Female Breast

Reproductive Block

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Objectives

You should be able to:

- Describe the shape and position of the female breast.
- Describe the structure of the mammary gland.
- List the blood supply of the female breast.
- Describe the lymphatic drainage of the female breast.
- Describe the applied anatomy in the female breast.

Important note!!!

قال لي الدكتور زاهد بخصوص الفروقات بينه وبين الفيميل سلايدز: "سلايداتهم قديمة والكلام اللي أنا ضفته ما أقدر أقول لكم انه مب مهم؛ لأنكم أطباء المستقبل، لكن اذا جيت أسوي MCQs اخذها من الفيميل سلايدز."

عمومًا أضفنا الميل سلايدز نشرًا للعلم والفائدة، وتبرئةً للذمة.

This lecture was presented by :

Dr. Zahid Kaimkhani Dr. Samira Shaheen

You can find more quizzes by Clicking HERE!

Special Thanks to Saleh Aljanah and Abdulaziz Alqarni!

You can find Atlas by Clicking HERE!

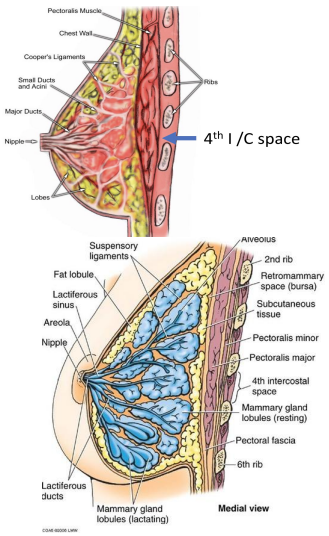
Breast

Shape & Position

- It is **conical** in shape.
- Behind the breasts is a space filled with loose areolar connective tissue called the **Retromammary space**, (allows the breast to move freely).
  - As in the connective tissue. NOT the area surrounding the nipples
- It lies on the front and the sides of the chest within the **superficial fascia.**
- Non-capsulated

The Breast Has:

Apex (Nipple)



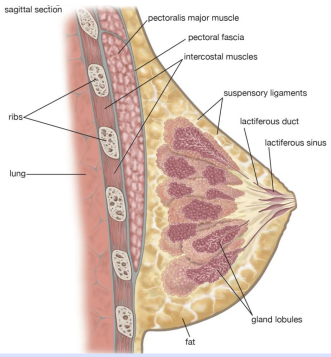
Nipple:

- **Conical eminence** that projects forwards from the anterior surface of the breast
- It lies opposite **4th intercostal space**
- It carries 15-20 narrow pores of the **lactiferous ducts**

Areola:

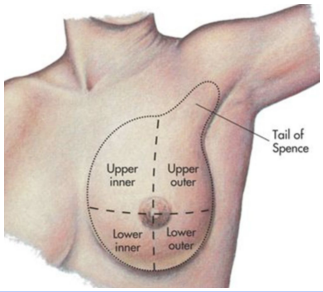
- It's **dark pink brownish circular area** of skin surrounds the nipple.
- The **subcutaneous tissues** of nipple & areola are **devoid of fat**

Base (Fairly Constant)



- Upper 2/3 of its base lies on fascia over Pectoralis major muscle.
- Its Inferolateral 1/3 lies on fascia over **Serratus anterior** & External oblique muscles.
- While its lower medial edge just overlaps with the upper part of the rectus sheath.
- Extends from **2nd rib superiorly** to **6 ribs inferiorly.**
- Extends from **sternum medially** to **midaxillary line laterally.**

Tail (Axillary tail/Process)

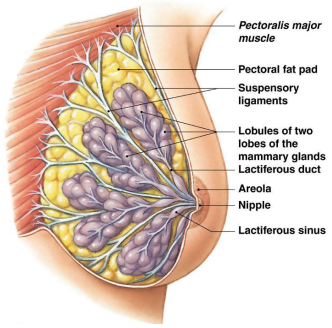


- Small **superolateral** part of the breast extends upward and laterally
- Lies in the subcutaneous fat.
- May pierce the deep fascia of the axillary floor and lie adjacent to axillary lymph nodes.

