BRACHIAL PLEXUS (✳ essay)

(B.P)

Q) DESCRIBE BRACHIAL PLEXUS

*) Formation
*) components
*) Parts
*) Branches
*) Applied Anatomy

} Subtopics

FORMATION :-

•) B.P is a network of nerves supplying the upper limb

•) Formed by Anterior / ventral rami of C_5 to T_1 spinal nerves (C_5, C_6, C_7, C_8, T_1)

•) sometimes
- → C_4 may take Part - Prefixed type of B.P
- → T_2 may take Part - Postfixed type of B.P

COMPONENTS :-

Roots :- Ventral rami of C_5 to T,

Trunks :- → upper (superior)
→ middle
→ lower (inferior)

Divisions :- → Anterior
→ Posterior

[Located behind the clavicle - Retroclavicular]

Cords :- → Lateral
→ medial
→ Posterior

PARTS :-

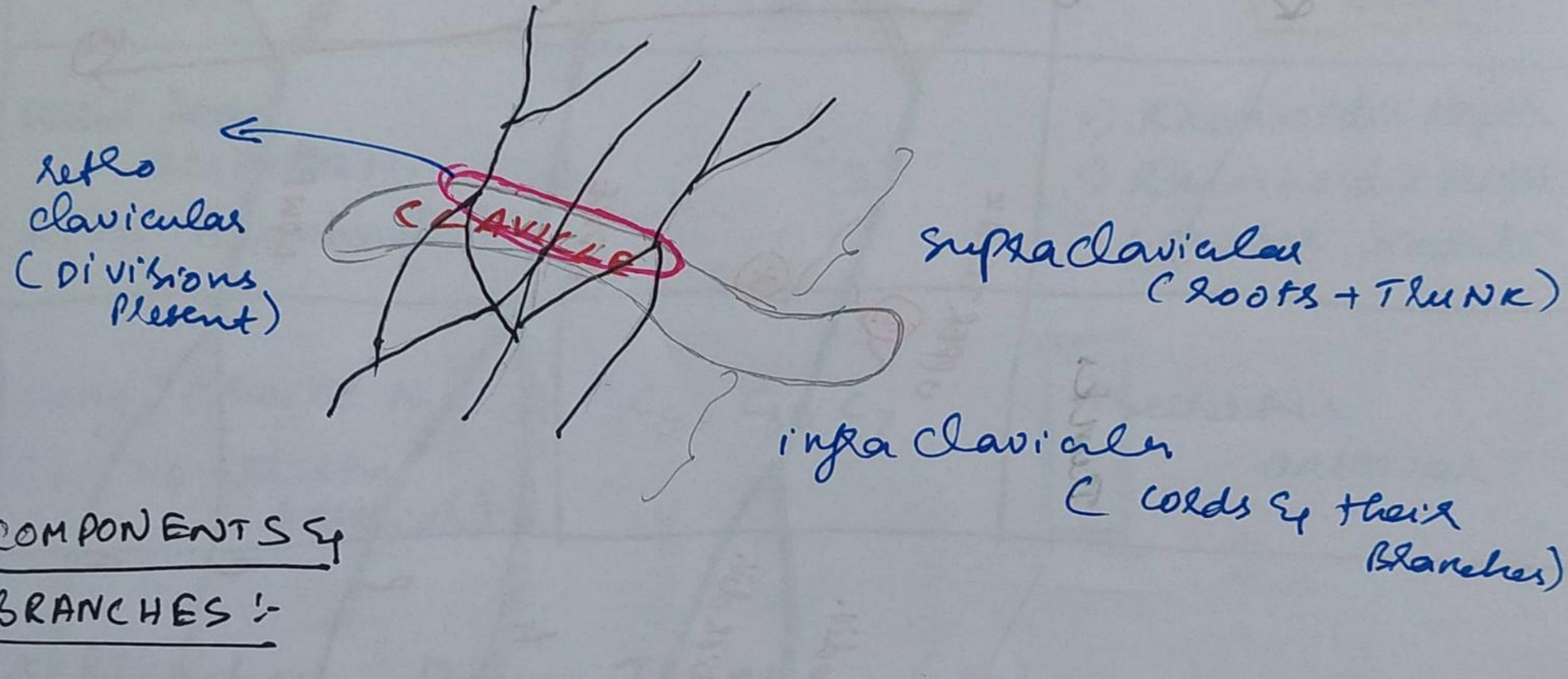
2 Parts → Supraclavicular Part
→ infraclavicular Part

⊛ **Supra clavicular Part**

- a) includes roots & Trunks
- b) Located in Posterior ▵ of neck

⊛ Infraclavicular Part

-) includes cords and their branches
-) Located in Axilla.



COMPONENTS &

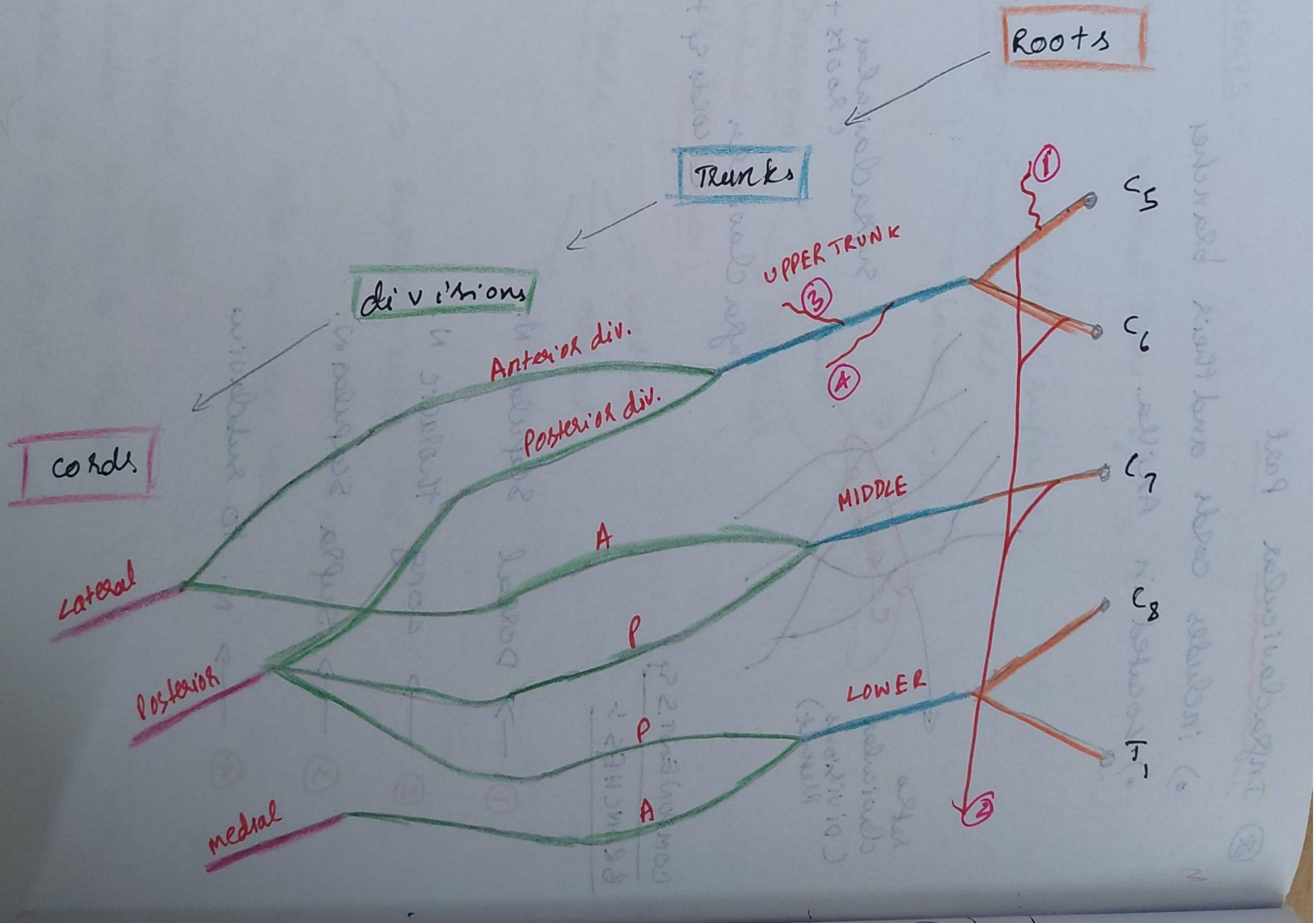
BRANCHES :-

① → Dorsal Scapular N.

② → Long thoracic N.

③ → Supra Scapular N.

④ → N. to subclavius



BRANCHES :-

⊛ Branches from Roots :- (2)

	Nerve	Root value	Supplies
①	Dorsal scapular N. (N. to Rhomboidis)	C_5	•) Rhomboidis major •) Rhomboidis minor •) Levator scapuli
②	Long Thoracic N. (N. to Serratus Anterior)	C_5, C_6, C_7	•) Serratus anterior

* Branches from Trunks (2)

•) Only upper trunk gives off Branches.

	Nerve	Root value	Supplies
①	Supra Scapular N.	$C_5 - C_6$	•) Supra Spinatus •) infra Spinatus
②	N. to Subclavius	C_5, C_6	•) Subclavius muscle

⊛ BRANCHES FROM CORDS

LATERAL CORD [LML]

↓ 2 Branches

- Lateral Pectoral N. (C_5, C_6, C_7)
- Musculo cutaneous N. (C_5, C_6, C_7)
- Lateral Root of Median N. (C_5, C_6, C_7)

MEDIAL CORD [M_4U]

↓ 5 Branches

- Medial Pectoral N. [C_8, T_1]
- Medial Root of Median N. [C_8, T_1]
- Medial cutaneous N. of Arm [C_8, T_1]
- Medial cutaneous N. of Forearm [C_8, T_1]
- Ulnar N. (C_7, C_8, T_1)

POSTERIOR CORD [ULNAR]

↓ 5 Branches

- Upper Subscapular N.
- Lower Subscapular N.
- Nerve to Latissimus Dorsi
- Axillary N. [C_5, C_6]
- Radial N. [C_5 to T_1] [$C_5 - C_6 - C_7 - C_8 - T_1$]

- Radial N. [$C_5 - T_1$]
  - LARGEST BRANCH of Brachial Plexus
  - Continuation of Posterior cord of B.P
  - $C_5 - T_1$ (C_5, C_6, C_7, C_8, T_1)

- Median N. [$C_5 - T_1$]
  - Formed by two roots
    - → Medial root of Median N. [C_8, T_1]
    - → Lateral root of Median N. [C_5, C_6, C_7]
  - $C_5 - T_1$ (C_5, C_6, C_7, C_8, T_1)

- Axillary N. [C_5, C_6]
  - Supplies deltoid, Teres minor

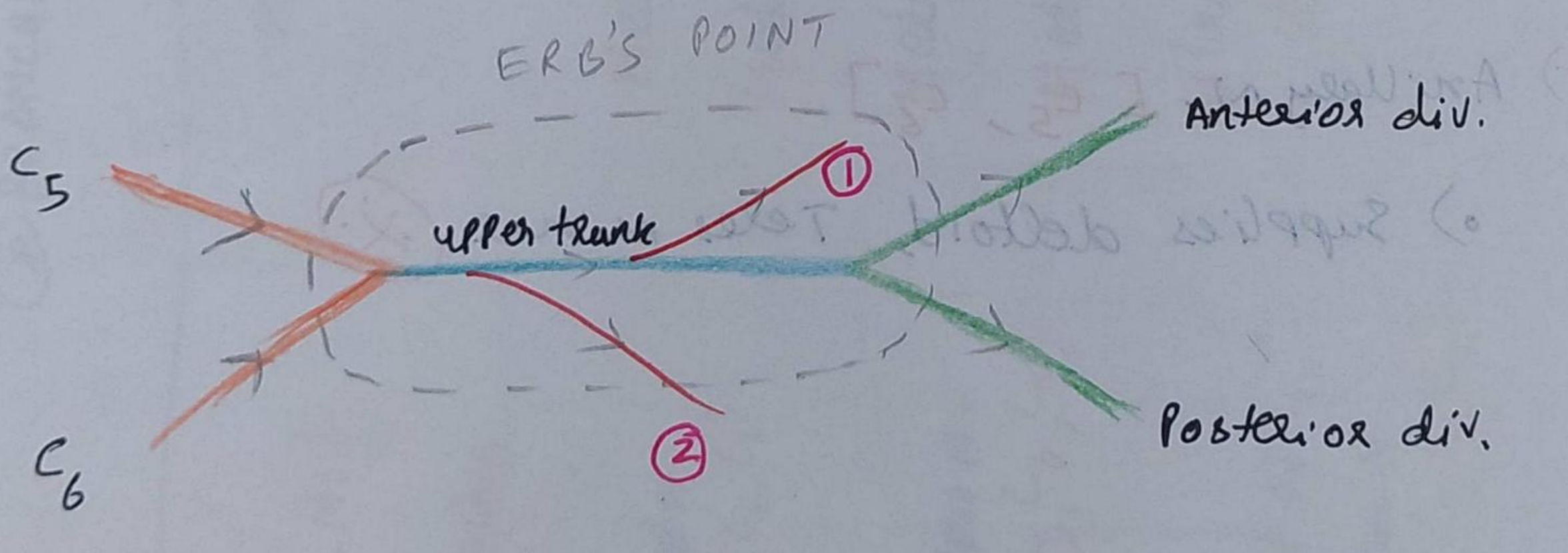
APPLIED ANATOMY :-

(1) ERB'S PALSY :

•) Due to injury of (Erbs Point) upper trunk of Brachial Plexus

a) Erb's Point :

•) meeting Point of 6 nerves
•) located on the upper branch of Brachial Plexus
•) Injury results in Erbs Palsy.



① - Supra scapular N.
② - N. to Subclavius

.) 6 nerves

- o) C_5 & C_6 roots
- .) supra scapular N. & N. to Subclavius
- o) Anterior & Posterior division of upper trunk

- o) Position of the upper limb [Policeman's tip deformity]
  - o) Arm - Adducted & medially rotated
  - .) Forearm - extended & Pronated.
  - o) wrist - Flexed

- .) Muscles Paralysed in Erb's Palsy :-

  Deltoid, Supraspinatus, infra spinatus, Biceps Brachi, Brachialis.

(2) KLUMPKE'S PALSY :

•) Due to ~~tm~~ Injury to Lower trunk of B.P

•) Nerve Roots involved : C_8 and T,

(*) Mainly T,

•) Muscles Paralysed : Intrinsic (small) muscles of hand

•) Clinical features :-

(1) Claw hand deformity

→ extension of MCP (meta carpo phalyngeal) Joints and flexion of Proximal & distal IP (inter phalyngeal) Joints

(2) Horners syndrome

→ Due to involvement of T, root

SCAPULAR REGION

Bony Landmarks of Scapula :-

(*) Coracoid Process: [An example of Atavistic epiphysis]

Attachement of 3 muscles → insertion of P. minor (Pectoralis)

Attachement of 3 muscles → common origin of coracobrachialis & Short head of Biceps Brachii

(*) Acromian Process : Top most bony landmark at the shoulder region

(*) Coracoacromial ligament :- [ligament b/w coracoid and acromion Process]

•) Prevents superior dislocation of Shoulder joint

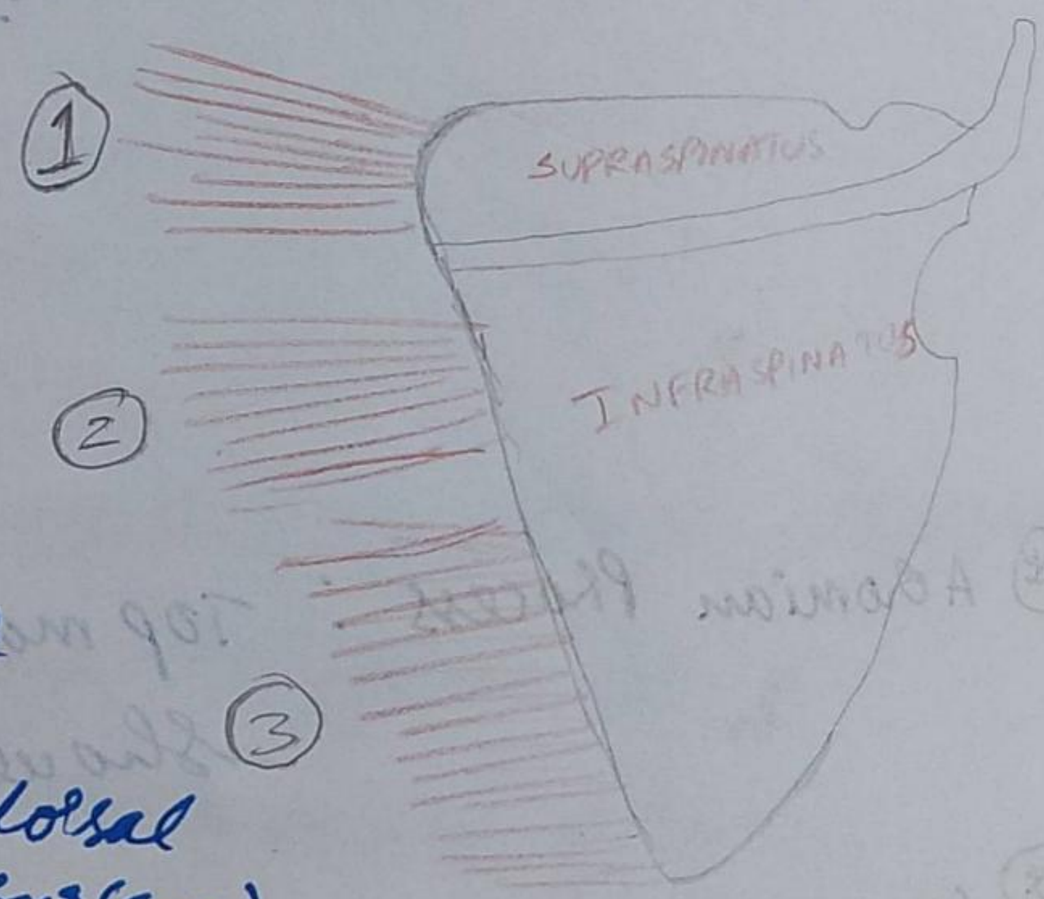
(*) Supra glenoid tubercule : Origin of Long head of biceps Brachii

↳ intracapsular in Origin : arises within fibrous capsule of Shoulder Joint

(*) Infra glenoid tubercule : Origin of long head of TRICEPS

(*) Medial Border of Scapula :

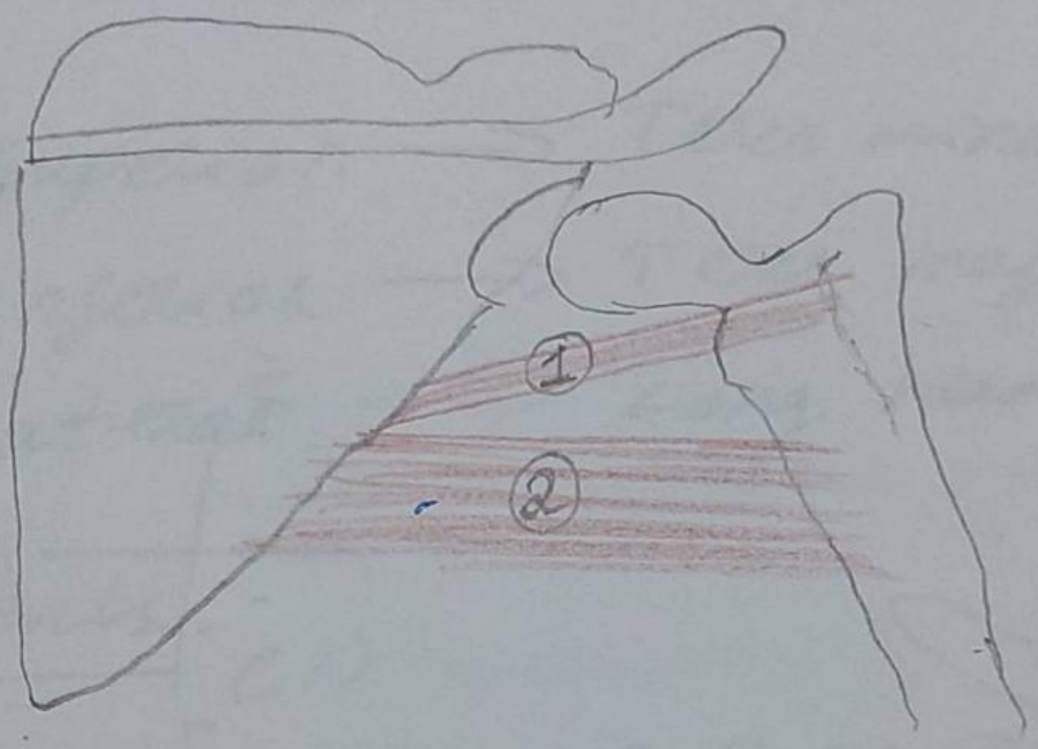
① → Levator Scapuli
② → Rhomboid minor
③ → Rhomboid major



①, ②, ③ → inserted into medial border of Scapula (along the dorsal surface)

All 3 muscles are supplied by Dorsal Scapular N. (X)

⊛ Lateral Border of Scapula:



① → Teres minor
② → Teres major

⊛ Trapezius :-

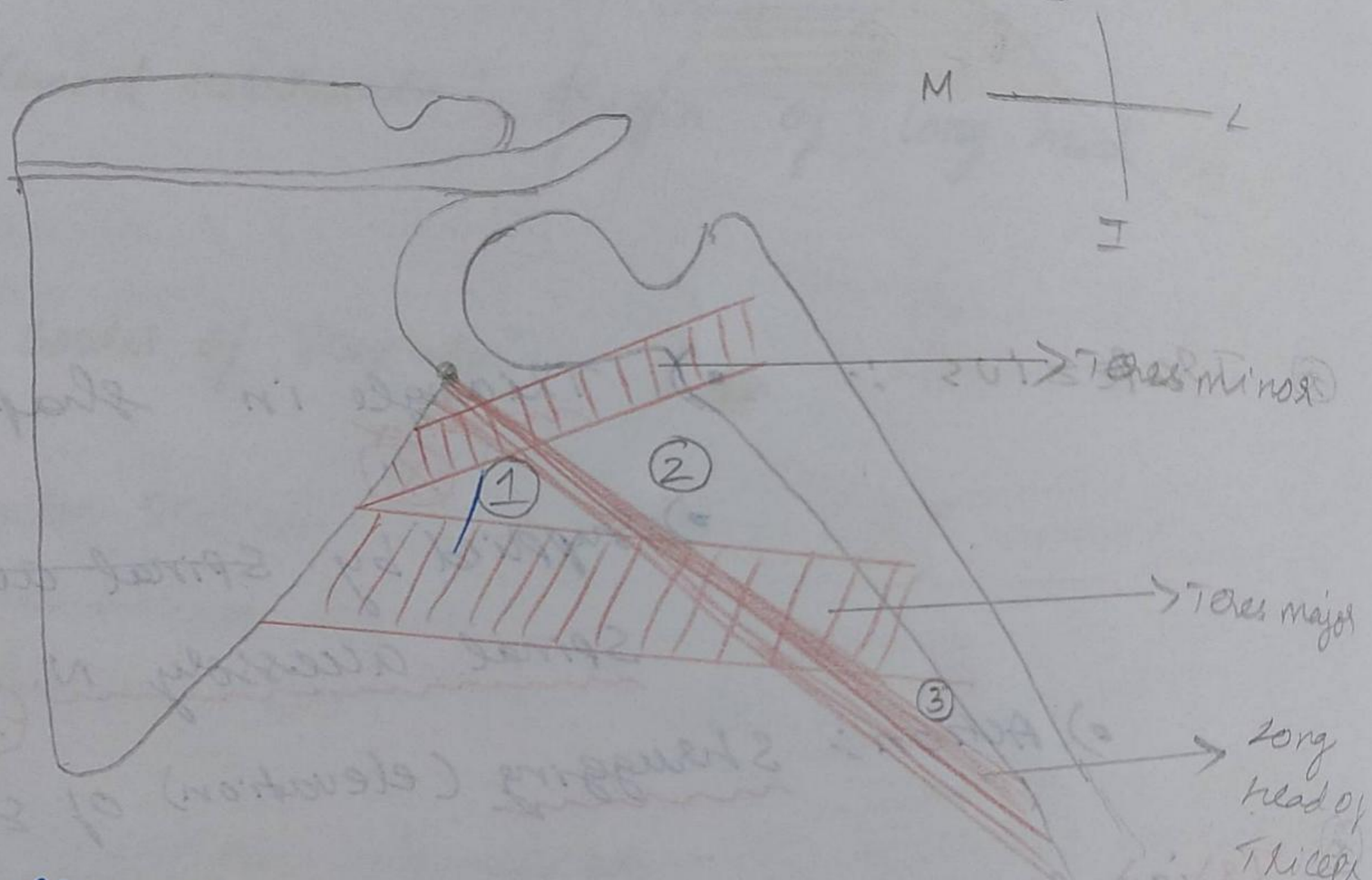
-) Triangle in shape
-) Supplied by ~~Spinal accessory~~ Spinal accessory N. (XI)
-) Action :- Shrugging (elevation) of shoulder

⊛ Triangle of ~~Auscult~~ Au

⊛ TRIANGLE OF AUSCULTATION

Trapezius	Scapula	Latissimus Dorsi
(medially by the lateral border of Trapezius)	(Laterally by the medial border of scapula)	(inferiorly by the upper border of L. Dorsi)

SCAPULAR SPACES [INTERMUSCULAR SPACES] (5 mark)



① → upper triangular space
② → quadrangular space
③ → lower triangular space

Boundaries & contents :-

① upper triangular space :-

Boundaries :-
(3)

Superior → Teres minor
inferior → Teres major
Lateral → Long head of Triceps

contents :-
(1)
•) circumflex scapular Artery
[A branch of
Subscapular A.]

② Quadrangular space :-

Boundaries :- superior → Teres minor
(4) inferior → Teres major
Lateral → Long head of triceps
medial → Surgical neck of humerus

CONTENTS :-
(2) •) Axillary N.
•) Posterior circumflex humeral vessels (Artery and vein)

③ LOWER TRIANGULAR SPACE

Boundaries :- (3)

Superior ⟶ Teres major

Medial ⟶ Long head of triceps

Lateral ⟶ Shaft of humerus

Contents :- (2)

1) Radial N.
2) Profunda Brachii Vessels (Artery + Vein)

SERRATUS ANTERIOR [BOXERS MUSCLE]

Origin : From upper 8 ribs by 8 digitations

Insertion : Pass backwards & gets inserted into the medial border of Scapula (along the costal surface) and Inferior angle of scapula.

Nerve supply: •) Long thoracic N. [Nerve of Bell / N. Serratus Anterior]

•) Root Value - C_5, C_6, C_7

•) directly arises from roots of B. Plexus

Actions:

① Protraction of scapula (forward movement of scapula)

② overhead abduction of shoulder Joint (above 90°)

Applied:

⑧ WINGING OF SCAPULA (-x-)

•) Due to injury to long thoracic N.

↓

•) Paralysis of Serratus Anterior muscle

↓

•) medial border of Scapula becomes more prominent

Levator scapulae: causes elevation of scapula

→ cause retraction of scapula

Rhomboids
(R. Major & R. Minor)

scapula → Protraction → Serratus anterior
scapula → Retraction → Rhomboids

PECTORAL REGION [Anterior thoracic wall region]

3 muscles:- 1) Pectoralis major → Largest & most superficial muscle
2) Pectoralis minor } Lie deep to P. major
3) Subclavius

Clavipectoral fascia:- Lies deep to P. major.

Mamary gland:- Located in superficial fascia of ~~Region~~ Pectoral region

PECTORALIS MAJOR [-X- 5 Marks]

a) Largest & most superficial muscle of the Pectoral Region.

