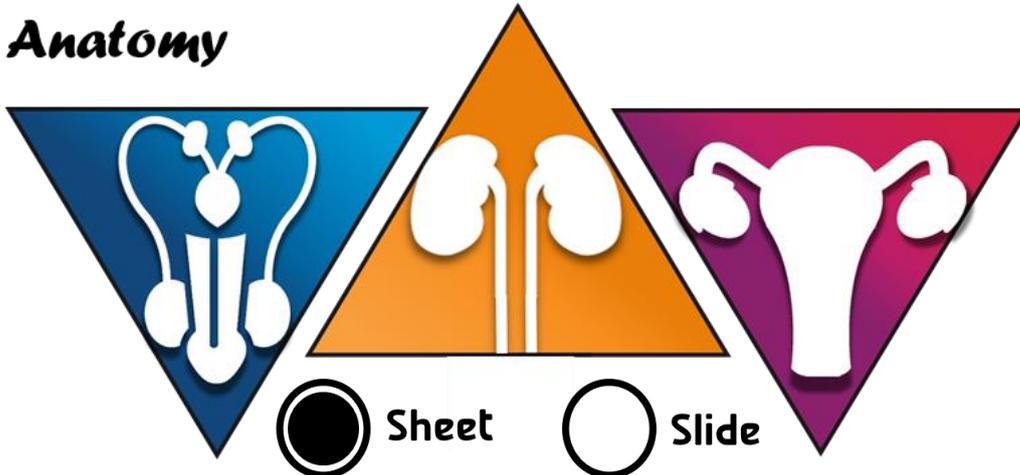




# Urogenital system

## Anatomy



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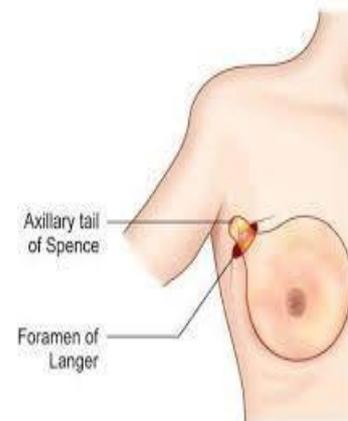
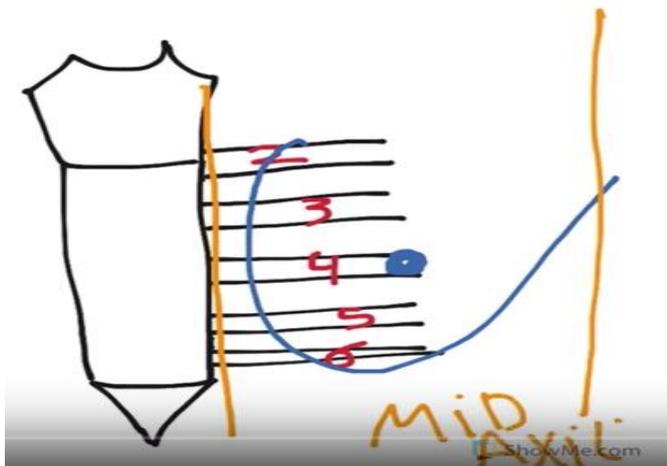
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- Ahmad Salman

## Anatomy of the Breast

- The breasts are specialized accessory glands of the skin that secrete milk.
- They are present in both sexes.
- Location:
  - It is located in superficial fascia of pectoral region, but it has an extension in the axilla called axillary tail.
  - It's axillary tail (axillary tail of Spence) extends upward and laterally, pierces the deep fascia and enters the axilla.
  - The opening in the deep fascia is known as (foramen of langer)



- Length: The base of the breast extends from the 2nd to 6th rib  
Width: From the lateral margin of the sternum to the midaxillary line.
- The nipple lies in the 4th intercostal space.

### Deep Relations:

The deep surface of the breast is related to the following structures in that order:

#### 1. The retromammary space:

It is loose areolar tissue between the gland and deep fascia (pectoral fascia).

Allows the free mobility of the breast over the deep fascia.

