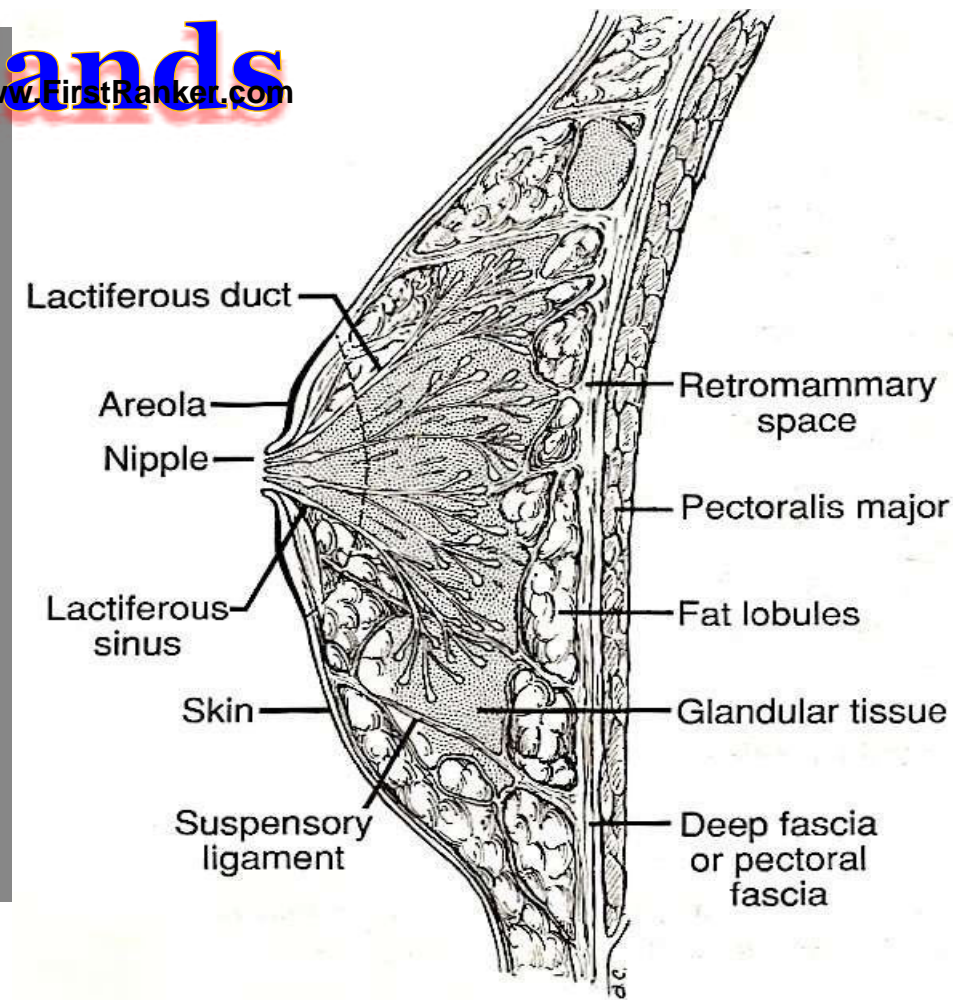
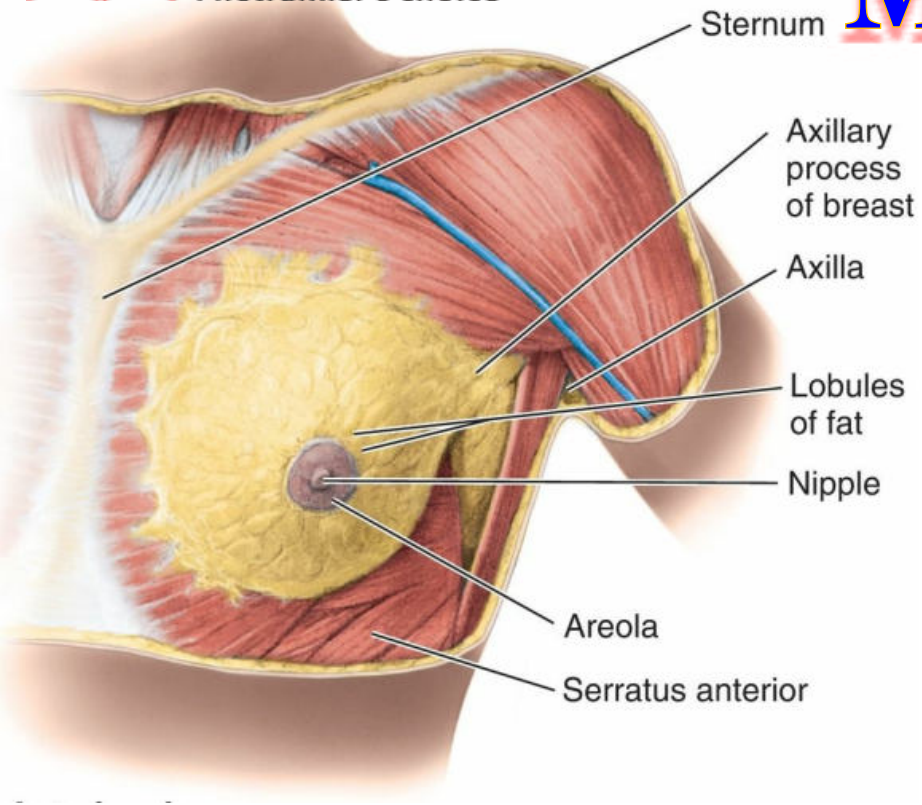
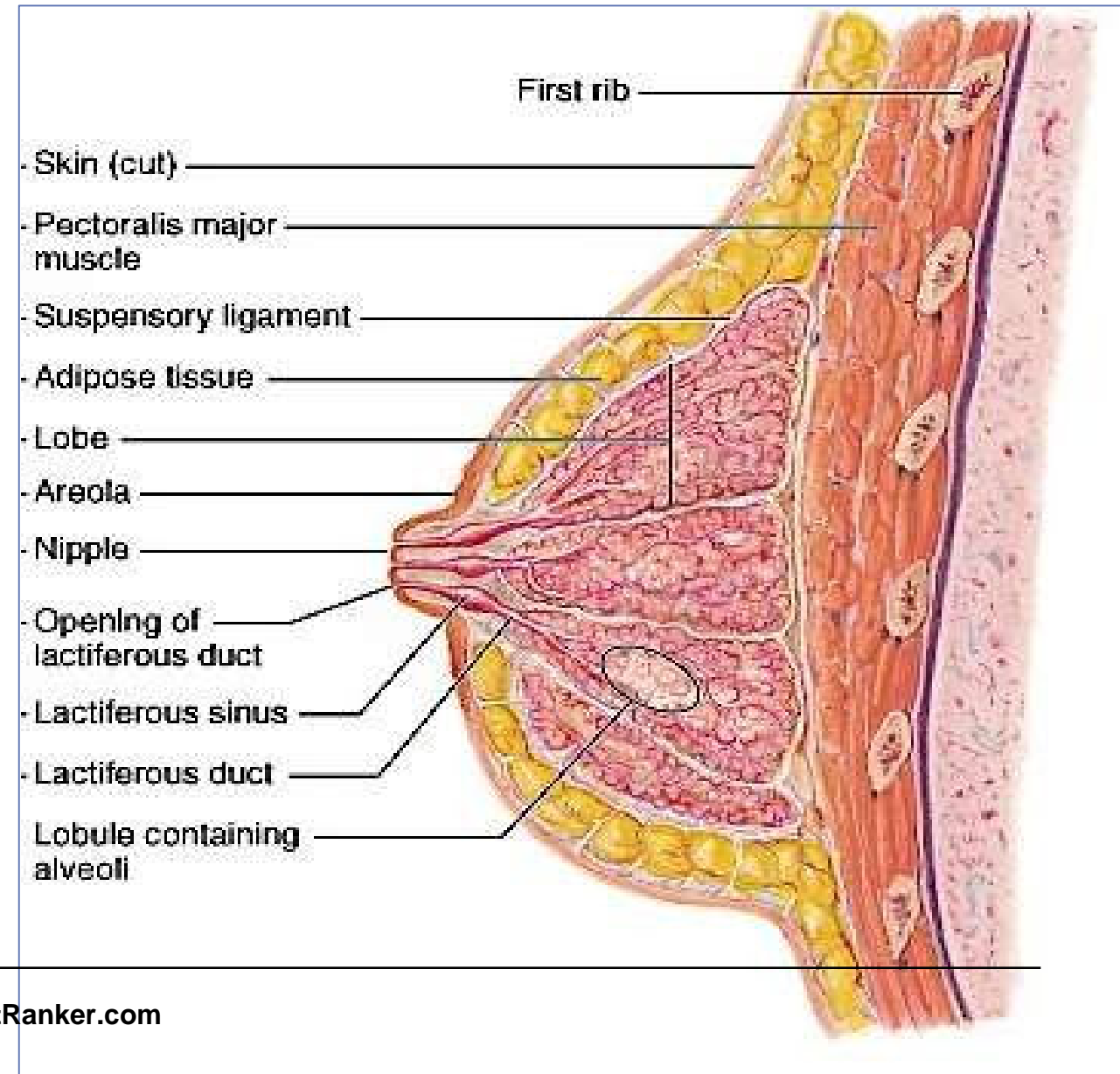


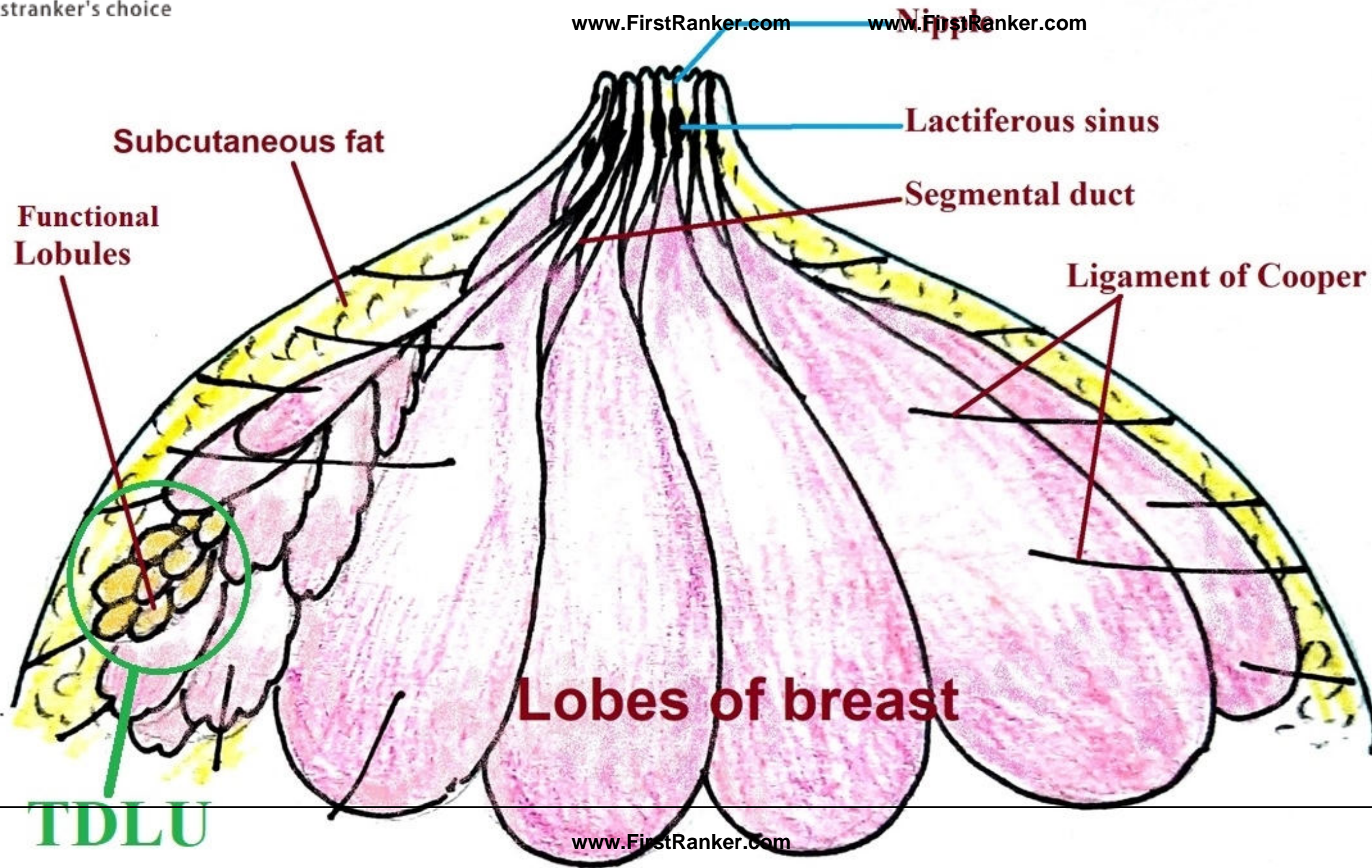
Mammary glands



- ❖ **Modified sweat gland in sup fascia**
- ❖ **No connective tissue covering.**
- ❖ **Accessory female reproductive organ.**

- Superficial & deep surface
- Superficial surface
 - Skin, nipple & areola
 - Under skin, superficial fascia has nerves/vessels
 - Nipple and areola - No subcutaneous fat and hair.



