BENIGN BREAST SWELLINGS

AN ESSAY

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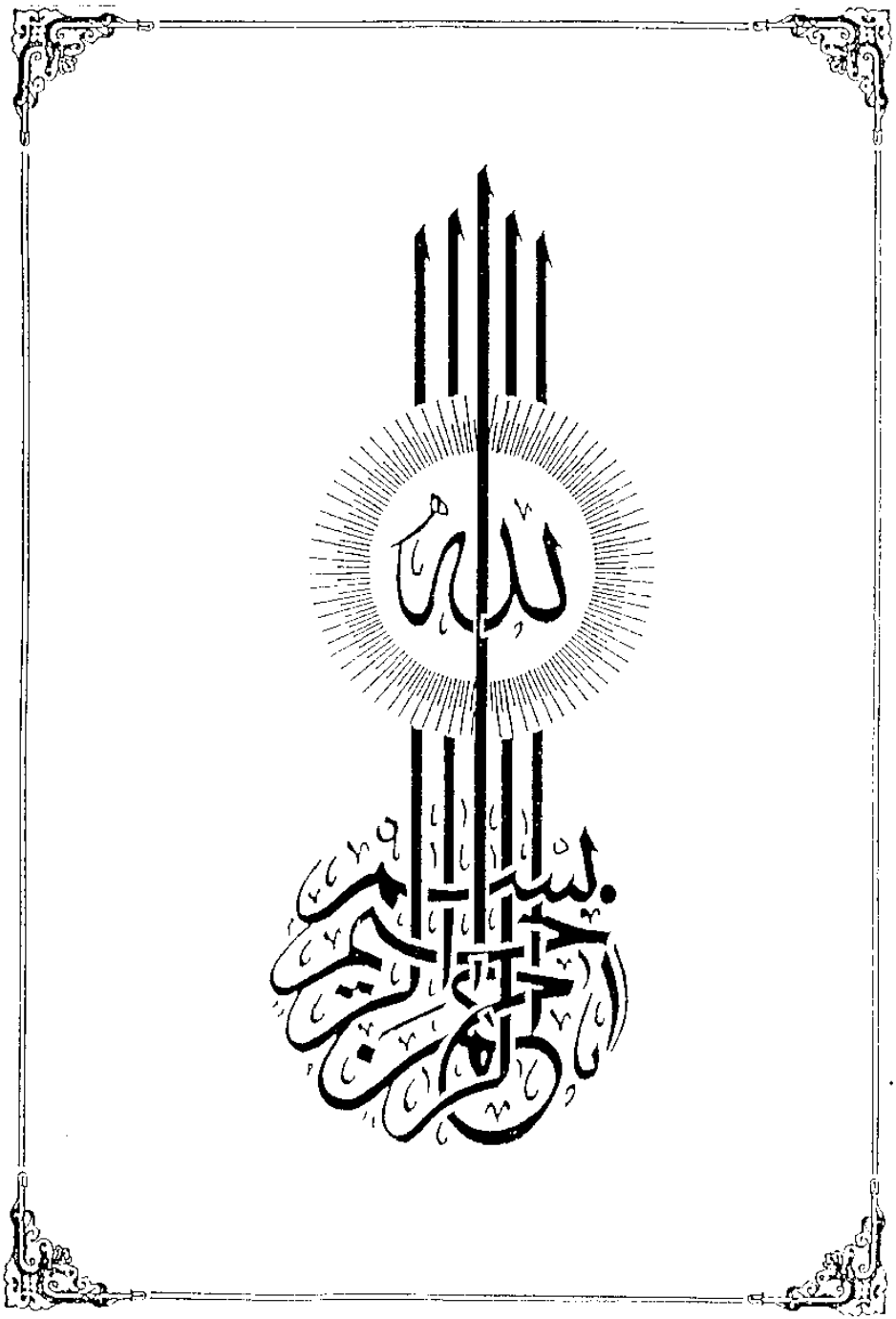

INTRODUCTION

IN THIS ESSAY DIFFERENT BENIGN BREAST LESIONS ARE FULLY DESCRIBED.

