BREAST

I. INTRODUCTION

The breast, also known as the mammary gland, is a paired exocrine gland. Rudimentary in men and children, it belongs to the female reproductive system. The size of the breast is individually variable. The mammary gland constitutes the organ of lactation and the breast, as a whole, has a particular aesthetic importance for women as it is the target of the most frequent aesthetic surgeries.

II. DESCRIPTIVE ANATOMY

A- SITUATION

The breast lies in the subcutaneous tissue just above the fascia superficialis of the anterior thoracic wall. Despite individual variations in size, the extent of the base of the breast is fairly constant: from near the midline to near the midaxillary line, and from the second to the sixth ribs. It overlies pectoralis major, overlapping on to serratus anterior and to a small part of the rectus sheath and external oblique muscle, a small part of the upper outer quadrant may extend laterally to form the axillary tail. Rarely, the breast may penetrate the deep fascia of the axillary floor.

B- DIMENSIONS

The breast weighs two hundreds to five hundred grams. Its weight increases during pregnancy, breast-feeding and premenstrual phase.

C- SHAPE

The shape of the breast consists of three concentric areas, the periareolar skin, the areola and the nipple.

The dermis of the periareolar skin is connected to the superficial fascia behind the breast by strands of fibrous tissue called the suspensory ligaments of cooper. The superficial fascia is the upward continuation of the membranous layer of superficial abdominal fascia of Scarpa and is condensed behind the breast forming a posterior capsule.
The periareolar skin is thin and smooth. During pregnancy and lactation, subcutaneous veins are usually visible.

The areola is an area of pigmented skin of three to five centimetres doubled in its deep face by a smooth muscle, the areolar muscle. Some large sebaceous glands under the areola, the areolar glands, may form small elevations (tubercles of Montgomery). Its color is individually different and is more pigmented during pregnancy.

The nipple projects just below the centre of the breast and is surrounded by the areola. It is columnar and is ten millimetres long and fifteen millimetres wide at its base.
Fifteen to twenty lactiferous ducts converge in a radial direction to open on the surface of the nipple. The nipple hardens when stimulated, this reflex is called theleretism.

III. STRUCTURE

A- MAMMARY GLAND

The mammary gland is a very sparse modified apocrine sweat gland yellowish in colour. It is built in irregular lobules separated by interlobular septa from which the lactiferous ducts converge to open on the summit of the nipple.

Each lobule contains ten to a hundred alveoli at the end of the terminal ducts and each lactiferous duct has a dilated sinus just below the nipple.

Alveoli are spherical collections lined of two layers one of epithelial cells that become the active milk-secreting structures during lactation and one of myoepithelial cells that has an importance in the pathological analysis of breast malignancies.

B- NON-LACTATING BREAST

The non-lactating breast is a fibrous and fatty tissue.

The suspensory ligaments of Cooper divide the pre-mammary space, a connective and adipous tissue, forming crests of Duret except behind the areola. This retroareolar space contains the lactiferous ducts surrounded by muscular fibres which contraction narrows their lumen ejecting milk during lactation.

Between the posterior capsule and the fascia over pectoralis major is the retro-mammary space (connective and adipous tissue), traversed by lymph vessels and some blood vessels but relatively avascular. The areola is particularly rich in pigmented cells, hair follicles and sweat glands.