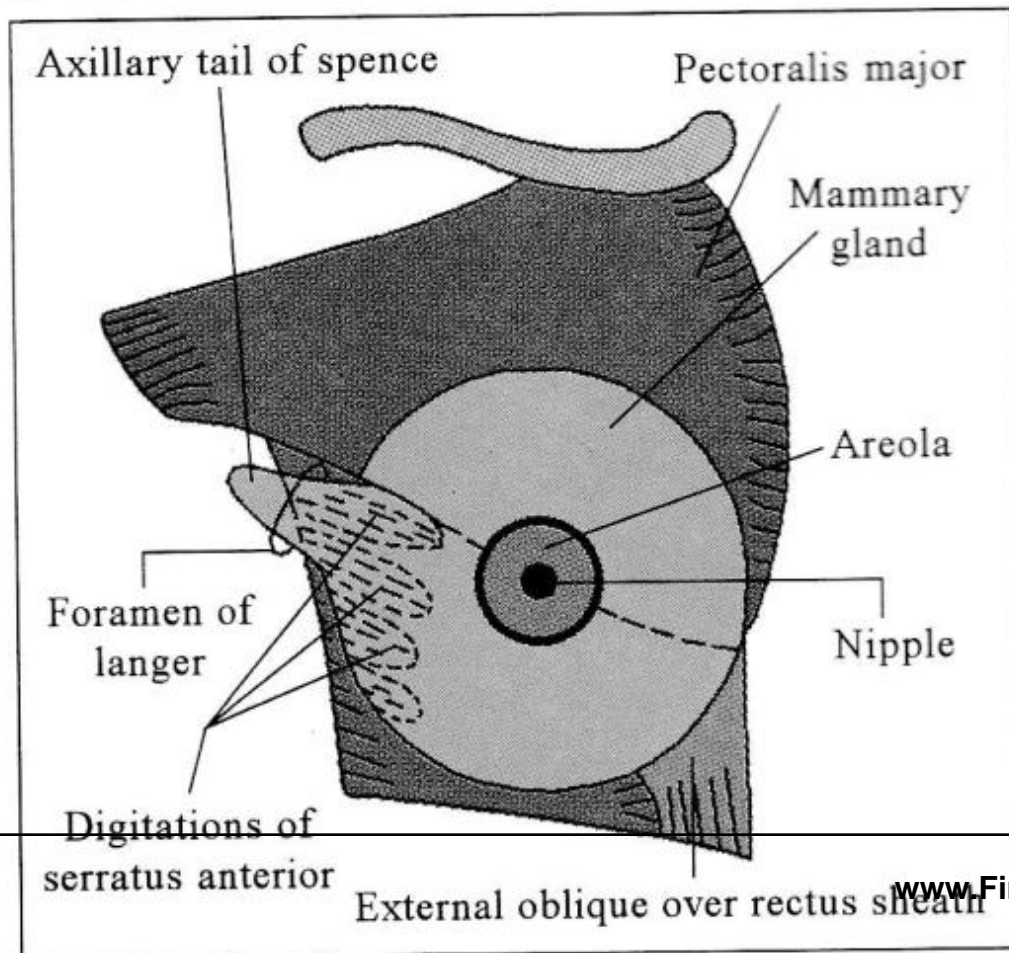


Extent—The glandular base extends :

Vertically, from the second to the sixth rib in the mid-clavicular line;

Horizontally, from the lateral border of sternum to the mid-axillary line along the fourth rib;

Mammary bed (Fig. 4.1)—The base of the gland rests upon the following structures :



Pectoralis major, in medial two thirds; *serratus anterior*, in lateral one-third; *external oblique aponeurosis*, in the infero-medial quadrant; it separates the breast from rectus abdominis.

Deep projections from the glandular parenchyma sometimes penetrate the superficial part of pectoralis major.

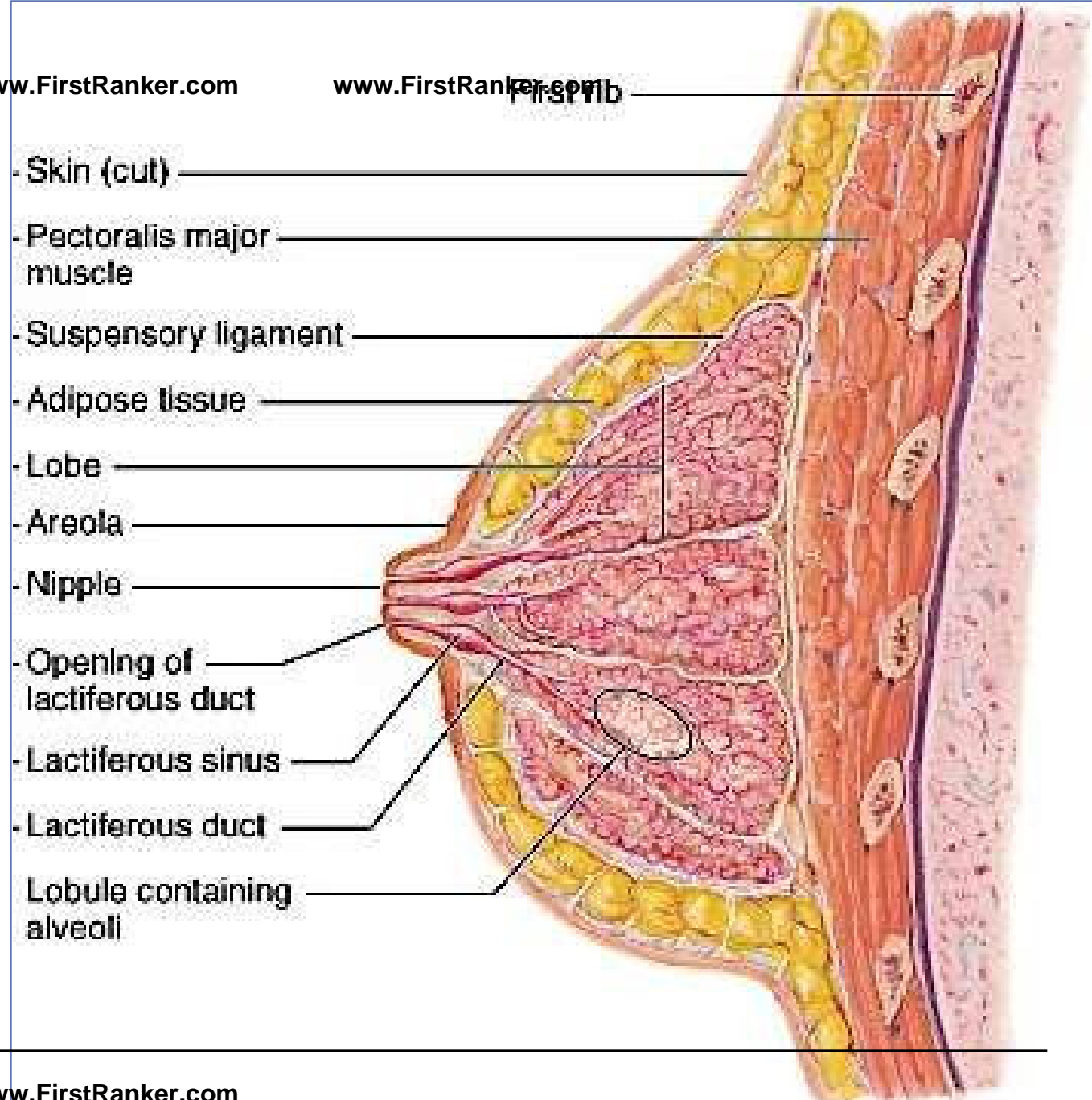
A **retro-mammary space** containing loose connective tissue intervenes between the base of the gland and the deep fascia covering the structures of the mammary bed. As a result, the normal breast can be moved *freely* over the pectoralis major. In invasion of breast carcinoma, the gland is *fixed* to the pectoralis major.

Axillary tail of spence—Sometimes a tail-like projection from the upper and outer quadrant of the gland enters the axilla through an opening in the axillary fascia known as *foramen of Langer*. This process comes in contact with the anterior group of axillary lymph nodes, and when enlarged, may be mistaken for a lipoma.

- 4th ICS, 4 inch from midline
- 15 – 20 lactiferous ducts open
- Presence of circular muscle, longitudinal muscle
- Rich nerve supply.

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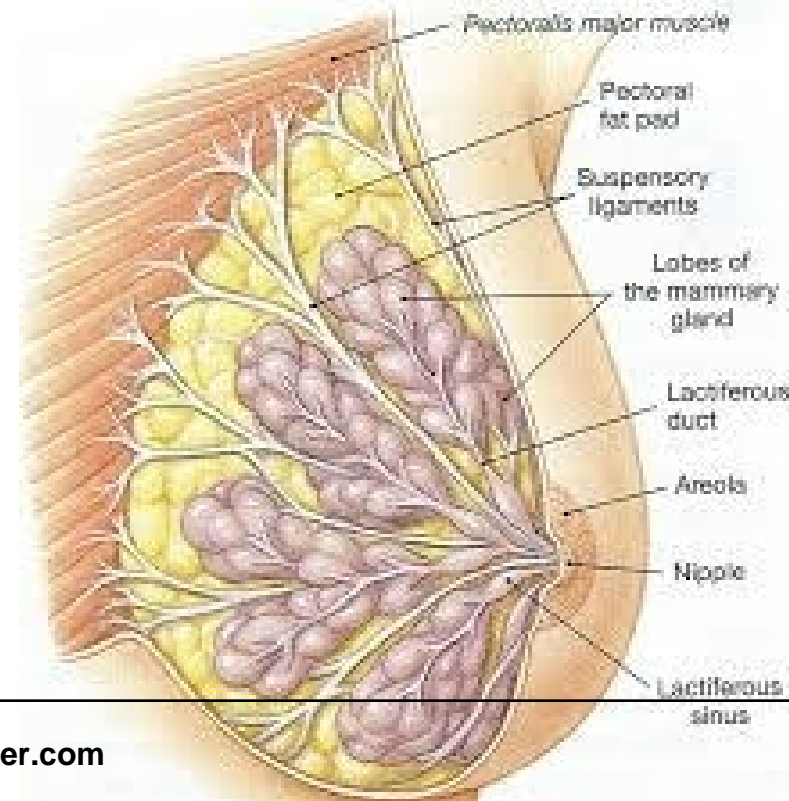
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- The diagram illustrates a cross-section of a breast. It shows the skin on the outside, followed by the pectoralis major muscle. A suspensory ligament is shown extending from the skin to the areola. Adipose tissue is located between the skin and the glandular tissue. The glandular tissue is divided into lobes, each containing lobules. A lactiferous duct is shown opening at the nipple, passing through a lactiferous sinus. The diagram also shows the circular and longitudinal muscles of the nipple.
- Skin (cut)
 - Pectoralis major muscle
 - Suspensory ligament
 - Adipose tissue
 - Lobe
 - Areola
 - Nipple
 - Opening of lactiferous duct
 - Lactiferous sinus
 - Lactiferous duct
 - Lobule containing alveoli