Origin : By 2 heads

i) clavicular head: Arises from medial $\frac{2}{3}$ of clavicle

ii) Sterno coastal head: Arises from anterior surface of sternum bone (&) From upper 6 coastal cartilages [Cartilage of Ribs]

Insertion :

Lateral Lip of intertubercular sulcus (Bicipital groove) of humerus

(Passes Shoulder Joint Anteriorly)

Nerve supply : By medial & Lateral Pectoral N.

Actions : ① Flexion of Shoulder Joint (Arm)

② Adduction of Shoulder Joint (Arm)

③ medial rotation of Shoulder Joint (Arm)

PECTORALIS MINOR

Origin: From 3rd, 4th & 5th ribs

Insation: Coracoid Process of Scapula

Nerve supply: By medial & Lateral Pectoral Nerves

Action: •) Protraction of Scapula
[Assists Serratus anterior for Protraction]

NOTE:
•) It does not act on Shoulder Joint as it is attached to only Coracoid Process
•) P. Minor divides the axillary A. into 3 Parts

SUBCLAVIUS

•) Present b/w Clavicle & 1st rib

Action: Stabilises (steadies) the clavicle bone

CLAVIPECTORAL FASCIA [½ mark]

- Lies deep to P. major.
- encloses 2 muscles → Subclavius
  → P. minor

Attachements: (4)

Superiorly → attached to clavicle

medially → attached to 1st rib & costo clavicular ligament [Ligament Present b/w 1st rib & clavicle]

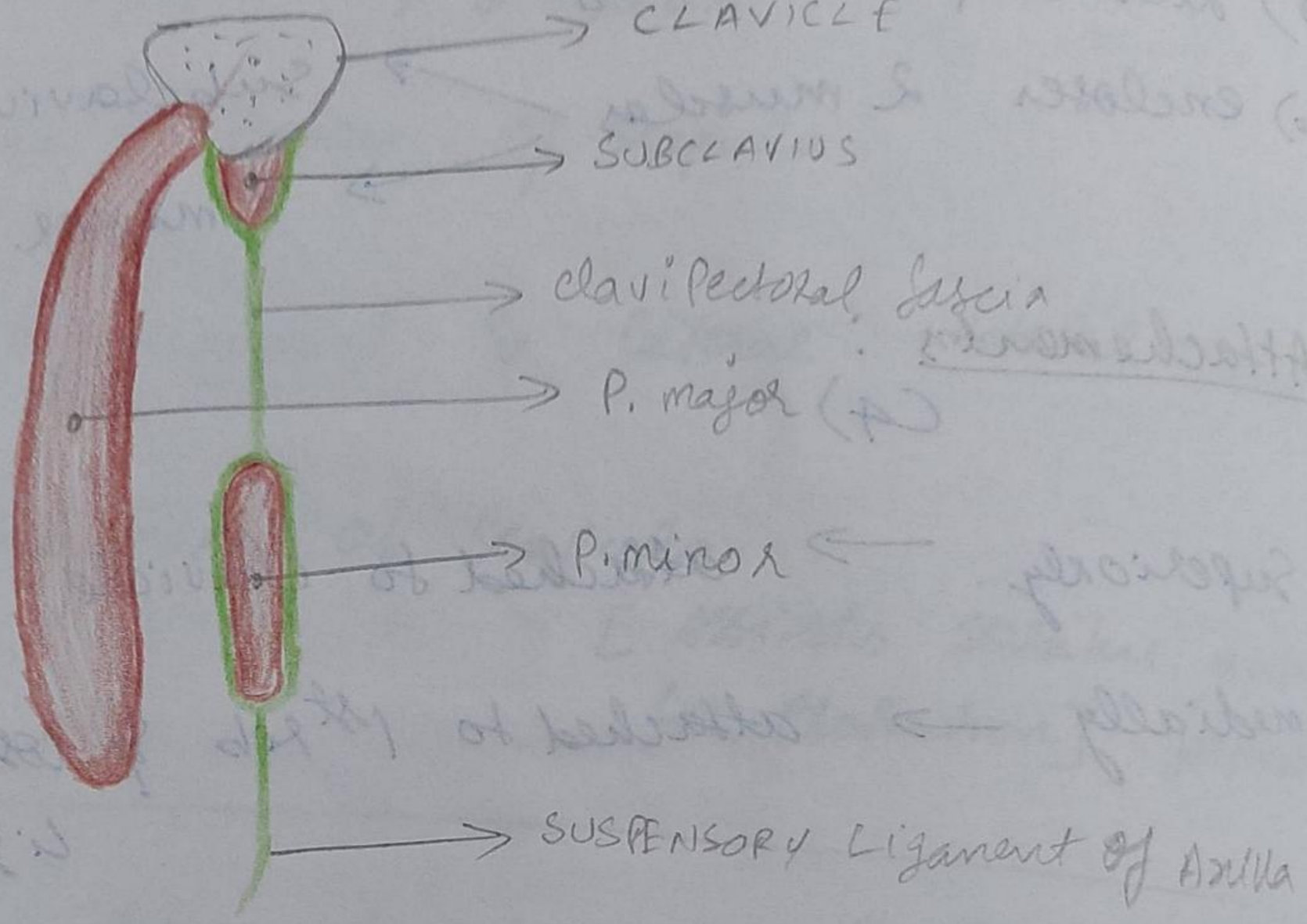
Laterally → C.P (Coracoid Process) of scapula & Coracoclavicular ligament

Inferiorly → continues as suspensory ligament of Axilla

STRUCTURES Piercing C.P fascia (CALL): (4) → 1 vein, 1 Artery, 1 nerve, lymphatics

- Cephalic vein
- Acromio thoracic / thoracoacromial A.
- Lateral Pectoral N.
- Lymphatics

Diagram :



DELTOID : [-∴ 5 Mark]

Origin : By 2 sets of fibres

Anterior fibres [From lateral $\frac{1}{3}$ of clavicle]

Lateral / Middle (not medial) / Acromial fibres [From acromion Process of scapula]

Posterior fibres [From spinous Process (spine) of scapula]

•) Lateral / Acromial / middle fibres are Multipinnate fibres

•) Anterior & Posterior fibres are unipinnate fibres

Insertion: Into 'V' shaped deltoid tuberosity of humerus

Nerve supply: Axillary N. (C_5, C_6)

Action:

Anterior fibres ⟶ flexion & medial rotation of arm (shoulder joint)

Middle fibres ⟶ Abduction (15-90°) of shoulder joint (arm)
↳ main action of deltoid.

Posterior fibres ⟶ Extension & Lateral Rotation of shoulder joint (arm)

[NOTE: Except adduction, all the movements of shoulder joint is performed by deltoid]

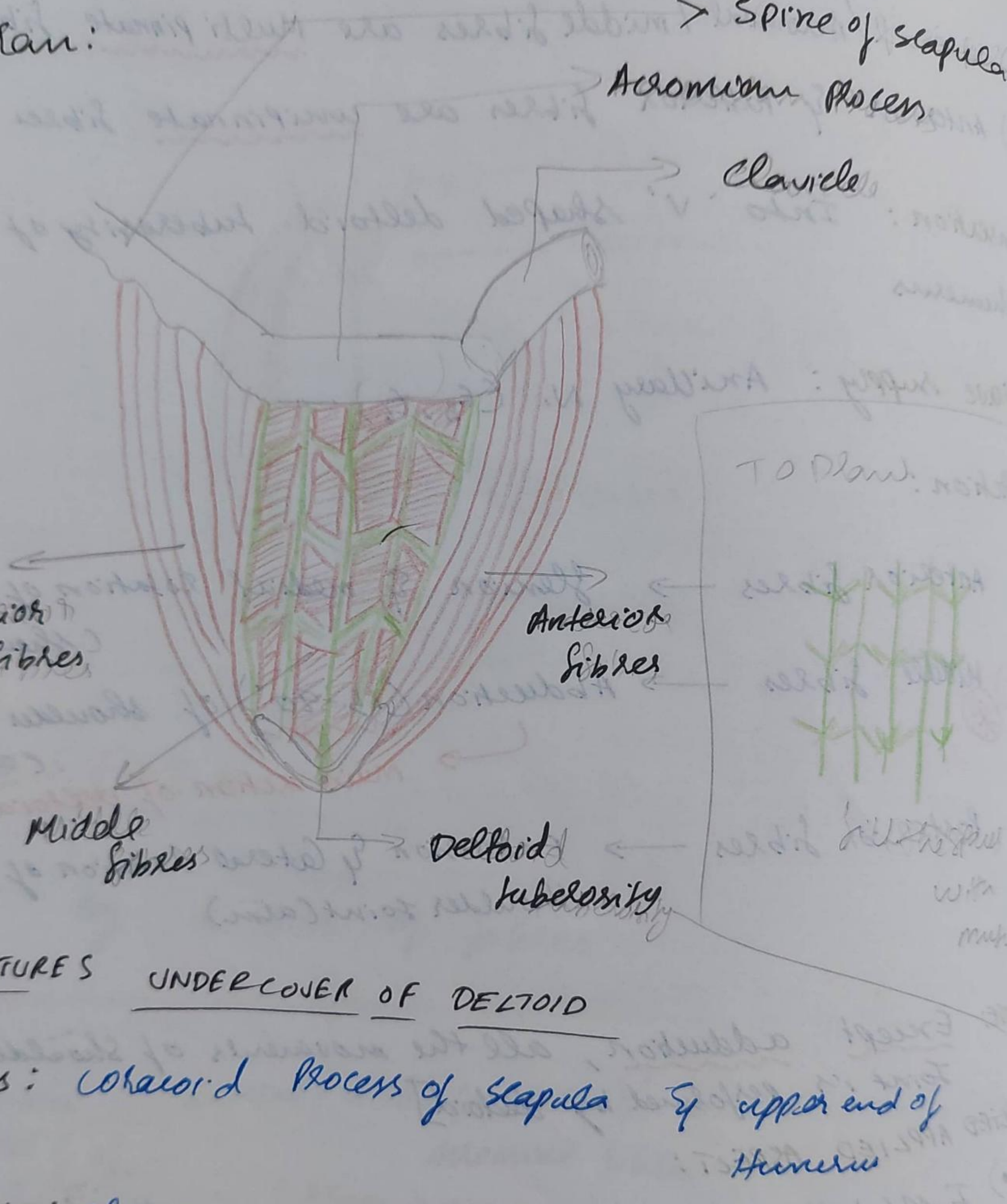
APPLIED ASPECT:

•) I.M (intra muscular) injection is given in the lower part of deltoid muscle [to avoid injury to Axillary N.]

↓

(since Axillary N. is present below the upper part of detoid)

Diagram:



STRUCTURES UNDERCOVER OF DELTOID

Bones: Coracoid Process of Scapula & upper end of Humerus

Joints: Shoulder joint

muscles :

Supra spinatus
Infra Spinatus
Teres minor
Subscapularis
} Rotator cuff muscles (SITS muscle)

P. minor
coraco brachialis
Short head of Biceps Brachi
} from Coracoid Process

Nerves & Blood vessels :

•) Axillary N.
•) Anterior and Posterior Circumflex humeral vessels
} wind around surgical neck of humerus

[NOTE: B/w deltoid muscle & P. major muscle, there is a groove called Delto Pectoral groove
↓
contains cephalic vein]

[NOTE: •) cephalic vein drains into Axillary vein
•) Basilic vein continues as Axillary vein]

AXILLARY NERVE [5 mark]

•) A.K.A "Circumflex nerve"

Formation / origin: Branch of Posterior cord of Brachial Plexus

Root Value: C_5, C_6

Course: •) After arising from Posterior cord, Axillary N. (AN) winds around the Surgical neck (SN) of Humerus along with PCHA (Posterior Circumflex humeral Artery/vessels)

•) Both AN, PCHA are contents of Quadrangular Space.

Termination: Axillary N. divides into 2 terminal branches - Anterior division & Posterior division the Posterior division further divides into a motor and a cutaneous branch., whereas the anterior division terminates as a motor branch.

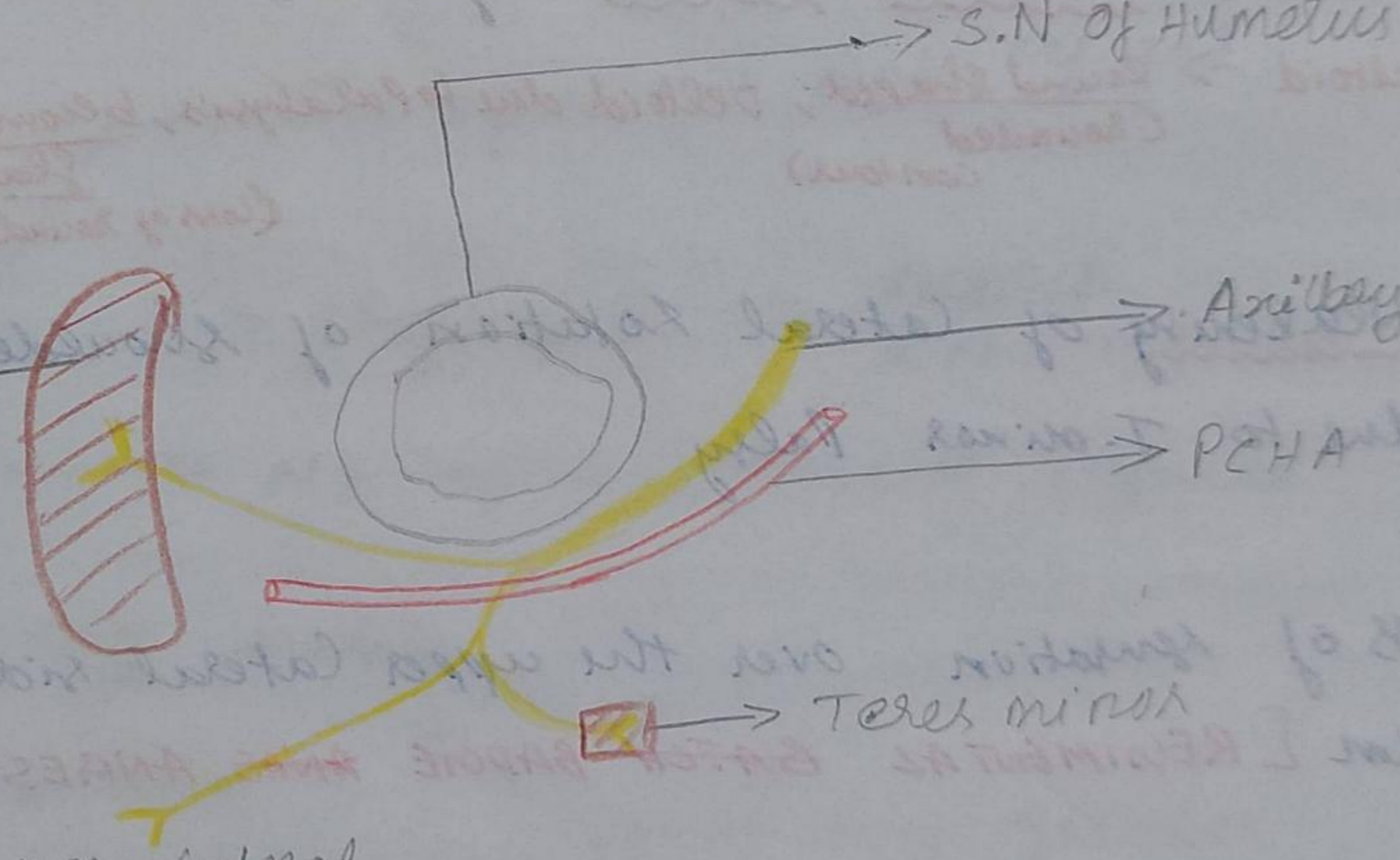
Branches

2 muscles supplied (motor / muscular Branch) :

•) Deltoid → By Ant. div.

•) Teres minor → by motor br. of Post div.

1 cutaneous branch : upper lateral cutaneous nerve of Arm.



Applied Aspect :

Axillary N. injury may be caused by

•) Inferior dislocation of Shoulder Joint
[MOST COMMON DISLOCATION OF SHOULDER JOINT]

•) Fracture of SN of humerus

•) IM injection given in wrong manner.

Clinical features:

① Loss of Abduction of Shoulder Joint (15-90°) } Due to deltoid Palsy

② Loss of Rounded Contour of the shoulder

[Deltoid → Round Shaped (Rounded contour), Deltoid due to Paralysis, becomes flat] (Loss of Rounded Contour)

③ Weakening of Lateral Rotation of Shoulder Joint due to T. minor Palsy

④ Loss of sensation over the upper Lateral side of Arm [REGIMENTAL ~~BATCH~~ BADGE ~~ANNS~~ ANAESTHESIA]

[NOTE: Axillary N. obeys hiltons Law ✗]

(*) 3 nerves which are in Direct contact with humerus

- Axillary N. [AN] — winds around SN of H (humerus)
- Radial N. [RN] — Passes through Spiral / Radial groove of shaft of H #
- Ulnar N. [UN] — runs behind medial epicondyle of H (ME)

Fracture of
- SN of H → AN injured
- Shaft of H → RN injured
- ME of H → UN injured

(*) Rotator cuff muscles

Supra spinatus
Infra spinatus
Teres minor
} inserted into greater tubercle

[small + teres MINOR]

Subscapularis } inserted into lesser tubercle

⊛ Inter tubercular sulcus / Bicipital groove of Humerus

3 Parts

Lateral lip → Pectoralis major

Floor → Lattisimus Dorsi

Medial lip → Teres major

LADY → Lattissimus Dorsi

B/W TWO MAJOR → P. major & T. major.

Greater tubercle — Supraspinatus, Infra spinatus, + teres minor

Lesser tubercle — Subscapularis

AXILLA [ARMPIT]

.) Pyramidal shaped Space

Boundaries | 4 walls

Anterior wall	Posterior wall	medial wall	Lateral wall
Formed by 2 Pectoral Region muscles •) P. major •) P. minor •) Subclavius •) Clavi Pectoral Fascia	Formed by Scapular muscles (3) •) Lattissimus Dorsi •) Teres major •) Subscapularis	•) Serratus anterior	•) upper end of humerus •) Coracobrachialis •) Biceps Brachii [Both heads]

Apex of Axilla : •) Directed upwards
•) a.k.a Cervico axillary canal

Base (floor) of Axilla : •) Directed downwards & Laterally
•) Formed by skin, superficial fascia & deep fascia

APPLIED: For drainage of Axillary Abscess, Incision is made at the floor (Base) of Axilla (X)

CONTENTS :

1. Axillary A. & it's branches
2. Axillary V. & its tributaries
3. Cords & their branches of B. Plexus
4. Axillary lymph nodes
5. Axillary Pad of Fat

Axillary sheath (X)
- → Derived from Prevertebral fascia
- → encloses Axillary A. & 3 cords of B. Plexus

Anterior axillary fold is formed by P. major. (X)

AXILLARY ARTERY [X]

EXTENT :

a) From outer border of 1st rib to the lower border of Teres major.

b) Continuation of Subclavian A.
Continues as Brachial A.

PARTS :

a) Divided int 3 Parts by P. Minor

1st Part ⟶ lies Proximal / Superior to P. Minor

2nd Part ⟶ lies behind / Posterior to P. Minor

3rd Part ⟶ lies Distal / inferior to P. minor.

Branches : (6)

6 Branches from 3 Parts of Axillary A.

From 1st Part (1) : a) Superior thoracic A.
(Supplies the mammary gland)

From 2nd Part (2) : a) Lateral / long thoracic A.
(<A)

b) Acromio ~~loba~~ thoracic /
Thoraco acromial A.
↓
① Pierces Clavi Pectoral fascia
② divides into 4 Branches — Acromial br
Pectoral br
Clavicular br
Deltoid br.

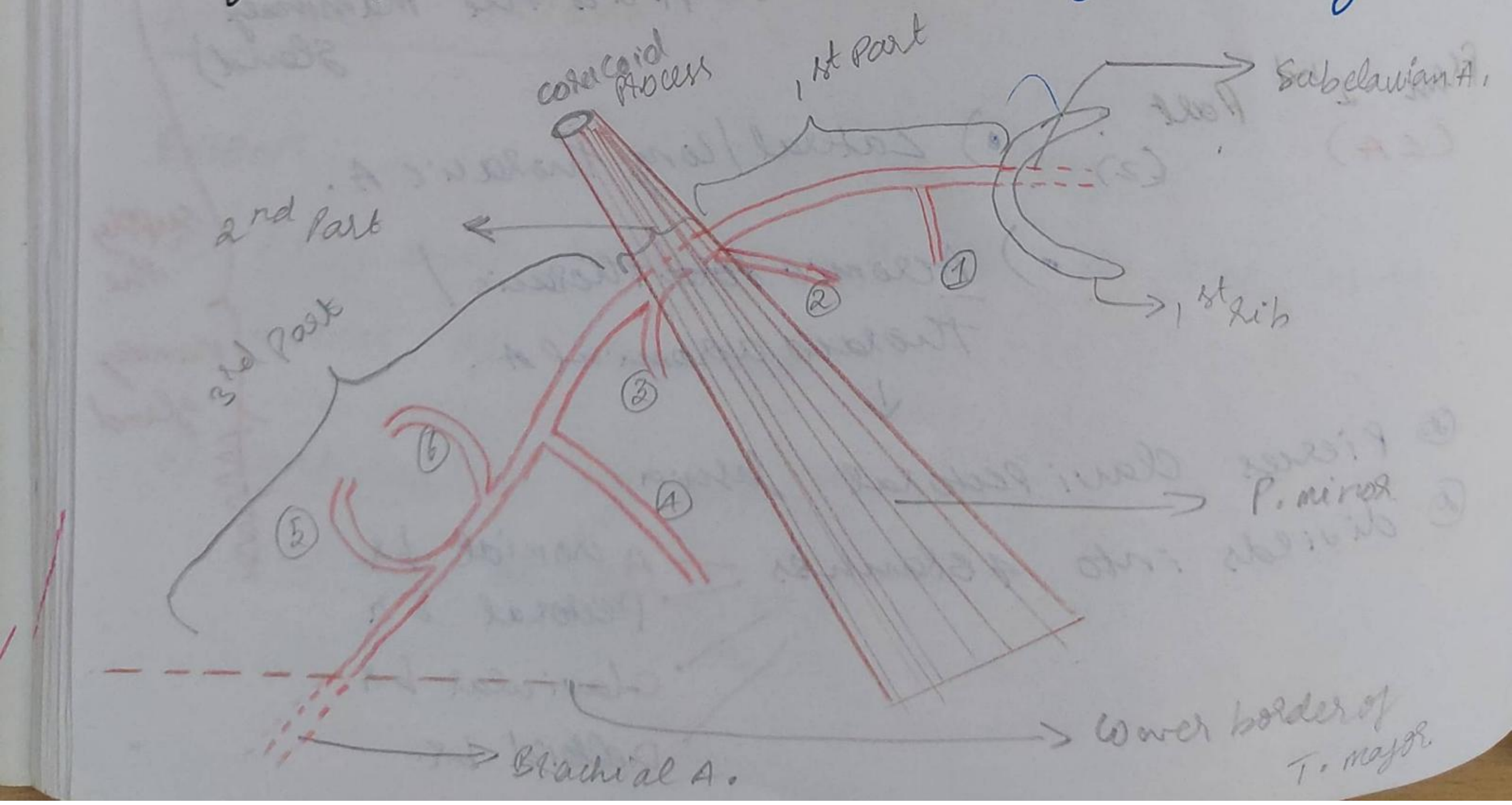
a, b supply the mammary gland

From 3rd Part : (3)

•) Subscapular A. :- •) Largest branch of Axillary A.
•) gives circumflex scapular A.
(content of upper Axilla)

•) Anterior Ch : •) wind around the surgical neck of humerus from front and behind respectively and anastamose with each other
Posterior circumflex humeral A.
(ACHA & PCHA)
•) PCHA accompanied by axillary N.

Diagram:



① Superior thoracic A.
② Acromio thoracic / thoracoacromial A.
③ Long / Lateral thoracic A.
④ Subscapular A.
⑤ ACHA
⑥ PCHA

MAMMARY GLAND [-x-x-x- Essay]

•) Modified sweat gland
•) well developed in females & rudimentary in males

SYNOPSIS

o) Location & extent
o) Deep relations [Mamary bed Structures]
•) 4 Quadrants
•) structure
•) Blood supply
•) Lymphatic drainage
•) Applied

Location & extent :

Location : located in the superficial fascia.

