

***ANATOMY OF THE
MAMMARY GLAND***

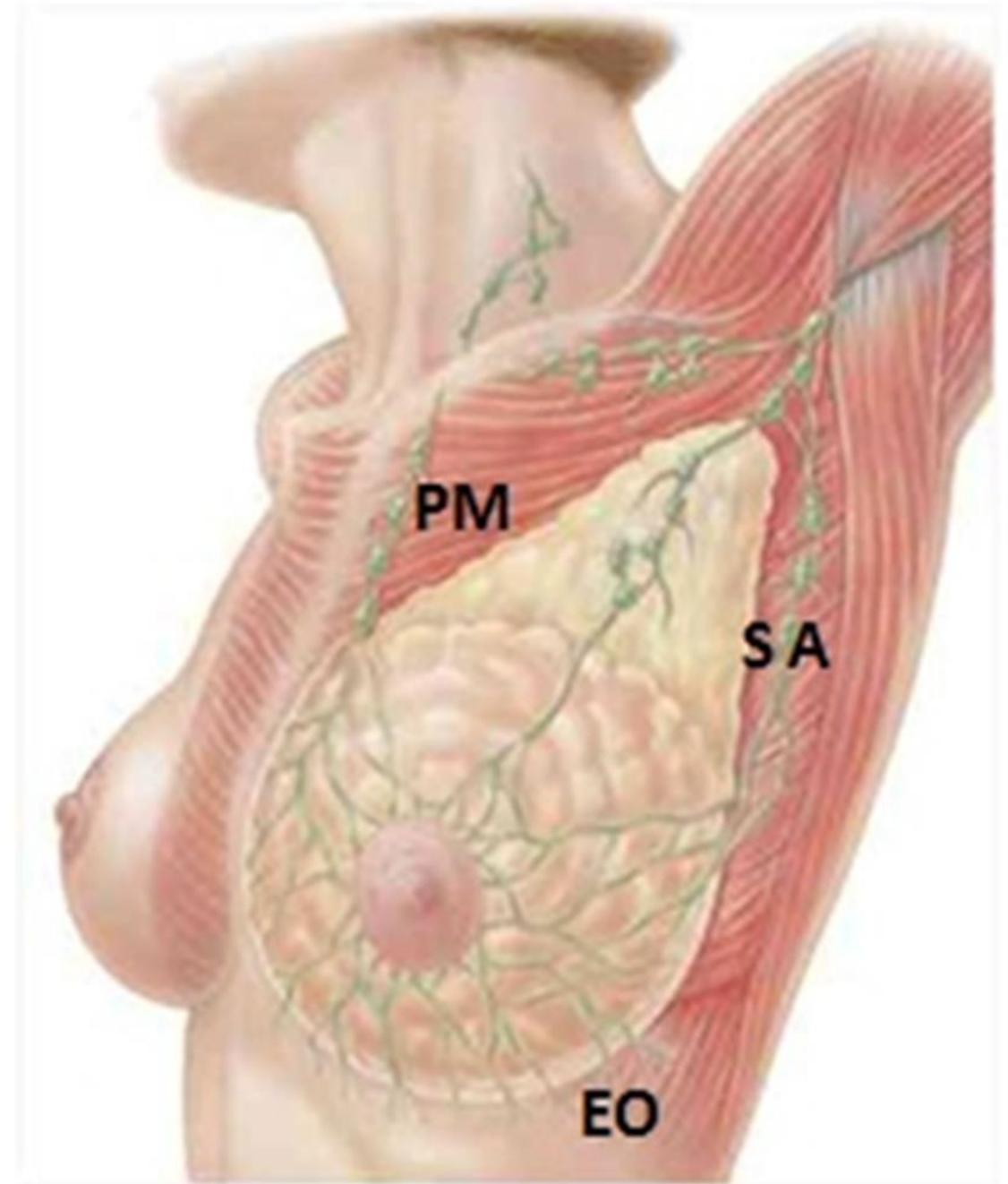
BY DR.DALIA M BIRAM

mammary gland is a modified sweat glands embedded in a fat of superficial fascia (give the size of the breast) & covered by skin including areola & nipple.

Shape : hemispherical with its apex at the nipple.

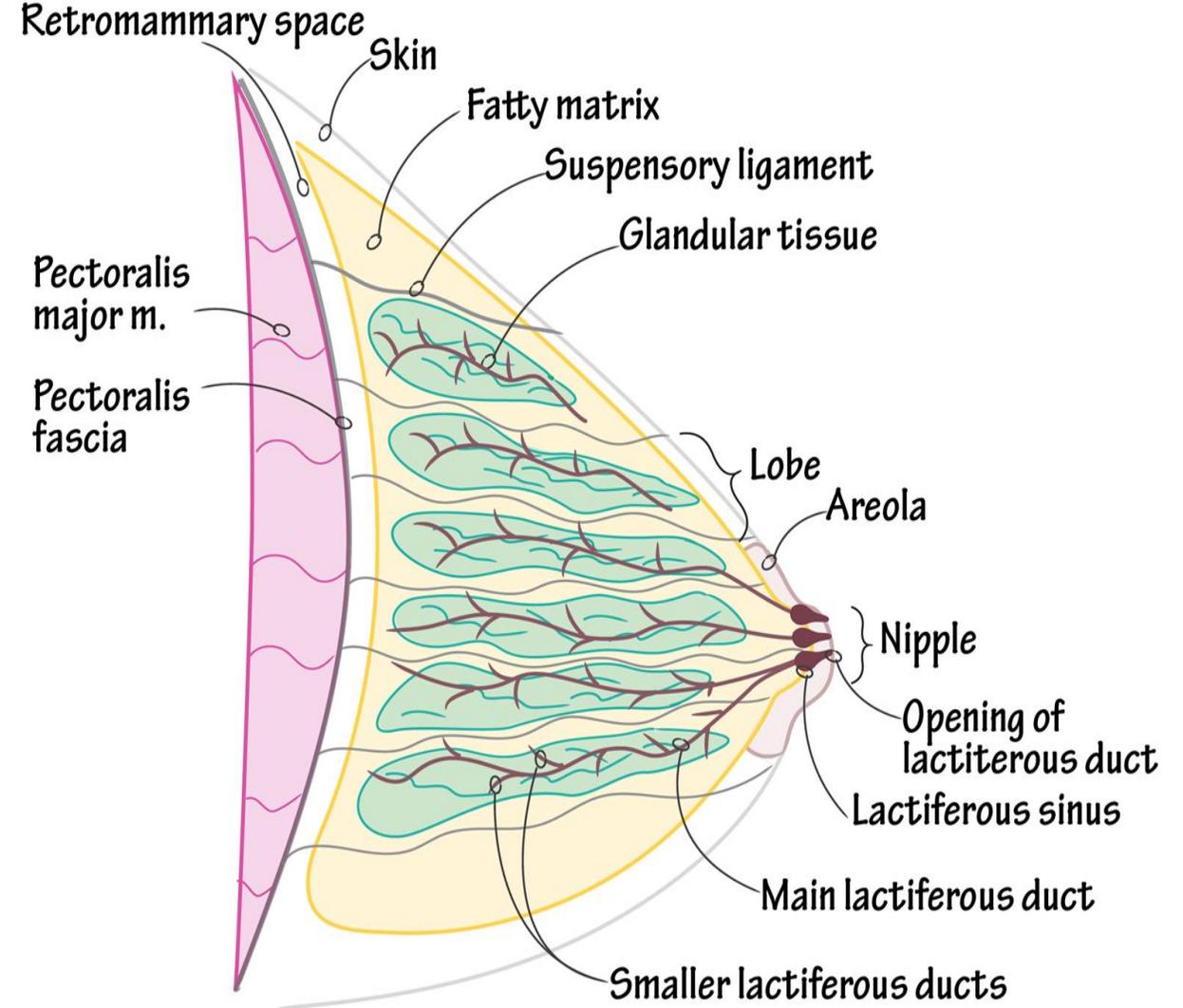
Extent: Its base extending from the 2nd rib (above) to 6th rib (below) and from the lateral border of sternum (medial) to the mid-axillary line (lateral). The axillary tail of the breast pierces the axillary fascia through the **foramen of Langer** to enter the axilla deep to pectoralis major muscle & rest on **subscapularis** muscle .

