INTRODUCTION

Mammoplasty is the plastic reconstruction of the breast. The male and female breasts may be reconstructed for many reasons and may be medically necessary or for aesthetic purposes. The three most common types of breast surgery are augmentation mammoplasty, reduction mammoplasty, mastopexy and breast reconstruction following mastectomy ***(Carleen et al., 2005).***

Reduction mammaplasty and mastopexy are two distinct yet interrelated procedures that share many points in common. Both operations result in lifting of the nipple and areola, reduction of the breast skin envelope, and generally an overall improvement in the shape of the breast. As a result, these goals are accomplished for both procedures using similar operative strategies. While recognizing these similarities, it is important to note that the major focus of breast reduction is to reduce the volume of the breast, whereas mastopexy is generally intended to lift and reshape the breast with little or no breast volume change. Typically, the aesthetic concerns in mastopexy are generally more demanding than those in breast reduction. Understanding the basic elements of each procedure is key for developing successful operative plan that provides the best results possible and yet minimizes potential complications ***(Scott et al., 2011).***

Breast augmentation is a procedure for enlarging breasts those are small, under developed or involuted post-partum or post-lactation. It can be done for purely cosmetic purposes, as when a woman wants larger breasts, or following mastectomy to replace surgically removed tissue. Glandular hypomastia may occur as a developmental or involutional process and affects a significant number of women. Developmental hypomastia is often seen as primary mammary hypoplasia or as a sequel of thoracic hypoplasia (Poland syndrome) or other chest wall deformity. Involutional hypomastia may develop in the postpartum setting and may be exacerbated by breast-feeding or significant weight loss. When compared to the norm, inadequate breast volume may lead to a negative body image, feelings of inadequacy, and low self-esteem. These disturbances may adversely affect a patient's interpersonal relationships and quality of life.There has been a steady increase in breast augmentation surgery with the emerging importance of body image, changes in social expectations, and the increasing acceptance of aesthetic surgery ***(Maxwell et al., 2006).***

Reconstructive mammaplasty is done as an alternative to breast forms and specially designed brassieres to achieve a more normal appearance of the breast. If this procedure is chosen, it is usually considered to be just one stage in the total plan of treatment for breast cancer. It has both a psychological and

physiological impact on the patient. Criteria used to determine whether reconstructive surgery is appropriate postmastectomy include the amount of tissue remaining after mastectomy, e.g., pectoral muscles, skin, and nipple; the probability of recurrent metastatic disease; appearance and size of the unoperated breast; and size and angle of the mastectomy scar. Adjuvant cancer therapy with radiation does not necessarily preclude additional plastic breast surgery ***(Sanjay et al., 2003)***.

Mammoplasty is a procedure, which has evolved tremendously over the years due to the continuous and ongoing quest on the part of Aesthetic Surgeons to achieve the objective of reshaping the breast size, improving breast shape and relocating the nipple areola complex, while minimizing scars and also preserving lactation and innervation to the nipple-areola complex. Many of the procedures in use currently do achieve all these objectives, but the quest for ideal operation continues ***(Gilman et al., 2010).***

AIM OF THE WORK

To study new surgical trends in reshaping the breast either augmentation, reduction & mastopexy or reconstruction and the outcome of each.

BREAST ANATOMY

I-Macroscopical anatomy of the breast

A-Site and Extension

The adult female breast is located within the superficial fascia of the anterior chest wall. The base of the breast extends from the level of the 2nd or 3rd rib to the infra-mammary fold, which is at the level of 6th or 7th rib, and from the sternal border medially to the mid-axillary line laterally. Two thirds of the base of the breast lies anterior to the pectoralis major muscle, while the remainder lies anterior to the serratus anterior muscle. A small part may lie over the aponeurosis of external oblique muscle. In about 95% of women there is a prolongation of the upper lateral quadrant towards the axilla forming tail (of Spense). The breast tissue passes up to the level of the 3rd rib in the axilla where it is in direct contact with the main lymph nodes of the breast (anterior axillary nodes). This process of breast tissue enters a hiatus (of Langer) in the deep fascia of the anterior axillary wall***(Lawson, 2002).***