Extent :

a) Horizontally → From lateral border of sternum bone to the MAL (mid axillary line)

b) vertically → From 2nd to 6th rib

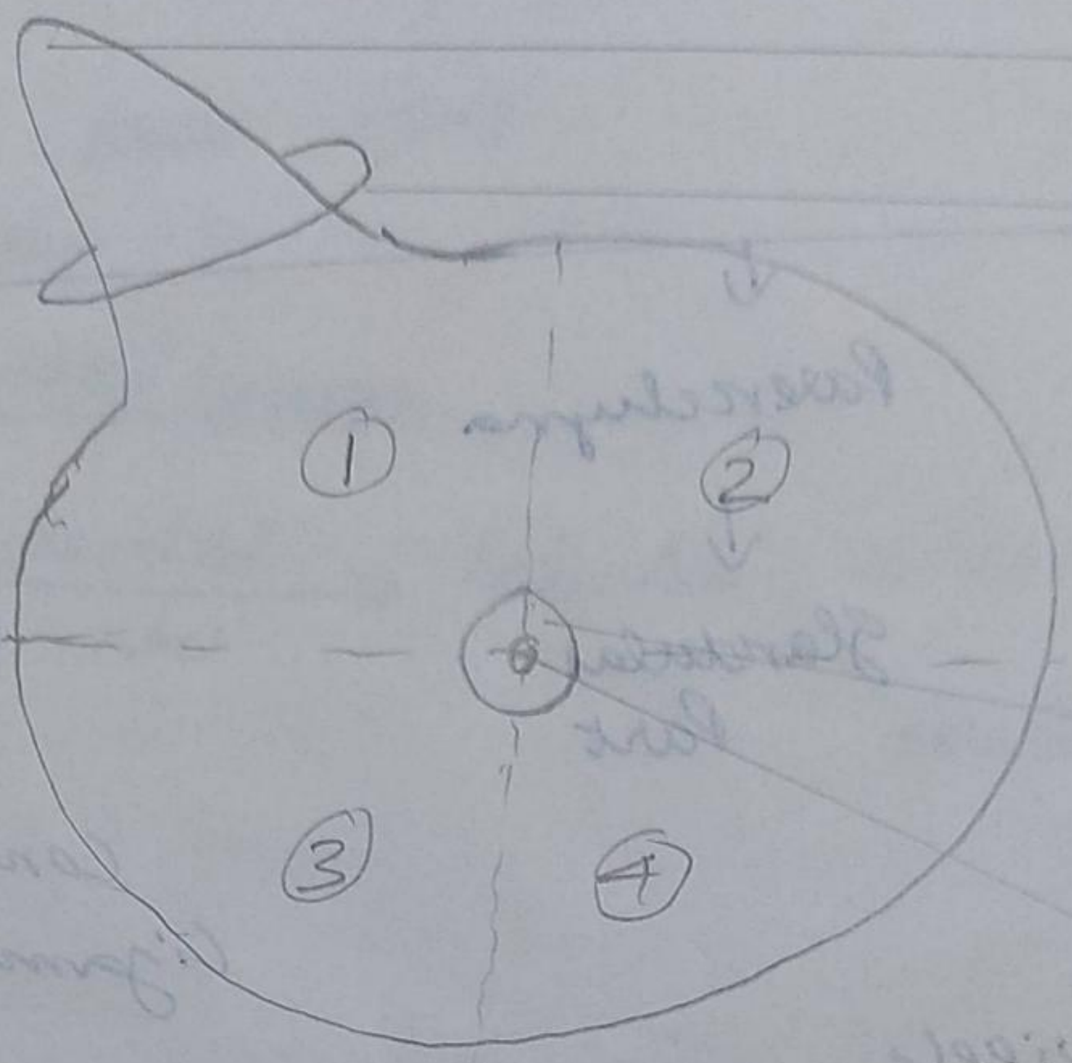
DEEP RELATIONS (MAMMARY BED STRUCTURES) :

① Deep fascia (Pectoral fascia)

② 3 muscles → a) P. major
b) Serratus anterior
c) external oblique aponeurosis

4 Quadrants :

① → UL (upper lateral)
② → UM (upper medial)
③ → LL (lower lateral)
④ → LM (lower medial)



⊛ Axillary tail of Spence :

-) Projection from UL Quadrant of mamary gland
-) Passes through an opening - Foramen of Langer

⊛ USUALLY carcinoma breast / breast Cancer arises from UL Quadrant

STRUCTURE :

- Skin
  - Nipple, Areola
- Parenchyma
  - Glandular Part
- Stroma
  - Fibro fatty tissue
    - Contains suspensory Ligament of Cooper

① Skin : → Nipple
→ Areola

Nipple : •) Conical shaped Projection
•) Located almost at the centre of the gland.
•) usually located in the 4th intercostal spaces
•) Supplied by 4th intercostal N. / 4th thoracic Spinal N. (T_4)

Areola : •) Darkly Pigmented area around the nipple.
•) Rich in Sebacious gland.
•) During Pregnancy & Lactation, enlarged Sebacious gland → Tubercules of Montgomery

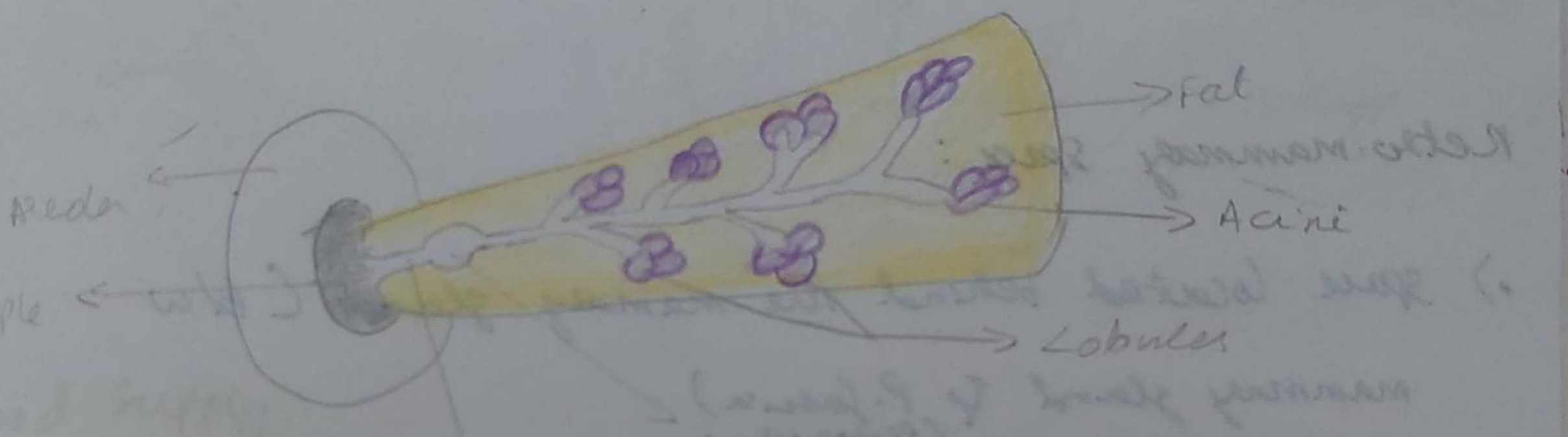
② Parenchyma : [Mammary gland Proper]

•) Glandular ~~Part~~ Part

•) Contains ~~15~~ 15–20 Lobes

•) ~~Lobes divided~~

•) Lobes —divided into→ Lobules —→ contains Acini ↓ secrete milk.



•) Each lobe is drained by 1 Lactiferous duct

•) All Lactiferous duct converge towards converge towards the nipple.

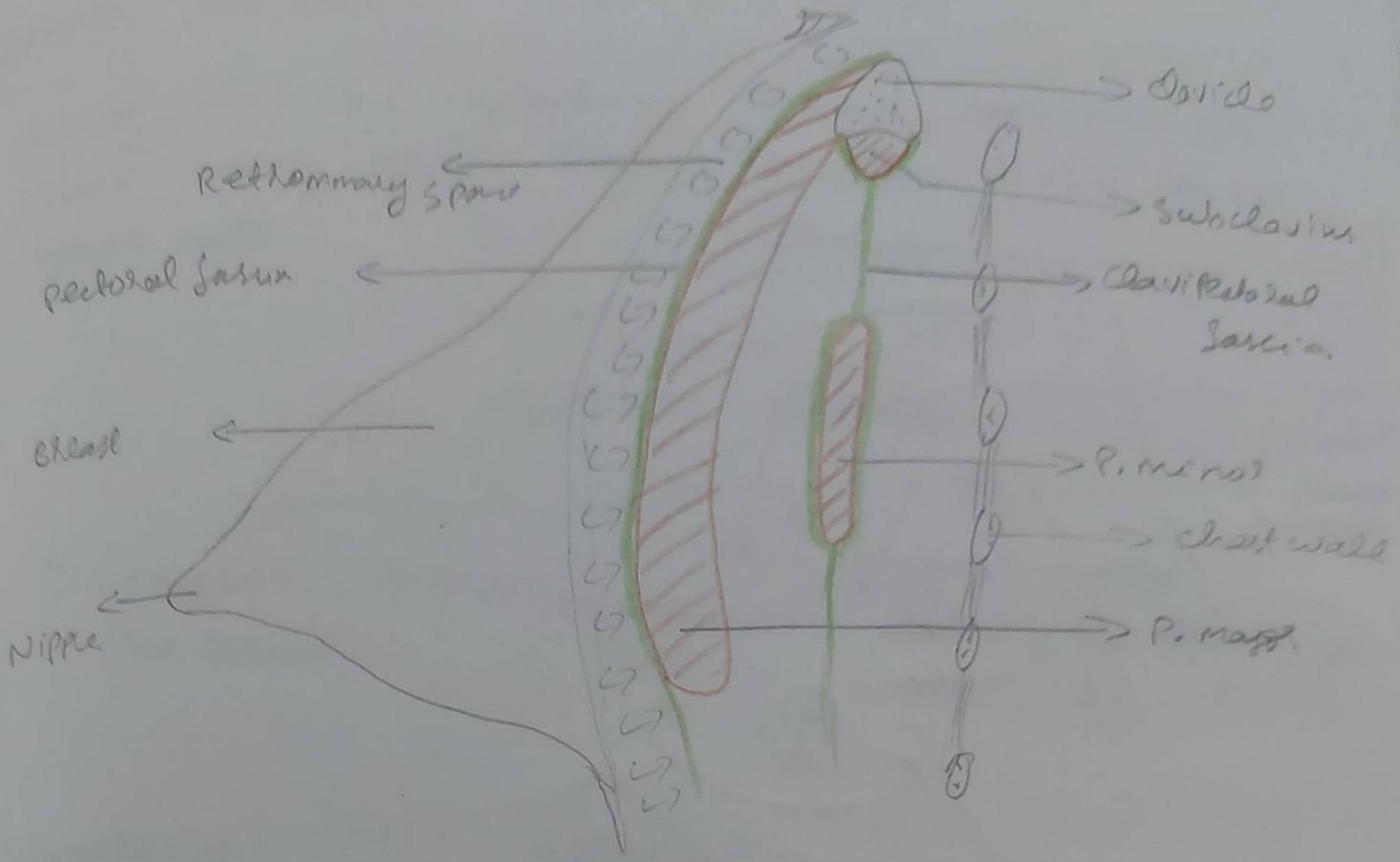
•) small dialatations of Lactiferous duct before opening into nipple —→ Lactiferous sinus

② Stroma :

-) Fibro fatty tissue
-) Suspensory ligament of cooper : Fibrous tissue extending from skin to the deep fascia (pectoral fascia)
-) Provides support to the mammary gland

Retro-mammary space :

-) space located behind the mamary gland (b/w mammary gland & P. fascia (pectoral))
-) Provides mobility to the mammary gland.
-) During Carcinoma breast, Retromammary space is obliterated and mobility of mammary gland is lost

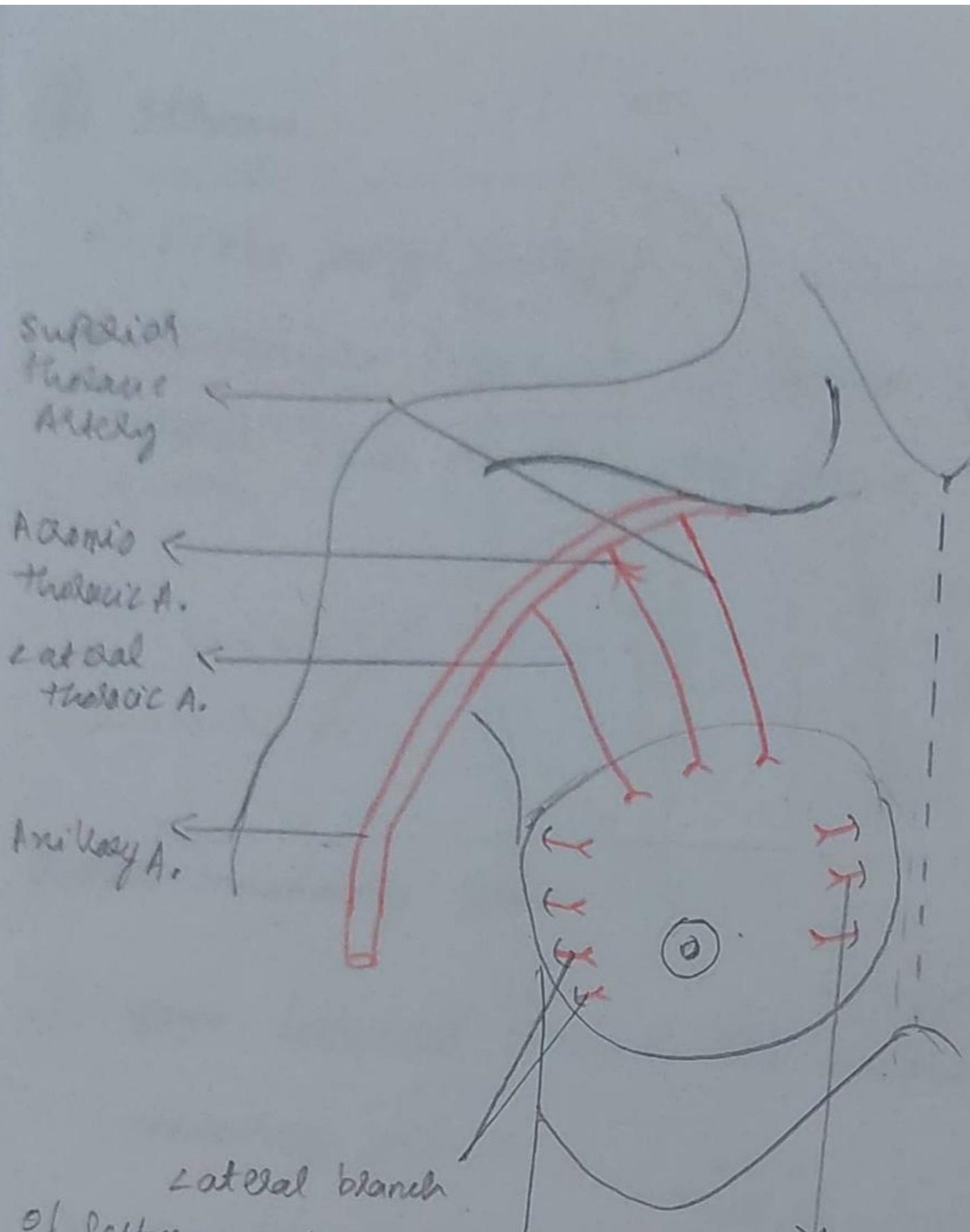


Blood supply:

① Arterial supply:

2 Arteries supplying Mammary gland

- Axillary A. → 3 branches
  - Superior Thoracic A.
  - Acromio Thoracic A.
  - Lateral Thoracic A.
- Internal thoracic A.
- Posterior Intercostal A.



② Venous drainage : [veins correspond to the arteries]

•) By Axillary V., Internal thoracic V. & Posterior intercostal V.

LYMPHATIC DRAINAGE: [½ mark]

.) Having clinical importance because, carcinoma of breast mainly spreads through lymphatic to the regional lymph nodes.

Lymphatic drainage

① Lymphatics draining the Breast

② Lymph nodes draining the Breast

1) Lymphatics:

Lymphatics

superficial lymphatics

↓

•) Drain the skin of the Breast except nipple & Areola

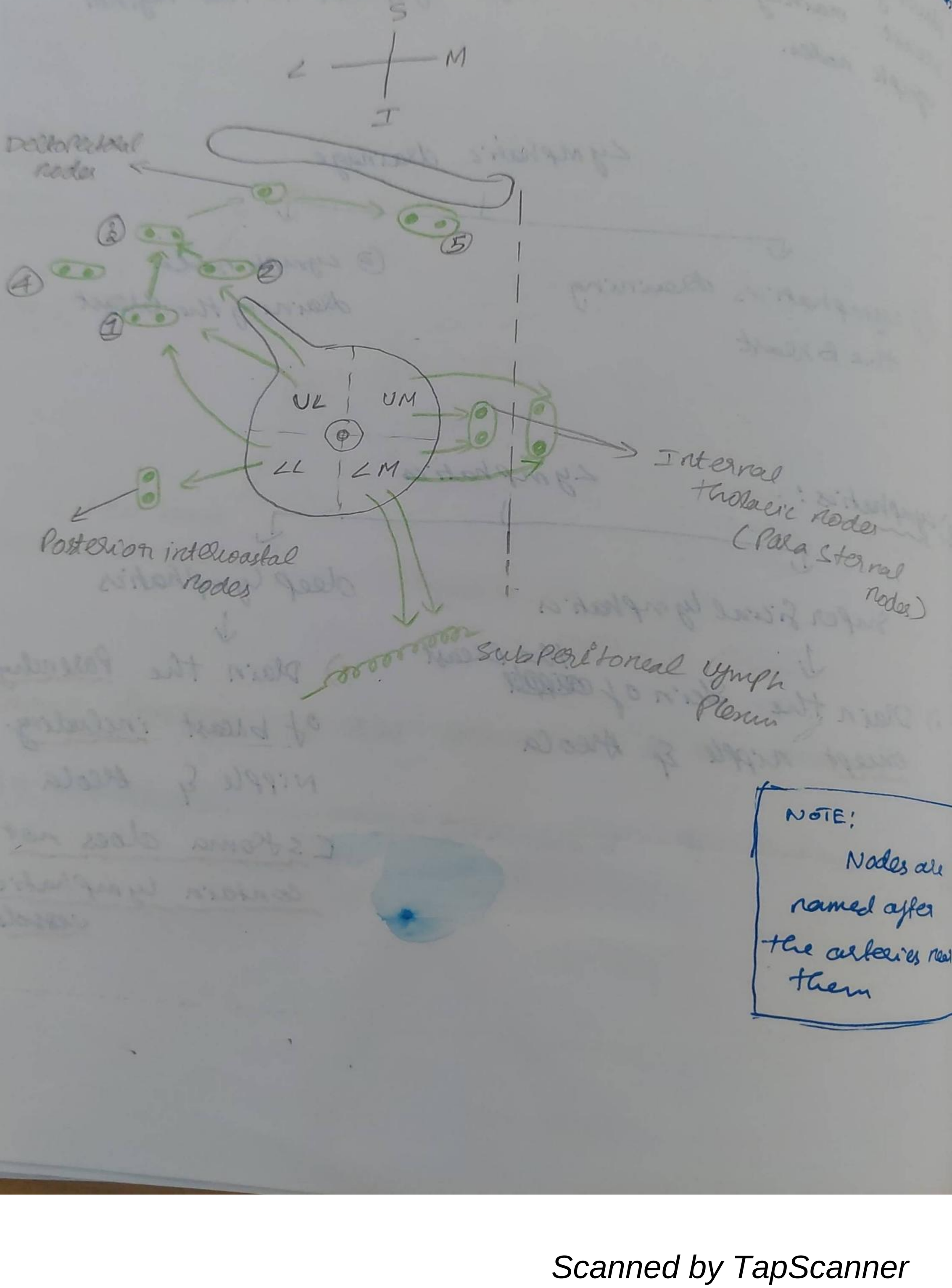
deep lymphatics

↓

•) Drain the Parenchyma of breast including Nipple & Areola

[Stroma does not contain lymphatic vessels.]

Subareolar Plexus of Sappey: Network of lymphatic vessels formed just behind the areola



NOTE:
Nodes are named after the arteries near them

5 groups of Axillary Nodes [Pectoral nodes]

1. → Anterior Axillary nodes
2. → Posterior Axillary nodes
3. → Central Axillary nodes
4. → Apical (infra clavicular) nodes
5. → Lateral axillary nodes

Posterior Apical

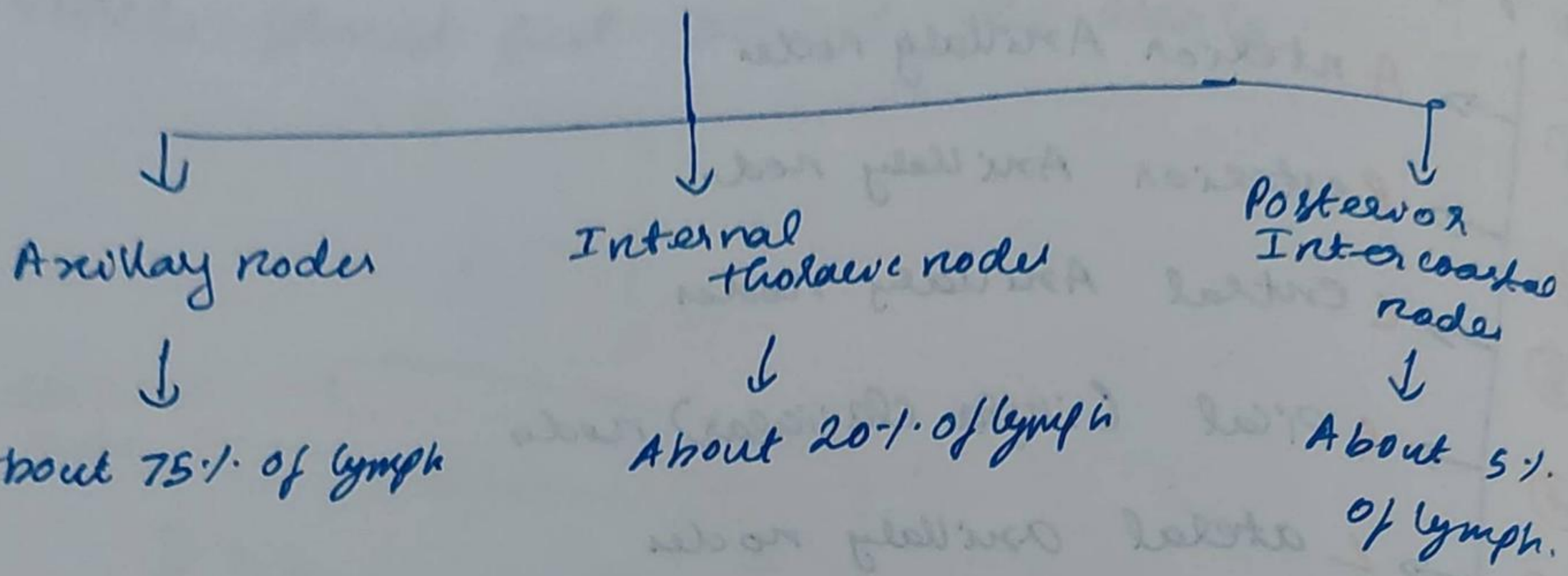
A P X C A L → Lateral

Anterior Central

Lymph flow

- → UL & LL Quadrant → Drain into Axillary nodes (mainly Anterior/ Pectoral Axillary nodes)
- → LL Quadrant → Also drains into Posterior Intercostal nodes
- → UM & LM Quadrant → Drains into internal thoracic nodes
- → LM Quadrant → also drains into subperitoneal plexus

(2) Lymph nodes draining the Breast



APPLIED ANATOMY :

a) CARCINOMA OF BREAST :

- a) most common Cancer in females
- a) more common after 40 years
- a) most commonly ~~affects~~ affects UL Quadrant of Breast
- a) Present as hard, Painless swelling
- a) Breast becomes immobile & fixed due to 'obliteration of Retromamary space.
- a) mainly spreads to the axillary nodes
- a) Peau d orange appearance, due to blockage of superficial lymphatics by tumour cells, Affected Skin of Breast resembles the skin of Orange.

a) Krukenbergs tumour : Lymph vessels from the IM Quadrant of Breast communicate with subPCA isoneal Lymph Plexus and carry cancer cells to it, From here Cancer cells migrate transcoelomically and deposit on the ovary producing a Secondary tumour in ovary called Krukenberg's tumour.

SHOULDER JOINT [GLENO HUMERAL JOINT]

[1 Essay, 2(5 marks)]
→ Rotator cuff
→ movement of Shoulder Joint

SYNOPSIS

- Type
- Articular surface
- Ligaments
- Relations
- movements & muscle Producing movenets
- Applied

TYPE OF JOINT:

- Ball and socket type of Synovial Joint
- Multiaxial Joint
- most mobile Joint in our Body
- least ~~stab~~ stable Joint
- Most common Joint undergoing dislocation eg recurrent dislocation. (Repeated)

Articular surfaces :-

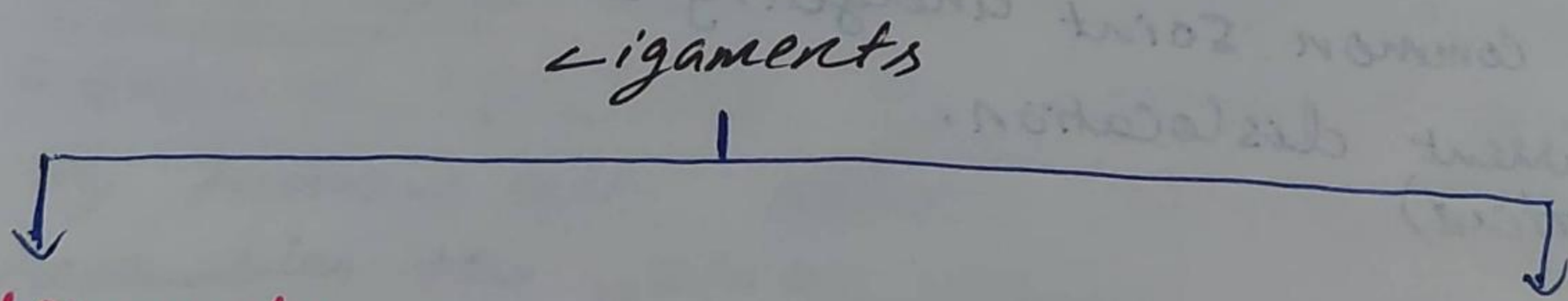
① Glenoid cavity of scapula.

-) small and very shallow.
-) faces cattelally
-) margins of glenoid cavity is enclosed by glenoid labrum.

② Head of humerus

-) Larger & round shaped
-) faces medially
-) only $\frac{1}{3}^{rd}$ of head of humerus comes in contact with glenoid cavity of scapula.

Ligaments :-



Main ligaments

1. Fibrous capsule
2. Glenohumeral ligament
3. Coracohumeral ligament
4. Transverse humeral ligament
5. Glenoid Labrum

Accessory ligaments

1. Coracoacromial ligamen
2. Coracoadomial etch

main Ligaments

1. Fibrous capsule:
   - surrounds the glenoid Labrum of Scapula.
   - surrounds the Anatomical neck of Humerus
   - synovial membrane lines the inner aspect of the fibrous capsule [synovial membrane secrets synovial fluid]

2. Ulnohumeral Ligament:
   - Formed by thickening of fibrous capsule
   - 3 parts → superior, middle, inferior

3. Coracohumeral Ligament:
   - From coracoid Process [CP] of Scapula to upper end of humerus [Greater tubercule]

4. Transverse Humeral Ligament:
   - extends transversely from greater tubercle and lesser tubercle of humerus
   - Bridges the bicipital groove and covers the tendon of Long head of Biceps brachii

5. Glenoid Labrum:

-) made up of fibro cartilage.
-) encloses the margin of glenoid cavity

ACCESSORY LIGAMENTS

1. Coracoacromial ligament:

-) b/w CP and Acromian process [AP] of scapula.
-) Prevents superior dislocation of shoulder joint.

2. Coracoacromial arch:

-) CP, AP, Coracoacromial ligament [CA], all 3 collectively known as coracoacromial arch
-) forms the secondary socket for shoulder jt.