Relation: It lies on the deep fascia covering the pectoralis major muscle except its infero-lateral part (lies on the serratus anterior & external oblique muscles) & its infero-medial part (lies on the upper part of rectus sheath). **The retromammary space** allows the breast to move on the deep fascia.



Breast (Lactating, Sagittal View)

- Structure:**
- ◆ **Mammary gland** is formed of 15-20 lobes separated by inter-lobular fibrous septa (**Cooper's ligaments**) or **suspensory ligament** which are attached from **the deep fascia to the skin**.
 - ◆ **60% of mammary gland** lies in the upper outer quadrant of the breast.
 - ◆ **Mammary gland is rudimentary in male breast, consists of duct only with no alveoli.**
 - ◆ **Each lobe has a lactiferous duct which is dilated at its end to form lactiferous sinus & narrow again to open separately on the apex of the nipple.**

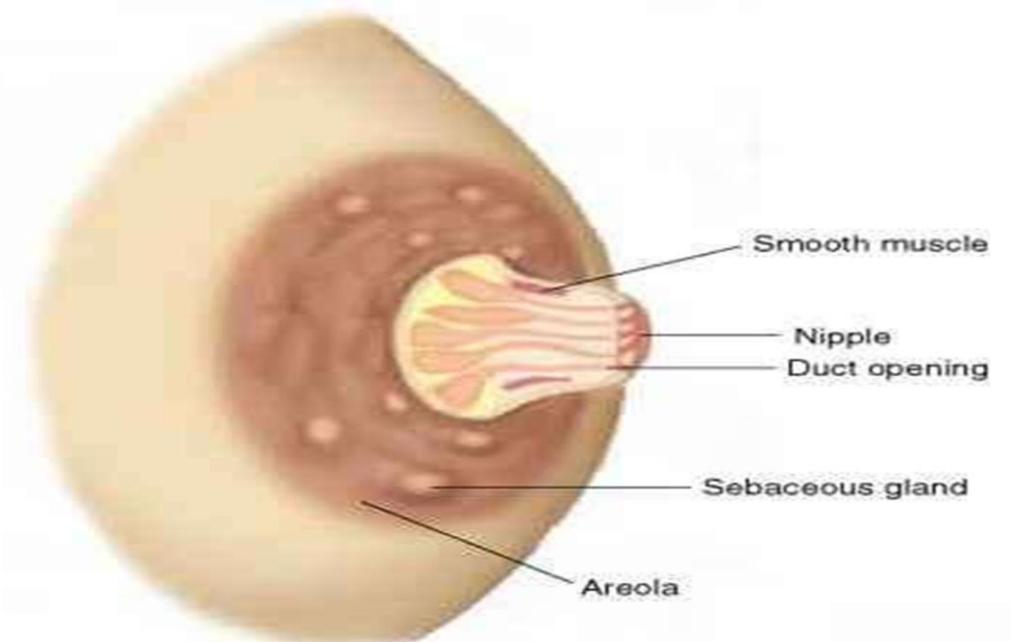


- **Nipple:** is a cylindrical eminence, presents 15-20 orifices of lactiferous ducts.

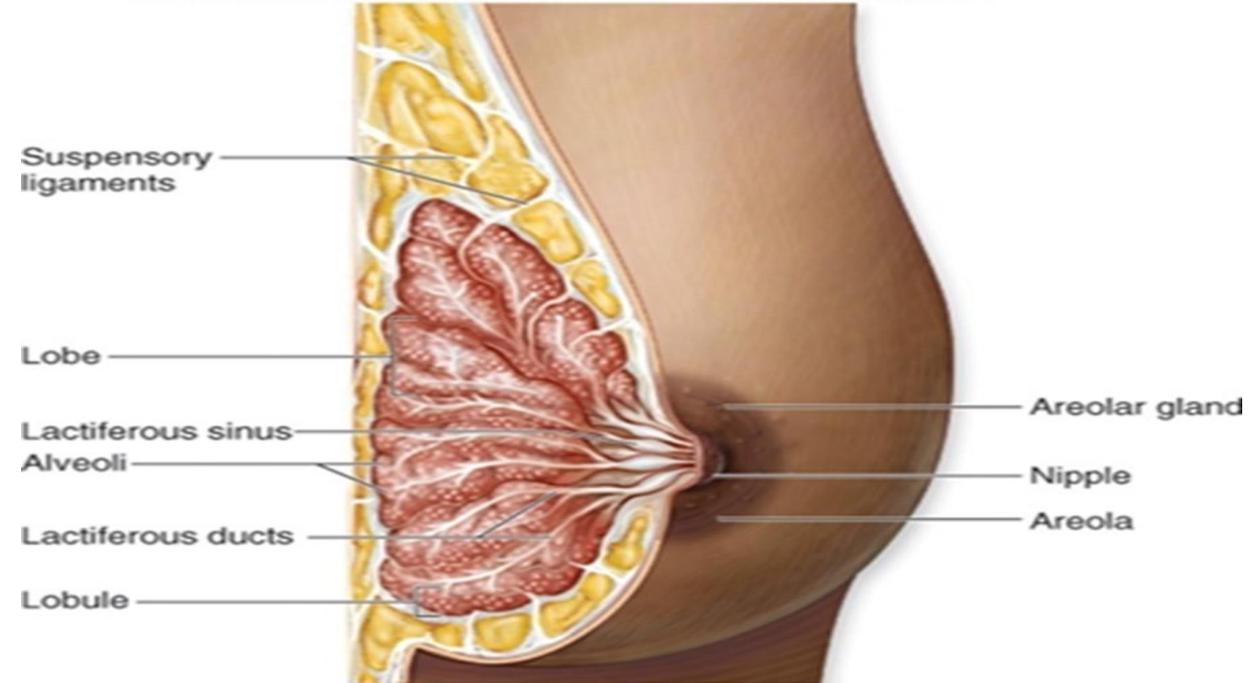
- * It contains smooth muscle fibers responsible for its erection. No fat in the nipple .

- * Accessory nipples (**polythelia**) may present along nipple line which extends from the anterior fold of axilla to the inguinal region.