BENIGN BREAST DISEASES ARE COMMON LESIONS IN SURGICAL PRACTICE . ALTHOUGH THEY ARE COMMON, THEIR AETIOLOGICAL FACTORS REMAIN OBSCURE . PERHAPS RECENT ADVANCES IN ENDOCRINOLOGY, HORMONAL MEASURMENT WITH RADIOIMMUNO ASSAY MAY PROVIDE BETTER UNDERSTANDING OF THEIR AETIOLOGICAL FACTORS .

HISTORICAL NOTES

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The breast has always been a symbol of womanhood and ultimate fertility . As a result both disease and surgery of the breast evoke a fear of mutilation and loss of feminity .

Cosmetic consideration, false vanity and fear of infertility have hindered early diagnosis and prompt treatment of breast cancer from times of earliest recorded history until today .

Herodotus, a Greek historian who just preceded Hippocrates, tells of Atossa, doughter of Cyrus and wife of Darius, who had a small breast tumour which she concealed until it reached a point of ulceration and wide spread disease .

In the Edwin Smith Surgical Papyrus, the earliest known medical record (3000 - 25000 B.C.), description is made of bulging tumours of the breasts that were differentiated from abscess and mastitis .

While drainge of breast abscesses was practiced, there is no evidence that operative procedures were utilized for treating breast cancer in Egypt .

Hippocrates considered cancer of breast incurable . Celsus, a Roman Schoolar in the first century A.D. emphasized the danger of operating on the breast if cancer was present rather than leaving the tumour in place .

Celsue also argued against removal of pectoral muscles when brast amputation was to be attempted .

Galen wrote, " Cancerous tumours are found in the breasts of woman, after cessation of menestruation, which, so long as it is regular, preserved good health " . He did recommend surgical excision of readily removable breast tumours and gave a remarkable description of the spreading ob breast cancer :

" We have often seen in the breast a tumour exactly resembling the animal called the crab ... We have often cured this disease in its early states, but after it has reached a large size, no one has cured it without operation " .

Lecnides of Alexandria was the first to stress that nipple retraction was an important clinical sign of breast cancer, and he described the technique for surgical and cautery excision of the breast that probably was most used through the Dark Ages .

Vesalius placed the anatomy of the breast and axilla in the proper prespective and advocated wide surgical excision with ligature control of bleeding vessels rather than cautery .

Fabriciue was critical of any partial excision of breast cancer, advocating radical surgery or non at all .

Severinus was one of the first surgeons to remove enlarged axillary lymph glands at the time of breast amputation .

Le Darn in the eighteenth century, point out that at its earliest stage, cancer breast was a local lision; that it spreadsto regional nodes via lymphatics; that early operation provided the best chance for cure; and that axillary nodal involvement was associated with a poorer prognosis .

Petit stressed block dissection and the need for wide excision with careful axillary nodal removal . He was skilled enough to be successful in this technique and recognized the poor prognosis associated with supraclavicular nodal involvement .

Some surgeons urged more extensive excision of breast tumours, when operable, leading up to the present concepts of radical mastectomy .

Syme, in 1842, recommended wide excision of cancers even when they were small .

Moor, 1867 has the advantage of the dawning of microscopic pathology when he stressed that local recurrence after breast amputation was due to disseminated tumour fragments not removed at the time of the initial operation . He outlined the essential principles of radical mastectomy except for pectoral muscle removal .

Lister described division of these muscles for adequate removal of the axillary glands, and Gross, in 1880, supported Moors radical operation and extended it to include pectoral fascia excision .

Gross was one of the first prominent American surgeons to be convinced that early, through operative procedures could cure woman with breast cancer and he was able to apply careful histologic study to his thesis. (Davis-Christopher, 1972) .

ANATOMY OF THE FEMALE BREAST

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Gross Anatomy :

The breast is a modified sweat gland lying on the pectoral Fascia and the musculature of the chest wall (Wilsm R.E., 1981) .

The mammary glands are two large hemispherical emenences lying within the superficial Fascia and situated on the front of the chest .

Each extends from the second rib above to the sixth rib below, and from the side of the sternum to the midaxillary line .