Mammary gland

Mammary Glands

Male Slides



- Modified sweat **(Apocrine)** glands (exocrine glands)
- **Present in both sexes.**
- Become functioning only in lactating females.
- Two-thirds of it rests on pectoralis major, one-third on serratus anterior, while its lower medial edge just overlaps the upper part of the rectus sheath).

Structures of Mammary Glands

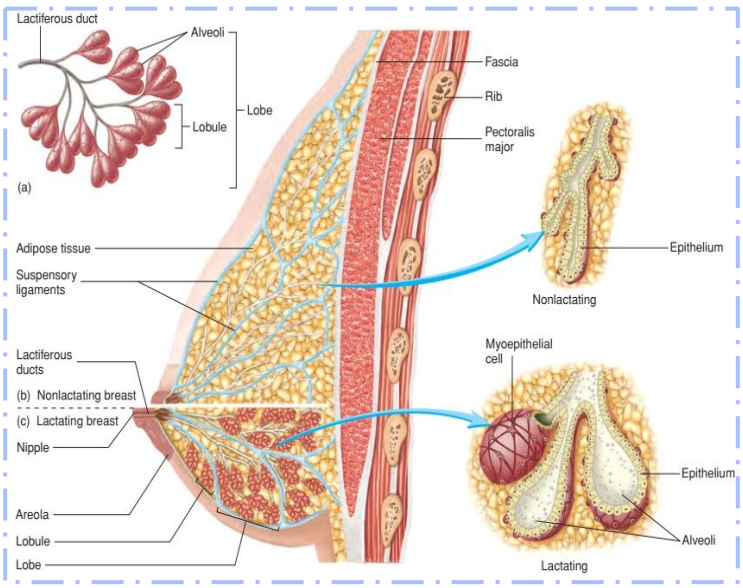
Made up of 15–20 lobes of glandular tissue. Each lobe formed of number of lobules. Embedded in subcutaneous fatty tissue of superficial fascia; this fat accounts for its smooth contour and most of its bulk.

Lobes and lobules are separated by interlobar and interlobular fibrous septa/strands & fatty tissue, called the **ligaments of Cooper or (suspensory ligaments)** running from the subcutaneous tissues to the fascia of the chest wall.

Importance? These ligaments give the breasts support by connecting the skin of the breast to the deep fascia of underlying pectoralis muscle.

It has from **15-20 lactiferous ducts** which open by the same number of openings on the summit of the nipple, Each lobe drains by its lactiferous duct on to the nipple.

Areola lubricated by the **areolar glands of Montgomery** (large, modified sebaceous glands which may form sebaceous cysts which may, in turn, become infected).



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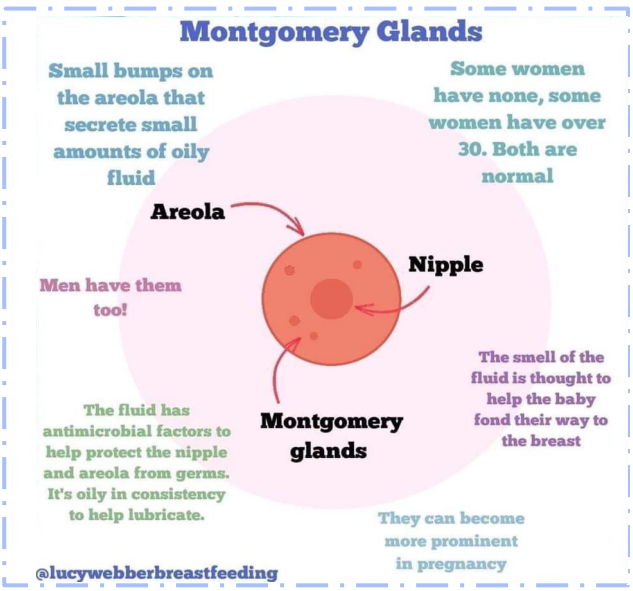


Mammary gland

Male Slides

Structure of the breast

1. Posterior Capsule of the breast
2. Fibrous strands (the suspensory ligaments of Cooper)

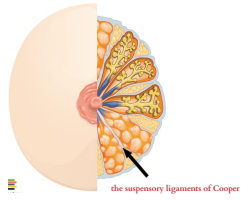
Male doctor: "The female slides state that : 'The breasts are non-capsulated'. That's an outdated information according to ***Last's Anatomy 11th edition***. Anyway this **will not come in the exam,** it's just for your knowledge".