- **Areola** is the pigmented skin around the nipple. Small rounded elevations, called the tubercles of Montgomery , are produced by enlargement of areolar sebaceous glands.



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(a) Anterior view

Arterial supply:

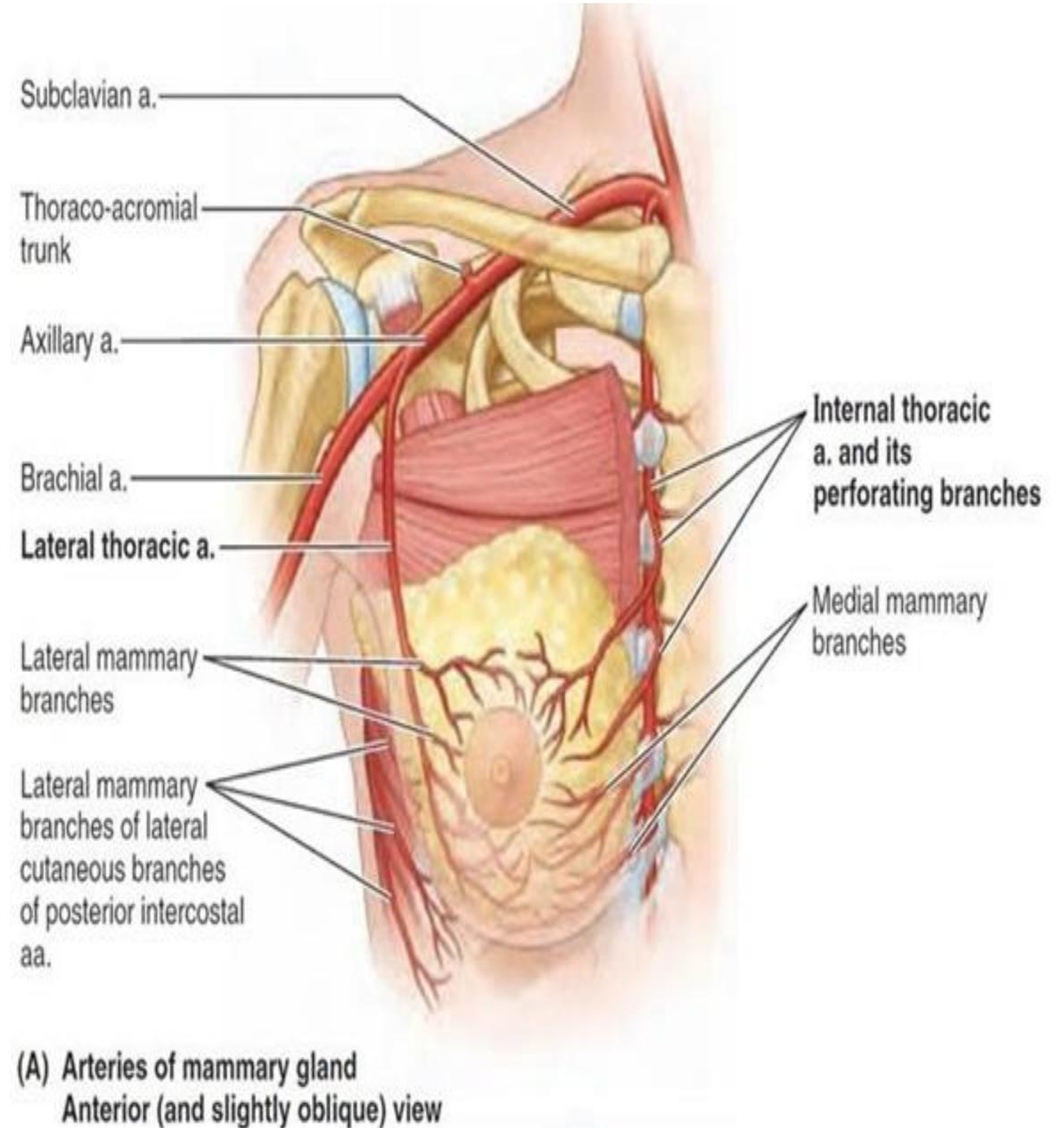
- **Lateral 1/2 & tail:**

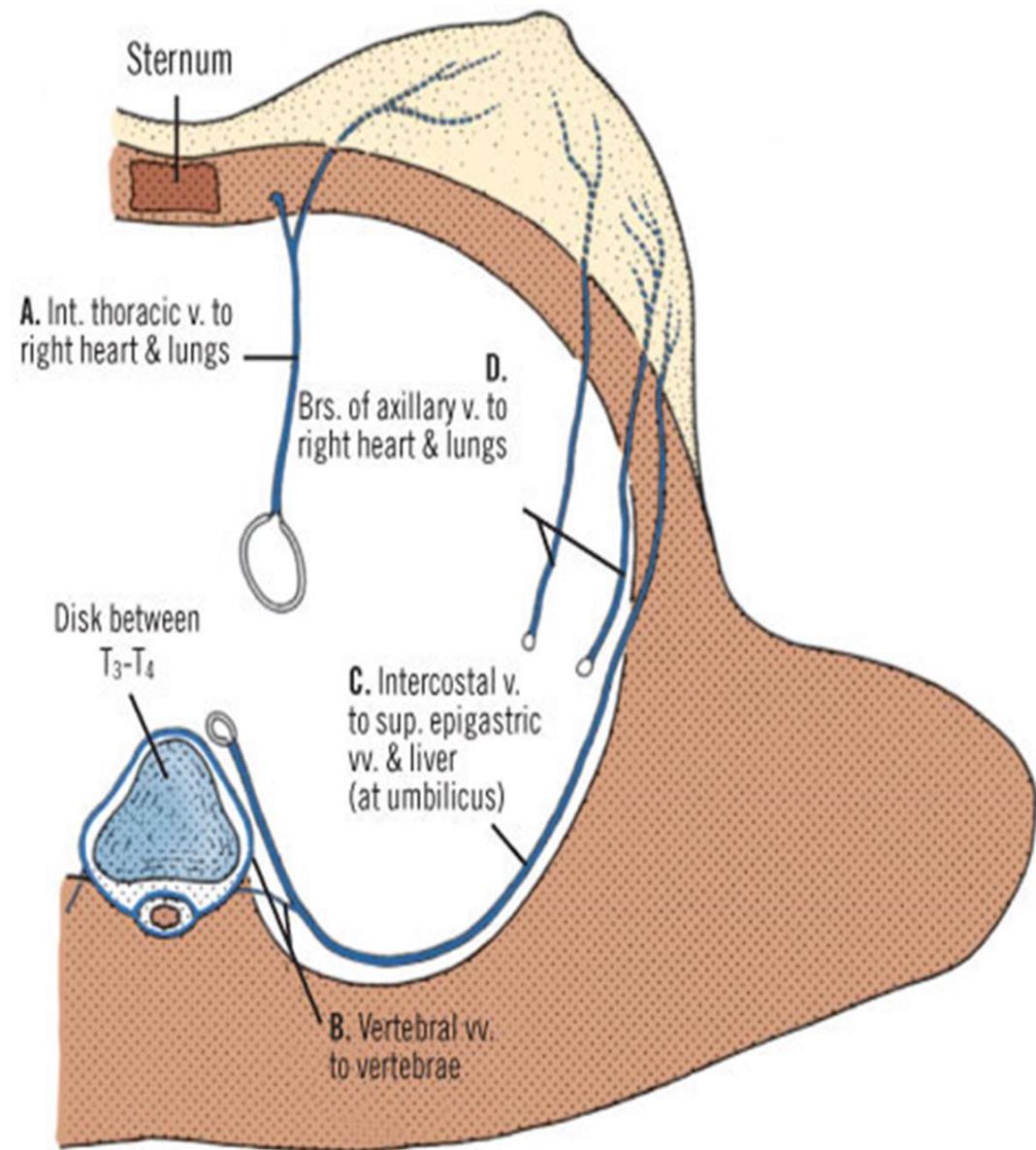
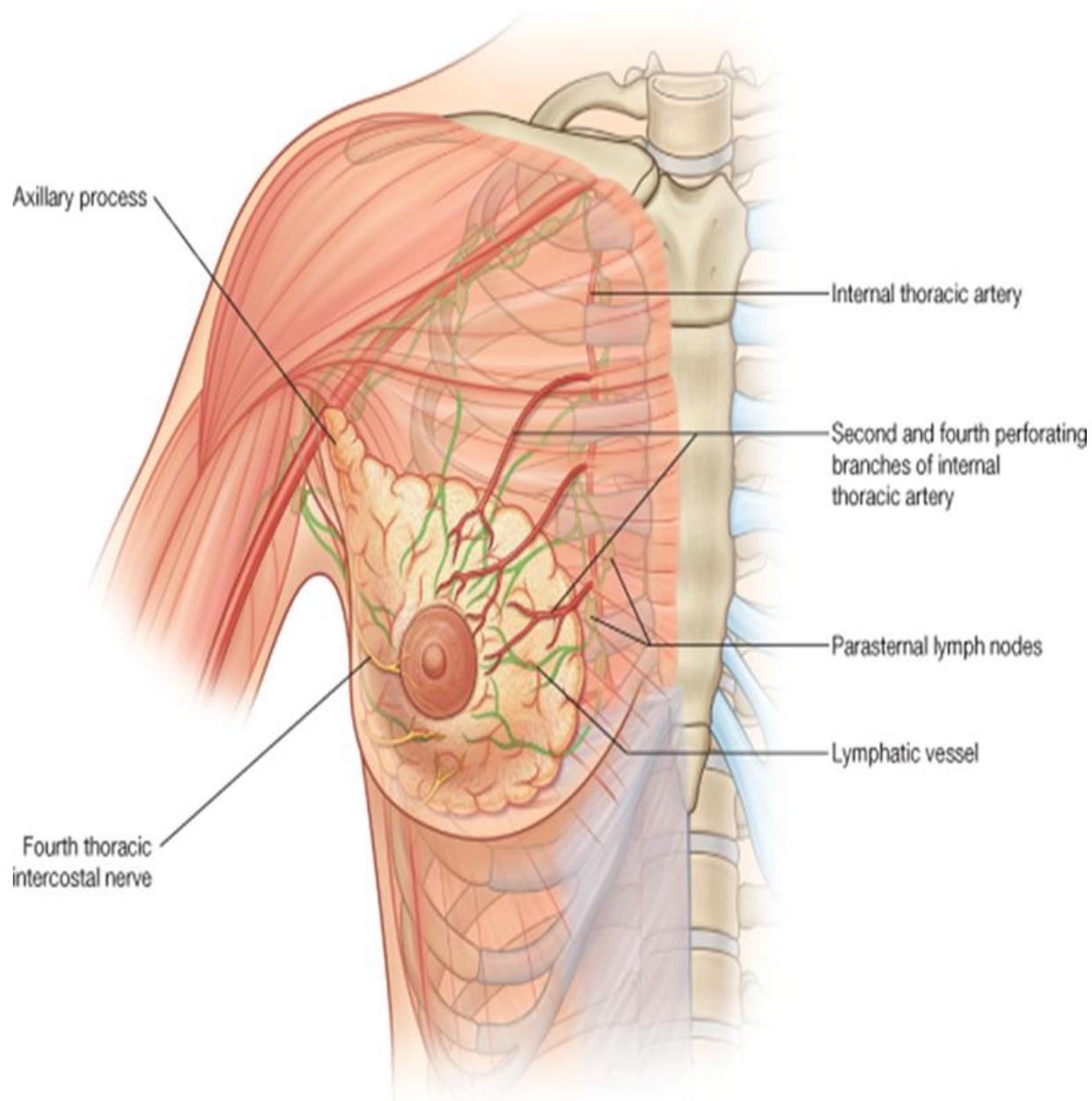
1-lateral thoracic artery (branch of 2nd part of axillary artery) They are accompanied by lymphatic vessels which drains into axillary lymph nodes

2- lateral branches of posterior intercostal arteries.

* **Medial 1/2:** perforating branches of internal thoracic artery . They are accompanied by lymphatic vessels which drains into parasternal lymph nodes.

