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TYPES OF SURGICAL TREATMENT FOR BREAST CANCER

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Abstract:

Introduction: *Breast cancer is considered the most common diagnosed cancer in females in US. It is estimated that 1 in eight females are diagnosed with breast cancer. There are several recognized risk factors that lead to the development of breast cancer.The management of breast cancer involves multidisciplinary one and usually involves surgery, radiation, and systemic therapy. Surgery is the management of breast cancer are still evolving and still considered a major part of the management. It is extremely essential to know that removal of lymph nodes have no treatment benefit to the patient and is used only for staging. The American Society of Clinical Oncology suggests that patients be seen in the clinic every three to six months for the first three years, every six to twelve months in years four and five, and every year afterwards.*

In this review, we will discuss the most recent evidence regarding to the diagnosis, treatment, and follow-up of patients with breast cancer for the general surgeon.

Aim of work: *In this review, we will discuss the types of surgical treatment for breast cancer*

Methodology: *We did a systematic search for types of surgical treatment for breast cancer using PubMed search engine (http://www.ncbi.nlm.nih.gov/) and Google Scholar search engine (https://scholar.google.com). We only included full articles.*

Conclusions: *Breast cancer is a considered one of the most common cancers however it is extremely complex disease. It is recommended that careful consideration should be given to the unique nature of each tumor and patient. Every newly diagnosed breast cancer should be presented at a multidisciplinary meeting to make sure that optimal treatment plan is carried out by all specialties involved. The American Society of Clinical Oncology suggests that patients be seen in the clinic every three to six months for the first three years, every six to twelve months in years four and five, and every year afterwards. Treatment for breast cancer will continue to develop; further improvements in outcomes will likely be based on the development of targeted therapies.*

Key words: *Surgery, management, breast cancer*

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INTRODUCTION:

Breast cancer is considered the most common diagnosed cancer in females in US [1]. It is estimated that 1 in eight females are diagnosed with breast cancer. There are several recognized risk factors that lead to the development of breast cancer. The management of breast cancer involves multidisciplinary one and usually involves surgery, radiation, and systemic therapy. Surgery is the management of breast cancer are still evolving and still considered a major part of the management. It is extremely essential to know that removal of lymph nodes have no treatment benefit to the patient and is used only for staging. The American Society of Clinical Oncology suggests that patients be seen in the clinic every three to six months for the first three years, every six to twelve months in years four and five, and every year afterwards.

In this review, we will discuss the most recent evidence regarding to the diagnosis, treatment, and follow-up of patients with breast cancer for the general surgeon.

METHODOLOGY:

We did a systematic search for types of surgical treatment for breast cancer using PubMed search engine (http://www.ncbi.nlm.nih.gov/) and Google Scholar search engine (https://scholar.google.com). We only included full articles.
The terms used in the search were: Surgery, management, breast cancer

Risk Factors

There are several recognized risk factors that lead to the development of breast cancer [2]. The most common way to assess the risk is to use the tool called Breast Cancer Risk Assessment Tool, it was developed by the National Cancer Institute and the National Surgical Adjuvant Breast and Bowel Project (NSABP) [3], and since then it has been updated in the recent dates for more accurate estimation of the risk for in African American, Pacific Islander, and Hispanic females [4]. It also involves age, race, previous breast biopsy and biopsy results, age at menarche, age at first live birth, and first degree relatives with breast cancer.

A famous clinical trial called The STAR (Study of Tamoxifen and Raloxifene) concluded that both tamoxifen and raloxifene decreased the risk of invasive breast cancer by about fifty percent but only tamoxifen has been concluded to decrease the risk of developing ductal carcinoma in situ (DCIS) [5]. The Lobular carcinoma in situ and atypical lobular hyperplasia are also known as lobular neoplasia [6]. Lobular neoplasia is a histologic diagnosis of cellular atypia that has an tenfold increase in the risk for the development of invasive breast cancer in either breast.[7] Females with lobular carcinoma in situ must be considered for the management with tamoxifen, which has been shown to reduce risk by more than fifty percent [8].

Atypical ductal hyperplasia is considered a premalignant injury that has five times higher risk for breast cancer. The chemoprevention with tamoxifen is considered effective in decreasing the risk by around eighty percent. Genetic also plays a major role; genetic mutations were found in five percent of women with familial breast cancer and involve the high-penetrance genes *TP53* (Li- Fraumeni syndrome) (191170 OMIM), *PTEN* (Cowden syndrome) (601728 OMIM), and *BRCA* mutations and several lower penetrance genes [9].