b-The deep fascia

The deep fascia or pectoral fascia encloses the pectoralis major and pectoralis minor muscles and then is reflected

laterally across the axilla to the latissimus dorsi muscle posteriorly. This deep fascia also extends from the clavicle and deltoid muscle above to the serratus anterior and external oblique muscles on the thoracic wall. The deep layer of pectoral fascia encloses the pectoralis minor and is reflected from the coracoid process to the clavicle as the costo – coracoid or clavi – pectoral fascia. This layer of pectoral fascia is continuous across the midline and superiorly into the neck as the deep cervical fascia. The upper portion of the clavi – pectoral fascia encloses the subclavius muscle and pectoralis minor muscle. The lower portion of the clavi – pectoral fascia located below pectoralis minor muscle is sometimes called the suspensory ligament of the axilla or the coraco – axillary fascia. The breast is supported by ligaments of Cooper, which give the young breast its protuberant shape and when atrophic in old age it renders the breast to be pendulous and ptosed***(Romrell and Bland, 2004).***

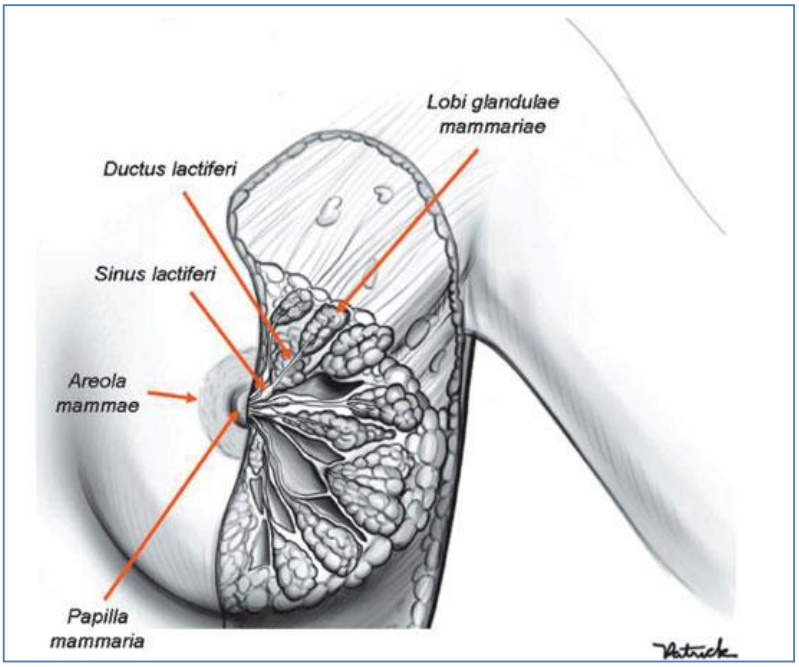

Fig (1) Form and components of the breast.***(Romrell and Bland, 2004).***

C-Shape of the breast

Normal breasts range widely in size and vary greatly in shape.The shape of the breast depends primarily upon the arrangement of the glandular tissue, the fibrous support structures and the skin envelope. Overtime, breast shape may transform dramatically with pregnancy, breast feeding, weight changes and aging. The "ideal" or even "normal!" breast shape is subjective and elusive. However, certain characteristics are generally considered aesthetically desirable. These characteristics include; round configuration from the frontal view, conical profile, superior fullness, firmness, nipple that point forwards and slightly upward and outward. In viewing the ideal breast in profile, the

level of the nipple is usually at or just above the inframammary fold***(Ramsclaar, 1988).***

II-Microscopical anatomy

The adult female breast has two components; these are the epithelial component responsible for milk formation and transport, namely the acini and ducts. Another component is supporting tissue as muscles, fascia and fat. The epithelial element consists of twenty or more lobes, each lobe drains into a mammary duct, each of which will ends separately at the nipple. The lobe consists of lobules, the number of which is very variable, each lobule is a collection of about tens to hundreds of acini grouped around and converging on a collecting duct, each acinus is a sphere of cells capable of milk secretion draining into a terminal duct ***(Cuschiere et al., 1996).***

