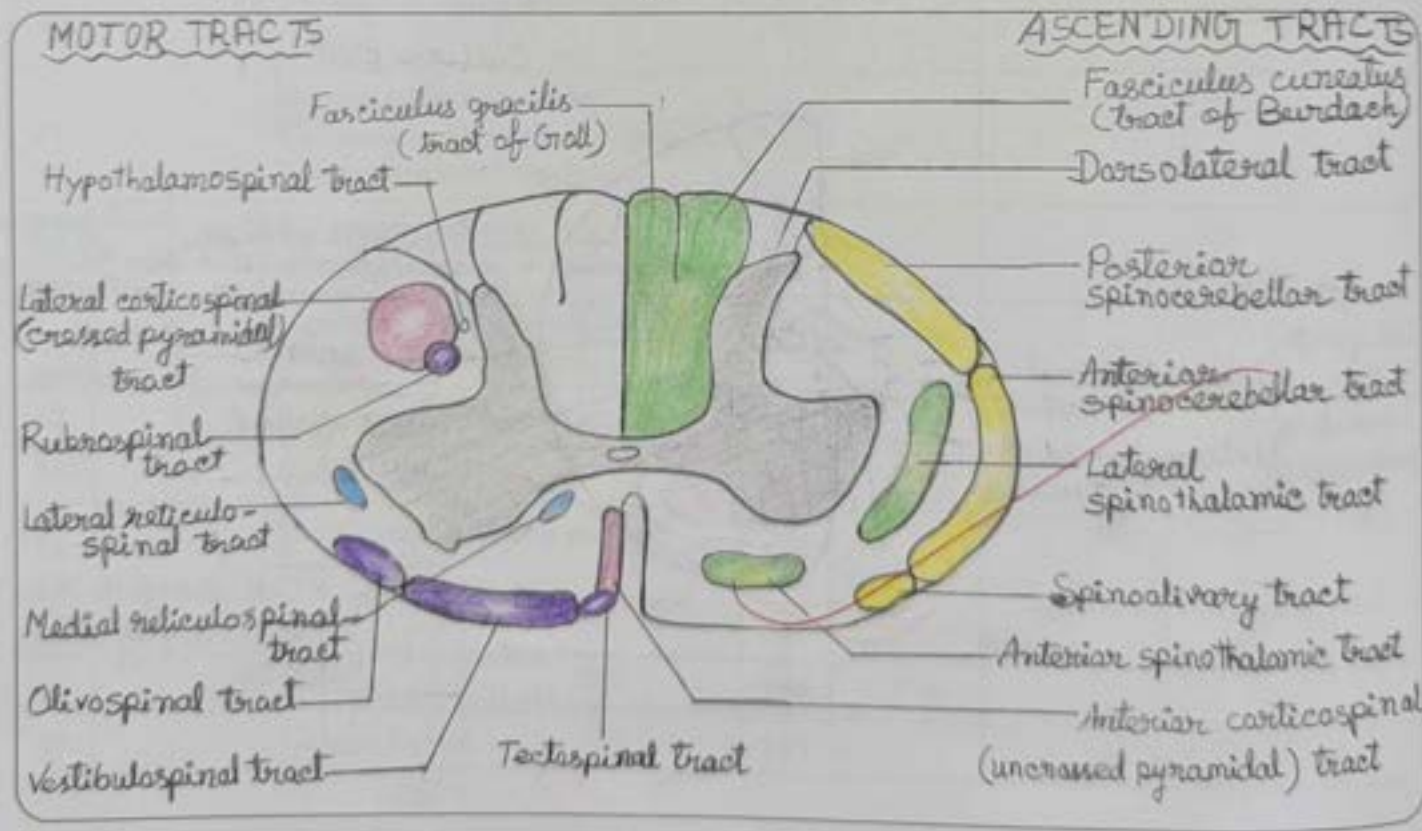
T.S. of Spinal Cord Showing Nucleus in Grey Column



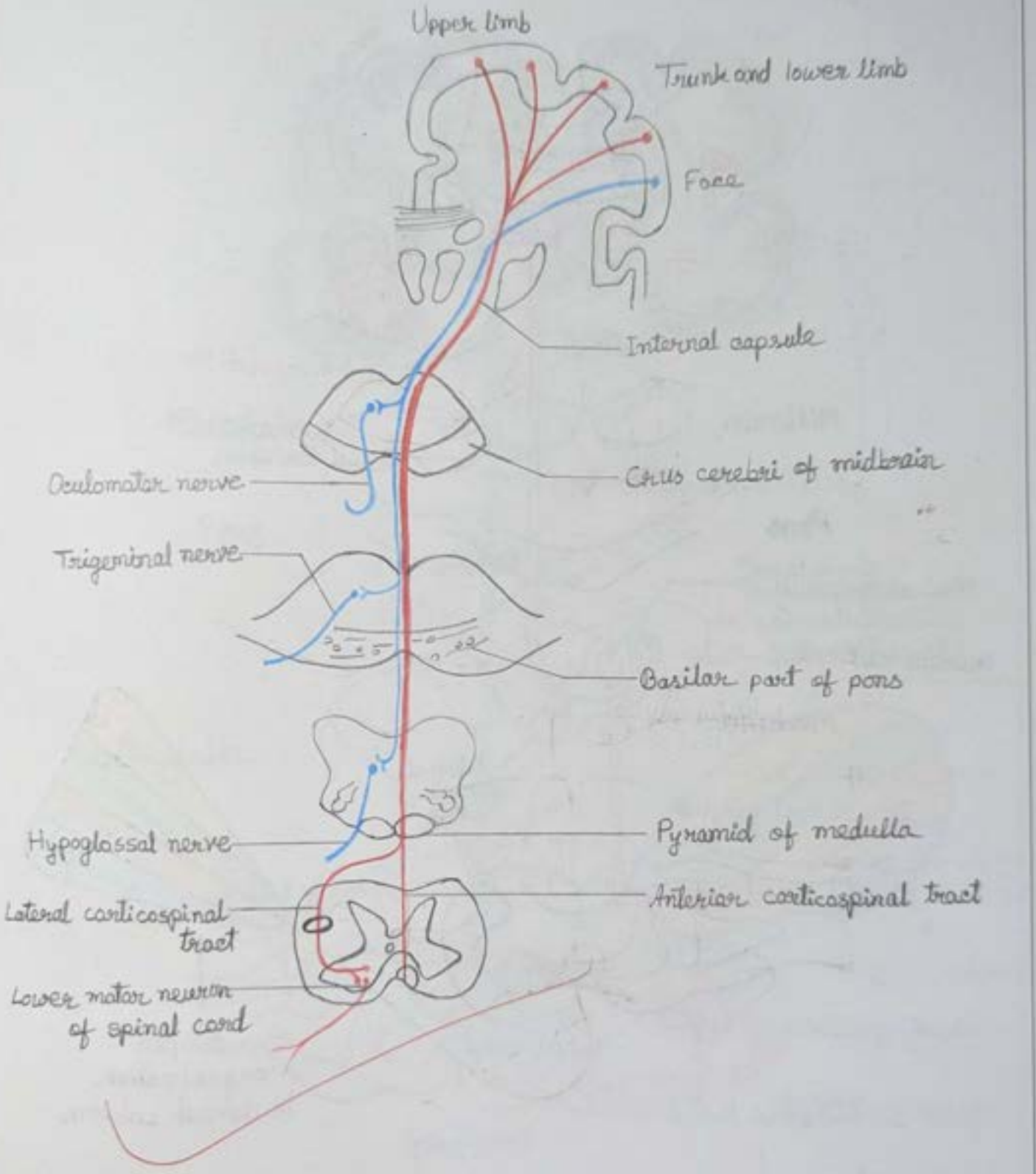
T.S. of Spinal Cord Showing Rexed Laminae



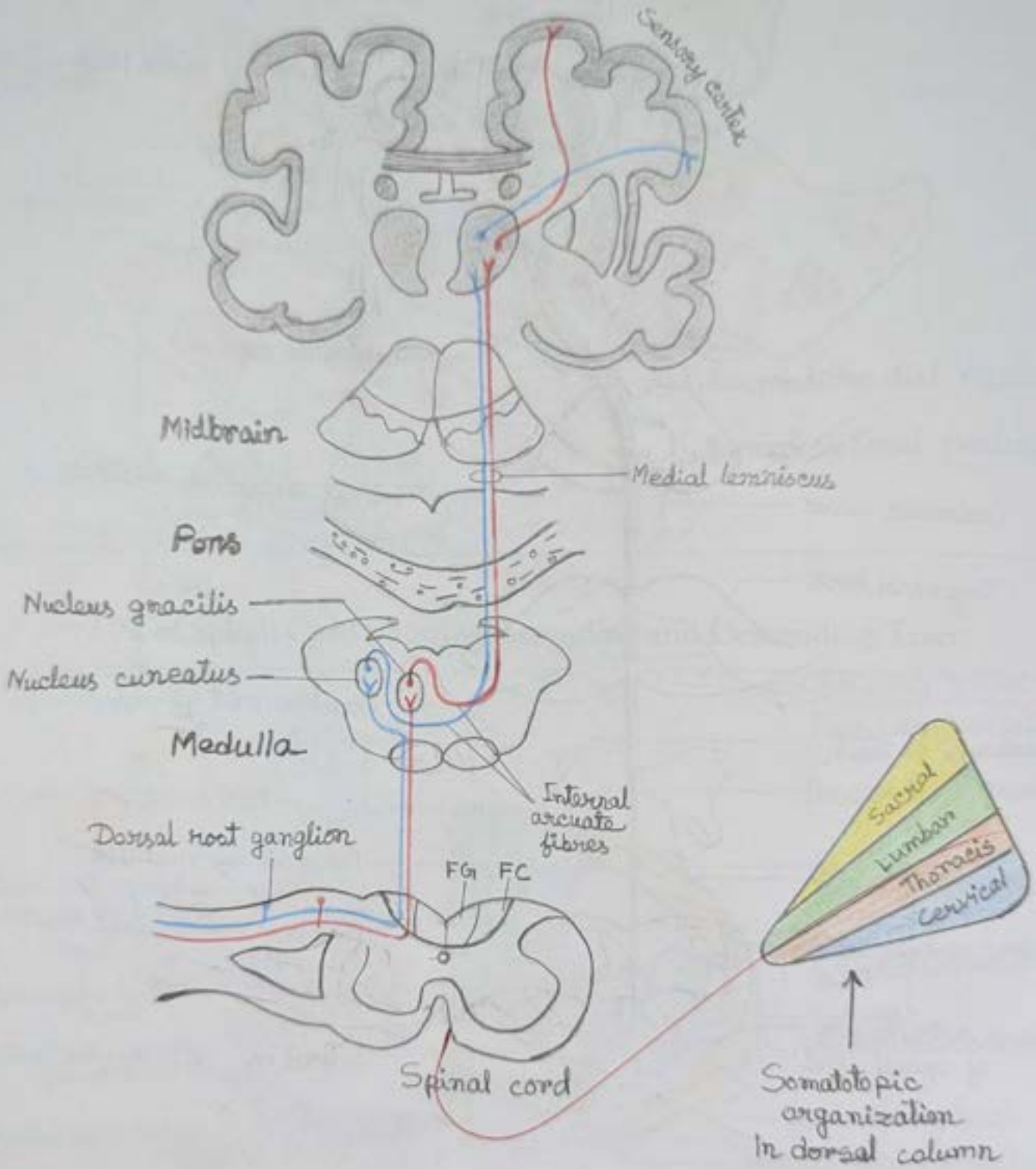
T.S. of Spinal Cord Showing Ascending and Descending Tracts



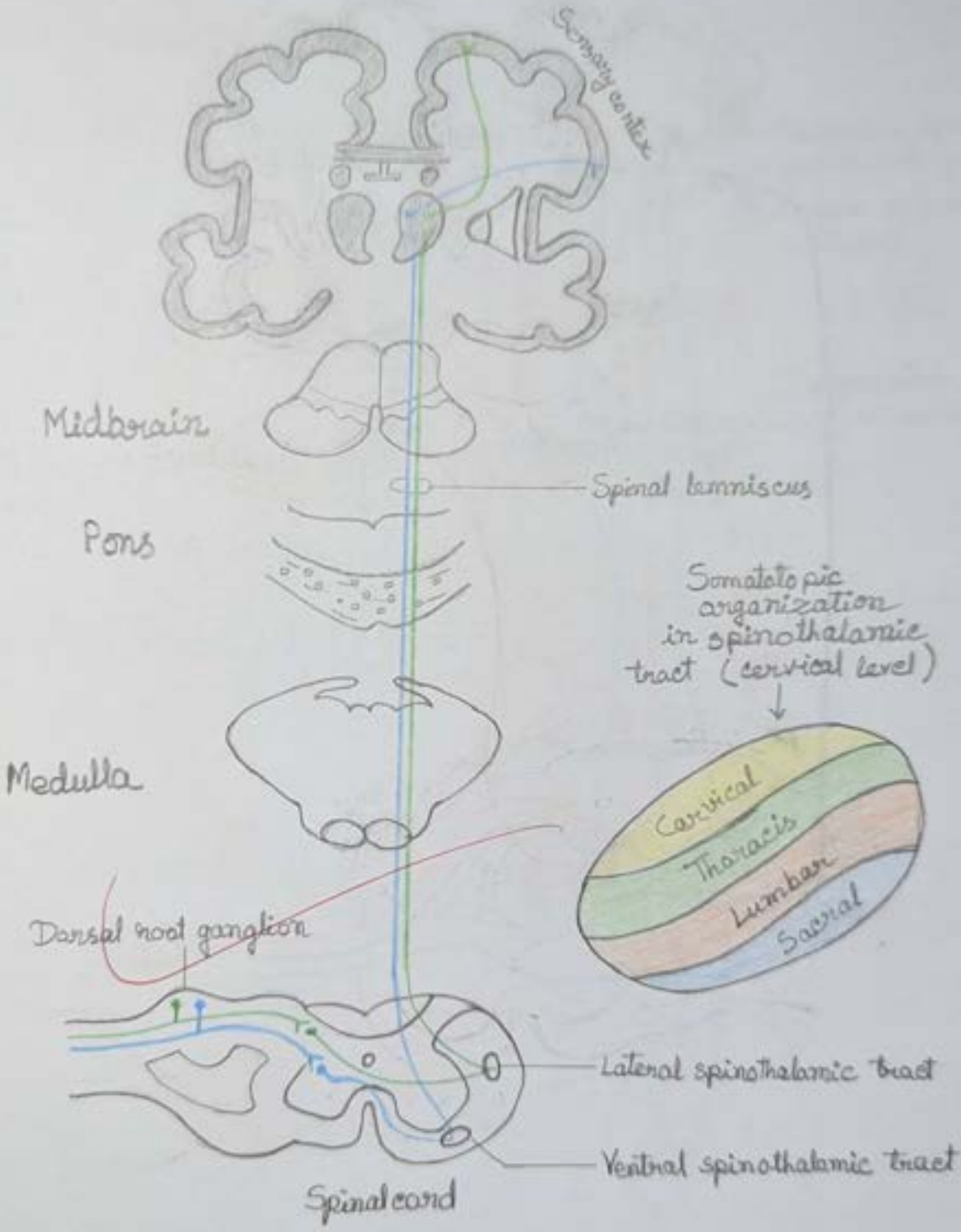
Corticospinal Tract



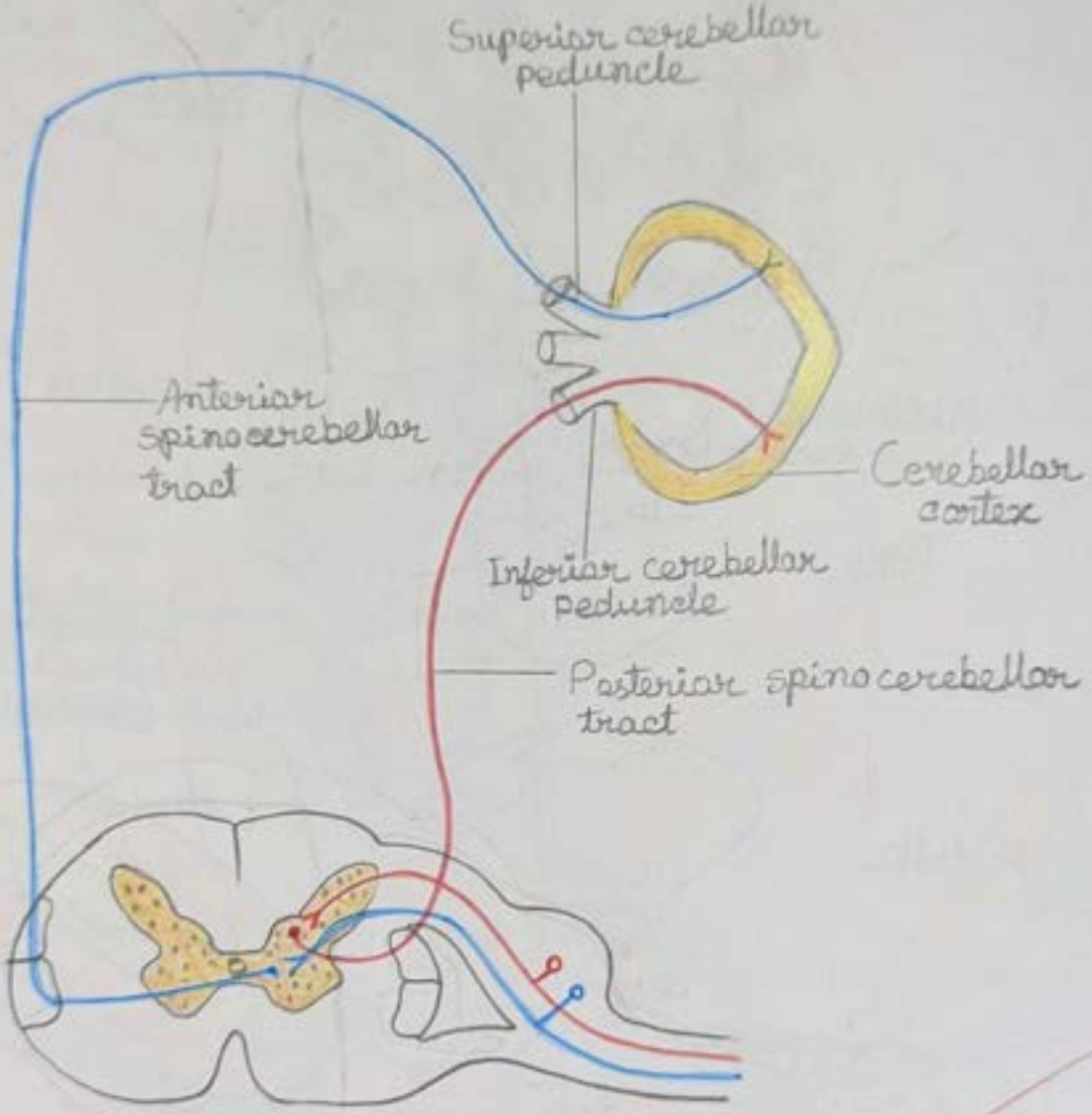
Dorsal Column Tract



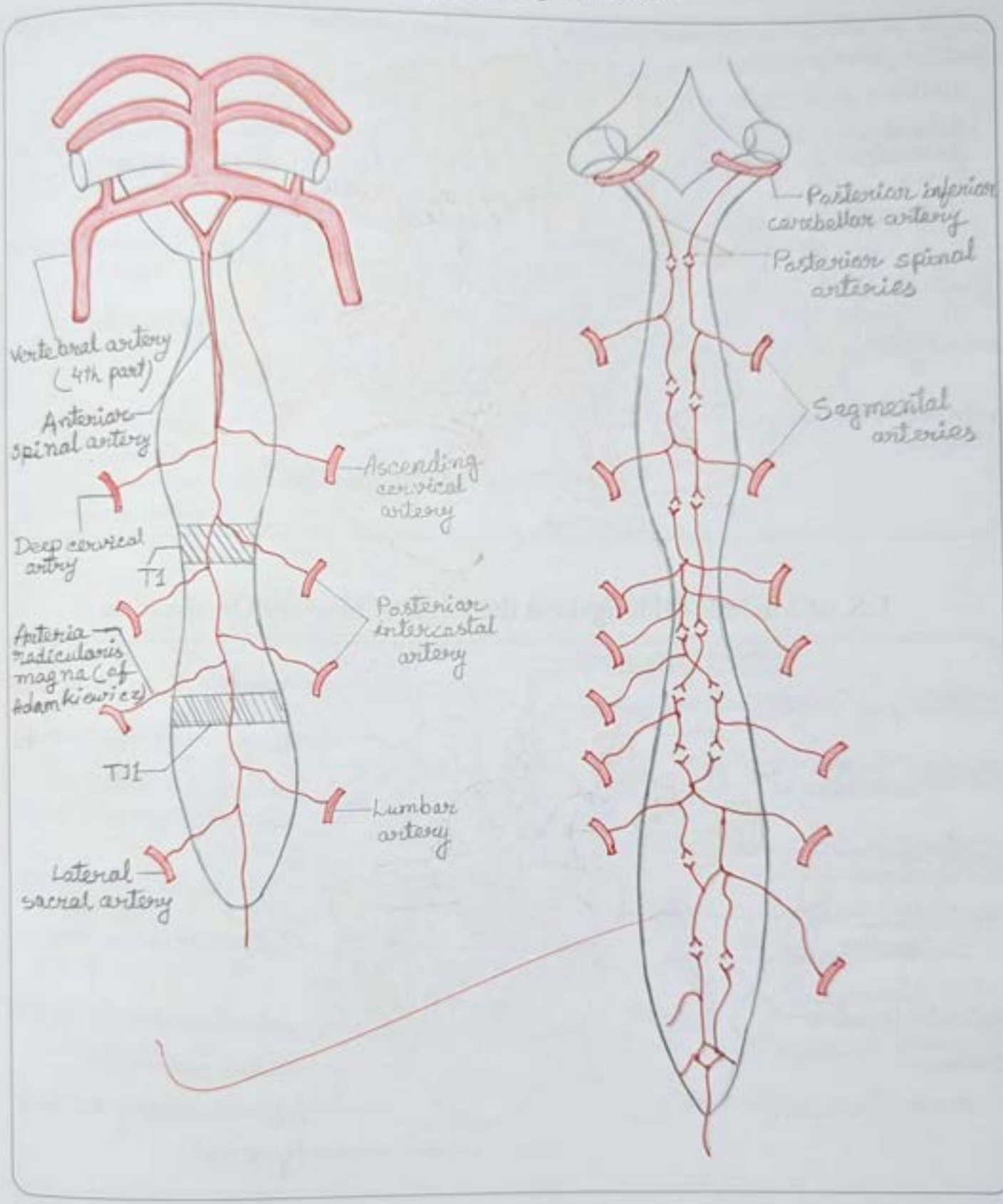
Lateral Spinothalamic Tract



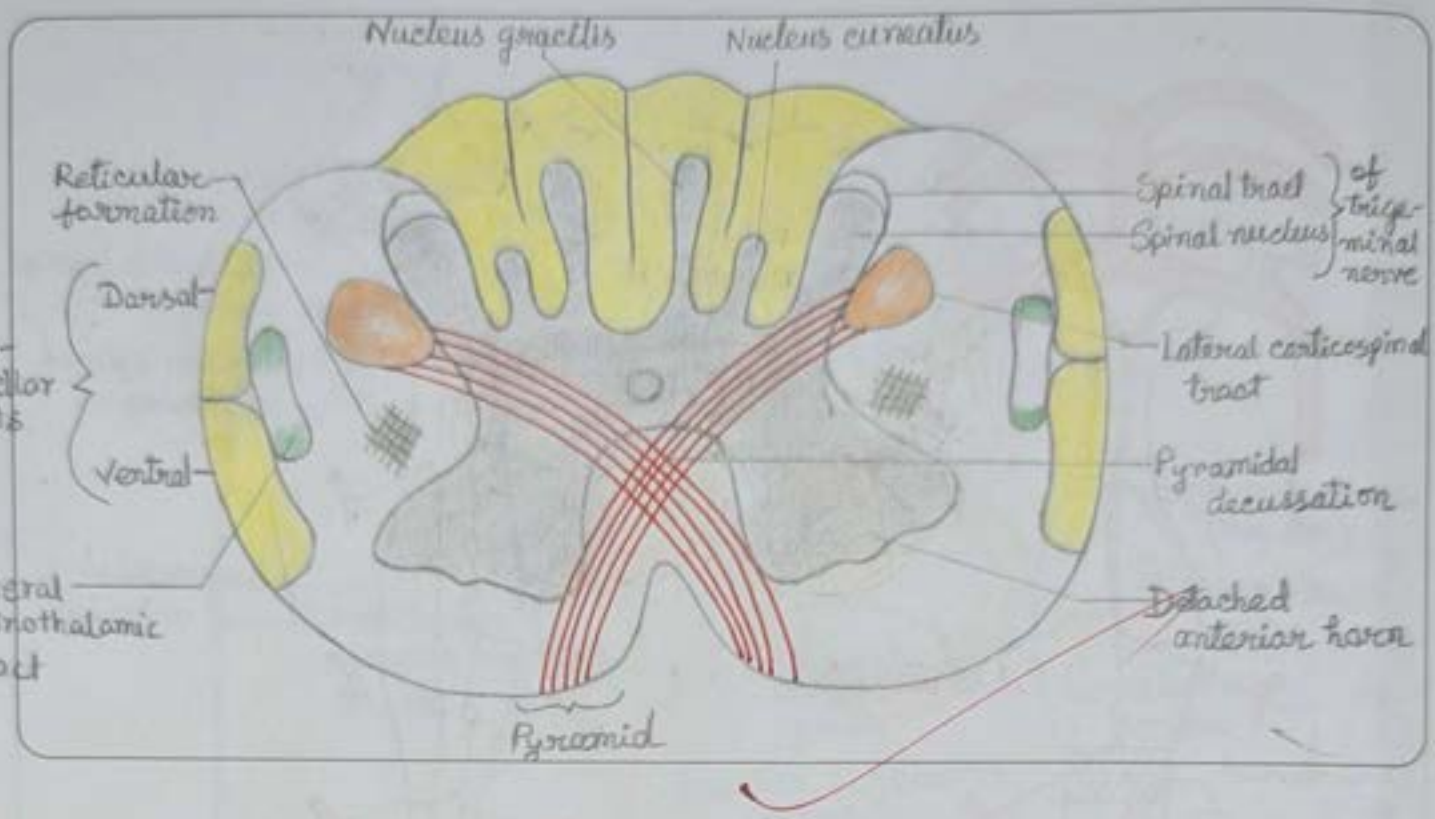
Anterior and Posterior Spinocerebellar Tract



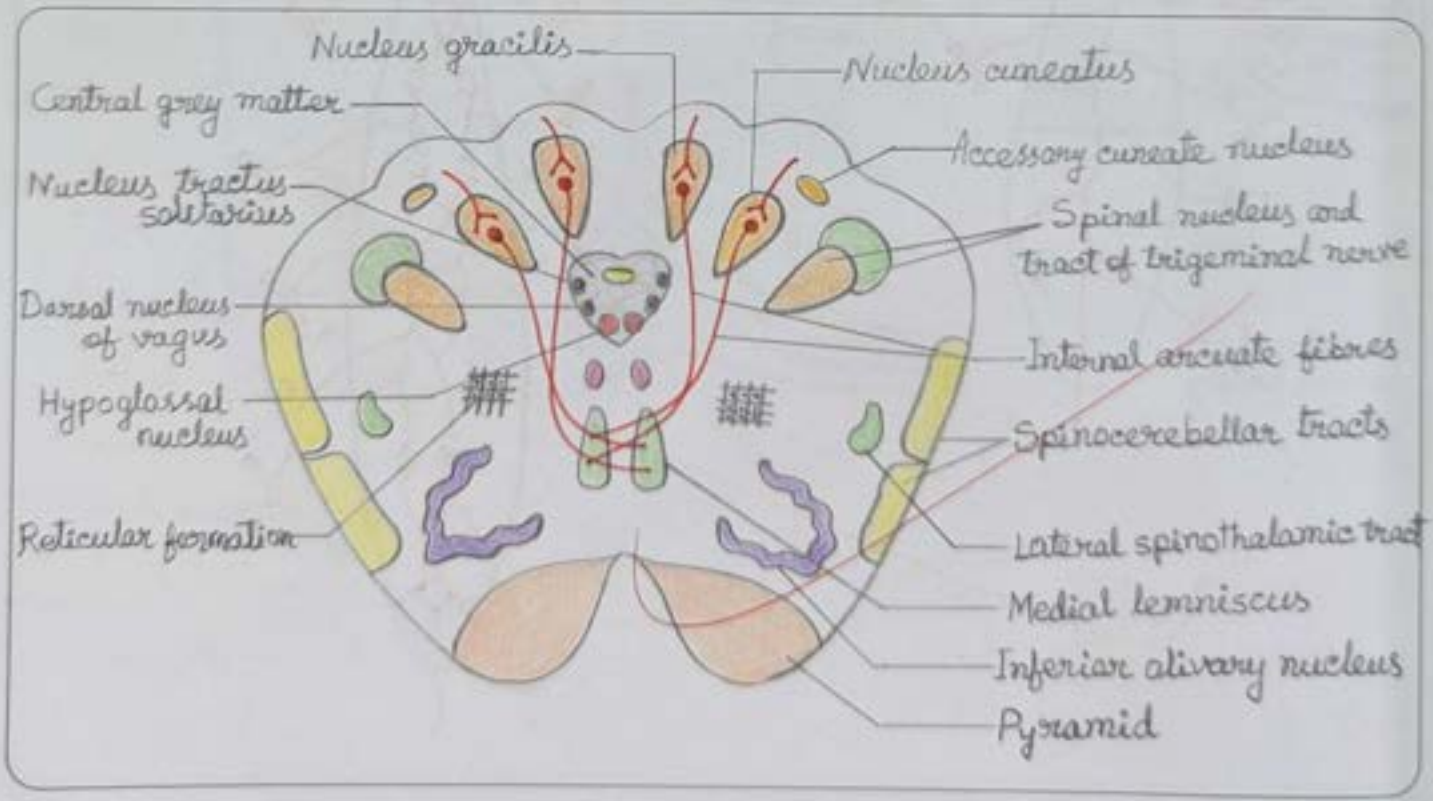
Blood Supply of Spinal Cord



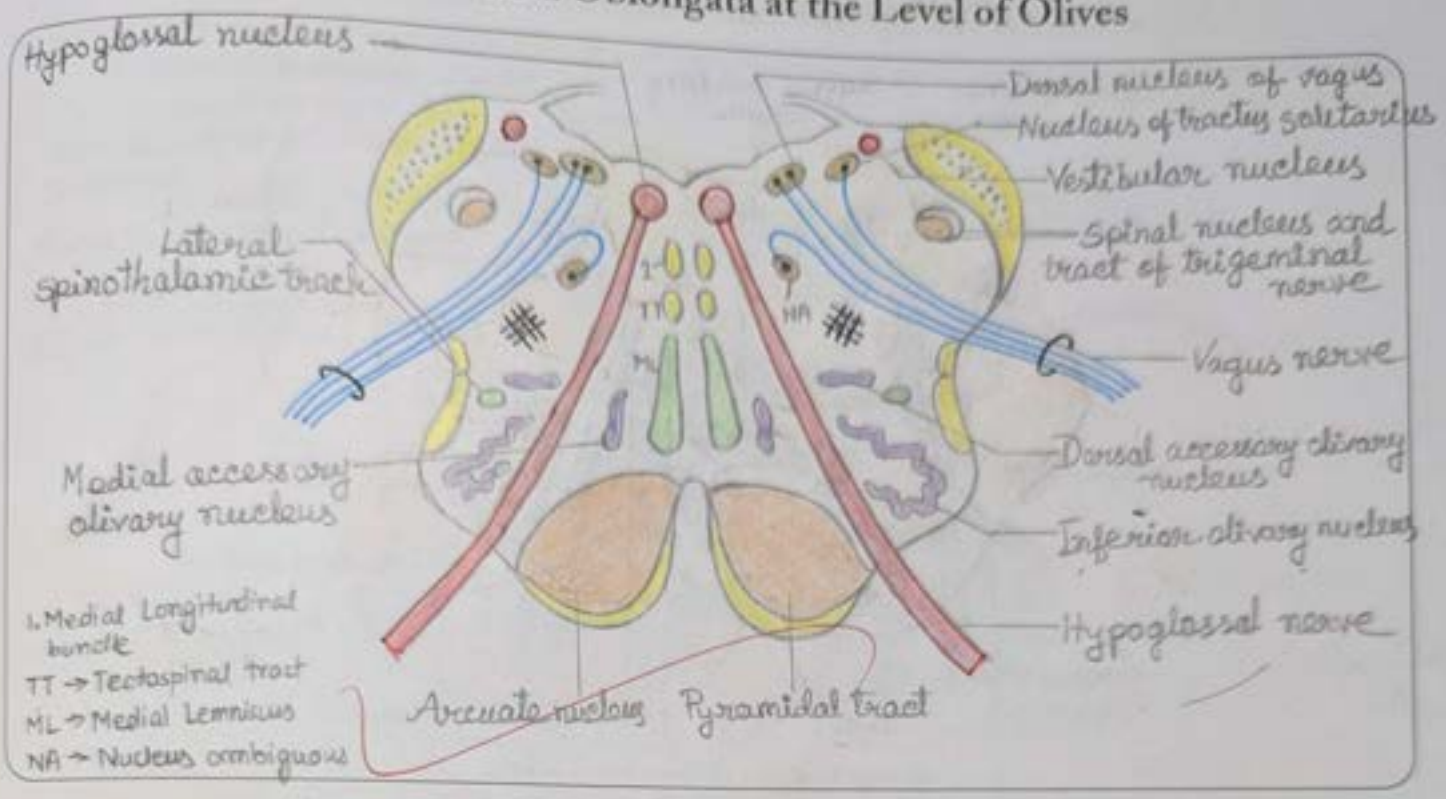
T.S. of Medulla Oblongata at the Level of Motor Decussation



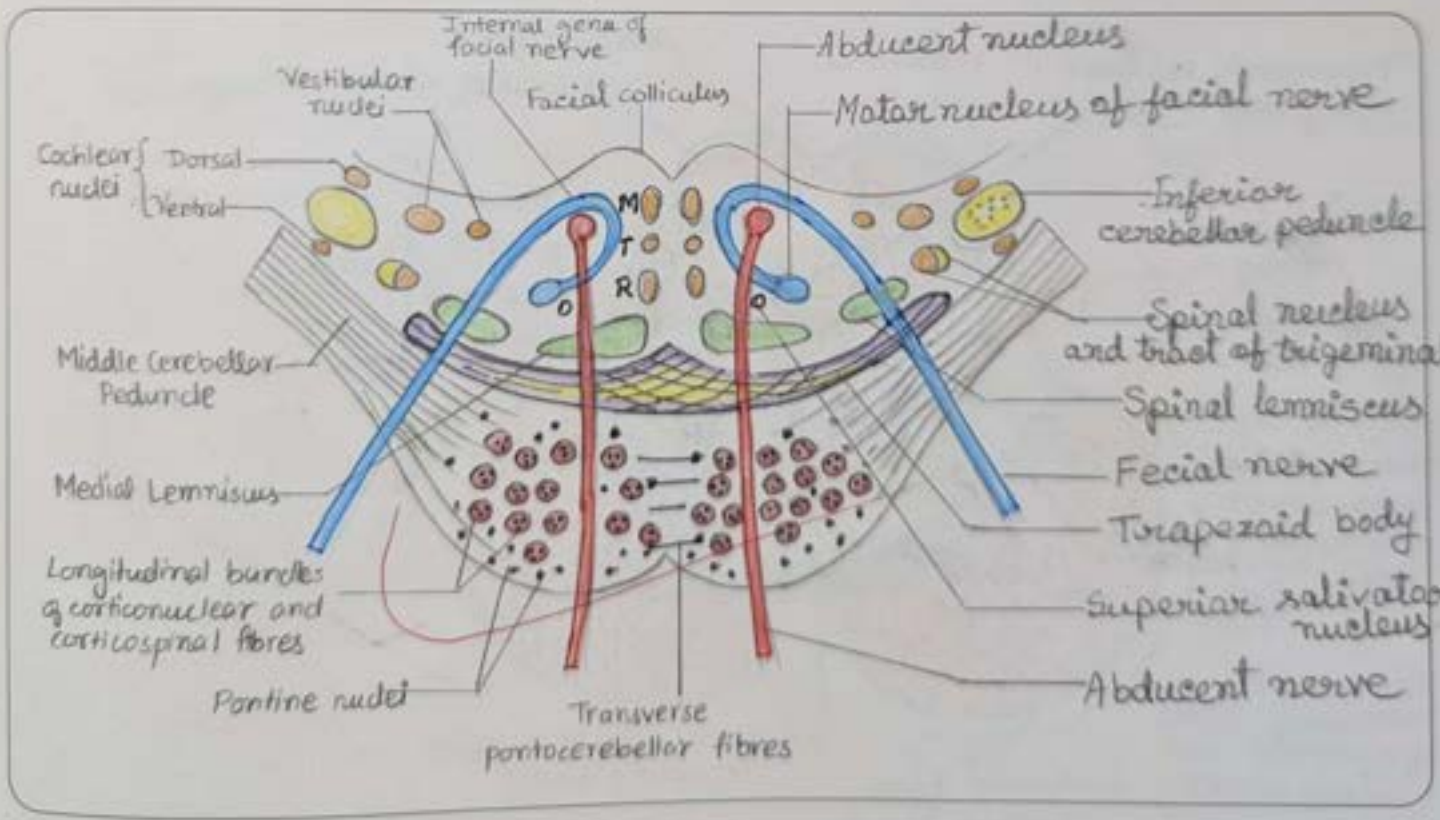
T.S. of Medulla Oblongata at the Level of Sensory Decussation