ROTATOR CUFF OF SHOULDER JOINT:

-) a.k.a "MUSCULOTENDINOUS CUFF"

Formation:

-) Formed by tendons of 4 muscles fusing with fibrous capsule of shoulder joint

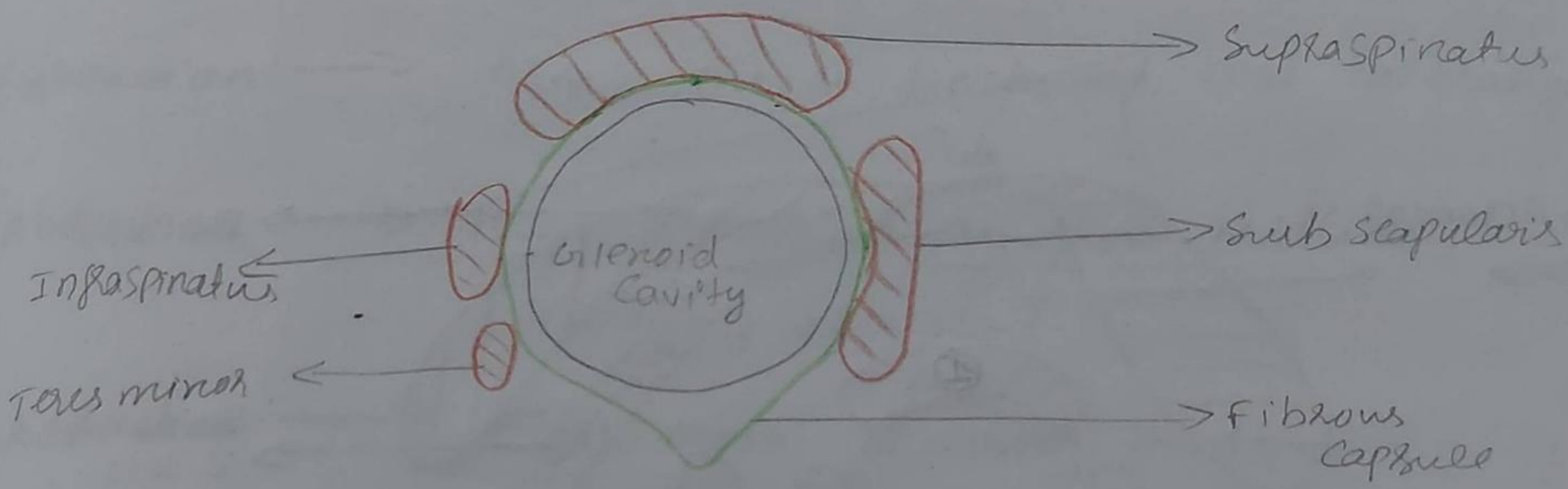
Supra spinatus ⟶ superiorly

Infra spinatus } Posteriorly [PIT]

(small t since minor) teres Minor

Subscapularis ⟶ Anteriorly

Inferiorly the fibrous capsule is lax/loose



Clinical importance :

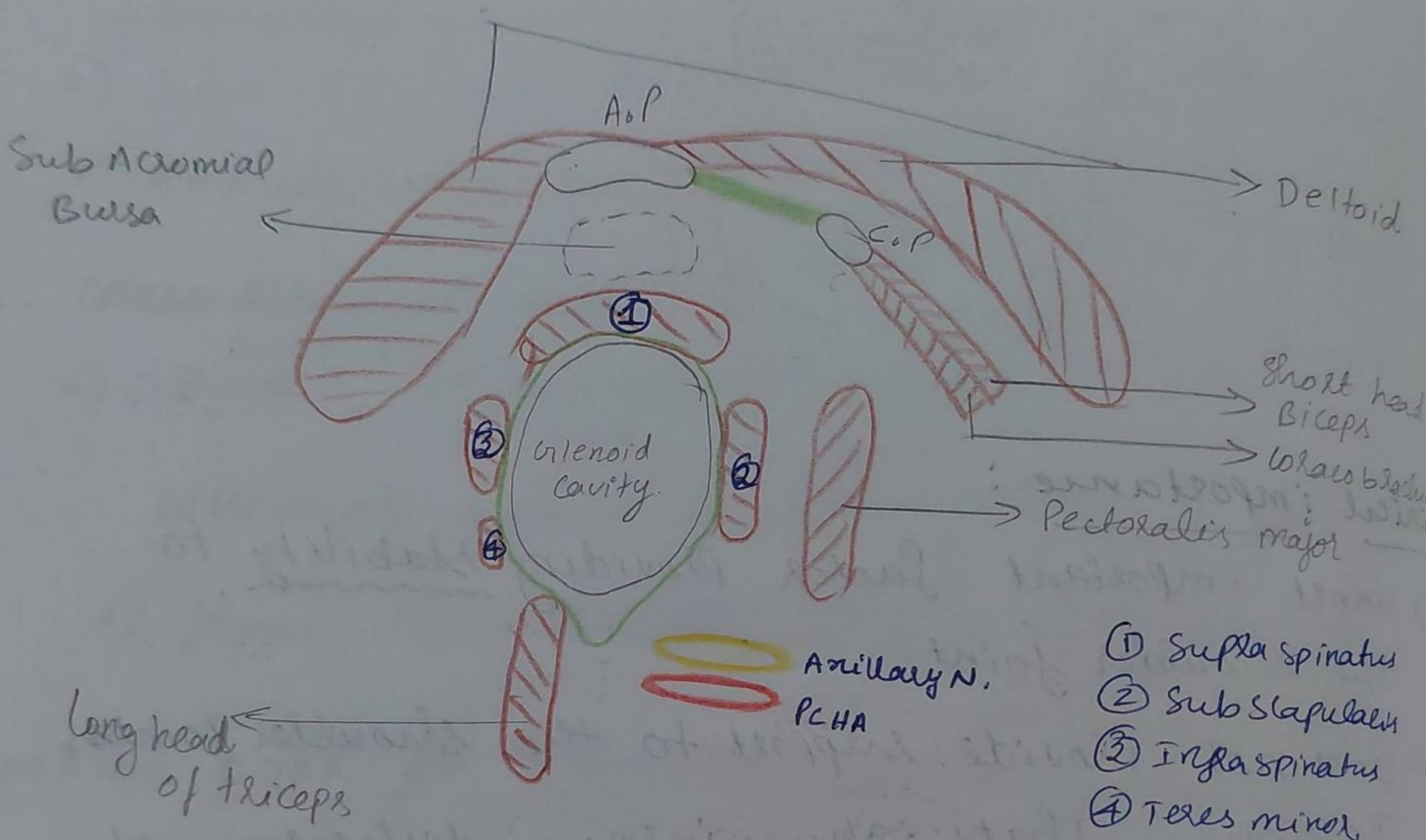
- Most important factor providing stability to the shoulder joint
- Does not provide support to the shoulder joint Inferiorly. That's why, inferior dislocation of shoulder joint is very common.

Applied :

- Most common (M/C) tendon affected in Rotator cuff disorder / lesion ⟶ Supraspinatus rupture ⟶ Difficulty in initiation of Abduction (0-15°)

•) All the rotator cuff muscles are rotators [either Cattoally or medially] except → Supraspinatus

RELATIONS :



Anterior : Subscapularis, Pectoralis major, Coraco brachialis, short head of Biceps, deltoid (anterior fibres)

Posterior : Infraspinatus, Teres minor, Deltoid [Post. fibres]

Superior : Supraspinatus, acromion Process, Subacromial Bursa

Inferior : Long head of Triceps, Axillary N., PCHA

MOVEMENTS : [5 Marks]

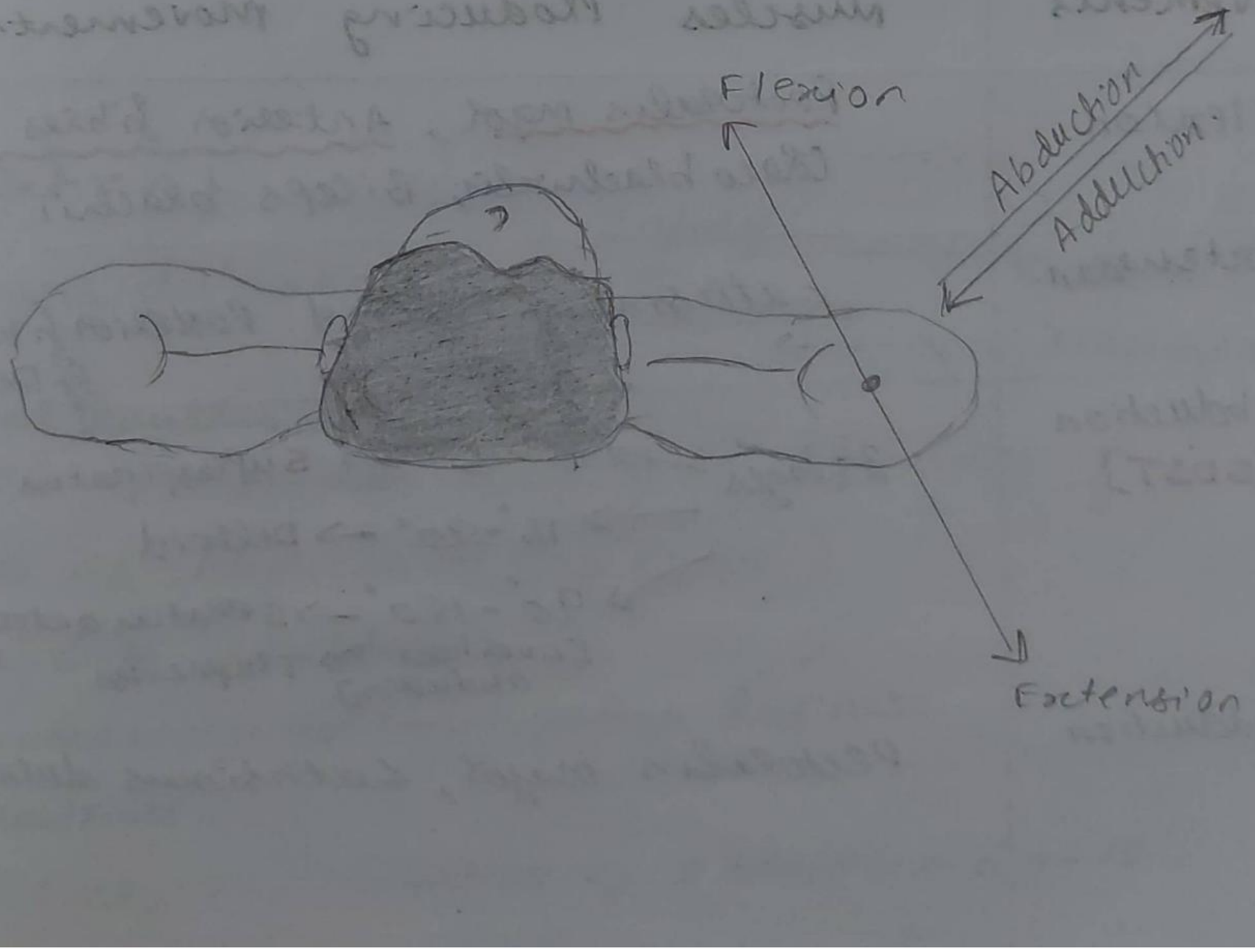
- Ball and Socket, multiaxial
- most mobile, least stable, M/c to undergo Dislocation and recurrent dislocation

Flexion ⟶ Arm moves forward and medially

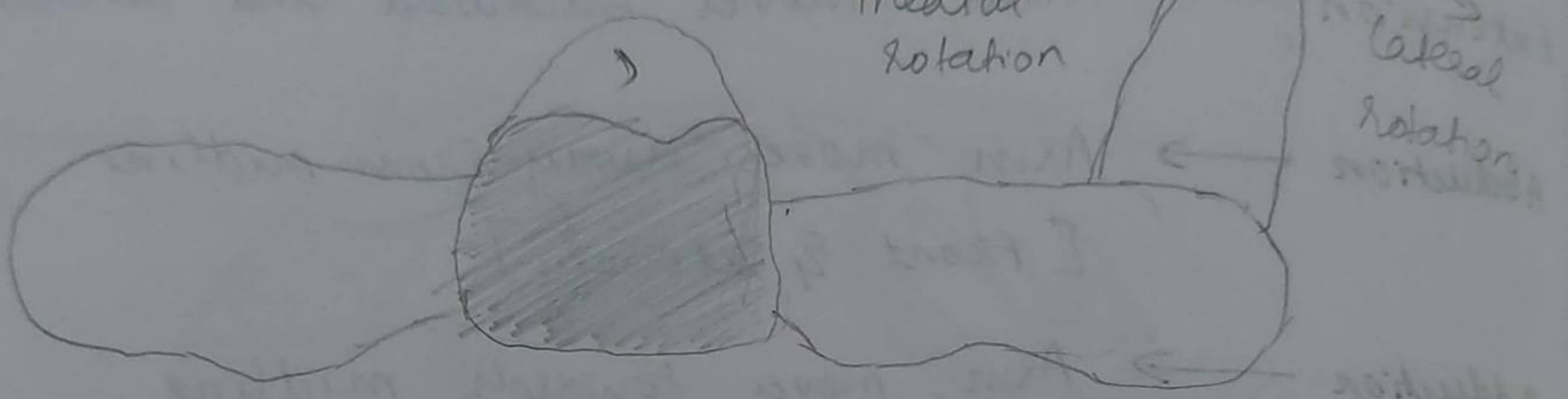
Extension ⟶ Arm moves backward and laterally.

Abduction ⟶ Arm moves away from midline [Front & Laterally]

Adduction ⟶ Arm moves towards midline [backward & medially]



When the elbow is semiflexed
- Hand moves medially → medial rotation
- Hand moves laterally → lateral rotation



Movements	Muscles Producing movements
1. Flexion	Pectoralis major, Anterior fibres of Deltoid, Coraco brachialis, Biceps brachii
2. Extension	Latissimus dorsi & Posterior fibres of Deltoid
3. Abduction [SDST]	2 stages → 0-15° → Supraspinatus → 15°-90° → Deltoid → 90°-180° → Serratus anterior [overhead abduction] → Trapezius
4. Adduction	Pectoralis major, Latissimus dorsi

5. Medial Rotation	Subscapularis (★)
6. Lateral Rotation	Posterior fibres of deltoid, Infraspinatus, Teres minor.

Abduction -> combination of atb movements

SCAPULO HUMERAL RHYTHYM

- During abduction of Shoulder Joint, Scapula and humerus move in a ratio of 1:2

→ For eg: During every 15° Abduction,
2° movement → occurs at Scapula
10° movement → occurs at Humerus

APPLIED:

① Dislocation:

- Inferior dislocation → Injury to Axillary N. → Paralysis of Deltoid & Teres minor.

Clinical features:
- Loss of Rounded contour of shoulder.
- Loss of Abduction (15° to 90°)

② Rotator cuff disorders:
- M/C muscle → supraspinatus rupture

Clinical features:
- Difficulty in initiation of Abduction (0-15°)

③ Frozen shoulder:

•) Limitation of all the movements of shoulder due to shrinkage of fibrous cartilage

④ Painfull arc syndrome:

•) Pain will be there during middle of Abduction of shoulder Joint [60°-90°] due to inflamation of Subacromial bursa.

FRONT OF ARM [FLEXOR COMPARTMENT OF ARM]

3 Muscles:

•) Biceps Brachii
•) Brachialis
•) Coracobrachialis

} Supplied by Musculocutaneous N.

Nerve of front of Arm: Musculocutaneous N.

Biceps Brachii

Origin:

1) Long head: From Supra glenoid tubercle of Scapula
   → [intracapsular origin]
2) Short head: From coracoid Process along with Coracobrachialis.

Insertion:

1) Biceps brachii tendon gets inserted into Radial tuberosity
2) Forms an expansion → Bicipital aponeurosis

Nerve supply: Musculocutaneous nerve

Action:

1) Main supinator muscle of forearm
2) Flexion of both shoulder & elbow joint

Clinical:

1) Biceps Jerk (reflex)

Tapping over the biceps tendon → Flexion of elbow
↓
Musculocutaneous N. is intact.

o) Root value of Biceps jerk [NOT MUSCULOCUTANEOUS NERVE]
it is C_5, C_6

BRACHIALIS [Hybrid / composite muscle]
→ single muscle supplied by more than 1 nerve

ORIGIN: From lower part of shaft of humerus

INSERTION: ~~All into middle of medial border of~~
into coronoid Process of ulna & ulnar tuberosity

Nerve supply: Musculocutaneous N. & Radial N.

Action: Main muscle causing flexion of elbow joint

CORACOBRACHIALIS

ORIGIN: From coracoid Process of Scapula along with short head of biceps

INSERTION: Into middle of medial border of shaft of humerus

NERVE SUPPLY: Musculocutaneous N. [Pierces Coracobrachialis muscle]

ACTION: Flexion of shoulder joint.

PECULIAR FEATURES:

1) Pierced by Musculo Cutaneous nerve
2) Cannot act on Elbow joint
3) Ligament of Struthers:
   a) Represents 2nd head of coracobrachialis muscle
   b) If Present, may cause Compression of Median N. (*) and Brachial A.

In most species, the coracobrachialis muscle has 2 Heads, Longus [1st head], Medius [2nd head], brevis [3rd head]. In HUMANS, the longus & medius fuse to form coracobrachialis muscle. 2nd head occurs rather rarely as Ligament of Struthers (coracobrachialis brevis)

1) Not involved in Erbs Palsy [since coracobrachialis is supplied by C_7 Post of musculocutaneous N.

Erbs Palsy → affects C_5 & C_6

BACK OF ARM [EXTENSOR COMPARTMENT OF ARM]

ONLY MUSCLE : Triceps Brachii

NERVE OF COMPARTMENT : Radial N.

TRICEPS BRACHII

- Triceps Brachii → Long head
  → Lateral head
  → Medial head.

ORIGIN : Long head → Arises from Infra Glenoid tubercle of Scapula

Medial head → Arise from Posterior aspect of Shaft of humerus [below radial groove]

Lateral head → Arise from the Posterior aspect of Shaft of humerus [above radial groove]

INSERTION : Into the Olecranon Process of ulna [All 3 heads unite to form triceps tendon]

NERVE SUPPLY : Radial N.

ACTION: Extension of elbow joint
[does not act on shoulder joint, since it inserts only into inferior glenoid tubercule]

ELBOW JOINT

TYPE:
- Hinge type of Synovial Joint
- uniaxial Joint.

ARTICULAR SURFACES:
[3]

- Lower end of humerus → Trochlea & Capitulum. (1)
- Upper end of → Radius → Head of Radius (1)
  → Ulna → Trochlear notch of ulna (1)

LIGAMENTS:
[3]

① Fibrous Capsule / Capsular Ligament
② Ulnar (medial) Collateral Ligament } closely associated with ulnar N.
③ Radial / Lateral collateral Ligament

RELATIONS:

•) Anterior: [contents of cubital fossa]

- → Median N.
- → Brachial A.
- → Biceps Brachi tendon
- → superficial branch of radial N.

•) Posterior: Triceps Brachii tendon

MOVEMENTS:

•) Flexion —(3 B's / 2 muscles)→ •) Biceps brachii
•) Brachialis
•) Brachio radialis

•) Extension —(2 muscles)→ •) Triceps [main muscle]
•) Anconeus *

APPLIED:

1. Tennis elbow [Lateral epicondylitis]
2. Golfer's elbow [medial epicondylitis]
3. ~~Sa~~ Student's / Miners elbow ['olecranon bursitis]
4. Pulled elbow. [subluxation of head of radius]
   [nursemaid's elbow]

1) Inflamation of Lateral epicondyle [common extensor Origin]

↓

Lateral epicondylitis ⟶ Tennis elbow

2) Inflamation of medial epicondyle [common flexor Origin]

↓

medial epicondylitis ⟶ Golfers elbow

3) Inflamation of olecranon Bursa ⟶ olecranon Bursitis

↓

Student's / miners elbow

4) pulled elbow / nursemaid's elbow

↓

a) Subluxation of head of Radius

[Partial dislocation]

a) Head of Radius comes out of Annular Ligament
a) common in below age of 5.

CARRYING ANGLE:

Angle formed by long axis of arm & long axis of forearm.

a) Normal carrying angle in males: 10-15°
a) normal carrying angle in females: >15° [more carrying angle in females so they can lift bucket]

• Fracture of medial epicondyle of humerus } Ulnar N. injury

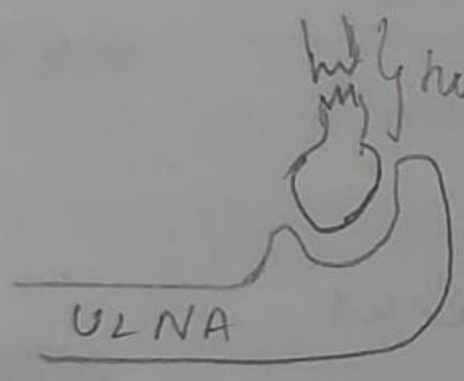
• Supra Condylar fracture of humerus } M/C nerve injured

↓

Median N. [Anterior interosseous nerve]

→ • Brachial artery compression

↳ Volkman's Ischemic contracture



— Supracondylar fracture of humerus

RADIO ULNAR JOINT [5 marks]

RADIOULNAR JOINT [5 marks]

3 TYPES

① Superior (Proximal)	② Medial	③ Inferior (Distal)
• Formed b/w upper ends of the radius & ulna • Pivot type of Synovial Joint	• Formed b/w interosseus borders (of shaft) of Radius & ulna. by interosseus membrane. • Syndesmosis type of fibrous Joint	• Formed b/w lower ends of radius & ulna • Pivot type of Synovial Joint

① → Superior Radioulnar Joint

② → Medial Radioulnar Joint

③ → Inferior Radioulnar Joint

[NOTE: Head of ulna is facing downwards]

	Superior Radioulnar Joint	Inferior Radioulnar Joint
TYPE	Pivot type of Synovial Joint	Pivot type of Synovial Joint
ARTICULAR SURFACES	a) Head of Radius b) Radial notch of ulna	a) Head of ulna b) ulnar notch of Radius
MAIN LIGAMENT [STABILISING FACTOR]	Annular Ligament	Articulating disk [Triangular Ligament]
MOVEMENTS	Supination & Pronation	Supination & Pronation

MIDDLE RADIO ULNAR JOINT:

a) Formed by interosseous membrane

TYPE: syndesmosis type of fibrous Joint

INTEROSSEOUS MEMBRANE:

features:

1) Directed downwards and medially [from radius to ulna]

2) Interosseous membrane, is pierced by Anterior interosseous vessels/artery.

RELATIONS:

Anterior ⟶ Anterior Interosseous vessels & nerve

Posterior ⟶ Posterior Interosseous vesses & nerve

FUNCTIONS:

① Holds the radius & ulna together

② Transmits weight from radius to ulna bone

③ Provides Origin / attachement to muscles.

OBLIQUE CORD ⟶ degenerated part of Flexor Pollicis Longus [FPL] tendon

SUPINATION AND PRONATION [⚹·⚹]

1) Rotational movement of forearm.

SUPINATION:

- Radius & ulna Parallel to each other.
- Palm faces anteriorly

PRONATION:

- Rotation of Radius [lower Part] over Ulna
  [Head of Radius Rotates within the Annular Ligament
- Palm faces Posteriorly.

Axis: Pases from head of Radius (above) to the Styloid Process of ulna (below)

2 Main muscles
- → SUPINATION:
  - Biceps Brachii (-x-) → [when the elbow is flexed]
  - Supinator
- → PRONATION:
  - Pronator teres
  - Pronator Quadratus

Brachioradialis → can cause both supination & Pronation [in mid Prone Position]

MUSCULOCOTANEOUS NERVE

FORMATION :

A branch of Lateral Cord of Brachial Plexus

ROOT VALUE : C_5, C_6, C_7

COORSE :

.) It Pierces the Coracobrachialis muscle in the upper Part of arm.

.) Then it Passes b/w biceps brachii and brachialis muscle

TERMINATION :

.) After crossing the elbow joint, it continues as Lateral cutaneous nerve of forearm.

BRANCHES :

.) nerve of Flexor Compartment [Front of arm]

.) supplies all 3 muscles of Front of arm

- → Biceps brachii
- → Brachialis
- → Coraco brachialis

a) Supplies the Skin of Lateral side of forearm.

APPLIED :

Injury to musculocutaneous nerve is rare.

•) loss of flexion & supination of forearm. [weakening]

•) loss of biceps tendon reflex

•) loss of sensation over the lateral aspect of forearm.

ANATOMICAL EVENTS / ANATOMICAL CHANGES OCCURING AT THE LEVEL OF INSERTION OF CORACOBRACHIALIS. [MIDDLE OF ARM] -X-X-

① Circular shaped shaft of Humerus changes to D^u shaped shaft } Bone

② Median N. crosses the Brachial A. anteriorly from lateral to medial

③ ulnar N. Pierces the medial intermuscular septum and enters Posterior compartment of arm

④ Radial N. Pierces the lateral intermuscular septum & enters anterior compartment of arm. } Nerve

⑤ Basilic vein Pierces the deep fascia } Vein

⑥ Nutrient Artery enters the shaft of Humerus } Artery

CUBITAL FOSSA [☆·☆·☆·]

DEFINITION:

Triangular shaped depression in front of elbow

BOUNDARIES: (6)

.) Medial → Pronator teres (lateral borders)
.) Lateral → Brachioradialis (medial borders)
.) Base → Horizontal imaginary line connecting 2 epicondyles of Humerus
.) Apex → meeting point of Pronator teres & Brachioradialis
.) Roof → Skin
superficial fascia [contain Median cubital V.]
deep fascia. [contain Bicipital Aponeurosis]
.) Floor → 2 muscles → Brachialis & Supinator.

CONTENTS [FROM MEDIAL TO LATERAL] :
(4) [MBBS]

1) Median N. : .) Medial most content of cubital fossa
.) Passes b/w 2 heads of Pronator teres muscle

2) Brachial A. : .) Lies just lateral to the median N.
.) at the level of neck of radius
Brachial A. — Divides into → Radial A.
→ Ulnar A.

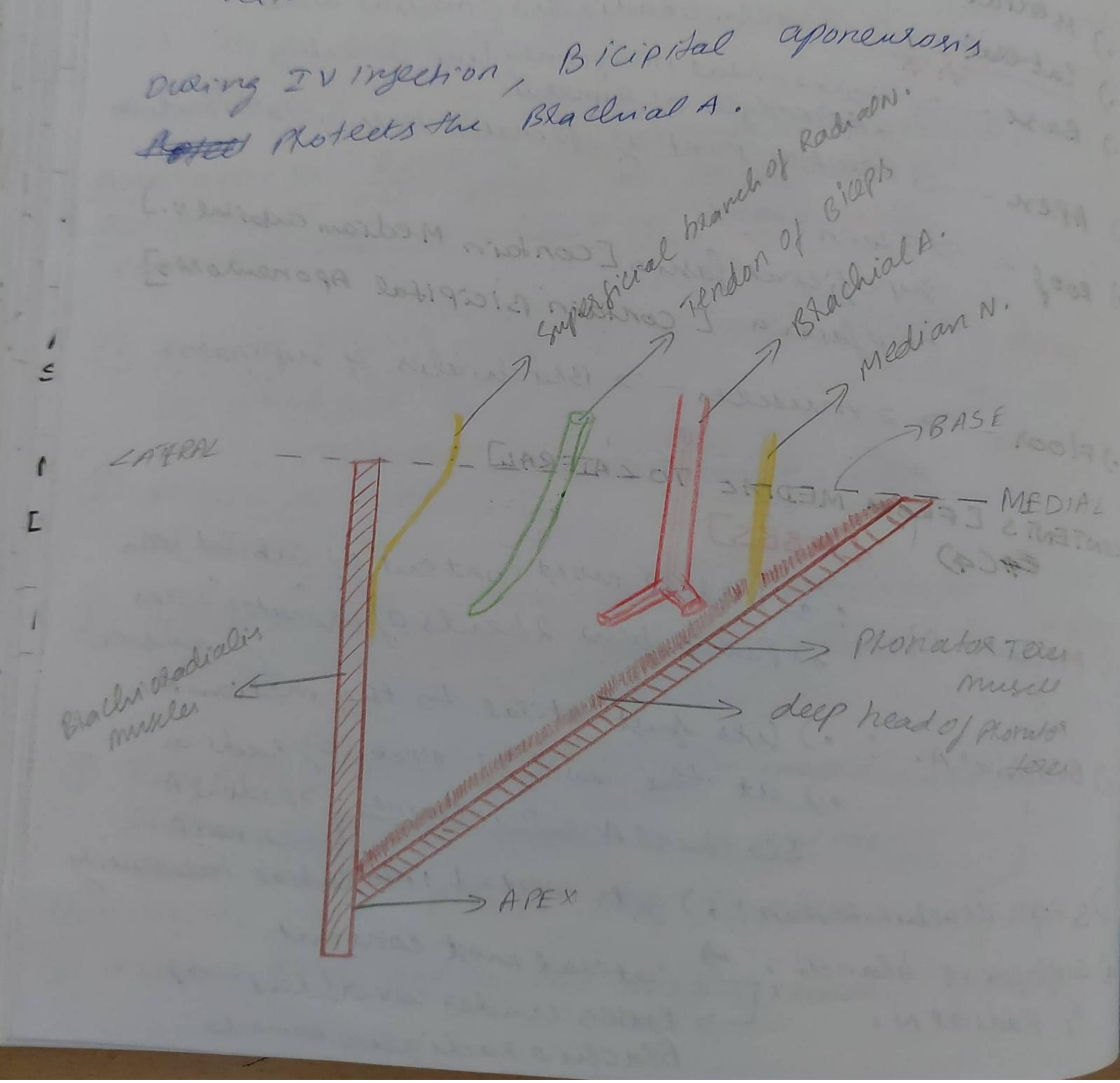
3) Biceps Brachii tendon : .) gets inserted into radial tuberosity

4) Superficial branch of Radial N. : → lateral most content
→ Passes under cover/deep of Brachioradialis muscle

APPLIED :

① Brachial artery → used for recording Blood Pressure
Pulsation

② median cubital vein → M/C vein used for IV (intravenous) injection.
During IV injection, Bicipital aponeurosis protects the Brachial A.