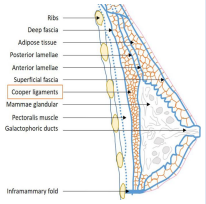
1. Posterior Capsule of the breast

The **superficial fascia** behind the breast (continuation of membranous layer of abdominal **fascia Scarpa**) condensed to form the posterior capsule.

2. Fibrous strands (The suspensory ligaments of cooper)

- Connect the dermis of the overlying skin to the ducts of the breast and this capsule.
- Help to maintain the **protuberance** of the young breast.
- **Atrophy** with age (Pendulous)
- If contracted by fibrosis associated with carcinoma of the breast-dimpling of the overlying skin.
- Also cause **pitting** of the edematous skin (malignant involvement of the skin lymphatic (Peau d'orange).





Pendulous Normal Pendulous

Peau d'orange

Blood Supply of the Breasts

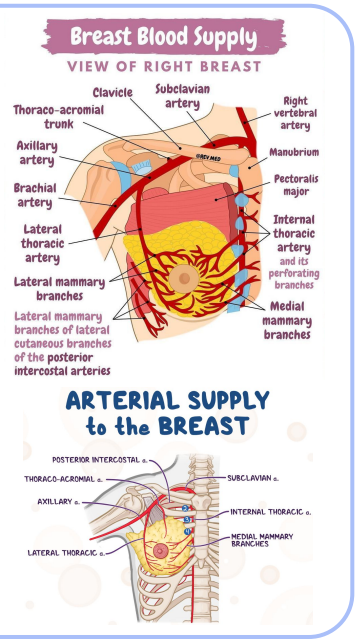
Arterial Supply

➥ **Perforating branches & mammary branches** of **internal thoracic (internal mammary) artery** supply the medial part of breast. Besides of sternum (those of the 2nd & 3rd spaces are the largest).

➥ **Mammary branches** of **lateral thoracic artery** (main arterial supply).

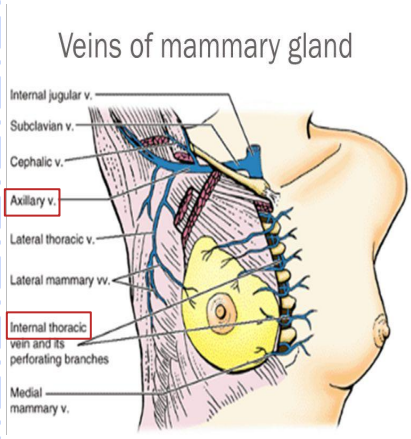
➥ **Small mammary branches** of the **posterior intercostal arteries.**

➥ **Pectoral branches** of **thoracoacromial artery** supply the upper part of the breast.



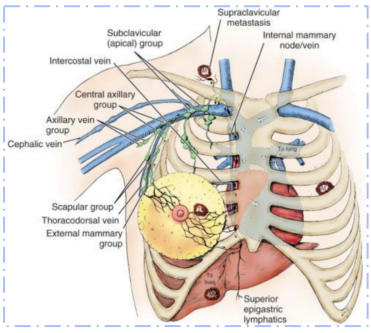
Venous Drainage

- **Veins are corresponding to the arteries**
- **Venous drainage from:**
  1-The **circular (circum-areolar) venous plexus** are found at the base of nipple
  2- Venous plexus from **glandular tissues**
- Finally, veins of this plexuses will drain into **axillary** & **intercostal thoracic veins.**



Venous drainage of the Breasts

Male Slides



- **Axillary** → **Subclavian vein**
- **Internal thoracic** → **Brachiocephalic vein**
- **Intercostal** → → → → Azygos vein (Right side)
  → → → → hemiazygous (Left) venous system.

Axillary lymph nodes

Axillary Lymph Nodes arranged into 5 groups which lie in axillary fat:

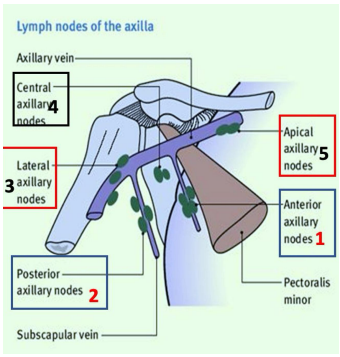
1- **Pectoral (Anterior) group**: which lies on the pectoralis minor along lateral thoracic vessels.

