Lectures of Human Anatomy

Female Breast

By

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Adult Female Breast (Mamma)

There are 2 mammary glands, lying in the superficial fascia on the front of the thorax. The breast is an accessory gland to the female reproductive system. Actually, it is modified sweat gland, to secrete milk. Breast is present in male, but in a rudimentary form.

*Site:* Although the breast varies in size, its base is almost constant in extension.
- It extends from the 2nd to the 6th rib and from the lateral edge of sternum to the mid-axillary line.
- It lies on pectoralis major (about 2/3rd of breast) and on serratus anterior (about 1/3rd) and to lesser extent on the rectus sheath and external oblique muscle.

Its upper lateral part may pierce the deep fascia, deep to pectoralis major, extending to axilla, called *axillary tail.*
- Nipple position is variable in females, however it lies opposite the 4th intercostal space in the mid-clavicular line.

*Structure of the breast:* It is formed of 3 structures:

- **Mammary gland.**
- **Fat** of superficial fascia (in which the gland is embedded).
- **Skin** (covering the gland).

1. **Skin:**
   - It covers the breast. It shows the prominence, called *nipple.*
   - The nipple is surrounded by a pigmented skin, called *areola.* The skin of areola is usually irregular due to presence of small tubercles called *Montgomery glands.* These are modified sebaceous glands, functioning in lubrication of this area.
   - N.B.: Clinically, these glands may form cysts and become infected.
   - The areola is pink in color in virgin, but darkly pigmented after the first pregnancy.

2. **Fat** of superficial fascia:
   - It surrounds the mammary gland and gives the breast its smooth contour and most of its bulk.

3. **Mammary gland:**
   - It is formed of 15-20 lobes, separated by fibrous septa, extending from the skin to the underlying fascia. The septa are called *suspensory ligaments* (or *ligaments of Cooper*).
   - Each lobe has a main duct called *lactiferous duct,* converging in a radial direction towards the nipple.
   - Each duct opens separately on the summit of the nipple.
- Just before the opening at the nipple, each duct dilates to form lactiferous sinus, beneath the areola.  
N.B.: Lactiferous sinuses ensure continuous follow up of milk to the fetus during lactation.

Breast changes throughout the female life:
1. In female child, it is rudimentary, like that of male.
2. At puberty, it enlarges and becomes hemi-spherical in shape.
3. At pregnancy, it becomes engorged with colostrum. Also, the nipple becomes darkly pigmented after the first pregnancy.  
   N.B.: Colostrum appears at the nipple by squeezing or pressure on the breast. It may be sign of pregnancy
4. In multiparous women, it becomes pendulous.
5. After menopause, it becomes atrophied and reduced in size and its skin becomes wrinkled.

Blood Supply
A. Arterial supply:
   1. Mammary branches from lateral thoracic and acromio-thoracic arteries (arising from the axillary artery.).
   2. Perforating branches from internal thoracic (internal mammary) artery.
   3. Perforating branches from the underlying intercostal arteries.
B. Venous drainage:
The veins correspond to the arteries of the breast.

Lymphatic Drainage:
It is of great importance in spread of breast cancer.  
Like other organs, lymphatic vessels draining the breast accompany the blood vessels supplying it, e.g. lymphatics passing along tributaries of the axillary vessels to reach axillary lymph nodes.  
1. Lateral quadrants and central part: drain into the pectoral group of axillary lymph nodes.
2. Medial quadrants: drain into the parasternal (internal mammary) lymph nodes.
Some lymphatics cross to the opposite parasternal lymph nodes to anastomose with that of the other breast. Therefore, examination of the other breast is important in case of cancer breast.

3. Some lymphatics from the upper part drain directly into apical group of axillary lymph nodes or may into one or two infraclavicular lymph nodes.
4. Some lymphatics from the infero-medial part drain into nodes along linea alba and rectus sheath.
5. Some lymphatics from the deep part pass along the intercostal vessels to drain into posterior intercostal nodes.

Clinical Points
1. Fibrous septa divide the breast into lobes so that infection is usually localized. Therefore, for drainage of breast abscess, radial incision must be done over the affected part, to minimize the destruction of other healthy lobes and ducts. This is because of the radial arrangement of lactiferous ducts.
2. In cancer breast, the tumor may extend into the suspensory ligaments causing contraction of their fibrous tissue. This results in traction on the skin and its dimpling (peau d'orange), and may nipple retraction.
3. Pectoral group of nodes receive about 75% of lymphatic drainage of breast. Moreover, about 60% of breast cancers occur in the upper quadrant of breast. Axillary lymph nodes represent the main sites for metastases of breast cancer. Therefore, examination of axillary lymph nodes is essential in diagnosis and follow up after surgical excision or radiological destruction. Surgical excision may result in lymphoedema of the upper limb.
4. Strong adduction of arm to put the pectoralis major in contraction is essential in examination of the breast lumps.

Breast cancer in the right side showing edema, erythema and peau d'orange

Axillary Lymph Nodes
They receive lymph from upper limb, thoraco-abdominal wall above the level of umbilicus and the breast of the corresponding side. They are about 30-50 in number, arranged in 5 groups, as follows:

1. Anterior (pectoral) group:
They lie along the anterior part of medial wall of axilla (deep to pectoralis major, on the lower border of pectoralis minor). They receive lymph from the front and side of chest including the breast. They send efferents to the central and apical groups.

2. **Posterior (subscapular) group:**
   They lie along the posterior part of medial wall of axilla (on the lower border of subscapularis). They receive lymph from the back of trunk above the level of umbilicus. They send efferents to the central and apical groups.

3. **Lateral group:**
   They lie on the lateral wall of axilla (along the medial side of lower part of axillary vessels). They receive most lymph of the upper limb. They send efferents to the central and apical groups.

4. **Central group:**
   They lie in the axillary fat, at the central part of axilla. They receive lymph from the previous 3 (anterior, posterior and lateral) groups. They send efferents to the apical group.

5. **Apical group:**
   They lie at the apex of axilla (on the lateral border of 1st rib, behind the clavicle). It lies along the medial side of the upper part of axillary vein, above pectoralis minor. They receive lymph from the other lymph groups and few lymphatics from the upper part of breast. Their efferents form the subclavian lymph trunk that joins the corresponding subclavian vein at the root of neck. Alternatively, the left trunk joins thoracic duct and the right one joins the right lymph trunk.