RECENT TRENDS IN THE MANAGEMENT OF THE EARLY CASES OF CARCINOMA OF THE BREAST

ESSAY

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"I ALWAYS INDEBTED TO GOD WHO HELP ME"

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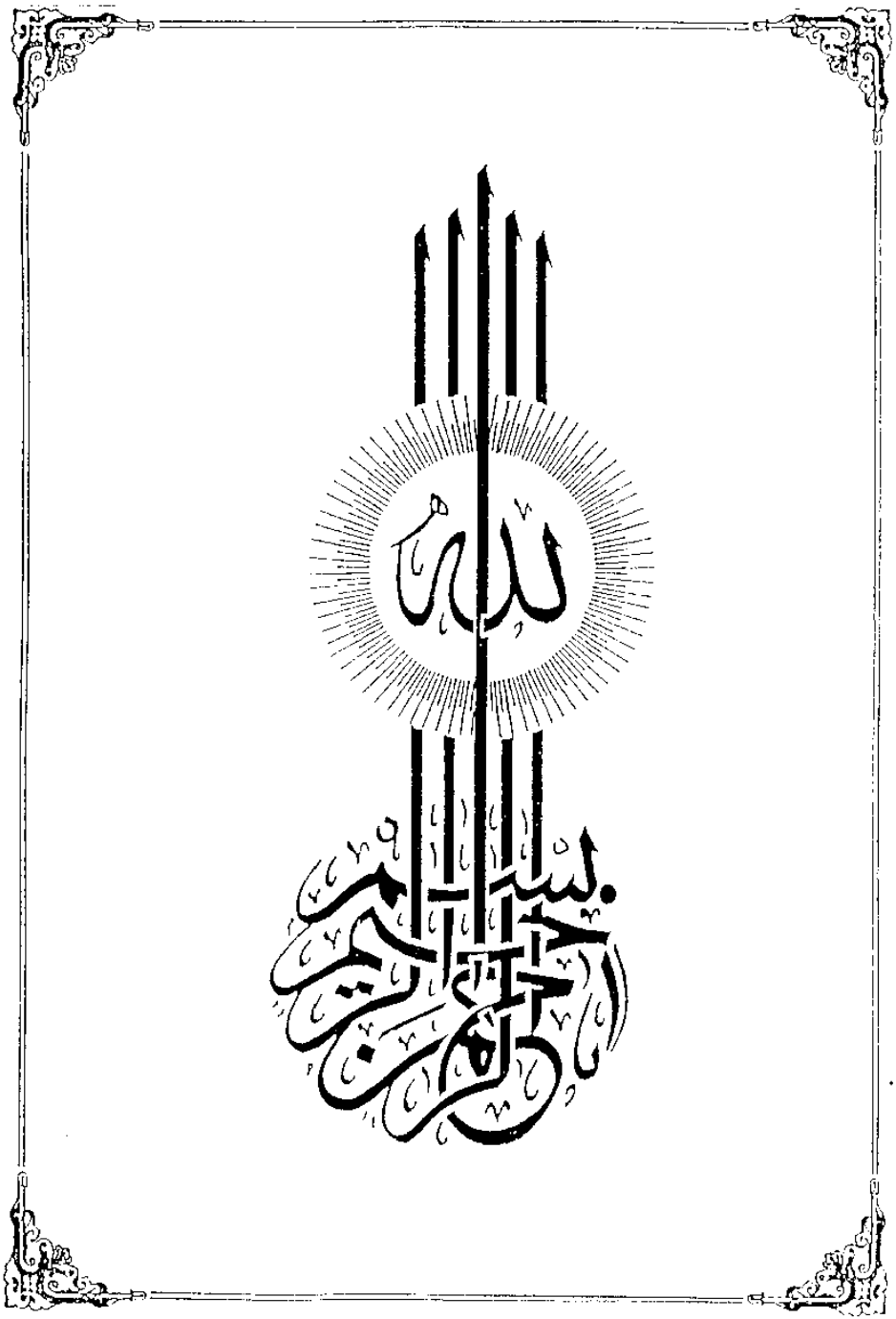

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ANATOMY

EMBRYOLOGY

In prenatal life, epithelial thickenings, called mammary ridges or milk lines, develop on each side of the anterior body wall, from the future axillary region to the medial aspect of the groin. The caudal two thirds of these ridges normally disappear, but in the middle of the cranial third the ridges thicken to form primordia of the mammary glands.

