New Trends In Management Of Early Breast Cancer

Essay

Submitted for partial fulfilment of M.sc. degree

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2017


قَالُوا سُبْحَانَكَ
لاَ عِلْمَ لَنَا
إِلاَّ مَا عَلَّمْتَنَا
إِنَّكَ أَنتَ
الْعَلِيمُ الْحَكِيمُ
صدق الله العظيم
سورة البقرة الآية (32)

First and foremost, thanks to "ALLAH" for granting me the power accomplish this work;

I would like to express my endless gratitude and appreciation to ***Prof. Dr: Aser mostafa Al Afify****, Professor of general surgery , Faculty of Medicine Ain Shams University for giving me the honour of working under his supervision and providing me with a lot of encouragement and support.*

My deepest gratitude and appreciation are to ***Dr: Wael Abd Alazeem Jumuah,*** *Assistant professor of general surgery, Faculty Of Medicine ,Ain Shams University for his acceptance to supervise my work for his continuous support, his valuable advice and encouragement.*

My deepest gratitude and appreciation are to ***Mohamed Aboul Naga,*** *Lecturer of general surgery, Faculty Of Medicine, Ain Shams University for his acceptance to supervise my work for his continuous support, his valuable advice and encouragement.*

Reda Attia Abdelsalam

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LIST OF ABBREVIATIONS

THR	**:**	Total Hip Replacement
WHR	**:**	waist-hip ratio
DCIS	**:**	ductal carcinoma in situ
LCIS	**:**	lobular carcinoma in situ
Her	**:**	Human epidermal growth factor receptor
ER	**:**	estrogen receptor
PR	**:**	progesteron receptor
TNBC	**:**	Triple-negative breast cancer
FISH	**:**	fluorescence in situ hybridization
EIC	**:**	extensive intraductal component
IBTR	**:**	ipsilateral Bdeast Tumer Recurance)
MBI	**:**	Molecular breast imaging
FNAC	**:**	fine needle aspiraton cytology
CNB	**:**	core needle biopsy
SLN	**:**	Sentinel lymph node
ACBS	**:**	American College of Breast Surgeons
H&E	**:**	hematoxylin and eosin stain and
IHC	**:**	immune histo chemistry (IHC)
ASCO	**:**	American Society of Clinical Oncology
CEA	**:**	carcinoembryonic antigen
CECs	**:**	Circulating endothelial cells
EPCs	**:**	endothelial precursor cells
CSCs	**:**	cancer stem-like cells

TAAs	**:**	tumor-associated antigens
RM	**:**	Radical mastectomy
MRM	**:**	Modified Radical Mastectomy
SSM	**:**	Skin sparing mastectomy
NSM	**:**	Nipple sparing mastectomy
BCS	**:**	Breast conserving surgery
SLE	**:**	systemic lupus erythromatosis
WLE	**:**	wide local excision
LR	**:**	local recurrence
IOMA	**:**	intraoperative margin assessment
CTP	**:**	cytologic touch preparation
SM	**:**	, shaved margin
IOUS	**:**	intraoperative ultrasound
PET	**:**	Positron Emission Tomography
ROLL	**:**	Radio-guided Occult Lesion Localization
NIRF	**:**	Infrared Fluorescence
NAC	**:**	nipple-areolar complex
RFA	**:**	Radiofrequency Ablation
HIFU	**:**	High-intensity focused ultrasound
ILA	**:**	Interstitial Laser ablation
WBRT	**:**	Whole breast radiotherapy
PBI	**:**	partial breast irradiation
PMRT	**:**	Postmastectomy radiotherapy
GnRHAs	**:**	Gonadotropin-releasing hormone analogs
G-CSF	**:**	granulocyte colony-stimulating factor

Introduction

Breast cancer is the most common female cancer. World wide more than a million women are diagnosed every year. In the last ten years, female breast cancer incidence rate has increased by13%, however, the mortality rate is declining ***(keshtgar et al.,2009)***

Diagnosis of breast cancer can be carried out by triple assessment, which include clinical evaluation, breast imaging and tissue diagnosis (cytological or histological).Full-filled digital mammography has allowed more confident identification of small clusters and microcalcifications. Digital equipment provides a major advantage in stereotactic procedures for impalpable lesions including guide wire placement, core biopsy and vacuum assisted excision where small lesions can be completely removed percutaneously using mammotome ***(Gotzsche et al., 2009)***

Sonography is more sensitive than mammography in evaluating breast masses in young patients ***(Houssami et al., 2003).***

The role of magnetic resonance imaging in the preoperative setting is still controversial. It is recognized as the most sensitive modality in identification and local staging of breast cancer ***(Sardanelli et al., 2010)***.

MRI has a higher negative predictive value(97% for a lesion of 2mm or More)for measuring the distance between nipple areolar complex and the lesion itself which is useful for planning nipple sparing mastectomy ***(Peters et al., 2011).***

Sentinel lymph node biopsy has been generally adopted as an alternative procedure to axillary lymph node dissection in node staging ***(De Boer et al., 2009).***

The routine use of preoperative axillary US and biopsy of abnormal nodes helpin identifying high-risk patients and thus aids in planning treatment**(Roy et al.,2014)**

Skin sparing mastectomy followed by immediate breast reconstruction is used for prophylaxis for high-risk patients. It is also a surgical option for patients with large in situ lesions not accessible to breast conservation or to invasive breast cancer associated with extensive in situ disease ***(Chunng and Sacchini, 2008).***

Radiofrequency ablation of small invasive breast cancer seems to be a feasible treatment option. Histopathological examination results in complete cell death of target lesion in17 of 20 patients in the study ***(Kinoshita et al., 2011).***

Breast conserving surgery followed by radiotherapy offer the same survival benefits as modified mastectomy in women with stage I or II breast cancer ***(Veronesi et al.,2002).***

Breast conservation therapy remains the treatment of choice for early stage breast cancer patients irrespective of molecular subtype.Negative margins of excision are desirable, but the width of of the negative margins does not influence outcome**(Demirci et al.,2012)**

The addition of adjuvant chemotherapy in early breast cancer improves overall survival by about 10%. Addition of hormonal treatment depends on estrogen receptor expression **(Jeorger and Thurilmann,2013)**.