2. The deep fascia: covering the pectoralis major muscle

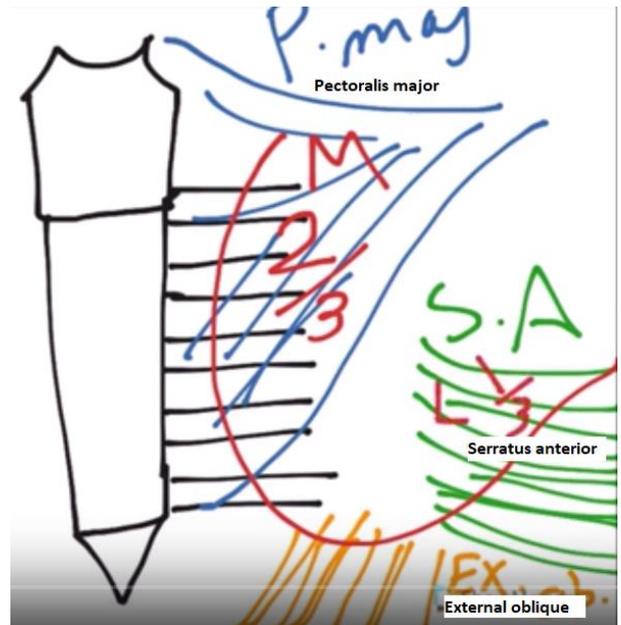
3. Muscles: (Origin and insertion NOT REQUIRED)

a) Pectoralis Major: originates from the sternum, upper costal cartilages (1-6), and clavicle. And inserted on the humerus.

b) Serratus Anterior: originates on the surface of the 1st to 8th ribs at the side of the chest and inserts along the entire anterior length of the medial border of the scapula.

c) External oblique: originate on the lower 8 ribs and runs downward in the anterior abdominal wall.

- The flat base of the breast lies on the **pectoralis major (medial 2/3)** and **serratus anterior (lateral 1/3)**. **The lower lateral part of the gland rests on the external oblique** muscle of the abdomen.



### Structure of the breast

Includes the skin, parenchyma and stroma.

1. Skin: covers the gland and fascia.

a) Nipple

conical projection from just below the centre of the breast, Lies in the 4<sup>th</sup> intercostal space, Contains:

- ✓ Circular smooth muscles to erect the nipple.
- ✓ Longitudinal smooth muscles to flatten the nipple.
- ✓ Carries the opening of lactiferous ducts (15-20 openings).

b) Areola:

- ✓ Pigmented area of skin that surrounds the base of the nipple.
- ✓ It is rich in modified sebaceous gland particularly at the outer margin.
- ✓ These become enlarged during pregnancy and lactation to form raised tubercles "tubercles of Montgomery".

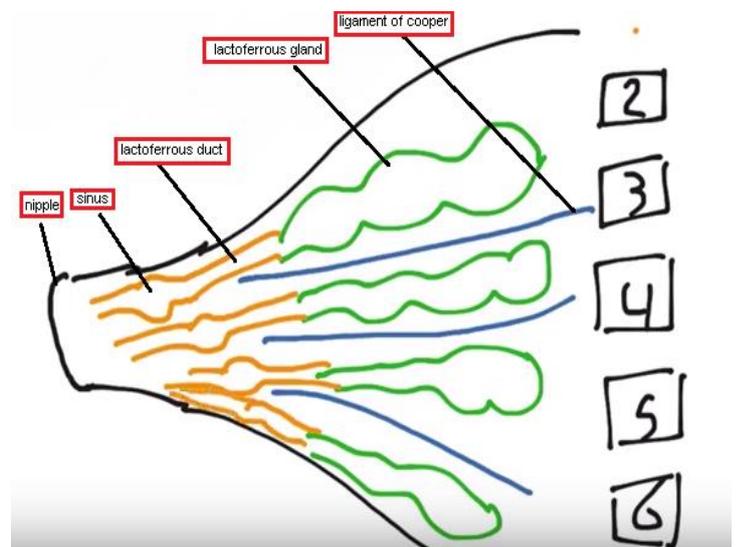
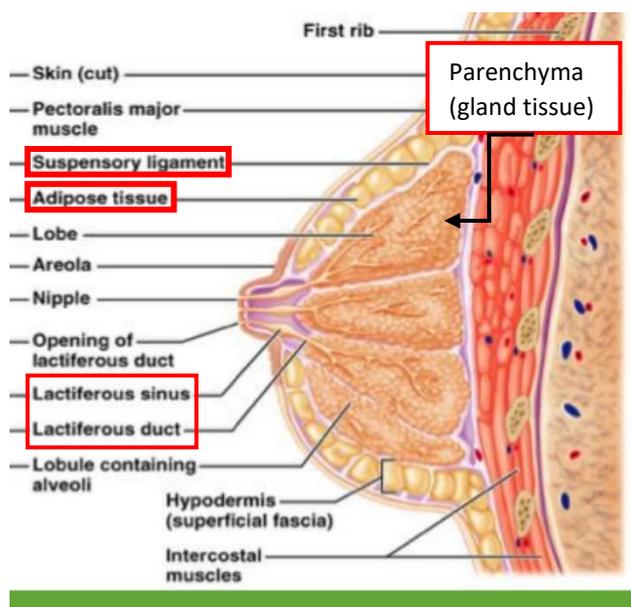
- Oily secretin, of these glands as of great importance to lubricate the nipple and areola and prevents them from cracking during lactation
- Fat is absent under the areola and nipple and both have no hair.

