Updates in Management of Breast Cancer by Oncoplastic Techniques

Essay

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Mohamed Fateen Anous

INTRODUCTION

Breast Surgery is now a recognized subspecialty of General Surgery with structured training for designated Breast Surgeons. Over the recent years, Breast cancer care has been enhanced by the emergence of Specialist Breast Surgeon with training in Oncoplastic Surgical skills – Oncoplastic Breast Surgeon (*Skillman J ,etal., 2003).*

The term oncoplastic surgery refers to surgery on the basis of oncological principles during which the techniques of plastic surgery are used, mostly for reconstructive and cosmetic reasons. The advantage of oncoplastic surgery for breast cancer is the possibility of performing a wider excision of the tumour with a good cosmetic result *(McGlothin T,2005).*

Randomized controlled trials (RCTs) over the past two decades have now established that radical mastectomy and breast conserving surgery are equivalent in terms of survival provided local recurrence rates after breast conservation surgery are kept at about 1 % per annum *(Fisher B ,etal., 2002).*

A careful evaluation of mammographic, ultrasound and sometimes MRI extent of the disease, its nearness to the nipple and the distribution of the cancer in either radial or circumferential manner are all essential to the planning and the eventual success of the oncoplastic procedures *(Clarke M, etal., 2005).*

The criteria for breast conserving surgery are relative. Contrary to the traditional teaching, breast conserving surgery is feasible every time it is judged possible to achieve complete surgical excision with good cosmosis. The size of the tumour relative to the breast volume is the deciding factor in determining the suitability of breast conserving surgery (*Petit J, etal., 2004)*.

It may even be suitable for women with large breasts in whom the tumour is up to 5 cm or even multifocal tumours confined to the same quadrant and when large operable tumours have been down-staged by neo-adjuvant chemotherapy. Oncoplastic techniques may be used during any kind of breast conserving surgery for breast cancer (*Petit J, etal,. 2004)*.

1) **The breast reduction techniques** there are several indications and contraindications. Also, cosmetic results after breast conserving surgery of breast cancer is determined by the location of the tumor as tumors located in the medial, central or lower quadrant yields worse results compared with other locations (*Petit J, etal.,2004)*.

2) **Volume displacement** procedures include local tissue rearrangement, reduction mamoplasty and mastopexy. While, volume replacement procedures include local and remote flaps from various regions of the body and implant insertion (*Petit J, etal,. 2004)*.

In general women with smaller breasts, with minimal ptosis were found to be better candidates for volume replacement procedures, e.g. local flap and latissmusdorsi flap, while women with larger and more ptotic breast would be better candidates for volume displacement procedures, e.g. adjacent tissue rearrangement, reduction mamoplasty and mastopexy (*Nannelli A, etal.,2004).*

AIM OF THE WORK

The aim of this work is to cure of the patient coupled with partial reconstruction of the defect to achieve a cosmetically acceptable result with a satisfactory physical and psychological outcome.

Oncoplastic breast surgery has the advantage of combining the oncological and aesthetic procedure in one operation.

List of abbreviations

TRAM flap	Transverse rectus abdominis myocutaneous flap
LCIS	lobular carcinoma in situ
DCIS	Ductal Carcinoma In Situ
BI-RADS	Breast imaging reporting and data system
PET	Positron Emission Tomography
FNA	Fine Needle Aspiration
CNB	Core needle biopsy
NAC	Nipple areola complex
ICAP	Intercostal artery perforator
TDAP	thoracodorsal artery perforator
SSM	Skin-sparing mastectomy
S-GAP	superior gluteal artery perforator
DIEP	deep inferior epigastric perforator
I-GAP	inferior gluteal artery perforator
NST	Invasive cancer of no special type
BRCA	Breast cancer gene
LD	Latissmus dorsi

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ANATOMY OF THE BREAST

Gross anatomy:

- **Extent and location:**

The adult female breast lies between the second and sixth ribs and between the sternal edge and the mid-axillary line **Fig (1)**. Breast tissue frequently extends into the axilla as the axillary tail of Spence. Posteriorly, the upper portion of the breast rests on the fascia of the pectoralis major muscle; infero-laterally, it is bounded by the fascia of the serratus anterior (*Morrow M, Khan S, 2006).*

- **Size and form:**

The size of the adult female breast varies widely among individuals, and considerable discrepancy in breast size is seen between the breasts of an individual woman. The breast is composed of skin, subcutaneous tissue, and breast tissue. The breast tissue includes both epithelial parenchymal elements and stroma. The epithelial component comprises about 10% to 15% of the breast mass, with the remainder being stroma. Each breast consists of 15 to 20 lobes of glandular tissue that are supported by a framework of fibrous connective tissue. The space between lobes is filled by adipose tissue. Variations in breast size are accounted for by differences in the amount of adipose tissue in the breast rather than the epithelial elements. Much of the epithelial

tissue of the breast is found in the upper outer quadrant, which is why this is the most frequent site of both benign and malignant breast disease. The lobes of the breast are subdivided into lobules, which are made up of branched tubuloalveolar glands. Each lobe ends in a lactiferous duct, 2 to 4 mm in diameter. Beneath the areola, the lactiferous ducts dilate into lactiferous sinuses and then open through a constricted orifice onto the nipple (*Morrow M, Khan S, 2006)***.**