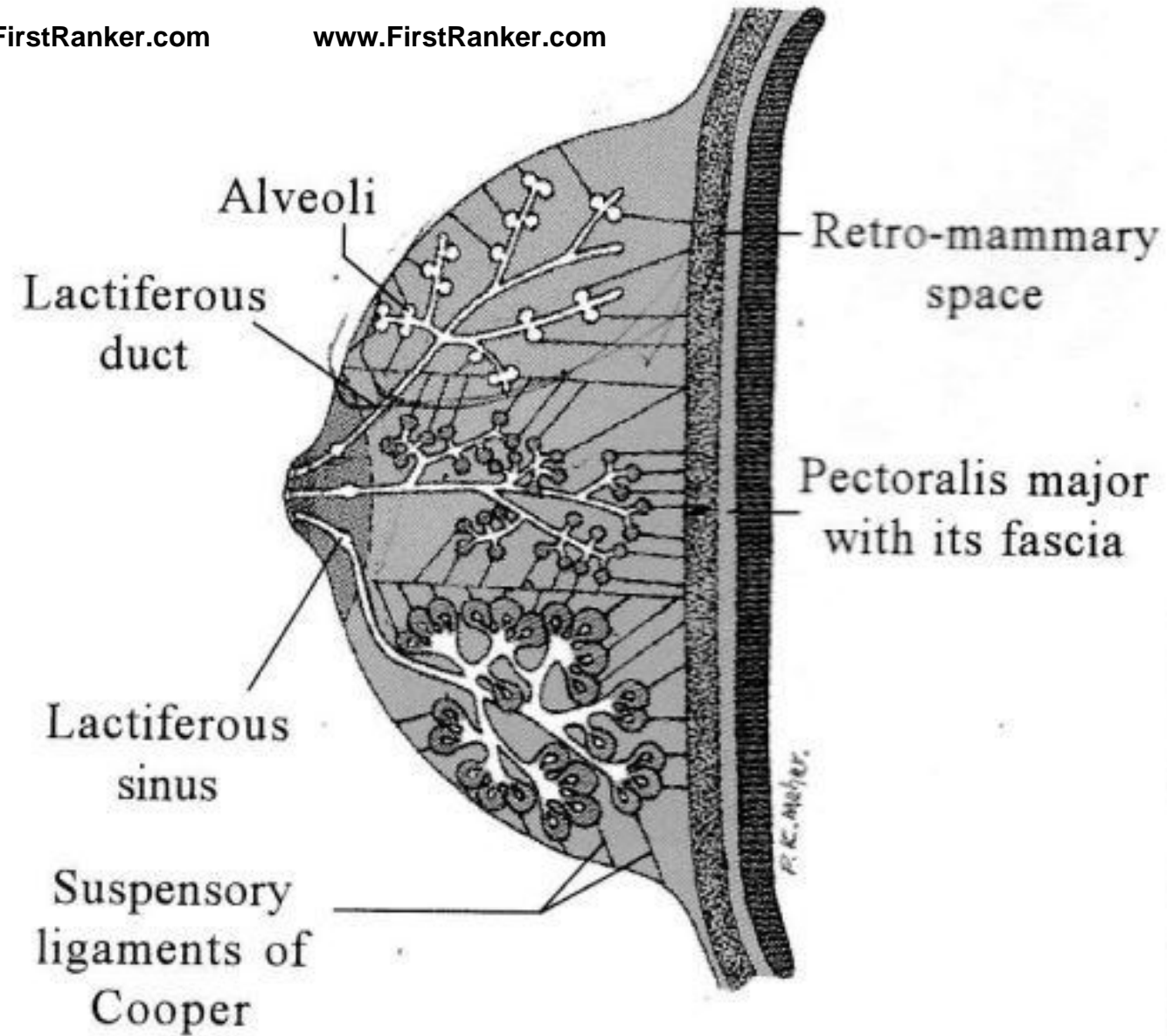
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Areola—It is a pigmented circular area of skin around the base of the nipple. The pigmentation is irreversibly darkened after first pregnancy. Outer margin of the areola contains a number of modified sebaceous glands, which are enlarged during pregnancy and lactation and are known as tubercles of Montgomery. Oily secretion of these glands provides protective lubricant during lactation. Besides these glands, the areolar contains sweat glands and accessory mammary glands. The skin of the areola and nipple is devoid of hair and subcutaneous fat.

Beneath the areola each lactiferous duct is dilated to form **lactiferous sinus**, before passing through the nipple. A sub-areolar **lymphatic plexus of Sappey** collects the lymph from the areola and nipple.



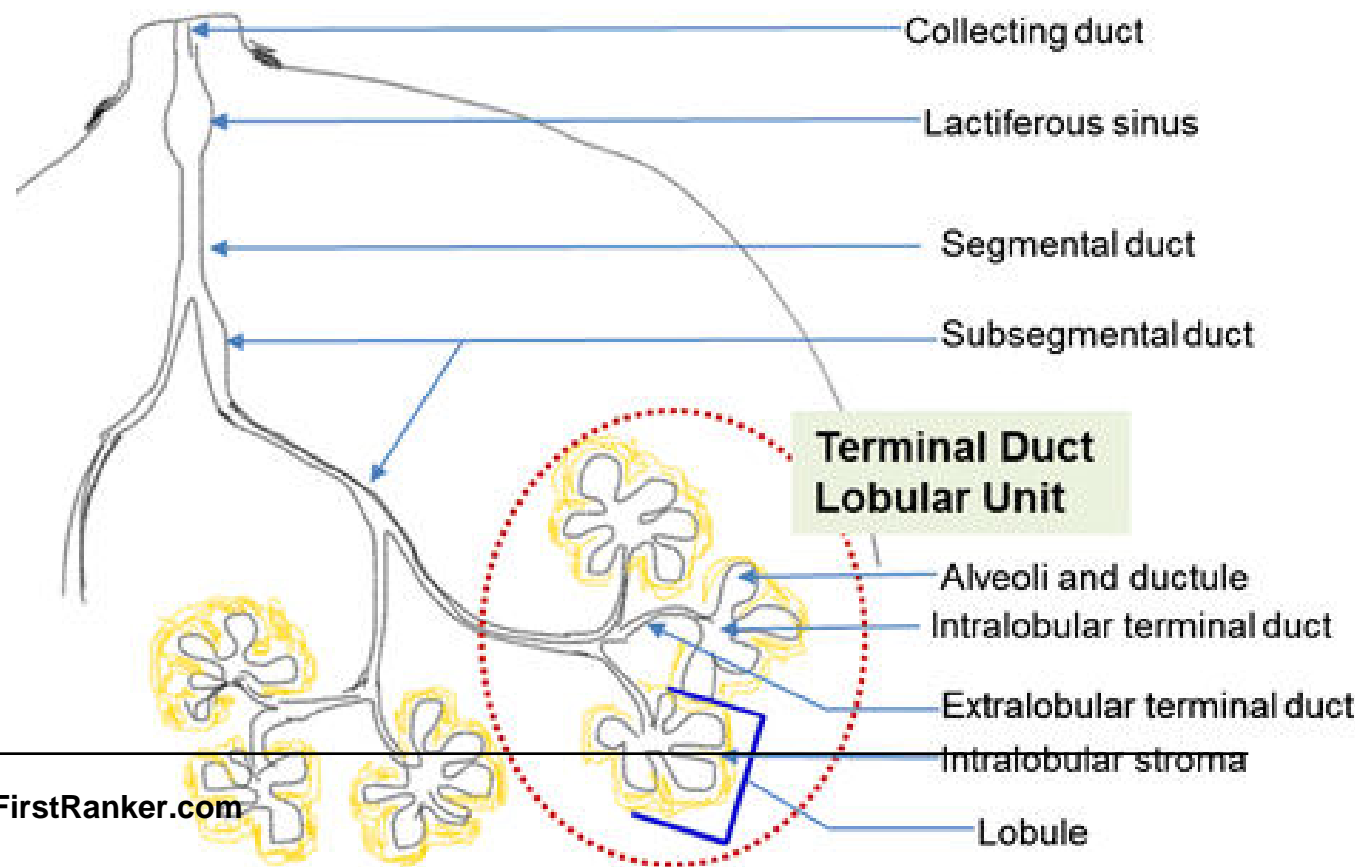
- Glandular portion with parenchyma
- Connective tissue i.e stroma
 - Fibrous tissue
 - Fatty tissue
 - Suspensory lig of cooper

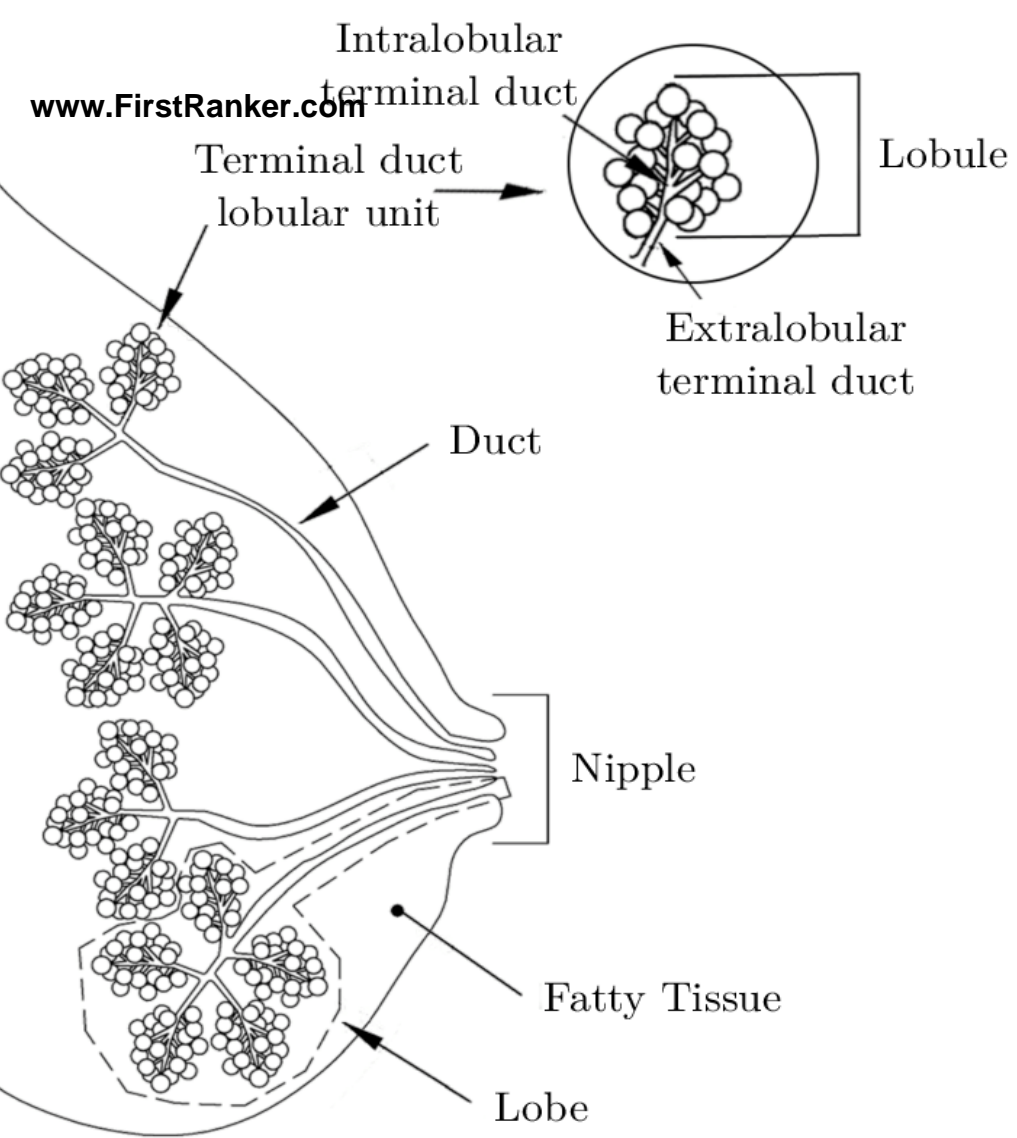
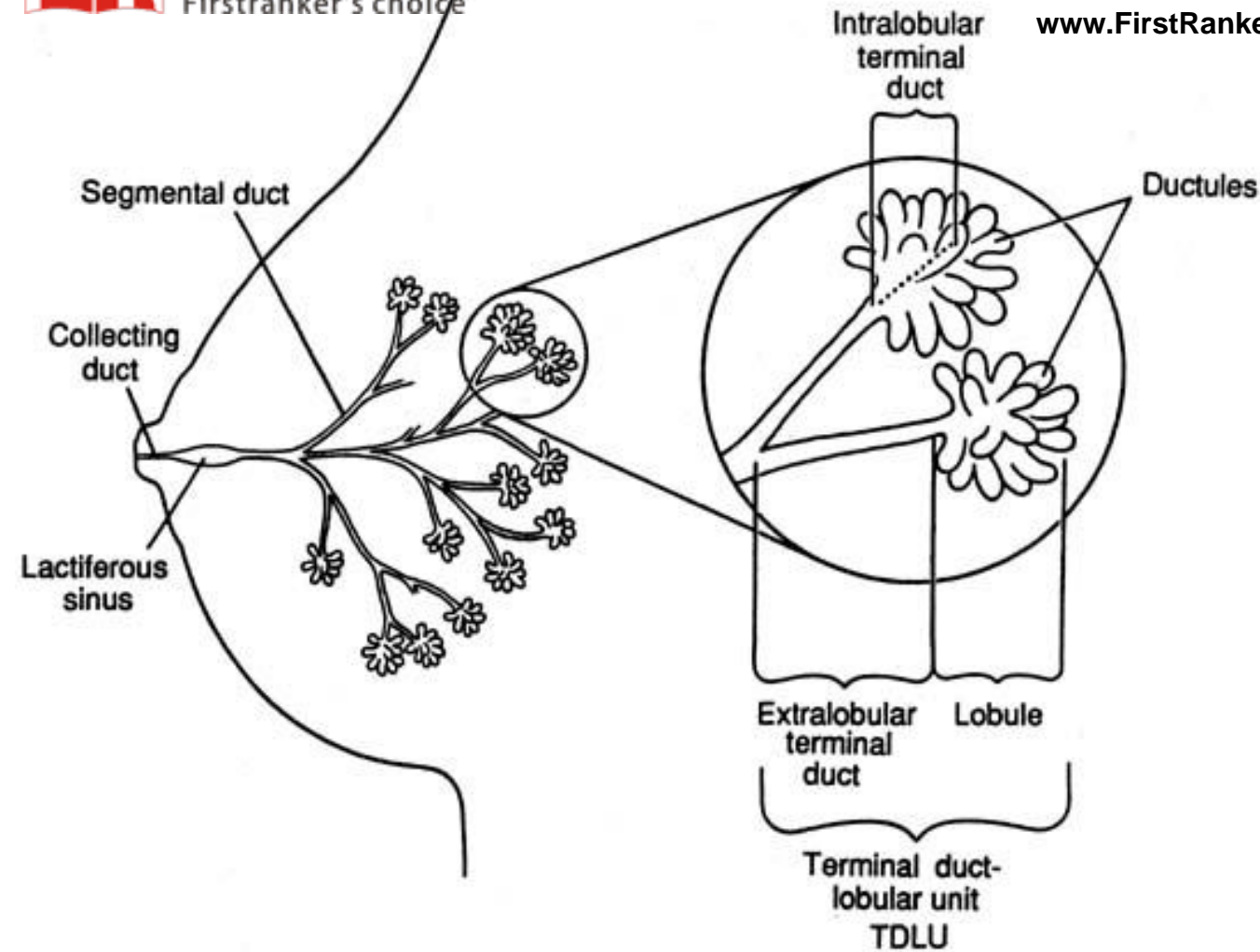