2. The stroma: The gland has no capsule. It has a stroma which is divided into:

- Fibrous stroma
  - ✓ Forms fibrous septa known as suspensory ligaments of Cooper.
  - ✓ The septa anchor the skin and the gland to the pectoral fascia.
  - ✓ The septa divide the gland into 15-20 lobules.
- Fatty stroma:
  - ✓ Forms the main bulk of the gland, the mammary gland is embedded into it.
  - ✓ It is responsible of the smooth contour of the breast.

3. Parenchyma (mammary gland):

- ✓ Consists of the glandular tissue which secretes milk.
- ✓ The glandular tissue is divided into 15-20 lobules
- ✓ Each lobule has a lactiferous duct.
- ✓ The lactiferous duct dilates under the areola to form to lactiferous sinus then become narrow again to open on the summit of the nipple.



## Breast Clock and Quadrants

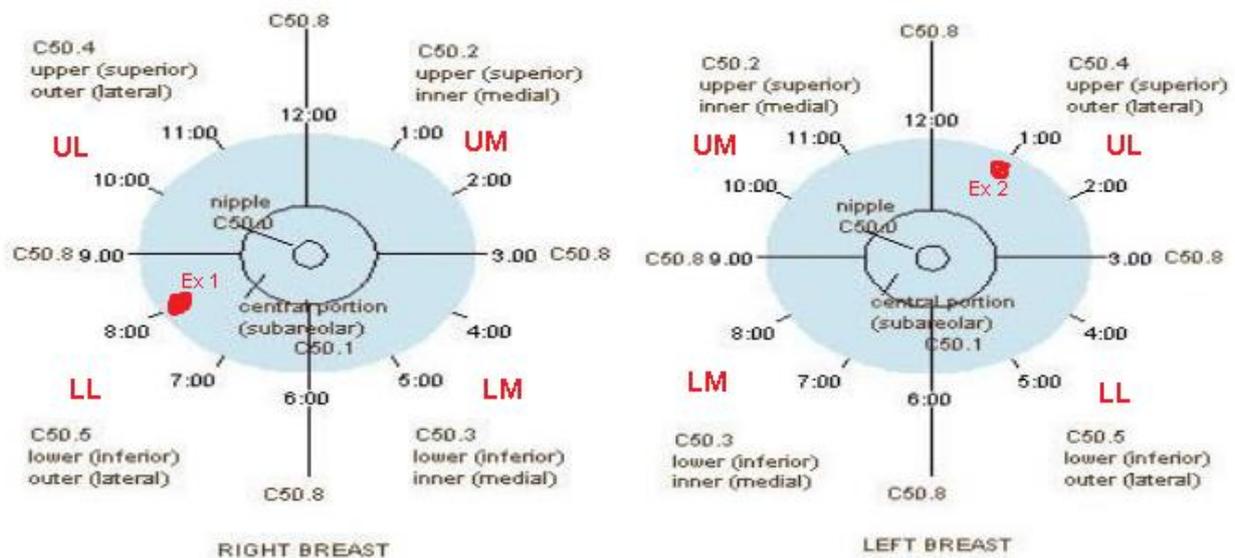
For proper description of the location of breast tumours we have two methods:

- Breast Quadrants:

Breast is divided into: -Upper lateral (outer) -Lower lateral(outer)  
 -Upper medial -Lower medial

- Breast Clock:

Using this method a more accurate description of the mass is achieved. Starting from upper midpoint of the breast and moving in clockwise direction we have a complete clock.



Ex.1: A tumor, Lower lateral quadrant, at 8 o'clock, right breast.

Ex.2 : A tumor, upper lateral quadrant, at 1 o'clock, left breast.

### Arterial supply:

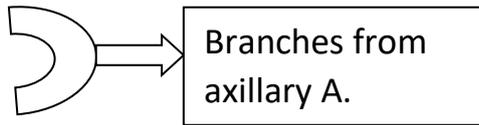
-The major artery in the area of our interest is the subclavian artery.