- **Nipple and areola:**

The nipple is located over the fourth intercostal space in the non pendulous breast and is surrounded by a circular, pigmented areola. Beneath the nipple and areola are bundles of radially arranged smooth-muscle fibers that are responsible for the erection of the nipple in response to a variety of stimuli. The nipple and areola contain sebaceous glands and apocrine sweat glands, but no hair follicles. In addition, the tubercles of Morgagni are nodular elevations formed by the openings of the Montgomery glands at the periphery of the areola. These glands are capable of secreting milk and are believed to represent an intermediate stage between sweat and mammary glands. The nipple and areolar region, as well as the remainder of the breast, is richly supplied with sensory innervation (*Morrow M ,Khan S, 2006)***.**

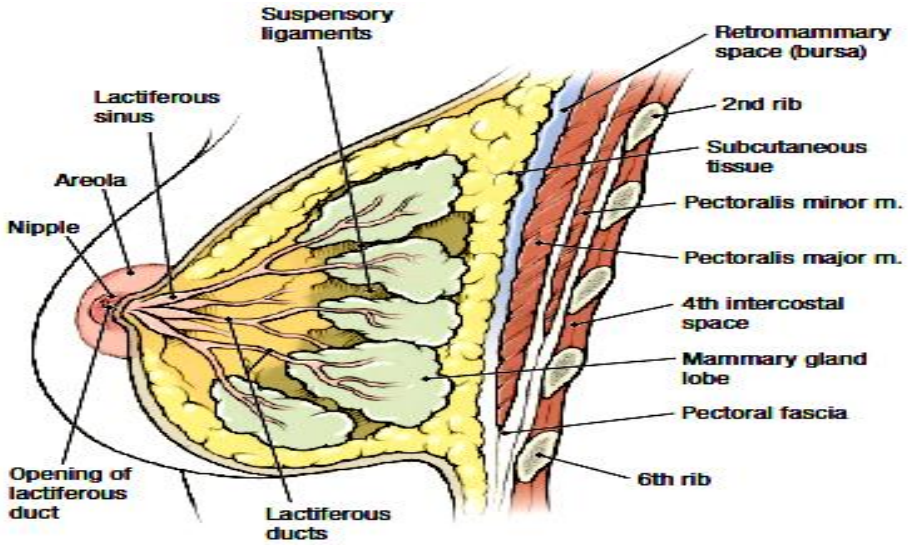

Figure (1): *Breast in sagittal section* (*Moore K, Dalley A F, 2005*)**.**

Fascia of the breast:

The fascial framework of the breast is important in relation to clinical manifestations of disease and surgical technique. Because the breast develops as a skin appendage, it does so within the superficial fascia, such that the superficial part of the superficial fascia forms an anterior boundary and the deep layer of the superficial fascia forms a posterior boundary. In between, condensation of this inter lobar fascia gives rise to ligaments of Cooper, called suspensory ligaments because they provide a supporting framework to the breast lobes **Fig (2)**. They are best developed in the upper part of the breast and are connected to both pectoral fascia and skin by fibrous extensions. In spite of these fibrous extensions, the superficial layer of superficial

fascia gives a plane of dissection between the skin and breast. The small subcutaneous fat lobules are readily differentiated from the much larger mammary fat lobules. Likewise, the retro-mammary space provides a ready plane of dissection between the deep layer of superficial fascia and the deep fascia of pectoralis major and serratus anterior. This structural fascial support is so intimately connected to interlobular and intra-lobular fascia with their enclosed ductal units, no ready plane of dissection exists within the breast substance and all surgery must be carried out by sharp dissection (*Wilkson SA, Adams E, 2009)*.

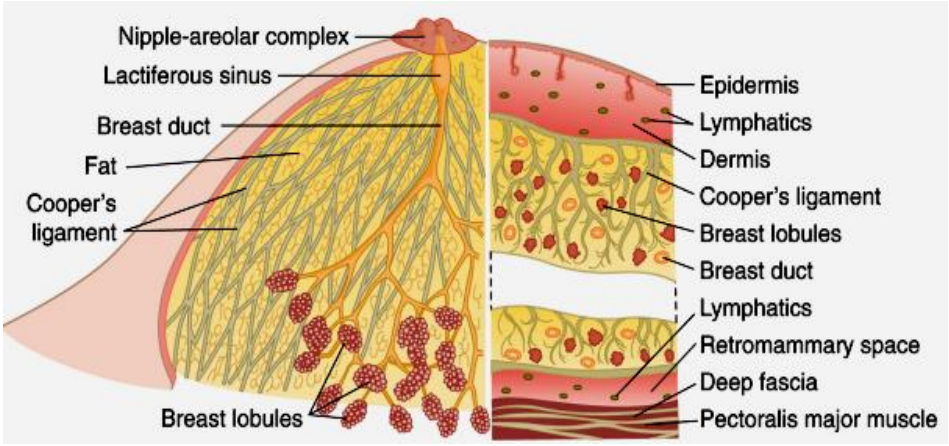

Figure (2): Cut-away diagram of a mature resting breast (*Iglehart J D, Smith B L ,2008).*

Vascular anatomy of the breast:

Arterial Anatomy:

There are three main sources of arterial blood supply:

- Internal mammary artery.
- Lateral thoracic artery.