www.FirstRanker.com **Fig. 4.3.** *Sagittal view of adult female breast.*

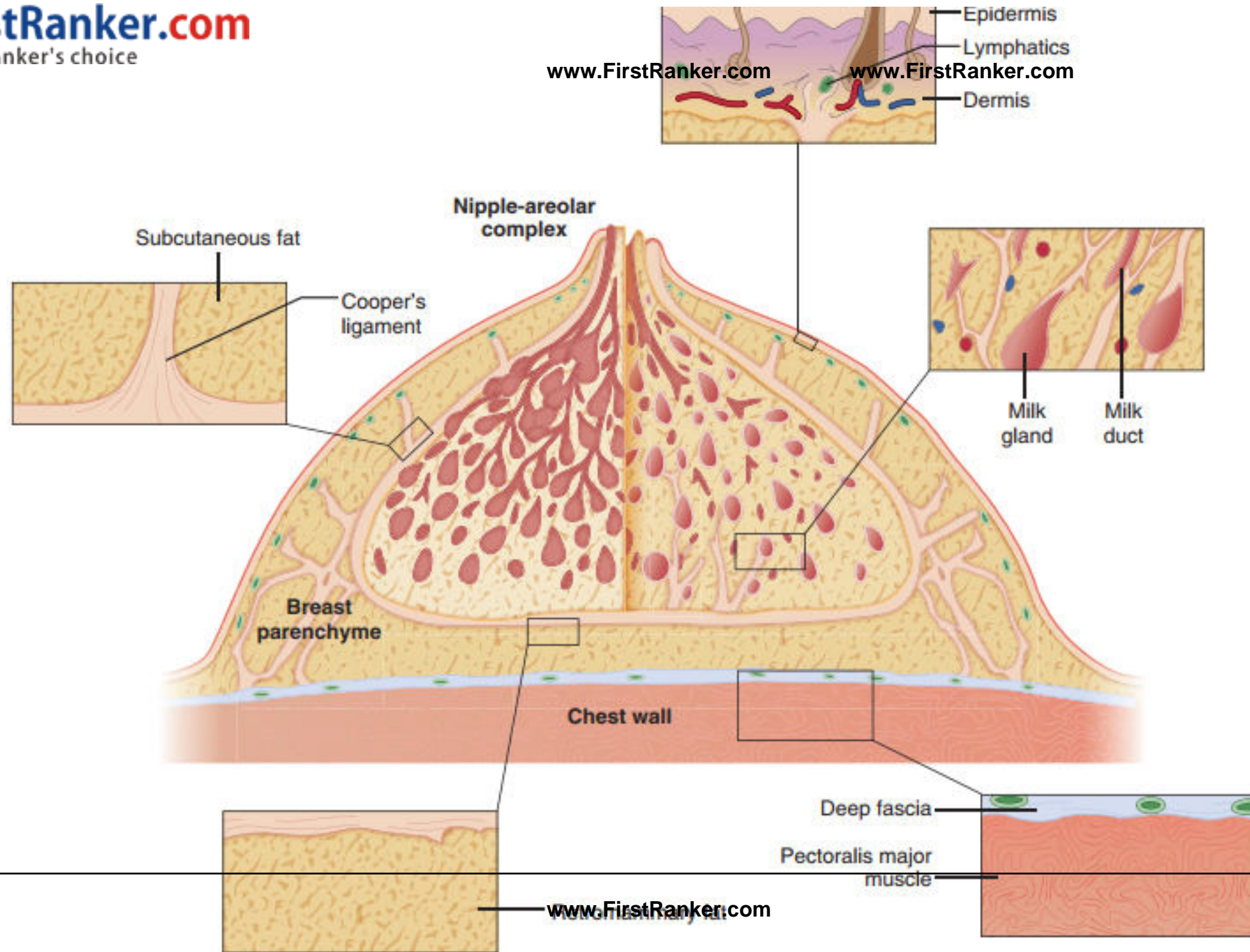
The ductal system begins at the nipple where the lactiferous sinuses open onto the skin. These lead into the lactiferous ducts which divide repeatedly to form the terminal ducts that open into a lobule comprising multiple acini (ductules). This terminal duct and associated lobule is termed the terminal duct-lobular unit, which is the morpho-functional unit of breast. TDLU is the most important glandular structure of breast secretes milk and it is basically a grapelike cluster of small alveoli that comprises lobule and terminal duct. The terminal ducts drain in to the subsegmental and segmental duct which drains into the lactiferous duct and collecting duct. TDLUs are effective functional unit. The secretory parts are surrounded by specialized connective tissue. So, TDLU consists of –

1. Extralobular terminal duct.
2. Intralobular terminal duct.
3. Lobule (functional unit).





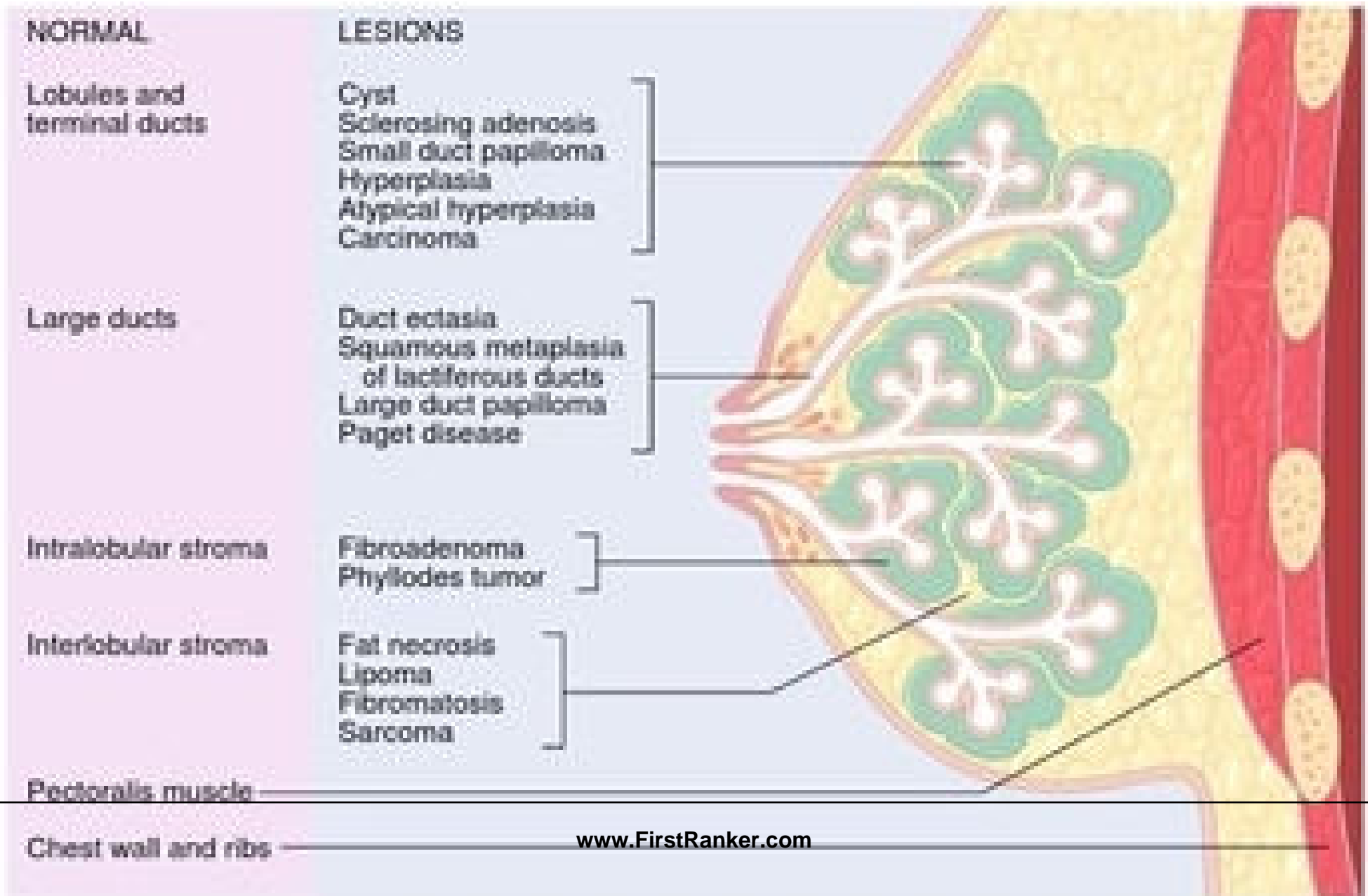
Although traditionally the breast is described as containing 15 to 20 distinct lobes, observation reveals that there are usually approximately six openings onto the nipple (galactophores), as some of the lobes join at the level of the collecting duct or even into the lactiferous sinus. Otherwise, there is no direct anatomical connection between the various lobes.