In early fetal life the epithelial thickening on each side gives rise to about 16 to 24 cellular cords that penetrate the underlying connective tissue then branch to form secondary cellular cords. By the eighth and ninth months cords become canalized and the original epithelial downgrowth now appear as a pit in which the rudimentary duct system opens (fig. 1). About full term the connective tissue elements underlying the pit proliferate, causing its lining to be elevated above the surrounding surface to form the nipple. If this does not occur the ducts open into a pit instead of a nipple-a defect known as inverted or crater nipple. At birth the rudimentary mammary glands are similar in both sexes with signs of hypertrophy and secretory activity (Witch's milk). (**The late W.J. Hamilton**, 1976).

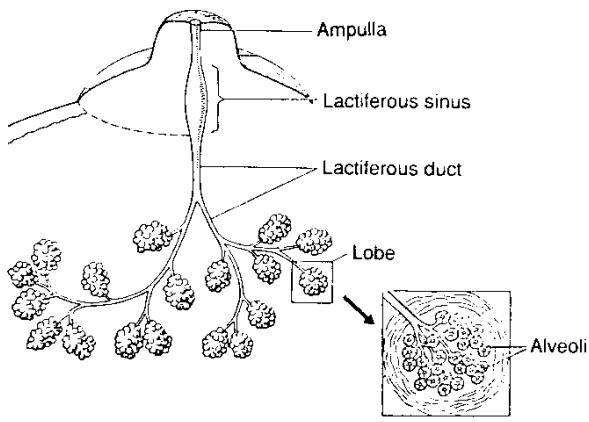

Figure 1 Schematic representation of the milk duct system. (From Wagner H. Topographische Anatomie derweiblichen Bust. In: Beller FK. Atlas der Mamma Chirurgie. Stuttgart: Schattauer, 1985.)

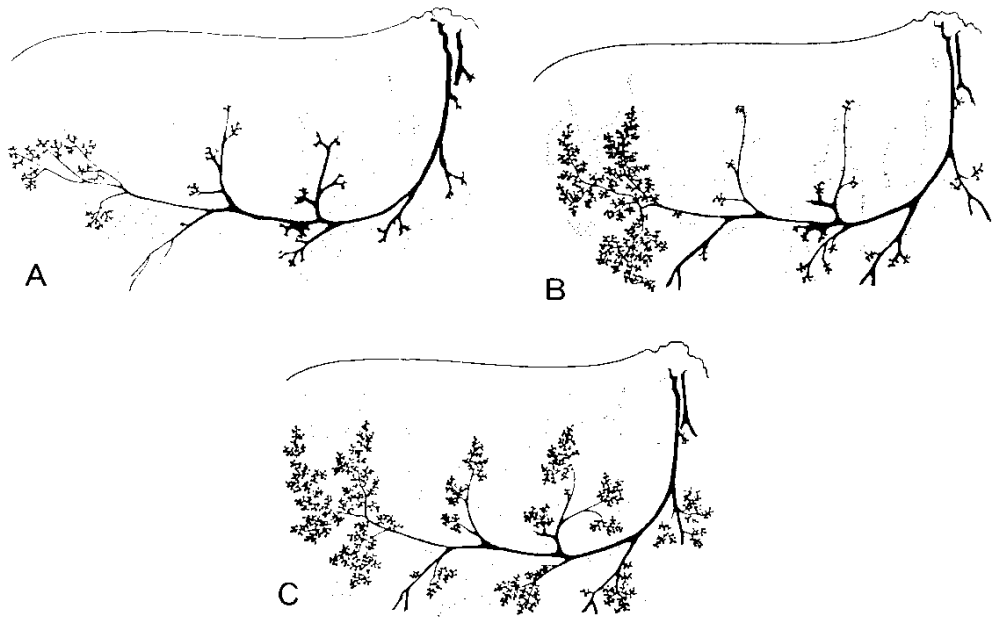

Figure 1 Development of the duct system. **A**, At 15 years. **B**, At 19 years. **C**, At reproductive age.

TOPOGRAPHY AND GENERAL DESCRIPTION

The breast is divided into four quadrants taking the nipple as a centre. Also there is a retro areolar area and axillary tail. During initial clinical diagnosis it is important to make this topography precise as it is valuable regarding nodal management and irradiation fields. (**J.Genin and Sh. Omar**, 1984).