-The subclavian artery ends at the first rib's lateral edge. At this point, it turns into the axillary artery.

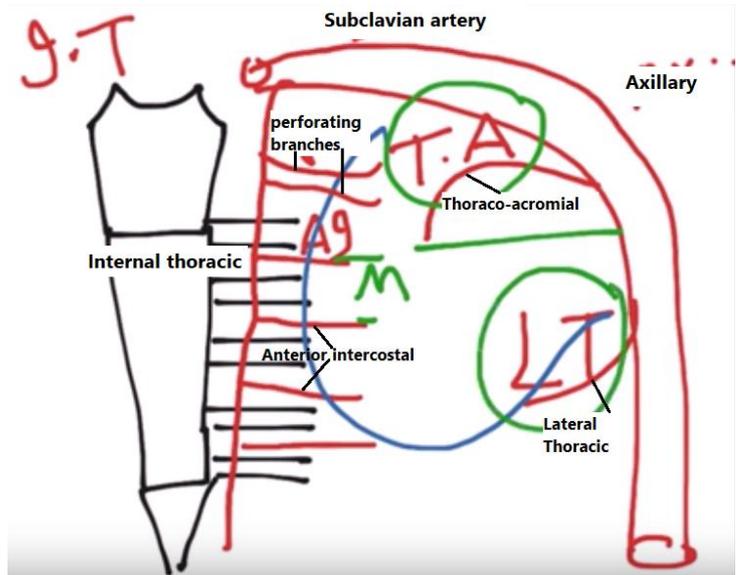
### Vessels of the breast:

- 1- Internal thoracic artery/internal mammary A.: arises from the subclavian A. near the sternal angle and runs posterior to intercostal cartilages. It gives off Anterior intercostal arteries and perforating branches.

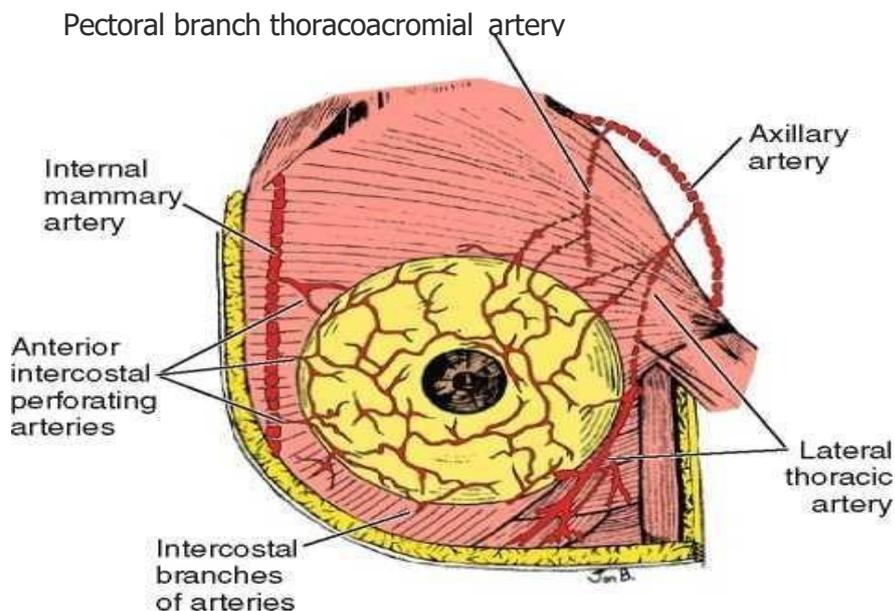
- 2- thoraco-acromial A.
- 3- Lateral thoracic A.



- **The medial part**
  - ✓ Perforating branches of the internal mammary artery
  - ✓ Anterior intercostal arteries from 2-6
- **The upper lateral part**
  - ✓ Pectoral branch of the thoraco acromial artery. (branch of axillary artery).



- **The lower lateral part:**
  - ✓ Lateral thoracic artery (branch of axillary artery).