Anatomic origin of common breast lesions

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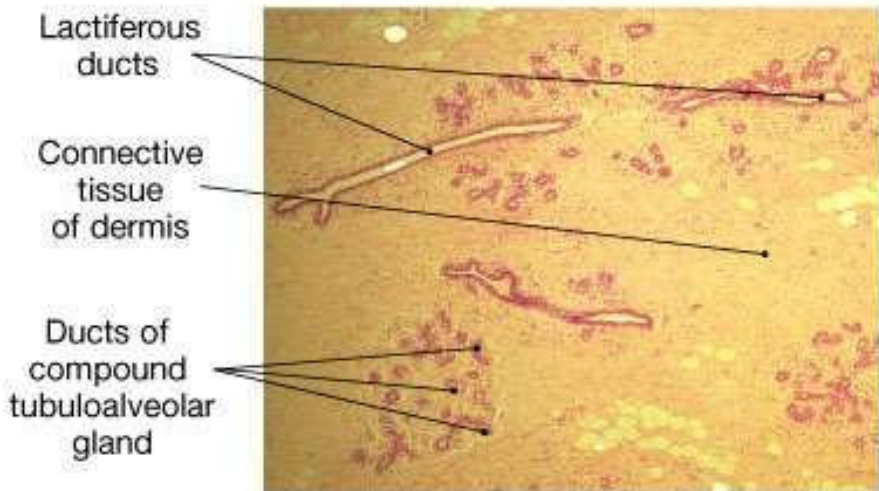
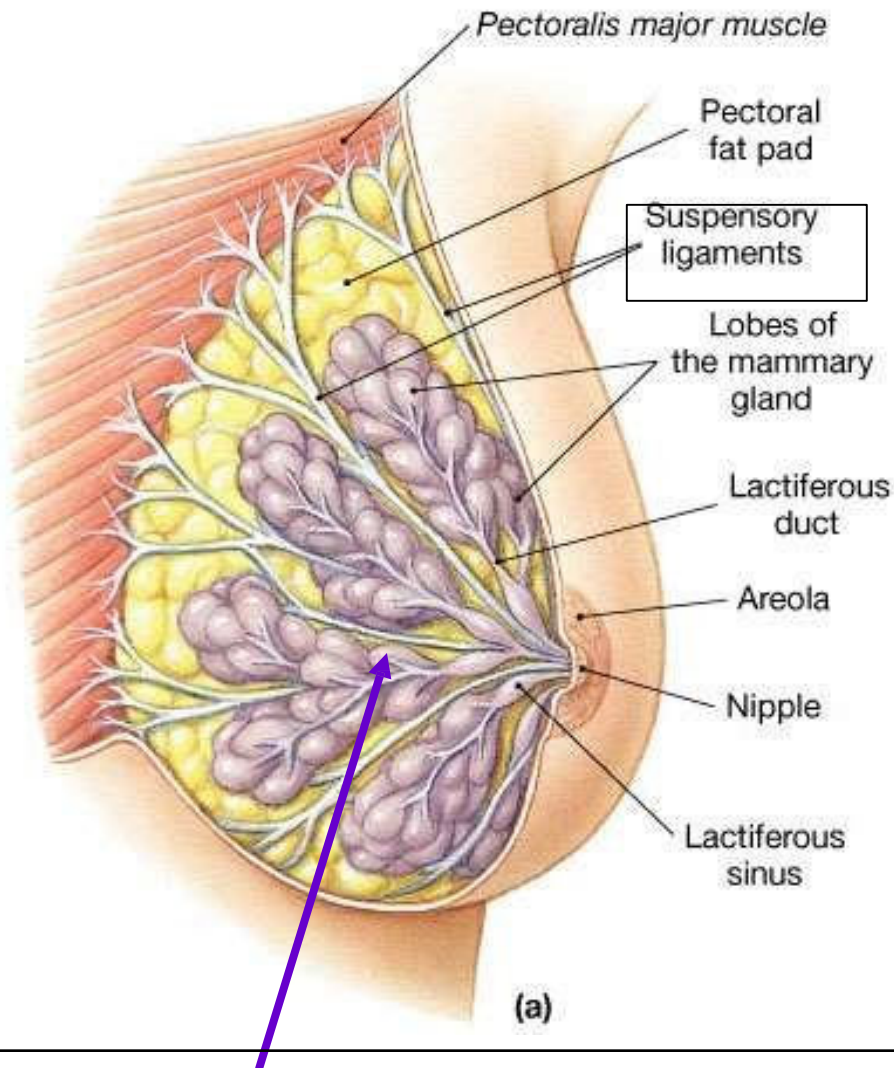


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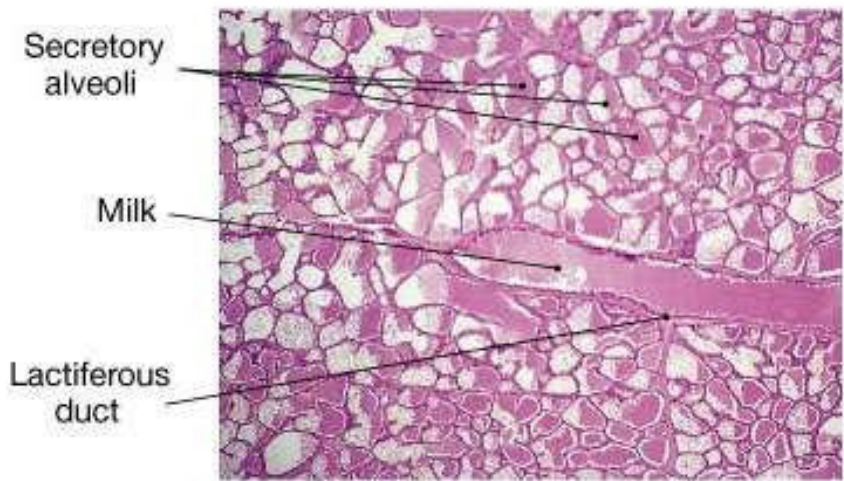
Mammary Gland: Structure

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(b) Inactive mammary gland



(c) Active mammary gland

Suspensory ligament running from skin to P Major

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Alveoli opening into duct

1. Internal thoracic artery (subclavian)

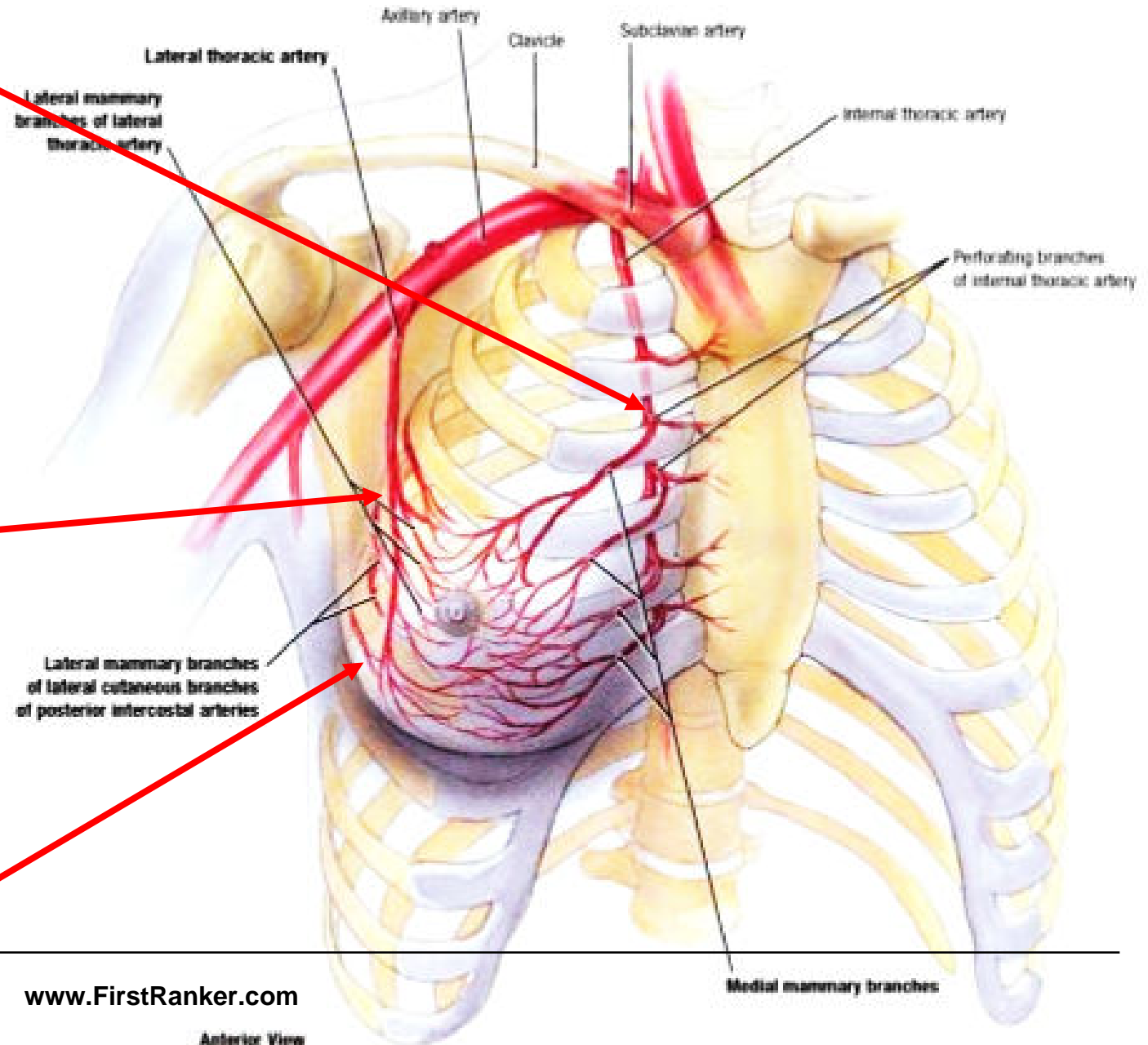
- perforating br – 2,3,4 ICS

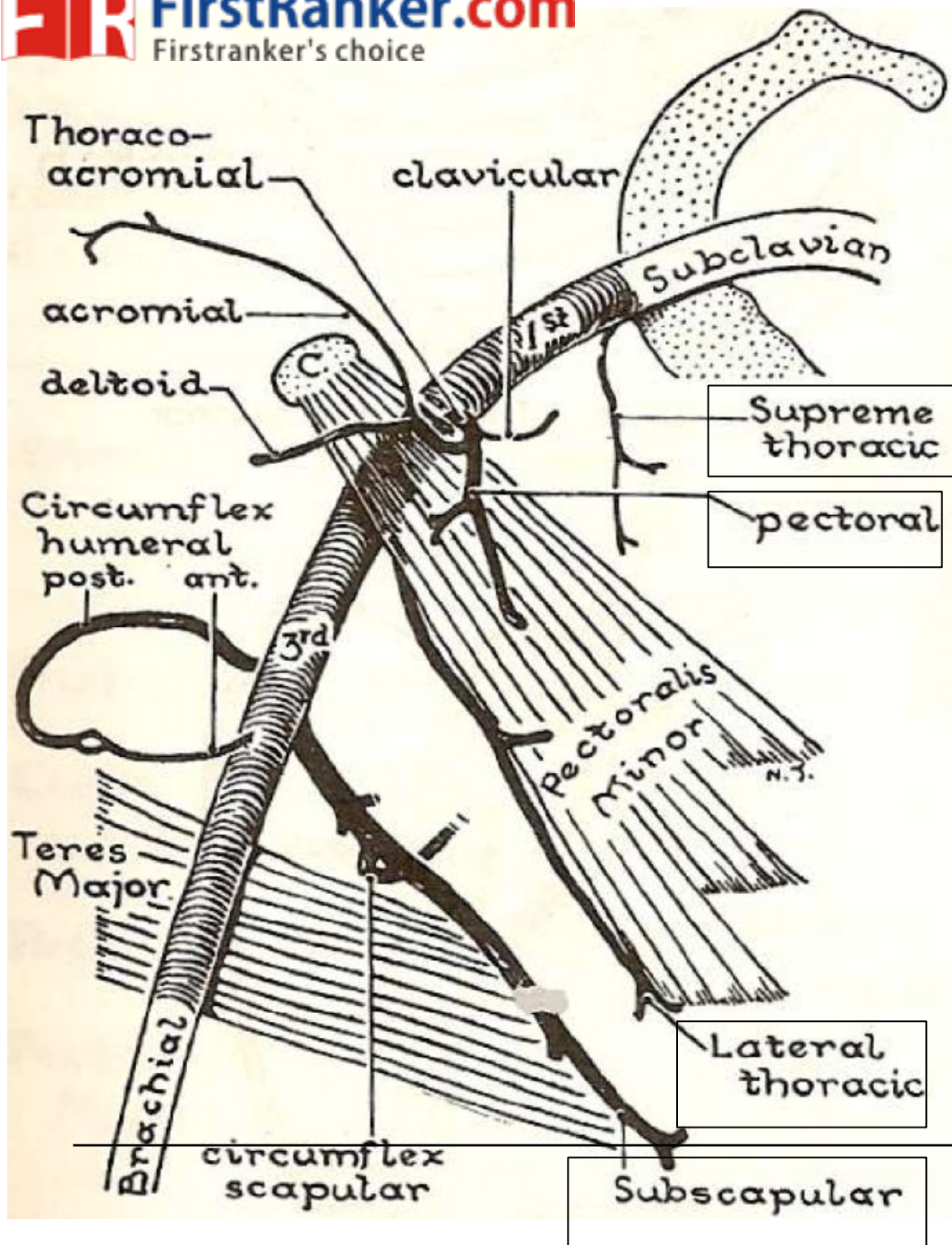
2. Br from **Axillary** :