Breast is a constituent element of the superficial layers of the costal region because it is embryologically and morphologically a group of highly specialized cutaneous glands. (**Chester B.Mcvay**, 1984).

These glands together with its fibrous and fatty tissues occupy the interval between the 2nd and 6th ribs, and stretches from the parasternal to the midaxillary line about the 4th rib. Its medial half rest above on the pectoralis major and below on the aponeurosis of the external oblique where it covers the upper part of the rectus abdominus. The lateral half of the breast lies upon the pectoralis major above and on the serratus anterior plus digitations of the external

oblique origin below. (**N.J. Grobler**, 1977).

However the breast is separated from these muscles by the deep fascia and between them there is a zone of loose areolar tissue named the retromammary or submammary "Space" Which allows the breast some degree of movement on the deep facia covering pectoralis major. This movement may be lost by invasion of an advanced mammary carcinoma to the deep fascia. Sometimes this deep fascia is penetrated by small projections of the mammary glandular tissue to reach the superficial part of the pectoralis major. (**Peter L. Williams**, et al, 1973).

The deep fascia is also pierced by a small part of breast tissue called the axillary tail (Of Spence) that extends upwards and laterally before it pierces this fascia at the lower border of pectoralis major muscle through foramen of Langer. This axillary tail is in close relationships with the axillary vessels.(N.J.Grobler ,1977).

Thus it may be visible as a definite mass simulating an axillary tumor or it may the seat of either benign or malignant tumours.(Chester B.Mcvay, 1984).

The size and shape of the mature mammary glands vary generally in different races and individuals. They also vary according to their state of functional activity. In nulliparous young adult they are usually hemispherical but somewhat flattened above the nipple. They become enlarged in pregnant and lactating women and usually undergo atrophy after the menopause. (The late **W. J.**Hamilton, 1976).

STRUCTURE OF THE BREAST.

The skin covering of the breast is smoother, translucent and more thinner than the skin covering most of the rest of the body. (The late **W.J.**Hamilton, 1976).

Thickening of this skin as revealed by mammography may beasign of malignancy. (**J. Genin and Sh. Omar**, 1984).

The nipple is a conical projection from just below the centre of the anterior surface of the breast at the level of the 4th intercostal space in nulliparous females. It is traversed by about 16 to 24 milk ducts which open on its wrinkled tip. It contains numerous non striated muscle fibers arranged mostly in circular fashion, and cause erection of the nipple upon its stimulation. Around the nipple is the areola which is about 5 cm in diameter. The colour of the areola and

nipple is rose pink in nulliparous white race females. It becomes dark brown after pregnancy and never returns to its original hue. There is no fat immediately beneath the skin of the areola and nipple. (Peter L.Williams, et al,1973).

But beneath the skin of the rest of the breast is the areolar subcutaneous tissue, within which lie the glandular elements of the breast. The superficial fascia not only forms a general covering for the secretory apparatus but also sends into it partitions which aid materially in supporting the glandular as well as the fatty elements. The fibrous periductal connective tissue with attachment to the skin were known as "Cooper's ligament". Parenchyma of the breast is prolonged peripherally along these ligaments to almost reach the corium. (Chester B.Mcvay, 1984).

This explains the difficulty of subcutaneous mastectomy which presents two risks: (1) Too superficial excision with possible cutaneous necrosis. (2) Too deep excision with risk of leaving tissue subcutaneously. (J. Genin and Sh. Omar, 1984).

BLOOD SUPPLY

Arteries (fig. 2)

Three major arteries generously supply the breast with blood. (**Benjamin F. Rush**, 1989).

(I) The internal mammary artery: The perforating rami of this artery course medialward from parasternal position. The 1st, 2nd and 3rd are the most frequent sources; the common number supplied to a gland is two.The perforating rami, after piercing the intercostal musculature, supply the pectoralis major muscle and send branches to the overlying skin. Those rami which reach the breast at 1st course superficially in the fatty tissue; ultimately however they attain a deeper level. They tend to converge upon the nipple; en rout they anastomose not only with vessels neighboring intercostal spaces but also with those derived from axillary and subclavian arteries. (**C.B.** Mcvay, 1984).

(II) The lateral thoracic branch of the axillary artery: It gives rise to the external mammary arteries which course down along the lateral border of the pectoralis minor muscle.