MEDIAN CUBITAL VEIN:

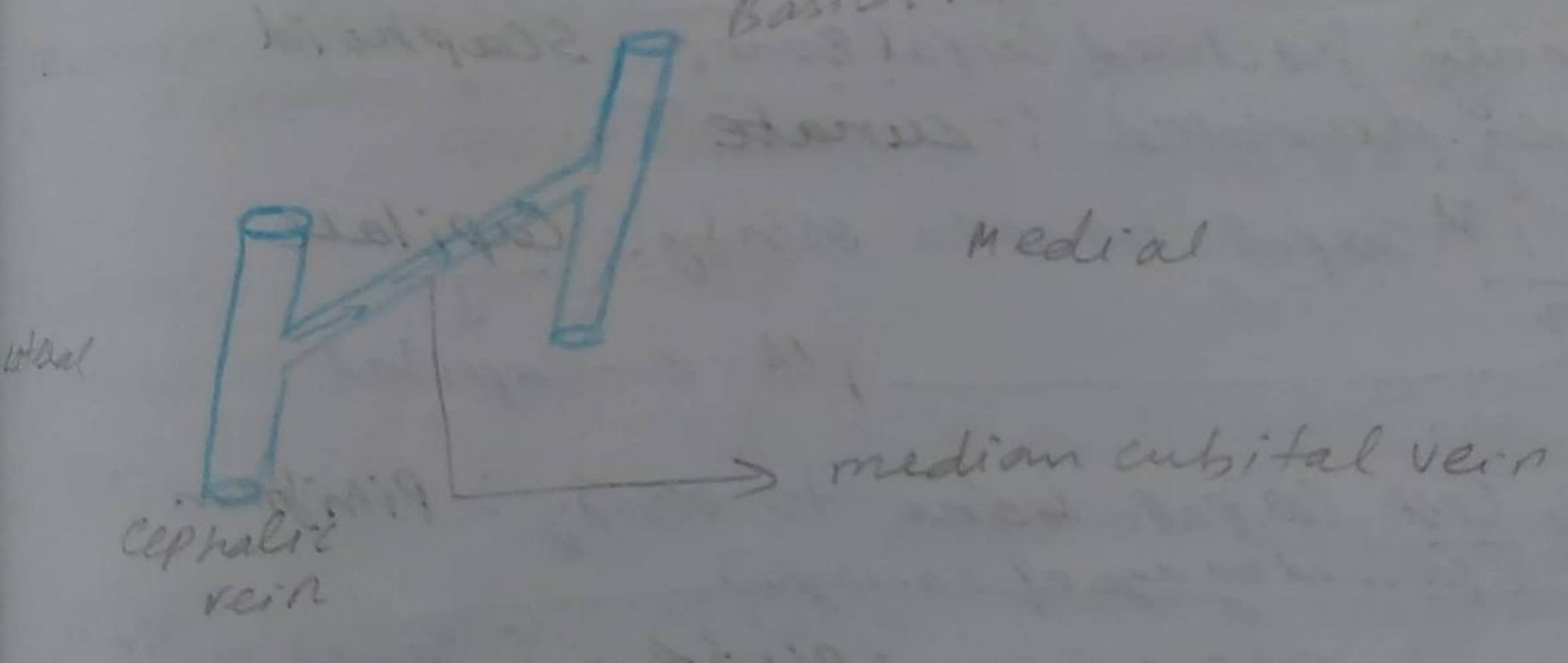
.) Superficial vein located in the root of cubital fossa.

COURSE:

.) arise from cephalic vein
.) run obliquely upward from Lateral to medial
.) drains into Basilic vein

APPLIED:

.) I.V injection
.) Bicipital aponeurosis Provides Protection for Brachial A.



CARPAL BONES (8)

-) Located at wrist
-) arranged in ROWS (lateral to medial

Proximal row
SLUC - Scaphoid (lateral most)
LOOKS - Lunate
TOO - Triquetral
PREETY - Pisiform (medial most)

distal row
TRY - Trapezium (lateral most)
TO - Trapezoid
CATCH - Capitate
HER - Hamate (medial most)

R
S L T P
lateral
medial
T T C H
Proximal row
distal row

1) Most commonly fractured Carpal Bone :- Scaphoid
2) Most commonly dislocated :- Lunate
3) Largest & 1st Carpal bone to ossify :- Capitate
1st ← capital
4) Smallest & last Carpal bone to ossify : Pisiform
[formed by age of 10-12 yrs]
5) Only Sesamoid Carpal bone : Pisiform [formed within flexor carpi ulnaris (FCU) Tendon]
6) Lunate dislocation → may cause compression of Median N.
Carpal Tunnel Syndrome
7) First bone to ~~start~~ of start ossification → clavicle

FLEXOR RETINACULUM OF HAND / WRIST

[TRANSVERSE CARPAL LIGAMENT]

o) Thick fibrous band located in front of wrist

FORMATION: By thickening / modification of deep fascia.

~~FORM~~

ATTACHEMENTS:

o) Medially → Pisiform & Hook of hamate

o) Laterally → Scaphoid (Tubercle of Scaphoid) & Trapezium (Crest of Trapezium)

RELATIONS:

STRUCTURES PASSING SUPERFICIAL TO FLEXOR RETINACULUM

1. Ulnar N.
2. Ulnar A.
3. Palmaris Longus tendon
4. Palmar cutaneous branch of ulnar N.
5. Palmar cutaneous branch of median N
6. Superficial palmar branch of Radial Artery

STRUCTURES PASSING DEEP TO THE FLEXOR RETINACULUM

[STRUCTURES PASSING THROUGH THE TUNNEL]

9 Flexor Tendons
- → 4 tendon of FDS (Flexor digitorum superficialis)
- → 4 tendon of FDP (Flexor digitorum Profundus)
- → 1 tendon of FPL (Flexor pollicis Longus)

1 nerve → Median N.

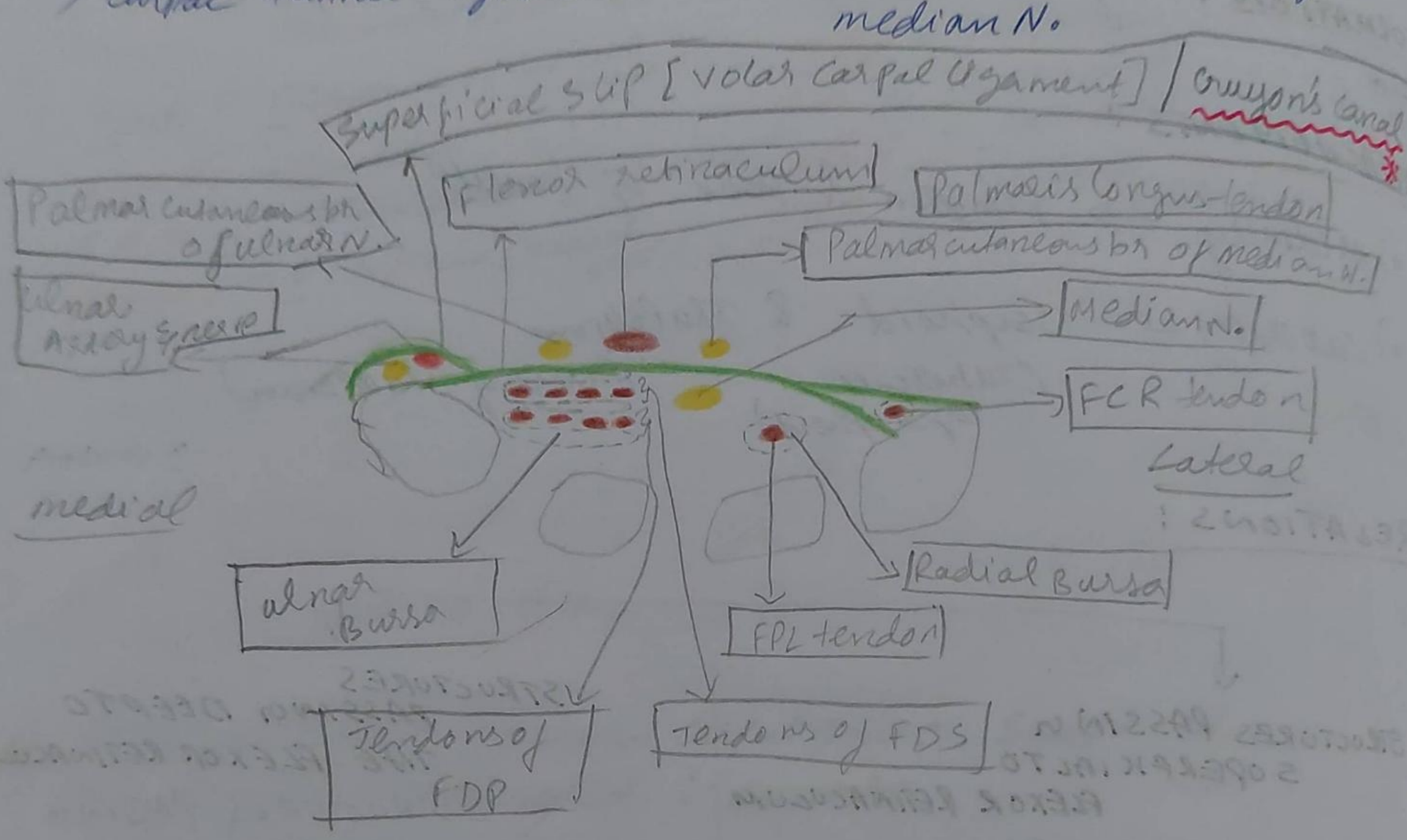
2 Bursae
- → Radial Bursae → Encloses tendon of FPL (1)
- → Ulnar Bursae → Encloses tendons of FDS(4), FDP(4)

FUNCTION:

a) TO hold the flexor tendon in Position

APPLIED:

•) Carpal tunnel Syndrome → due to compression of median N.



a) FCR tendon → Passes b/w the 2 slips of Flexor retinaculum.

a) Radial Bursa not related to FC radialis
a) ulnar Bursa not related to FC ulnaris

a) Carpal tunnel Syndrome [CTC]: diagnostic test → Tinnel's sign, Phalen test } Both +ve in CTC

CARPAL TUNNEL SYNDROME [CTS]

1) It is a clinical condition of Compression of MEDIAN NERVE deep to the flexor retinaculum

CONDITIONS CAUSING CTS :

① Tenosynovitis - inflamation of the synovial sheath of flexor tendons

② Myxedema [hypothyroidism]

③ Dislocation of lunate bone

④ osteoarthritis

Hypothyroidism
↓
Thyroxine ↓
↓
~~BSA~~ BMR ↓ (Basal metabolic rate)
↓
↑ in accumulation of fibrofatty tissue in carpal tunnel
↓
Compression of median N.
↓
CTS

CLINICAL FEATURES :

① ATROPHY / weakness / wasting of thenar muscles

② severe pain on Palmar aspect of Lateral 3½ fingers

③ Pain will be severe at night

④ APE thumb deformity may occur, if not treated.

⑤④ If not treated, APE thumb deformity may occur.

TREATMENT :

a) Decompression of median N., done by surgical incision (~~cutting~~ cutting) of Flexor Retinaculum.

b) PHALENS TEST } +ve in CTS
TINELS SIGN }

PALMAR APONEUROSIS

FORMATION:

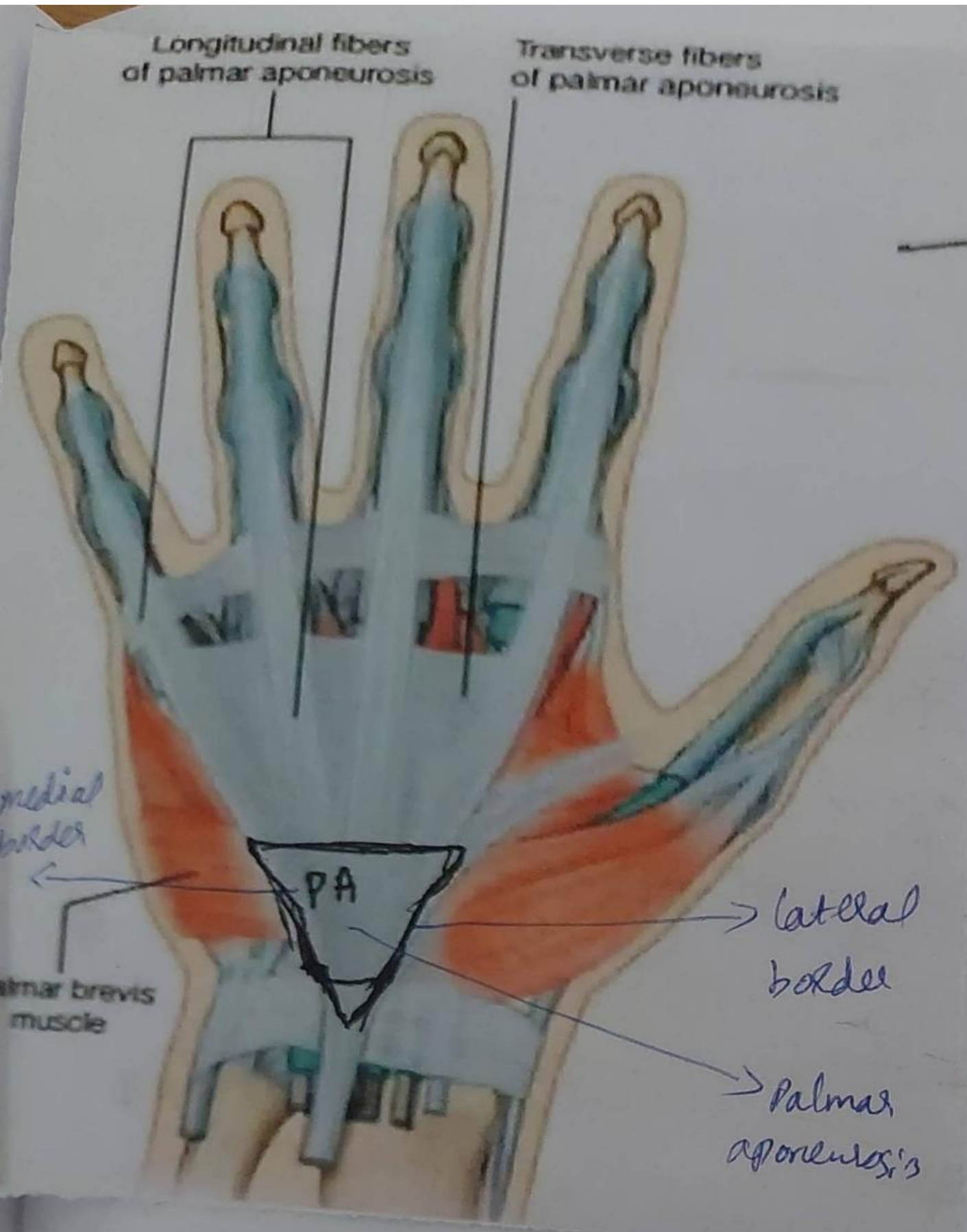
- Formed by thickening of deep fascia of the Palm
- Continuation of Palmaris Longus tendon

FEATURES:

- Triangular in shape → Apex → directed Proximally
  → Base → directed distally
- Base of Palmar aponeurosis → divides into 4 slips → enters into medial 4 fingers.
- Has 2 borders → medial border.
  → Lateral border

FUNCTIONS:

- Provides Protection to the vessels & nerves of Palm.
- Improves the grip of hand.



APPLIED:

DUPUYTREN'S CONTRACTURE:

- Due to inflamation of Palmar aponeurosis (medial side), leads to flexion deformity of finger.
- Most common finger affected - Ring finger

BRACHIORADIALIS

o) muscle of extensor compartment of forearm (back)

o) located on cateral side of forearm.

ORIGIN: From cateral supracondylar ridge of humerus bone

INSERTION: moves almost vertically downwards & gets inserted into the styloid Proces of radius

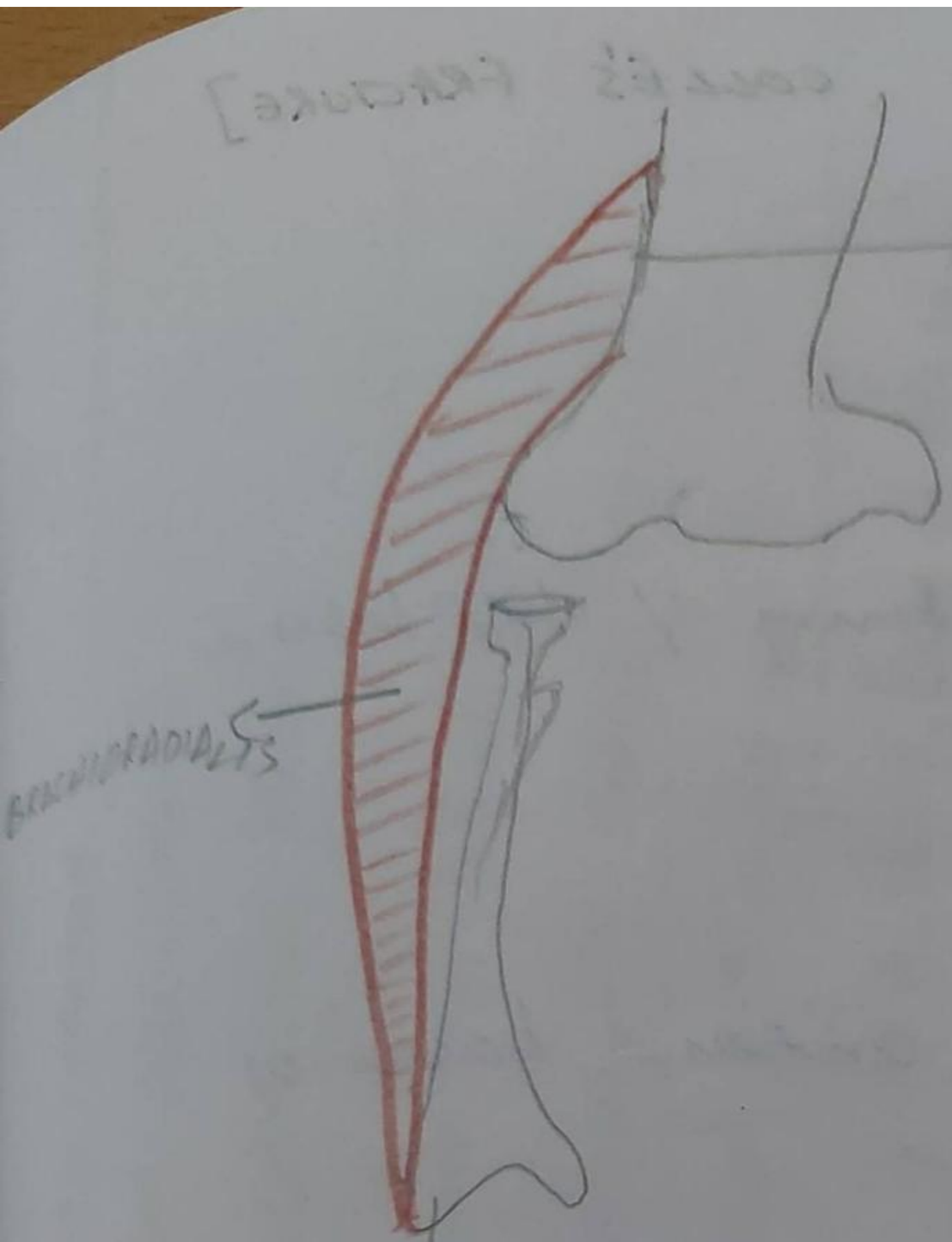
NERVE SUPPLY: Radial N. (supplies both flexor & extensor muscles)

ACTION:

o) CAUSE FLEXION of elbow joint [Although it belongs to extensor compartment of forearm]

o) Forms cateral ~~boundary~~ boundary of cubital fossa

DIAGRAM:

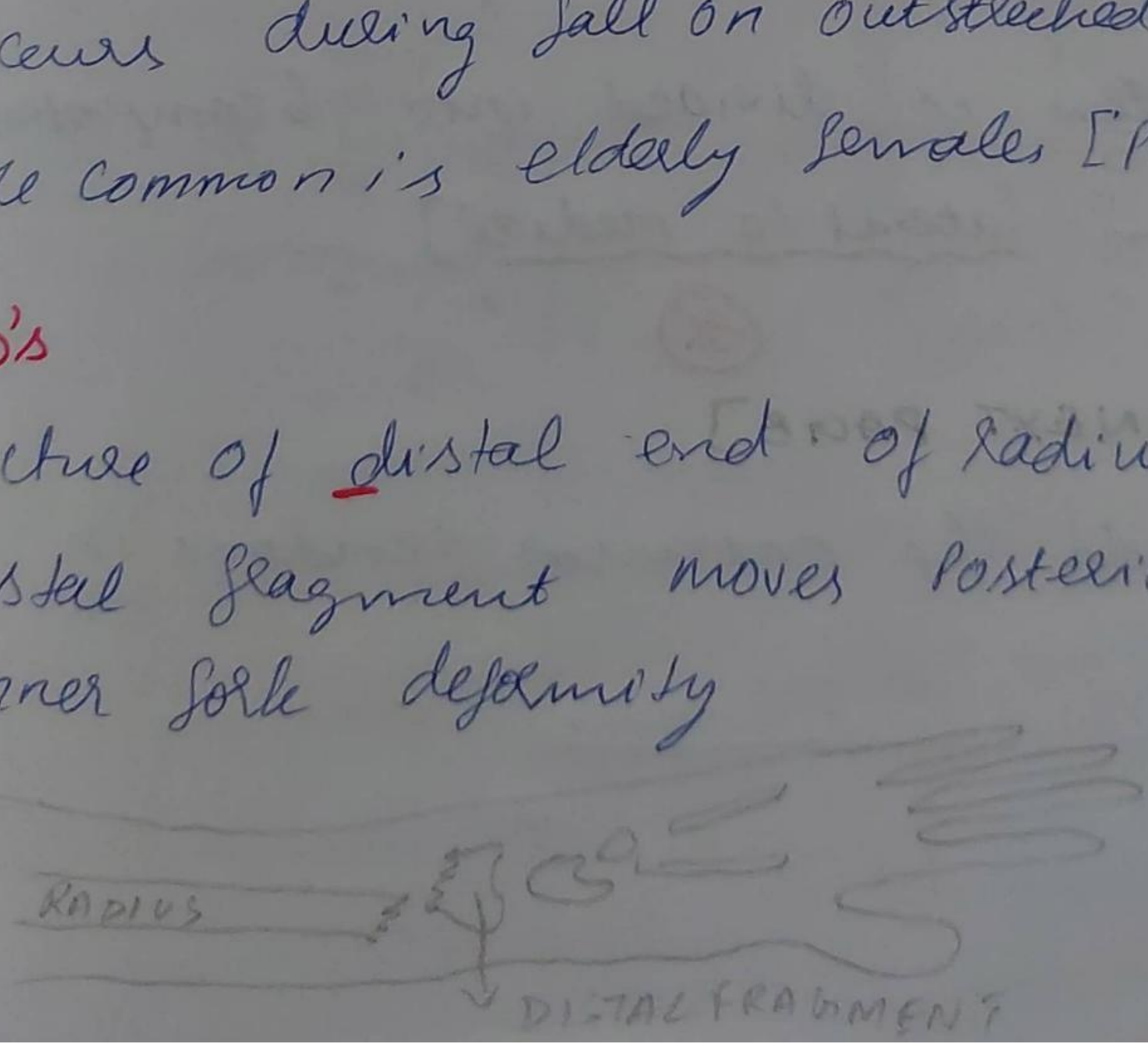


COLLE'S FRACTURE

- Occurs during fall on outstretched hand
- more common is elderly females [Post menopausal osteoporosis]

3D's

1. Fracture of distal end of radius.
2. Distal fragment moves posteriorly (Dorsally)
3. Dinner fork deformity



SMITH'S FRACTURE [REVERSE OF COLLE'S FRACTURE]

-x-

•) Distal fragment displaced

EXTENSOR RETINACULUM

FORMATION: Formed by the thickening of deep fascia at the back of wrist.

ATTACHMENT:

•) Lateral → Lower end of anterior border of radius

•) medial → Triquetral and Pisiform bone

STRUCTURES PASSING THROUGH VARIOUS COMPARTMENTS OF EXTENSOR RETINACULUM

•) extensor retinaculum is divided into 6 compartments [numbered from lateral to medial]

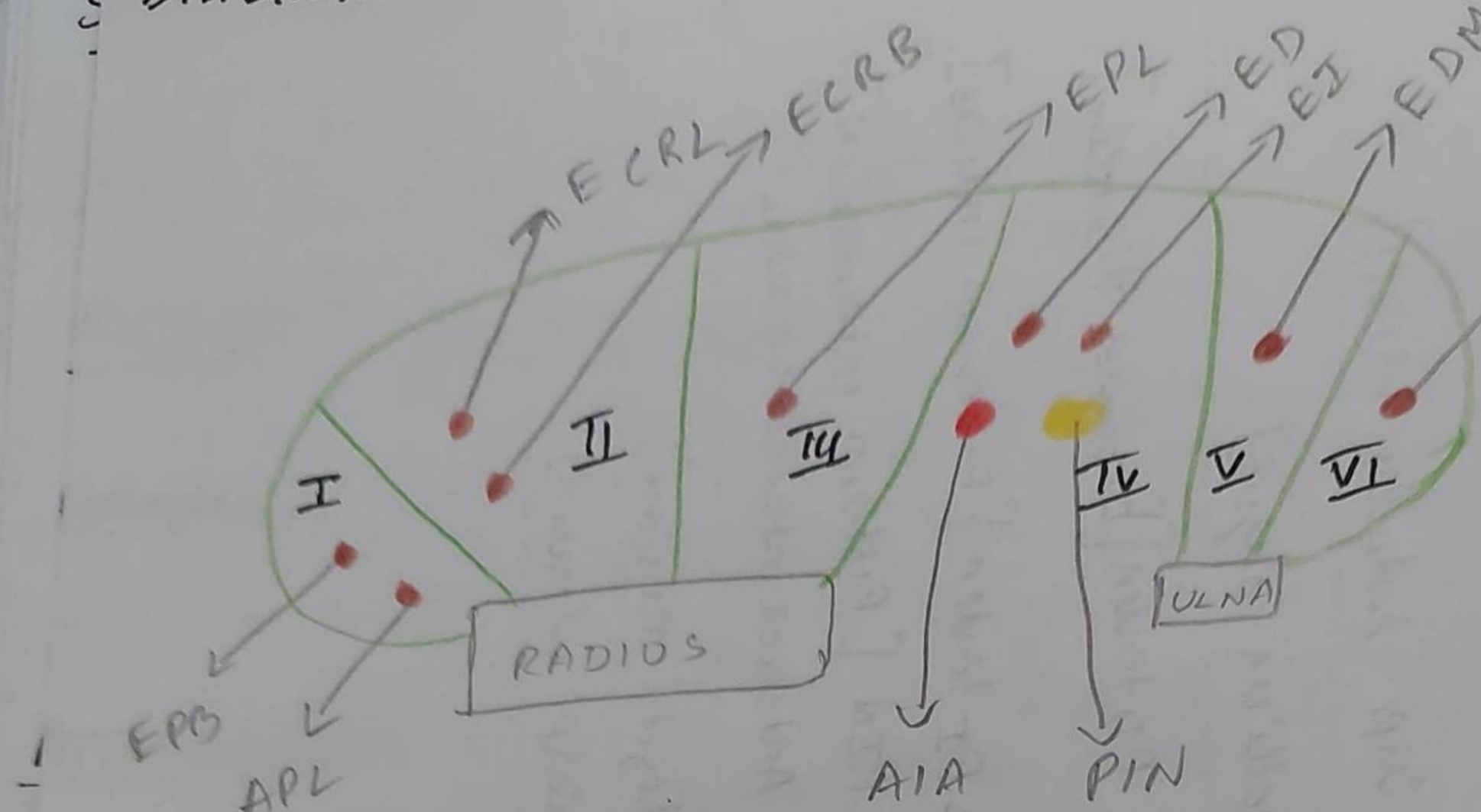
-x-

TABLE: [REFER NEXT PAGE]

FUNCTION: To hold the extensor tendons in position

COMPARTMENTS	STRUCTURES PASSING THROUGH
I	•) APL tendon [Abductor Pollicis Longus] •) EPB tendon [Extensor Pollicis brevis]
II	•) ECRL tendon [extensor Carpi Radialis Longus] •) ECRB tendon [extensor Carpi Radialis brevis]
III	•) EPL tendon [Extensor pollicis Longus]
IV [⁂]	4 Structures → 2 tendon → ED tendon [Extensor digitorum] → EI tendon [Extensor indicis] → 1 nerve → PIN [Posterior interosseous N.] → 1 artery → Anterior interosseous artery
V	•) EDM tendon [Extensor digiti minimi]
VI	•) ECU tendon [Extensor Carpi ulnaris]

DIAGRAM :



ANATOMICAL SNUFF BOX

•) Triangle shaped depression on the lateral aspect of wrist, when the thumb is extended

BOUNDARIES :

•) Antero lateral boundary :
- •) APL tendon [Abductor Pollicis longus]
- •) EPB tendon [Extensor Pollicis brevis]

•) Postero medial boundary : •) EPL tendon [Extensor Pollicis longus]

•) Roof :
- •) Skin
- •) Superficial fascia — contains → cephalic V. (X)
- •) Deep fascia → superficial branch of radial N. (X)

1) FLOOR : Scaphoid & Trapezium.