- Sup thoracic Art
- Thoraco acromial – pectoral br
- Lat thoracic art
- Subscapular art

2. Intercostal art –

- 2,3,4th ICS lat br
- 2nd IC Art largest br –
- supply upper breast, Nipple and areola)

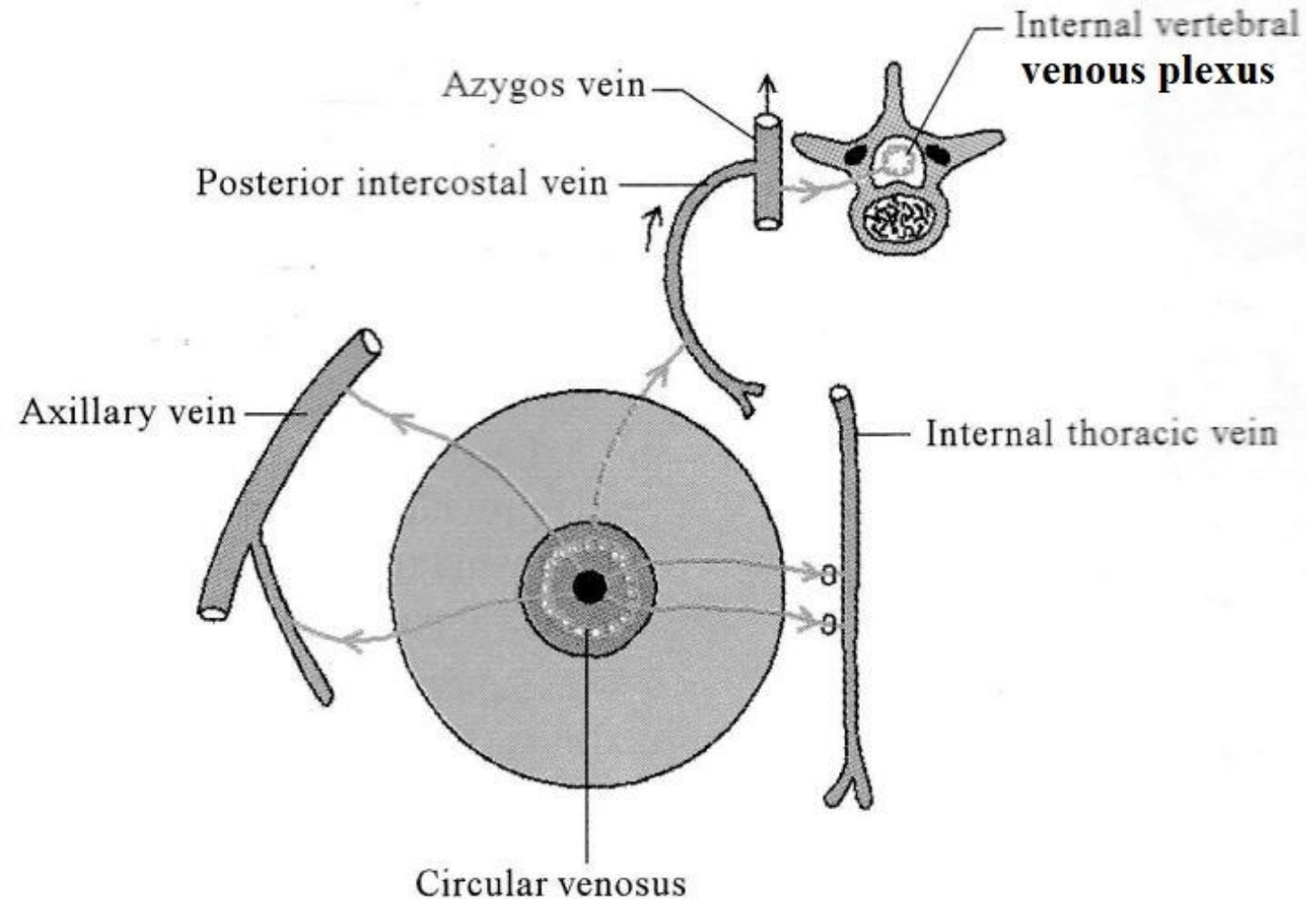




Branches of Axillary

1. Sup thoracic Art
2. Thoraco-acromial pectoral br
3. Lat thoracic art
4. Subscapular art

- Superficial and deep veins
- Circulus venosus (part of superficial vein): sub areolar plexus of vein
- Superficial and deep vein drain into
 - Int mammary V
 - Axillary V
 - Post IC vein – which drain into Azygous vein



Communication via Post IC vein, Azygous and Internal vert plexus which in turn communicate with transverse and sagittal sinus spreads malignancy to abdominal organs, brain, vertebrae, ribs and skull

Lymphatic drainage Of Mammary gland

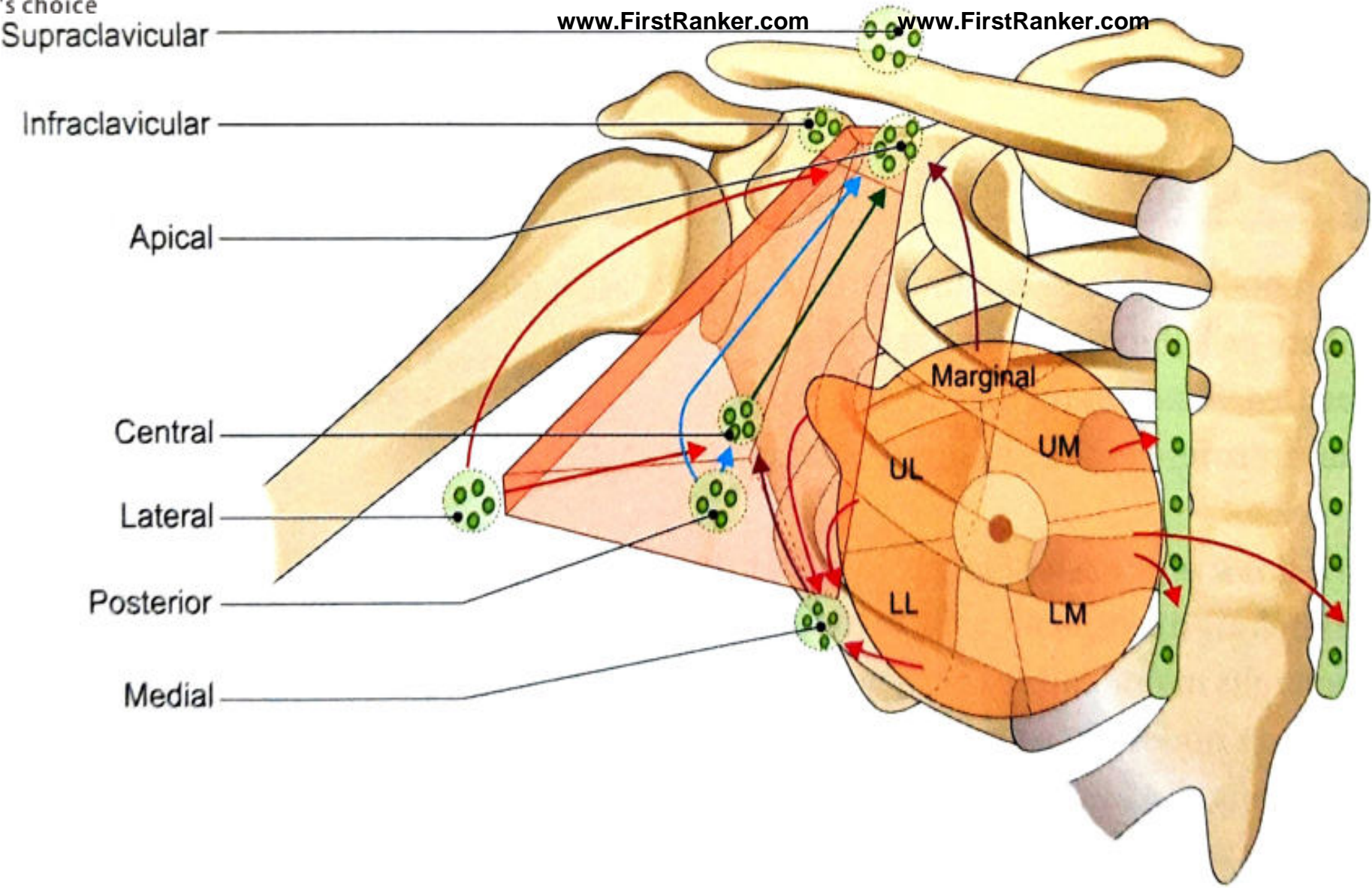


Fig. 6.4: Axillary lymph nodes and lymphatic drainage of mammary gland.