***Venous Drainage:** axillary , & internal thoracic ,posterior intercostal. veins. By the second pathway, metastases of the breast readily reach the lungs. By the third pathway, metastases may travel to the skeleton and the central nervous system.





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Axillary lymph nodes

1. Anterior (pectoral) group:

Deep to the lower border of pectoralis major muscle along the lower border of pectoralis minor & lateral thoracic vessels.

It drains the anterior wall of trunk till the umbilicus (including the breast) and sends their efferents to central & apical groups.

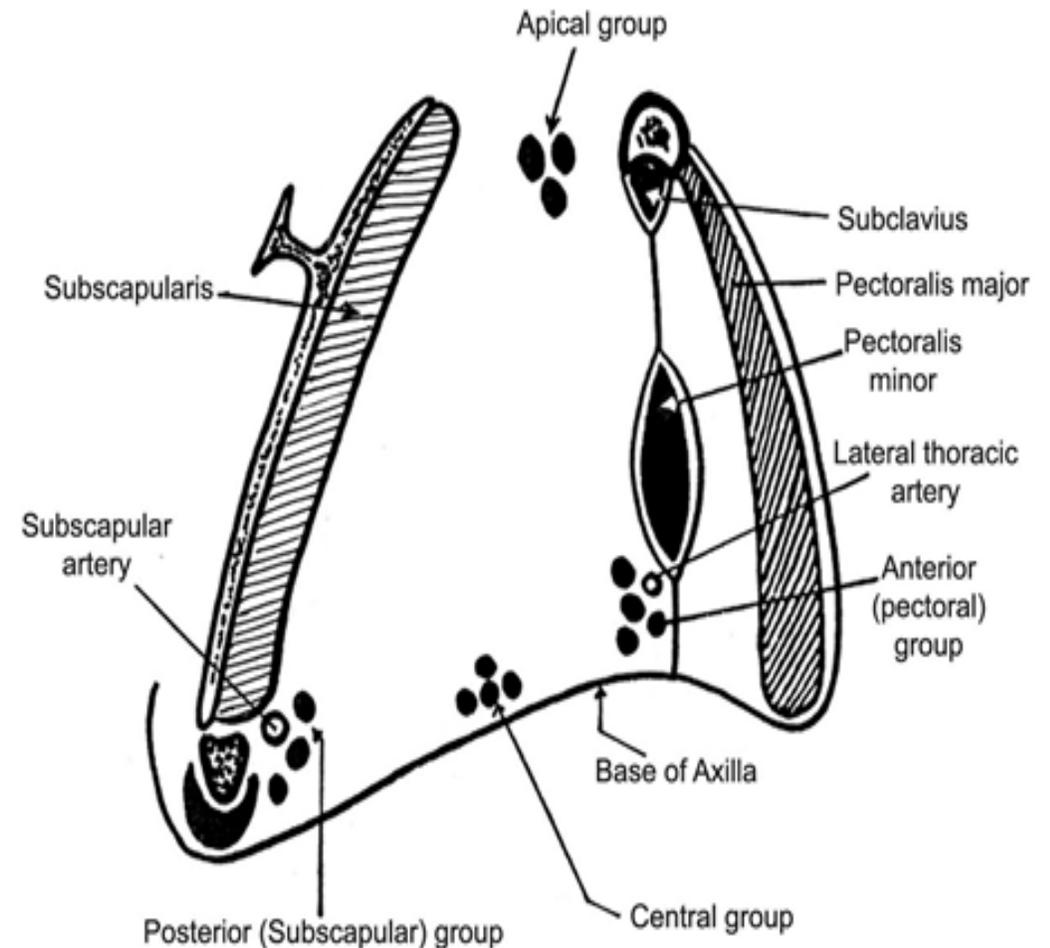
This group is **the main lymph drainage of breast**.