Venous drainage:

- 1) The subcutaneous tissues venous circle at the base
- 2) The gland and stroma small veins that accompany the arteries mammary and posterior intercostal and axillary veins

## Lymphatic drainage of the female breast:

- ✓ The superficial lymphatics, form a dense plexus deep to the areola which is called the subareolar plexus
  - ✓ The deep lymphatics form a plexus on the deep fascia of pectoralis major which is called the deep lymphatic plexus
- 1- The central and lateral parts of the gland drain into the pectoral (anterior) group of axillary lymph nodes
    - One or two large lymphatics from the upper part of the gland pierce the clavicular head of pectoralis major and the clavipectoral fascia to end in the apical group of axillary lymph nodes
  - 2- Lymphatics from the medial part of the gland pass through the intercostal spaces with the perforating branches of the internal mammary artery to end in the internal mammary (parasternal) lymph nodes.
    - Lymphatics from the medial part of the gland also cross the midline to anastomose with the lymphatics of the opposite breast
  - 3- Lymphatics from the inferomedial part of the gland anastomose the lymphatics of the rectus sheath, linea alba and subdiaphragmatic lymphatics.

Area	Lymph Group
Central and lateral parts	Pectoral (anterior) group of axillary lymph nodes
Upper part	Apical group of axillary lymph nodes
Medial part	Internal mammary (parasternal) lymph nodes Cross to opposite breast
Inferomedial part	Lymphatics of the rectus sheath, linea alba and subdiaphragmatic lymphatics

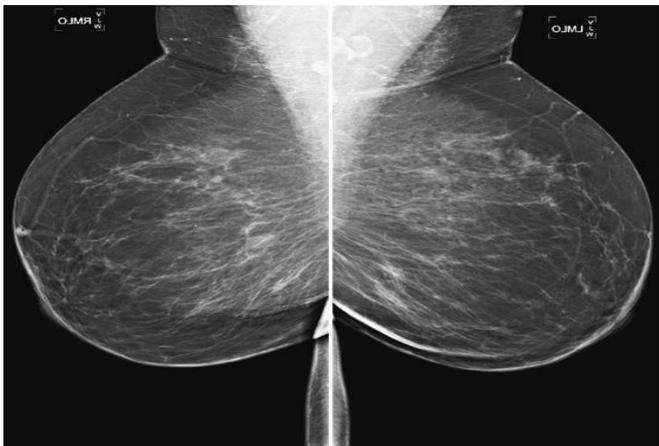
## Breast Cancer

Carcinoma of the breast may give rise to the following features:

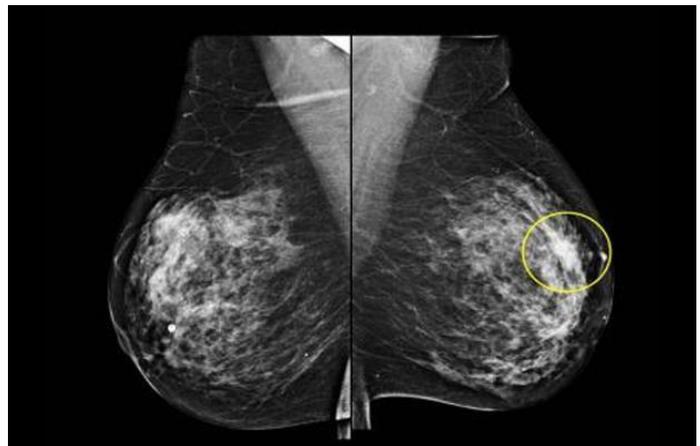
- 1) Retraction or puckering of the skin due to invasion of the ligament of Cooper.
- 2) Peau d'orange or oedema with pitting oedema is due to obstruction of cutaneous lymphatics by cancer cells and pitting due to fixation of the hair follicles to subcutaneous tissue.
- 3) Retraction of the nipple is due to extension of the growth along the lactiferous ducts with accompanying fibrosis.
- 4) Breast may become fixed with the deep fascia, pectoral muscle and chest wall due to direct spread to the subjacent structures.
- 5) Axillary lymph nodes may be involved, these are stony, hard and fixed

## Mammography

Mammography is a radiographic examination of the breast. This technique is extensively used for screening the breasts for benign and malignant tumours and cysts.



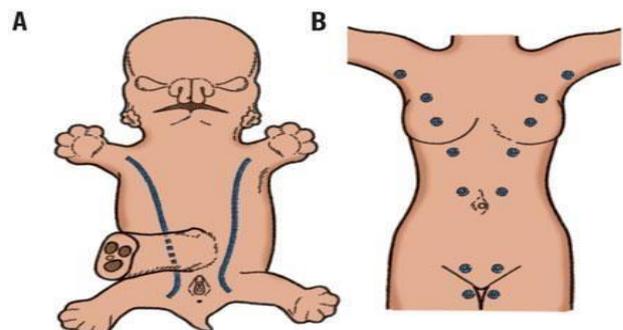
Normal breast



Breast cancer

## Development of the Breasts

- ✓ A linear thickening of ectoderm on each side of the body appears, it is called the milk ridge, which extends from the axilla obliquely to the inguinal region.