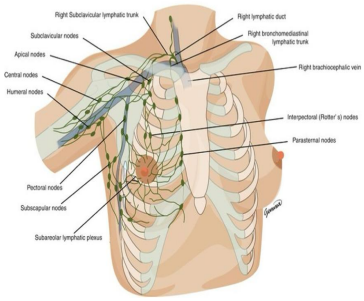
2- **Subscapular (Posterior) group**: which lies on posterior wall of axilla on lower border of subscapularis; along subscapular vessels.

3- **Brachial (Lateral) group**: lies on lateral wall of axilla along 3rd part of axillary vessels.

4- **Central group**: lies in axillary fat at the base of axilla.

5- **Apical group**: lies at apex of axilla immediately behind the clavicle.





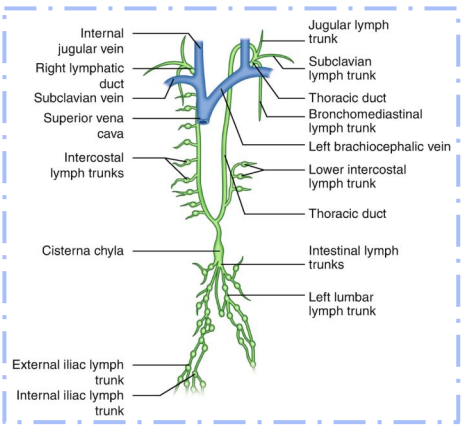
Subclavian lymph trunk:

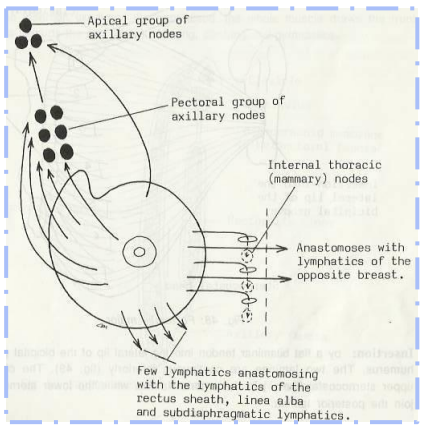
➥ It is formed by the union of efferent lymph vessels of the apical group.

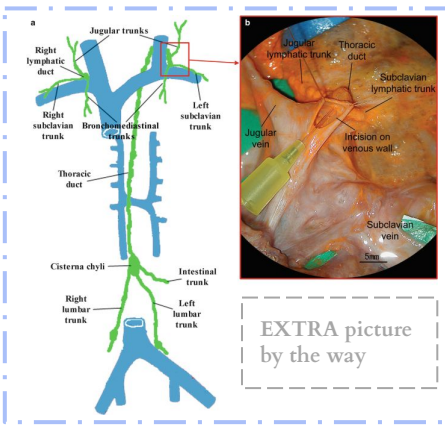
➥ Efferent drainage of axillary lymph nodes continue with cervical lymph nodes.

- **On right side** - Drain into **right lymphatic duct.** Which usually opens in **RIGHT** subclavian vein.
- **On left side** - **Thoracic duct.** Which usually opens in **LEFT** subclavian vein.

Both will terminate at the junction between the **internal jugular** and the **subclavian vein**, thus, the lymphatic drainage returns to the circulation.