Of these, the *BRCA* gene mutations are the considered the most important. Another ten percent of breast cancer are familial without identified genetic mutation [10]. The National Comprehensive Cancer Network has published guidelines for referral for workup testing and genetic counseling. The criteria in a patient without a known diagnosis of breast cancer involve at least two primary breast cancers on the same side of the family, 1 or more ovarian cancers on the same side of the family, breast cancer in a first- or second-degree relative diagnosed before age forty five old , known mutation in a breast cancer susceptibility gene within the family, and male breast cancer [11]. The detailed information of the guidelines can be found on the National Comprehensive Cancer Network website. Patients who have a higher familial risk are suggested to check for genetic counseling and genetic testing. They must also be given the options of prophylactic bilateral mastectomy and oophorectomy, which have been linked to better prognosis and overall survival [12].

The *BRCA* gene were identified more than twenty years ago [13]. Since their identification, they have provided us important understanding of breast cancer biology.

Both *BRCA1* and *BRCA2* mutations have a sixty to eighty percent overall risk for the development of breast cancer and are also linked to other cancers, such as ovarian cancer. *BRCA1* is more likely linked to ovarian cancer than *BRCA2*, where *BRCA2* was shown to be more linked to pancreatic malignancy and male breast malignancy [14].

Females with known *BRCA* mutations are suggested to perform more surveillance to involve annual mammography and annual bilateral breast magnetic resonance imaging. In addition to more surveillance, tamoxifen could add more risk reduction in patients with the *BRCA* gene.

Treatment of Breast Cancer

The management of breast cancer involves multidisciplinary one and usually involves surgery, radiation, and systemic therapy. Many risk factors could be used to decide on the management plan, the sequencing of the therapies. Many patients with early-stage breast cancer will go to surgery first. In patients with huge cancer size, skin involvement, or bulky nodal disease, several advocate of neoadjuvant chemotherapy since response to chemotherapy provides prognostic information.

Patients with inflammatory breast cancer are recommended to get chemotherapy first. Radiation is often given after chemotherapy and surgery, if it is given after surgery but before chemotherapy.

Ductal carcinoma in situ has a special characteristic. Management of the breast in DCIS to early-stage invasive breast cancer. though low-risk patients may undergo simple lumpectomy. About 15 of patients with DCIS would have an associated invasive cancer [15].

Surgical Management of the Breast

Surgery has been the main method for the management of breast cancer for many years. Halsted, was the first who did a radical mastectomy in 1882. The Halstedian method stayed to be the gold standard for the surgical management of breast cancer for more than eighty years. For more than thirty years, surgical management of the breast has developed from radical approaches to less extreme, breast-conserving procedures, though the recent method has been a trend of increasing mastectomy rates for unknown reasons [16].

The progression to less radical methods has been well established. 1 trial, the NSABP B-04, started in 1971, in comparison to radical mastectomy without radiation versus simple mastectomy with radiation versus simple mastectomy without radiation.

Another trial, NSABP B-06, involved a randomized comparison of mastectomy versus lumpectomy alone versus lumpectomy with radiation for patients who had stage one or two disease with tumors less than four centimeters. Overall, more than 2000 females were selected from 1976 through 1984. Axillary dissection was done in all groups. No differences were found in overall survival however major differences in recurrence rate were observed, with the lumpectomy-alone groups having about forty percent rate of recurrence at twenty years. So, the gold standard of care for breast-conserving surgery has become lumpectomy with radiation. Absolute contraindications to lumpectomy include prior radiation therapy, pregnancy, multicentrictumor, inability to obtain clear margins (large tumor or invasion into adjacent structures), and physical inability to tolerate radiation therapy. Relative contraindications involve multifocal tumor, connective tissue disease, and a large tumor to breast size ratio. Recurrences should be managed with mastectomy.

The contralateral prophylactic mastectomy has been trending recently. The main reasons for this are multifactorial but mainly in part are driven by patients' misunderstanding of the overall risk of developing a contralateral cancer [17].