CONTENT :

a) RADIAL ARTERY (only content)

APPLIED :

a) Radical A. Pulsation Can be Palpated

b) Cephalic V. Can be used for I.V injection.

Most common site of Radial A. Palpation

↓

Anterior surface of Lower end of Radius (Just Lateral to FCR tendon)

WRIST JOINT [RADIOCARPAL JOINT]

ULNA does not take part in wrist Joint

TYPE :

a) ellipsoid type of Synovial joint

b) Biaxial Joint.

ARTICULAR SURFACES

1. Lower end of Radius
2. Scaphoid, Lunate
3. Triquetral [Sometimes]

MOVEMENTS OF WRIST JOINT

-) Flexion → -) FCU tendon
  -) FCR tendon
  -) PL tendon [Palmaris Longus]
-) Extension → -) ECU tendon
  -) ECRL tendon
  -) ECRB tendon

-) Adduction [ULNAR deviation] → -) FCU
  -) ECU

-) Abduction [RADIAL deviation] →
  -) FCR
  -) ECRL
  -) ECRB } Radialis tendons
  -) APL
  -) EPB
  -) EPL } Pollicis tendons

1st CMC [CARPO METACARPAL [redacted]] JOINT [-ve]

[CMC 1st of Thumb]

-) most mobile CMC joint

TYPE: Saddle type of Synovial joint.

ARTICULAR SURFACES :

i) Trapezium (Distal Distal Surface)
ii) Base of 1st metacarpal bone.

MOVEMENTS :

i) Adduction of Thumb (Thumb moves towards other fingers) ⟶ a) Adductor Pollicis tendon

ii) Abduction of Thumb (Thumb moves away from other fingers) ⟶ a) APL tendon [Abductor Pollicis Longus]
a) APB tendon [Abductor Pollicis brevis]

i) Extension of Thumb ⟶ a) EPL tendon
a) EPB tendon.

i) Flexion of Thumb ⟶ a) FPL tendon
a) FPB tendon

i) Opposition of Thumb ⟶ a) Opponens Pollicis

INTRINSIC MUSCLES OF HAND [5-8]
[small muscles]

-) origin & insertion confined to the Palm.
-) contains 20 muscles

-)

20 muscles
- 15 muscles → supplied by → Ulnar N. [MUSICIAN'S NERVE]
- 5 muscles → supplied by → Median N.
  - Lateral 2 lumbricals
  - Opponens Pollicis
  - Abductor Pollicis brevis [APB]
  - Flexor Pollicis brevis [FPB]

  (3 Thenar muscles)

Intrinsic muscle
- 5 groups
  - Thenar muscles (4)
  - Hypothenar muscles (4)
  - Lumbricals (4)
  - Interossei muscles (8)
    - Palmar (4)
    - Dorsal (4)

THENAR MUSCLES (4)

1) Opponens Pollicis
2) Abductor Pollicis Brevis } median N.
3) Flexor Pollicis Brevis
4) Adductor Pollicis } ulnar N. ✳

→ Hybrid muscle, since occasionaly deep head supplied by ulnar N. ✳

(related to)
Book test, Foment / Forment test ✳

HYPOTHENAR MUSCLES (4)

1) Opponens digiti minimi
2) ~~Adductor~~ Abductor digiti minimi
3) Flexor digiti minimi
} by ulnar N. [DEEP branch]

4) Palmaris brevis [Superficial muscle] } by ulnar N. [SUPERFICIAL BRANCH] ✳✳✳✳

→ only muscle supplied by superficial branch of ulnar N.

PALMARIS BREVIS :

•) Superficial muscle of the Palm [Hypothenar Region]

ORIGIN: From Palmar aponeurosis & Flexor retinaculum

INSERTION : into the Skin of medial side of Palm.

NERVE SUPPLY : SUPERFICIAL BRANCH OF ULNAR N.

ACTION : Provides grip to the hand.

NOTE : Superficial / Subcutaneous muscles
↓ are called as
"Panniculus carnosus"

•) Palmaris brevis
•) Platysma
•) Dartos muscle of the Scrotum
•) Facial muscles

LUMBRICALS (4)

1) numbered from lateral to medial.
2) lateral 2 lumbricals → by median N.
3) medial 2 lumbricals → by deep br of ulnar N.

INTEROSSEI (8)

- → Dorsal interossei (4)
- → Palmar interossei (4)

} Supplied by deep br of ulnar N.

LUMBRICALS

1) 4 lumbricals numbered from lateral to medial.

ORIGIN: Arise from the 4 tendons of FDP (Flexor digitorum Profundus) ✱

L_1 → from lateral side of FDP tendon of index finger

L_2 → from lateral side of FDP tendon middle finger

L_3 → adjacent sides of FDP tendons of middle & ring finger

L_4 ⟶ adjacent sides of FDP tendon of ring finger & little finger.

•) Lateral 2 lumbrical [1, st & 2nd] ⟶ Unipinnate

•) medial 2 lumbrical ⟶ Bipinnate

[3rd & 4th]

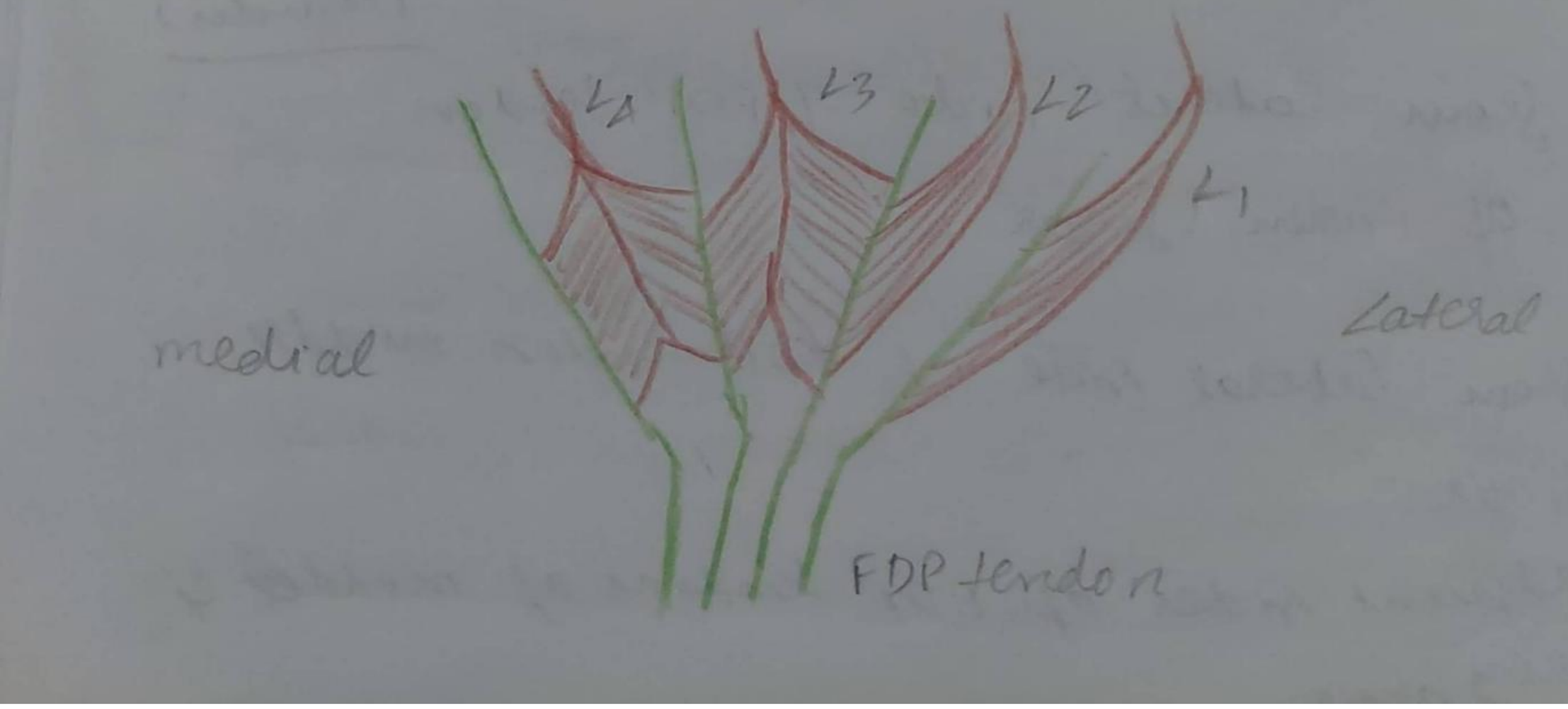
INSERTION: Into DDE (Dorsal digital expansion) of fingers / extensor expansion.

N.S: L_1 & L_2 ⟶ median N.

L_3 & L_4 ⟶ ulnar N.

ACTIONS: •) Flexion of MCP joints

•) Extension of both Proximal & distal IP (inter Phalangyeal) joints



APPLIED !

CLAW HAND a.k.a "Main en griffe"

⇒ due to Palalysis of lumbericals (mainly & interossei muscle

position :

i) MCP Joints → Extension

ii) IP Joints → Flexed.

2 Types

PARTIAL [INCOMPLETE]

[ULNAR CLAW HAND DEFORMITY]

i) due to Paralysis of medial 2 lumbericals.

ii) Only medial 2 fingers undergo clawing.

iii) due to ulnar N. injury [fracture of Medial epicondyle of Humerus]

COMPLETE

i) Due to Paralysis of all 4 lumbericals

ii) All the medial 4 fingers undergo clawing

iii) due to combined injury of median & ulnar nerves

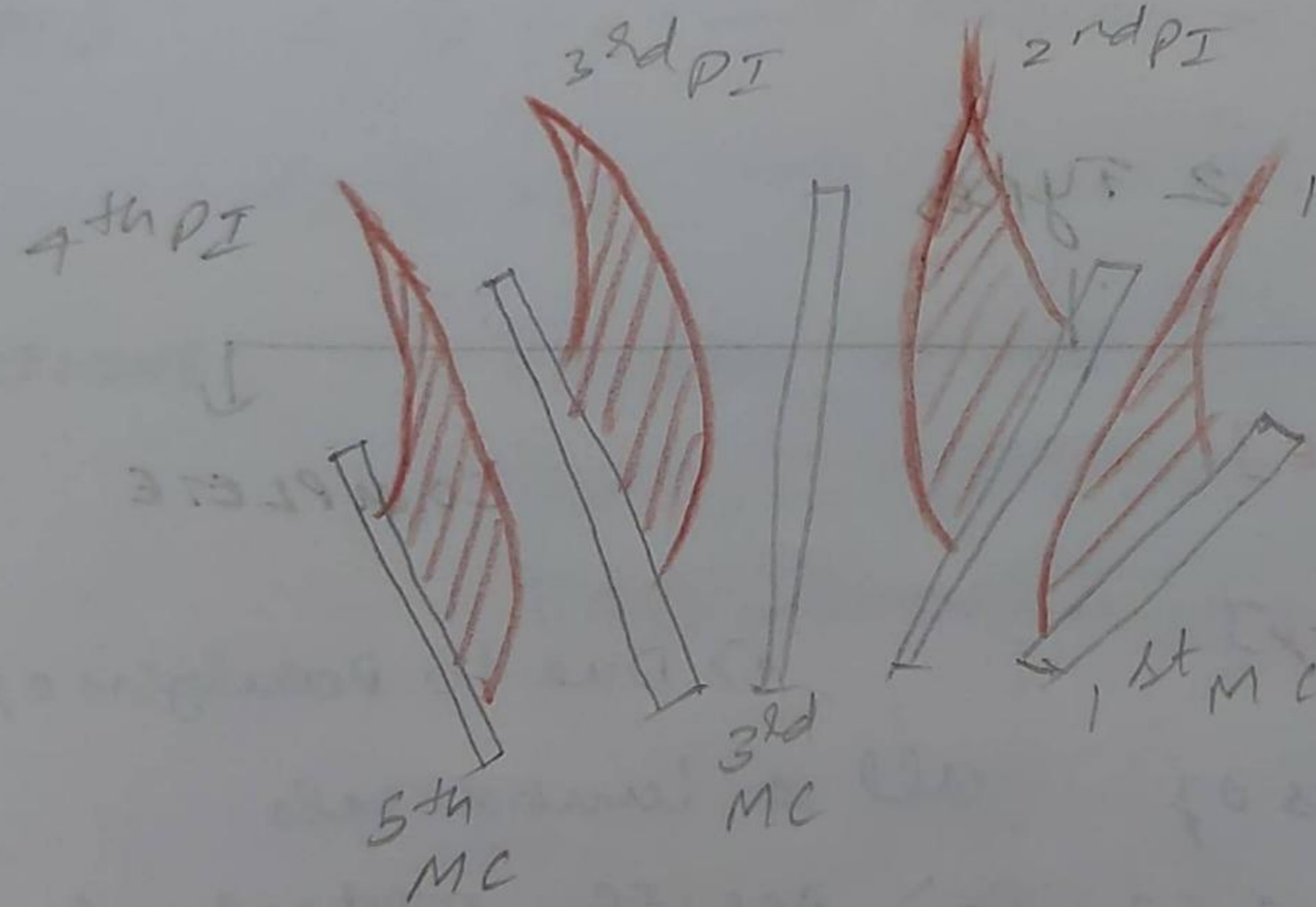
INTEROSSEI MUSCLE [5 mark]

- contains 8 muscles.
- 2 types → Dorsal interossei (4)
  → Palmar interossei (4)

PALMAR INTEROSSEI [4]

- All muscles are unipinnate

Origin: Arise from the metacarpal bones [except 3rd metacarpal Bone]



- 1st PI → from medial side of 1st Metacarpal
- 2nd PI → from medial side of 2nd metacarpal
- 3rd PI → from lateral side of 4th MC
- 4th PI → from lateral sid of 5th MC

INSERTION : into the DDE (dorsal digital expansion) of fingers.

NERVE SUPPLY : Ulnar N. (deep branch)

ACTION : Cause Adduction (fingers movement towards middle finger) of fingers

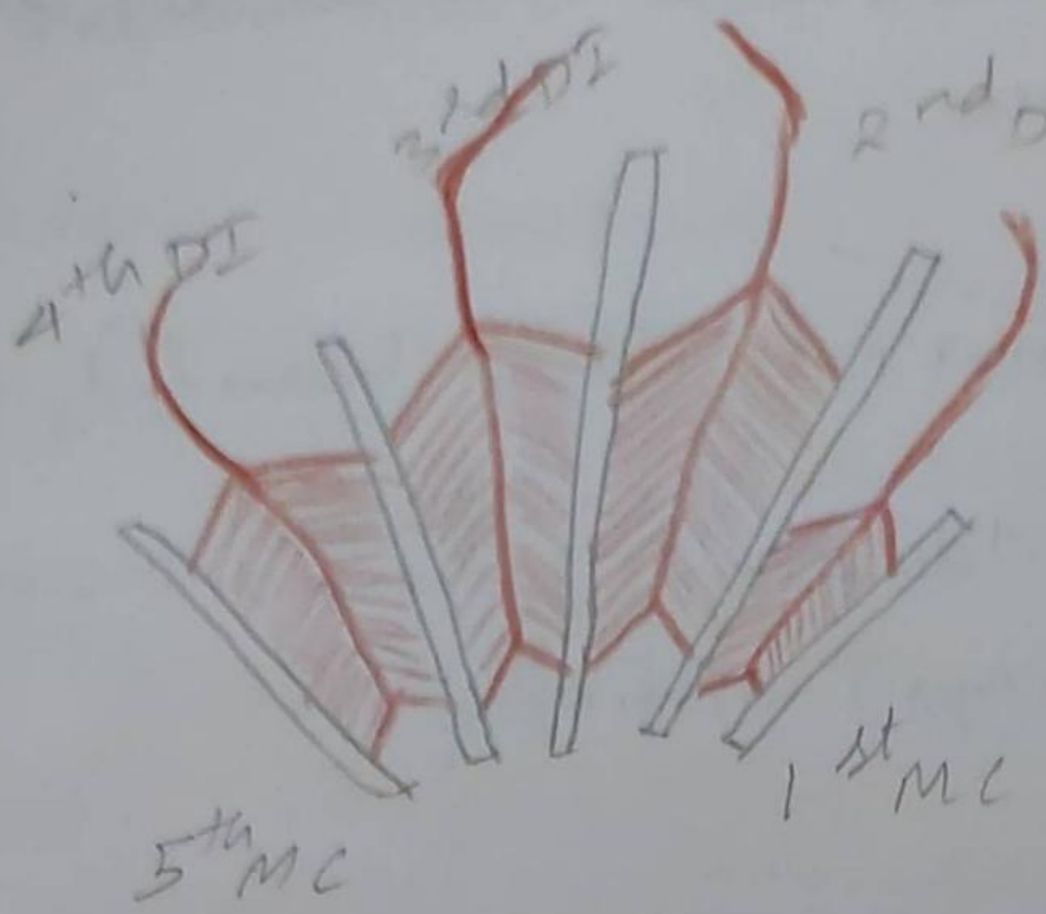
NOTE :

- PAD ⇒ Palmar interossei → Adduction
- DAB ⇒ Dorsal interossei → Abduction
- Palmar interossei not attached to middle finger and does not arise from 3rd MC bone

DORSAL INTEROSSEI [4]

- All muscles are bipinnate

ORIGIN : All 4 DI arise from adjacent sides of all the 5 MC Bones.



INSERTION: into DDE of finger [except Thumb and little finger]

Nerve supply: Ulnar N. (deep branch)

Action: Abduction of fingers

NOTE: DI not attached to Thumb & little finger

CARD TEST: a) TO test Adduction of fingers
b) for testing Palmar interossei
c) Test for ulnar N.

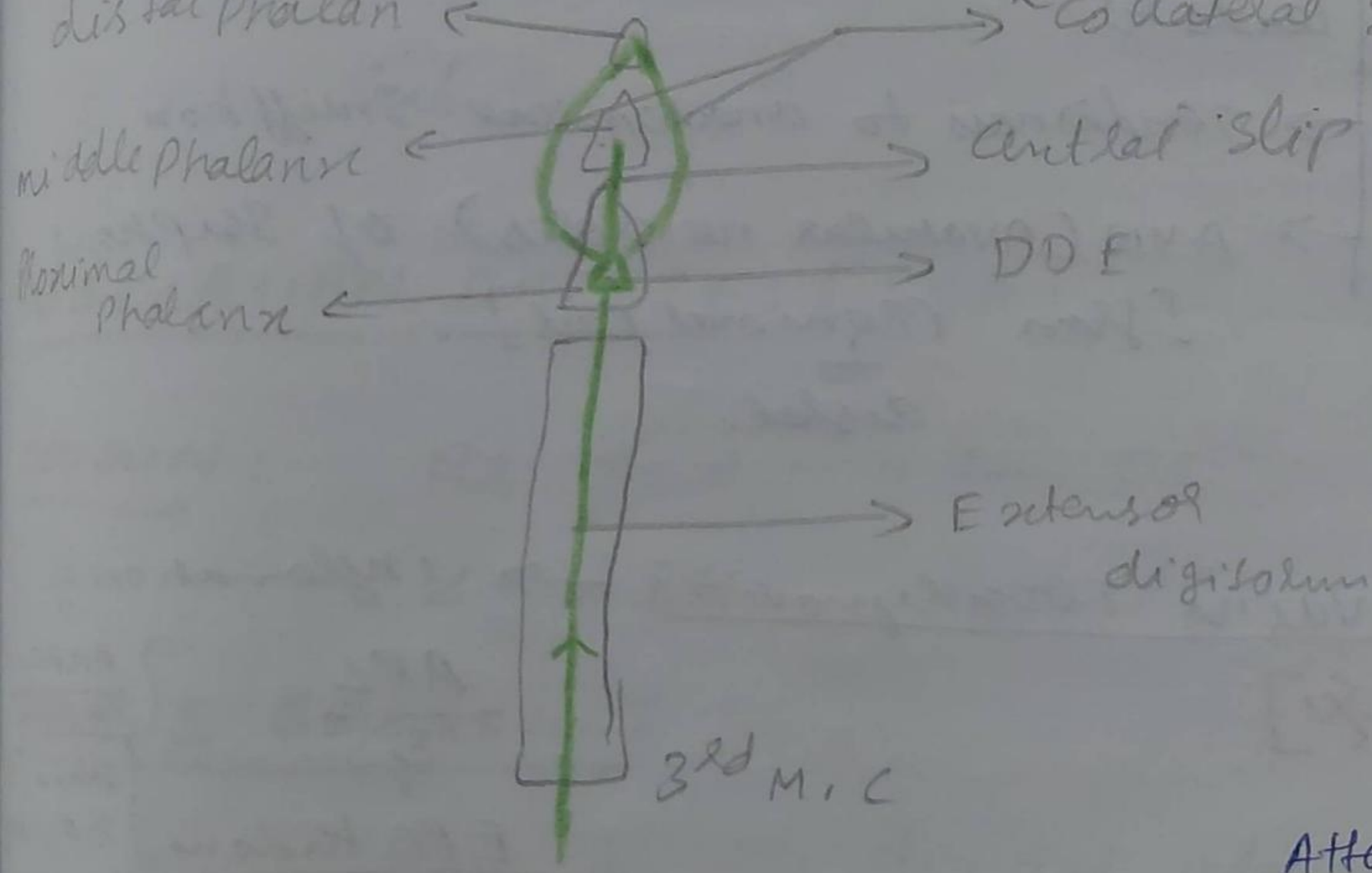
EGAWA'S TEST: a) TO test Abduction of fingers
b) for testing Dorsal interossei
c) Test for ulnar N.

DORSAL DIGITAL EXPANSION [DDE] / EXTENSOR EXPANSION OF DIGITS

Formation: Formed by the 4 tendons of extensor digitorum.

SHAPE: Triangular shaped

DDE OF MIDDLE FINGER:



Apex of DDE → Divides into 2 slips

- → 1 Central Slip → Attached to middle Phalanx
- → 2 Collateral Slips → Attached to the distal Phalanx

SIGNIFICANCE OF DDE

a) It Gives insertion to all lumbricales & all interossei muscles.

NOTE:

Structures → Extensor digitorum [ED] tendon

- Structures related to DDE → lumbricals
- → Interossei

- Scaphoid fracture
  - leads to
    - → Tenderness to anatomical Snuffbox
    - → AVN (AVascular necrosis) of Scaphoid [from Proximal Part] to distal.

- **De Quervain's Tenosynovitis** → inflammation of [✗]

APL & EPB tendons } Anterolateral Boundary of Anatomical Snuff Box

ARTERIES OF UPPER LIMB

- Axillary A.
- Brachial A.
- Arches of hand.

3 main branches of Arch of Aorta.

1. Brachio Cephalic trunk (BCT) → Rt. Subclavian A. (SCA)
   → Rt. Common Carotic A. (CCA)
2. Lt. Common Carotid A.
3. Lt. Subclavian A.

SUBCLAVIAN ARTERY [SCA]

ORIGIN :
- Rt SCA → from BCT
- Lt SCA → from Aortic Arch

PARTS & BRANCHES :

- Subclavian A. → divided into 3 Parts by Scalenous Anterior muscle
- 3 Parts → 1st Part, 2nd Part, 3rd Part

NOTE : Scalene tubercle → gives insertion to Scalenus Anterior
↓ Present in
medial border of 1st rib (inner)

PARTS & BRANCHES [VIT C D]

- 1st Part → V ertebral A.
  → I nternal Thoracic A.
  → T hyrocervical trunk → S uprascapular A.
  → I nferior Thyroid A.
  → T ransverse cervical A.
- 2nd Part → C osto cervical trunk
- 3rd Part → D orsal Scapular A.

AXILLARY ARTERY

EXTENT : From outer border of 1st rib (continuation of Subclavian A.) to the lower border of Teres major (continues as Brachial A.)

PARTS & BRANCHES :

a) 3 Parts by Pectoralis minor muscle.

1st part [lies Proximal to Pectoralis minor] → 1 Branch → Superior thoracic A.

2nd part [lies behind to Pectoralis minor] → 2 Branch → Acromiothoracic / Thoracoacromial A.
→ Lateral / long thoracic A.

3rd part [lies distal to pectoralis minor] → 3 Branches → Subscapular A.
→ ACHA
→ PCHA

SALSAP

1) Subscapular A. :
→ gives Circumflex scapular A. [content of upper △ space]
→ largest branch of Axillary A.

2) Axillary N. & PCHA → Both are contents of Quadrangular space.

1) PCHA winds around Surgical neck of humerus from behind, accompanies Axillary N.
2) ACHA winds around surgical Neck of humerus from front

RELATIONS :

	Anterior	Posterior	Medial	Lateral
1st Part	•) P. Major	•) MEDIAL CORD OF BRACHIAL PLEXUS	•) Axillary vein	•) Lateral cord, Posterior cord.
2nd Part	•) P. major •) P. minor	•) Posterior cord.	•) Axillary vein •) medial cord	•) Lateral cord
3rd Part	•) P. Major.	•) Axillary N. •) Radial N.	•) Ulnar N. •) Axillary vein	•) Musculo cutaneous N.

DIAGRAM : REFER ~~DED~~ AXILLARY A. NOTES, CONTAINS AXILLA DIAGRAM "

-> easy up ·) constant ·) some valuable concept behind.

·) IN ~~Second Part~~ 2nd Part, 3 Cords of Brachial Plexus → Form same relation to the Part of Axillary Artery.

(i.e) Lateral Cord → Present Laterally

~~Posterior~~ Cord → Present ~~as~~ Posteriorly

~~And~~ medial cord → Present medially.

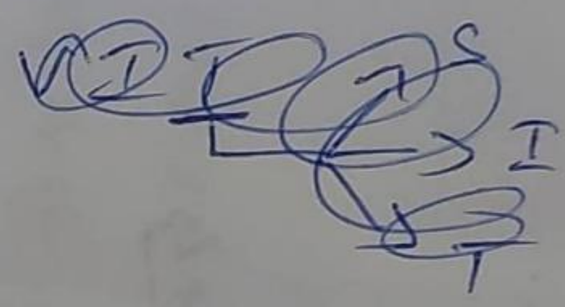
·) Branches of Cords → Form same relation to 3rd Part of Axillary Artery.

APPLIED ANATOMY : [FOR both Axillary A. & Subclavian A.]

o) Arterial anastamoses around Scapula
[Scapular Anastamoses]

↓

formed b/w branches of SA, (1st Part of Subclavian A.) and AA_3 (3rd Part of Axillary A.)

•) branches of SA_1 ⟶ 

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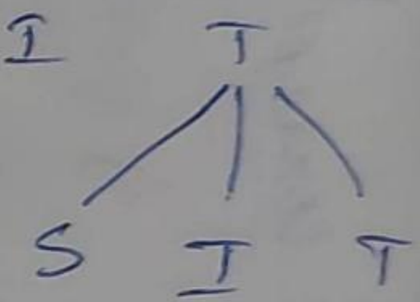


•) branches of AA_3 ⟶ S, A, P

PULSATING SCAPULA :

o) In COARCTATION (Narrowing) of Aorta ⟶ Scapular anastomoses will become Significant

BRACHIAL ARTERY

Extent: From lower border of teres major [continuation of Axillary A.] to the neck of radius bone [divides into radial A. & ulnar A.]