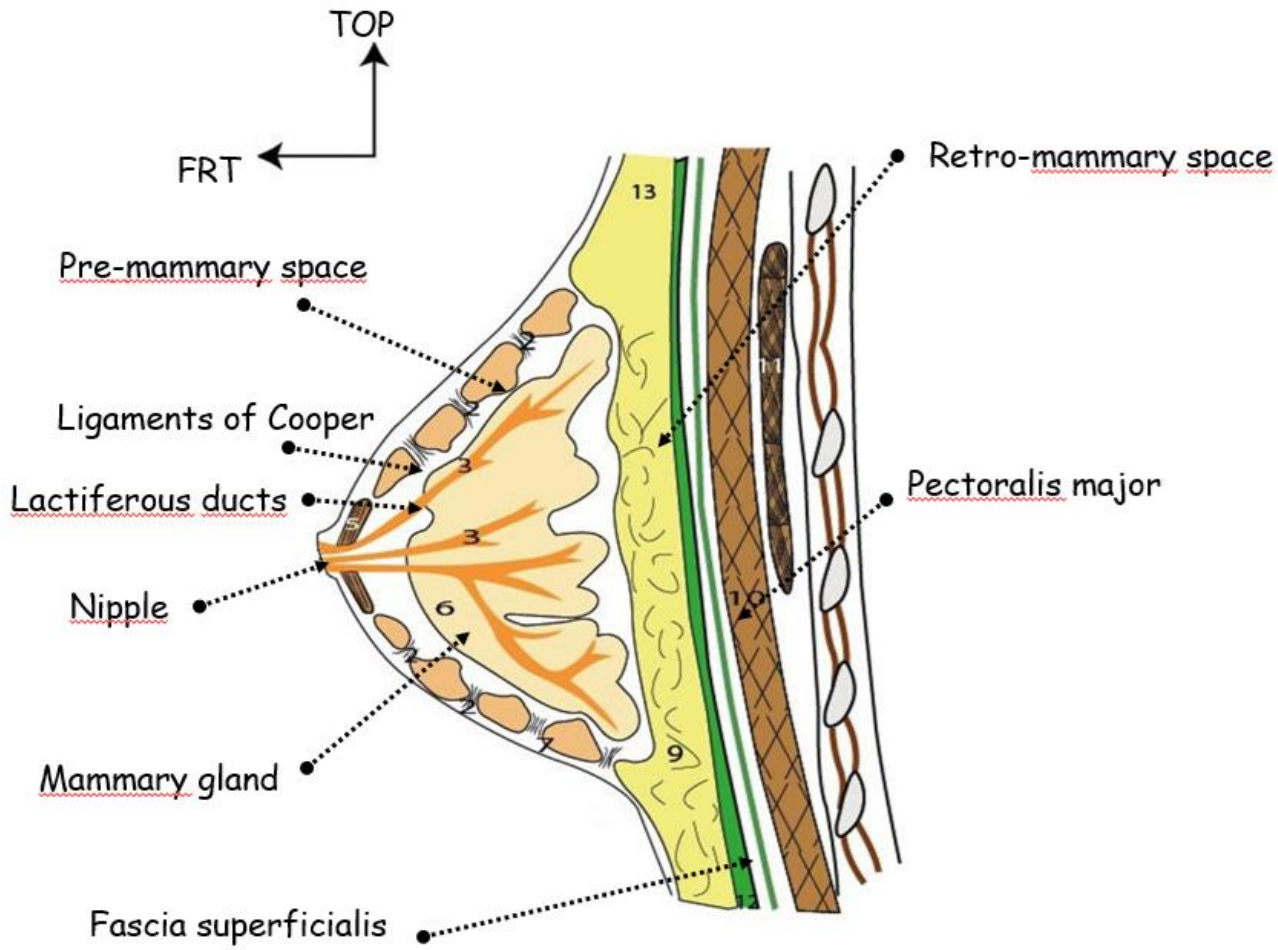

Figure 1: Sagittal section showing the structure of breast

IV. SUPPORTS

The breast is connected to the nipple by the open ends of lactiferous ducts and to the areola and anterior thoracic wall by suspensory ligaments of Cooper.

V. ANATOMICAL RELATIONS

The breast is a superficial organ lying on the anterior thoracic wall. Thus, it is in contact from front to back with pectoralis major and pectoralis minor muscles, ribs, intercostal muscles and pedicles and pleura and lungs.

VI. BLOOD SUPPLY, LTMPH DRAINAGE AND NERVE SUPPLY

A- ARTERIES

The blood supply of the breast is, mainly, ensured by the subclavian and axillary arteries through four pedicles.

The lateral thoracic artery, from the axillary, gives branches that curl around the border of pectoralis major and by other branches that pierce the muscle and penetrate the gland in its lateral side.

The internal thoracic artery, from the subclavian, sends branches through the intercostal spaces beside the sternum that penetrate the gland in its medial side.

The intercostal arteries, from the aorta, supply the posterior side of the gland through small perforating branches.

The thoracoacromial artery, from the axillary, gives pectoral branches that supply the upper part of the breast.

The various supplying arteries form an anastomosing network.