Surgical Management of the Axilla

It is extremely essential to know that removal of lymph nodes have no treatment benefit to the patient and is used only for staging. As with the management of the breast, with time management of the axilla has been less trending. The pioneering work by Morton et al in sentinel lymph node biopsy in melanoma helped the application of this technique to other malignant cancers. Its use in breast cancer was formed by Guiliano et al This development transformed surgical management of the axilla, and for more than an era, the standard of care has remained sentinel lymph node biopsy in the clinically negative axilla followed by axillary lymph node dissection in those with positive sentinel lymph nodes. But it was known from NSABP B-32 and other studies that a large number of women with positive sentinel lymph node(s) would no have any other positive lymph nodes on completion dissection. Nomograms to predict the likelihood of additional (nonsentinel) positive lymph nodes were developed and used widely in the clinic.84,85 With higher use of adjuvant therapies, patients who had the removal of sentinel lymph nodes only without completion axillary dissection had less recurrence rates.

In one of the American College of Surgeons Oncology Group trial, it was showed that, in selected patients, completion axillary dissection may be safely omitted.88,89 Patients with stage 1 or 2 breast cancer undergoing breast-conserving therapy with less than three positive lymph nodes had no differences in survival or recurrence at a mean six year follow-up.

This study led to a wide spread change in the management of the axilla in patients who meet the selection criteria [18].

To repeat, in patients with tumors smaller than five centimeters, clinically lymph node–negative axilla, less than three positive lymph nodes, and treatment with breast-conserving therapy (to include whole-breast radiation) and adjuvant systemic hormonal therapy or chemotherapy, completion axillary lymph node dissection could be omitted safely.

The Sentinel lymph node biopsy is usually indicated in any invasive cancer with a clinically negative axilla. Studies have also supported sentinel lymph node biopsy in patients undergoing mastectomy for DCIS or high risk lesions.[19] The NSABP B-27 trial and other studies showed sentinel lymph node biopsy to be accurate after neoadjuvant therapy.

Chemotherapy

In the age of molecular biology, the decision to offer chemotherapy is progressively based on analysis of each tumor. Aside from the molecular profile, relative indications for chemotherapy include large tumor size (> two cm), positive lymph nodes, ER-negative and progesterone receptor–negativetumors,HER-2/neu–positive tumors, and inflammatory breast cancer. Anthracycline-based regimens have been found to be better than methotrexate-based regimens, although the adverse effects are more substantial. Anthracyclines are associated with cardiotoxicity and should be used cautiously or avoided in older patients with cardiac disease, particularly if used in combination with trastuzumab. The addition of taxanes to chemotherapy has been revealed to improve results and is recently used as standard management.[20]

Radiation Therapy

Radiation after lumpectomy is linked to a less local recurrence rate. In patients who have had a mastectomy, large tumor size (> five cm), four or more positive lymph nodes, close margins, or inflammatory breast cancer are all indications for adjuvant radiation.107 Females with recurrent cancer who have not had prior radiation should also be offered this therapy. Radiation usually consists of whole-breast radiation given for six to six and half ½ weeks, including a boost dose. Accelerated partial breast irradiation has recently been announced, and the American Society for Radiation Oncology has published guidelines for the use of this technology.[21] While there are multiple delivery systems for this therapy, not all have been evaluated in clinical trials.

Staging

Surgery stays to be the most accurate way of staging nonmetastatic malignant tumors. The staging system for breast cancer follows TNM system. The prognosis that is based on size and nodal status without a proper understanding of the underlying individual tumor biology is flawed.

Follow-up

The American Society of Clinical Oncology suggests that patients be seen in the clinic every three to six months for the first three years, every six to twelve months in years four and five, and every year afterwards.

CONCLUSIONS:

Breast cancer is a considered one of the most common cancers however it is extremely complex disease. It is recommended that careful consideration should be given to the unique nature of each tumor and patient. Every newly diagnosed breast cancer should be presented at a multidisciplinary meeting to make sure that optimal treatment plan is carried out by all specialties involved. The American Society of Clinical Oncology suggests that patients be seen in the clinic every three to six months for the first three years, every six to twelve months in years four and five,and every year afterwards.

Treatment for breast cancer will continue to develop; further improvements in outcomes will likely be based on the development of targeted therapies.