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- ✓ The ridge disappears except for a small part in the pectoral region.
- ✓ This localized area thickens, becomes slightly depressed, and sends off 15 to 20 solid cords, which grow into the underlying mesenchyme.
- ✓ The underlying mesenchyme proliferates. The ectodermal cords responsible for the formation of the ducts and alveoli (parenchyma) and the mesenchyme responsible for the connective tissue and its vessels (stroma).
- ✓ The depressed ectodermal thickening becomes raised to form the nipple.
- ✓ At the fifth month, the areola is recognized as a circular pigmented area of skin around the future nipple.

## Histology of the breast

The mammary gland is a compound tubule alveolar, apocrine gland, formed of lobes and lobules.

The lobules are separated by dense & fatty C.T.

### ☒ **Resting gland: (No lactation)**

- Ducts (lactiferous ducts) are embedded in **abundance of fatty C.T.** and are considered the principal glandular elements.

- The ductule epithelium cells show small alterations and vacuolation during the menstrual cycle.

-Alveoli are **collapsed** and represented by solid cords of cells.

Numbers in the figure above represent:

1-Sinus lactiferous 2-Connective tissue sheath 3- Coarse fibrous collagenous connective tissue between acini.

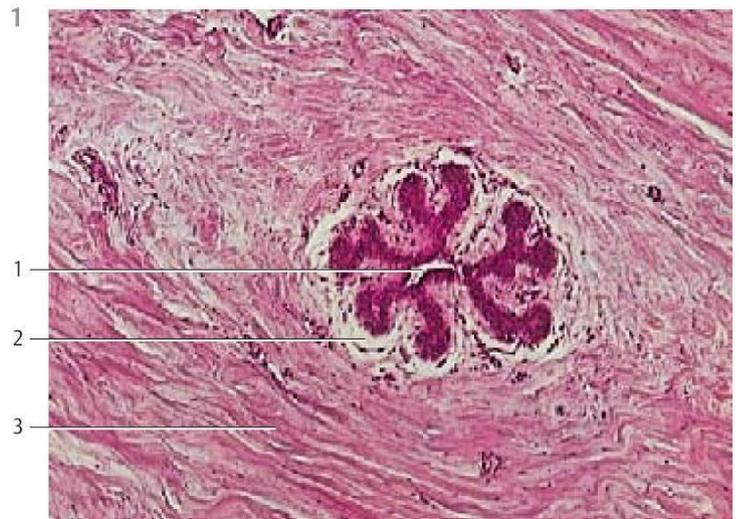
### ☒ **Lactating gland:**

- Little amount of C.T. and many secretory acini and ducts.

- Some acini and ducts are distended with milk others are empty.

- The acini are lined by either tall columnar or low cuboidal cells depending on the state of activity

-Milk in acini appears interrupted with vacuoles of dissolved fat.



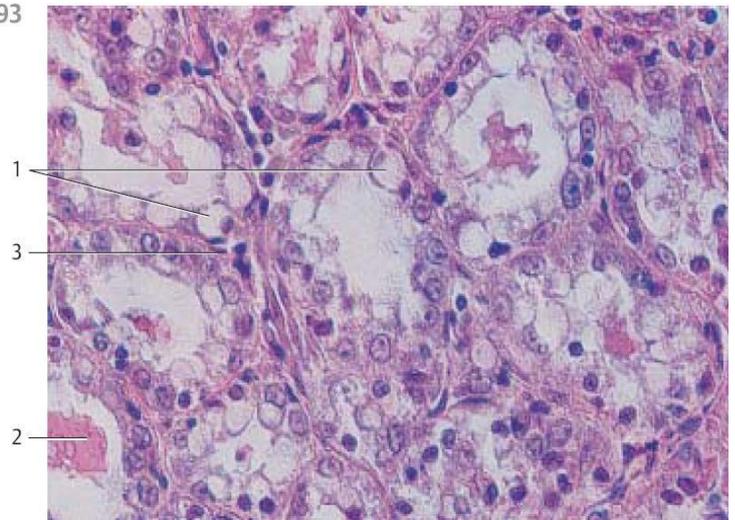
-Myoepithelial cells are found around the acini and beneath the terminal ductule epithelium to facilitate milk ejaculation.

1-Secretory product in gland cells (vacuoles)

2-Secretory product

3-Myoepithelial cells

593



The End