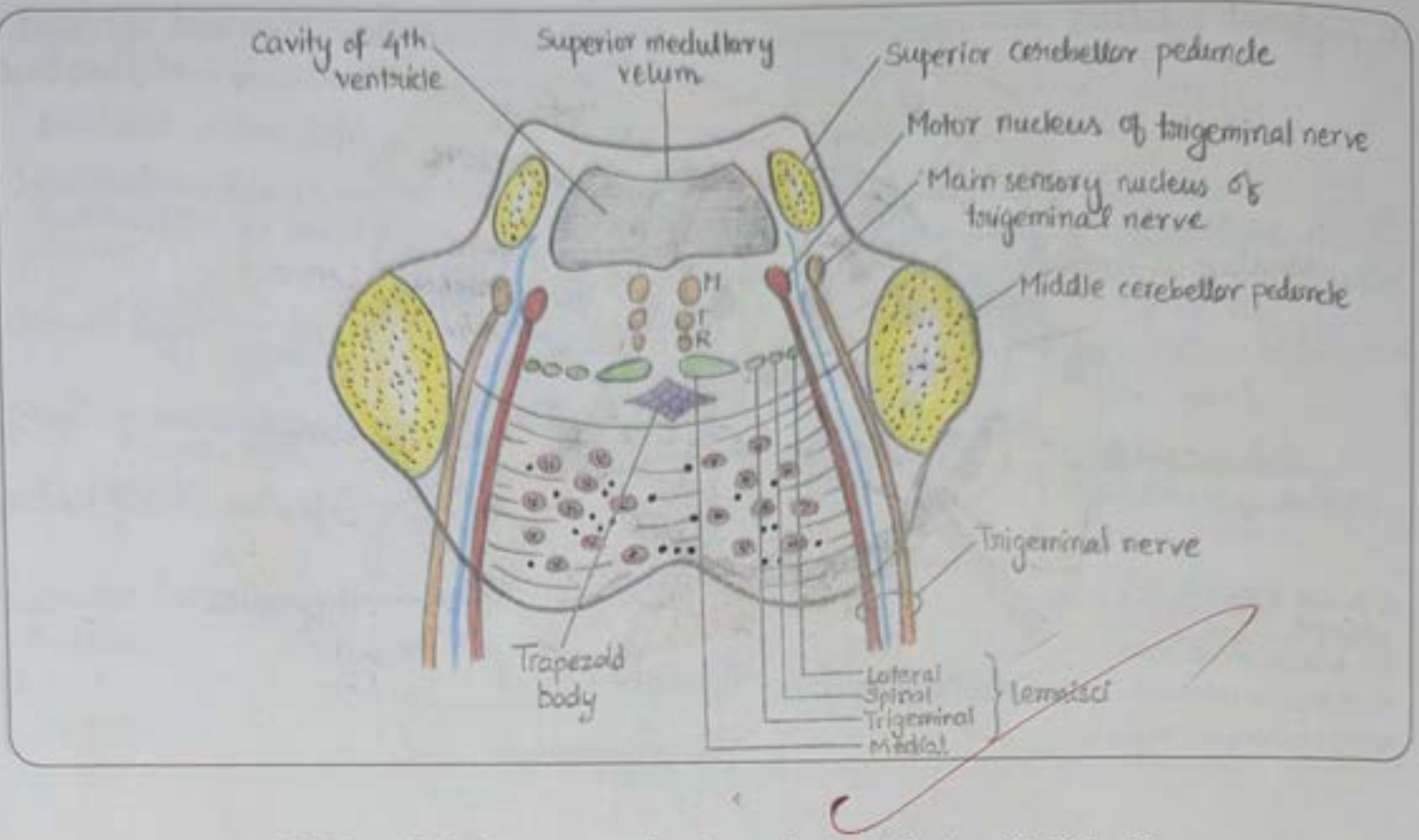
T.S. of Medulla Oblongata at the Level of Olives



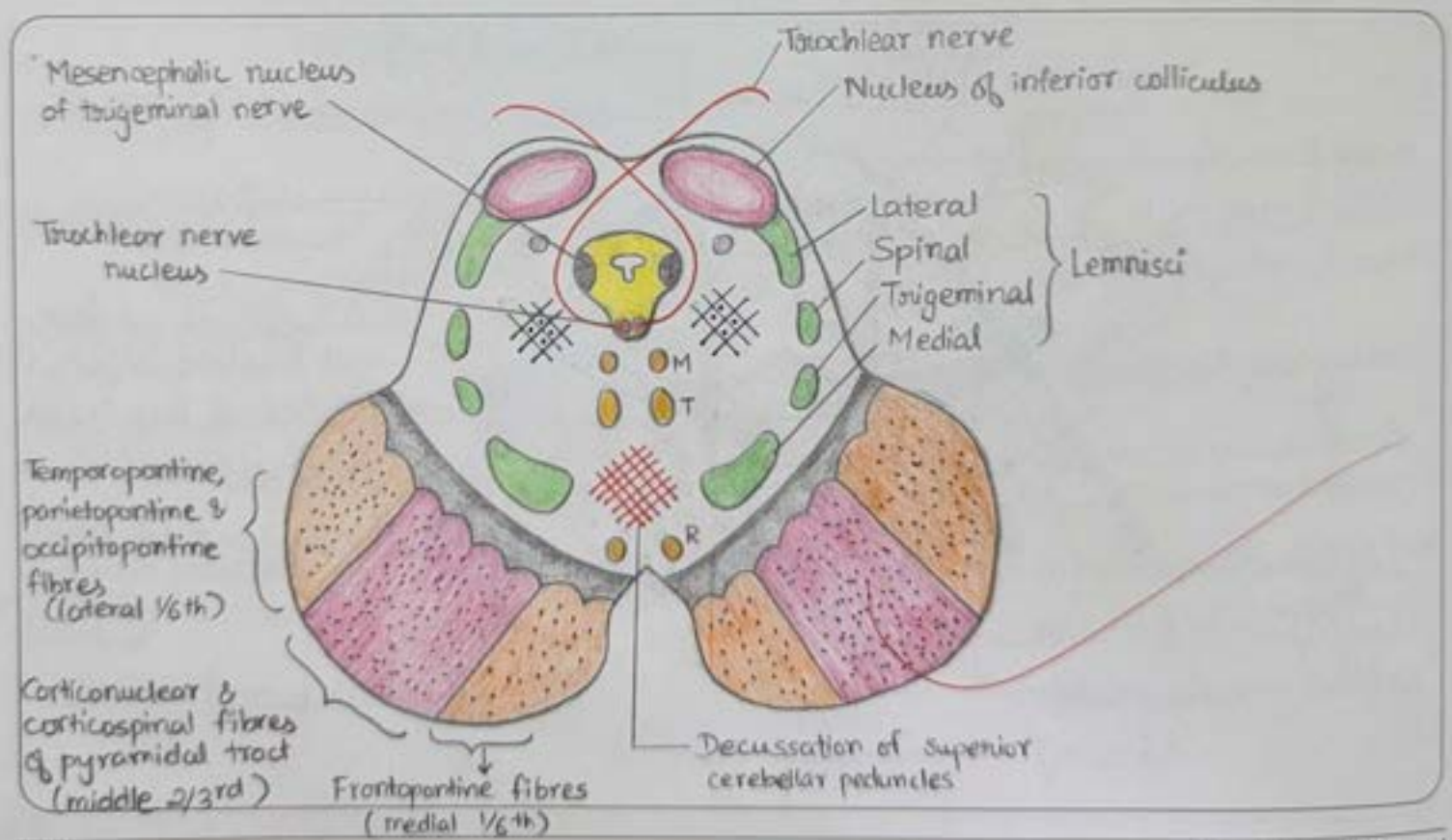
T.S. through Lower Part of the Pons



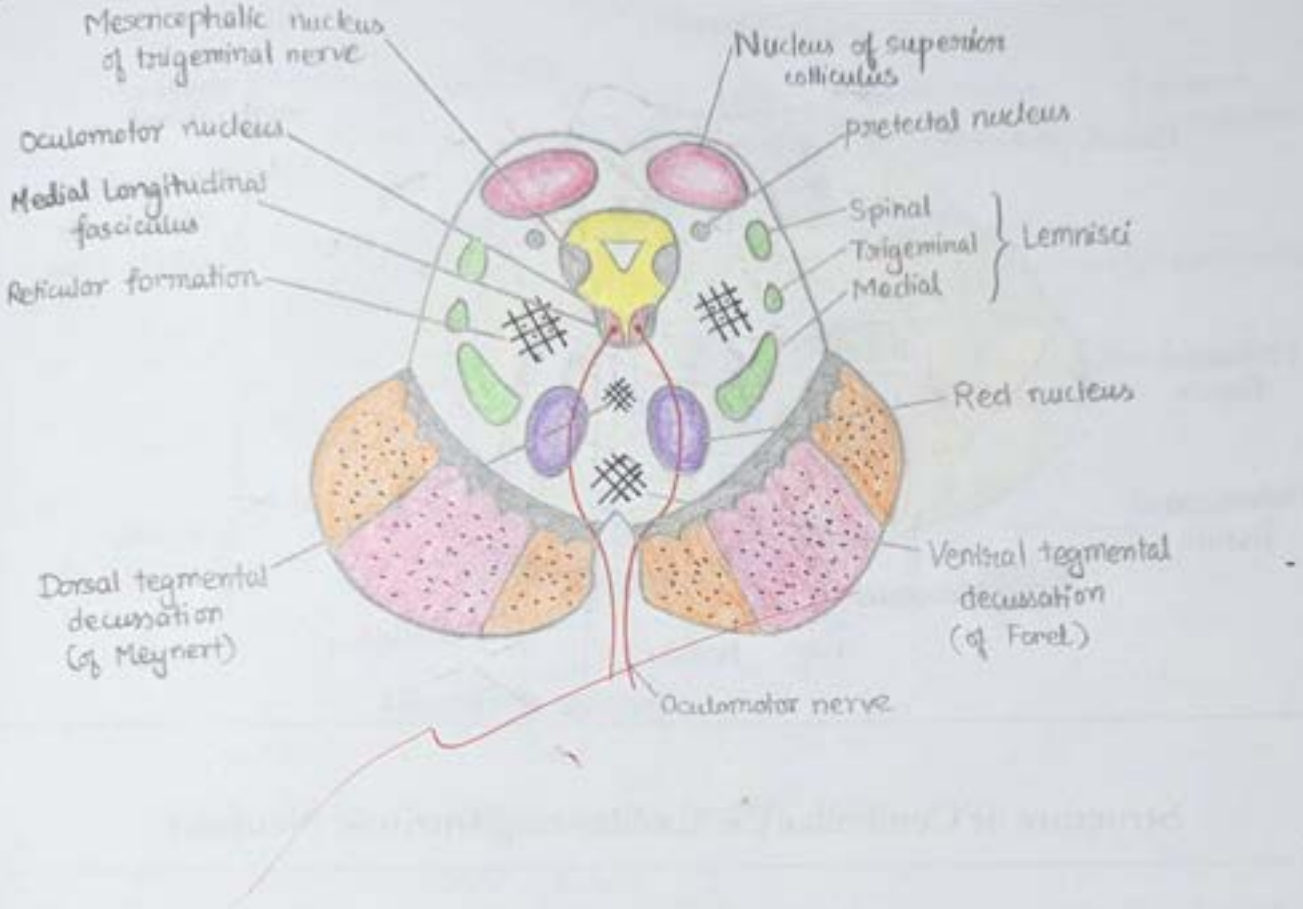
T.S. through Upper Part of the Pons



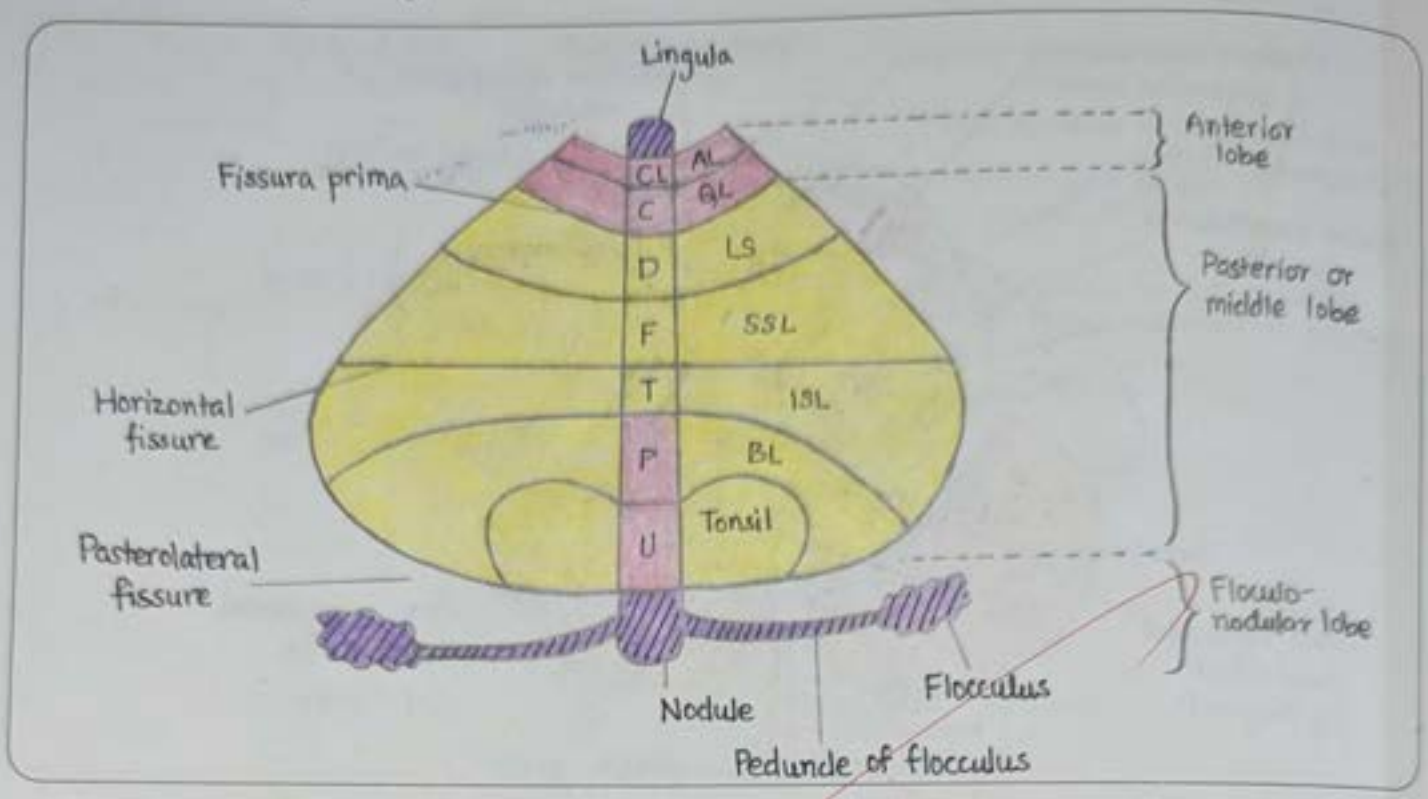
T.S. of Midbrain at the Level of Inferior Colliculi



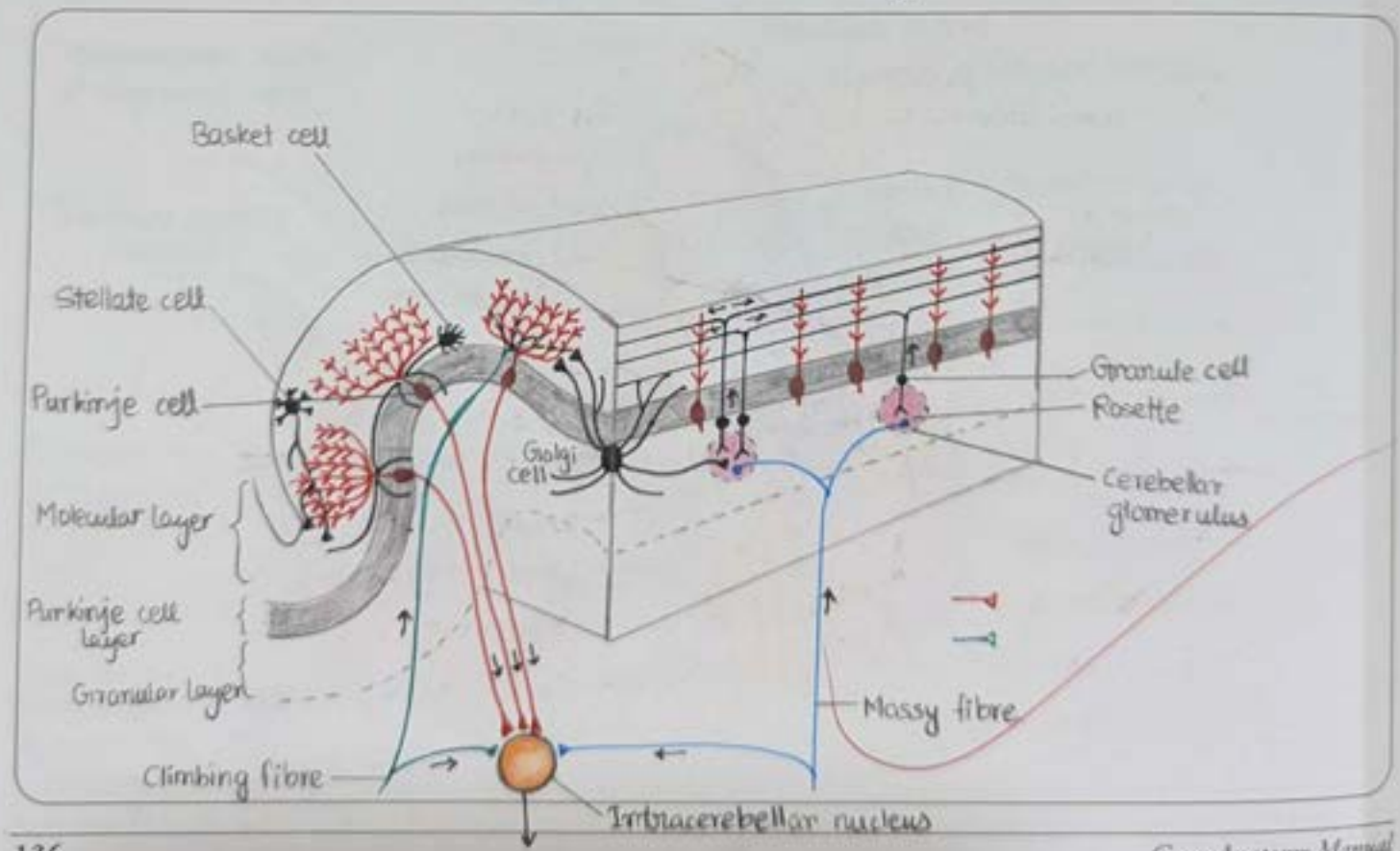
T.S. of Midbrain at the Level of Superior Colliculi



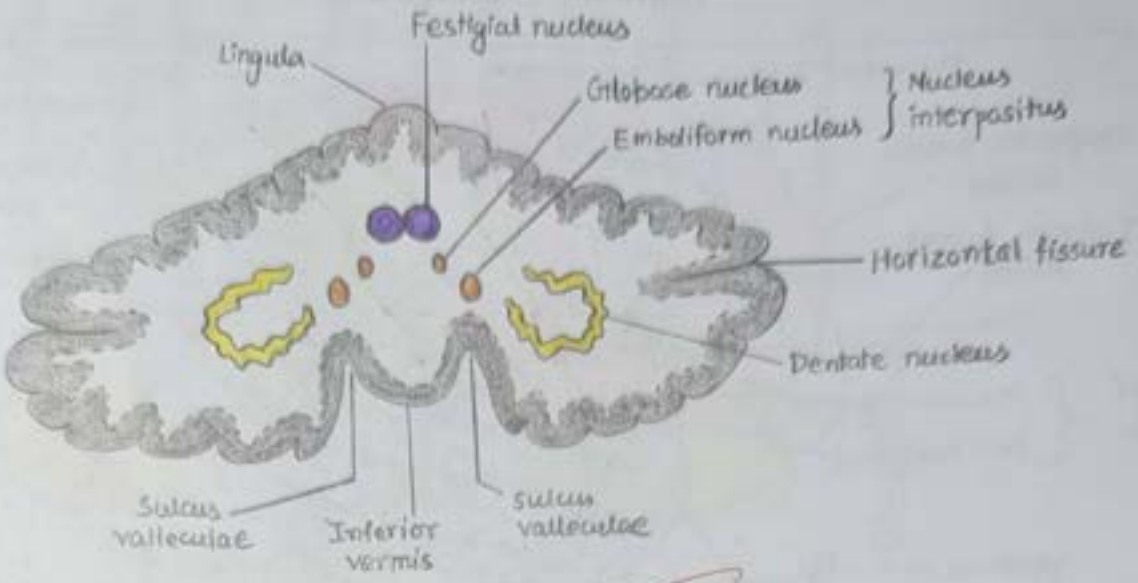
Morphological and Functional Subdivisions of Cerebellum



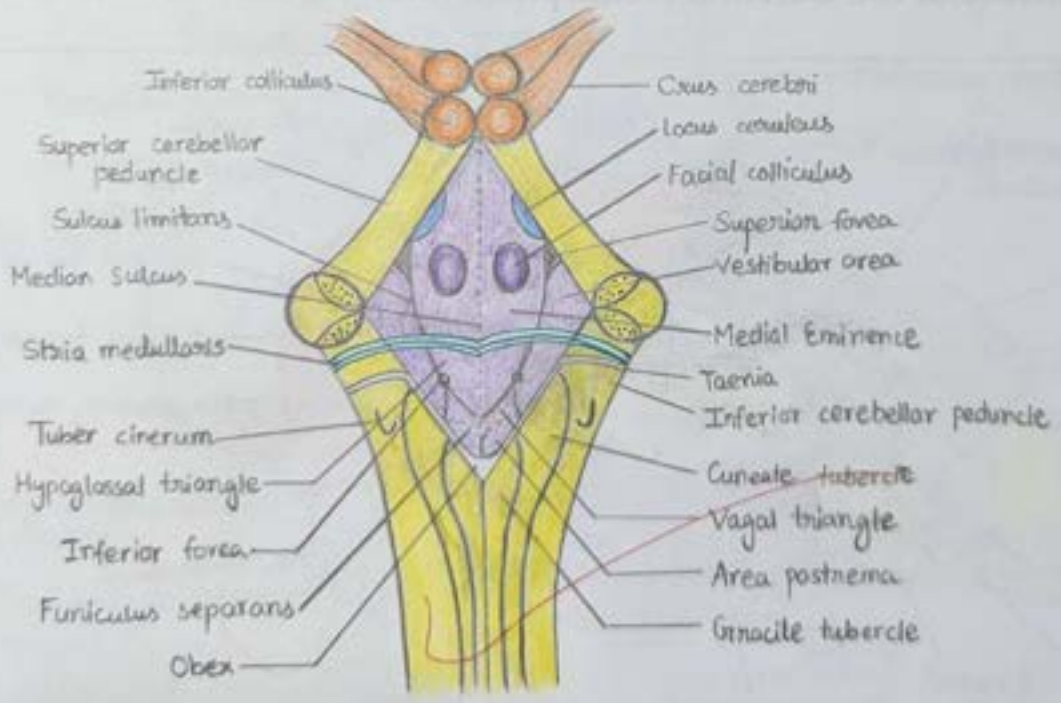
Structure of Cerebellar Cortex Showing Intrinsic Neurons



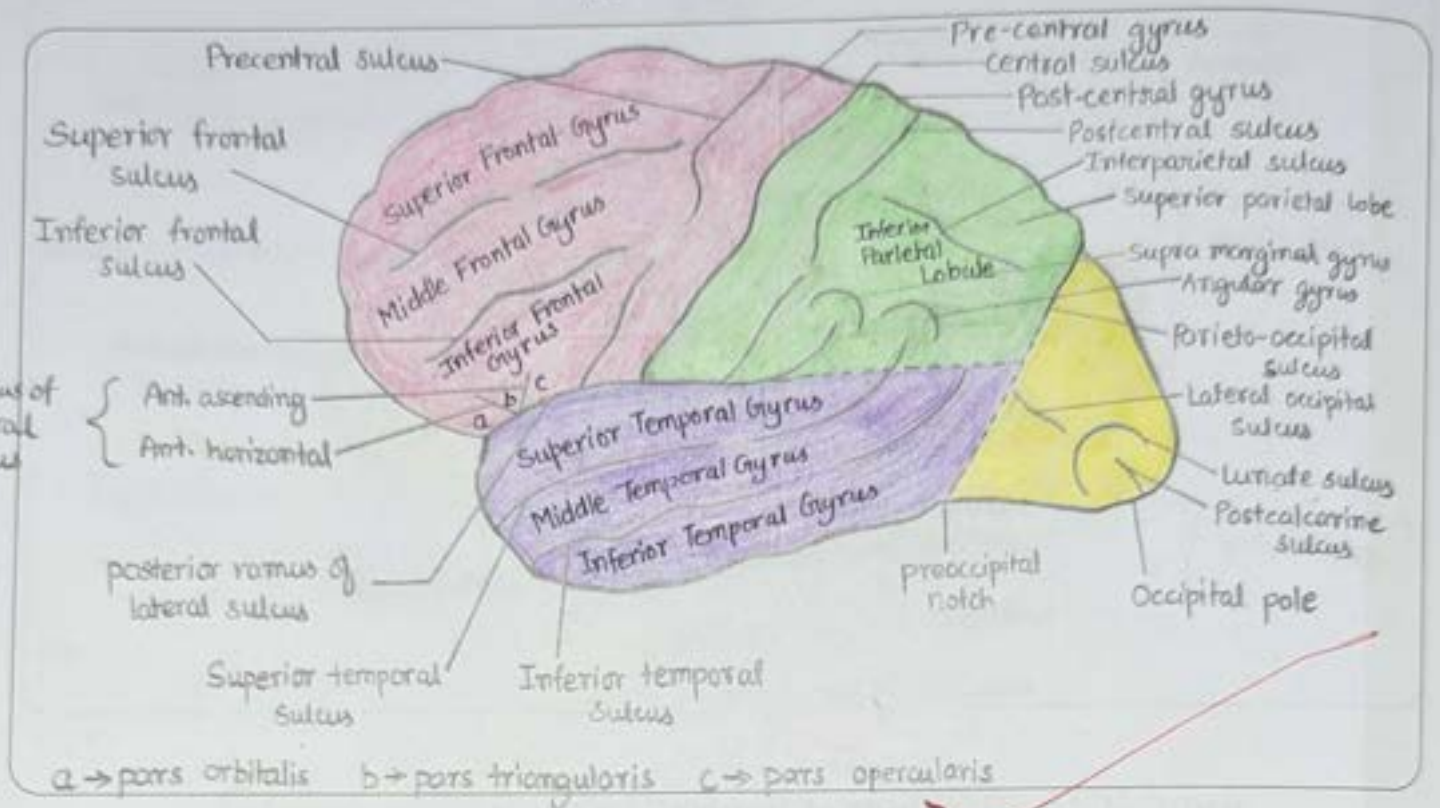
Horizontal Section of Cerebellum Showing Intracerebellar Nuclei



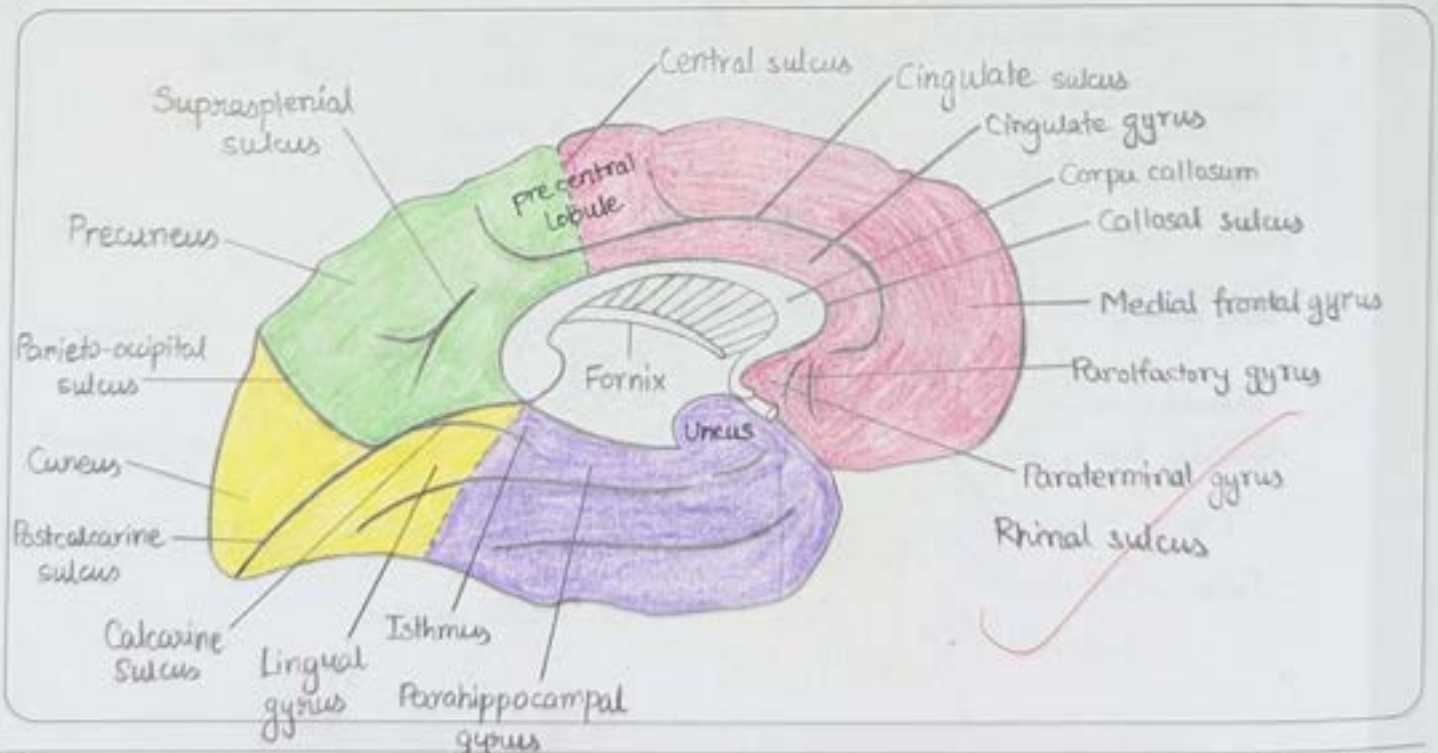
Floor of Fourth Ventricle



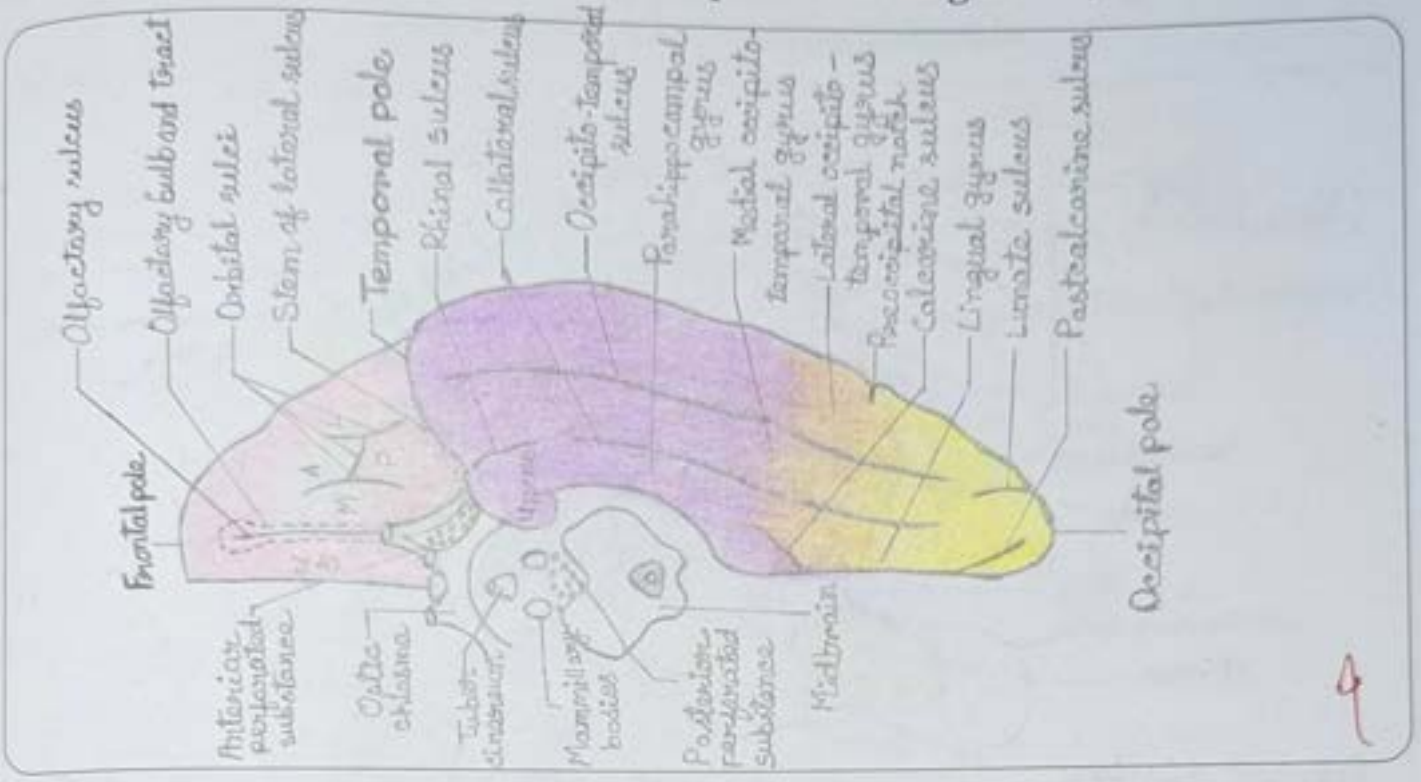
Superolateral Surface of the Cerebral Hemisphere Showing Lobes, Sulci and Gyri