BRANCHES:

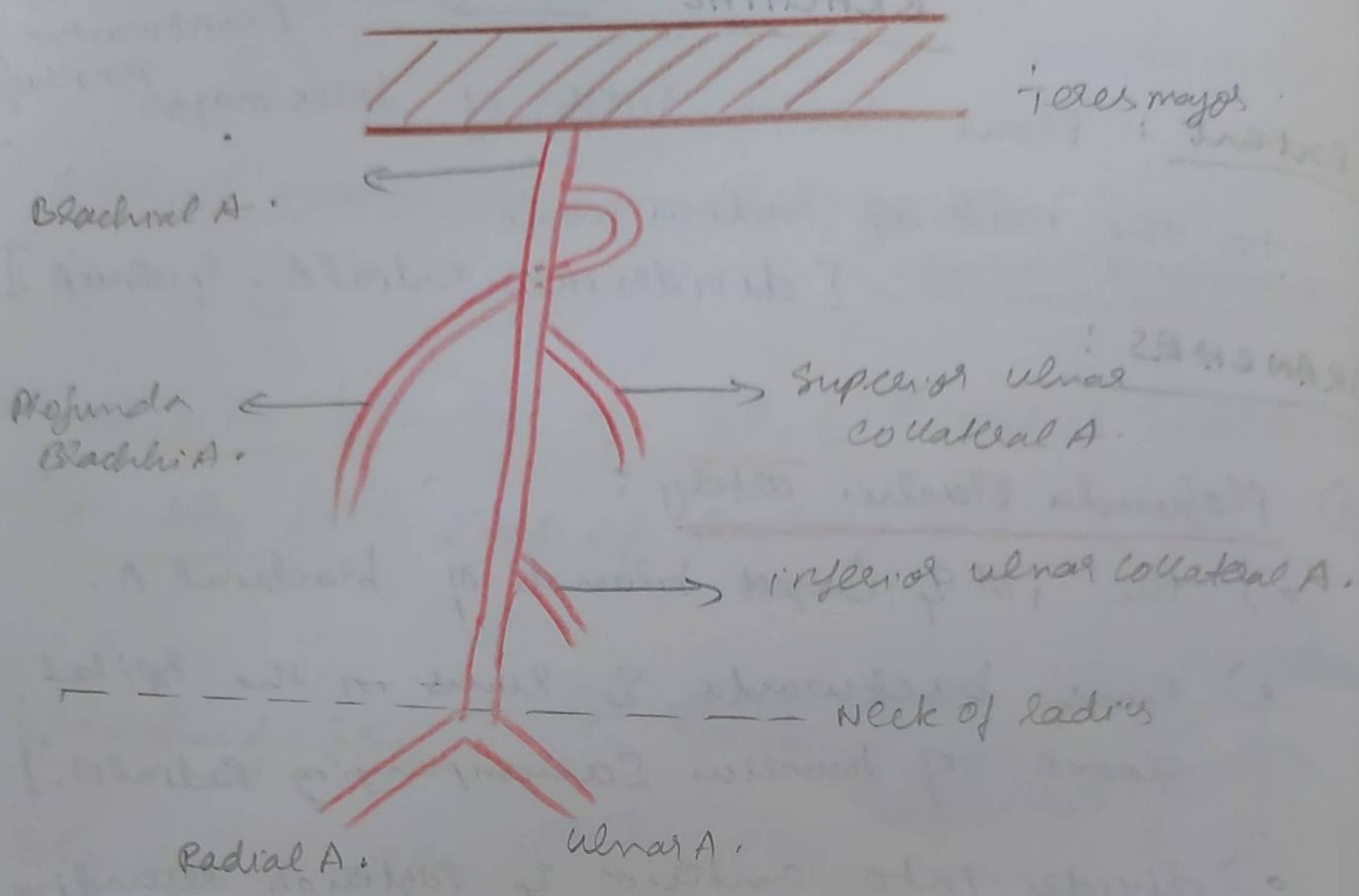
1) **Profunda Brachii artery:**
   a) the 1st & largest branch of brachial A.
   b) Runs backwards & runs in the spiral groove of humerus [accompanying Radial N.]
   c) divides into anterior & posterior descending branches.

2) Superior & inferior ulnar collateral A.

3) Muscular branches to supply the muscles of arm

4) Nutrient artery to humerus.

5) 2 terminal branches of Brachial A. [within cubital fossa] → Radial A.
                                                              → ulnar A.



RELATIONS:

a) In the front of Arm, median N. & Brachial A. are closely related.

b) In the upper Part of arm → Brachial A. lies medial to median N.

c) At the middle of arm → median N. Crosses Brachial A. (Lateral to medial)

d) Lower Part of Arm & cubital fossa → Median N. lies medial to Brachial A.

APPLIED ASPECTS

1) Brachial artery Pulsations → used for checking the blood Pressure

2) In supracondylar fracture of humerus, Brachial A may get compressed → Leads to Volkmann's Ischemic contracture.

3) During injury of arteries of forearm & hand, Brachial A. can be compressed against the shaft of humerus (at the middle of arm) to control ~~bleeding~~ blood loss

PALMAR ARCHES

1) 2 types → Superficial Palmar arch.
→ deep Palmar arch

2) Both arches are formed by anastamoses b/w Radial A. & ulnar A.

SUPERFICIAL PALMAR ARCH

Formation :

- Main continuation of Ulnar artery
- Superficial branch of ulnar A. anastamose with superficial branch of Radial A.

RELATIONS :

- Superficial - Palmar aponeurosis
- Deep - Flexor tendons of fingers [FDS, FDP]

BRANCHES :

1. 1 Proper Palmar digital artery / branch
2. 3 common Palmar digital artery / branches

DEEP PALMAR ARCH

Formation :

- Main continuation of Radial artery
- Formed by anastamoses of deep branch of Radial A. & Ulnar A.

RELATIONS:

.) Superficial - Long flexor tendons [FDS, FDP], Lumbricales

.) Deep - metacarpal bones & interossei muscles.

BRANCHES:

.) Palmar metacarpal arteries

.) Perforating Arteries

APPLIED:

.) During injury to Palmar arches

↓

Profuse bleeding may ~~occ~~ occur.

↓

Bleeding can be controlled by compressing the Radial A. against the Shaft of humerus at the middle of arm (insertion of coraco brachialis.

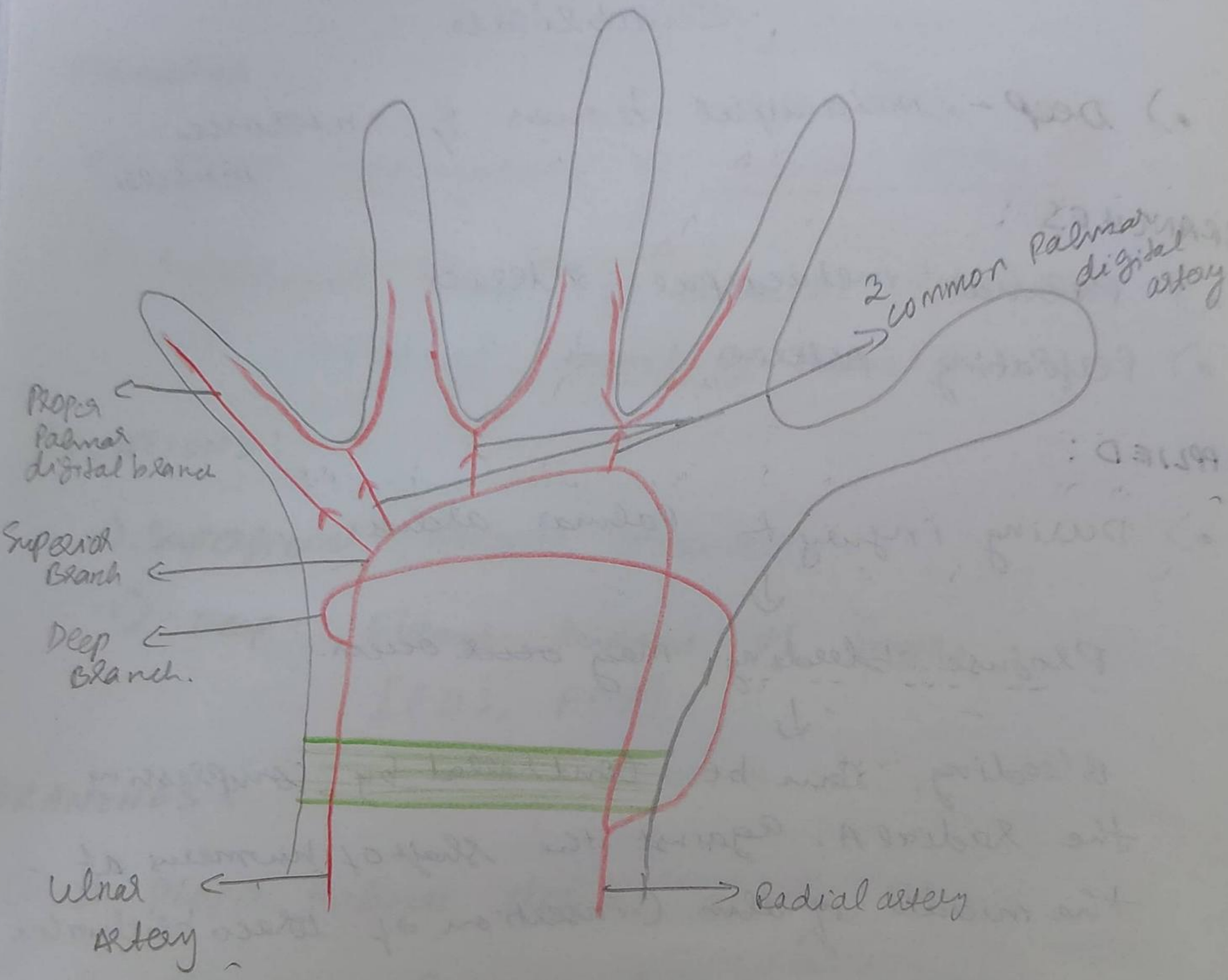
NOTE:

.) Deep Palmar arch lies 1cm proximal to the Superficial Palmar arch.

.) Princeps Pollicis Artery, a branch of Radial A. Supply the thumb.

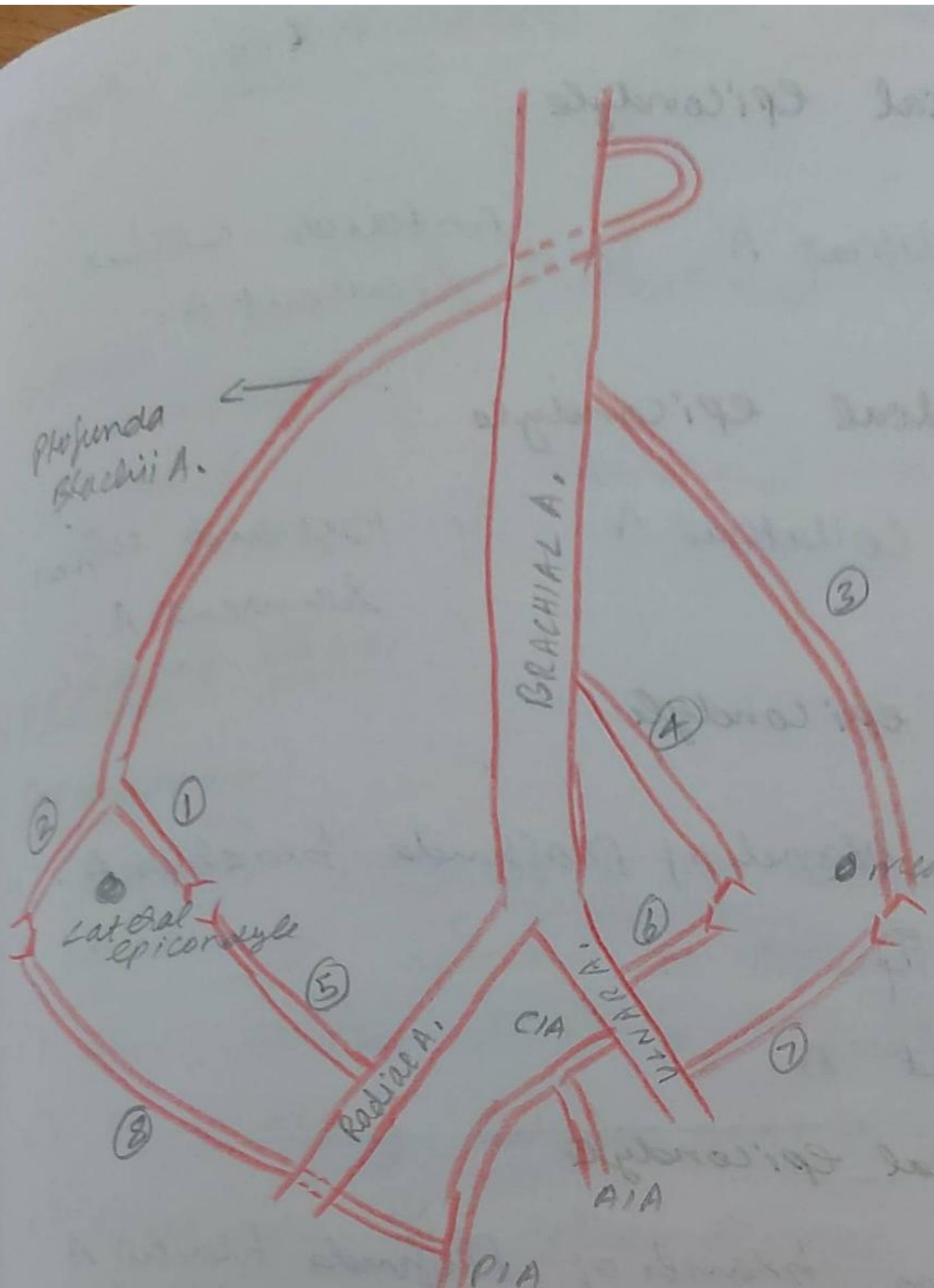
.) Radialis indicis A; a branch of Radial A. Supply index finger

DIAGRAM :



ANASTAMOSIS AROUND ELBOW JOINT [5 Mark]

a) Formed b/w branches of Brachial A., Radial A., Ulnar A.



① Anterior descending br of Profunda brachii A

② Posterior descending br of Profunda brachii A.

③ Superior ulnar collateral A.

④ Inferior ulnar collateral A.

⑤ Radial recurrent A.

⑥ Anterior ulnar recurrent A

⑦ Posterior ulnar recurrent A.

⑧ Interosseus recurrent A.

CIA - Common interosseous A. [Branch of ulnar A.]
AIA - Anterior " "
PIA - Posterior " "

Recurrent means reverse

① In front of Medial epicondyle.

Inferior ulnar collateral A. & Anterior ulnar Recurrent A.

② Behind the medial epicondyle

Superior ulnar collateral A. & Posterior ulnar Recurrent A.

③ Infront of Lateral epicondyle

Anterior descending branch of Profunda brachii A.

&

Radial Recurrent A.

④ Behind the Lateral Epicondyle

Posterior descending branch of Profunda brachii A.

&

Inter osseous ~~Recurrent~~ Recurrent A.
[A branch of Posterior interosseous A.]

CLINICAL SIGNIFICANCE

a) During flexion of elbow, BA may get compressed, This anastamoses around elbow Provides alternate Pathway to maintain blood circulation to fore arm & Hand.

VENOUS DRAINAGE OF UPPER LIMB

Dorsal venous arch of hand → Lateral end → Continues upwards as Cephalic vein

Dorsal venous arch of hand → Medial end → Continues upwards as Basilic vein.

CEPHALIC VEIN :

Formation :

- Lateral end of dorsal venous arch continues upward as cephalic vein.
- Runs in the roof of anatomical snuff box.
- Runs along lateral side of forearm & arm
- Runs in the deltopectoral groove.
- Pierces clavipectoral fascia.

TERMINATION :

- Cephalic vein, drains into axillary vein.

BASILIC VEIN

- Pierces the deep fascia at the middle level of arm [insertion of Coracobrachialis
- Continues as Axillary vein.

MEDIAN CUBITAL VEIN :- NOTES ALREADY GIVEN.

RADIAL NERVE

FORMATION :

-) A branch of posterior cord of Brachial Plexus in the Axilla
-) Largest branch of Brachial Plexus.

ROOT VALUE : C_5, C_6, C_7, C_8, T_1 [$C_5 - T_1$]

COURSE :

-) Radial nerve runs in the radial groove / spiral groove at the mid shaft of humerus (accompanied by Profunda brachii A.)
-) both are contents of lower triangular space.
-) Radial N. Pierces the lateral intermuscular septum, enters the anterior compartment of arm.

TERIMINATION :

-) In front of lateral epicondyl of humerus, (At the level of elbow)

Radial N. divides into 2 branches.

- → Superficial terminal branch → Purely Sensory
- → deep terminal branch → Purely motor.
  [PIN - Posterior interosseous N.]

superficial terminal branch of Radial N.

- a) lateral most content of cubital fossa
- b) runs undercover of Brachio Radialis muscle
- c) runs in the roof of Anatomical snuff box.
- d) Purely Sensory → Supplies the skin of Lateral $2\frac{1}{2}$ fingers [Dorsal aspect] (excluding nail beds)
  - ↳ by median N.

deep terminal branch of Radial N.

1) a.k.a Posterior interosseous nerve (PIN)

- a) Purely motor nerve (main nerve of back of fore arm
- b) Passes b/w the 2 heads of Supinator muscle [PIN]
- c) Pierces the supinator muscle through ~~arcade~~ arcade of Frohse.

BRANCHES Of Radial nerve (in the Spiral groove)

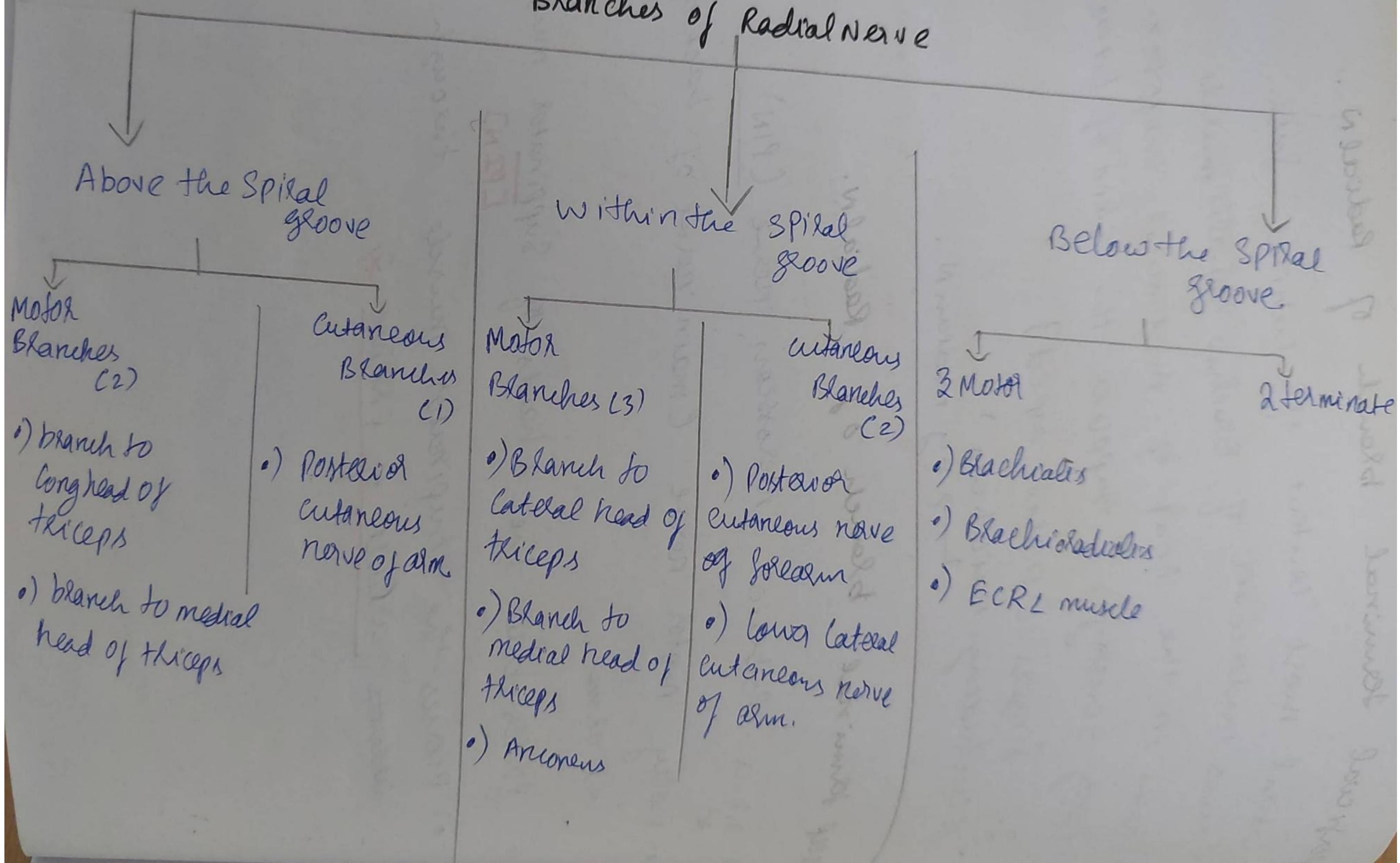
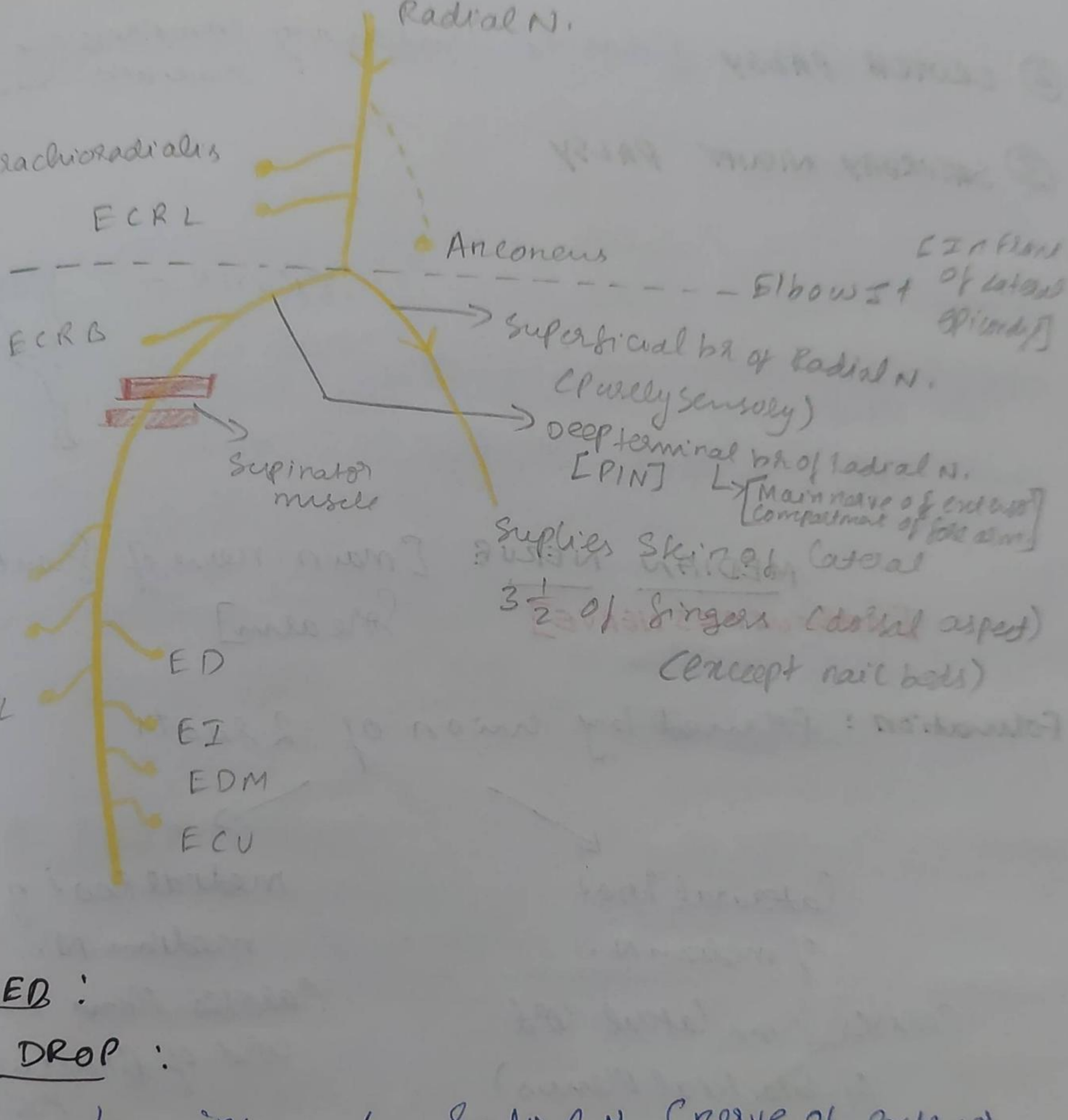


DIAGRAM:



APPLIED:

WRIST DROP:

1) due to injury to Radial N. (nerve of extensor compartment of forearm)
2) wrist is in flexed position
3) loss of extension of wrist due to Paralysis of extensor muscles of forearm.

c) M/C site of Radial N. injury → fracture of shaft of humerus → wrist drop

② CRUTCH PALSY [Base of crutch may compress the Radial N. in axilla]

③ SATURDAY NIGHT PALSY

CRUTCH —

MEDIAN NERVE

[LABOURER'S NERVE]

[Main nerve of front of forearm]

Formation: Formed by union of 2 roots

↙ Lateral Root of median N. (arises from lateral cord of brachial plexus) [C_5, C_6, C_7]

↘ Medial Root of median N. (arises from medial cord of Brachial Plexus) [C_8, T_1]

ROOT VALUE: C_5, C_6, C_7, C_8, T_1 [$C_5 - T_1$]

COURSE:

ARM

.) Median N. is Closely related to brachial artery.

In the upper Part of Arm → Median nerves lies Cateral to the brachial A.

At the middle of arm → Median nerve crosses the Brachial A. [from Lateral to medial]

In the lower Part of arm → Median N. lies medial to the Brachial A.

CUBITAL FOSSA

.) Median N. is the medial most content of Cubital Fossa

.) Leaves the cubital fossa & enters the front of forearm by Passing b/w the 2 heads of Pronator Teres muscle.