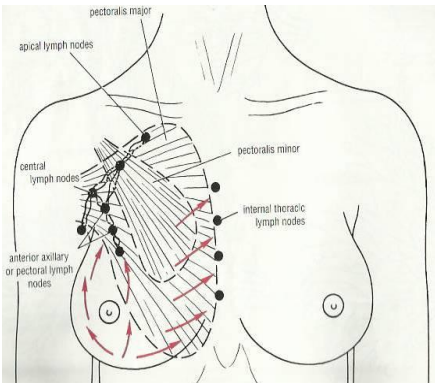


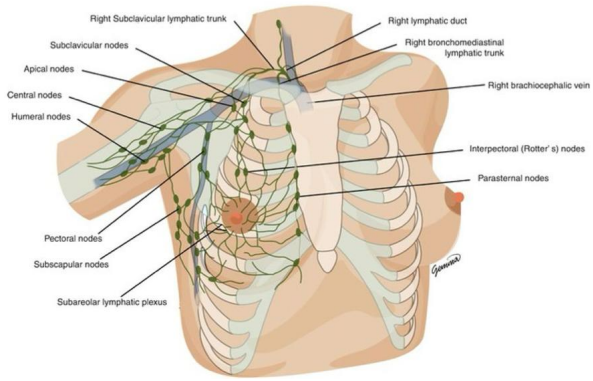
EXTRA picture by the way

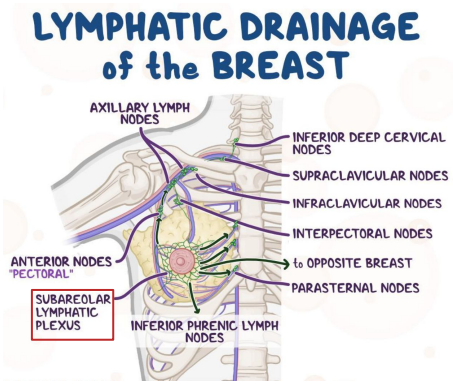
Lymphatic Drainage of the mammary gland

Lymph Vessels

Superficial lymphatic plexus **(Subareolar plexus):**	Lies beneath the areola	Both plexuses radiate in many directions and drain into: A. Axillary groups B. Internal thoracic lymph nodes.
Deep lymphatic plexus **(Submammary plexus):**	Lies on the deep fascia covering pectoralis major.	

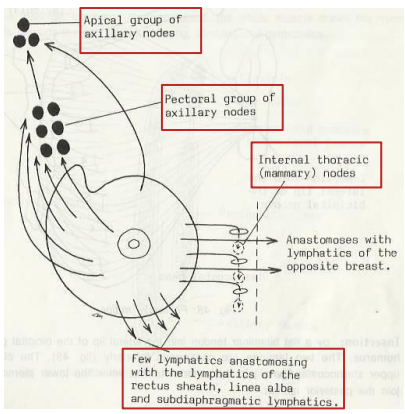


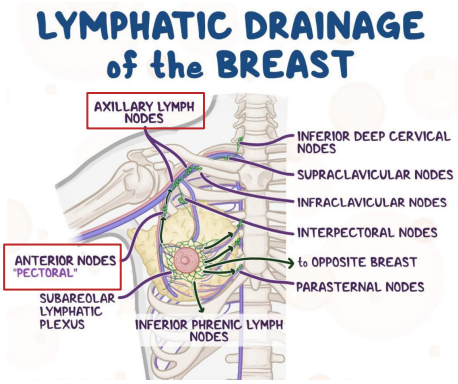


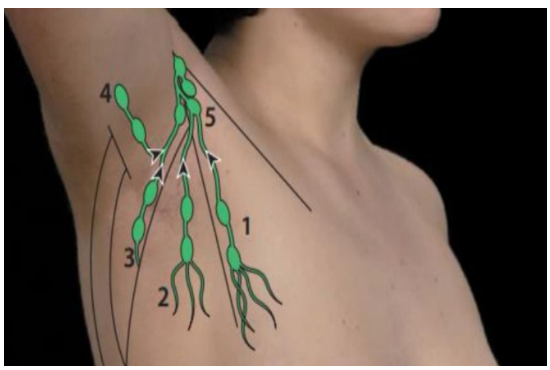


Lymph Nodes

Central & lateral parts: (of the gland)	(75%) drain into **pectoral group** of axillary LN.
Upper part: (of the gland)	drains into **apical group** of axillary LN.
Medial part: (of the gland)	drains into **internal thoracic (parasternal)** LN, forming a chain along the internal thoracic vessels. Some lymphatics from the medial pass across the front of sternum part anastomose with lymphatics of **opposite breast.**
Inferomedial part (of the gland):	anastomose with lymphatics **of rectus sheath, linea alba** and **sub diaphragmatic LN.**







Applied anatomy

Breast Cancer

It is a common surgical condition.
60% of carcinomas of breast occur in the **upper lateral quadrant.**