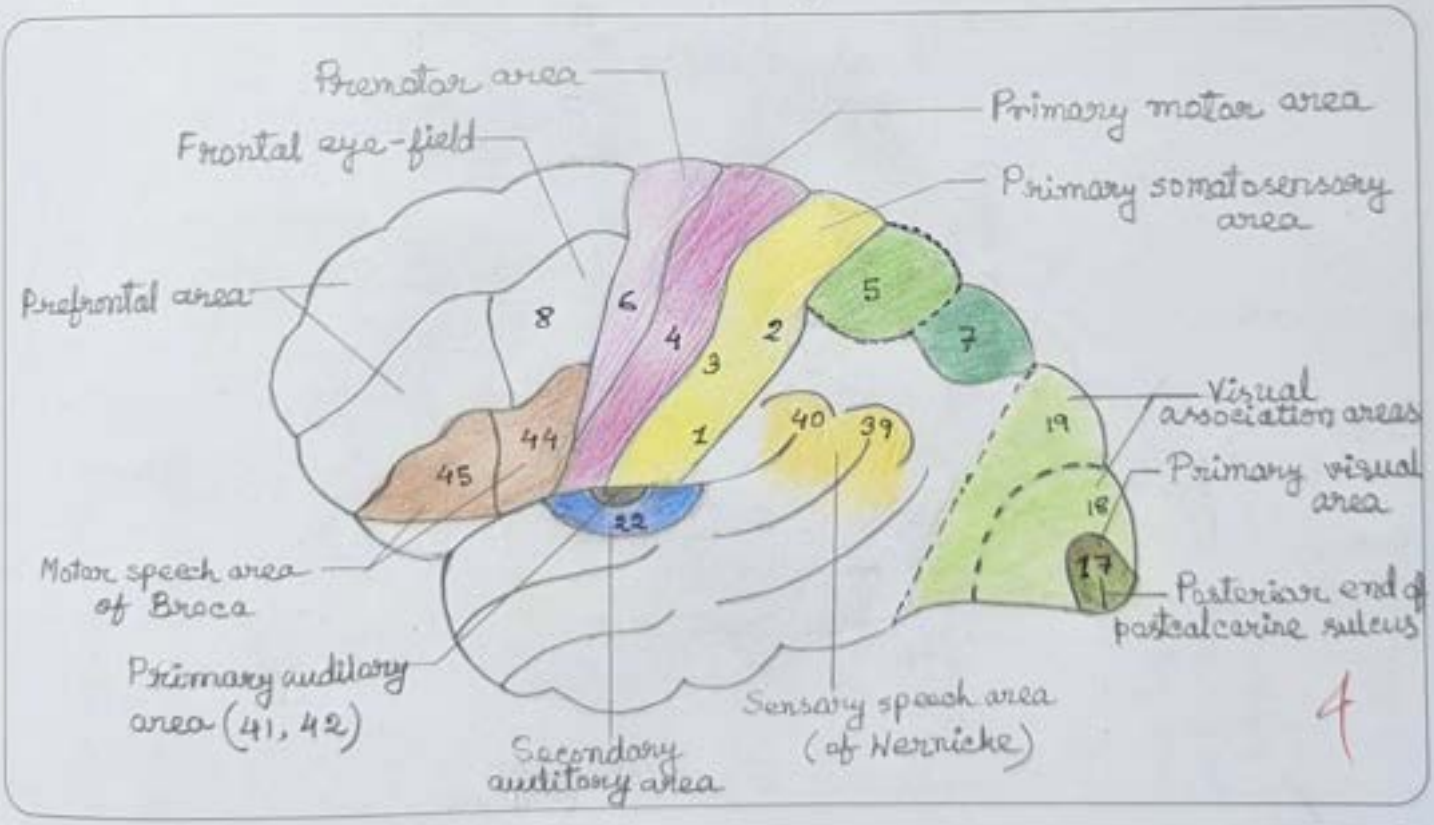
Medial Surface of the Cerebral Hemisphere Showing Lobes, Sulci and Gyri



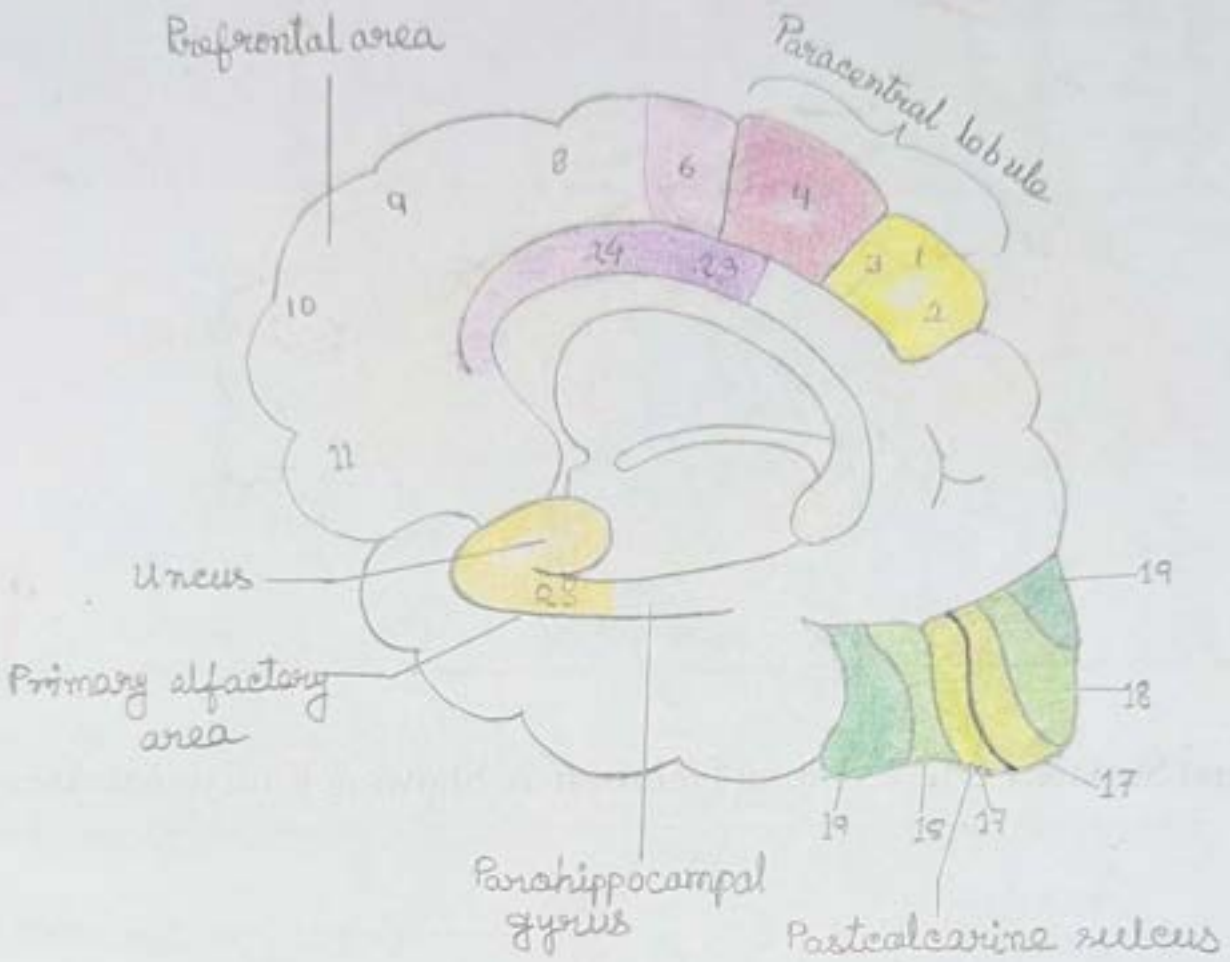
Inferior Surface of the Cerebral Hemisphere Showing Lobes, Sulci and Gyri



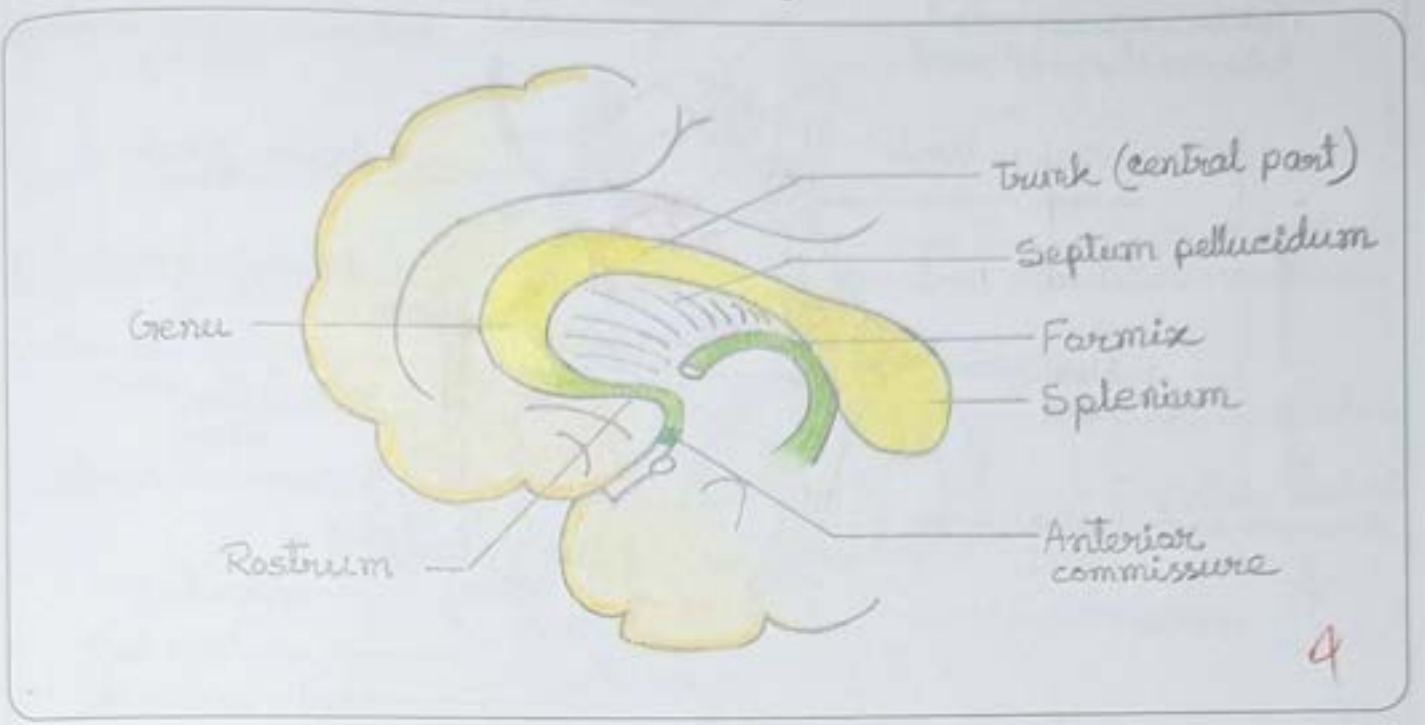
Superolateral Surface of the Cerebral Hemisphere Showing Functional Areas



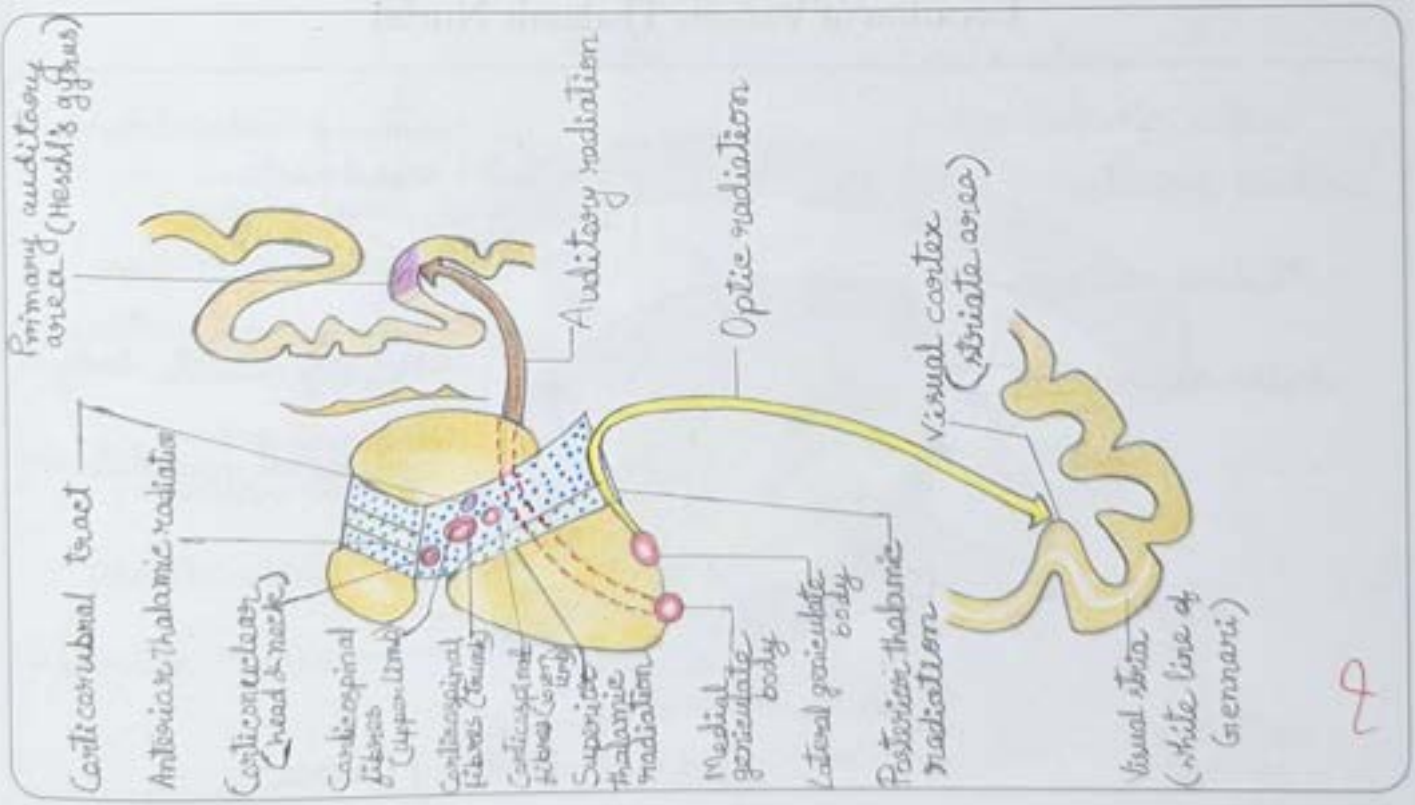
Medial Surface of the Cerebral Hemisphere Showing Functional Areas



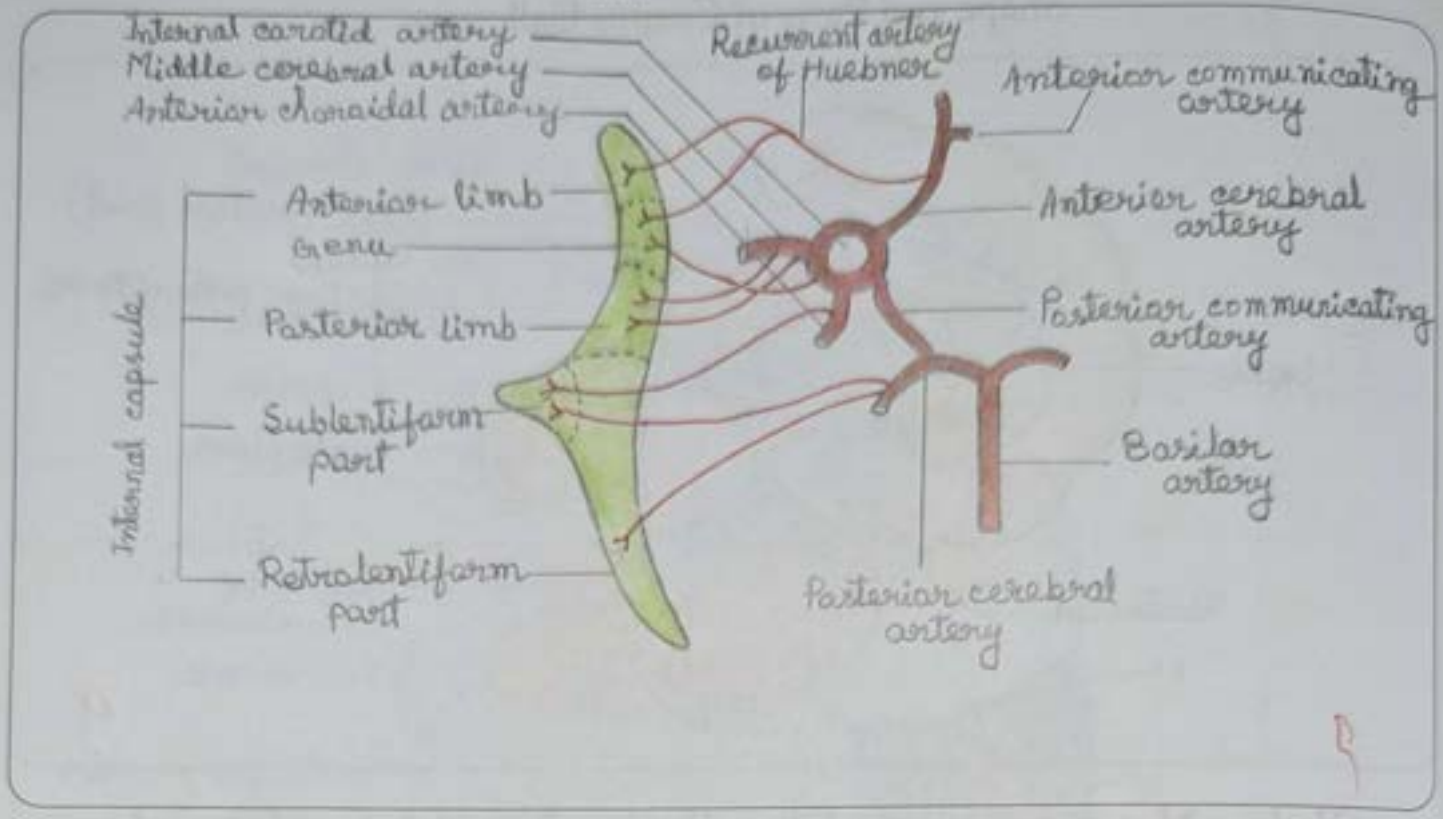
Median Sagittal Section of the Cerebrum Showing Shape and Parts of Corpus Callosum



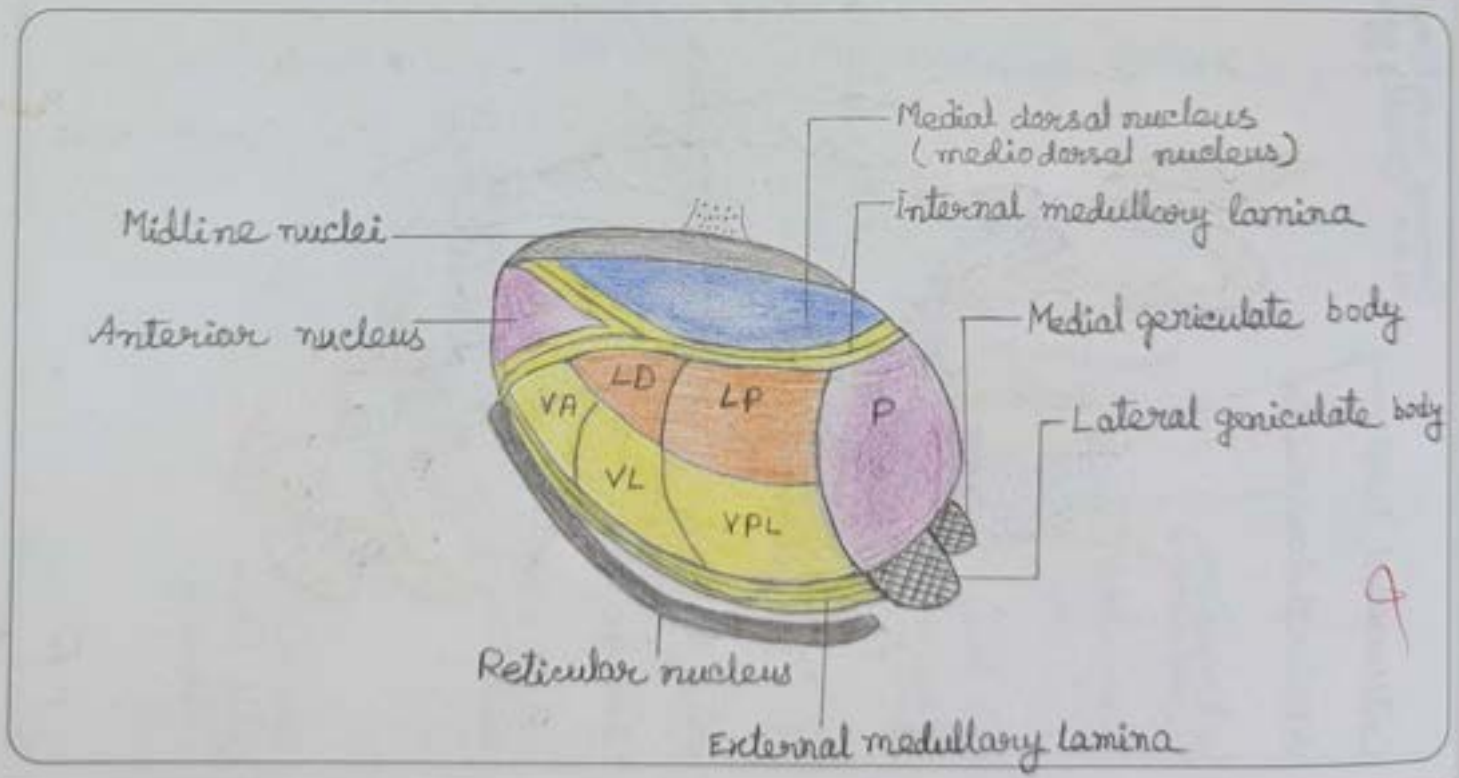
Various Motor and Sensory Fibers Passing through Internal Capsule



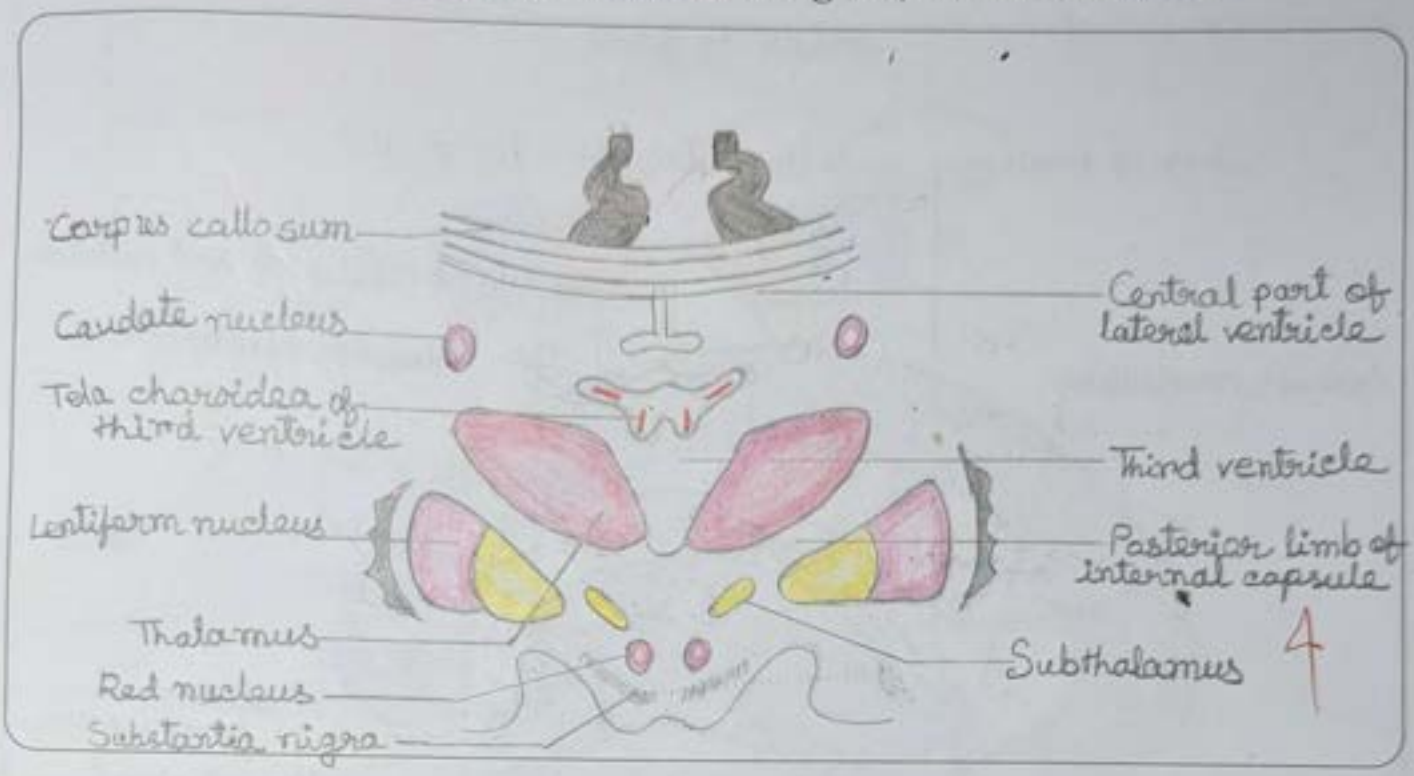
Arteries Supplying the Internal Capsule



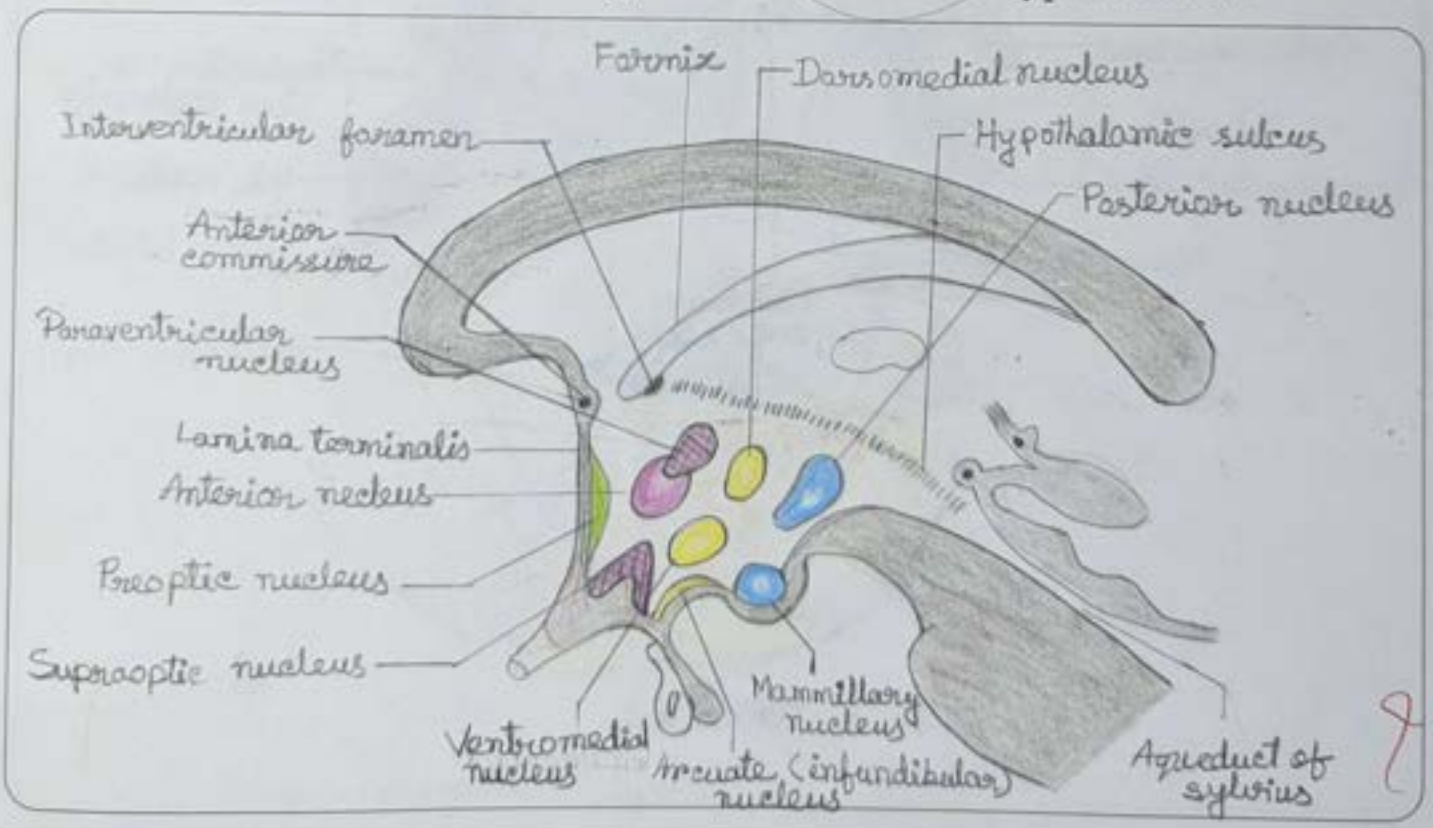
Horizontal Section of the Thalamus to Show the Location of Various Thalamic Nuclei



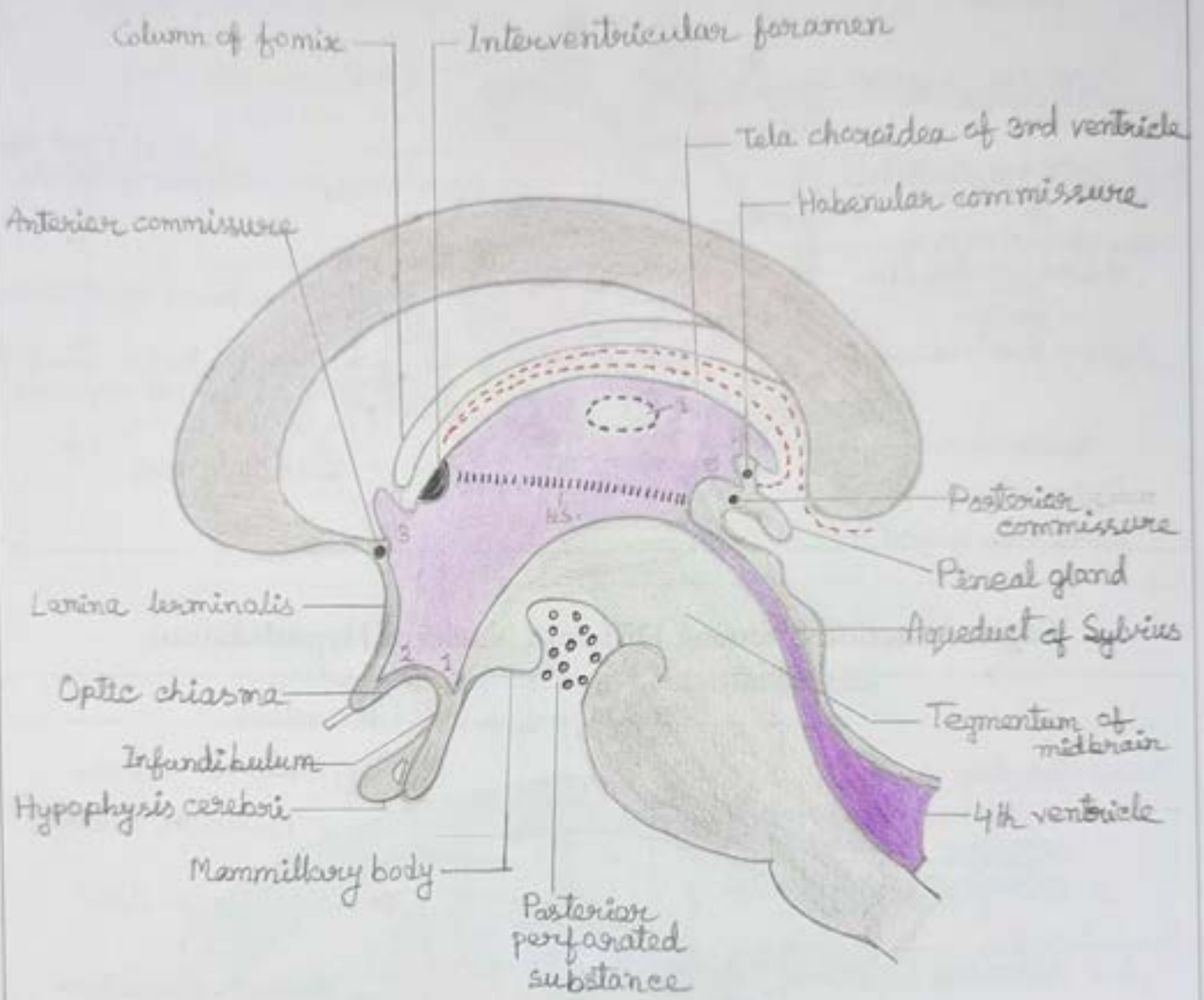
A Coronal Section of Brain Showing relations of Thalamus



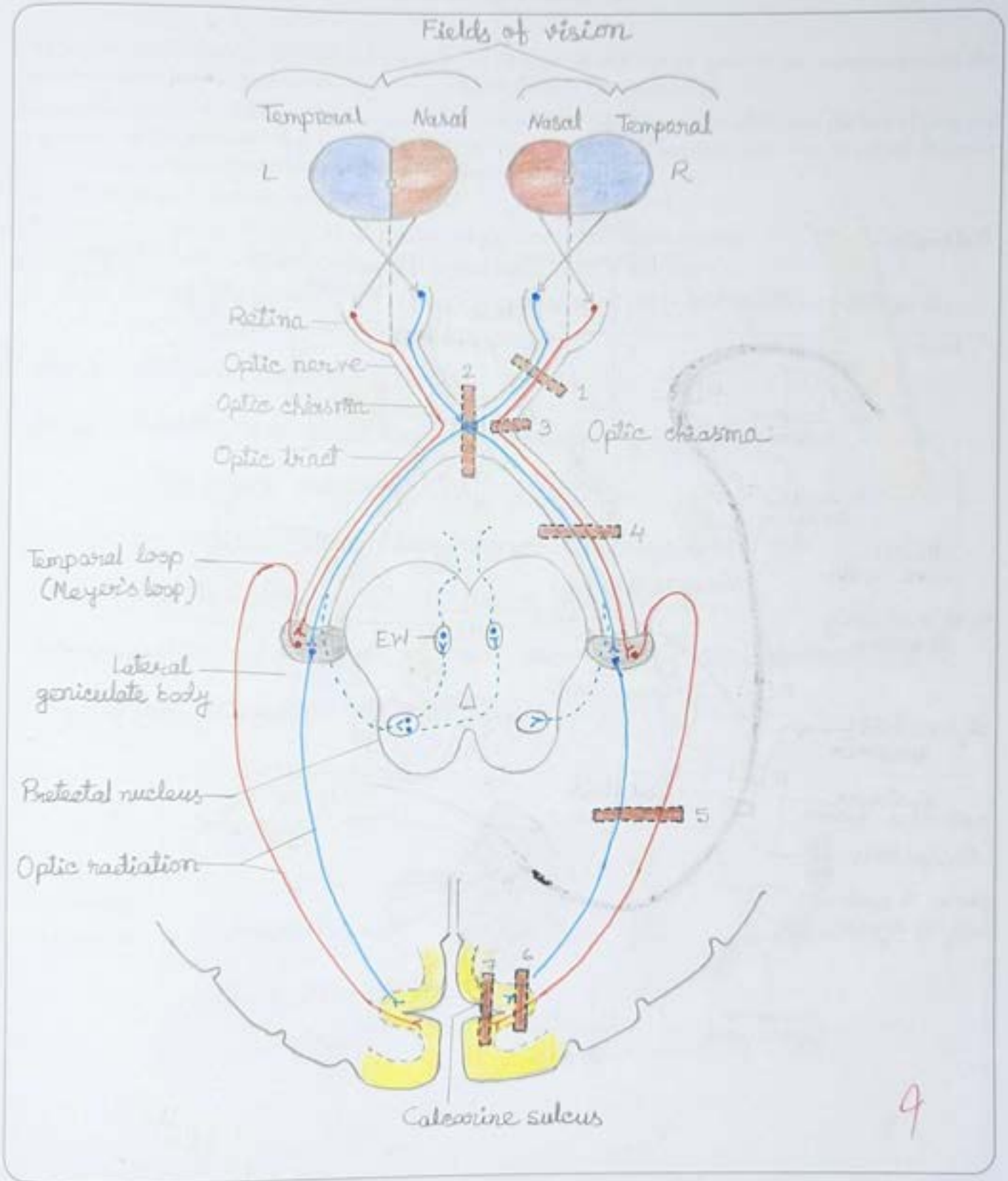
Sagittal Section Showing Different Nuclei of Hypothalamus



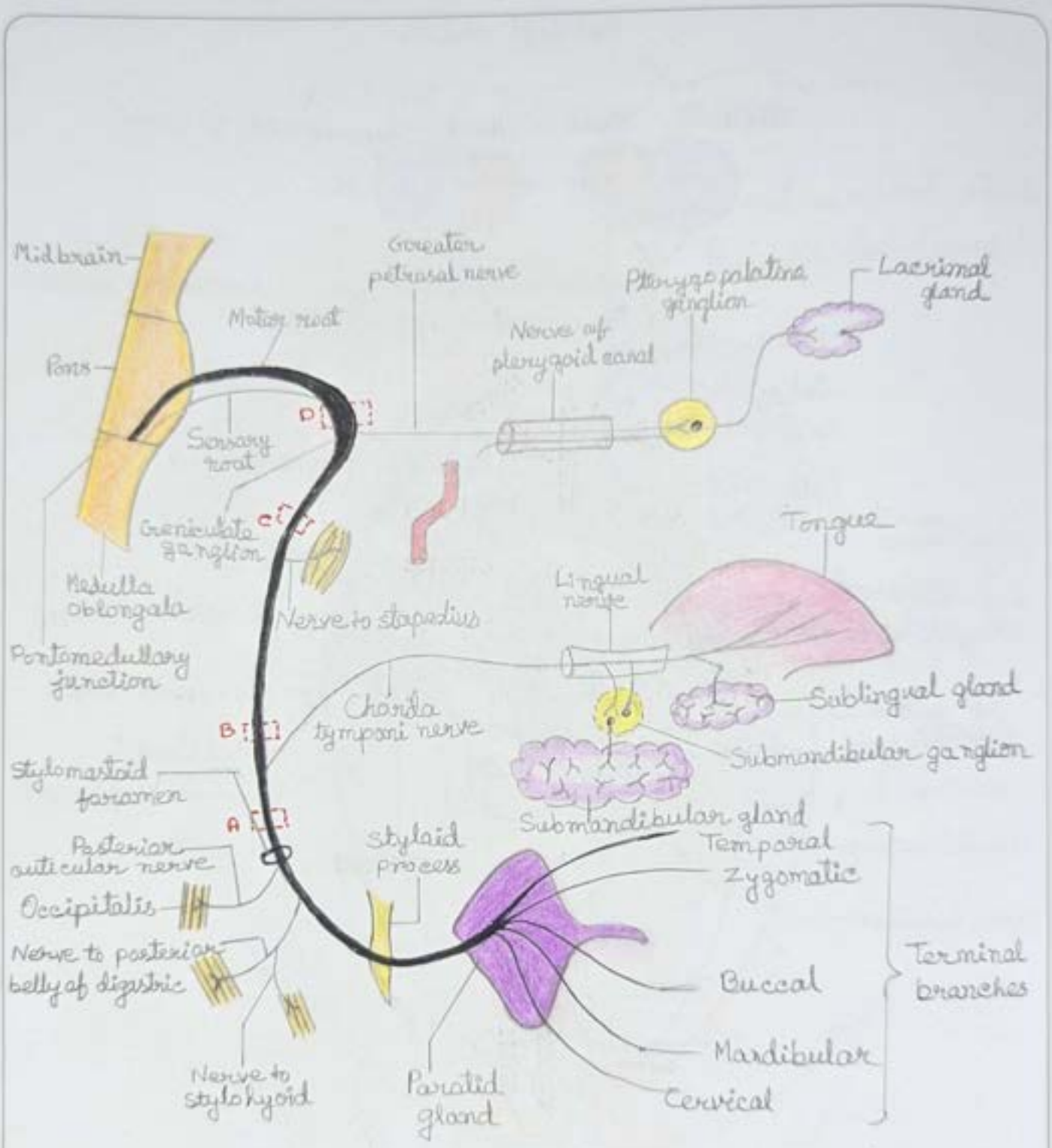
Boundaries of Third Ventricle



Visual Pathway



Facial Nerve—Course and Distribution



Incomplete 9

Clinical Case-1

A 35 yr old man with high BP and sudden onset of nystagmus and vertigo came to the hospital patient also complaints about slurred speech, hoarseness of voice and difficulty in swallowing.