Usually, it is the **1st group** to be affected by **breast cancer**.

2. Posterior (subscapular) group:

Along subscapular vessels .

It drains the **posterior wall of trunk** till the iliac crest & **axillary tail of breast** and sends their efferents to central & apical groups.



AXILLARY LYMPH NODES
(Sagittal section of Axilla)

3. Lateral (humeral) group:

Lies *along* the axillary vein .

It drains the *upper limb* and sends their efferents to central & apical groups.

This group is ***never affected in cancer breast & should be preserved*** in any breast surgery to avoid postoperative arm oedema.

4. Central (basal) group:

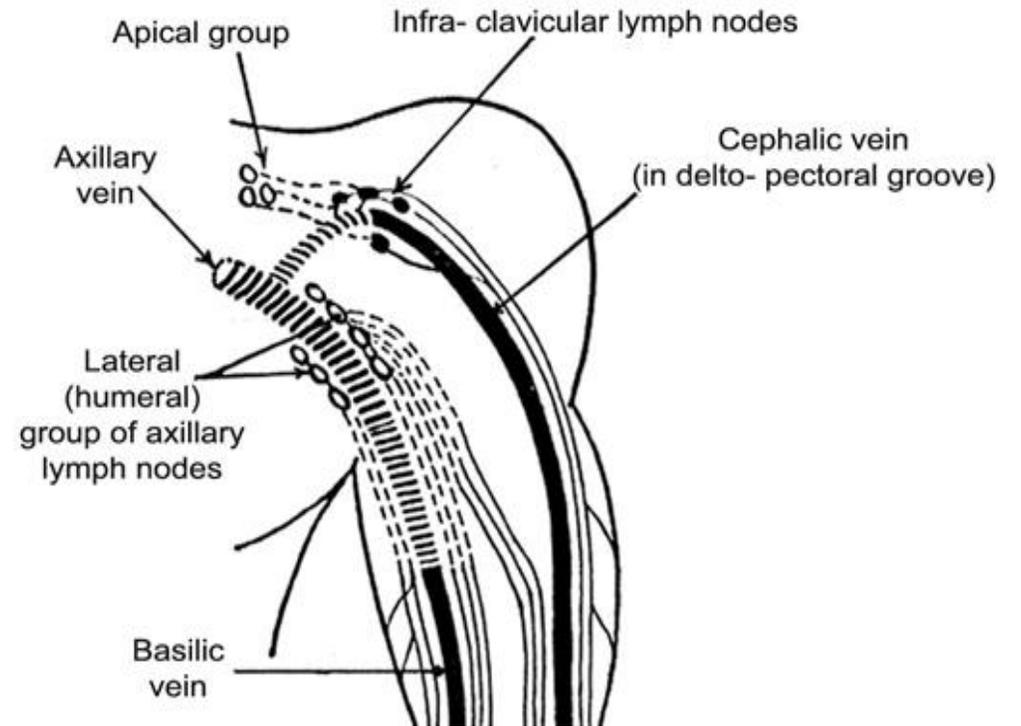
Lying on the base of axilla .

It drains the above mentioned groups and sends their efferents to apical group.

5. Apical group:

At the apex of axilla .

It drains all the above mentioned groups and their efferents form **subclavian lymph trunk** .



The lymphatic drainage of the breast passes along the following pathways:

1-Superficial lymphatics: to sub-areolar and circumareolar lymphatic plexus.

2. Deep lymphatics :

a. Laterally:

1- Most of breast drains to **pectoral (anterior)** lymph nodes. then to basal , apical lymph nodes ,supraclavicular lymph nodes .

2- axillary tail drains in the subscapular (posterior) lymph nodes

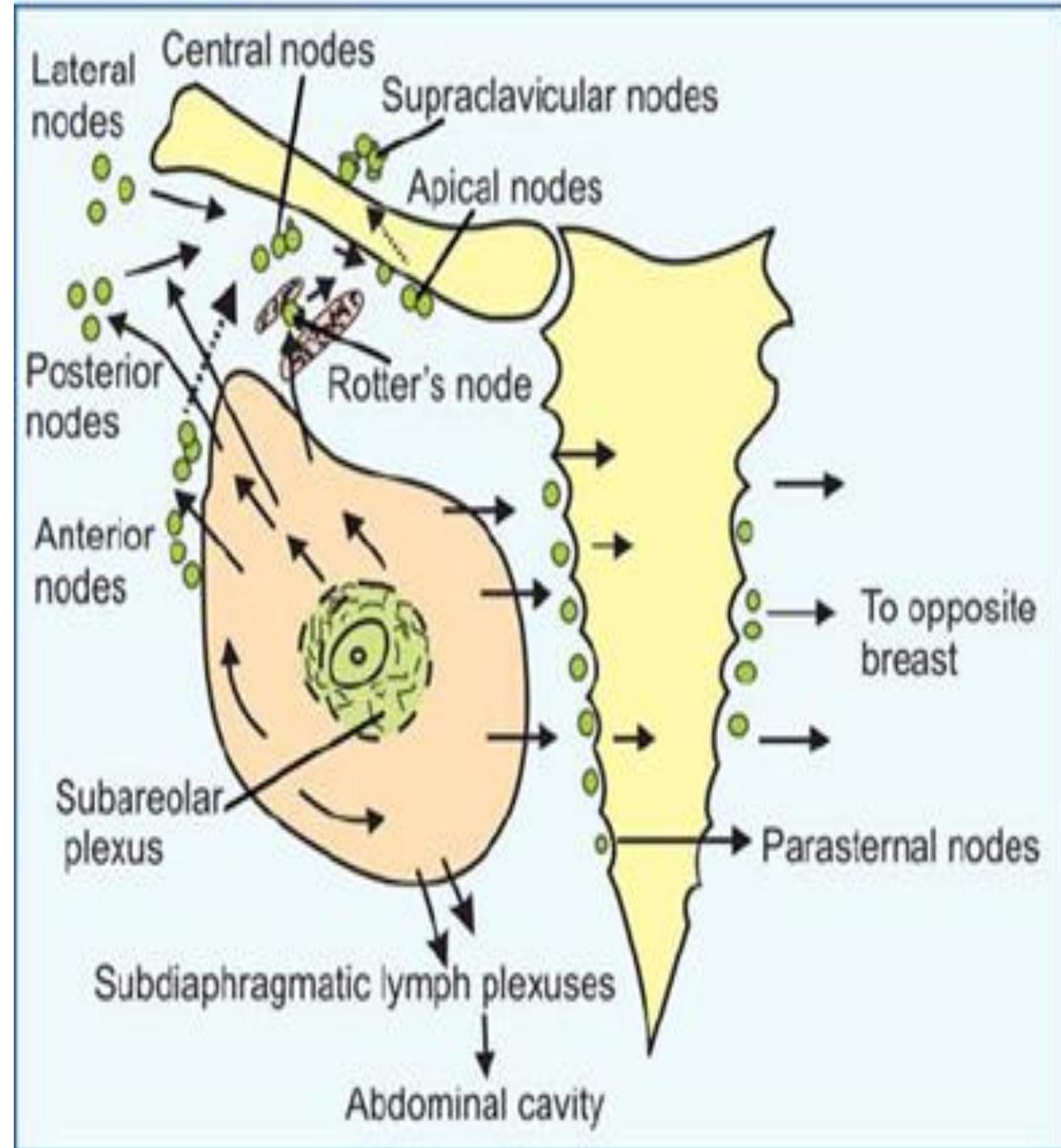
b. Medially: Some lymphatics from medial part of the breast drains to:

1.The internal thoracic (**parasternal**) lymph nodes **2.**The opposite breast & axilla.

c.Upwards: Some lymphatics pass from the upper part of breast directly to infra-clavicular & supra-clavicular lymph nodes.

D-Downwards: Some lymphatics from lower part of breast communicates with the lymphatics in the **rectus sheath** leading to malignant nodule in the umbilicus (sister Joseph nodule) and to the subdiaphragmatic l.n.

Breast cancer produce lymphatic spread mainly to anterior basal apical groups of axillary lymph nodes .



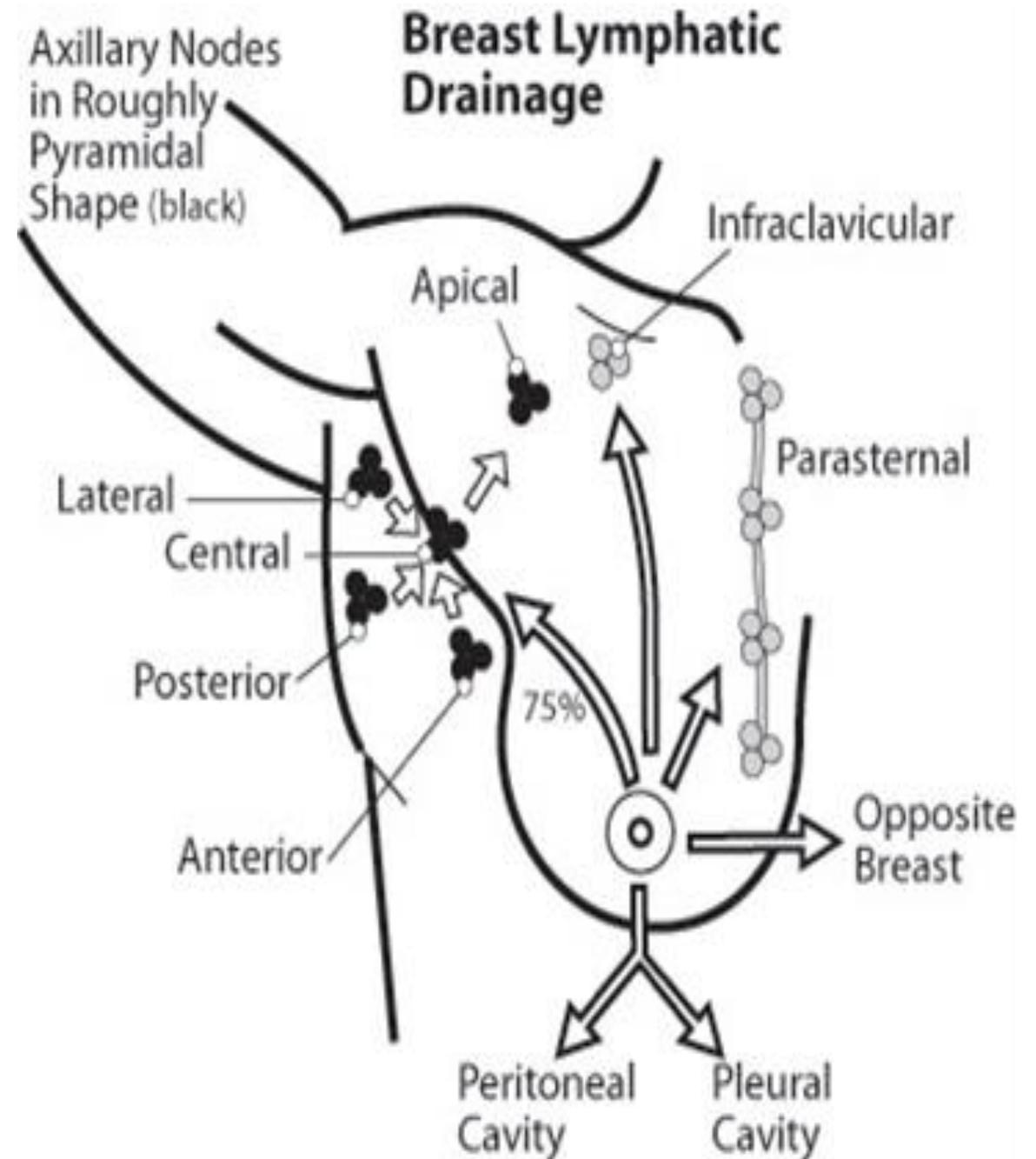
The axillary L. Ns are divided into 3 levels.

