DIFFERENT METHODS FOR EARLY DETECTION AND DIAGNOSIS OF CANCER BREAST

ESSAY

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By

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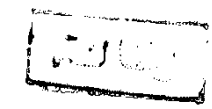

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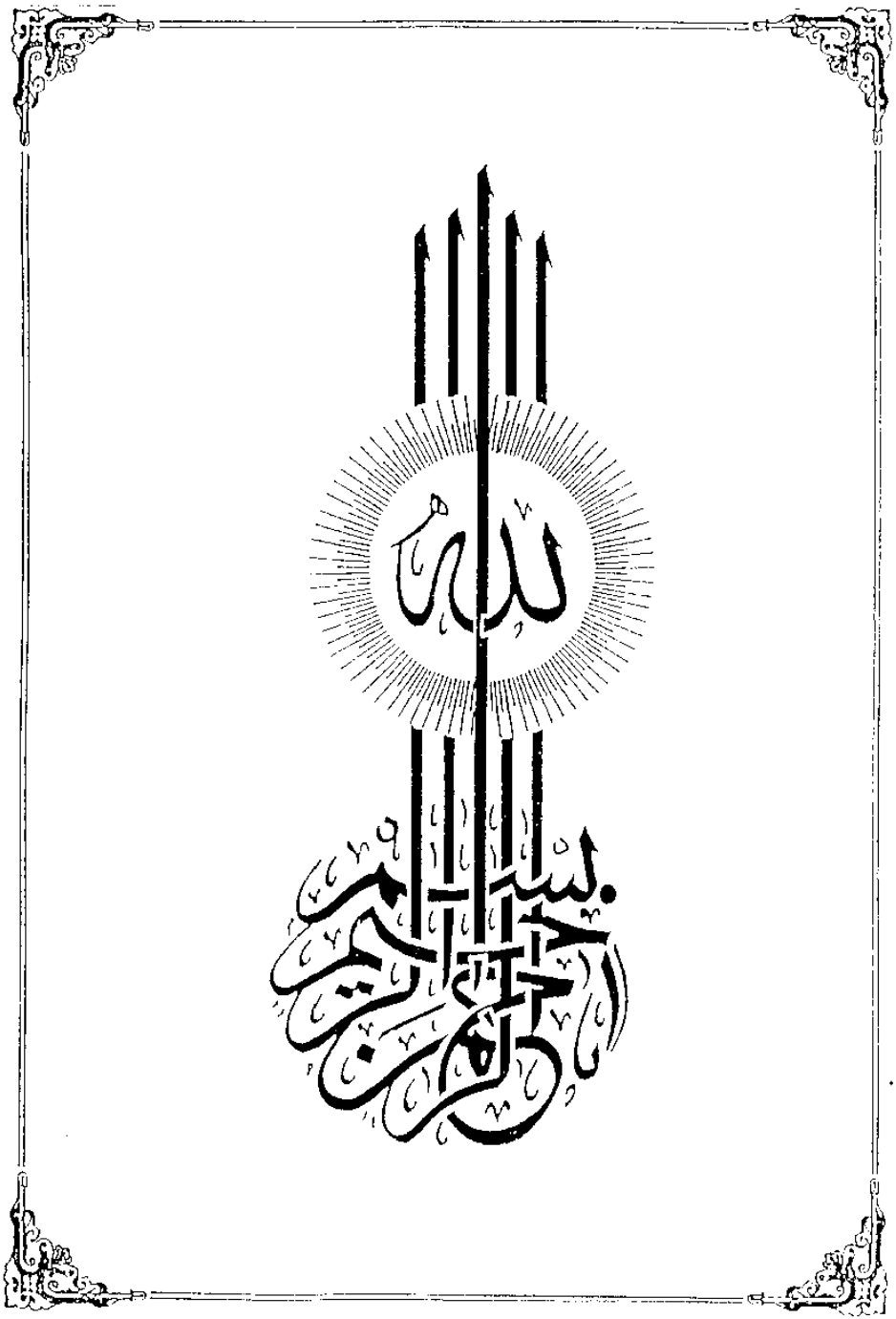
TO MY PARENTS



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C O N T E N T S

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INTRODUCTION

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Breast cancer is the most common cancer among women all over the world including Egypt. Statistical reports from National Cancer Institute in Cairo show that breast cancer accounts for 34.8% of total malignancy among Egyptian females. So, it is seemed reasonable to exert an intensive effort towards early detection and diagnosis of carcinoma of the breast.