On examination, doctor find out there is paralysis of left palatine and laryngeal muscles also the loss of pain and temperature on the left sided face and on the body below neck region of opposite side. Gait of patient is ataxic. The above sign and symptoms leads to the vascular lesion in brainstem.

Q.1 Which artery is involved in above case?

Q.2 Name the nucleus affected leads to paralysis of palatine and laryngeal muscles

Q.3 Name the tract affected leads to loss of pain and temperature of side face

Q.4 Name the tract affected leads to loss of pain and temperature of the body below the neck of right side.

Ans.1 - Posterior inferior cerebellar artery

Ans.2 - Nucleus ambiguus leads to paralysis of palatine and laryngeal muscles.

Ans-3 - Spinal tract of trigeminal nerve is responsible for ipsilateral loss of pain & temperature of face.

Ans-4 - Lateral spinothalamic tract lesion causes contralateral loss of pain and temperature.

Clinical Case-2

A 29 yr old biker met with head on collision in road traffic accident brought to the hospital with fracture of humerus eventually developed with right hemiplegia with increased muscle tone and tendon reflexes. On MRI, a small lesion is found at the internal capsule of left cerebral hemisphere. The Babinski sign is also positive on right side.

Q.1 Enumerate the parts and fibers present in the Internal Capsule.

Q.2 Write the arterial supply of internal capsule?

Q.3 The above mention case is UMN or LMN. Explain

Q.4 Which artery is known as artery of cerebral haemorrhage?

Ans-1:- Anterior limb, Genu, Posterior limb, Retrolentiform part and Sublentiform part.

Ans-2:- (i) Branches from anterior cerebral artery

(ii) Branches from middle cerebral artery

(iii) Branches from posterior cerebral artery

(iv) Branches from internal carotid artery

(v) Branches from anterior choroidal artery

Ans-3:- Above mentioned case is UMN lession, as right hemiplegia occurs due to lession of internal capsule of left cerebral hemisphere which is a contralateral response. Also babinski sign is positive.

Ans-4:- Lenticulostriate branch of middle cerebral artery.

Clinical Case-3

A 64 yr old man with stooped posture came to neurologist complaints of

Bradykinesia. On examination doctor noticed resting tremors, lead pipe or cogwheel type muscular rigidity, pill rolling movements of hands, mask like face, shuffling gait.

Q.1 Name the clinical condition.

Q.2 Deficiency of which neurotransmitter leads to above mentioned disease.

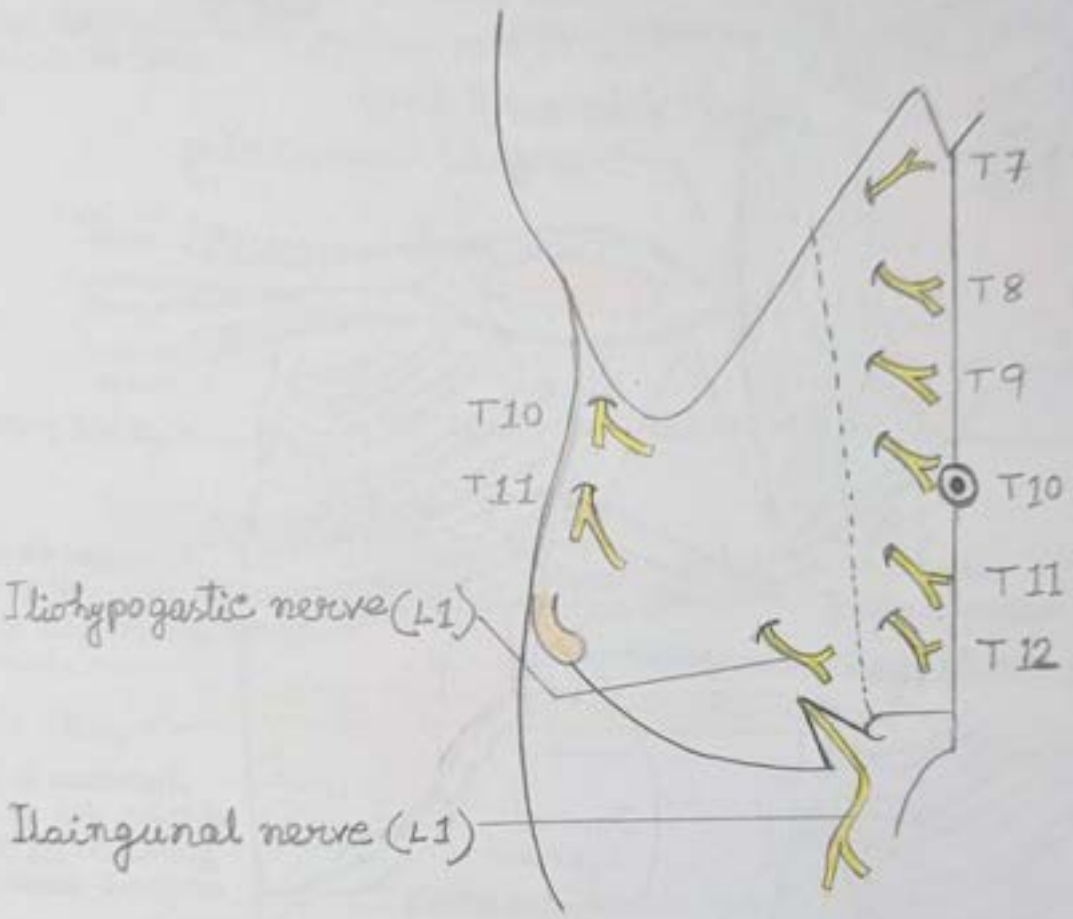
Q.3 Write its treatment?

Ans-1:- Parkinsonism

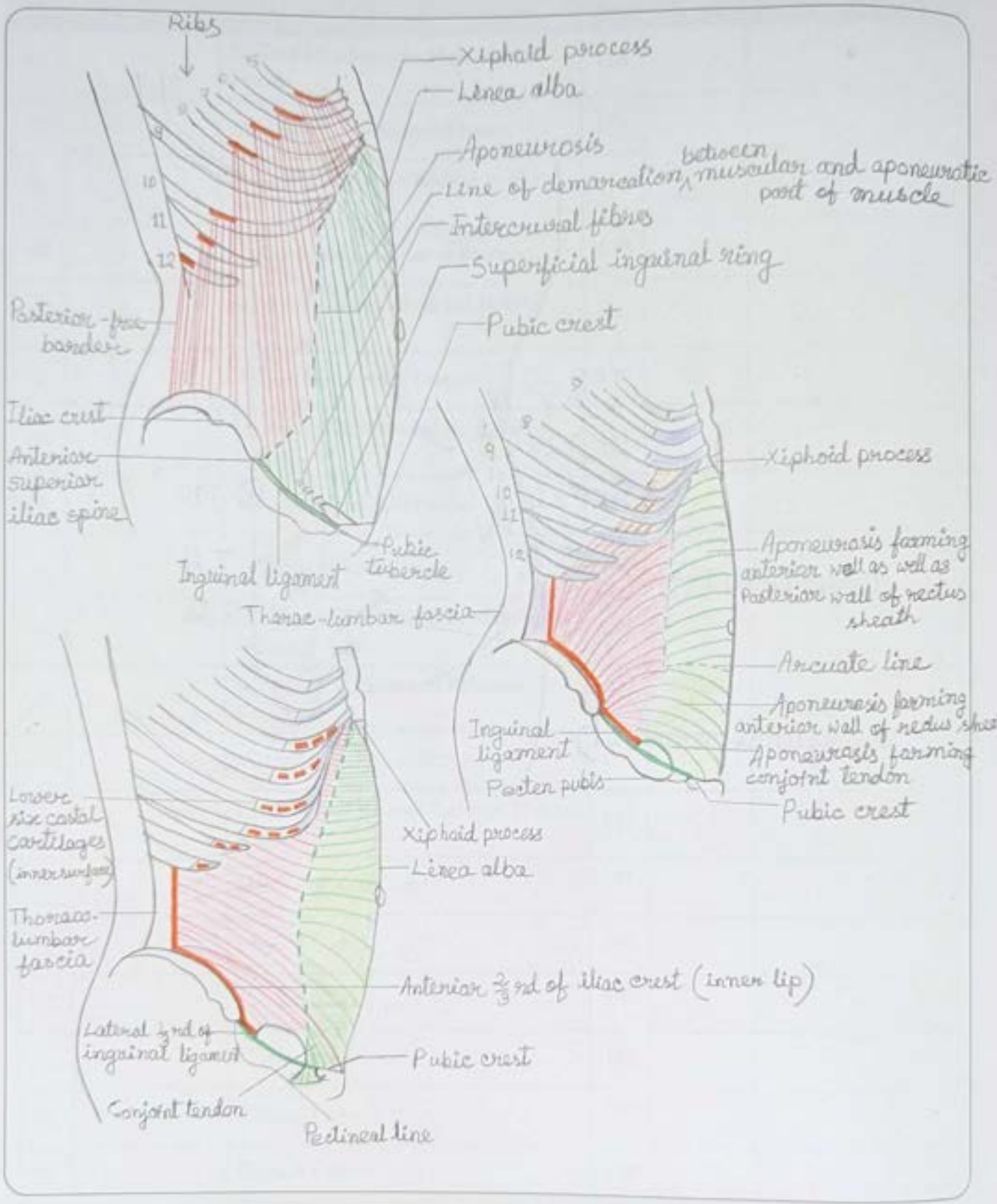
Ans-2:- Dopamin

Ans-3:- Adminstration of L-Dopa.

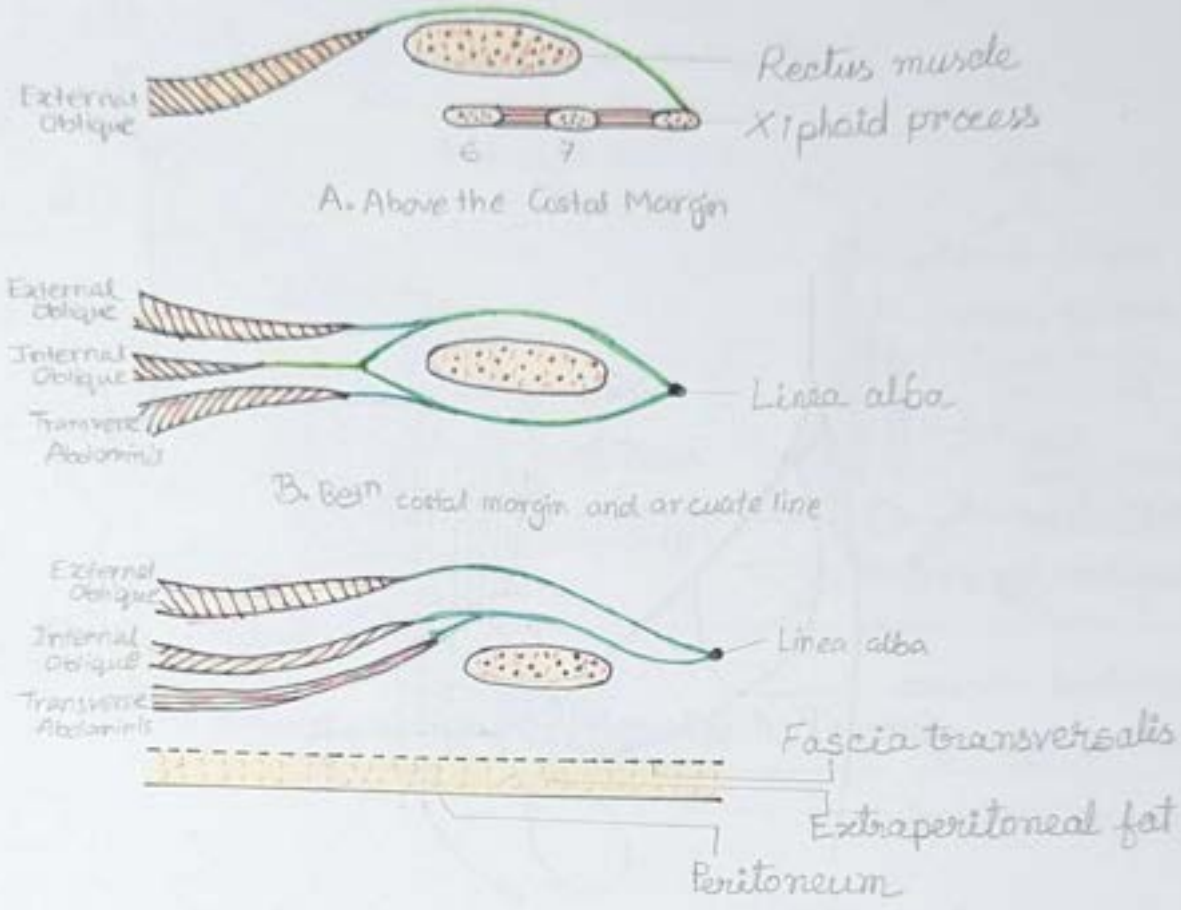
Cutaneous Nerve Supply of the Anterior Abdominal Wall



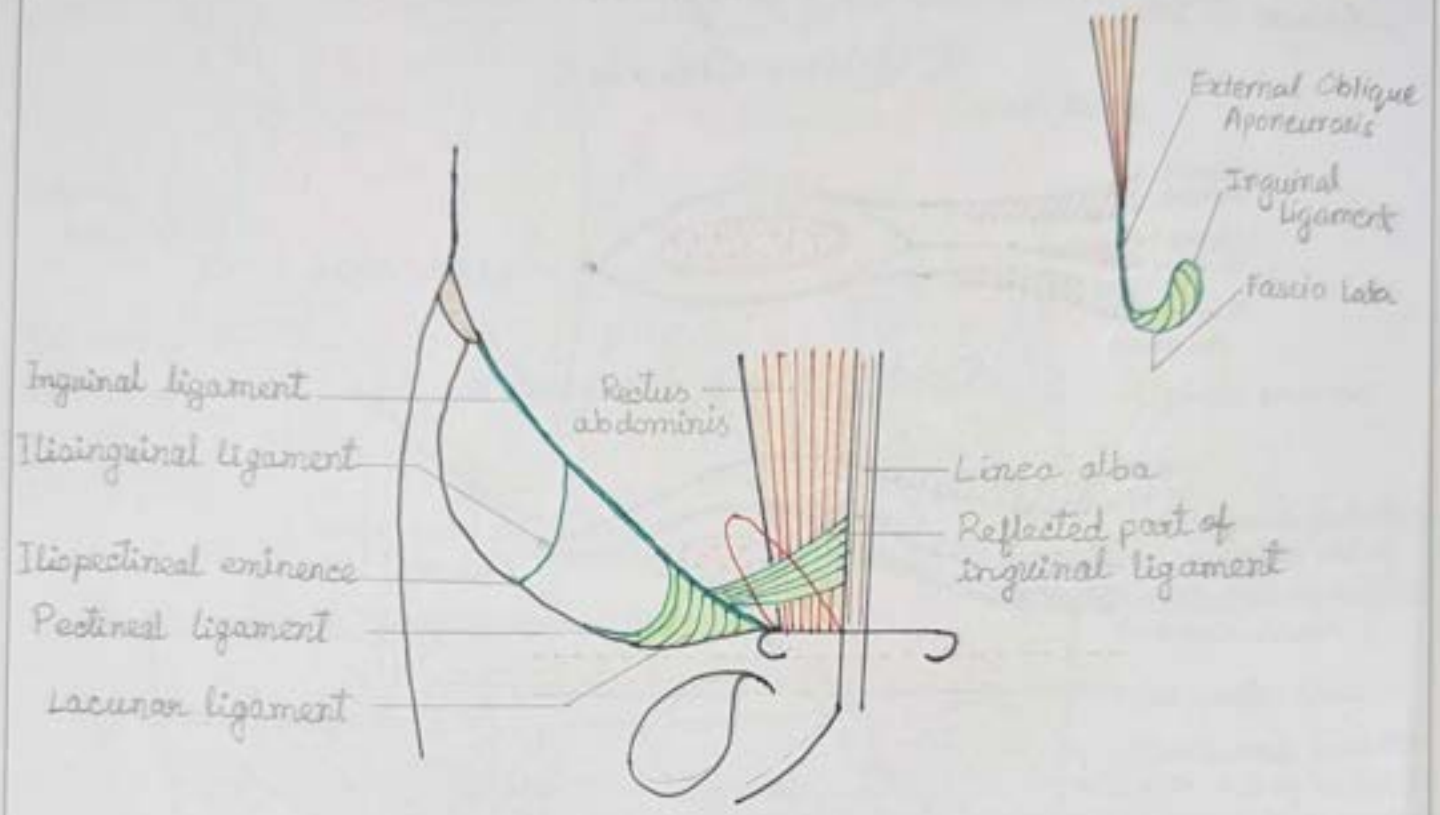
Muscles of Anterior Abdominal Wall



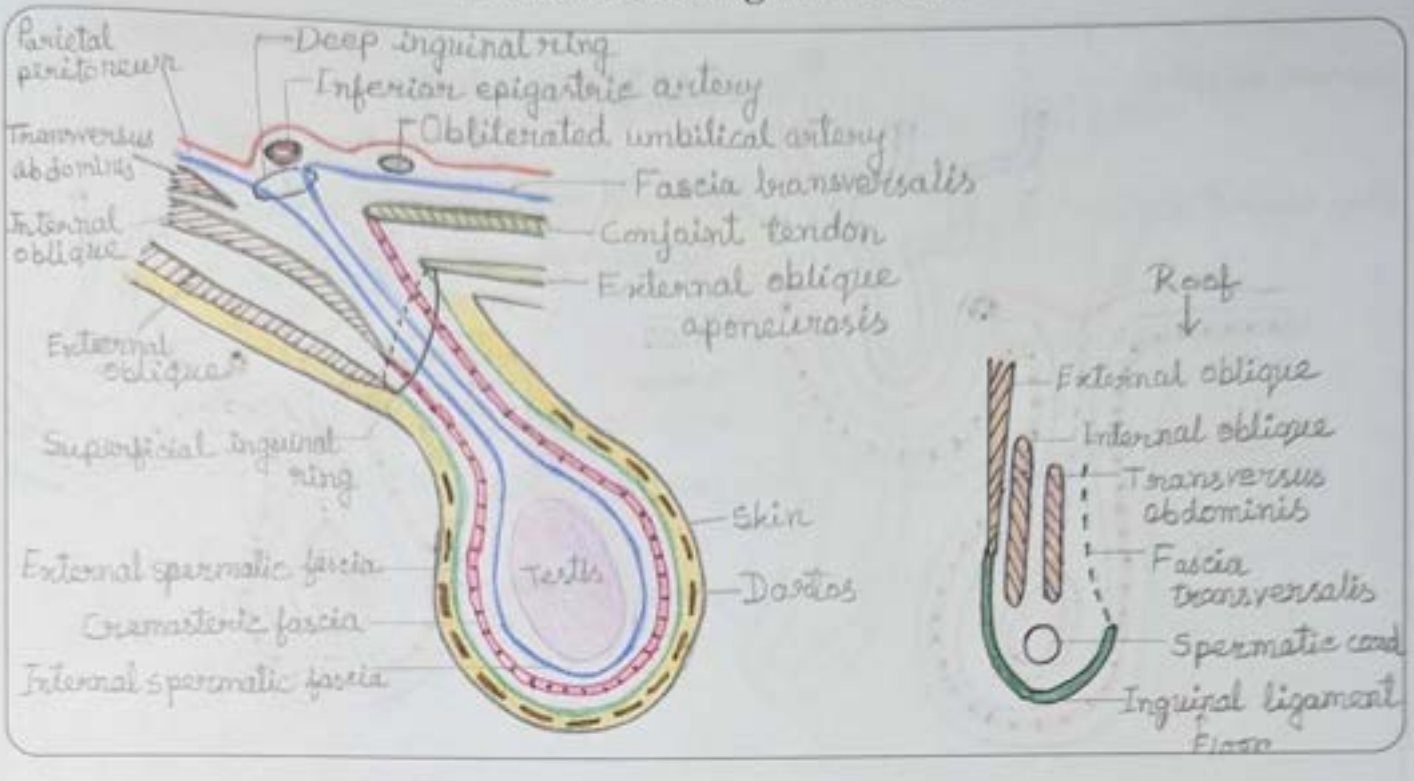
Formation of Rectus Sheath—Anterior and Posterior Wall



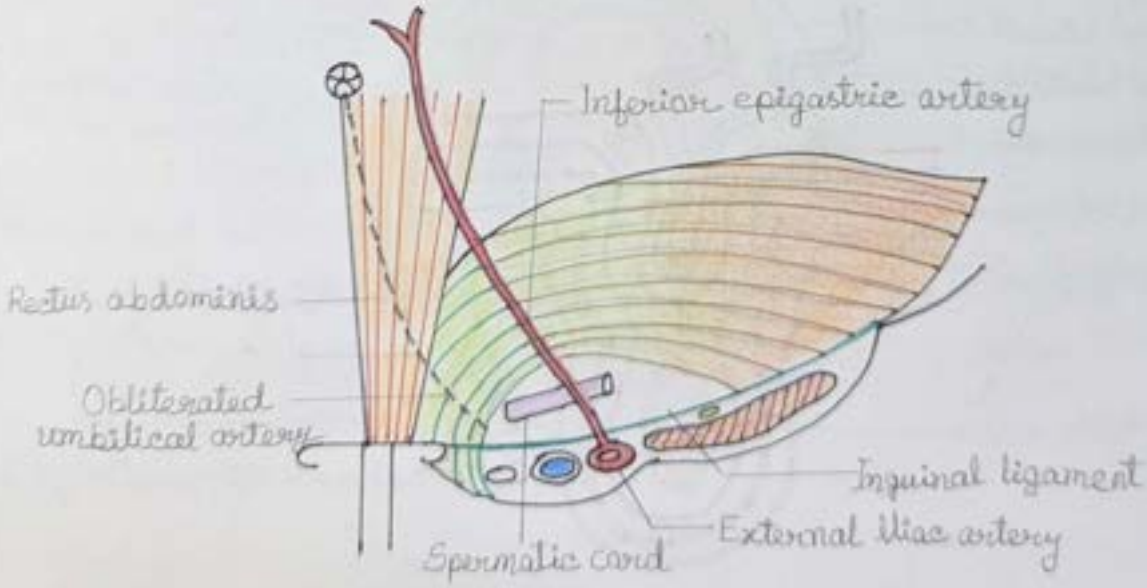
Inguinal Ligament and its Extension



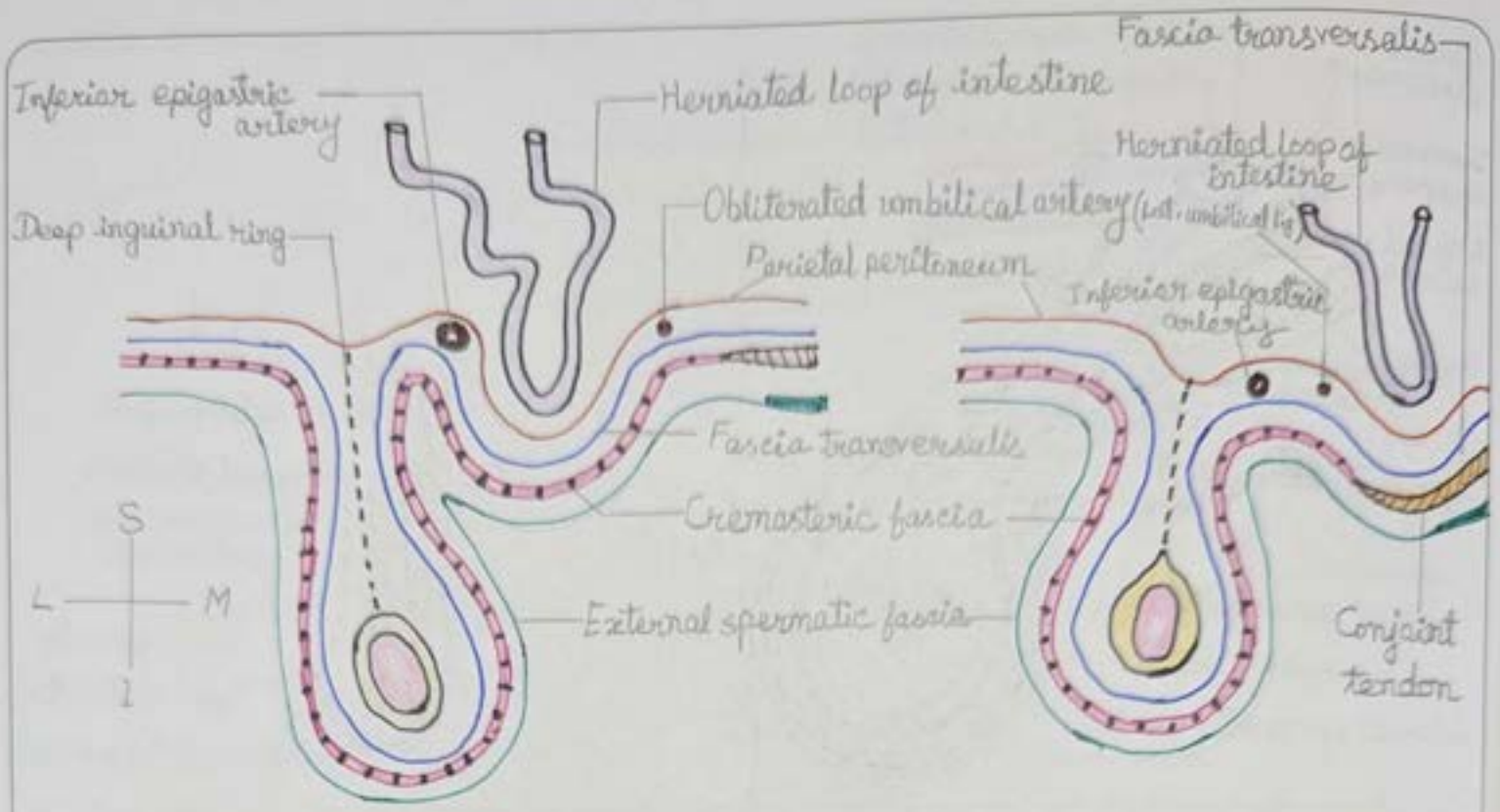
Boundaries of Inguinal Canal



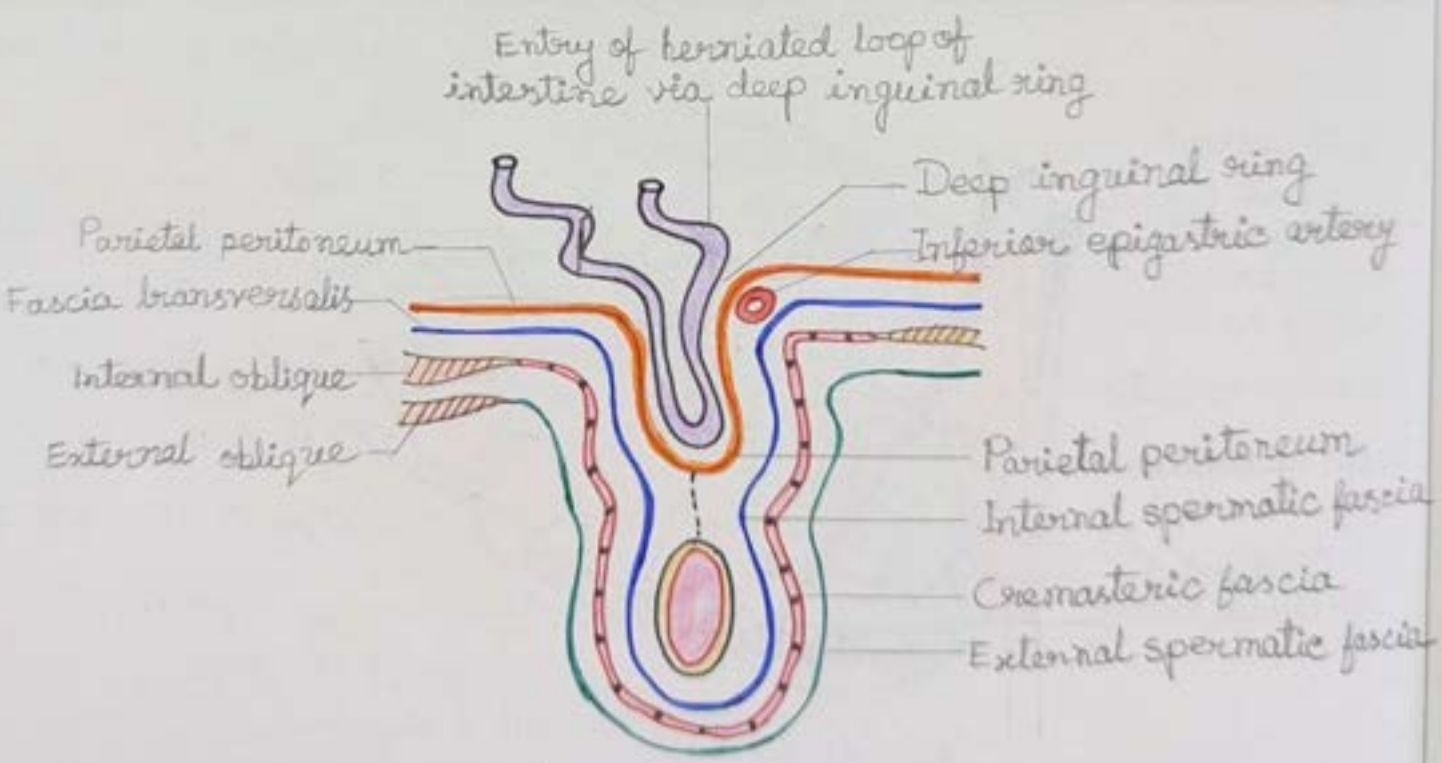
Boundaries of Inguinal (Hesselbach) Triangle