REFERENCES:

1. **American Cancer Society.2012** Breast cancer: facts & figures 2011-2012. http://www.cancer.org/acs /groups/content/@epidemiologysurveilance /documents/document/acspc-030975.pdf. Accessed October 11, 2012.
2. **Freedman AN, Seminara D, Gail MH, et al.2005** Cancer risk prediction models: a workshop on development, evaluation, and application. J Natl Cancer Inst. 2005;97(10):715-723.
3. **Gail MH, Brinton LA, Byar DP, et al.1989** Projecting individualized probabilities of developing breast cancer for white females who are being examined annually. J Natl Cancer Inst. 1989;81(24):1879-1886.
4. **Gail MH, Costantino JP, Pee D, et al.2007** Projecting individualized absolute invasive breast cancer risk in African American women. J Natl Cancer Inst. 2007;99(23):1782-1792.
5. **Vogel VG, Costantino JP, Wickerham DL, et al;** National Surgical Adjuvant Breast and Bowel Project (NSABP). Effects of tamoxifen vs raloxifene on the risk of developing invasive

breast cancer and other disease outcomes: the NSABP Study of Tamoxifen and Ral.

6. **Oppong BA, King TA.2011** Recommendations for women with lobular carcinoma in situ (LCIS). Oncology (Williston Park). 2011;25(11):1051-1056; 1058.
7. **Anderson BO, Calhoun KE, Rosen EL.2006** Evolving concepts in the management of lobular neoplasia. J Natl Compr Canc Netw. 2006;4(5):511-522.
8. **Fisher B, Costantino JP, Wickerham DL, et al.2005** Tamoxifen for the prevention of breast cancer: current status of the National Surgical Adjuvant Breast and Bowel Project P-1 study. J Natl Cancer Inst. 2005;97(22):1652-1662.
9. **Njiaju UO, Olopade OI.2012** Genetic determinants of breast cancer risk: a review of current literature and issues pertaining to clinical application. Breast J. 2012;18(5):436-442.
10. **Shannon KM, Chittenden A.2012** Genetic testing by cancer site: breast. Cancer J. 2012;18(4):310-319.
11. **Bevers TB, Anderson BO, Bonaccio E, et al.2009** NCCN clinical practice guidelines in oncology: breast cancer screening and diagnosis. J Natl Compr Canc Netw. 2009;7(10):1060-1096.
12. **Brown P.2005** Risk assessment: controversies and management of moderate- to high-risk individuals. Breast J. 2005;11(suppl 1):S11-S19.
13. **Miki Y, Swensen J, Shattuck-Eidens D, et al.1994** A strong candidate for the breast and ovarian cancer susceptibility gene BRCA1. Science. 1994;266(5182):66-71.
14. **Petrucelli N, Daly MB, Feldman GL.2010** Hereditary breast and ovarian cancer due to mutations in BRCA1 and BRCA2. Genet Med. 2010;12(5):245-259.
15. **Virnig BA, Tuttle TM, Shamliyan T, Kane RL.2010** Ductal carcinoma in situ of the breast: a systematic review of incidence, treatment, and outcomes. J Natl Cancer Inst. 2010;102(3):170-178.
16. **McGuire KP, Santillan AA, Kaur P, et al.2009** Are mastectomies on the rise? a 13-year trend analysis of the selection of mastectomy versus breast conservation therapy in 5865 patients. Ann Surg Oncol. 2009;16(10):2682-2690.
17. **Bedrosian I, Hu C-Y, Chang GJ.2010** Population-based study of contralateral prophylactic mastectomy and survival outcomes of breast cancer patients. J Natl Cancer Inst. 2010;102(6):401-409.
18. **Gainer SM, Hunt KK, Beitsch P, Caudle AS, Mittendorf EA, Lucci A.2012** Changing behavior in clinical practice in response to the ACOSOG Z0011 trial: a survey of the American Society of Breast Surgeons. Ann Surg Oncol. 2012;19(10):3152-3158.
19. **Lambert K, Patani N, Mokbel K.2012** Ductal carcinoma in situ: recent advances and future prospects. Int J Surg Oncol. 2012;2012:347385. doi:10.1155/2012/347385.
20. **Ferguson T, Wilcken N, Vagg R, Ghersi D, Nowak AK.2007** Taxanes for adjuvant treatment of early breast cancer. Cochrane Database Syst Rev. 2007;(4):CD004421.
21. **Smith BD, Arthur DW, Buchholz TA, et al.2009** Accelerated partial breast irradiation consensus statement from the American Society for Radiation Oncology (ASTRO). Int J Radiat Oncol Biol Phys. 2009;74(4):987-1001.