Supraclavicular lymph nodes

Infraclavicular lymph nodes

- 1 Brachial vein
- 2 Axillary vein
- 3 Subclavian vein

Humeral (lateral) lymph nodes

Central lymph nodes

Axillary lymph nodes

Apical lymph nodes

Subscapular (posterior) lymph nodes

Pectoral (anterior) lymph nodes

Pectoralis minor

Interpectoral nodes

Pectoralis major

Subareolar lymphatic plexus

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Subclavian lymphatic trunk

Deep cervical lymph nodes

Internal jugular vein

Right lymphatic duct

Right brachiocephalic vein and artery

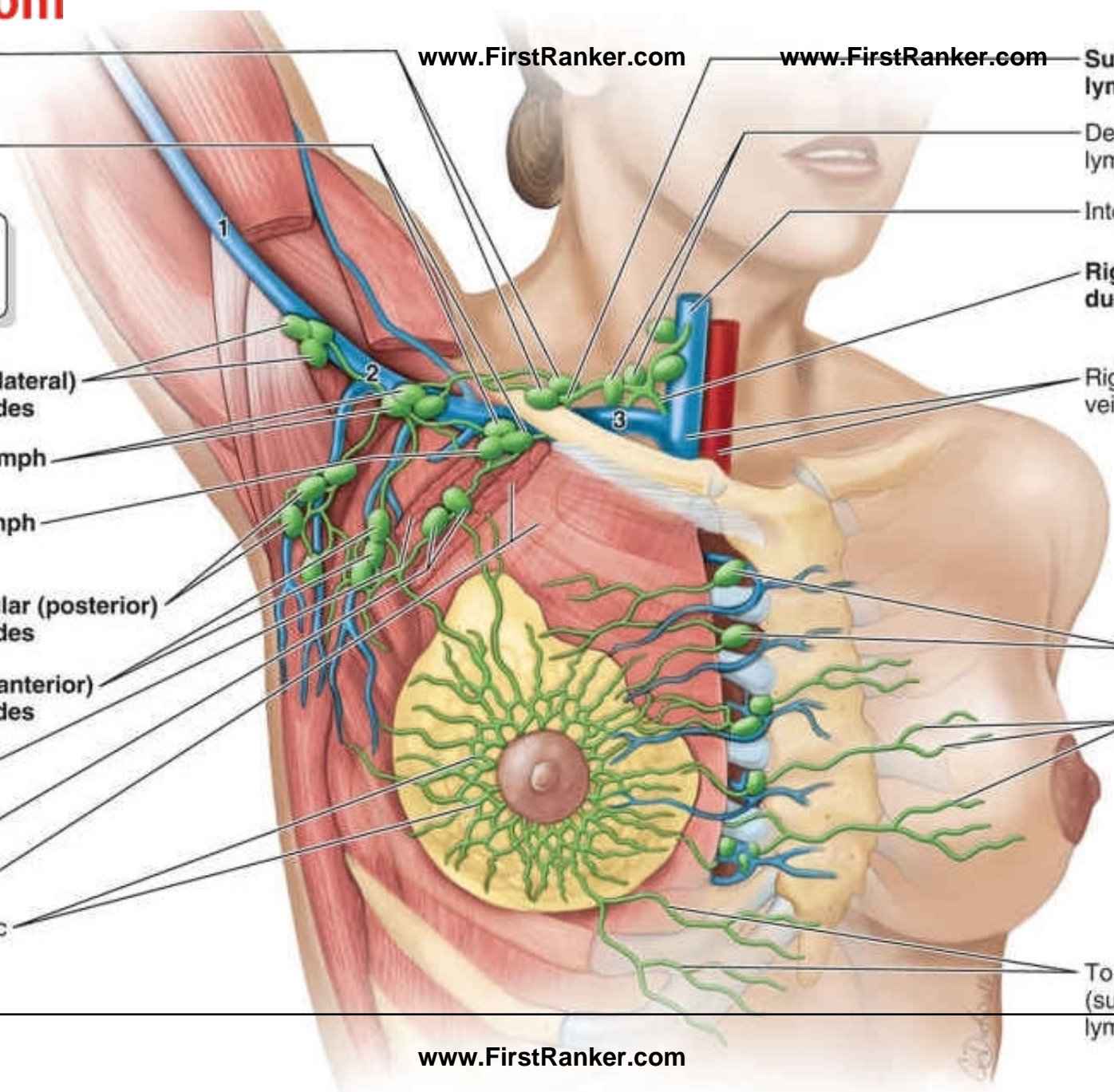
Parasternal lymph nodes

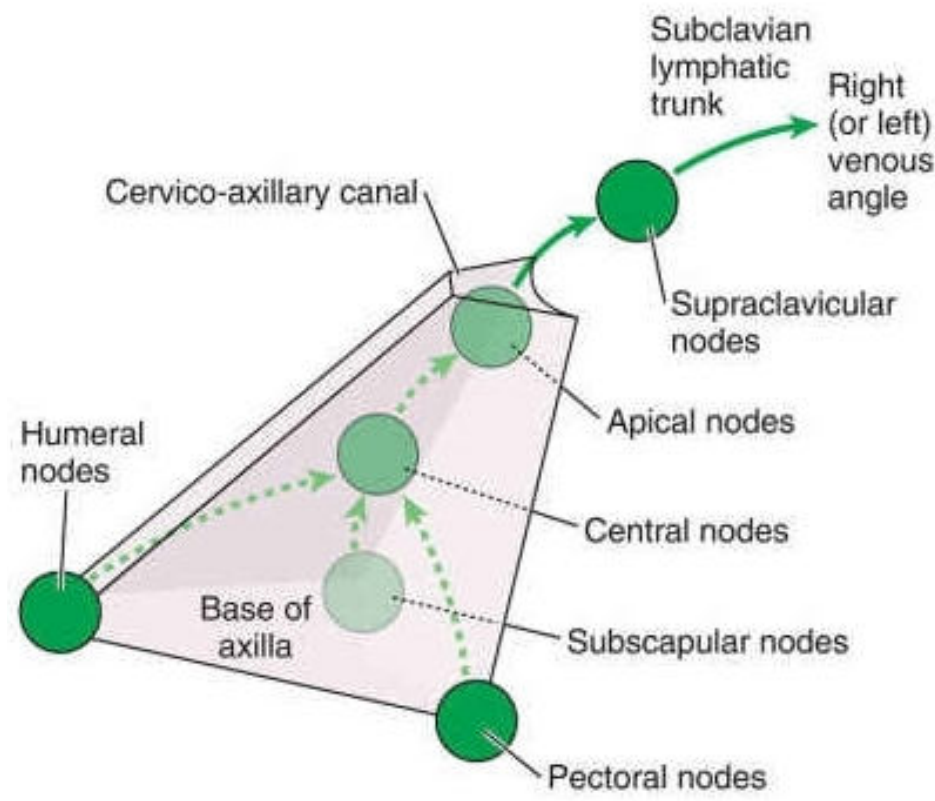
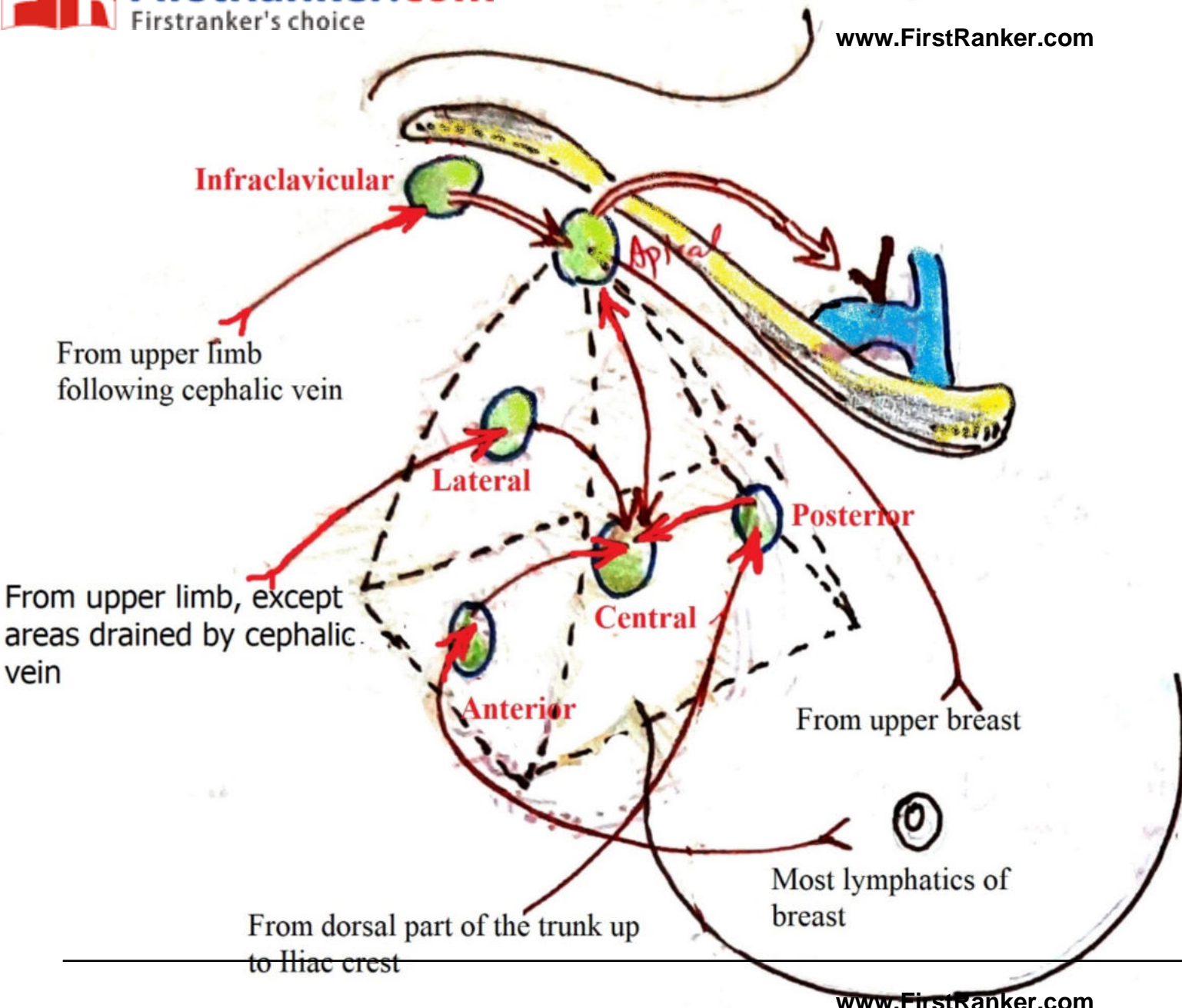
To contralateral (left) breast

To abdominal (subdiaphragmatic) lymphatics

(A) Anterior view

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(C) Axillary lymph nodes

Lymphatics of mammary glands are of two sets

Parenchyma including areola & nipple

Vessels from plexuses in the interlobular connective tissue & walls of lactiferous ducts

From Areola & Nipple

Subareolar plexus of Sappey

Majority of vessels (75%) drain to

Anterior group

Few vessels follow axillary tail to posterior (subscapular) group.

Skin excluding areola & nipple

Lymphatics drain radially from

Inner breast

To parasternal nodes

Outer breast

To Axillary Group

Upper breast

To Infra clavicular Group of LNs

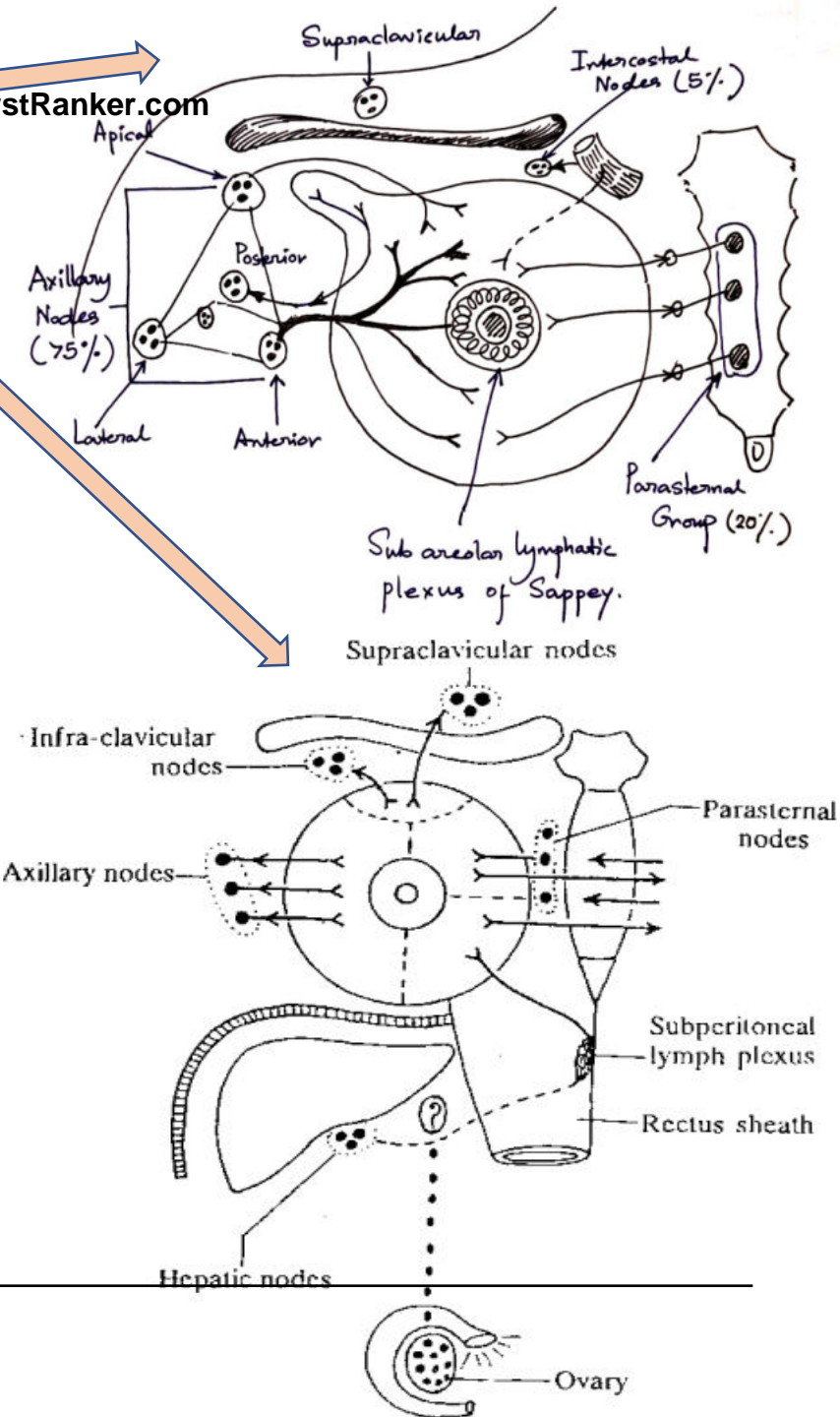
To Supra clavicular Group of LNs

About (5%) from post and lateral part of breast drain to post intercostal nodes.

Rest (20%) accompanies perforating branches of Int Thoracic art and drain into parasternal (internal mammary) nodes, from both medial & lateral part of breast.

The lymphatics communicate with those of Rectus sheath and form a **Sub peritoneal plexus** by piercing the upper part of linea alba.