I. Lymph nodes. inferior to lower border of pectoralis minor.

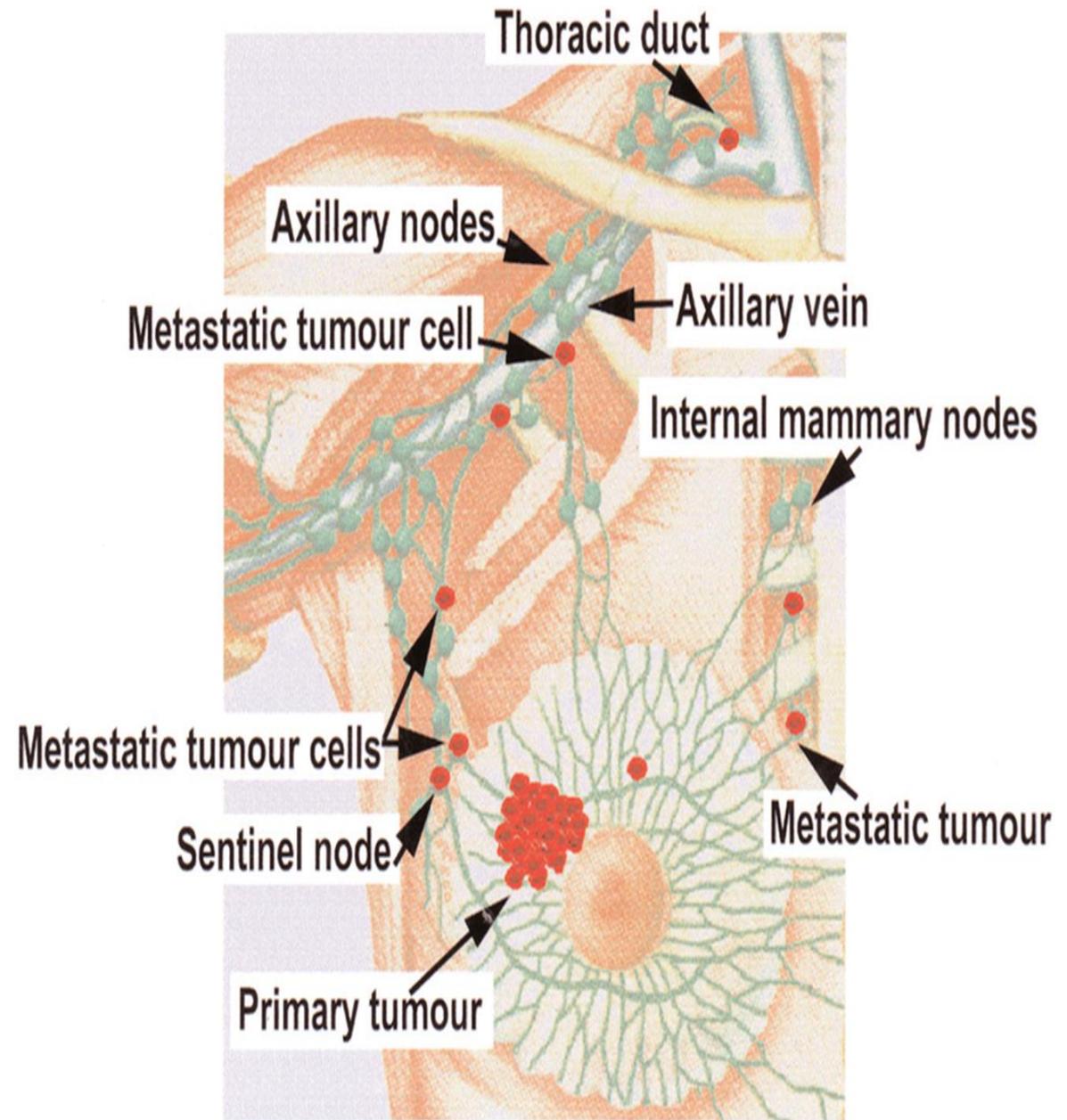
II. LNs directly deep to pectoralis minor.

III. Lymph nodes superior to pectoralis minor.

Prognosis is inversely related to the level of axillary Lymph nodes involvement.



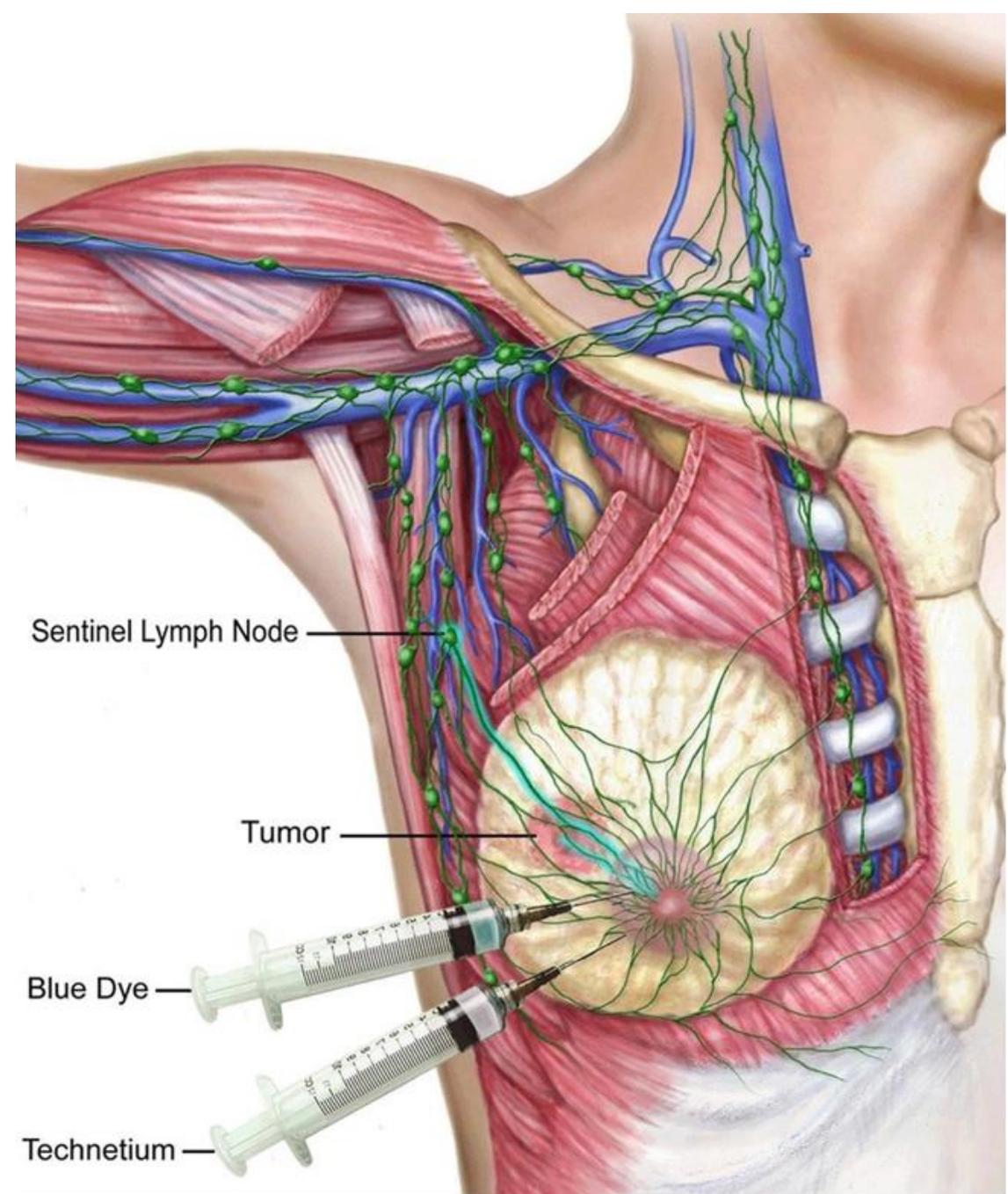
-Sentinel lymph node is the first node receiving lymph from the primary tumor .