Direct and Indirect Inguinal Hernia

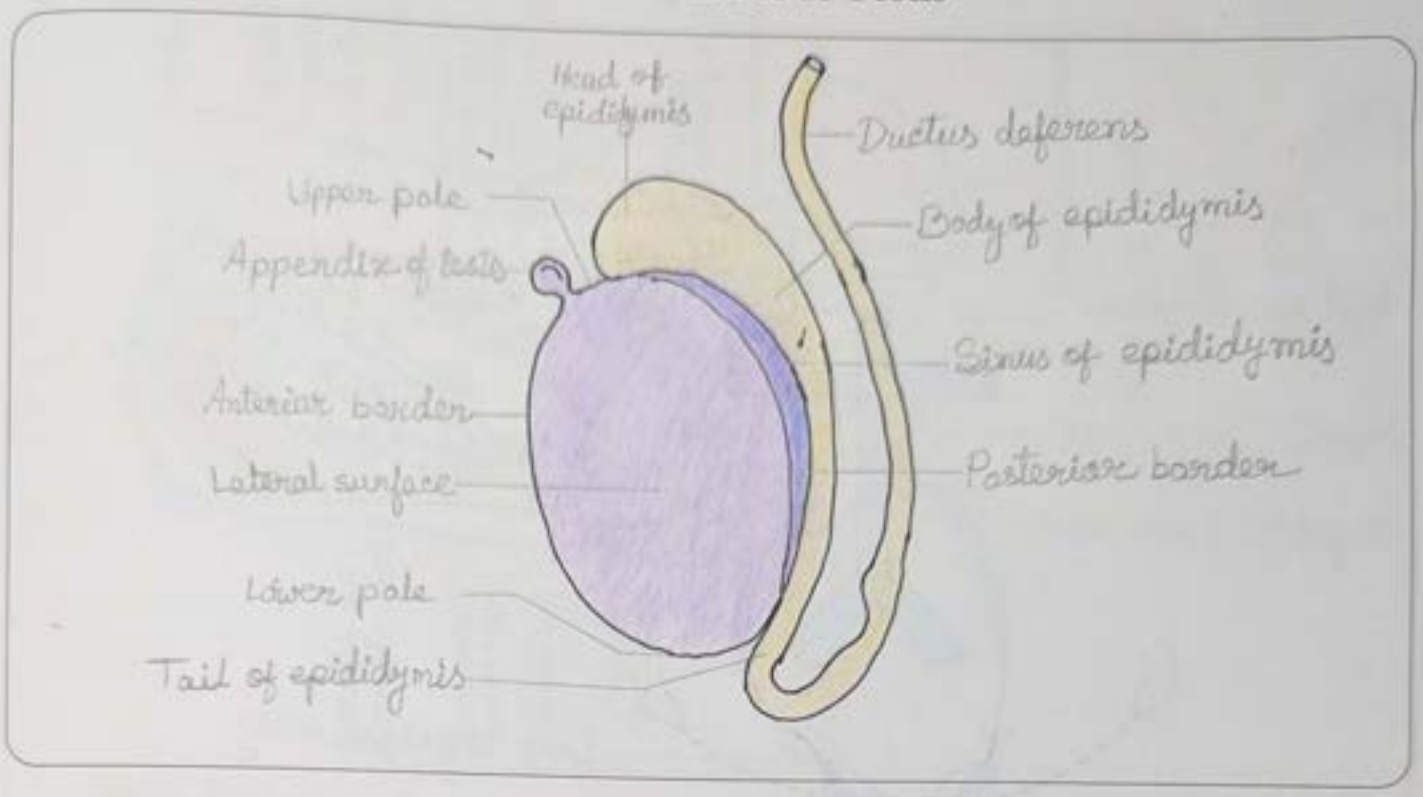


Direct Inguinal Hernia

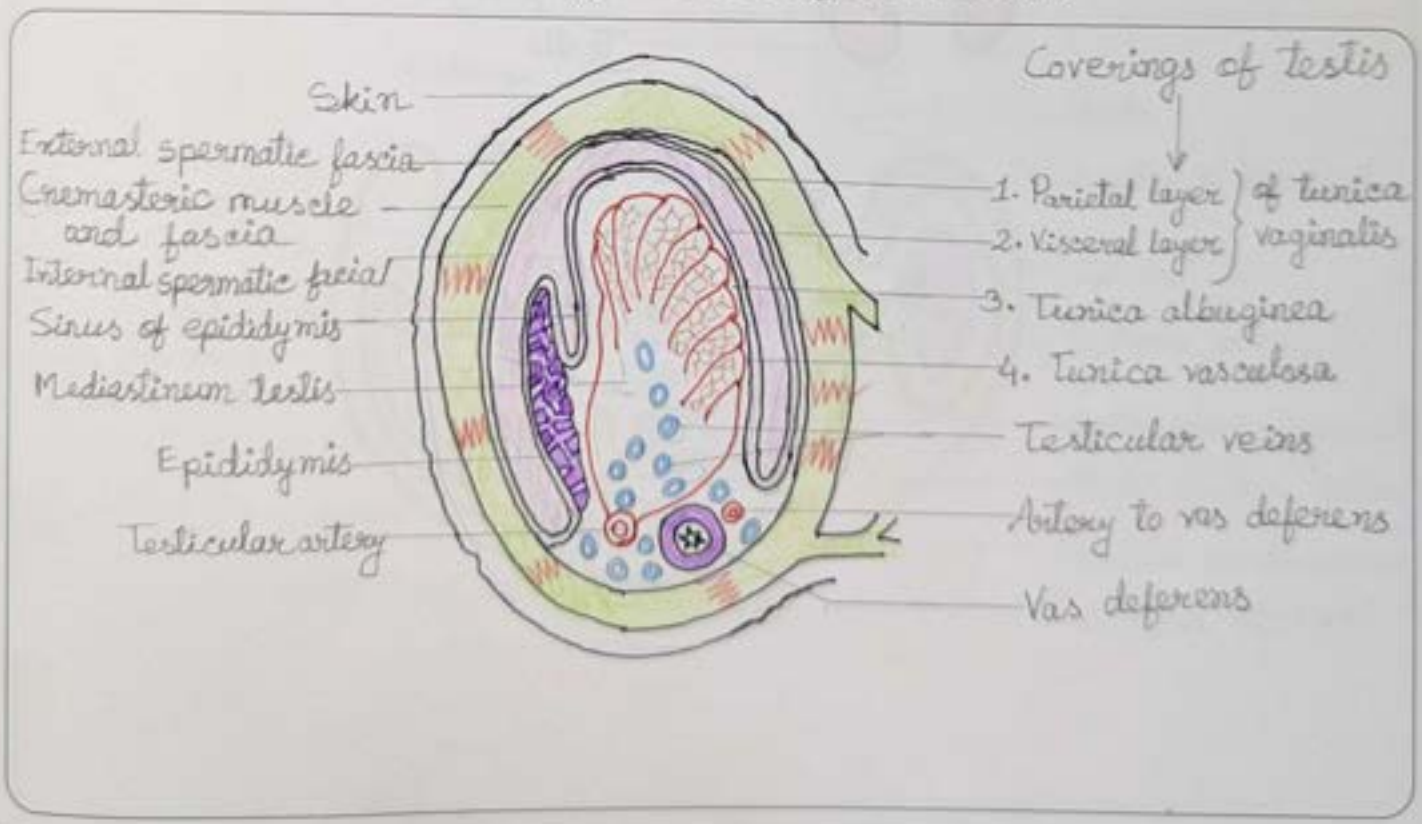


Indirect Inguinal Hernia

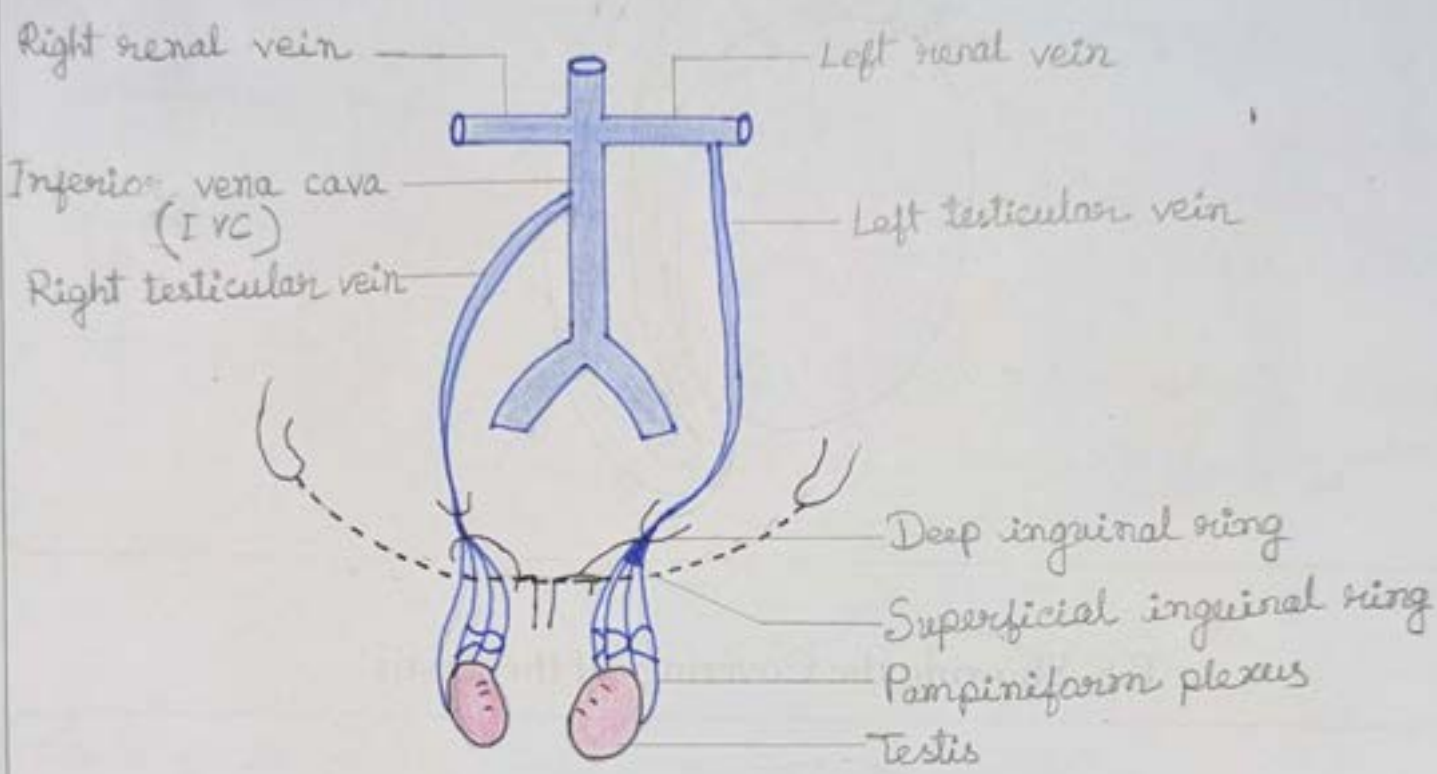
External Features of Testis



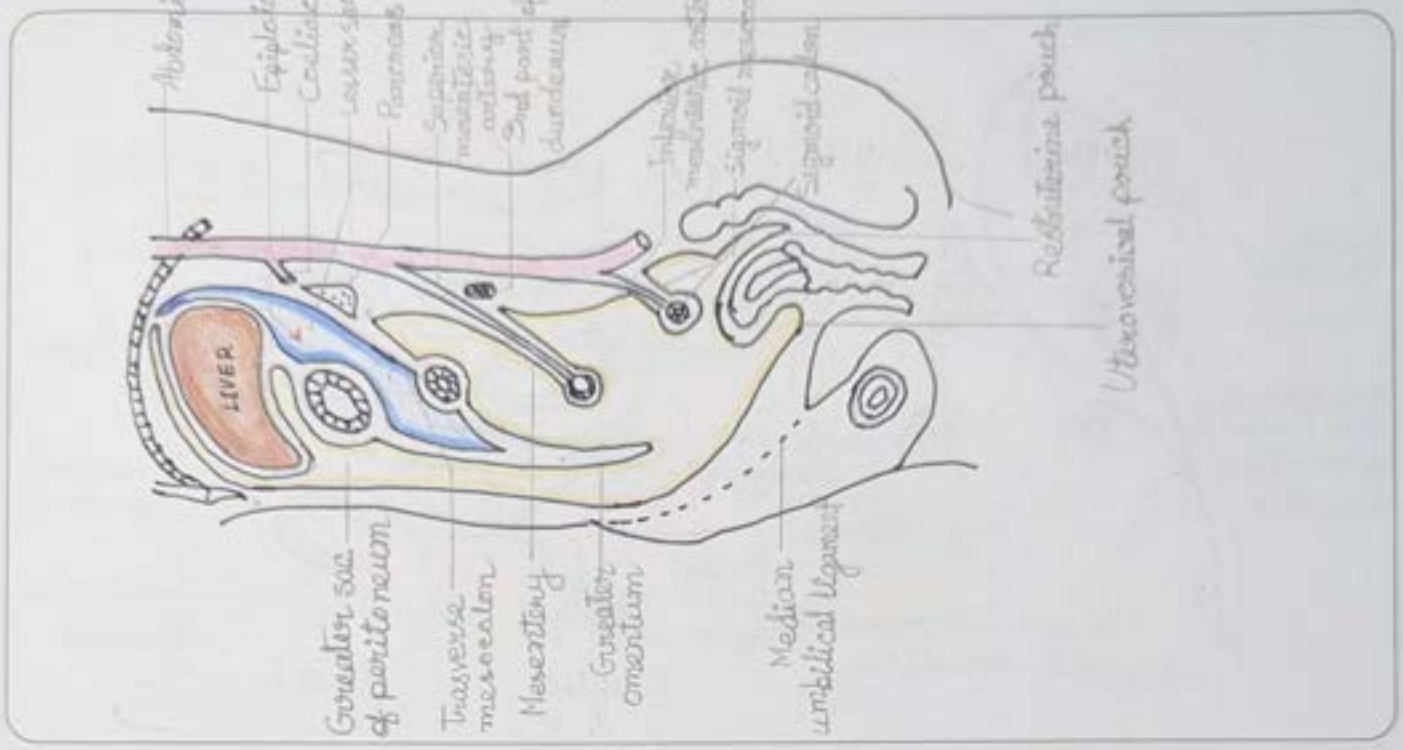
T.S. Showing the Coverings of the Testis



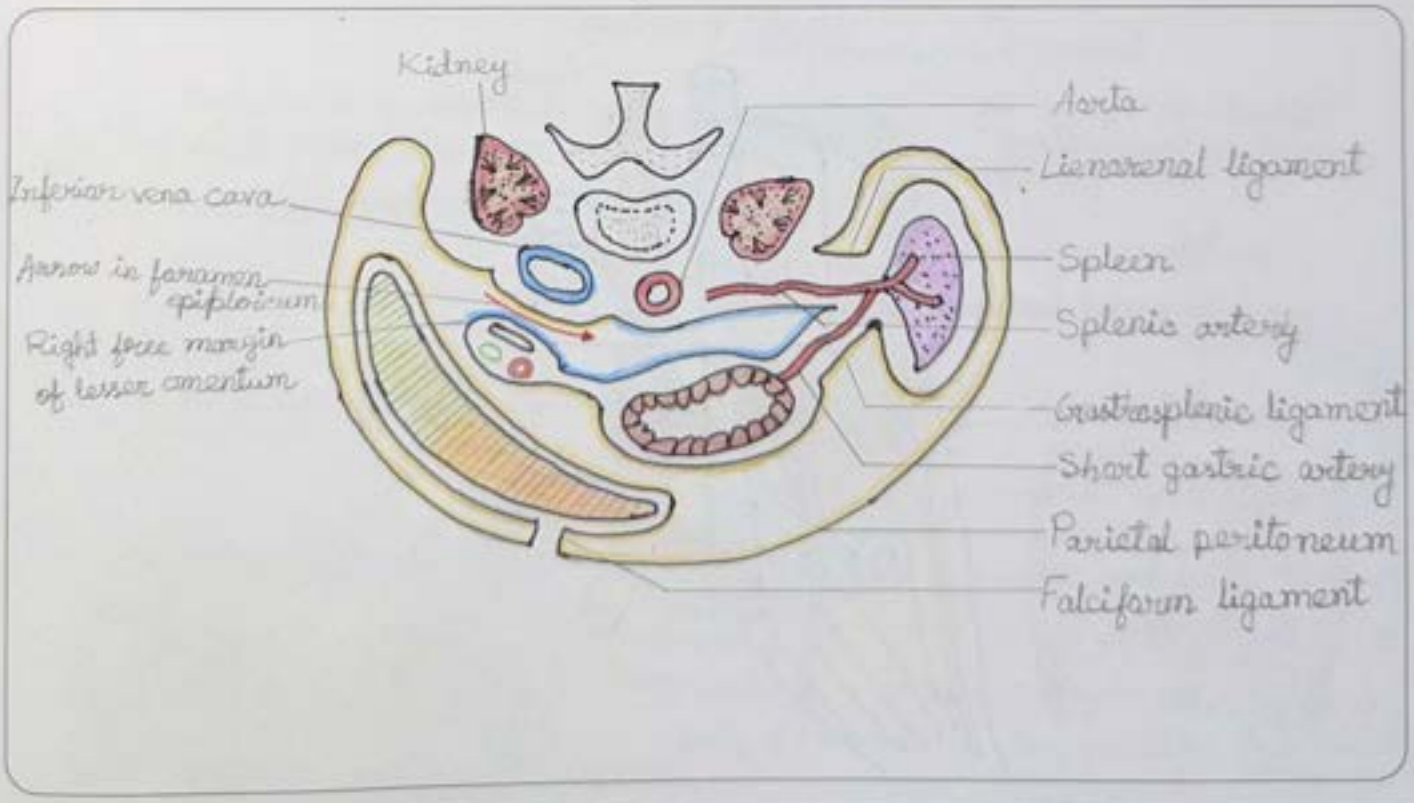
Venous Drainage of Testis



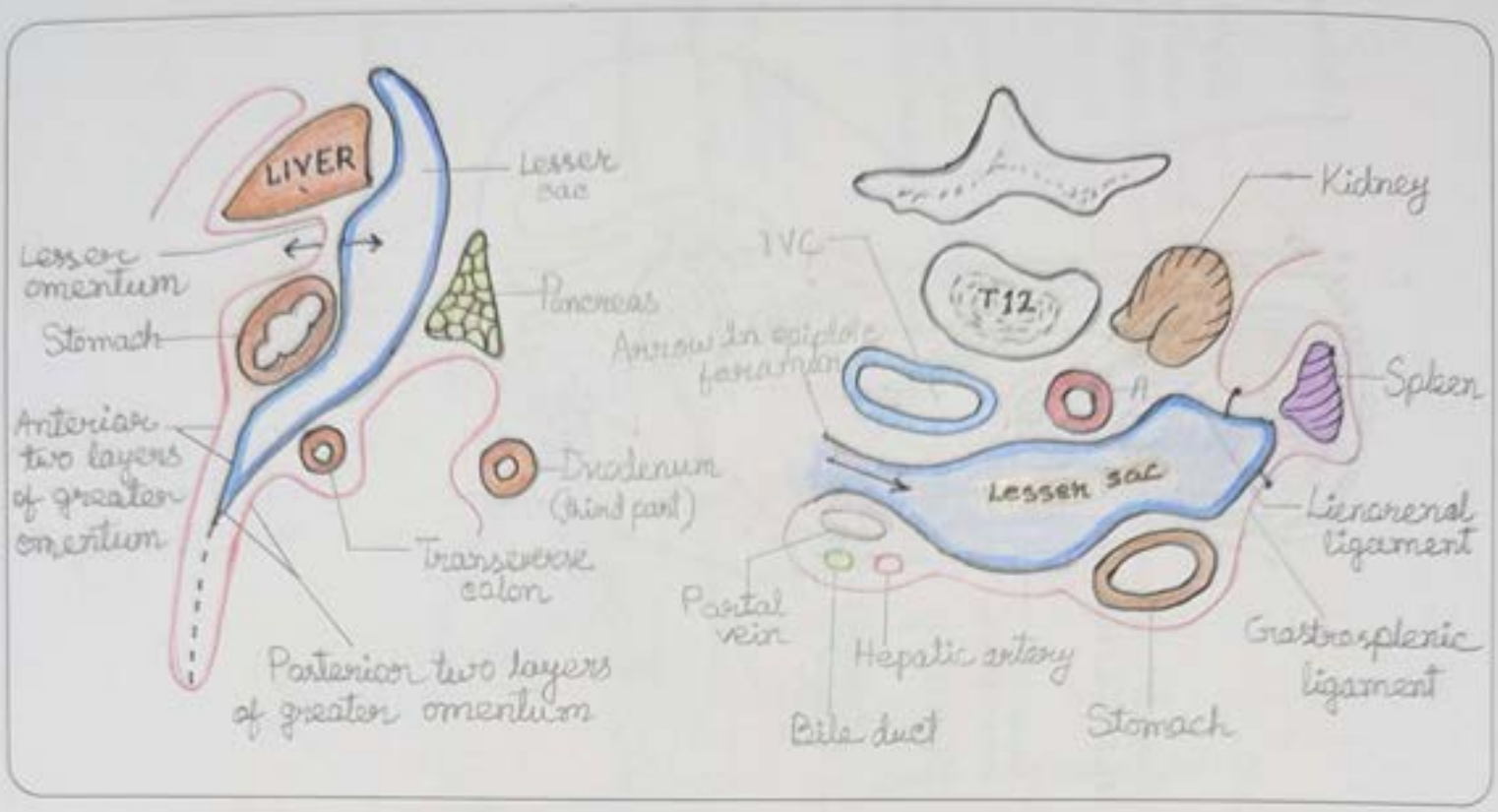
Vertical Disposition of Peritoneum



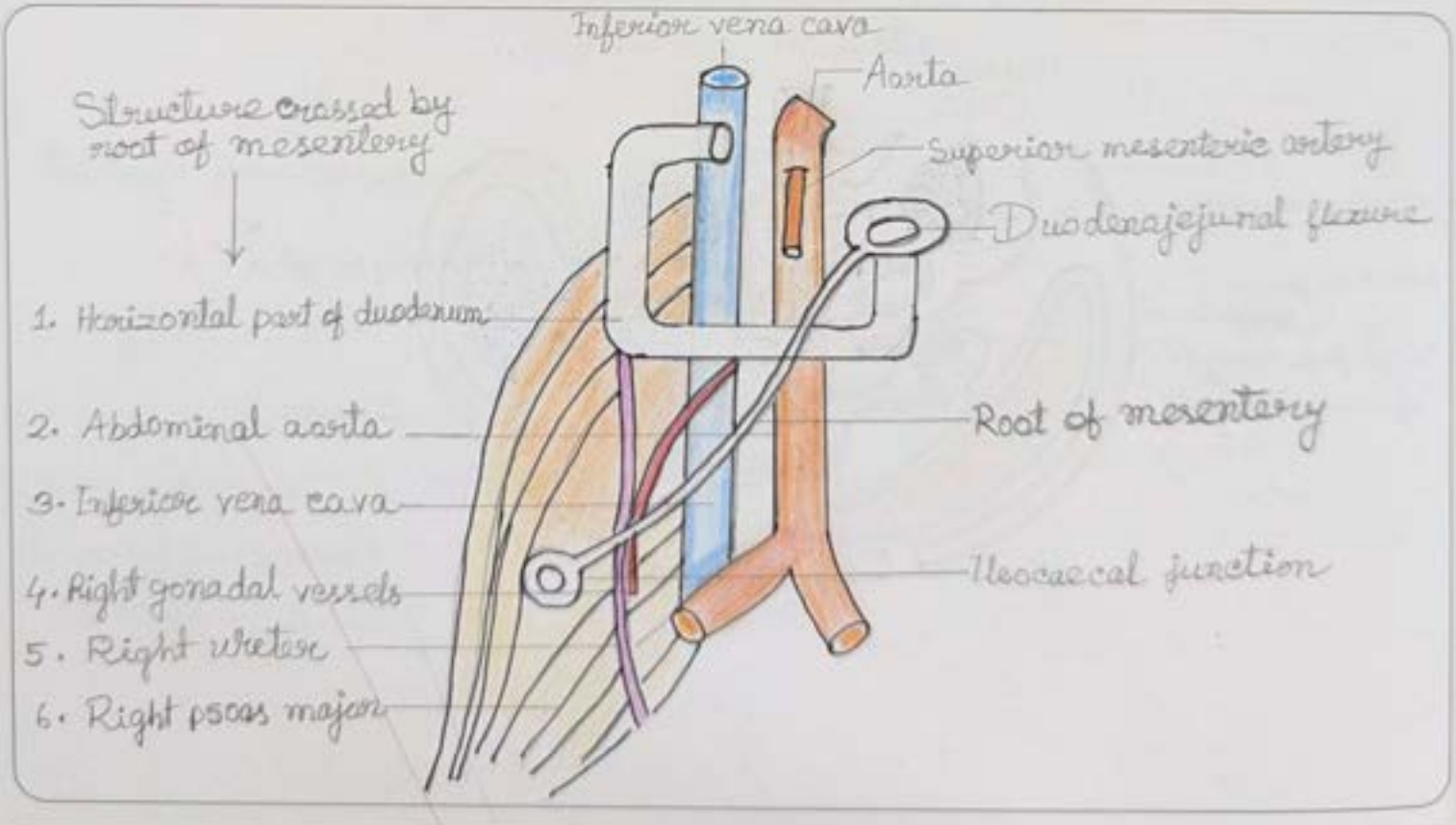
Horizontal Disposition of Peritoneum



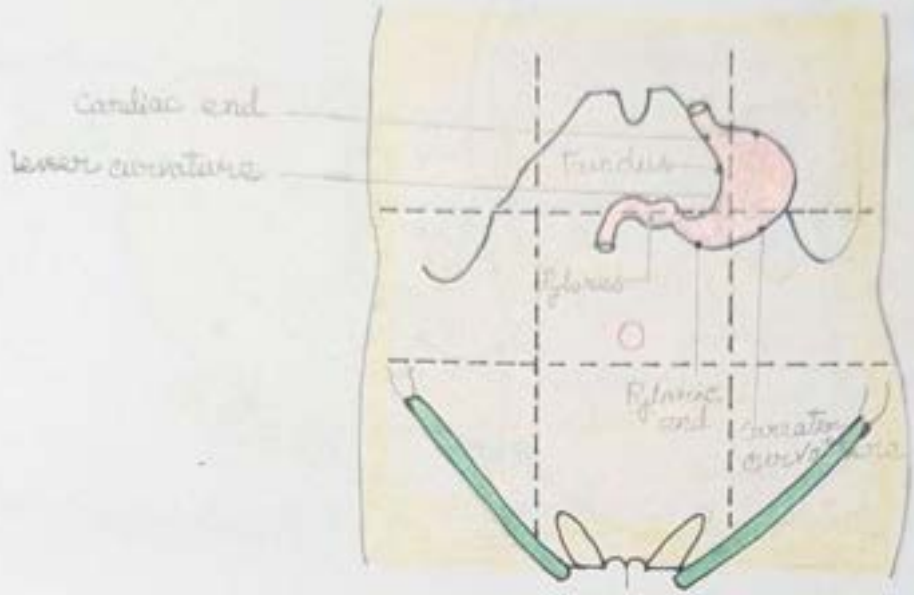
Lesser Sac



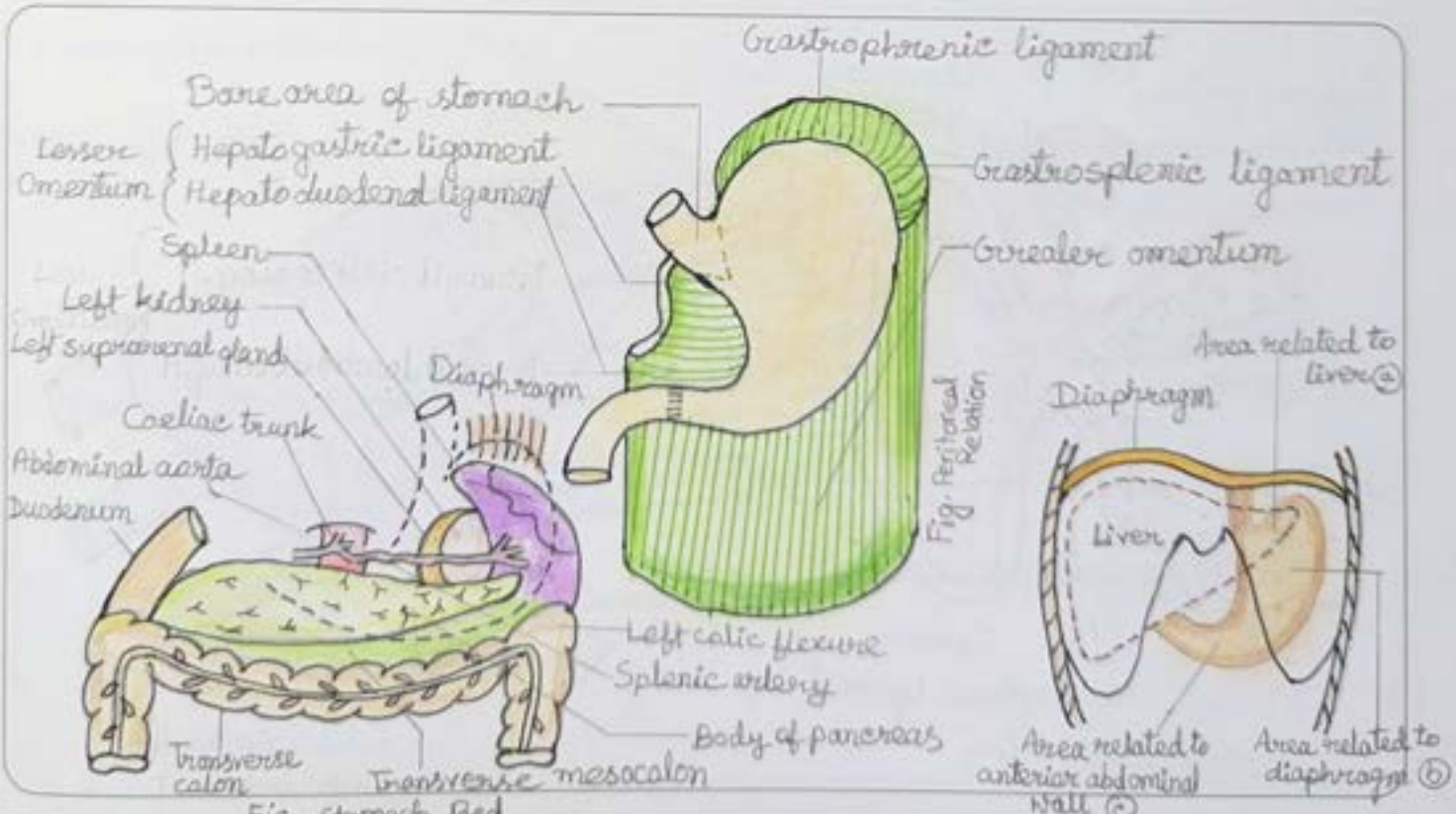
Structures Crossed By the Mesentry



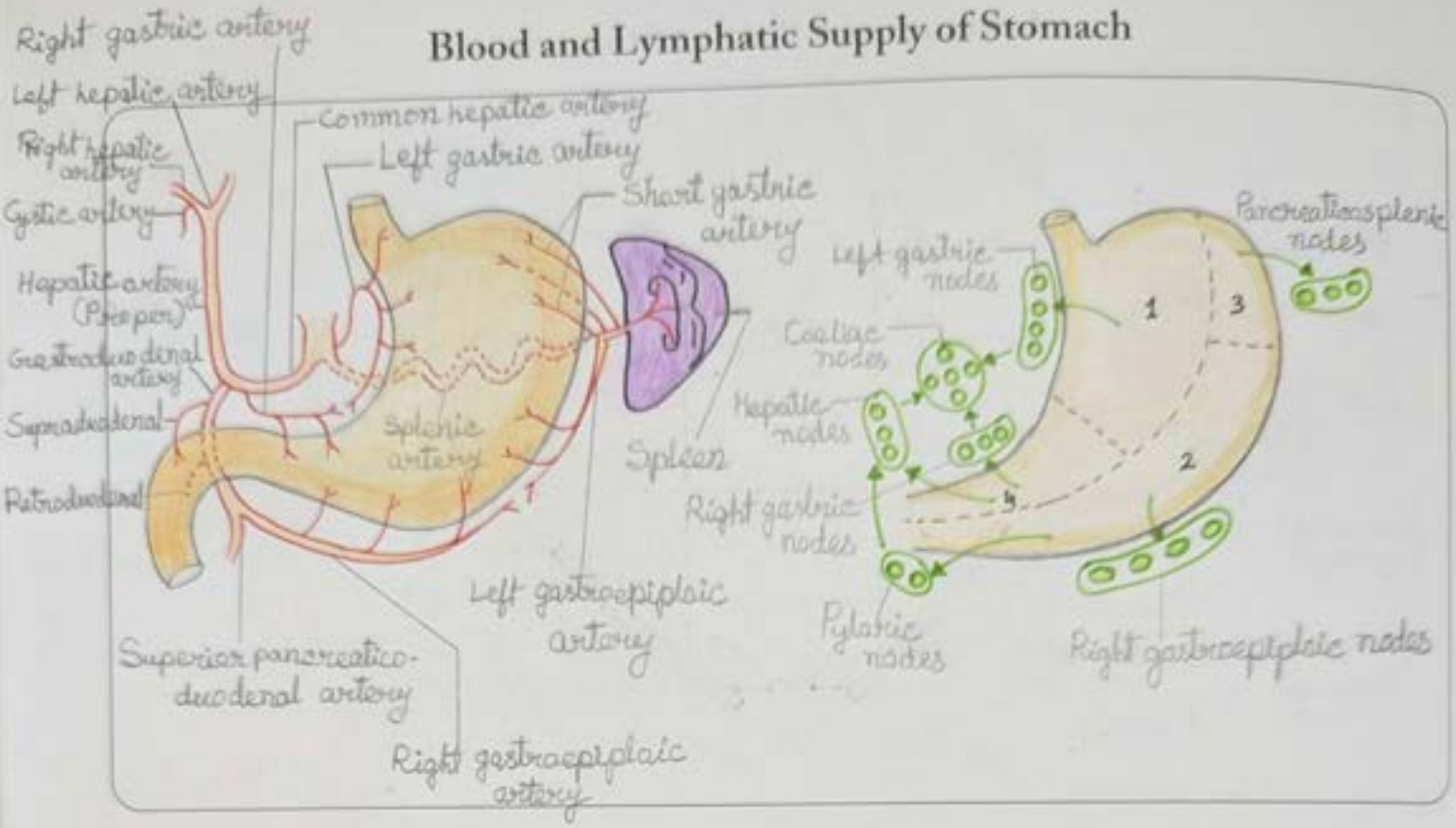
Location and Parts of Stomach



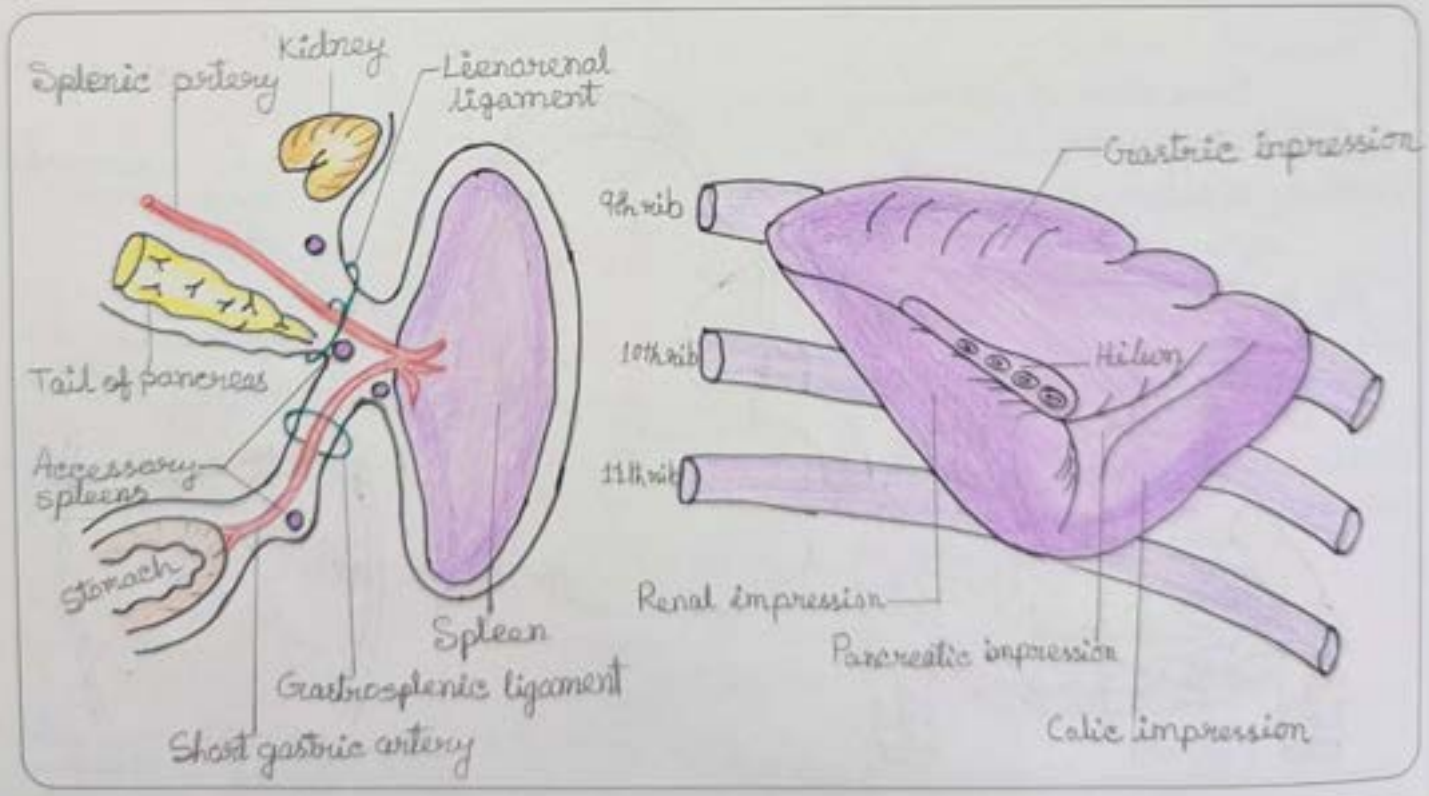
Relations of Stomach



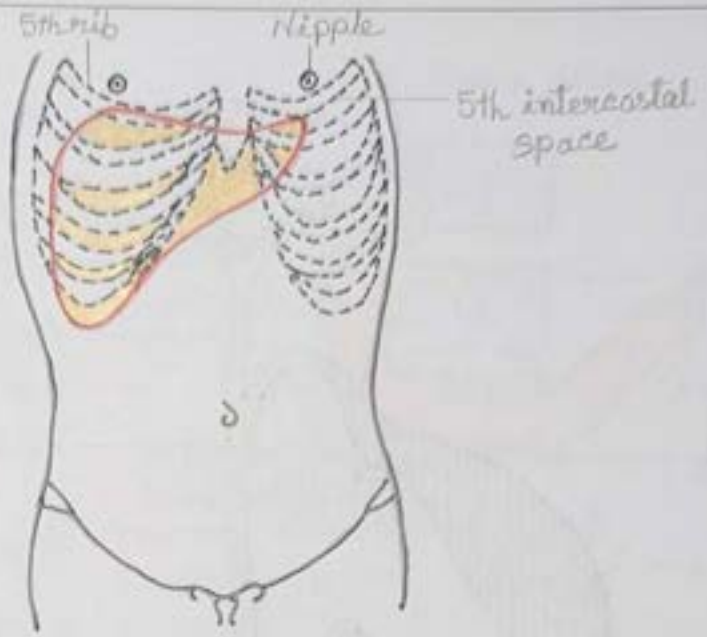
Blood and Lymphatic Supply of Stomach



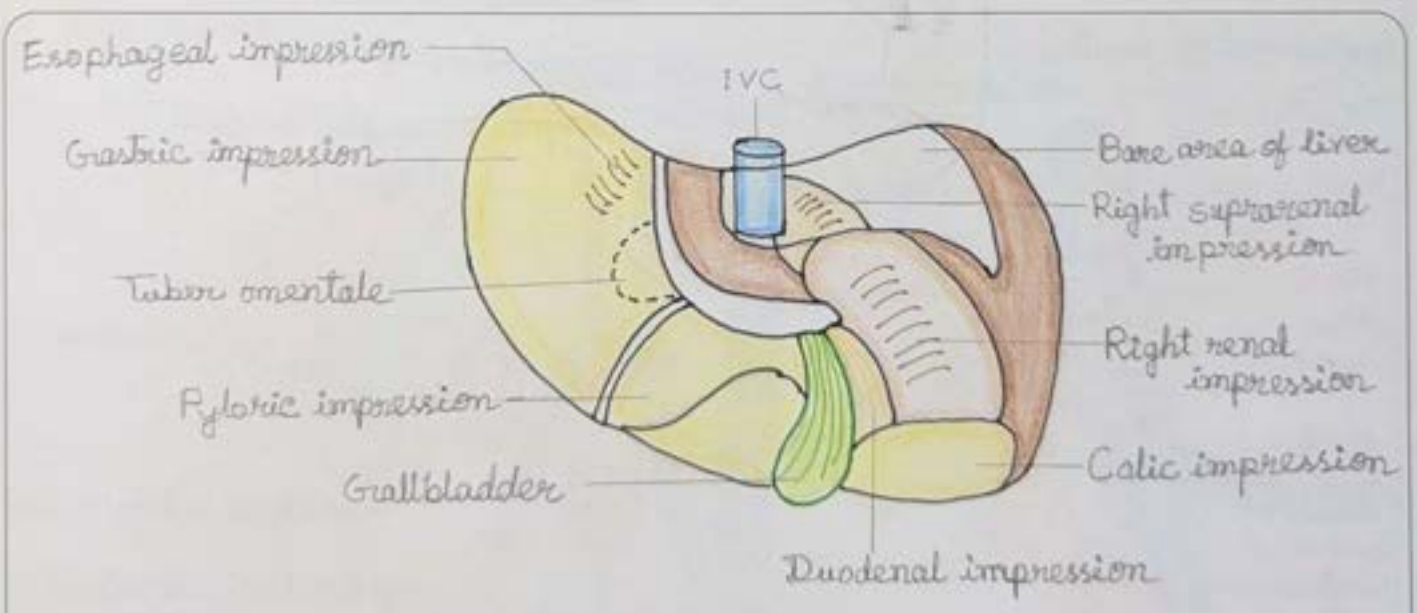
Peritoneal and Visceral Relation of Spleen