Their weights and dimensions differ at different periods of Life and in different individuals . The left breast is generally larger than the right . The deep surface of the breast is nearly circular, flattened and its large axis directed towards the axilla (Andereson 1978) .

However mammary parenchyma may actually reach the clavicle cranially and beyond the costal margin caudally in 15% of cases and occasionally crosses the middle line anteriorly .

It lies in close proximity to the skin and can penetrate to the pectoralis fascia .

Laterally the gland curves around the free border of the pectoralis major muscle and in 95% of women projects into the lower axilla as the " tail of spence " .

The axillary projection or tail is sometimes so large that it forms a visible axillary mass which enlarges premenstrually and during lactation . Such well developed axillary projections are commonly mistaken for axillary lipomas or enlarged axillary lymph nodes .

Carcinoma may develop in the axillary tail and confuse the diagnosis .

The upper outer sector of the breast is thicker than the remainder of the breast because it contains a greater bulk of mammary tissue (Haagensen 1971) .

Deep to the breast lie portion of pectoralis major, the serratus anterior and the external oblique muscles as well as the upper terminus of the rectus sheath, (Donegan W.L., 1972) .

The breast is composed of about 15 to 20 segments which converge on the nipple in radial fashion .

Each segment opens into the nipple by a separate opening. Azzopardi (1979) mentioned that there are only 5 to 9 ductal openings in the nipple and the rest of the openings are merly pits which end blindly .

Surrounding the nipple is the areola which is an area of pigmented skin . It is marked by prominant sebaceaus and rudimenary milk glands, the tubrecle of Montgomery (Donegan W.L., 1972) .

Support of the breast :

The young breast is protuberent, the elder one is pendulus . The former is supported by fibrous tissue strands connecting the deep fascia with the overlying skin these are the ligaments of Astley Cooper .

When atrophic they allow the organ to droop, when contracted from fibrosis around a carcinoma they cause pitting of the skin, (Last R.J., 1972) .

Fascial Reflections :

The mamaary gland is ectodermal in origin andsituated between the superficial and deep layers of superficial fascia .

The superficial layer of superficial immediatly beneath the skin is extremly thin and difficult to identify . It is some what thicker at the distal portion of the mammary gland and becomes progressively thinner toward the clavicle .

The deep layer of superficial fascia passes immediatly deep to the mammary gland . Connective tissue extension of this deep layer may pass across the retromammary space and unite with the deep pectoral fascia on the pectoralis major muscle .

These fascial bands support the breast by tying it down to the underlying pectoral fascia .

The deep or pectoral layer of fascia encloses the pectoralis major and minor muscles, then reflected laterally across the axilla to the latissmus dorsi muscle posteriorly .

This deep fascia also extends from the clavicle and deltoid muscle above to serratus anterior and external oblique muscles on the thoracic wall distally (Haagensen, 1971) .

Microanatomy of the breast and its reflection on Benign Breast diseases :

The epithelial system of the breast is devided in the following order from the nipple opening : collecting duct, lactiferous sinus, segmental duct, subsegmental (large and medium sized) duct , ductule and lobule. The acinus is the smallest epithelial structure which is situated within the lobule, (Azzopardi, 1979) .

Parts affected in different diseases :

Cystic disease and fibroadenoma are both diseases of the lobules. That is why fibroadenomas develop only after puberty and usually before the menopause i.e. during the time that most breasts are well endowed with lobules and are subjected to certain hormonal influences which affect the lobule .

Also this explains why most examples of carcinoma that have a definite origin solely within the fibroadenoma are instances of lobular carcinoma .

Breast cyst being of lobular origin explain how a tension cyst is formed . Such a cyst originate from the lobule after it has undergone apocrine transformation . There is only one exit, the ductule, and if this becomes blocked for what ever reason, a tension cyst results .

Duct ectasia is primarily a disease of the ducts with secondary changes in the breast lobules .

Traumatic fat necrosis affects the subcutanuous adipose tissue (Azzopardi, 1979) .

Apocrine glands are embeded in the nipple stroma . The rare adenoma of the nipple is derived from these glands, (Symmers,1966).