Early detection and diagnosis of cancer breast are the subject of this essay. Early detection is directed towards the preclinical phase of the disease aiming at earlier discovery when the tumour is small and localised with no metastasis, but diagnosis refers to the use of physical or laboratory tests to identify cancer in patients who have a suggestive symptoms or signs.

Many modalities can be used for early detection and diagnosis of breast cancer, periodic physical examination, breast self-examination, mammography Xeromammography, computed tomographic mammography, thermography, transillumination, ultrasonography, nuclear magnetic resonance, cytological examination and identification of certain tumour markers for breast carcinoma.

Early detection is associated with earlier clinical and pathological stages as well as better survival rate and treatment of breast cancer, so every effort must be done to maximise benefits, to lower costs and to minimize the adverse effects of each modality used.

This essay is aimed at reviewing the literature about early detection and diagnosis of breast cancer and throwing the light on the effectiveness of the different modalities used for these purposes.

A N A T O M Y

The breast is a modified sweat gland (Wilson,1981). The male breast throughout lire and the immature female breast resembles each other. At puberty the female nipple and the breast both enlarge and thereafter retain the female form throughout life. The female form is very variable in dead but the size of the base of the breast is fairly constant. (Last, 1979).

It extends vertically from the second rib to the sixth rib in the mild clavicular line, and transversely at the level of the fourth costal cartilage, rrom the lateral border of the sternum to the anterior axillary line. Actually a thin layer of the mammary tissue extends considerably rarther on all sides (to the clavicle above, to the 7th and 8th ribs below, to the midline medially and to the edge of latissmius dorsi posterioly). The full extention of the breast ia apparent in cases of milk engorgement. This fact is important to surgeon when he seeks to remove the whole breast. (Snell, 1981).

The axillary tail of Spence: is a prolongation from the outer part of the gland which passes up to the level of the 3rd rib in the axilla, where it is in direct contact with the anterior axillary lymph gland. This process

of the breast tissue gets into the axilla, through an opening in the deep fascia, known as formen Longer. The axillary tail of the breast is of considerable surgical importance in some normal cases, it is palbable and in a few cases it can be seen in the premenstrual phase and during lactation. A well developed axillary tail is sometimes mistaken for a mass of enlarged lymph nodes or lipoma. (Du-Plesis, 1975).

The deep surface of the breast is related to the pectoralis major, serratus anterior, external oblique and and upper part of the anterior rectus sheeth. The breast is however separated from these muscles by deep fascia called the pectoral fascia, between the breast and this fascia, there is a zone of loose areolar tissue called retromammary or submammary space which allows the breast to be movable on the deep fascia also it contains the deep submammary plexus of lymphatics.

The nipple is a cylindrical or conical eminence situated about the level of the fourth intercostal space 10 cm from the midline except in pendulous breast where it becomes lower down. It is transversed by the lactiferous ducts which open separately by minute orifices on its wrinkled tip.

The base of the nipple is encircled by a coloured patch of skin called the areole. The areolar epithelum contains numerous glands of three kinds, sweat glands, sabaceous glands and accessory mammary glands. The sabaceous glands called the areolar glands of Montogomery. They become much enlarged during pregnancy and lactation. (Snell, 1981).

The breast is anchored to the overlying skin and the underlying pectoral fascia by anterior and posterior suspensery ligaments. The anterior ligaments are called ligaments of Cooper. (Du-Plesis, 1975).

These ligaments are hollow conical projections of fibrous tissue filled with breast tissue. The apices of the cones being attached firmly to the superficial fascia and thereby to the overlying skin. The ligaments are accompanied by lymphatics of the breast. In cancer of the breast, the malignant cells invades these ligaments leading to contraction along these strands which may cause either actual dimpling of the skin or merely attachment of the skin to the underlying growth so that the skin can not be pinched up from the lump. If malignant cells grow along the posterior suspensory ligaments, the breast becomes fixed to the pectoralis major muscle so the breast can not be

moved in the longitudinal axis of the muscle. (Du-Plesis, 1975).