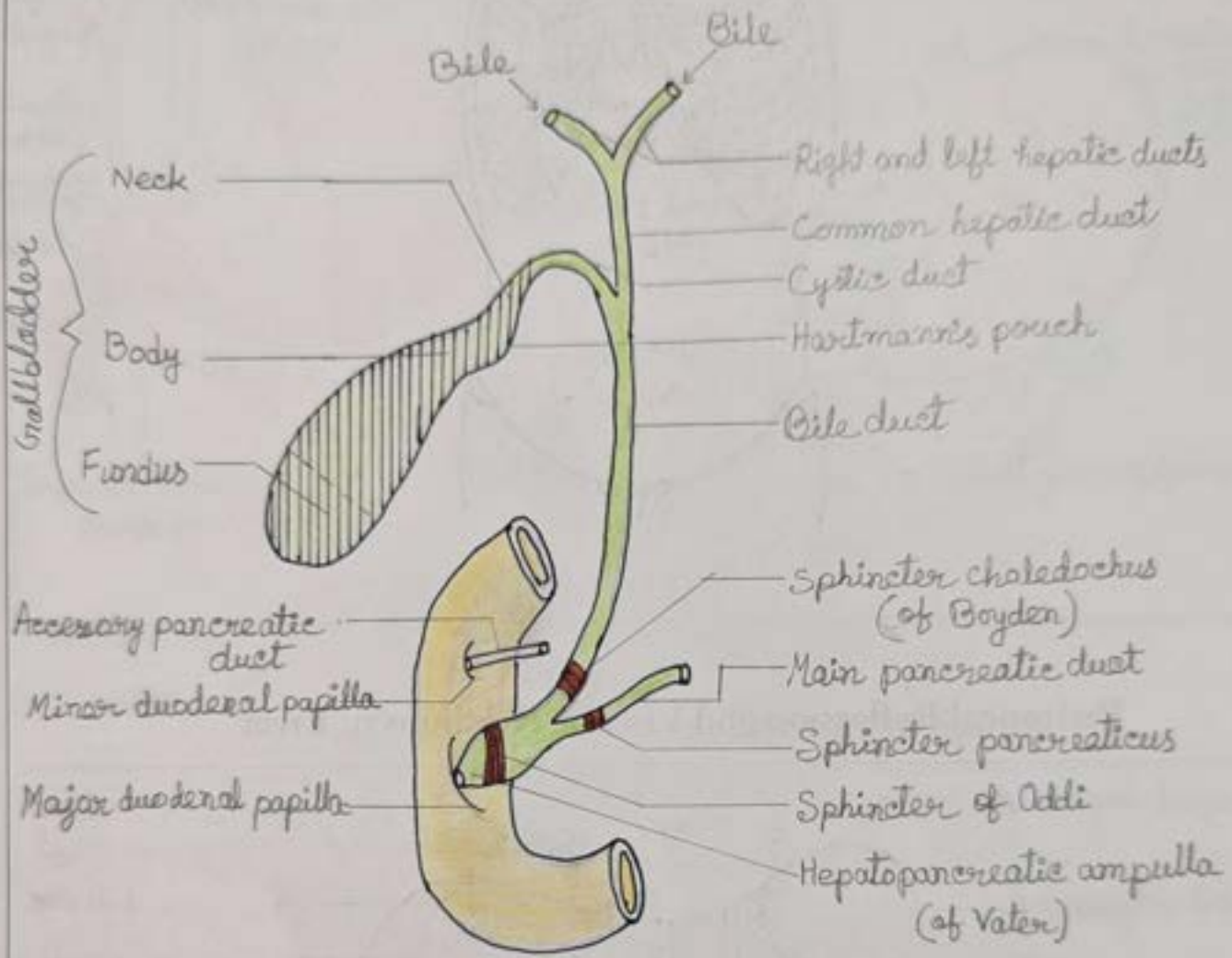
Location and External Features of Liver



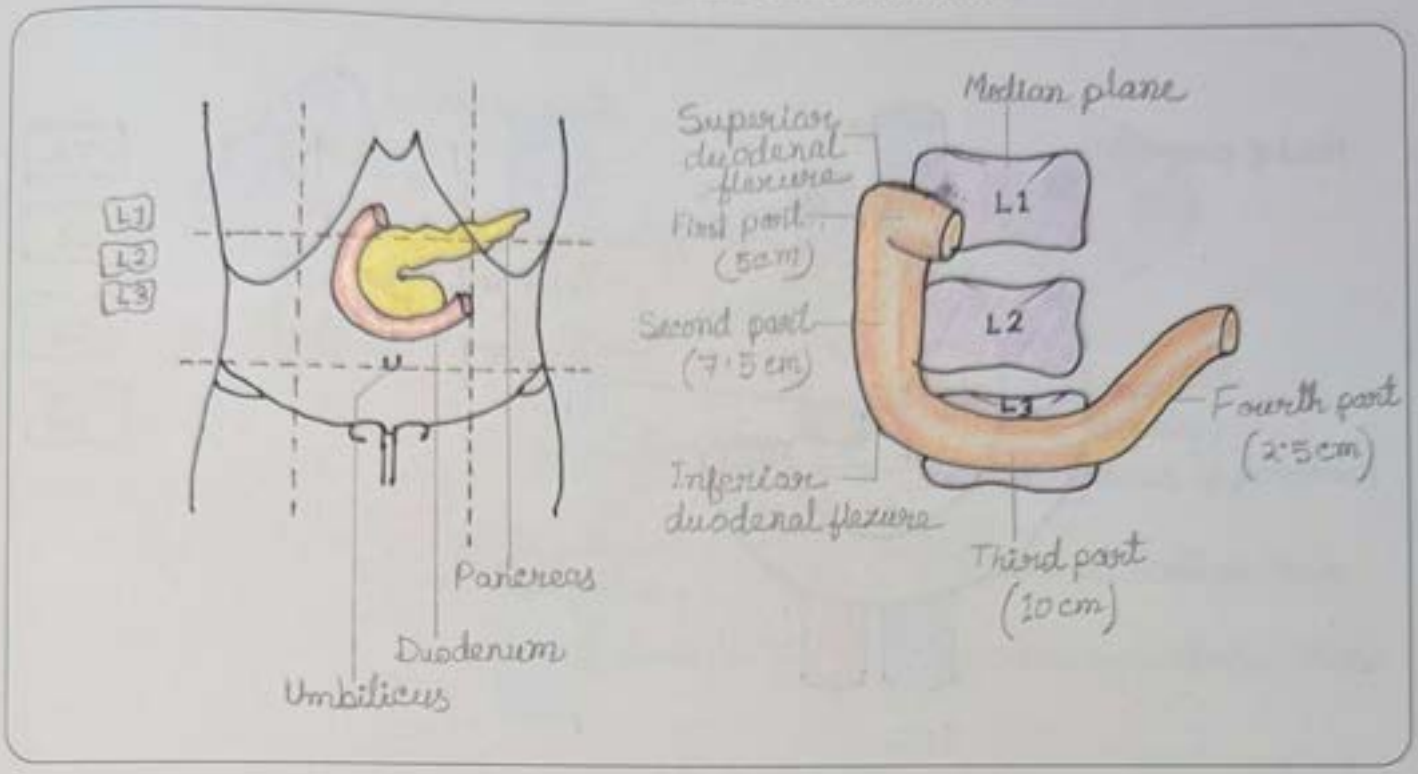
Peritoneal Reflection and Visceral Relations of Liver



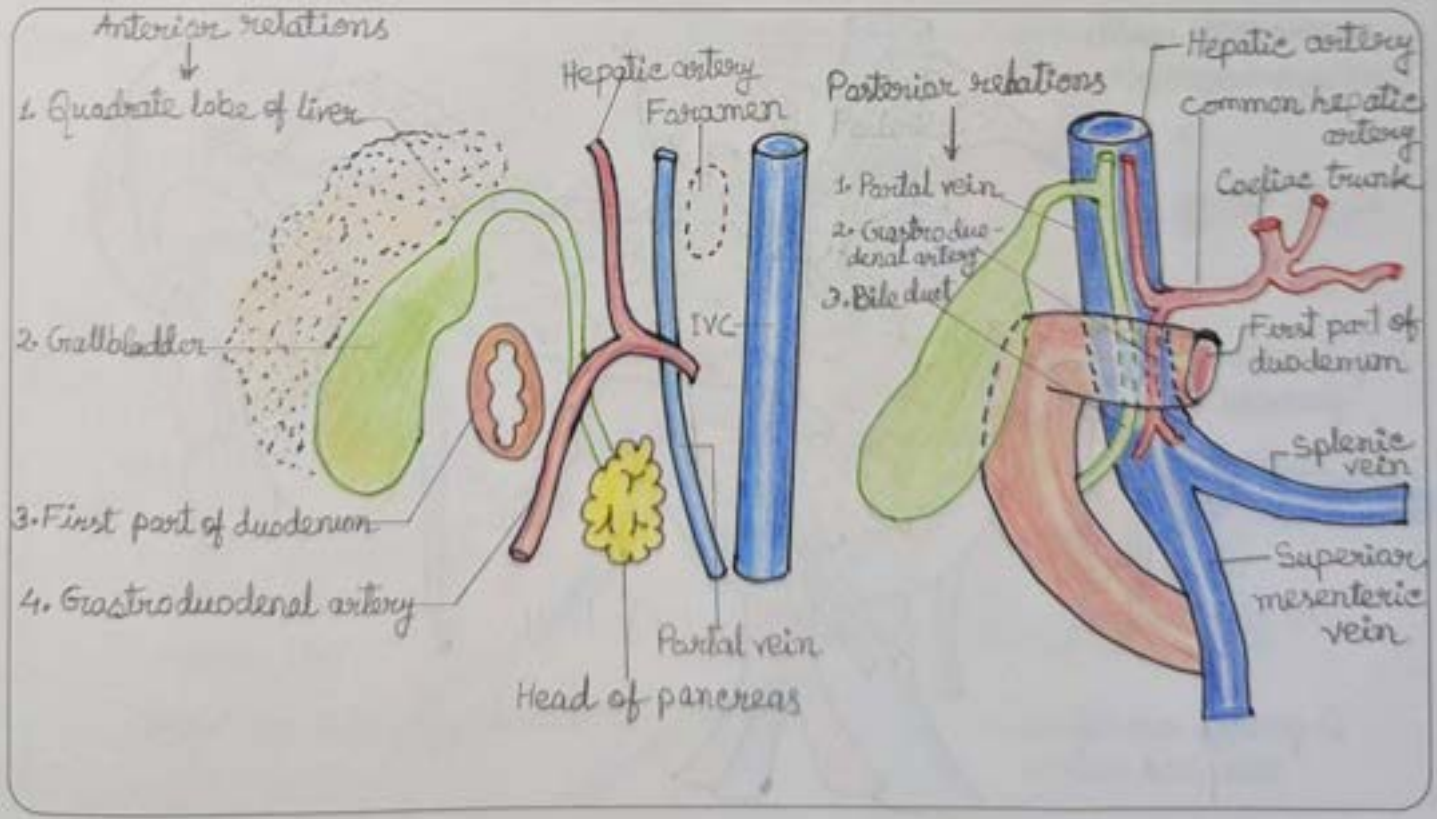
Components of Extra-Hepatic Biliary Apparatus



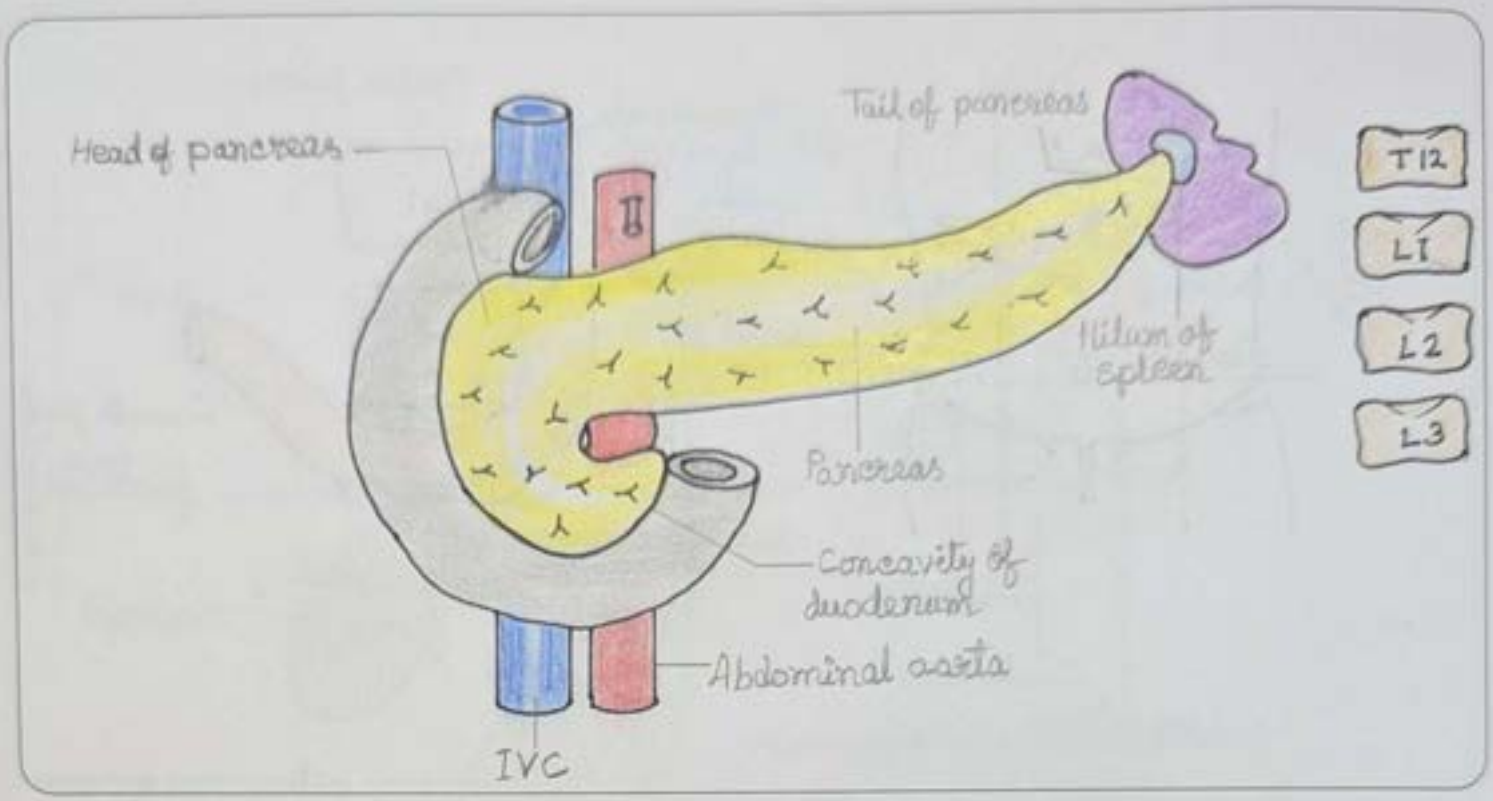
Location and Parts of Duodenum



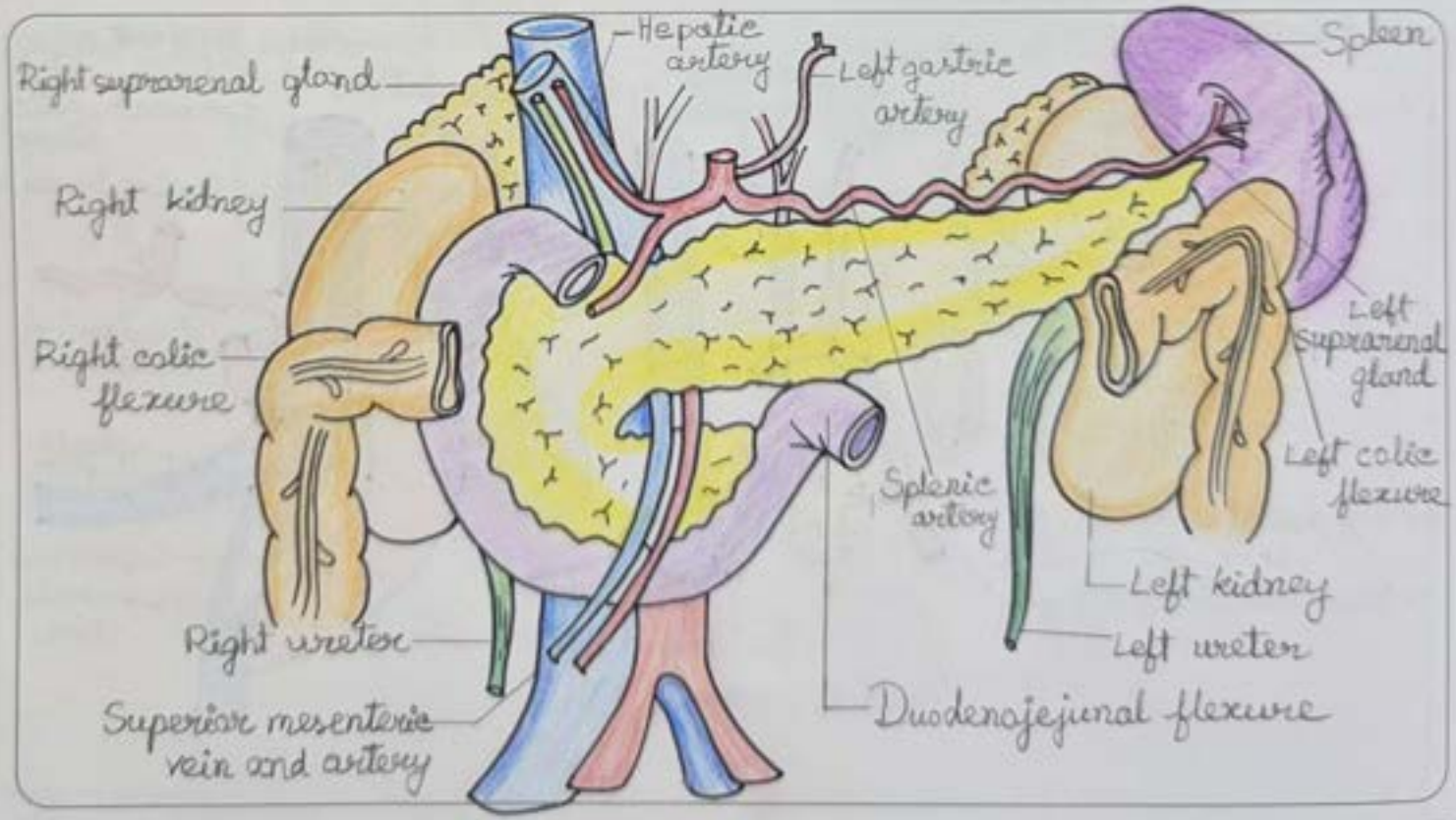
Relations of Duodenum



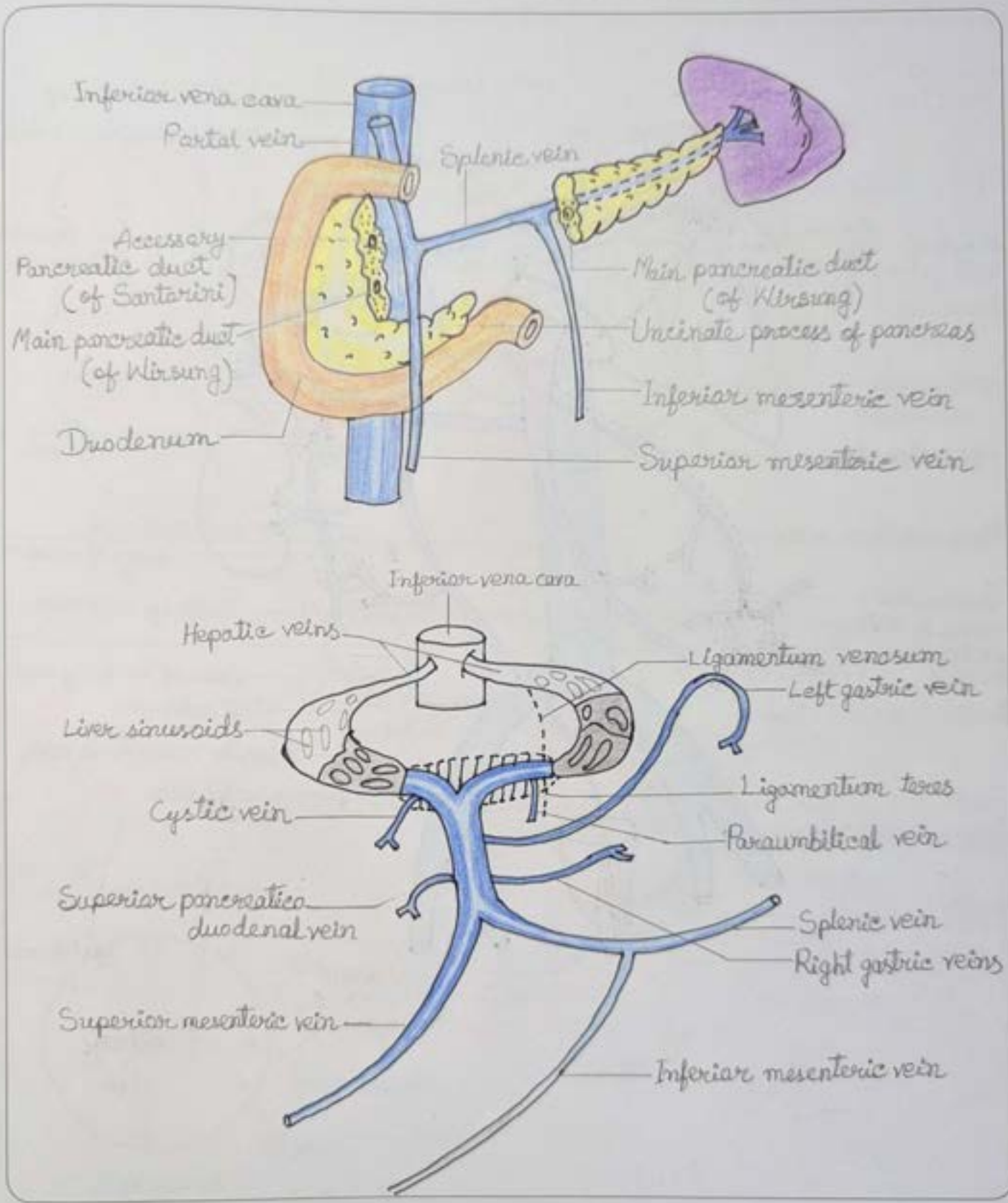
Location and Parts of Pancreas



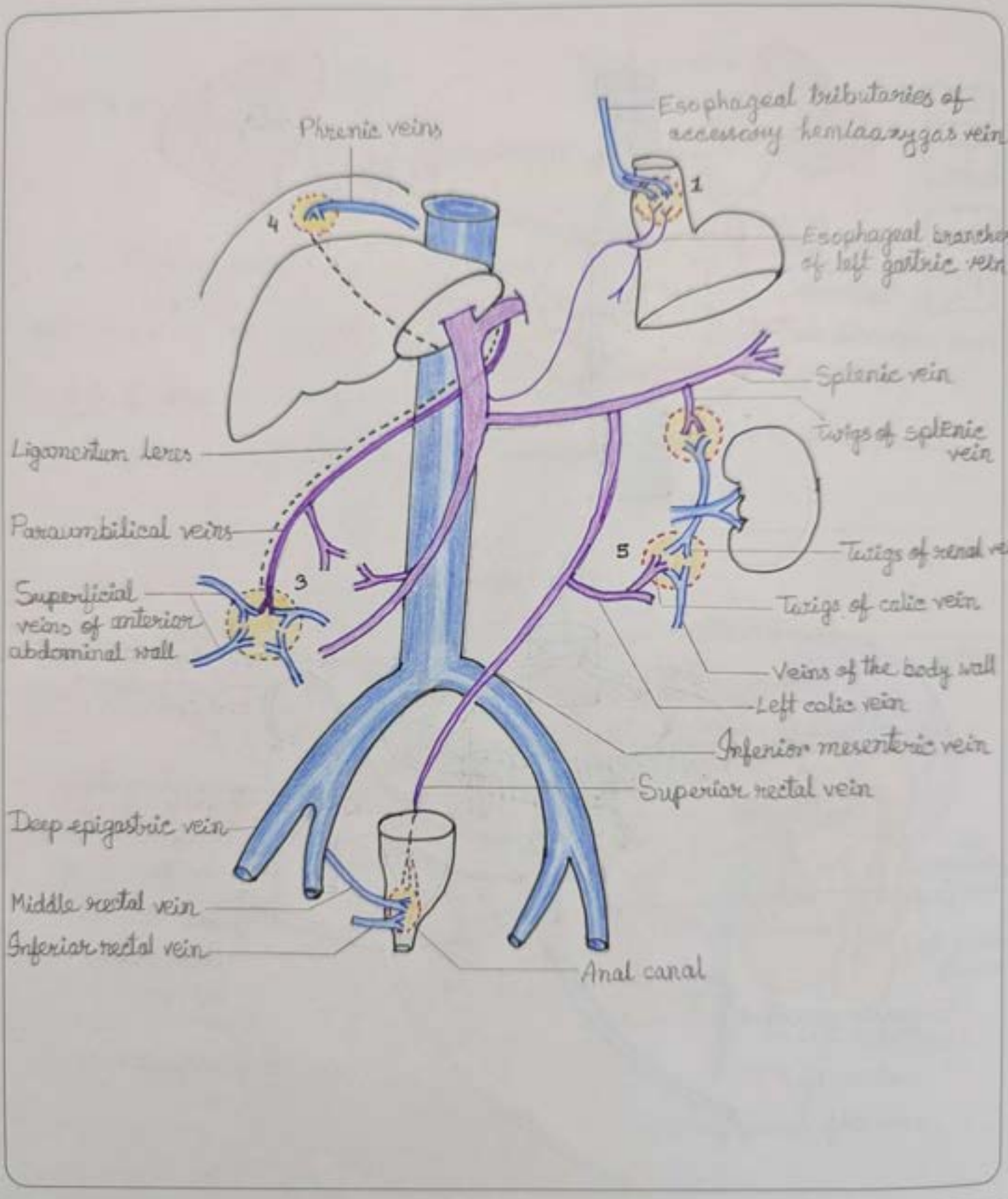
Relations of Pancreas



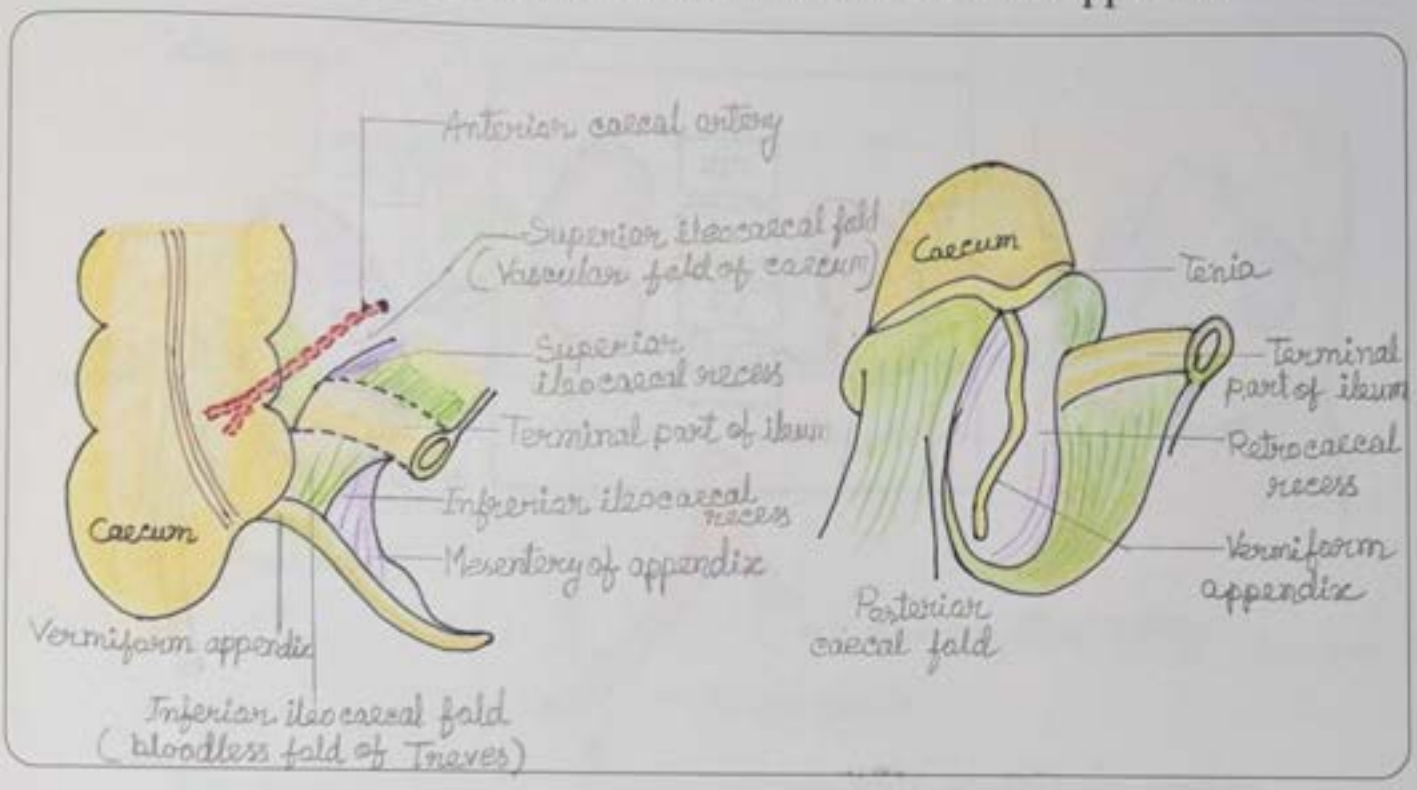
Formation and Tributaries of Portal Vein



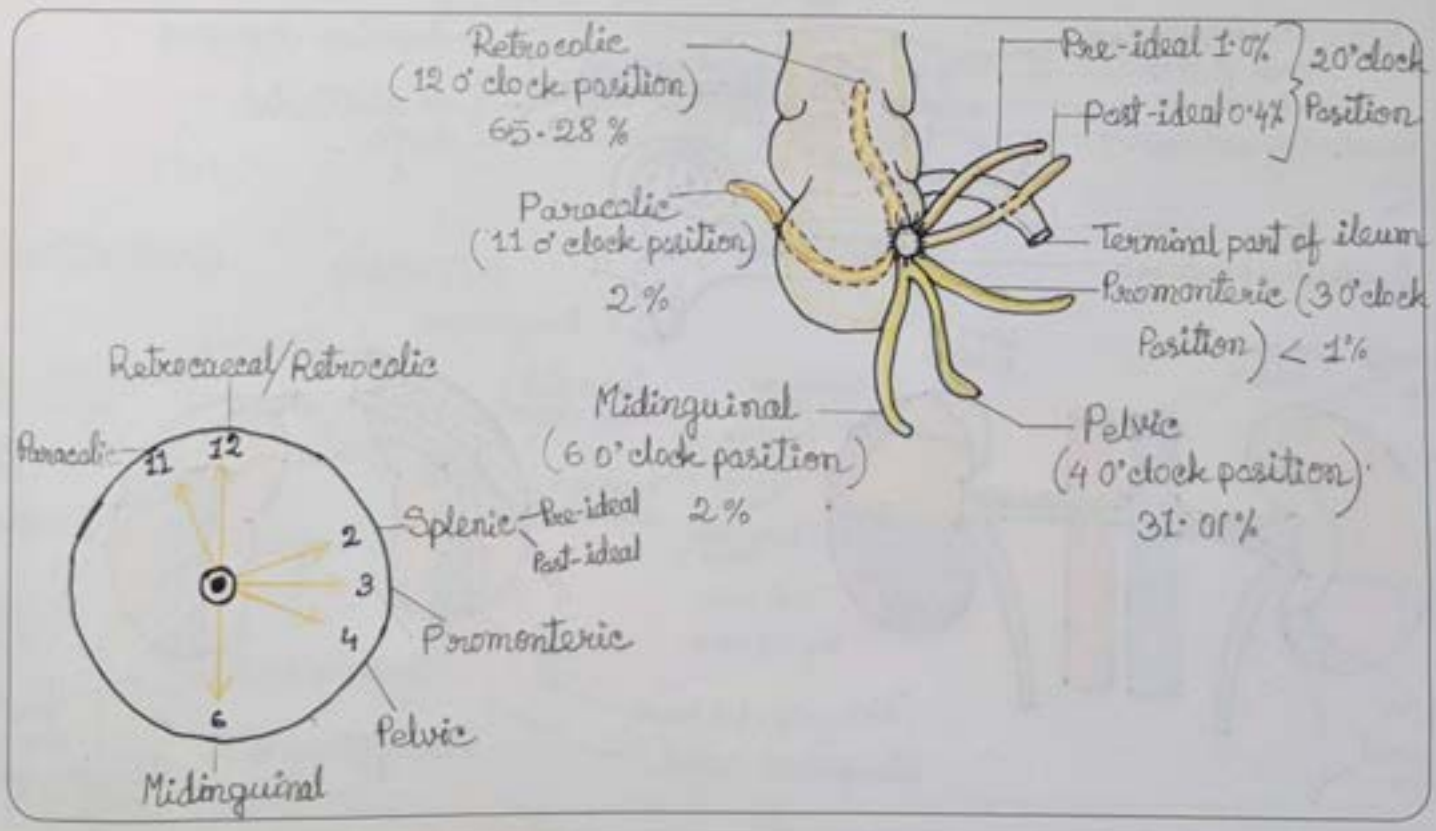
Sites of Portocaval Anastomosis



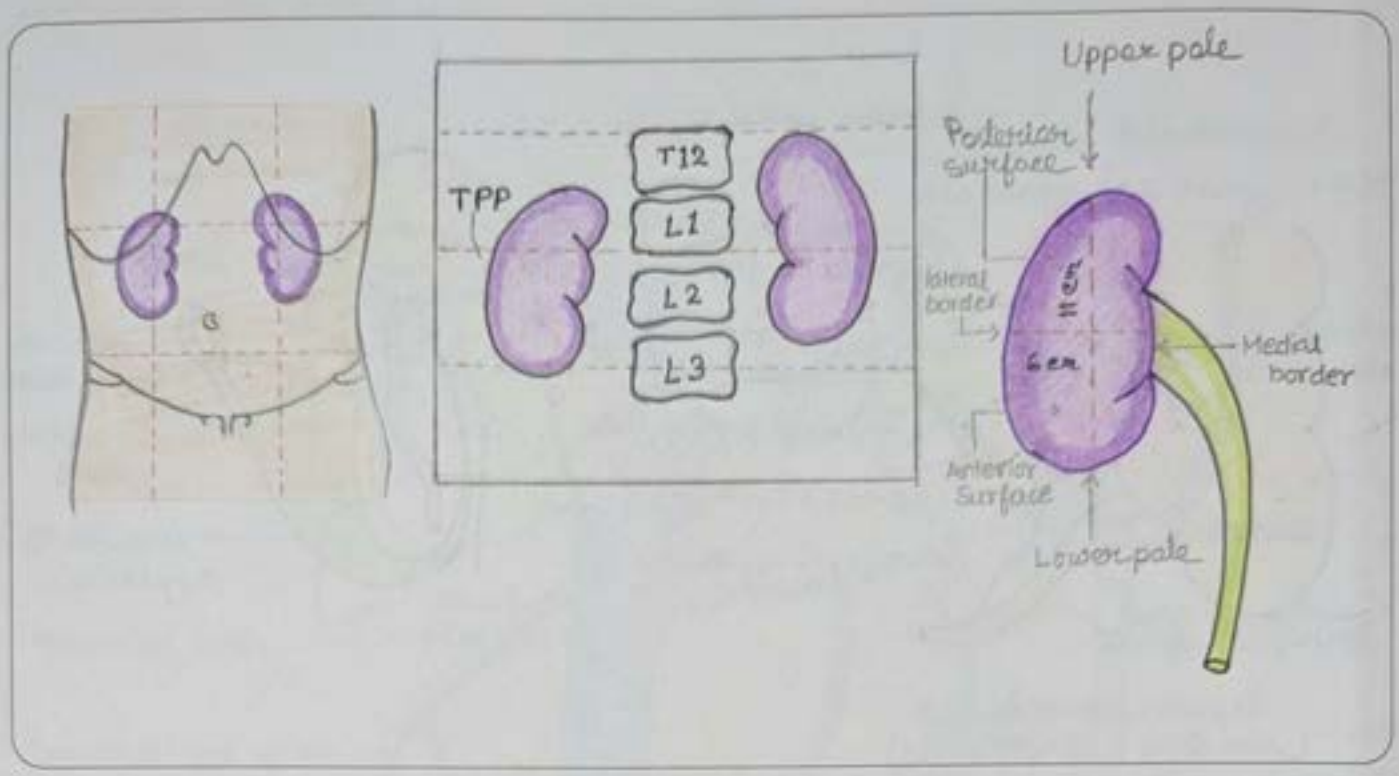
Peritoneal and Posterior Relations of Vermiform Appendix