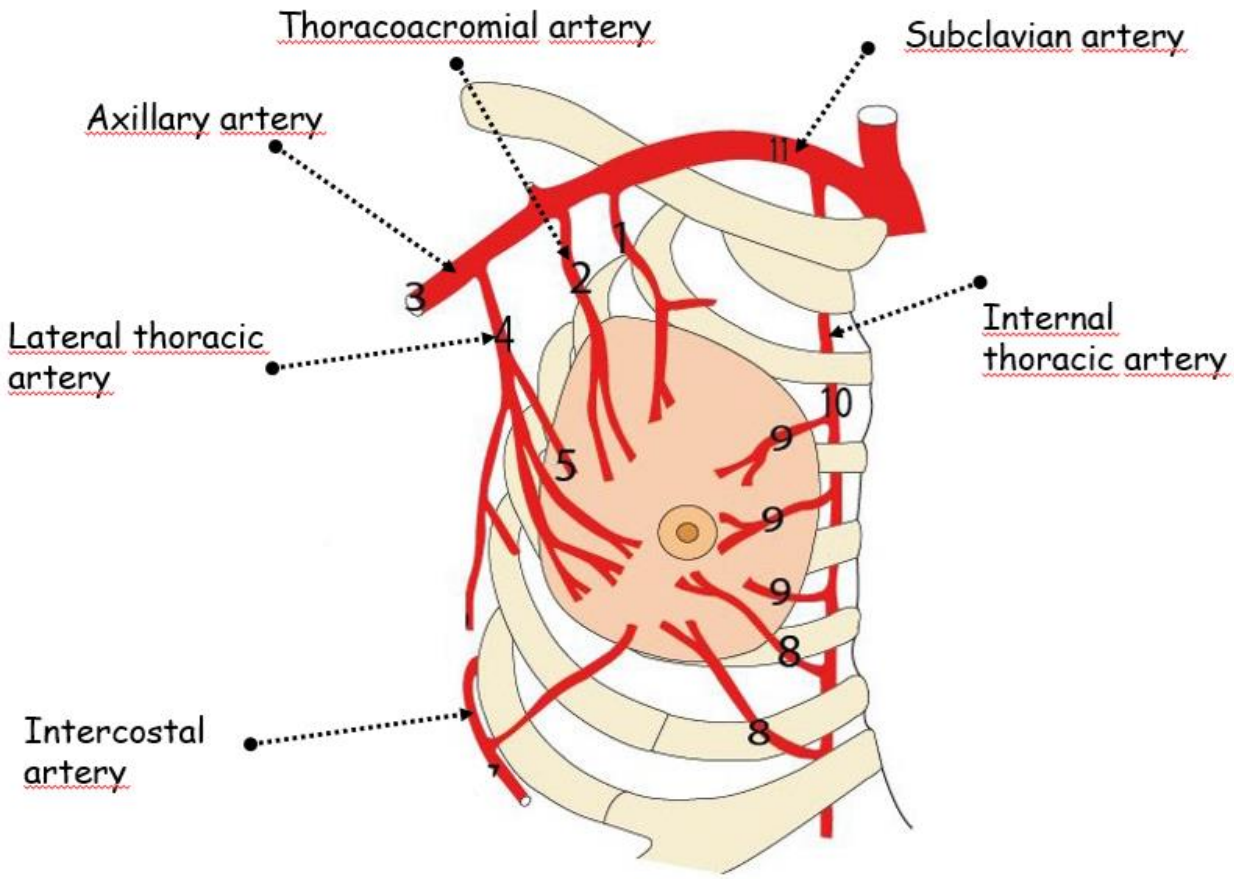

Figure 2: Overview of the arteries of breast

B- VEINS

The veins of the breast are deep and superficial.

The deep veins run with the main arteries to internal thoracic and axillary veins.

Some drainage to posterior intercostal veins provides an important link to vertebral veins.

The superficial veins anastomose across the midline.

C- LYMPH DRAINAGE

The lymphatics of the breast are common to the mammary gland and overlying skin, they

cross the midline and are deep and superficial.

The deep lymphatics consist of two main chains.

The infraclavicular and axillary nodes the upper and lower outer quadrants and are subdivided in the axillary fossa into five groups, pectoral, subscapular, lateral, central and apical groups.