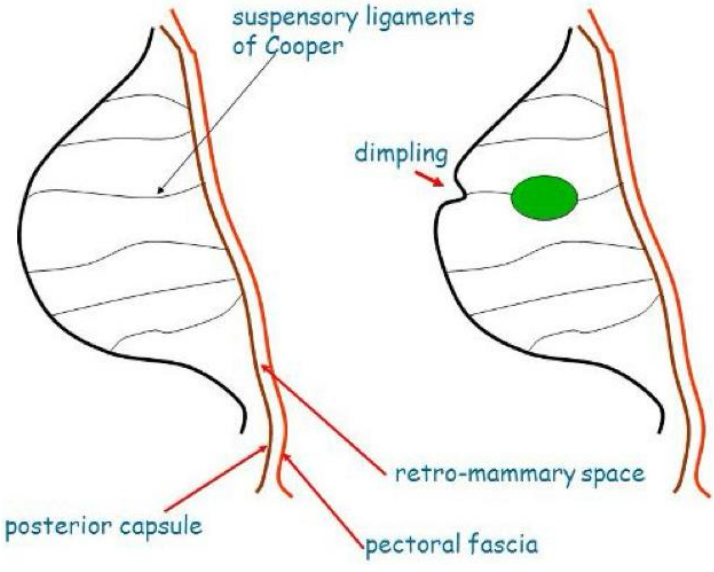
75% of lymph from the breast **drains** into the **axillary lymph nodes.**

Carcinoma of one side can spread to **other breast** and the **opposite axillary lymph nodes are affected** because of the anastomosing lymphatics between both breasts.

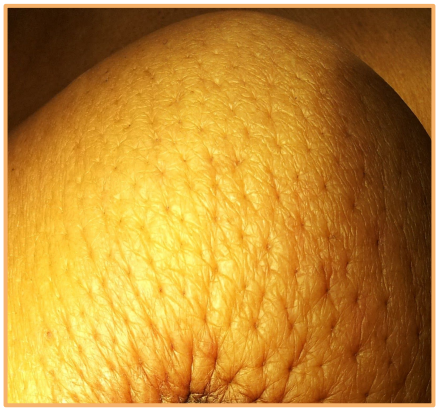
In patients with **localized breast cancer**, a simple mastectomy, followed by radiotherapy to the axillary lymph nodes is the **treatment of choice.**

The lactiferous ducts are **radially arranged** from the nipple, so **incision** of the gland should be made in a **radial direction** to **avoid cutting** through the ducts.

Infiltration of the ligaments of Cooper leads to its shortening giving DIMPLING (Lymphedema) **peau d'orange** appearance of the breast.



Peau d'orange

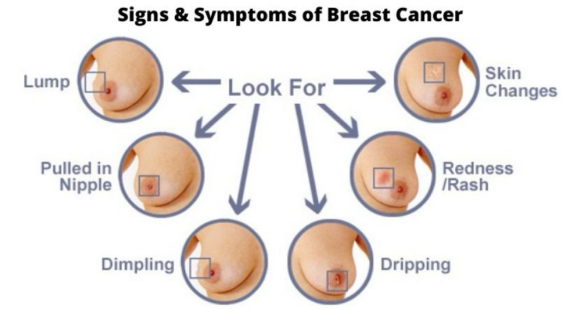


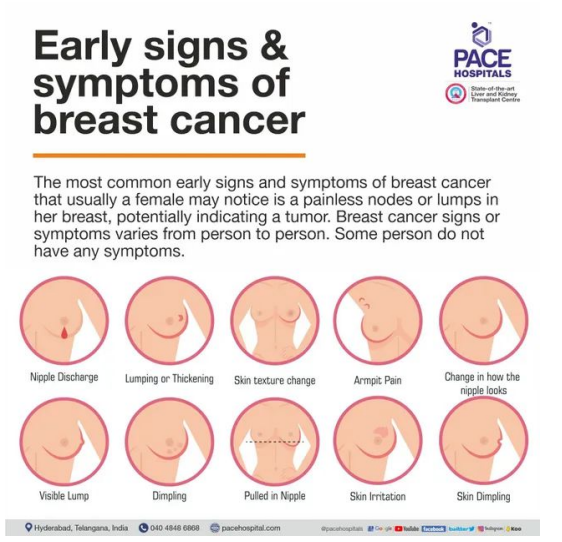
Breast Cancer

Male Slides

Signs & Symptoms of Breast Cancer

1. Irritation or dimpling of breast skin.
2. Thickening or swelling of part of the breast.
3. New lump in the breast or underarm (armpit).
4. Nipple discharge other than breast milk, including blood.
5. Redness or flaky skin in the nipple area or the breast.
6. Pulling in of the nipple or pain in the nipple area.