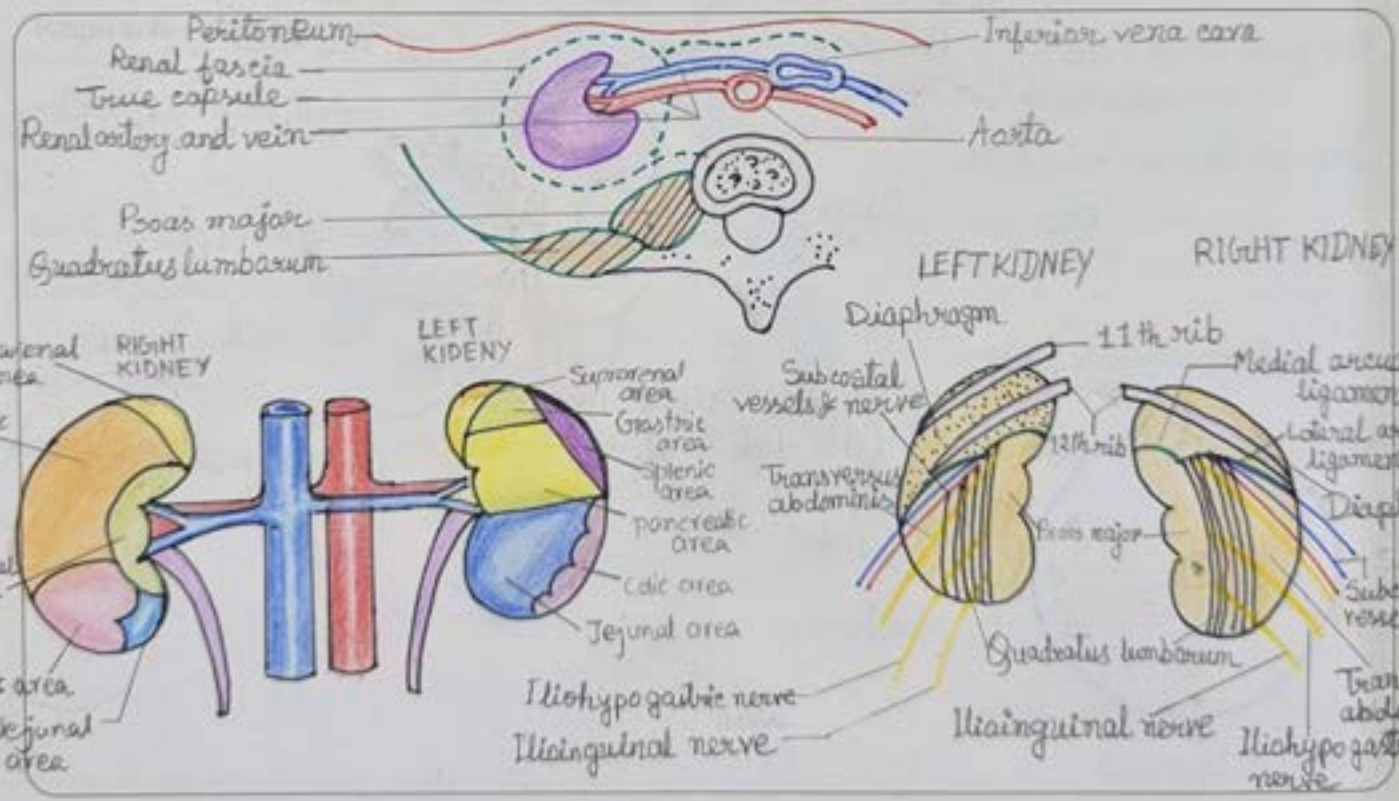
Position of Vermiform Appendix



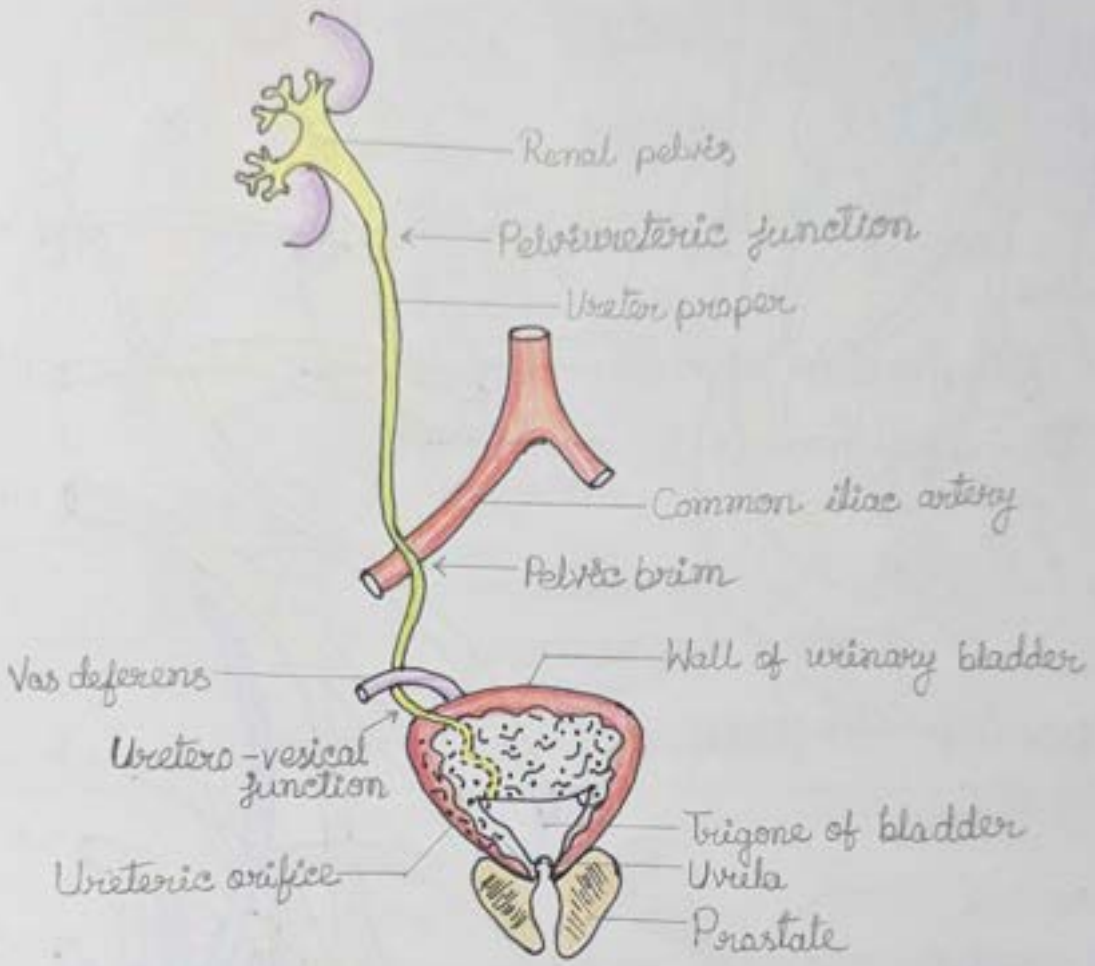
Location and External Features of Kidney



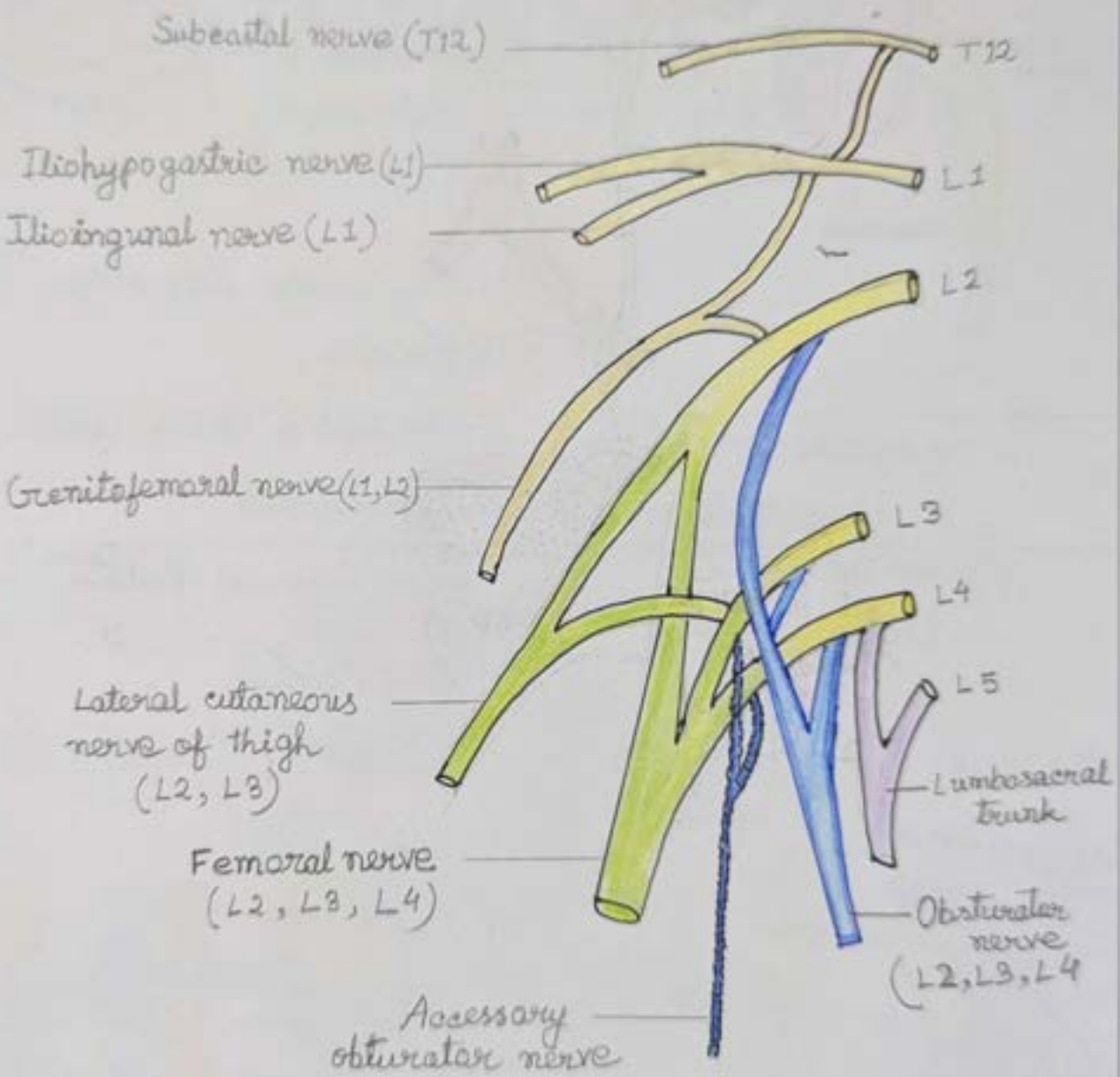
Coverings and Relations of Kidney



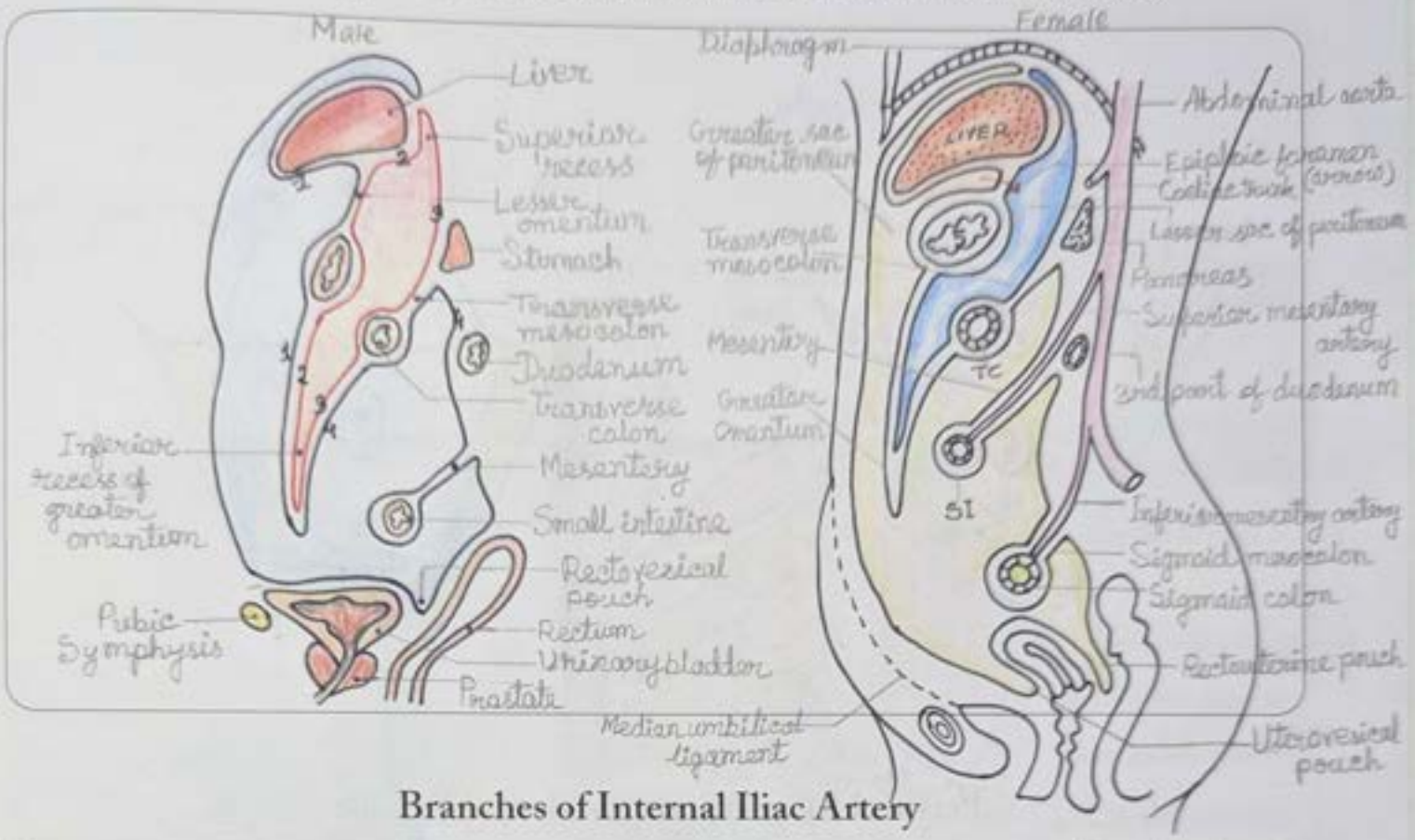
Constrictions of Ureter



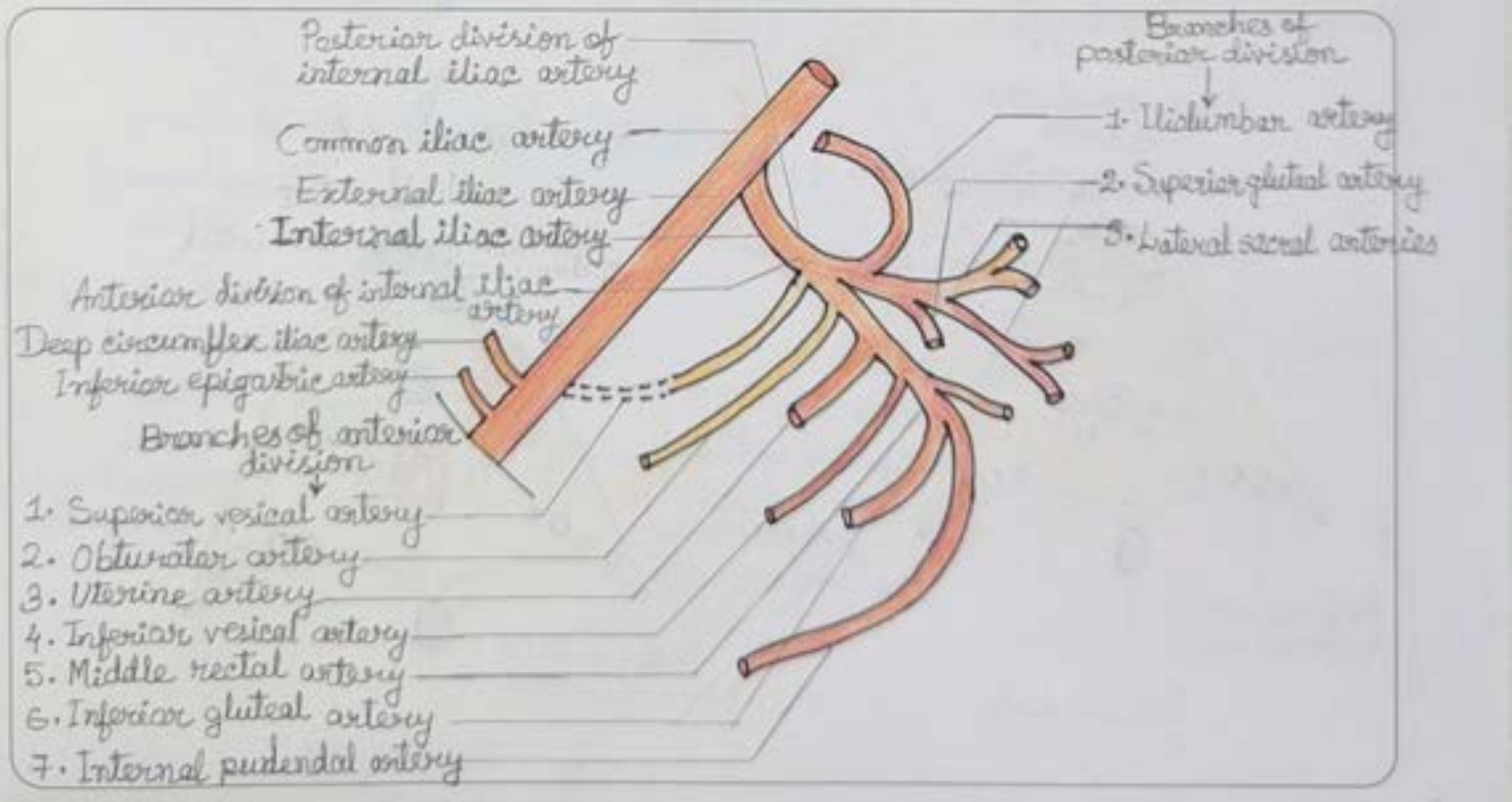
Lumbar Plexus



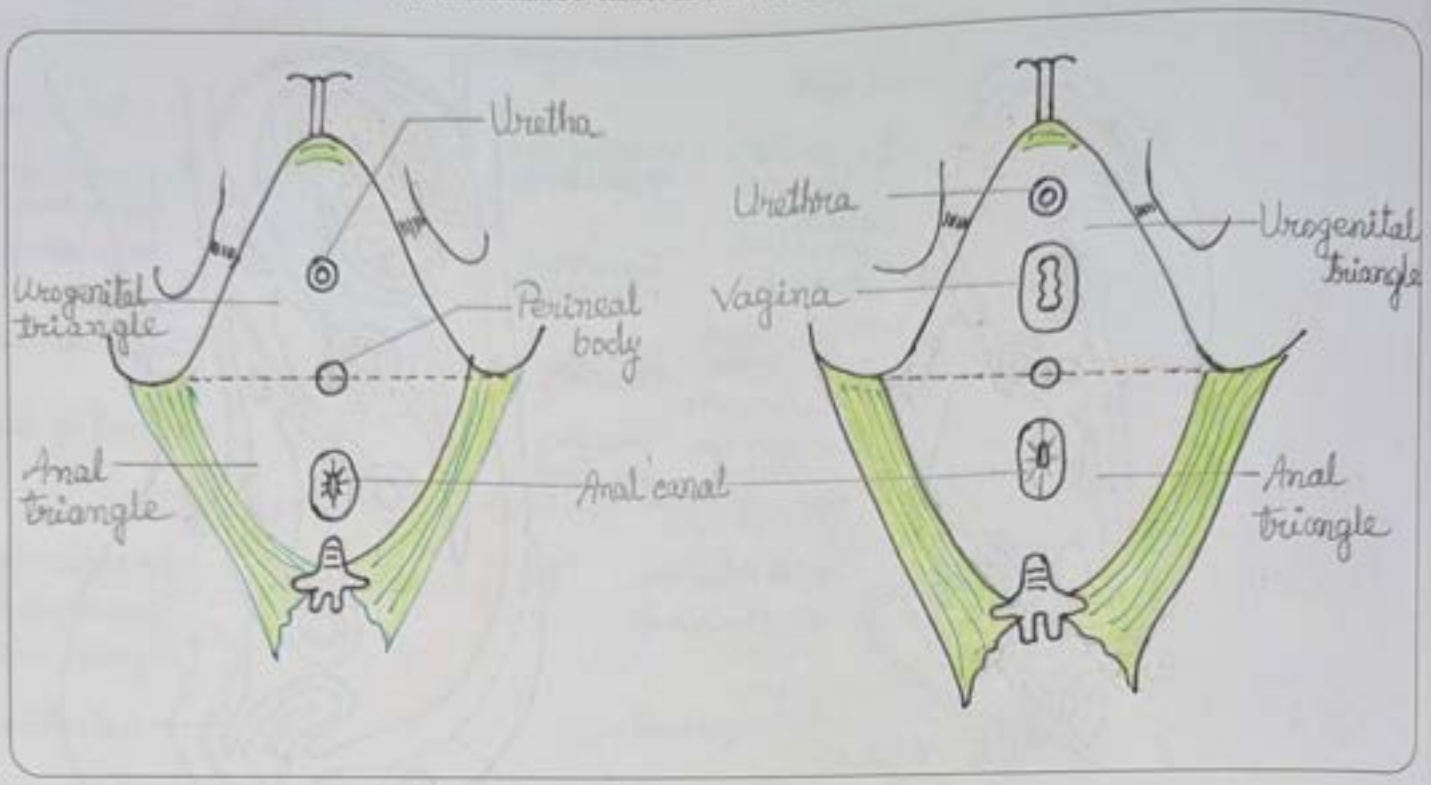
Vertical Disposition of Peritoneum in Male and Female Pelvis