An acute infection of the mammary gland may occur during lactation. Pathogenic bacteria gain entrance to the breasttissue through a crack in the nipple. Because of the presence of fibrous septa, the infectous remains localised to one compartment or lobe to begin with. Should an abcess occur, it should be drained by through a radial incision to avoid spreading of infection into neighbouring compartments. A radial incision will also minimize the damage to the radially arranged ducts. (Snell, 1981).

The glandular tissue consists of 15 to 20 lobes and these are composed of lobules connected together by areolar connective tissue, blood vessels and ducts.The smallest lobules consists of a cluster of rounded alveoli which open into the smallest branches of lactiferous ducts. These branches unite to form larger ducts which ends in the main excretory ducts or the lactiferous ducts.

Each duct drains a lobe of the gland. The lactiferous ducts (15-20) converge towards the areola beneath which they form dilation called the lactiferous sinuses or ampullae which serve as reservoirs for milk and abnormal discharge.

At the base of the nipple, they can become contracted and run a straight course to its summit perforating it be separate orifices. Each lactiferous duct is lined by a spiral arrangement of contractile myo-epithelial cells.

FASCIAL RELATIONSHIP OF THE MAMMARY GLAND

The mammary gland is situated between the superficial and deep layers of superficial fascia, more or less enclosed in a trabeculated sac of connective tissue. The superficial layer of the superficial fascia immediately beneath the skin is extremely thin and difficult to identify. A thin layer of fat may separate this from the skin. The superficial layer is somewhat thicker at the distal portion of the mammary gland, and becomes progressively thinner toward the clavicle. The deep layer of the superficial fascia passes immediately deep to the mammary gland connective tissue extension of this deep layer may pass across the retro-mammary space and unite with the deep pectoral fascia on the pectoralis major muscle.

The deep or pectoral layer of fascia enclose the pectoralis major and pectoralis minor muscle, 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 the serratus anterior

and external oblique muscles on the thoracic wall distally.

Although the breast lies within the superficial fascia it can readily be separated from the underlying muscle through a plane of cleavage between the superficial and deep fascia.

The superficial layer of the mammary fascia is continuous on the abdominal wall, where it blends with the superficial fascia of Scarpa.

BLOOD SUPPLY OF THE BREAST

The arterial supply is derived from lateral thoracic A. (from the 2nd part of axillary A.) by branches that curl around the lower border of pectoralis major ms. and by other branches that pierce the muscle.

The internal thoracic artery sends branches through the intercostal spaces besides the sternum, those of the second and the third spaces are particularly large.

Similar perforating branches arise from the 2nd, 3rd and 4th intercostal arteries.

Pectoral branches of the acromio-thoracic artery supply the upper part of the breast.

The venous drainage describes an anastomotic circle around the base of the nipple called the circulus venosus.

From this circle, branches transmit the venous blood to the circumference of the gland and simply follows the above mentioned arteries. However the venous blood (like that from the thyroid gland) is received into large veins that receive also blood from the vertebrae and thoracic cage. So spread of malignancy by veins can thus involve these bones. (Last, 1979).

Because the superficial venous and lymphatic vessels draining the breast are near the skin, this explain why skin flaps in operation for cancer must be thin and phebitis of one of these veins feel exactly as a thick piece of catgut immediately beneath the skin, the condition produces no discolouration of the skin. It is called Mondor's disease. The cord may take months to disappear and has no relationship to cancer. (Du-Plesis, 1975).

NERVE SUPPLY

The secreting tissue is supplied by sympathatic fibres, they reach the gland via the second to the sixth intercostal nerves. However the secretory activities are largly under the hormonal control of the ovary and pituitary gland. The overlying skin is supplied by the anterior and lateral branches of the fourth, fifth and sixth intercostal nerves. (Du-Plesis, 1975).