FOREARM

a) Median nerve passes just deep to the flexor digitorum superficialis (FDS)

(b/w FDS & FDP muscles)

WRIST

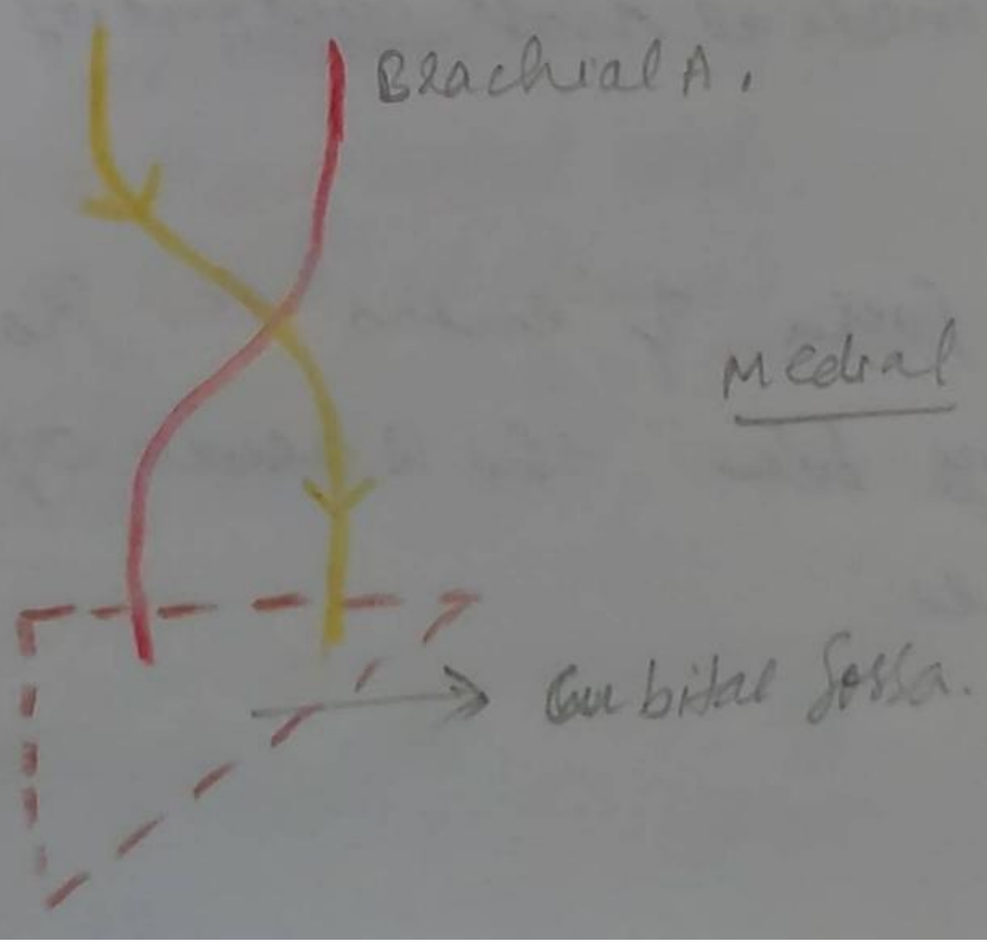
Median N. Passes deep to the flexor retinaculum

[Through the carpal tunnel]

PALM

Termination :- Median N. divides into medial and lateral divisions

MEDIAN N. in the arm.

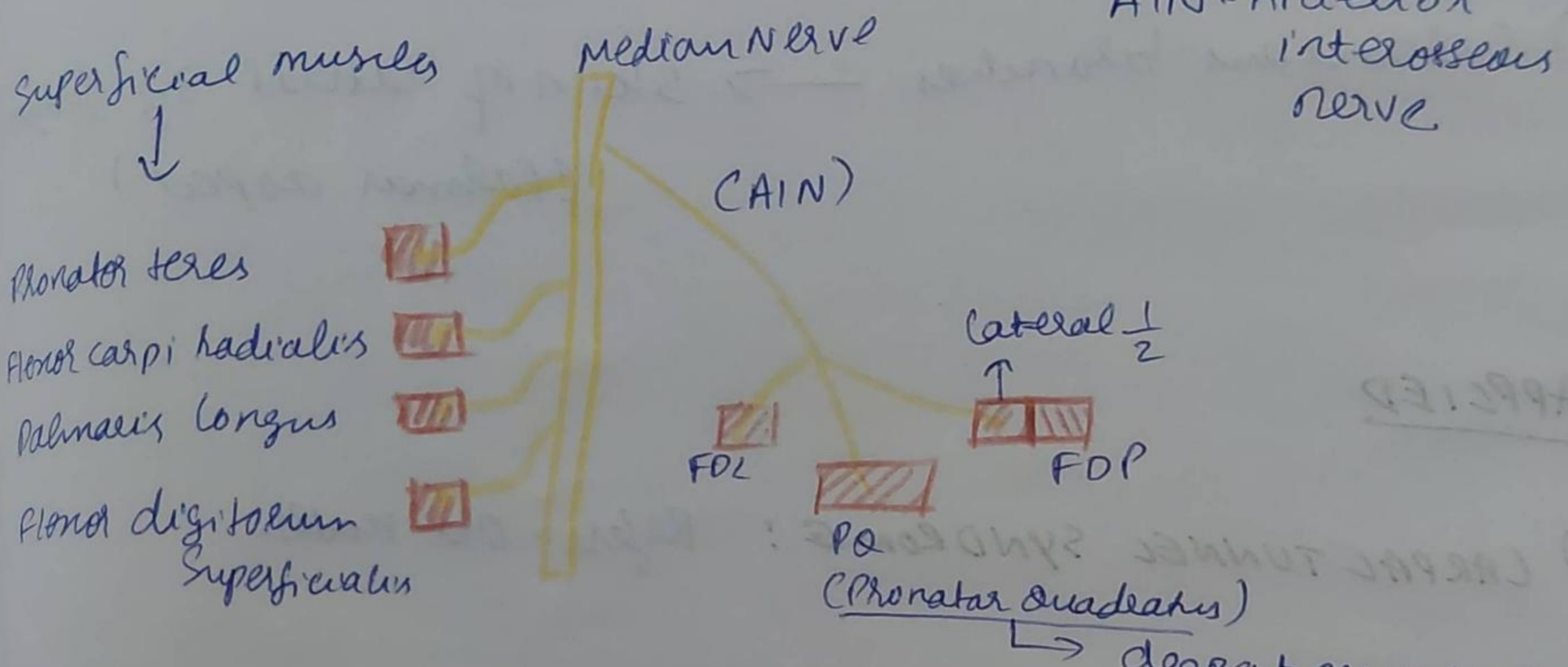


BRANCHES OF MEDIAN NERVE

① In the Arm : no branches.

② IN THE FRONT OF FOREARM :

a) Median N. is the ~~radian~~ main nerve of flexor compartment of forearm



b) AIN (Anterior interosseous N.), a branch of Median N. supplies $2\frac{1}{2}$ deep muscles.

c) FDP → hybrid muscle
- → medial $\frac{1}{2}$ → ulnar N.
- → Lateral $\frac{1}{2}$ — median N. (by AIN branch)

③ In the palm

a) Motor branches → 8 muscles of the palm:
- Lateral 2 lumbricales (1st & 2nd)
- Opponens Pollicis
- Abductor Pollicis brevis
- Flexor Pollicis brevis

} supplied by recurrent branch of median N.

b) Cutaneous branches → Skin of lateral $3\frac{1}{2}$ fingers (Palmar aspect)

APPLIED

① CARPAL TUNNEL SYNDROME: Refer old notes.

② PRONATOR TERES SYNDROME: Compression of median N. b/w it's 2 head.

③ POINTING INDEX:

a) Due to injury to median N.

a) Index finger cannot be flexed.

(due to paralysis of FDS, FDP of index finger)

(4) APE THUMB DEFORMITY :

1) Due to injury to median N.
2) Thumb is in adducted position
3) APL muscles not affected → So thumb in adducted position -

ULNAR NERVE [MUSICIAN'S NERVE]

FORMATION / ORIGIN :

- a branch of medial cord of brachial Plexus arising in the axilla.

ROOT VALUE : C_7, C_8, T_1

COURSE :

① IN THE ARM

- runs along the medial side of the arm
- Pierces the medial intermuscular septum at the middle of arm (at the insertion of coracobrachialis muscle)
- enters Posterior compartment of arm

② AT THE ELBOW

- ulnar N. runs behind the medial epicondyle of humerus

③ In the FOREARM

- ulnar N. passes b/w the 2 heads of Flexor carpi ulnaris muscle (FCU)
- runs just lateral to FCU muscle

④ At the wrist

.) ulnar N. Passes superficially to the flexor retinaculum of wrist accompanied by ulnar artery

⑤ IN THE PALM

Termination: ulnar N. by dividing into superficial and deep branches

BRANCHES OF ULNAR N.:

① IN THE ARM: No branches in the arm.

② IN THE FRONT OF FOREARM: ulnar N. supplies $1\frac{1}{2}$ muscles

-) Flexor carpi ulnaris
-) Medial $\frac{1}{2}$ of Flexor digitorum Profundus [FDP]

③ IN THE PALM:

MOTOR BRANCHES:

-) superficial br. of ulnar N. → Supplies palmaris brevis
-) Deep br of ulnar N. → 2 hypothenar muscles.
  → medial 2 lumbricales. (3rd & 4th ∠'s)
  → All 4 Palmar interossei + Dorsal interossei

→ Flexor Pollicus Brevis [occasionaly, supplied by ulnar N.]

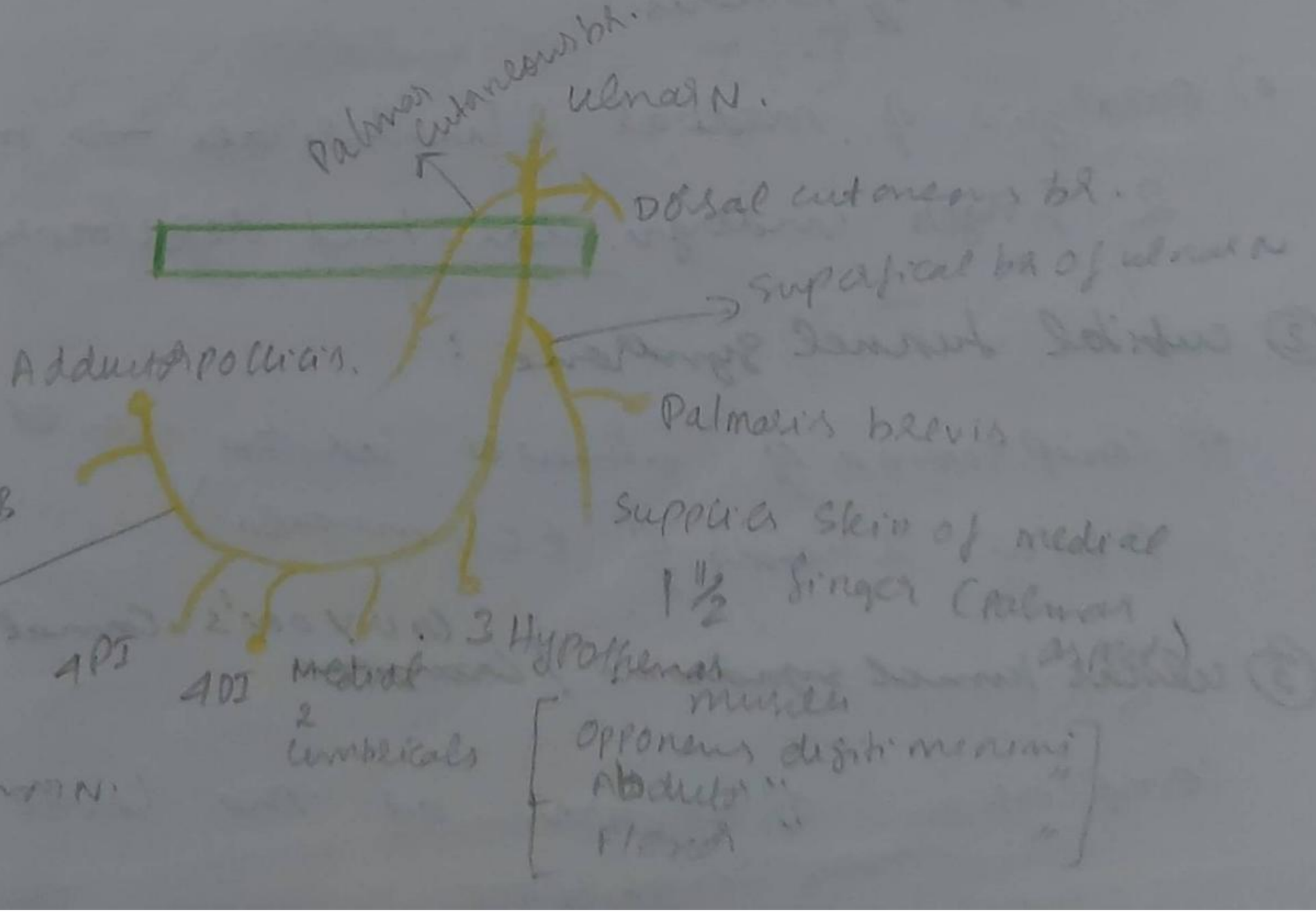
→ Adductor Pollicis.

CUTANEOUS BRANCHES :

1) Palmar cutaneous br of ulnar N. → Passes superficial to the Flexor Retinaculum and supplies skin of medial side of Palm (Skin over the hypothenar eminence)

2) Superficial branch of ulnar N. → supplies skin of medial 1 1/2 fingers (palmar aspect)

3) Dorsal cutaneous br of ulnar N. → Skin of medial 1 1/2 fingers (dorsal aspect)



- PI — Palmar interossei
- DI - Dorsal interossei
- ulnar nerve - main nerve of Palm
- ~~PCU~~ FCU tendon inserted into Pisiform & Hamate bone
- ~~Median~~ to deep branch of ulnar N. terminates into Adductor Policis muscle.

APPLIED ASPECT

① Partial claw hand / incomplete / ulnar claw hand

- Usual site of ulnar nerve injury → Fracture of Medial epicondyle of humerus. deforming.
- Paralysis of medial 2 lumbricales → medial 2 fingers undergo claw hand deformity

② cubital tunnel syndrome :

- Compression of ulnar N. at the level of elbow (b/w 2 heads of FCU muscle)

③ Ulnar tunnel syndrome / GUYON's canal syndrome :

Compression of ulnar N. at the level of wrist

Autonomous zone

.) for ulnar N. - Tip of little finger

.) for median N. - Tip of index finger

.) for radial N - Dorsal aspect of first web space
(Superficial br of radial N.)

.) Autonomus zone → Specialised area of the hand supplied by ONE particular nerve (no overlaping)

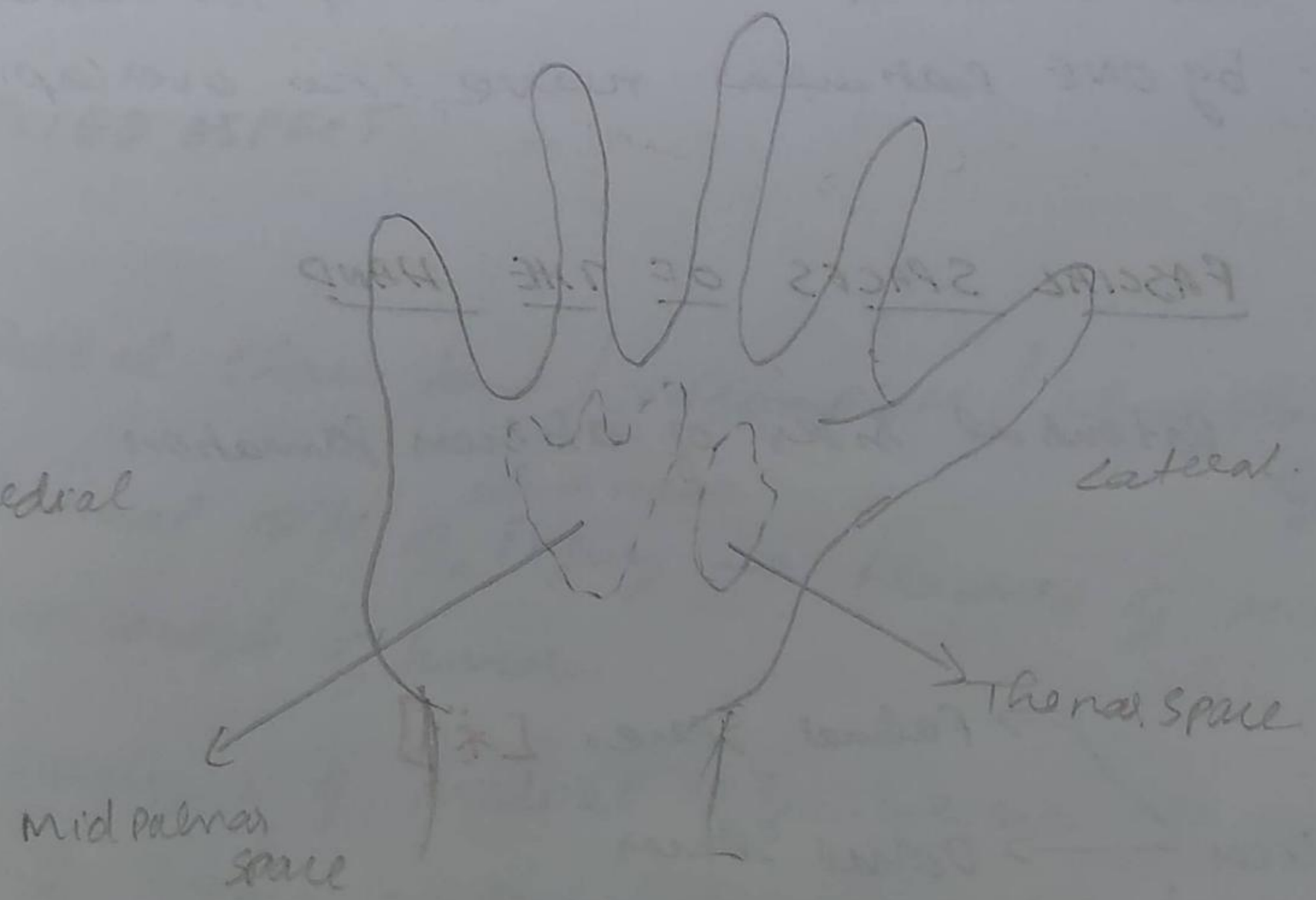
FASCIAL SPACES OF THE HAND

Clinical importance: Potential sites of abscess formation

Types of spaces → Palmar Spaces [*]
→ Dorsal Spaces
→ Forearm Space (Space of Parona)

Palmar space

•) Mid Palmar Space
•) Thenar space
•) Pulp space of finger.

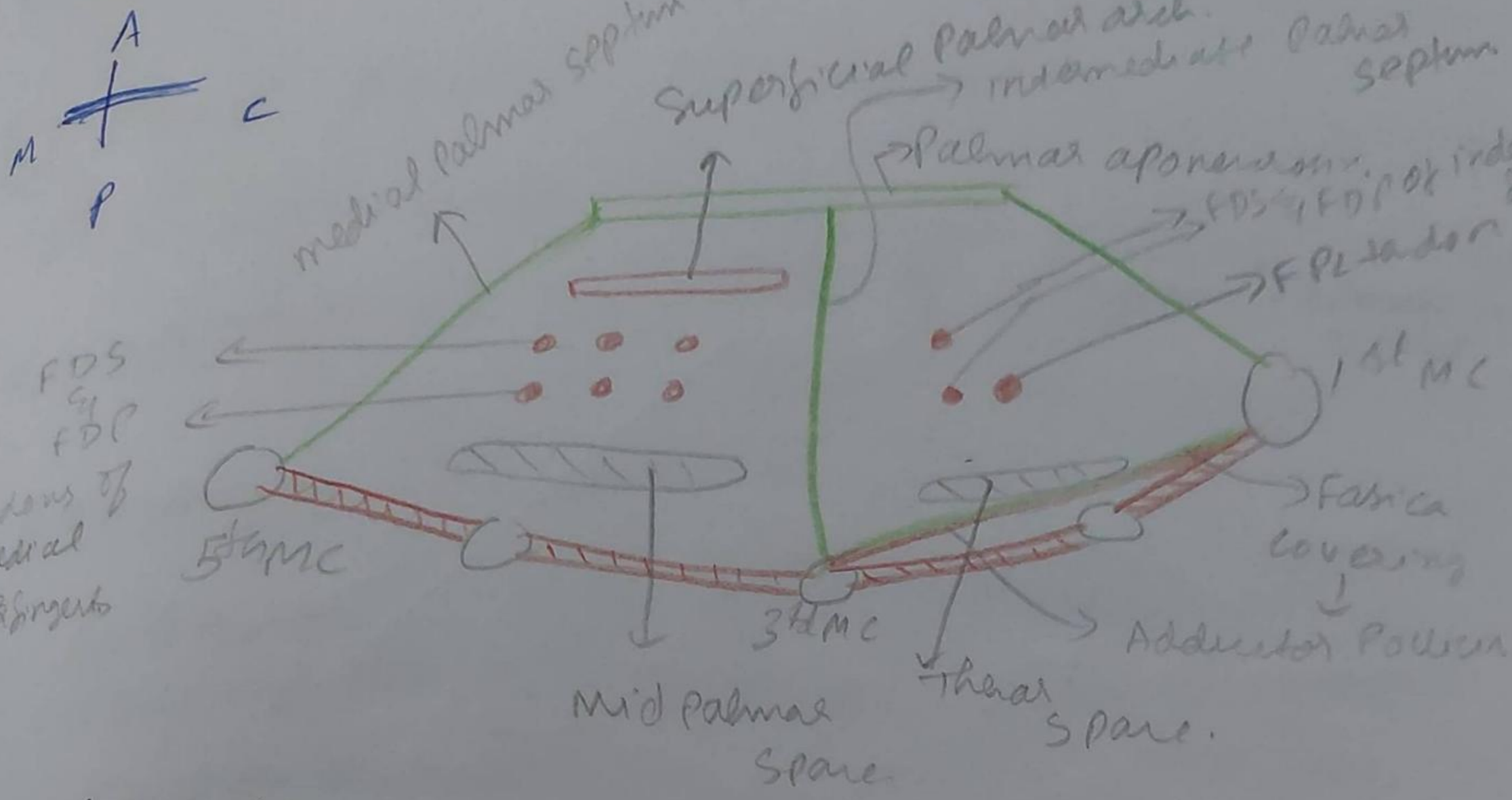


① MID PALMAR SPACE

LOCATION: on the medial $\frac{1}{2}$ of the Palm.

BOUNDARIES:

Cross section of Hand



Boundaries :-

MIDPALMAR SPACE

Anterior → Palmar aponeurosis
→ Superficial Palmar arch.
→ FDS & FDP tendons of medial 3 fingers
→ medial 3 Lumbricals.

Posterior → 3, 4, 5 metacarpal bones & Interossei

Medial → medial palmar septum

Lateral → Intermadiate Palmar Septum

② THENAR SPACE

Location: on the Cateral 1/2 of the Palm

BOUNDARIES:

-) Anterior → ·) Palmar aponeurosis,
·) FDS, FDP tendons of index finger
·) FPL tendon
·) 1st Lumbrical

-) Posterior → ·) Fascia covering Adductor Pollicis muscles

i) Medial → Intermediate Palmar Septum
ii) Lateral → Lateral Palmar septum.

(3) PULP SPACE OF FINGERS

→ Subcutaneous Space.

Location : at the tips of fingers (Palmar aspect)

Boundaries :-

Anterior (superficial) → Skin & Fascia

Posterior (Deep) → Distal Part of distal Phalanges of fingers

APPLIED :

i) Infection & Abscess formation may occur in these spaces

→ From midpalmar space → Incision is made in the medial & web spaces

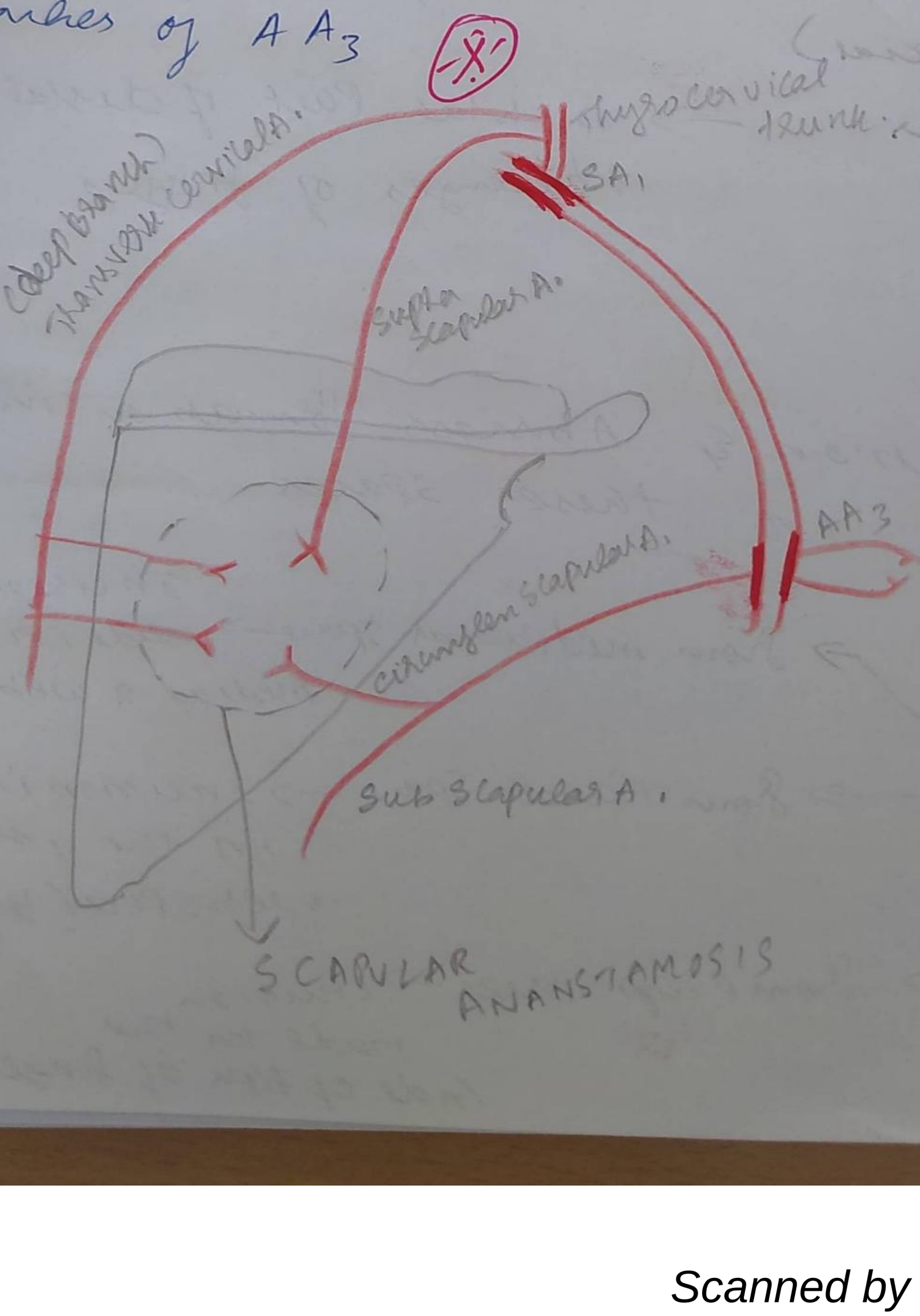
i) For drainage of Abscess → From Thenar Space → Incision is made in the 1st web space (b/w thumb & Index finger)

→ From Pulp space → Incision made on the side of tips of fingertips

o) Infection of Pulpspace → Felon / whitlow
(Abscess)

ARTERIAL ANASTAMOSIS ~~AND SC~~ AROUND SCAPULA [SCAPULAR ANASTAMOSIS]

- Formed b/w branches of SA, & branches of AA_3



c) Branches of SA, taking Part in Anastamoses

→ supra scapular. A
(br of thyrocervical trunk)

→ Transverse Cervical A.
(br of Thyro Cervical trunk)

d) Branches of AA$_3$ taking Part in Anastamoses

→ circumflex scapular. A
(br of subscapular A.)

CLINICAL IMPORTANCE: (Scapular anastamoses

1) If, there is obstruction of Subclavian A. or Axillary A., this anastomoses Provides alternate Pathway of blood flow to maintain blood to upper limb

EXTRAS :

✱ AXXILLARY ARCH SYNDROME :

Langers arch (Axillary arch) → Fibrous Band. & it is a Part of Lattissimus dorsi ✱

[Rarely] ↓ Present in Axilla → may cause compression of Axillary V. leading ↓ to Axillary vein → thrombosis ↓ (Blood clotting)

✱ Subscapular Bursa → communicates with the cavity of shoulder joint