The internal thoracic nodes drain the upper and lower inner quadrants and are scattered through intercostal spaces.

The deep lymphatics drain to supraclavicular nodes and to thoracic duct or the right lymphatic trunk.

The superficial lymphatics drain to the opposite breast, cervical nodes, the peritoneal cavity and liver through the diaphragm or through the rectus sheath, or even to inguinal nodes via the anterior abdominal wall.

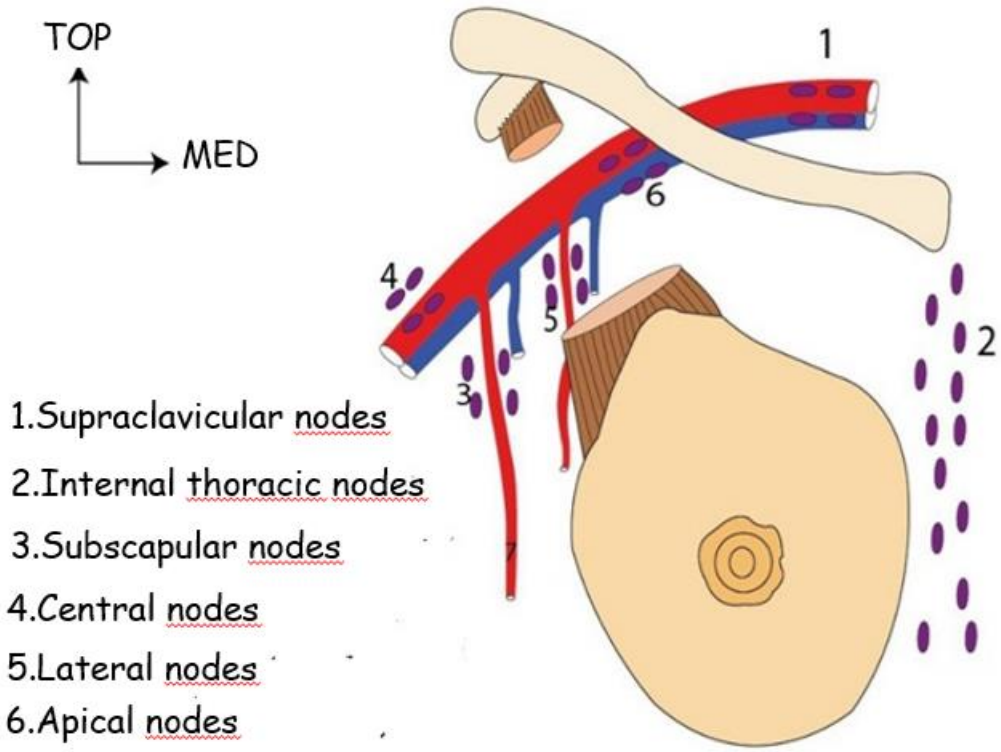

Figure 3: Overview of the lymph drainage of breast

D- NERVES

The overlying skin is supplied by the cutaneous branches of intercostal nerves T4 to T6. Sympathetic fibres supply the blood vessels and glands, but the control of lactation is hormonal.

VII. SURGICAL APPROACH

The extensive removal of the breast and adjacent tissues for carcinoma so common in earlier decades has now given place in many cases to local excision supplemented by radiotherapy and chemotherapy.

If simple mastectomy is required, the breast is stripped off the pectoralis fascia and adjacent muscles, together with axillary fat and lymph nodes.

For more radical procedures, one or both pectoral muscles can be removed as well.

In axillary dissections, damage to the long thoracic and thoracodorsal nerves as well as to the main branches of the brachial plexus must be avoided, but the intercostobrachial nerve can be cut when clearing fat and lymph nodes.

If both pectoral muscles are being removed the pectoral nerves can also be cut, but if pectoralis major remains the lateral pectoral nerve must be preserved so that at least part of the muscle retains a nerve supply.

VIII. CONCLUSION

The breast is a size-variable organ that occupies the anterior thoracic wall.

It has a major role in lactation and benefits from a rich blood supply allowing different procedures according to the degree of removal required. Lymph drainage is ensured mainly by the axillary nodes very important during clinical assessment of malignancies. Its secretion is neurohormonal

mediated.