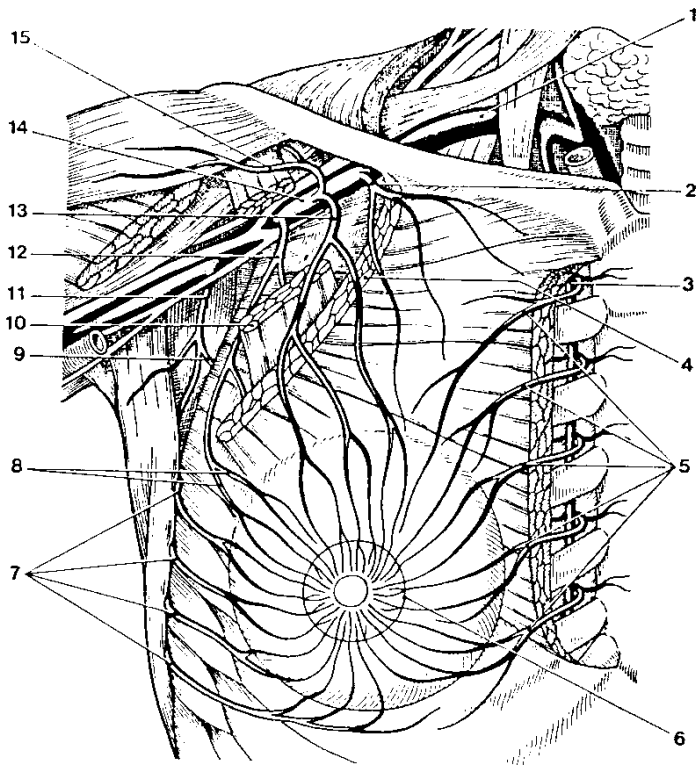

Figure 2 Arterial blood supply to the breast. *1*, subclavian artery; *2*, superior thoracic artery; *3*, internal thoracic artery, *4*, major pectoralis muscle; *5*, perforating branches of the internal mammary artery; *6*, arterial plexus around areola; *7*, intercostal arteries; *8*, pectoral branches of the lateral thoracic artery; *9*, circumflex scapular artery; *10*, minor pectoralis muscle; *11*, subscapular artery; *12*, lateral thoracic artery; *13*, pectoral branch of the thoracoacromial artery; *14*, axillary artery; *15*, deltoid branch of the thoracoacromial artery.

(III Acromio thoracic branch of the axillary artery: It gives rise to the pectoral branch at the medial edge of the pectoralis minor muscle. This vessel course between pectoralis minor and major, then gives branches to the posterior surface of the breast. In addition to the above mentioned major vessels, there are other vessels namely, the superior branch of the axillary artery, the lateral perforating branches of the intercostal arteries and branches of the subscapular artery. They contribute minor amounts to the blood supply. (**B.F.**Rush, 1989).

VENOUS DRAINAGE

By the way of superficial and deep veins.

(I) The superficial subcutaneous veins: They form a rich anastomosing network before they drain into the internal mammary vein or occasionally into the superficial veins of the lower neck. These superficial veins become markedly dilated during pregnancy and may become prominent over an area of underlying neoplasm. (**B. F.**Rush, 1989).

(II) The deep veins: They correspond to the arterial blood supply.

1- Perforating branches of the internal mammary vein.

They are the largest veins draining the breast, pass through intercostal spaces to empty finally into innominate veins, thence to the pulmonary capillary network and so they are easy routes for metastatic carcinomatous emboli to the lung.

2- Tributaries to the axillary vein.

3- The intercostal veins:- One of the most important routes, travel posteriorly to the vertebral veins and thence to the azygos veins and the superior vena cava. The vertebral veins is a separate system paralleling the caval system. It drains not only the vertebrae but also the bones of the pelvis, upper ends of the femur, the shoulder girdle, the upper ends of the humeri and the skull. (**C. B.**Mcvay, 1984).

The anastomosis of the intercostal veins with the vertebral veins is the explanation for the often great metastasis of breast cancer to the vertebral bodies or even the sacrum or pelvis without presence of metastatic deposition in the lung. Variation of pressure inside the thoracic cavity induced by straining or coughing change the flow pattern within the valveless anastomosing veins so that blood from the breast through the inter costal vessels is forced down along the vertebral plexus. (**B.F.**,Rush, 1989).