Drain into **sub diaphragmatic nodes** and some pass through Falciform ligament to reach the



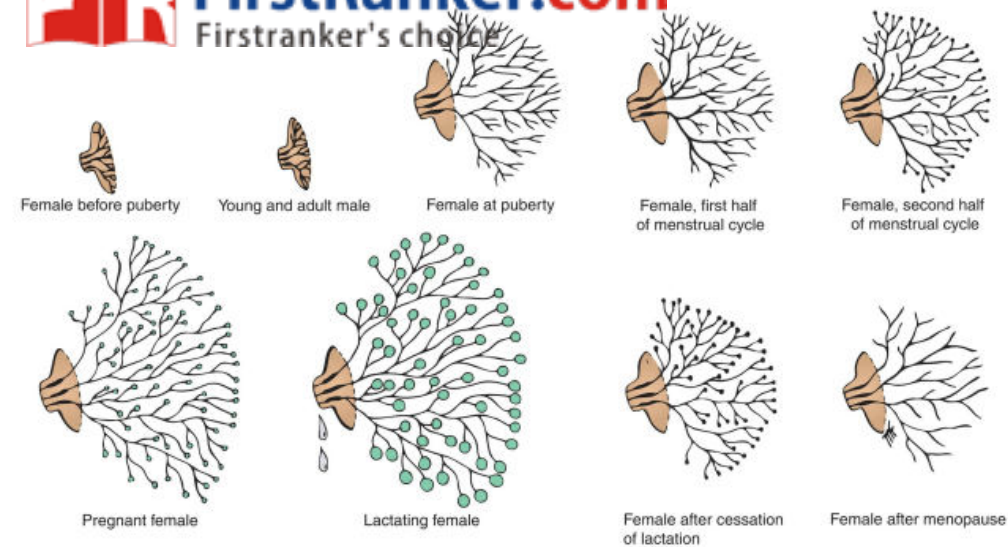


Figure 3.15 Extent of the development of the ducts and secretory alveoli in the breasts in both sexes at different stages of activity.

Late

During the second half of pregnancy, the growth process slows. However, the breasts continue to enlarge, **mostly because of the distention of the secretory alveoli** with the fluid secretion called **colostrum**.

Postweaning

The breasts **return to their inactive state** once the baby has been weaned. The remaining milk is absorbed; the secretory alveoli shrink, and most of them disappear. The interlobular connective tissue thickens. The breasts and the nipples shrink and return nearly to their original size. The pigmentation of the areola fades, but the area never lightens to its original color.

Postmenopause

The **breast atrophies after the menopause**. Most of the secretory alveoli disappear, leaving behind the ducts. The amount of adipose tissue may **increase or decrease**. The breasts tend to shrink in size and become more pendulous. The atrophy after menopause is caused by the absence of ovarian estrogens and progesterone.

Young Women

In young women, the breasts tend to protrude forward from a circular base.

Pregnancy

Early

In the early months of pregnancy, the duct system rapidly increases in length and branching. The **secretory alveoli develop at the ends of the smaller ducts**, and the **connective tissue becomes filled with expanding and budding secretory alveoli**. The **vascularity of the connective tissue also increases** to provide adequate nourishment for the developing gland. The **nipple enlarges**, and the **areola becomes darker and more extensive as a result of increased deposits of melanin pigment in the epidermis**. The **areolar glands enlarge and become more active**.

- Investigations

- Mammography

- Soft tissue radiographs of breast.
 - Cyst (well defined smooth opacity) and carcinomas (irregular density, distortion of breast tissue, calcification)

- FNAC (fine needle aspiration cytology)

- Used for cell diagnosis

- **AXILLARY TAIL**

- Well developed axillary tail mistaken for enlarged lymph nodes/Lipoma

- **Nipple**

- Cracked nipple
 - in later pregnancy and lactation.
 - Nipple to be washed, and lubricated with lanolin
- Discharges

- management depends upon presence of lump

- Infections and inflammations – cause mastitis with abscess
- Cysts
- Tumors
 - Benign – Lipoma, fibro adenoma
 - Malignant – carcinoma “more in nulliparous and bearing child protective”
 - Spread by local, lymphatic and blood stream.
 - LN involvement shows metastatic potential.
 - Advanced disease – involve supraclavicular LN

– Malignant tumours continued

- Presentation –

- Hard lump with retracted nipple
- Peau d'orange (orange like skin) – involvement of skin of breast due to cutaneous lymphatic oedema
- Advanced – ulceration, fixation to chest wall, metastasis to viscera, bone

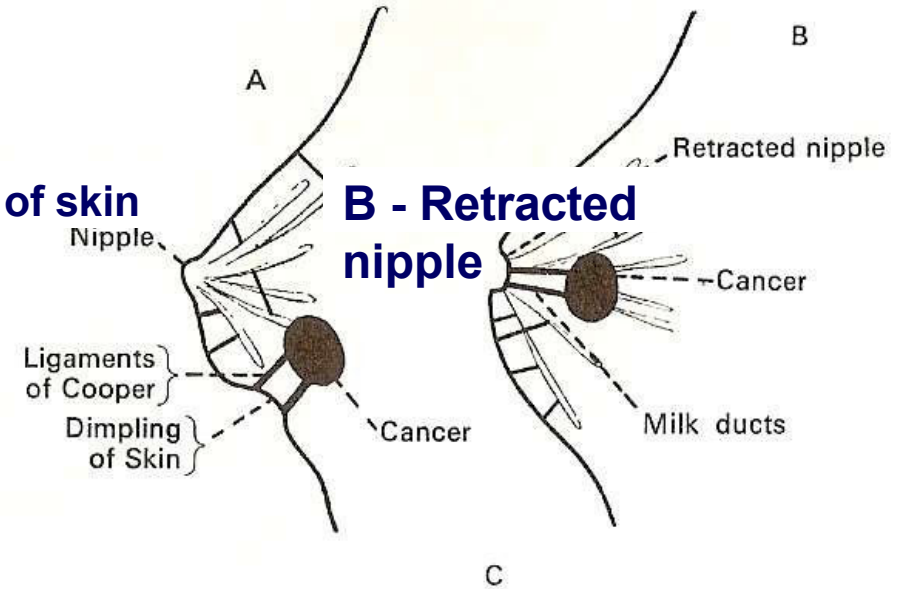
- Treatment

- Mastectomy
- Radiotherapy
- Hormone therapy
- chemotherapy

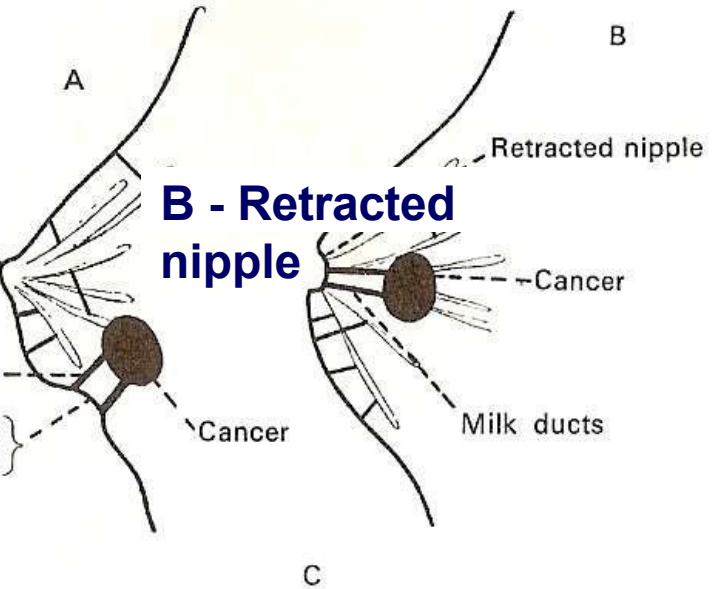
❖ Breast cancer

- Peau'd orange
 - nipple retraction,
 - skin dimpling
- **Metastasis :**
 - skull and brain (Batsons plexus of veins)

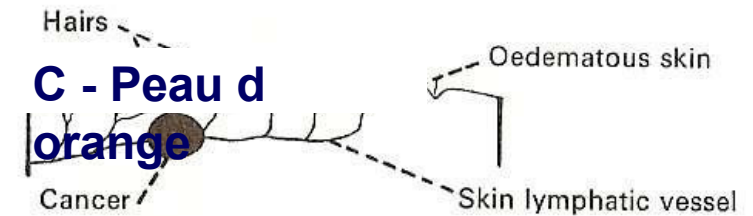
A - Dimpling of skin



B - Retracted nipple



C - Peau d orange



- A – due to pull by lig of cooper**
- B - due to retraction of milk ducts**
- C – due to lymphatic obstruction**



KRUKENBERGS TUMOUR

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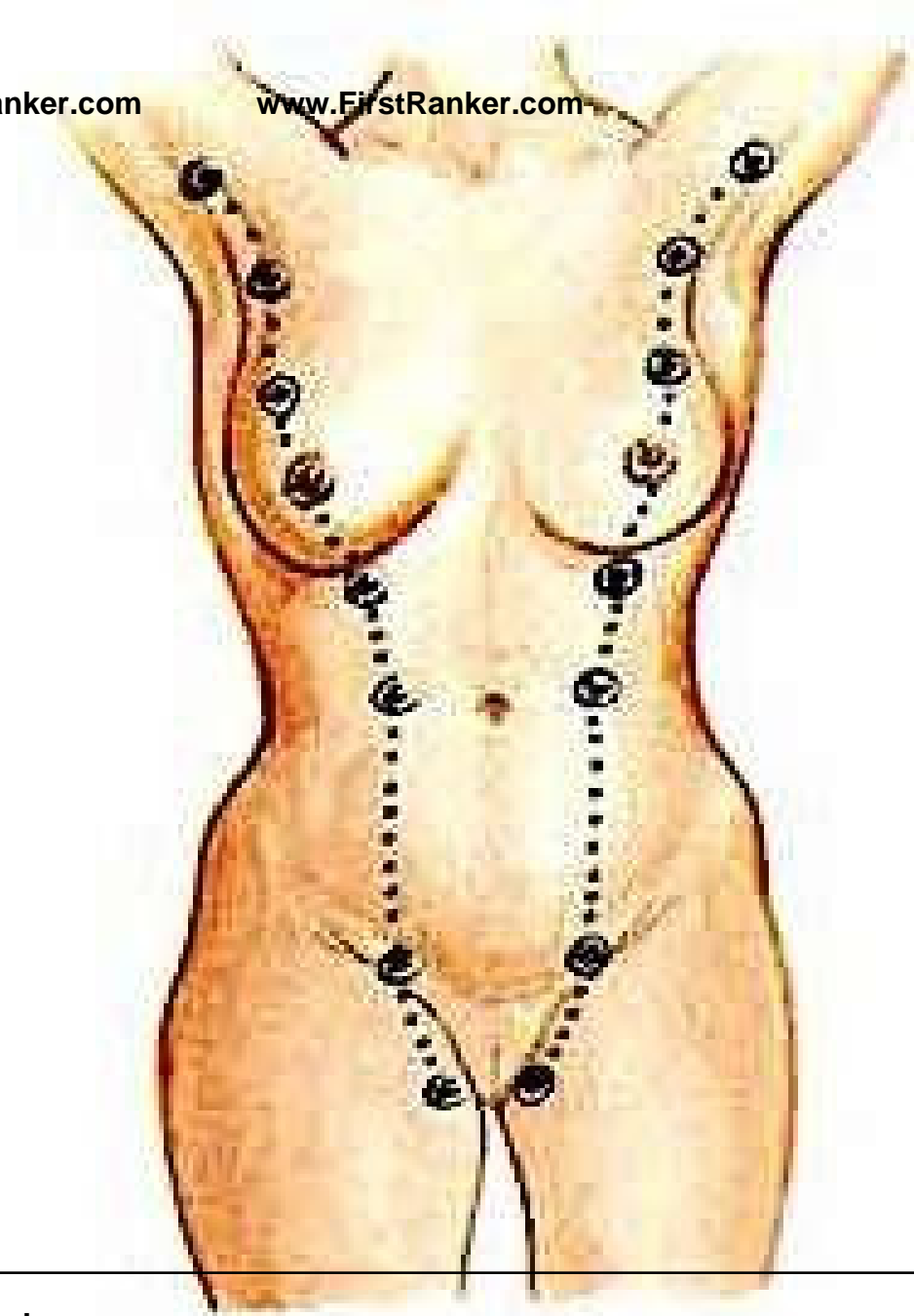
Secondary deposits in ovaries due to spread from Ca breast :

- Lymph inferomedial part
- communicate with rectus sheath –
- pierce Linea alba – forms **Sub peritoneal**
- **plexus** – drain into subdiaphragmatic LN –
- pass through Falciform lig –
- reach hepatic node –
 - – Cause obstructive jaundice
- Tumor cells drop from sub peritoneal
- plexus into general cavity –
- reach surface of ovary and enter through Ostia left by ovulating Graafian follicle – KRUKENBERGS (secondary deposits on surface of ovary)



Congenital anomalies

- **Polythelia**
 - Supernumerary nipples over breast
- **Athelia**
 - No nipple over breast (mainly accessory breast)
- **Polymastia**
 - Accessory breast along milk ridge
- **Amastia**
 - No breast development
- **Amazia**
 - Nipple developed, no breast development



Milk lines