How does breast cancer metastases to bone (vertebrae)?

Some venous drainage to post intercostal veins that links to int. vertebral venous plexus. Reflux blood flow through these large valveless veins results in spread of malignancy.

Breast Cancer in Saudi Arabia

Extra

For your knowledge, skip

Journal of Cancer Policy Volume 12, June 2017, Pages 83-89

Breast cancer is the Most common females' cancer and the leading cause of cancer death worldwide. There is a substantial rise in the incidence of breast cancer in Saudi Arabia in recent years, particularly among younger females compared to affected females' in western countries. There have been several factors implicated to the etiology of breast cancer, which differ for different geographical locations. Breast cancer continues to be the leading type of cancer in Saudi Arabia in term of frequency, accounting for 17% of overall adult malignancies, with a rapidly increasing incidence during recent decades. Breast cancer represents nearly one-third of newly diagnosed cancers in Saudi women, with the highest age
-adjusted distribution being 38.2% among patients aged 30 to 59 years.

Development of breast

Mammary ridge (Milk Line)

- In 7th week embryo
- Bilateral Thickened epidermis
- Extends from the (base of the forelimb) axilla to (base of the hindlimb) the inguinal region.

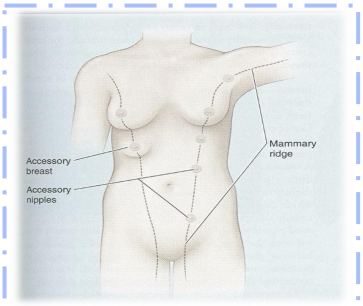
In Humans

Major part of the ridge disappears soon after it forms **EXCEPT** for a small part in the pectoral (thoracic) region

In Animals

Several mammary glands are formed along this ridge

POLYTHELIA	Accessory nipple (usually in axilla).
POLYMASTIA	Complete accessory breast.
INVERTED NIPPLE	The nipples are pointed inward rather than pointing out.



Clinical notes

Male Slides

The Breast of a Pregnant Female

- The whole breast is enlarged and the axillary tail is possibly noticed for the first time.
- Many dilated veins can be seen under the breast skin.
- The nipple and areola are more deeply pigmented and the areolar glands (Montgomery) are larger and more numerous.

Intradermal swelling and pitting of the skin may be seen in breast cancers. What is the anatomical explanation for this?

- This is due to skin edema and is known as peau d'orange. It is a classic sign of advanced breast cancer and is caused by blockage of the lymphatic drainage of the skin by cancer cells

MCQs

Q1- On which of the following do 2/3rds of the Breast tissue lie on?			
A- Pectoralis minor	B- External oblique	C- Serratus anterior	D- Pectoralis Major
Q2- Patient with cancer in the lateral part of the breast, the metastasis goes to which lymph node?			
A- Subscapular L.N.	B- Brachial L.N.	C- Parasternal L.N.	D- Pectoral L.N.
Q3- Which one of the following represents the number of lactiferous ducts in each Breast?			
A- Less than 10	B- From 10-15	C- From 15-20	D-More than 20
Q4- A 57-year-old woman presented with a dimpling appearance of her left breast which of the following structures is involved in this case?			
A-Pectoralis Major	B- Pectoralis minor	C- Suspensory ligament	D- Retromammary Space
Q5- What's the best way to take an incision from a patient with breast abscess?			
A- Axial	B- Radial	C- Oblique	D- Transverse
Q6- Peau d'orange appearance is due to invasion of which of the following?			
A- Lactiferous ducts	B- Retromammary Space	C- Ligaments of cooper	D- Fascia of Pectoralis Major

Answers: 1-D 2-D 3-C 4-C 5-B 6-C

For Anki flashcards click here

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