There is elastic tissue in the ducts while the lobules are completly devoid of it . That is why there is no elastic tissue in fibroadenomas, cysts and apocrine cysts . Parous women have more elastic tissue in the duct walls which may be due to the age per se or due to pregnancy (Davies, 1973) .

The ductal lobular epithelial system of the breast is lined by two cell types . The inner cell is larger and taller, rests on the basment membrane but extends inwards to the luminal space . They are epithelial cells . The outer cell is smaller and wedged between the

bases of two adjacent inner type cells . Some workers consider it as being epithelial, another as of un proven nature, many have regarded it as a myo epithelial cells . The presence of the two cell type structure is extremly important in distinguishing between benign diseases or tumours and malignant tumours .

The two cell type is a distinctive feature in sclerosing adenosis . It also differentiate between papilloma and papillary cystadenoma in one hand and papillary carcinoma on the other , (Azzopardi, 1979) .

Blood Supply of the Breast :

The blood supply of the breast is derived from

1. Internal mammary artery which arise from the first part of the subclavian artery . The perforating branches of the second , third and fourth spaces give branches to the breast and during lactation are of large size (Warwick R., Williams P.L., 1973).

These perforating branches supply the medial two thirds of the breast, (Donegan W.L., 1972) .

2. The axillary artery through the highest thoracic, the thoracocaromial and the lateral thoracic branches which supply the upper margin and lateral third of the breast .
3. The anterior rami of the intercostal arteries have small mammary branches which arise in the anterior axillary line and pass through the third, the fourth and the fifth interspaces but they are of little significance, (Donegan W.L., 1972) .

The venous drainage system of the breast consists of a superficial subcutanous venous plexus immediatly deep to th circumareolar tributaries .

These beins pass across the middle line, they have been well demonestrated by Massopoust and Gardener (1950) . They noted that superficial veins of the breast drain primarily medially or medially and superiorly to the upper quadrant towards the clavicular region . The deep veins accompany the arteries . The three large perforating tributaries drain usually through the second, third and fourth intercostal spaces to the internal mammary veins to the innominate veins to the innominate vein . Many tributaries from the deeper surface of the breast, chest wall and pectoralis muscles drain into the axillary vein .

The deeper venous drainage of the breast is directed laterally and posteriorly into the costal veins which in turn terminate in the azygos vein and vertebral veins .

The bertebral venous plexus communicate freely with the intercostal veins , (Batson, 1940) .

Lymphatic Drainage of the Breast :

Haagensen (1971) demonestrated that the lymphatics tend to accompany the blood vessels . He further said that they pass in all directions from the breast with the main direction towards the axilla .

The lymph nodes lie in the fatty tissue along the course of the axillary vein . They vary in number from less than ten to morethan forty . They receive the greater part of lymphatic drainage of the breast . Wilson R.E. (1981) . Aaid that the lymphatic network of the breast is exceedingly rich and drainage is extensive in many directions from the breast itself .

Lymphatic channels of the skin overlying the breast are valveless and communicate with the subepithelial plexus which flow toward the subareolar plexus of lymphatics which is called " subareolar plexus of Sappey " . Fine lymphatic ducts flow from the subareolar plexus along the lactiferous ducts in the periductal connective tissue . The flow of htese lymphatics is unidirectional toward the perilobular or interlobular network and then along the major venous channels to the draining lymph lymph nodes .

Donegan W.L. (1972), reported that contrary to the original belief that lymph from the parenchyma of the breast converged in the subareolar plexus, recent evidence indicates that the valves of the collecting trunks cause lymph to flow from superficial parts including the subareolar plexus toward major collecting trunks lying in the deep cutaneous tissue .

There are three main pathways for lymphatic channels of the breast to enter the lymph nodes .

(a) The axillary pathway is the major route . Lymphatics from the breast pass through the axillary fascia alonge with the lateral thoracic blood vessels to the lateral group of lymph nodes (Wilson R.E., 1981) .

Trunks leading to the axilla may take various courses . Most lymphatics leave the tail of the breast or pass over the lateral margin of the pectoralis major to drain into the pectoral and central groups of axillary nodes then to the infraclavicular group of lymph nodes, then to the supraclavicular nodes to the major trunks which empty into venous system, (Donegan, W.L., 1972) .