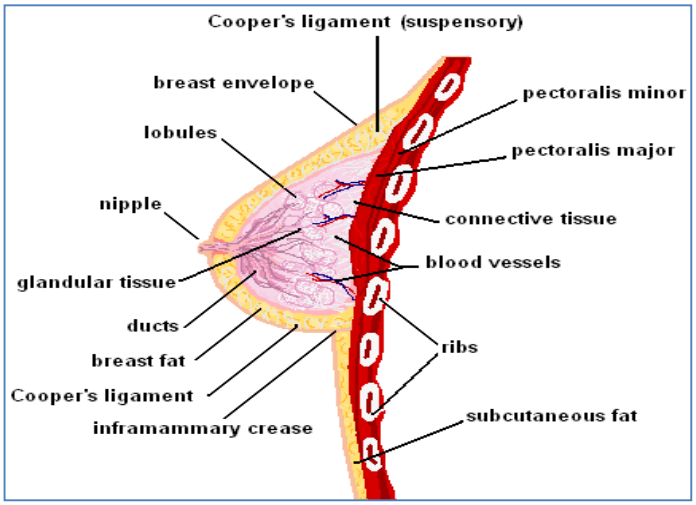

Fig. (2): Microscopical anatomy of the breast.***(Cuschiere et al., 1996).***

Therefore, the mammary gland is a fibro – fatty – glandular structure composed of:

a) Glandular tissue.

b) Fibrous tissue, connecting its lobes.

c) Fatty tissue in the intervals between the lobes.

The mammary gland is contained within the superficial pectoral fascia, which divides to encapsulate the gland between the anterior layer and a posterior layer, these layer are continuous cephalically with the superficial cervical fascia, and they rejoin at the inframammary fold to become continuous caudally with the Camper'sand Scarpa'ssuperficial abdominal fascia***(John and William, 2002)***.

Actually, a thin layer of mammary tissue extends considerably farther from the clavicle above to the 7^{th} Or 8^{th} rib below and from the midline to the edge of latissimus dorsi posteriorly. This fact is important when performing a mastectomy, the aim of which is to remove thewhole breast ***(Saunders and Baum, 2000).***

The breast is made up of lobules which are embedded in fat, this fat accounts for its smooth contour and most of its bulk, these lobules are separated by fibrous septa running from the subcutaneous tissues to the fascia of the chest wall

(the ligaments of Cooper). These when they contract due to malignant invasion will produce the characteristic fixation and retraction which is known as puckering. Each lobule drains lactiferous duct onto the nipple which is surrounded by pigmented areola, this area is lubricated by the areolar glands of Montgomery, which are large modified sebaceous glands which may form sebaceous cysts, which may, in turnbecome infected***(David et al., 2005).***

Between the breast and the deep fascia there is a loose connective tissue in the submammary space this allow some movement of the breast on the deep pectoral fascia so, advanced mammary carcinoma may by invasion, fix the breast to the pectoralis major. The Nipple projects from the centre of the breast anteriorly. Its shape varies from conical to flattened, depending on nervous, hormonal, developmental and other factors. Its level in most young females is at the fourth intercostals space, and it turns from pink to light brown or darker in nulliparous women. It is surrounded by the areola which is a disc of skin that encircles the base of the nipple, varying in color from pink to dark browndepending on the parity and race***(David et al., 2005).***

The areola contains involuntary muscles arranged in concentric rings as well as radially in the subcutaneous tissues. The nipple is covered by thick skin with corrugations. Near its

apex, the orifices of the lactiferous ducts lie. The nipple contains smooth muscle fibers arranged concentrically and longitudinally, thus it is an erectilestructure that points outwards ***(Saunders and Baum, 2000).***