I Anatomical analysis of the physical signs of cancer of the breast:

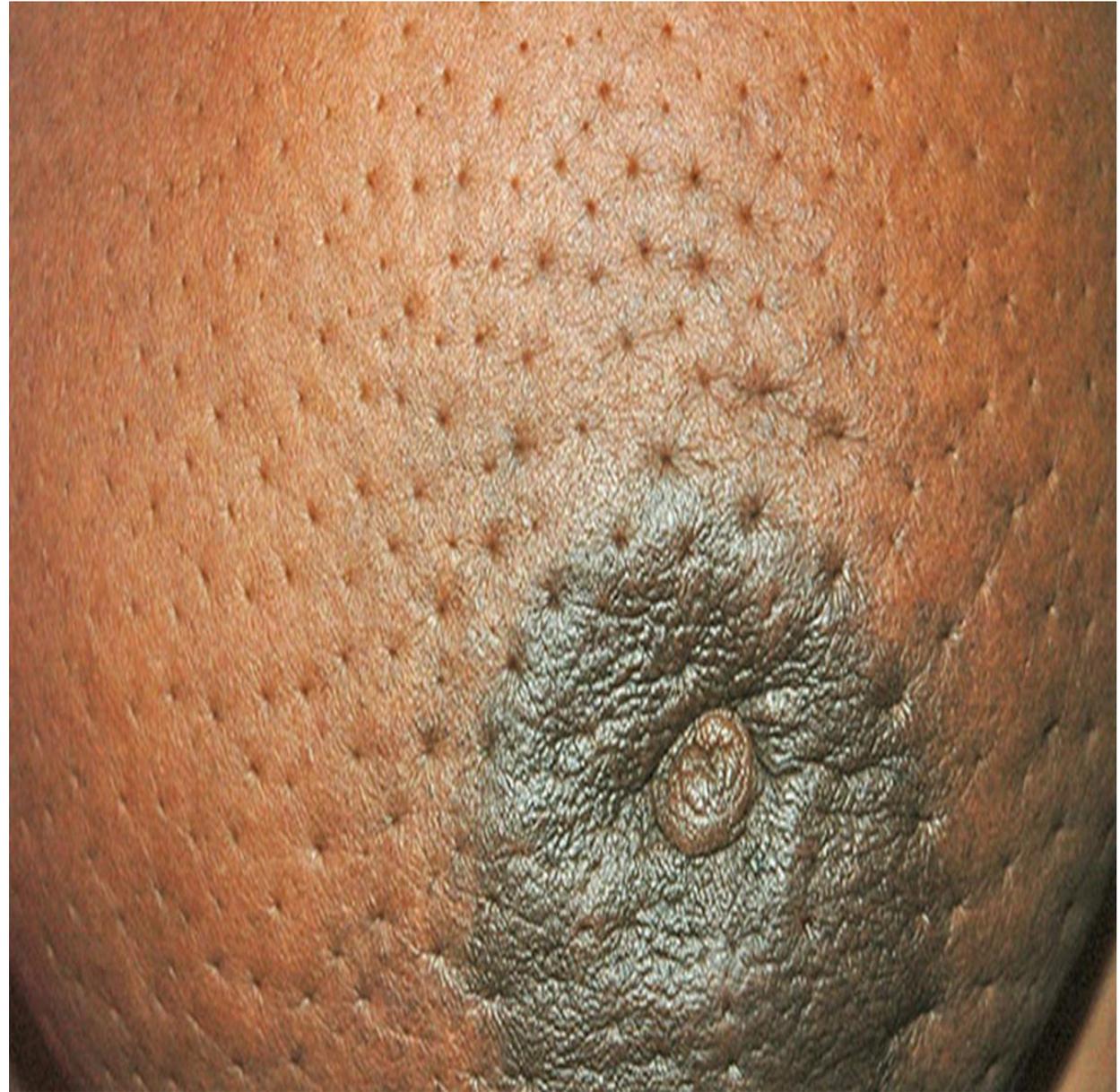
1. Invasion of the deep fascia (fibrosis of retro-mammary space, leads to fixation of the breast (advanced cases).

2. Invasion of the suspensory ligaments, leads to shortening of the ligaments -----dimpling of overlying skin.



3. If tumor tissue blocks the deep lymphatics, lymph from the skin cannot be drained away, and the skin becomes pitted and edematous, resemble texture of the skin of orange (**peau d' orange**)

4. Invasion of the lactiferous ducts, leads to shortening of the ducts ----- **retracted (inverted) nipple**



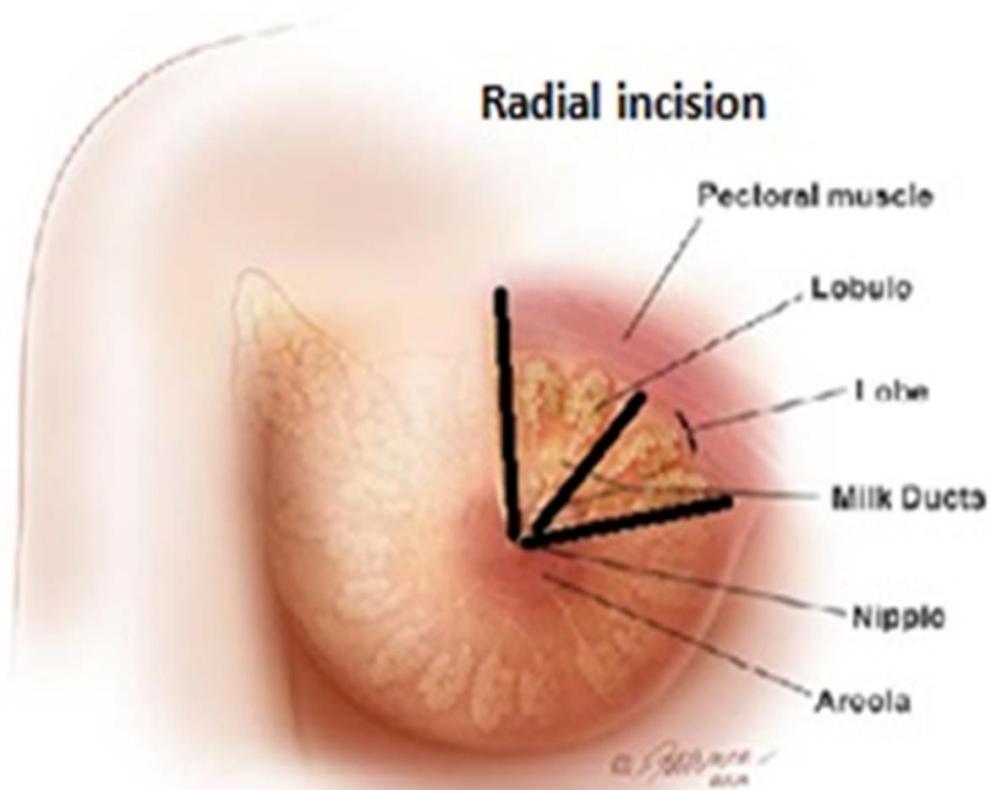
- II. In case of **breast abscess**, incision must be done in a radial direction ,to minimize ducts damage



Retracted nipple



Peau d' orange



Radial incision