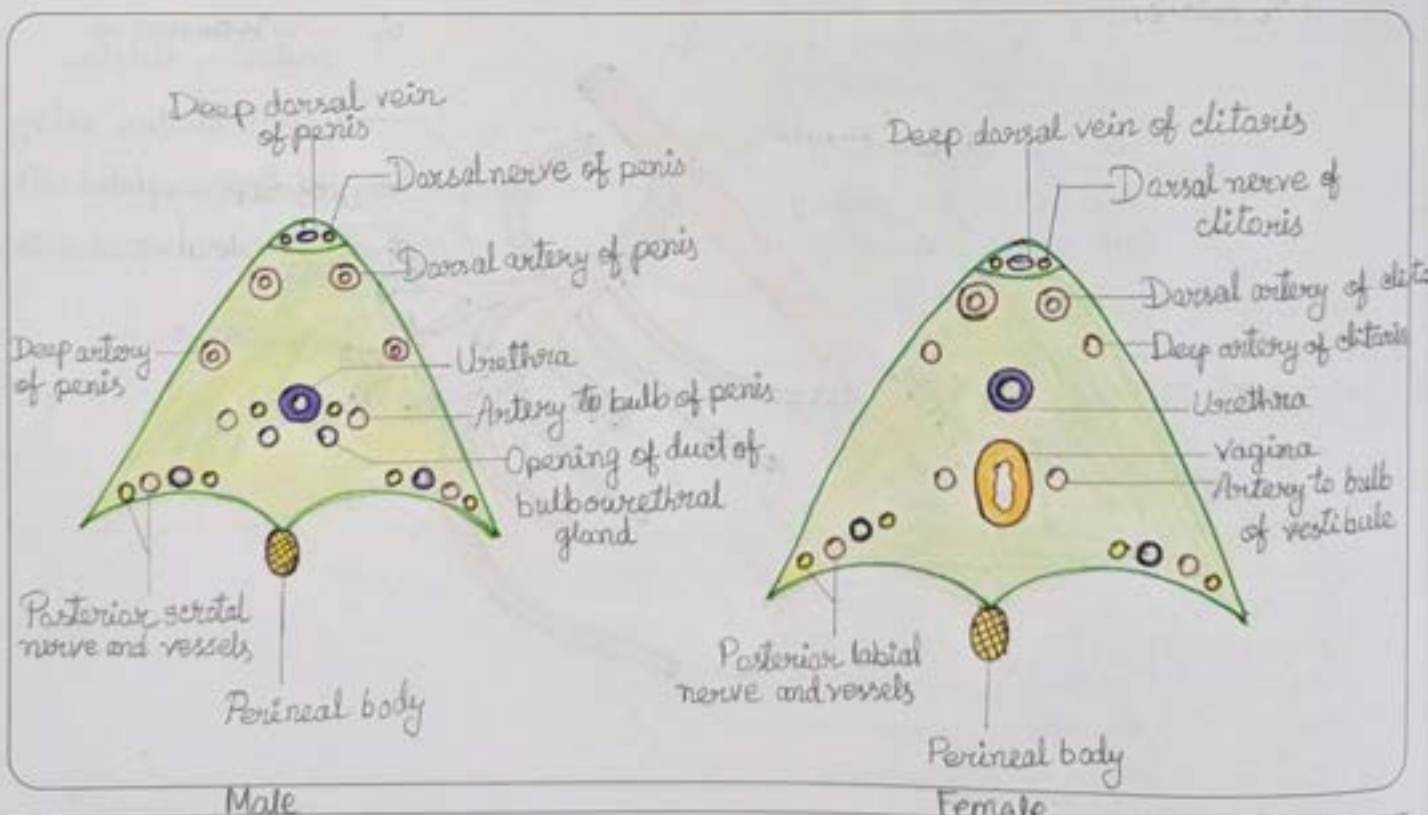
Branches of Internal Iliac Artery



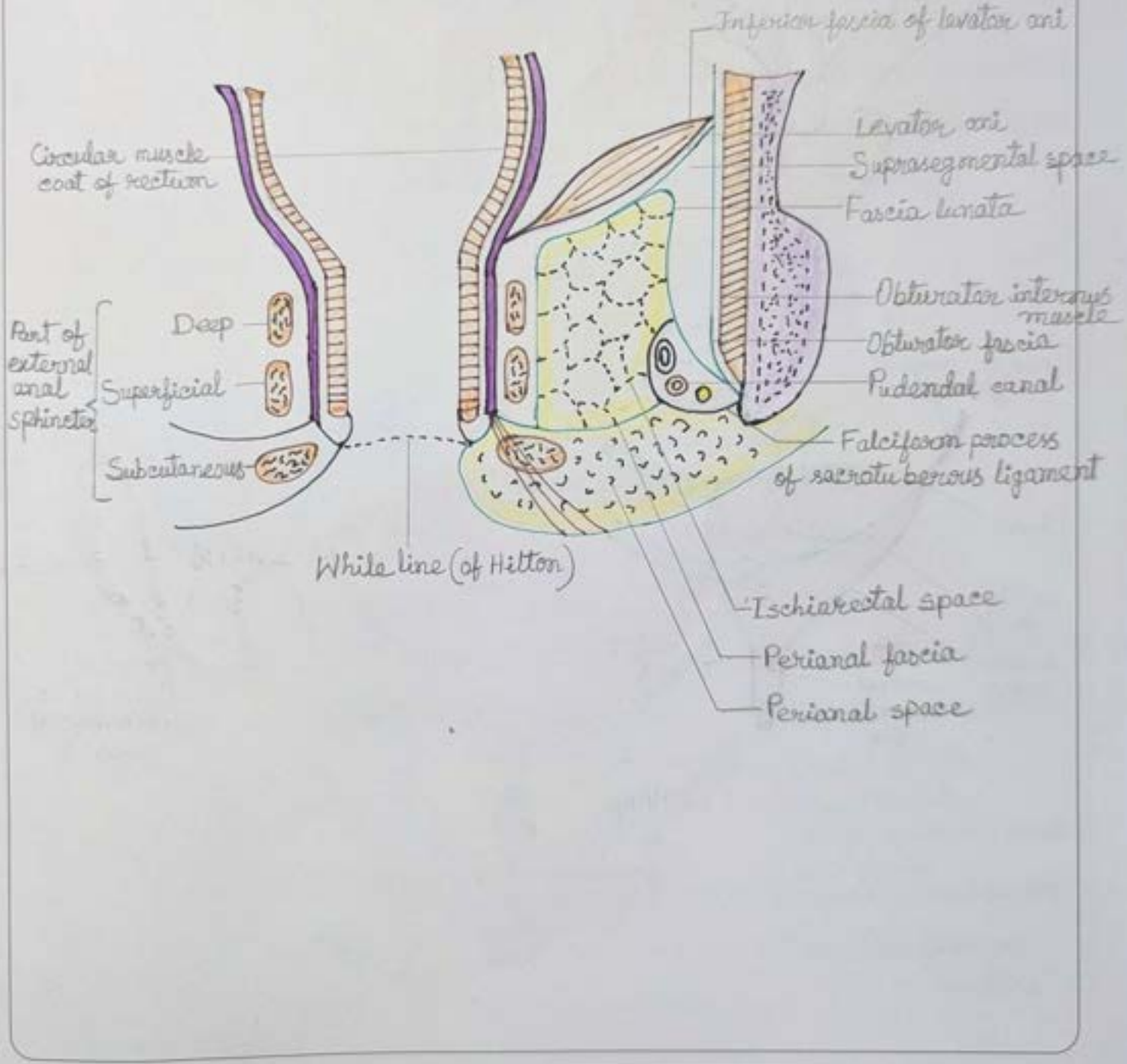
Boundaries and Division of Perineum



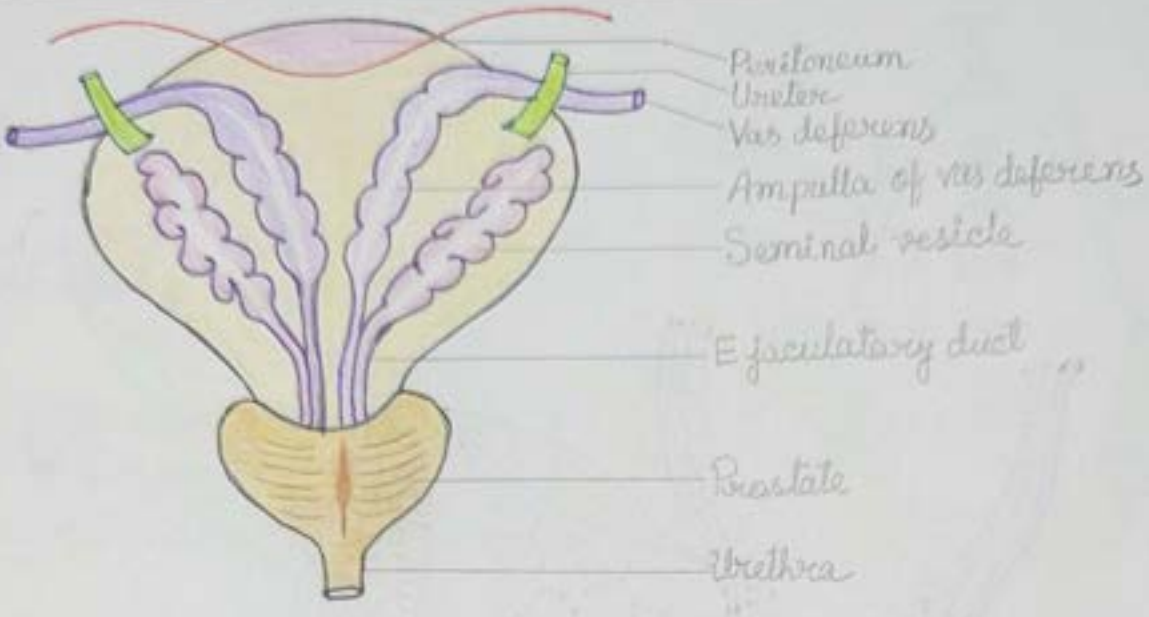
Perineal Membrane in Male and Female



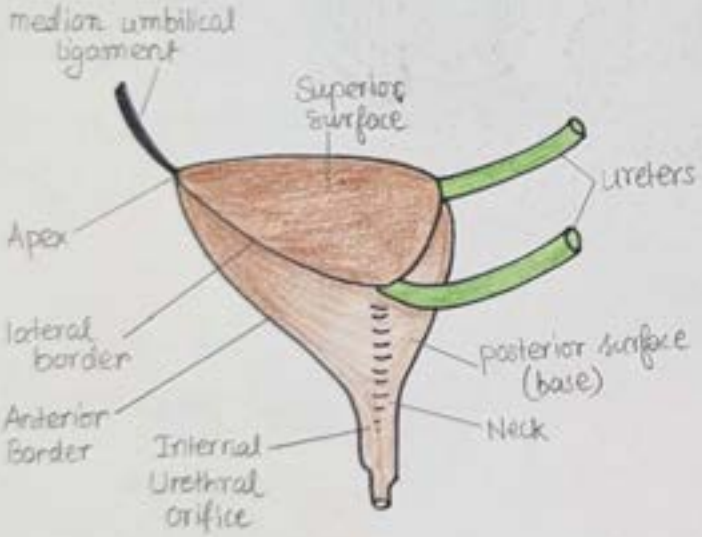
Boundaries of Ischiorectal Fossa

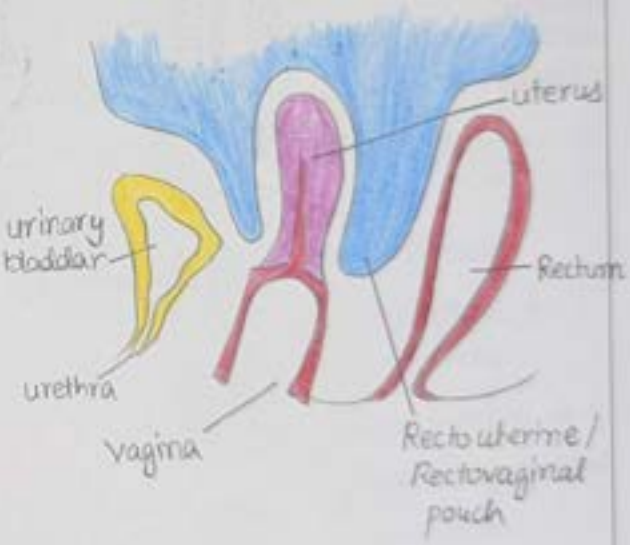


Relations of Urinary Bladder in Male and Female



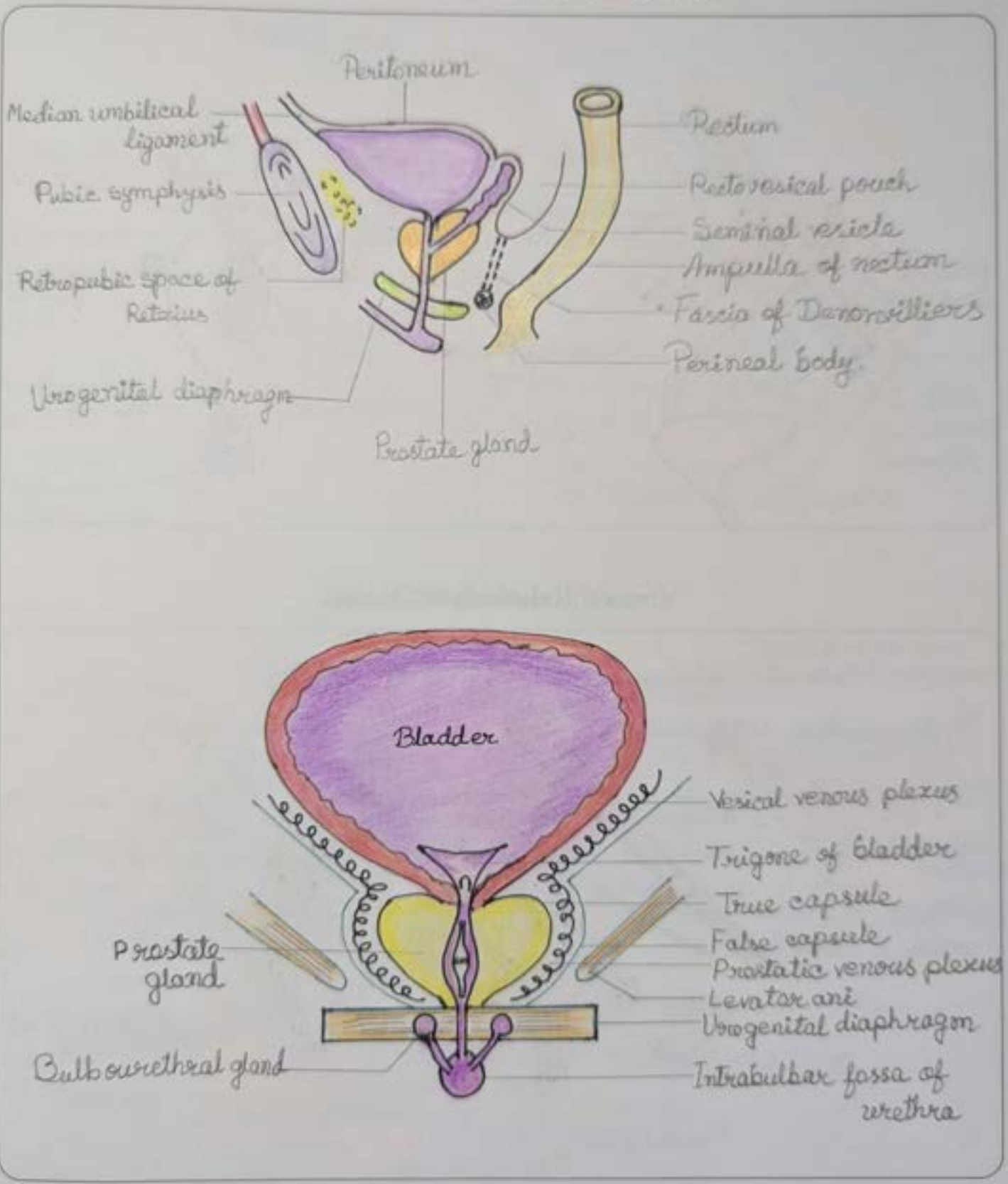
MALE



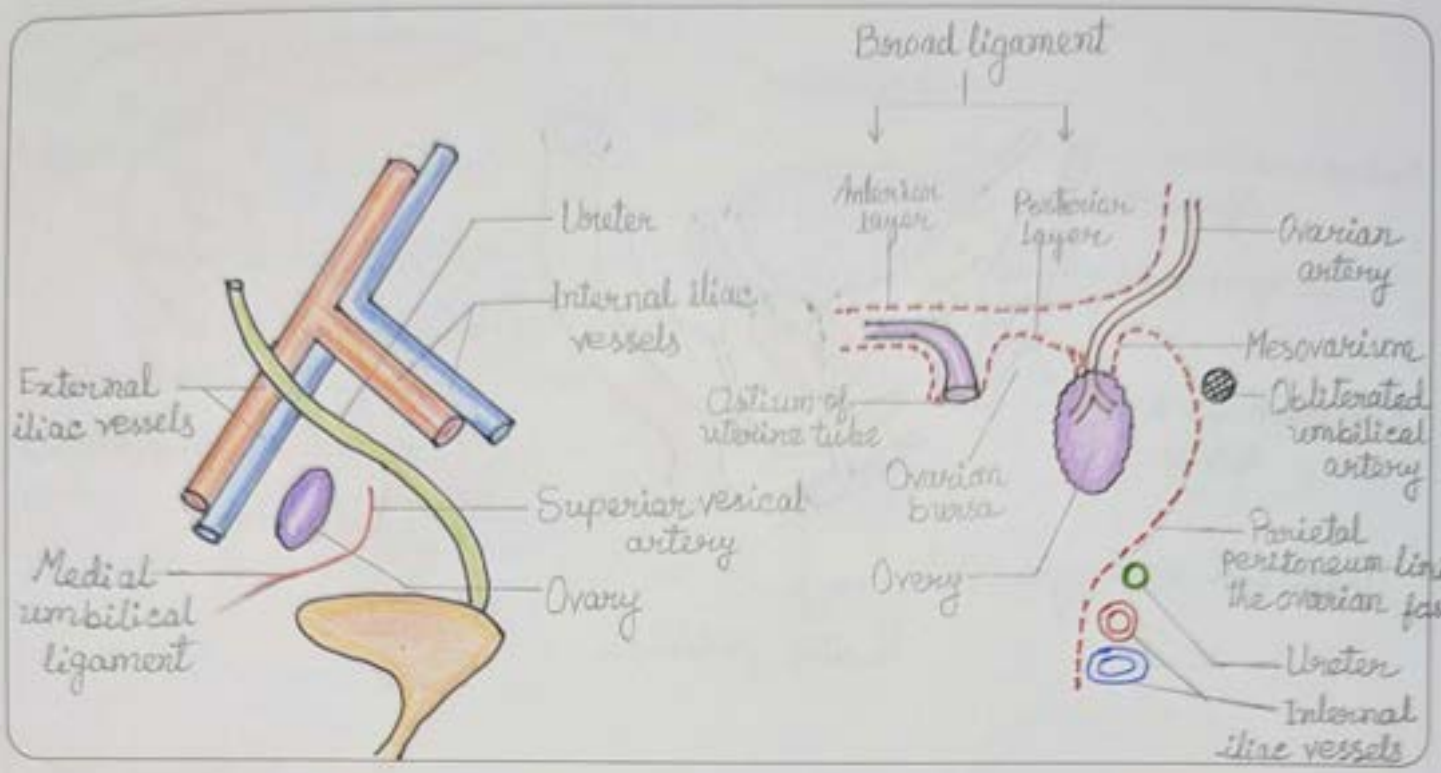


FEMALE

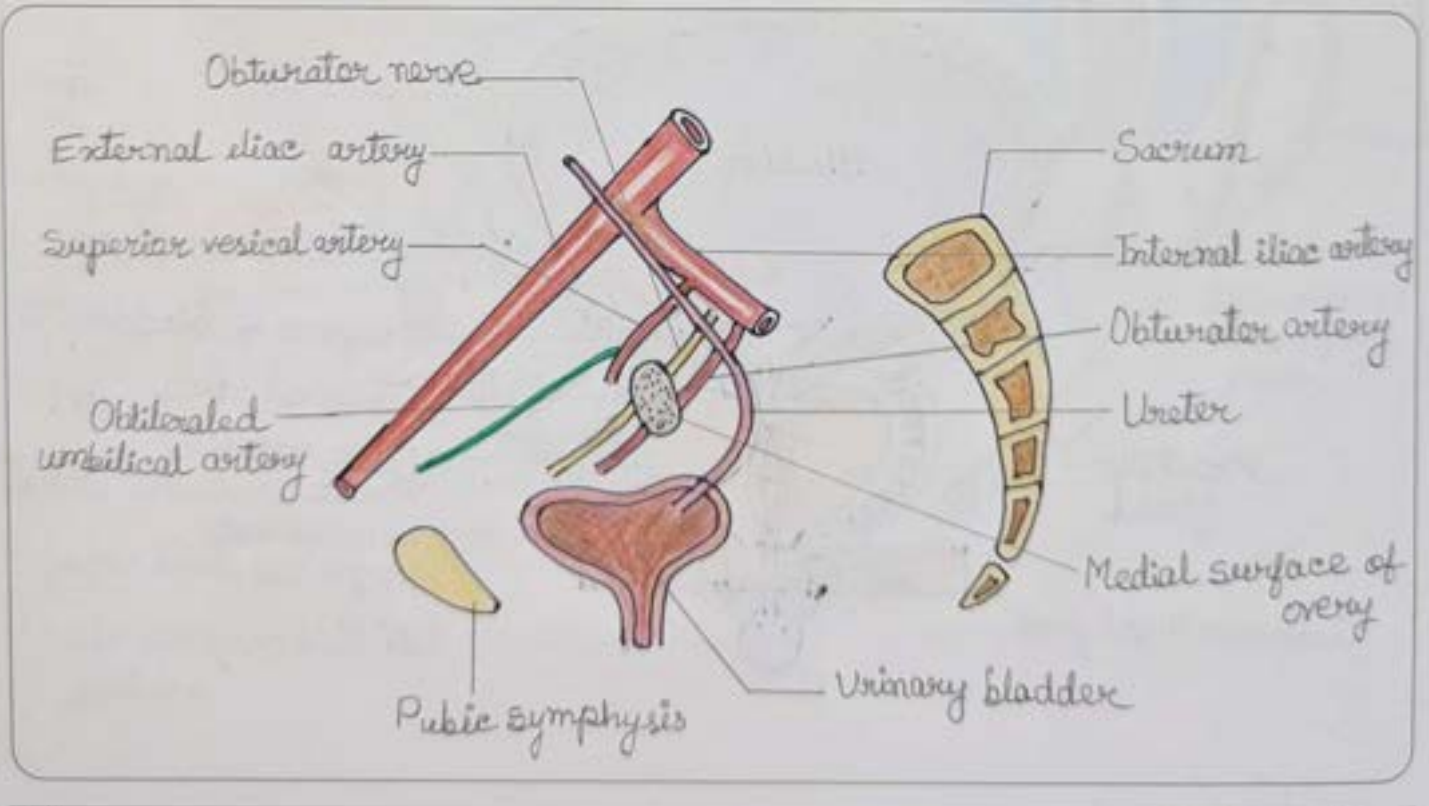
Location and Relations of Prostate



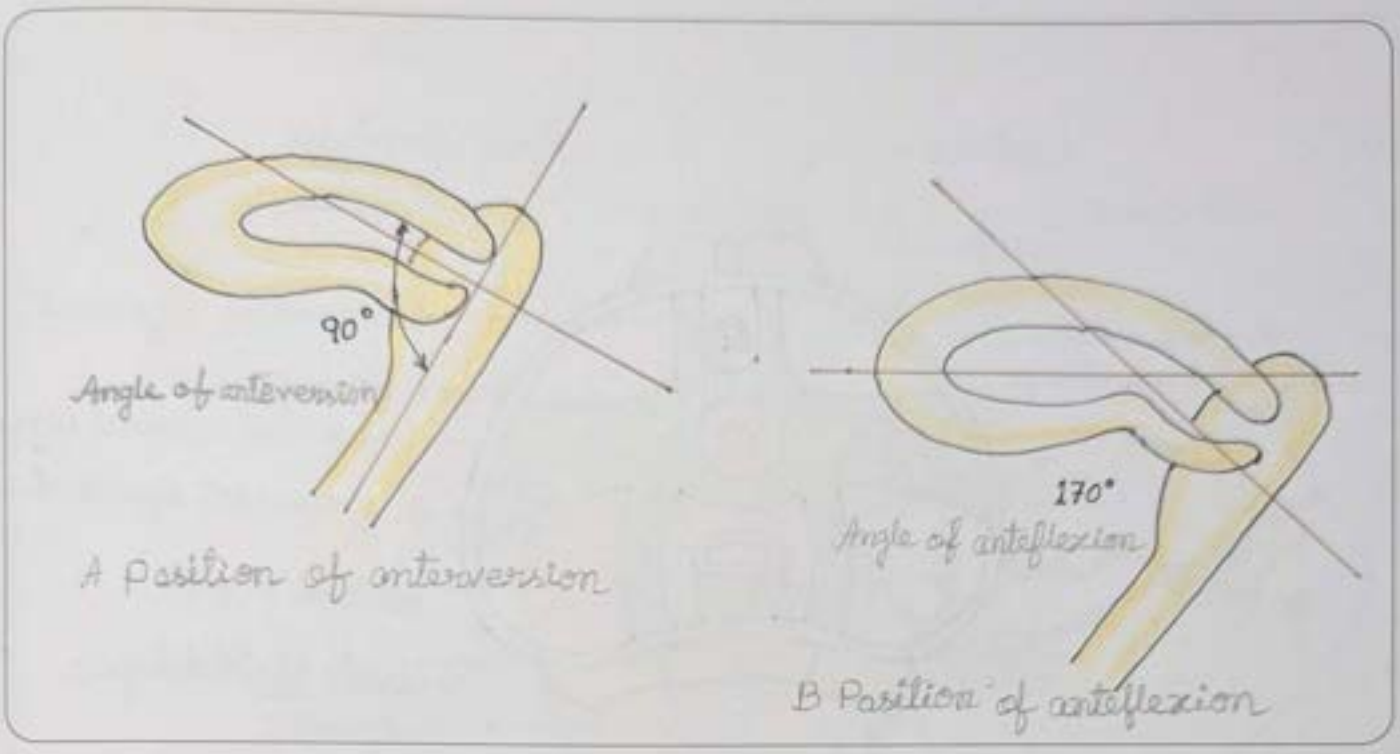
Location and Peritoneal Relations of Ovaries



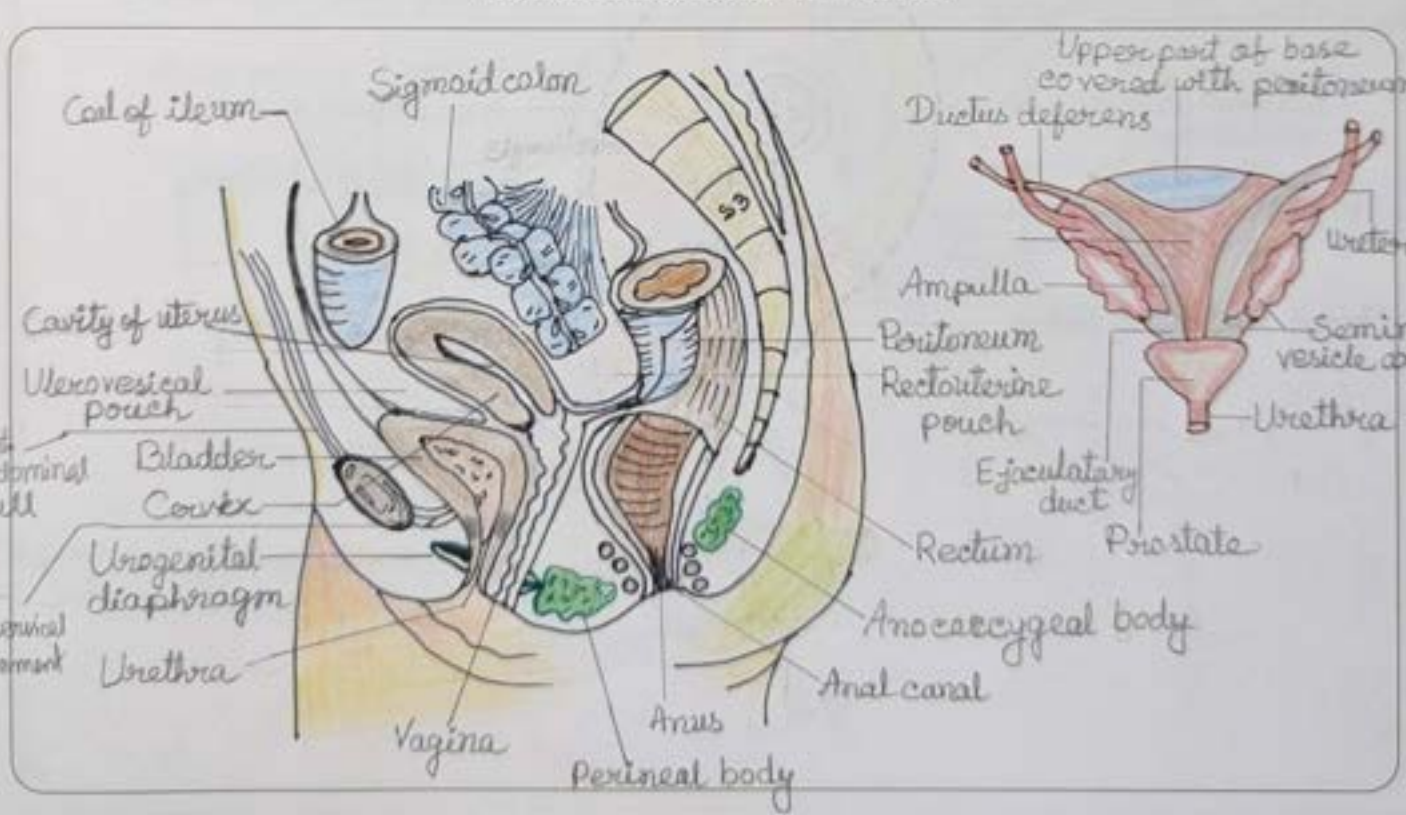
Visceral Relations of Ovaries



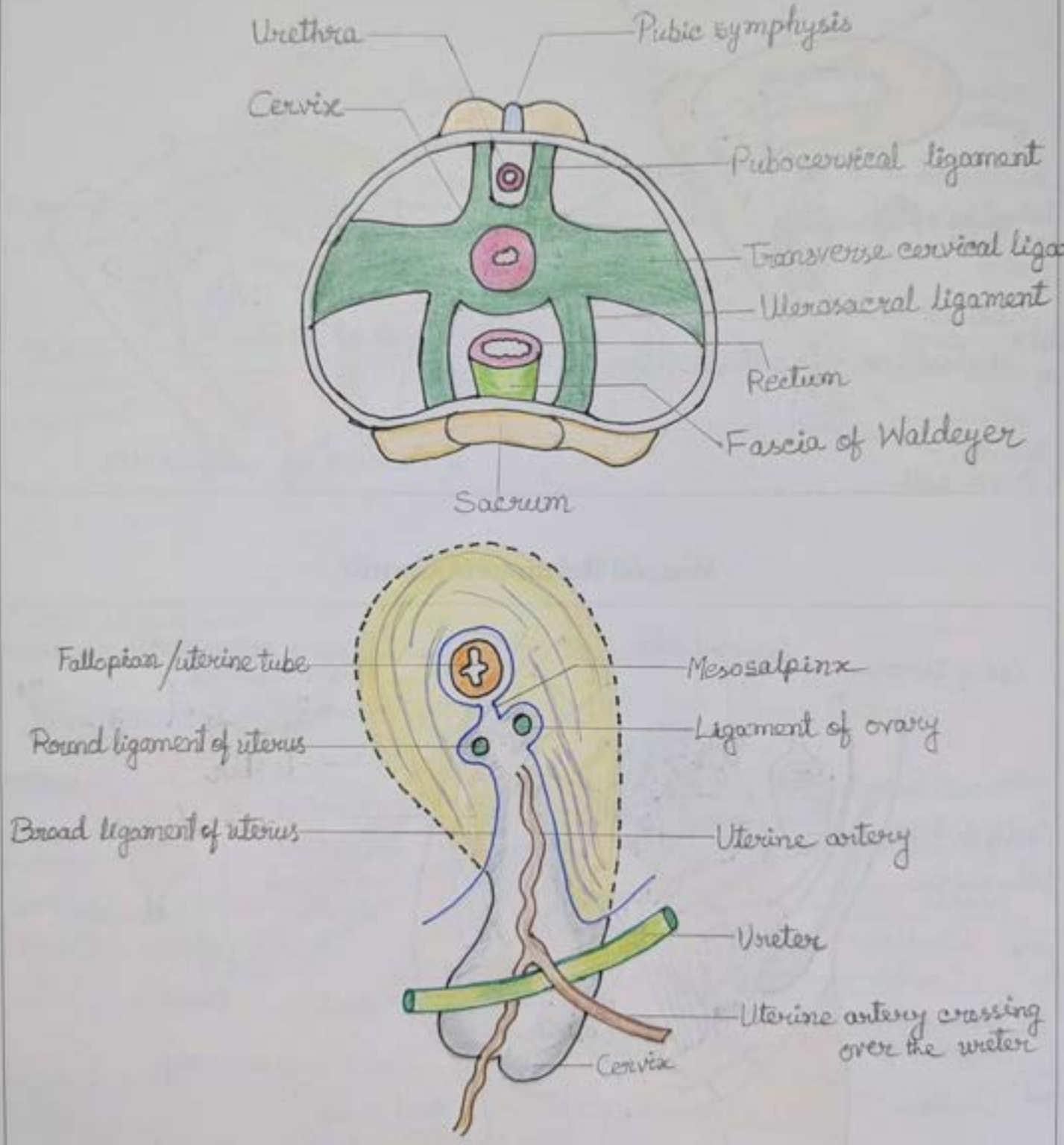
Location and Peritoneal Relations of Uterus



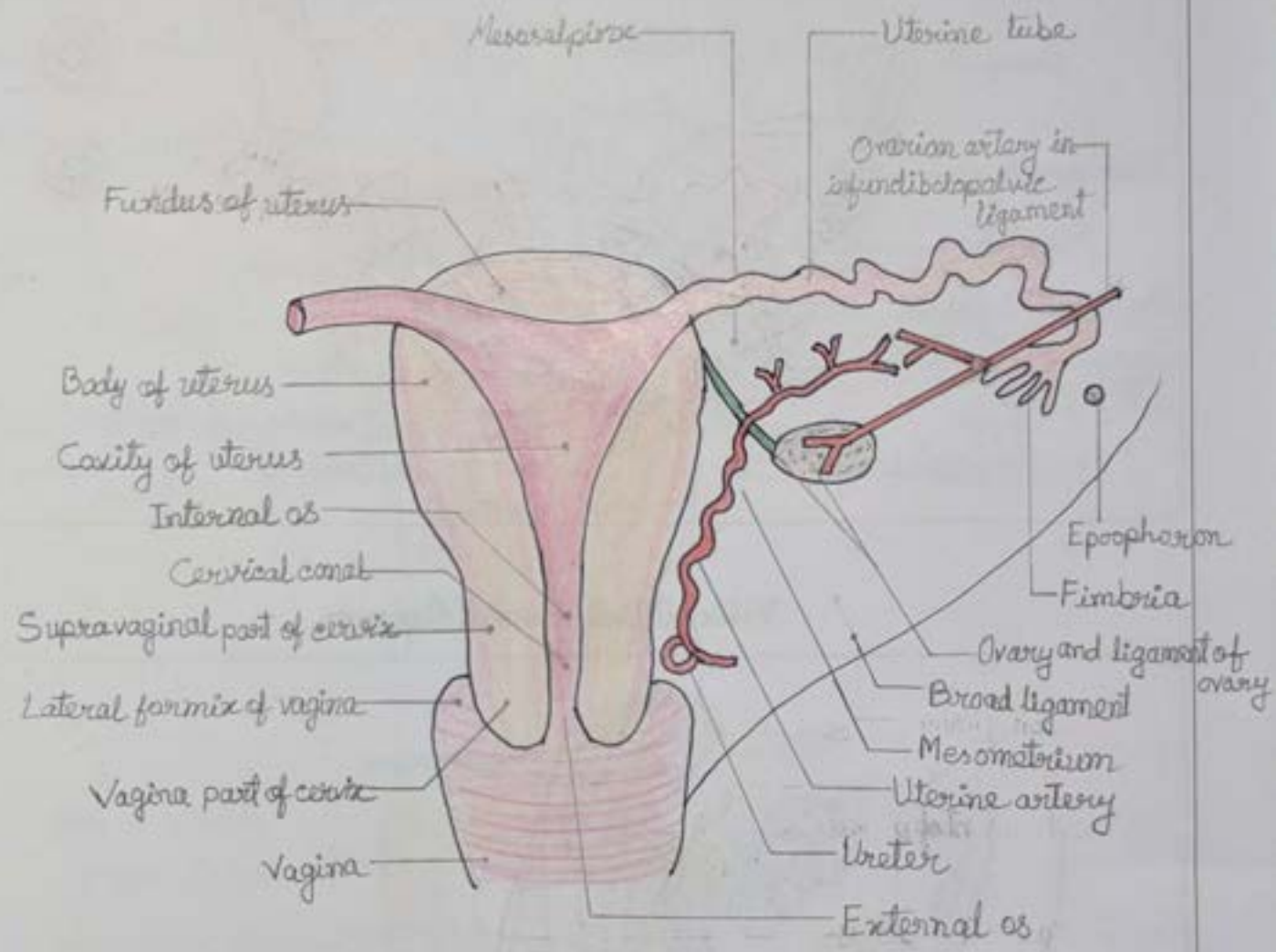
Visceral Relations of Uterus



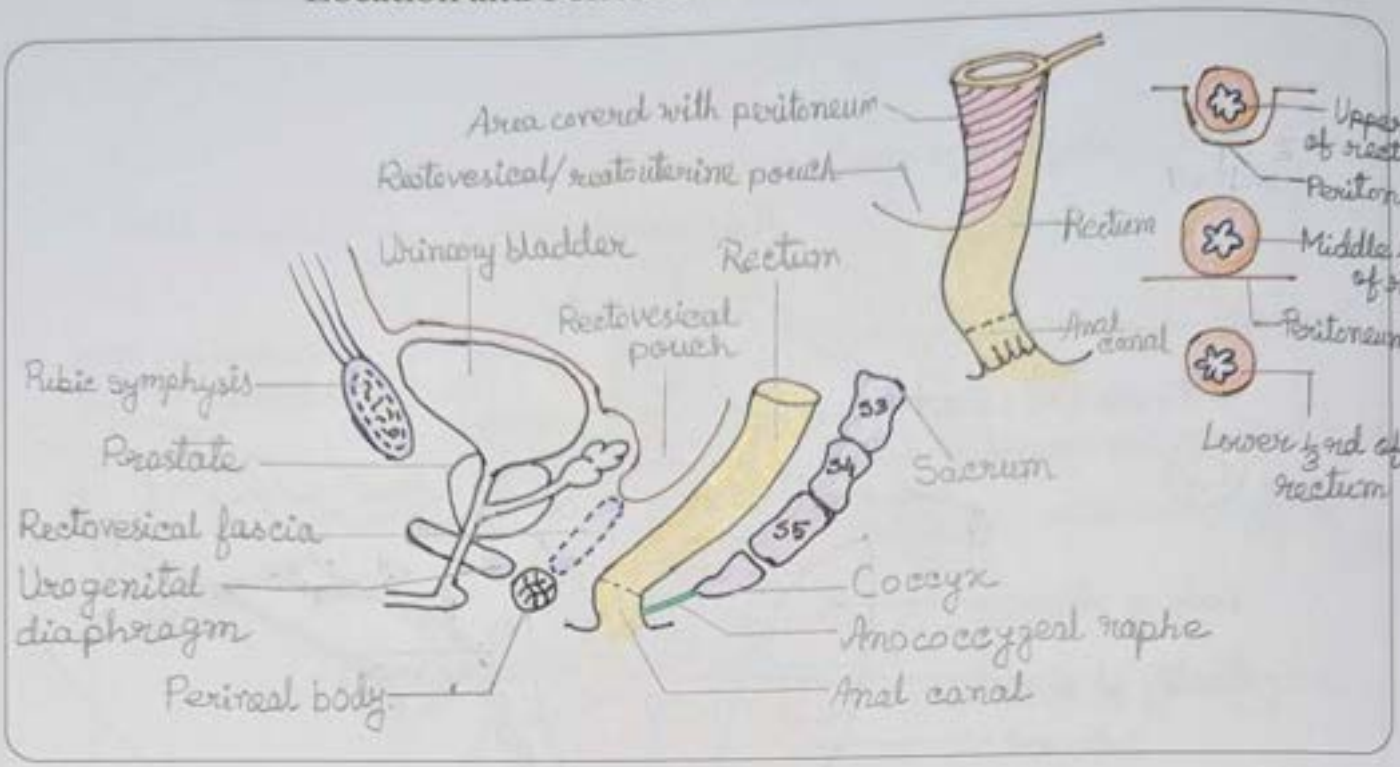
Supports of Uterus



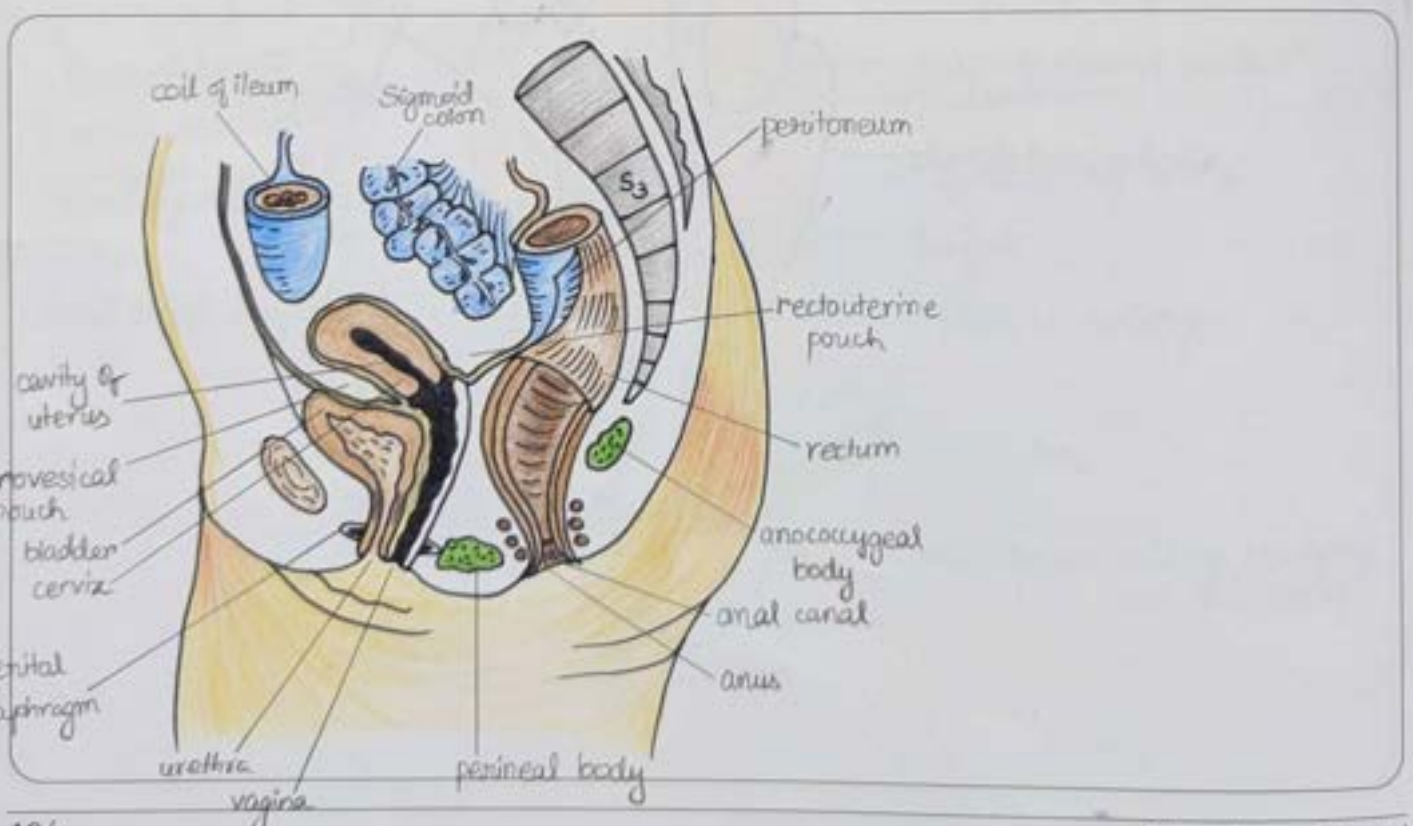
Location and Peritoneal Relations of Fallopian Tube



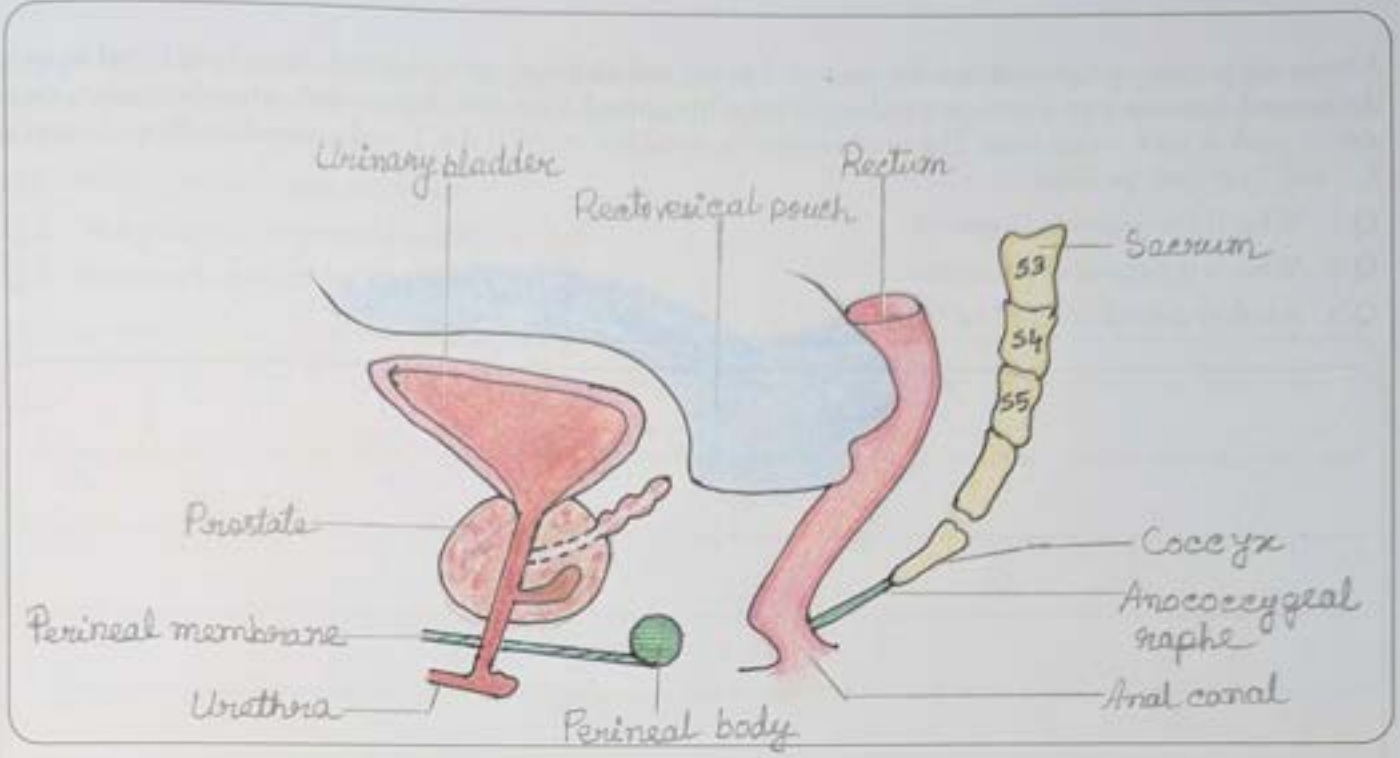
Location and Peritoneal Relations of Rectum



Visceral Relations of Rectum



Location and Visceral Relations of Anal Canal



Interior of Anal Canal