III-Blood supply of the breast

a- Arterial blood supply

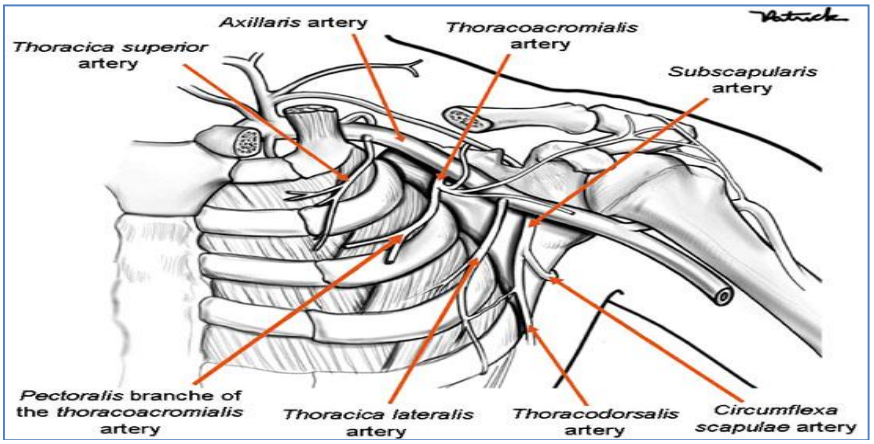

Fig. (3): Arterial blood supply of the breast.***(John et al., 2002).***

Firstly, anterior perforating branches of the internal mammary artery that penetrate each intercostals space, supply the inner quadrants medially and the overlying pectoralis major muscle origin along the lateral sternal border. Arteries of the 2nd& 4th spaces provide the predominant supply.

Secondly, the outer quadrants of the breast are supplied by the lateral thoracic (external mammary) artery, which

perforates the lateral segment of the pectoralis major muscle and comes around its lateral border. Lateral branches of posterior intercostal arteries with the third space artery also supply the outer quadrants segmentally, the fourth and fifth space arteries providing the predominant supply**.**

Thirdly, small branches of the thoracoacrmial artery penetrate the pectoralis major muscle to enter and supply the deep surface of the breast. All of these arteries connect with each others via collateral branches in the breast and overlying skin***(John et al., 2002).***

b- Venous drainage of the breast

There is a circular venous plexus around the areola. From this and from the glandular tissue, blood drains in veins, which accompany the corresponding arteries that supply the breast to the axillary, internal thoracic and intercostals veins. The internal thoracic veins are venae comitents to the inferior half of the internal thoracic artery and veins unite at the third costal cartilage to ascend medialto the artery, ending in thebrachiocephalic vein ***(David et al., 2005).***

The superficial system is significant as it anastomoses acrossthe midline of the anterior chest wall emptying to internal thoracic veins and to lower neck veins.

The deep system is the intercostal veins, which accompany the arteries, in addition to draining into azygos systems, they have the particular significance in considering the natural history of the breast cancer, and they communicate with the vertebral veins. This route could explain the predilection of bone metastasis from the breast cancer to the axialskeleton***(Cuschiere and Preece, 1996)***.