The addition of neoadjuvant carboplatin to a regimen of a taxane, an anthracycline, and targeted therapy significantly increase the proportion of patients acheving a pathological complete response. This regimen seems to increase responses in patients with tripple-negative breast cancer, but not in those with HER2-positive breast cancer **(Von Micnckwitz et al.,2014).**

Oncoplastic surgery of breast cancer has generated great excitement over the past years and has become an integrated component of the surgical treatment of breast cancer . Oncoplastic surgical procedures associate the best surgical oncologic priciples to achieve wide tumor-free margins with the best principles of plastic surgery to optimise cosmotic outcomes**(Franceschini er al.,2012)**

AIM OF THE WORK

This essay aims to outline the recent and different methods for diagnosis of early breast cancer as well as reviewing update treatments of early breast cancer.

Chapter (1):

Anatomy of the breast

I-Development:-

At the fifth or sixth week of fetal development, two ventral bands of thickened ectoderm (mammary ridges, milk lines) are evident in the embryo. In most mammals, paired breasts develop along these ridges, which extend from the base of the forelimb (future axilla) to the region of the hind limb (inguinal area). These ridges are not prominent in the human embryo and disappear after a short time, except for small portions that may persist in the pectoral region. Accessory breasts (polymastia) or accessory nipples (polythelia) may occur along the milk line when normal regression fails **(Bland et al., 2010).**

Each breast develops when an ingrowth of ectoderm forms a primary tissue bud in the mesenchyme. The primary bud, in turn, initiates the development of 15 to 20 secondary buds. Epithelial cords develop from the secondary buds and extend into the surrounding mesenchyme. Major (lactiferous) ducts develop, which open into a shallow mammary pit. During infancy, a proliferation of mesenchyme transforms the mammary pit into a nipple. If there is failure of a pit to

elevate above skin level, an inverted nipple results. This congenital malformation occurs in 4% of infants. At birth, the breasts are identical in males and females, demonstrating only the presence of major ducts. **(Bland et al., 2010).**

II-Gross anatomy:-

Each breast (right or left) is a rounded elevation present on the front of the upper part of the thorax, over the pectoral region. Over the centre of the breast the skin shows a dark circular area which is called the areola. In the centre of the areola there is a conical projection called the nipple **(Singh,2002).**

The adult female breast is located within the superficial fascia of the anterior chest wall. The base of the breast extends from the second rib above to the sixth or seventh rib below, and from the sternal border medially to the midaxillary line laterally. Two-thirds of the base of the breast lies anterior to the pectoralis major muscle; the remainder lies anterior to the serratus anterior muscle (fig.1). A small part may lie over the aponeurosis of the external oblique muscle **(Skandalakis et al., 2006).**

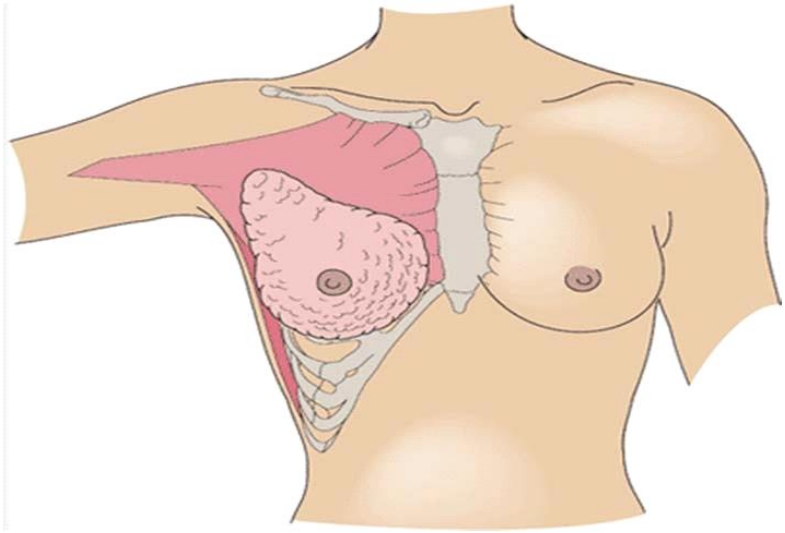

Fig. (1): The adult female breast. The upper and medial portions of the breast rest on the pectoralis major muscle, and the inferolateral portion rests on the serratus anterior **(Morrow and Khan, 2006).**

In the axillary region there is a prolongation beyond the anterior axillary line called the tail of Spencer. In adult women (i.e., after puberty), this has the shape of a drop, assuming the shape of a cone in nulliparous women and a more pendulous contour in multiparous women **(Westreich2009)**

The ligaments of Cooper 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 skin overlying the breast. These ligaments account for the dimpling of the skin overlying a carcinoma**(Sainsbury, 2004).**