IV-Never supply of the breast

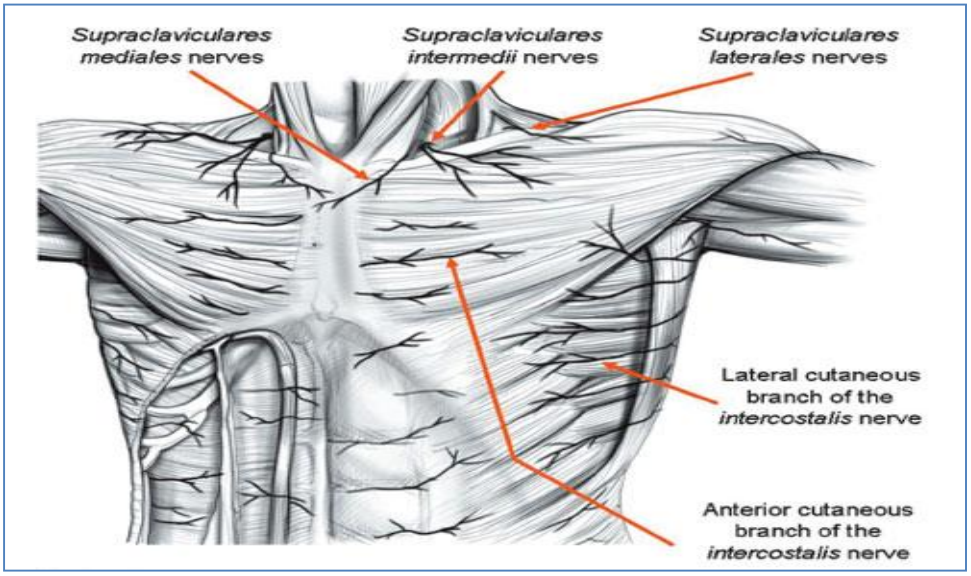

Fig. (4): Nerve supply of the breast.***(Lawson, 2002).***

Skin of the breast is innervated by cutaneous nerves of the thorax**.** The lateral cutaneous branches of the intercostals nerves (T2 – T6) give lateral mammary branches on the axillary side of the breast. Anterior cutaneous branches of the intercostals nerves

(T2 – T5) supply medial mammary branches to the sternal side of the gland. The skin over the upper most part of the gland is supplied by branches from the supra-clavicular nerves (cervical nerves C3 – C4). Nerves to the mammary parenchyma include both sensory and sympathetic fibers the sympathetic fibers pass to the glandular tissue, the smooth muscles of the areola, the nipple, and the blood vessels***(Lawson, 2002).***

V-Lymphatic drainage of the breast

a - Lymph vessels

Each lobule of the breast tissue has an extensive lymphatic plexus which in merged to form Sappy's sub-areolar plexus and deep fascial plexus which are interconnected with each other. The sub-areolar plexus drains the skin of the breast, the nipple and the areola in addition to some of the central portion of the gland***(Kumar et al., 2005)***.

Lymph flows unidirectionally from the superficial to the deep plexuses and form the sub-areolar plexus through the lymphatic vessels of the lactiferous ducts to the peri-lobular and the deep subcutaneous plexus. Flow from the deep subcutaneous and infra-mammary lymphatic vessels move centrifugally towards the axillary and internal mammary lymph nodes. Approximately 97% of the lymph from the breast flows to the axillary lymph nodes, whereas 3% of the lymph from the breast

is estimated to flow to the internal mammary chain. Drainage of the lymph to internal mammary chain may be observed after injection of any quadrant of the breast witha dye ***(Harris, 2004).***

b- Lymph Nodes

Romrell and Bland, 2004mentioned that the axillary lymph nodes are classified anatomically into five groups but they are classified surgically into six groups:

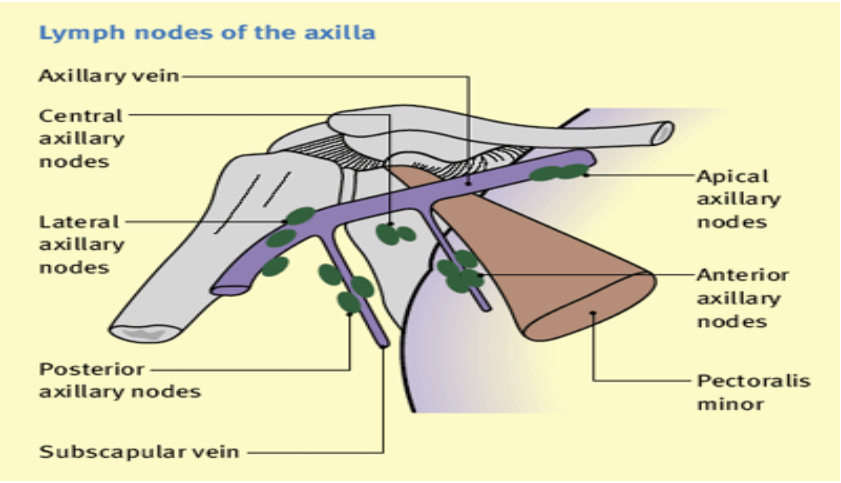

Fig. (5): Axillary lymph nodes.***(Romrell and Bland, 2004)***

1- Axillary vein (Lateral) group: 4-6 nodes medial or posterior to the axillary vein. These lymph nodes receive most of the lymph drainage from the upper extremity. The exception is lymph that drains into delto – pectoral lymph nodes; a lymph node group sometimes is called the infra-clavicular lymph node. The delto – pectoral lymph nodes drain into the sub-clavicular lymph node group.