

Review: Breast cancer

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Abstract

Breast cancer is the most common cancer in women worldwide, and 70–80 per cent of patients with the advanced, non-metastatic disease will be cured. With new treatments, advanced breast cancer with remote organ metastases is found untreatable. Breast cancer is a heterogeneous disease at the molecular level, with activation of the human epidermal growth factor receptor 2 activations of hormone receptors (oestrogen receptor and progesterone receptor), (HER2, encoded by ERBB2), and/or BRCA mutations being the most common molecular characteristics. Treatment options vary depending on the molecular subtype. Breast cancer treatment is multidisciplinary, encompassing both locoregional (surgery and radiation therapy) and systematic approaches. Endocrine treatment for hormone receptor-positive illness, anti-HER2 therapy for HER2-positive disease, chemotherapy, poly(ADP-ribose) polymerase inhibitors for BRCA mutation carriers, bone stabilizing agents, and, most recently, immunotherapy are all examples of systemic therapies. Individualization of care, as well as patient de-escalation and escalation focused on tumor pathology and early therapy response, are among the goals of future clinical concepts of breast cancer.

Keywords: Breast cancer, non-metastatic disease, heterogeneous disease

1- Introduction

Cancer is characterized as "uncontrolled cell growth." It is a gradual sequence of epigenetic modifications that arise in an individual cell clone as a result of modifications in a small number of specific genes, such as proto-oncogenes and immune cell genes (1-2). Breast cancer is the commonest cancer in females worldwide, and it is treatable in 70-80% of women with symptomatic, non-metastatic cancer. Developed breast cancer with distant tissue metastases is not deemed incurable due to recently accepted therapies (3).

2- Breast cancer history

Breast cancer has been recorded since 1600 B.C. At least 8 surgical cases were described in a papyrus that was 468 meters long and described 48 surgical cases. Breast cancers, one of which was almost definitely a breast tumor, were among them. This papyrus was identified by Edwin Smith and is thought to have originated in Egypt. Egyptians, who were declared a god in ancient Egypt, wrote the book. The world's oldest health history is this papyrus book. The papyrus was believed to be an article written in 1600 BC. Papyrus became much older than that, dating back to about 3000 BC (4).

The use of cauterization with a tool called a fire drill was also identified in the treatment of these tumors or ulcers of the breast.' The author came to the conclusion that there is no effective cure for breast cancer. The patient, who lived at the end of

the sixth century Bc, was well-known. Atos' queen, Kiros' daughter, and Danius' wife allegedly had Cancer is a disease that affects women. "She has inflammation of the breast," the phyma (damaged breast) that began to enlarge." She, on the other hand, The Persians finally healed him without mutilating his breasts. Kroton's doctor Democedes. As a result, it is now thought that the Queen was suffering from mastitis, not a malignant tumor. Indeed, In this case, Herodot, who was known for his technical prose, used the cryptic term phyma, which may mean either abscess or neoplasm. Alice's (Cyrus' daughter) case was mentioned by Herodot (535). (B.C.). She detected a nodule in her breast but kept it secret until it ruptured. as if it were an open wound, through the skin Her father then dialed a doctor's phone. who was successful in removing the tumor (5). Celzo recognized the importance of surgery in the earliest stages of cancer and stated that just tiny cancers may be removed, whereas bigger tumors could only be aggravated by surgery. Hippocrates was a Greek physician. (460 AD) established the distinction of malignant tumors. He Breast cancer is thought to be untreatable. According to the tenets of the Church, Melancholy was the main cause, according to Greek physician Galen (130-200 AD). in the progression of breast cancer, The treatments included a special diet and exorcism. Treatments that are suggested(5). Santa Agatha is the patron saint of women suffering from breast cancer. According to tradition, she was a stunning young lady from a wealthy and well-respected household. During the reign of the Ottomans, she resided in Catania, Sicily. Decia was a Roman emperor (200-251 AD). Decia sent his regent (governor) To exterminate the Christians, Kvintian went to Sicily. He learned about it there. He ordered Agatha, a young and attractive woman, to be brought to him. He deserves it. Agate, a devout Christian, turned him down due to her religious beliefs. As a result, Kvintian agreed to imprison her. She attempted unsuccessfully for thirty days to persuade Agatha. to take on the role of Kvintian He ordered Agatha to be tortured because he was angry. Rather than sparkling, primitive machines spread her arms and legs. One breast was amputated due to pincers. "Aren't you?" Agatha inquired. Embarrassed to take away what your mother used to feed you?" She was in a good mood. In addition, they were expected to walk shoeless over hot coals. However, a major quake caused one of the jury's walls to collapse, killing her. Agatha, the woman martyr and patroness of breast diseases, was declared a saint. on February 5th, her sacrifice is commemorated (5). Alexandra resident Leonidus identified breast cancer surgery. It happened for the first time in the first century since Christ. The protocol contained the following: the replacement of cancerous tissue and skin, as well as some healthy tissue and skin. To he used cauterization to stem the bleeding. Cutting and cauterization are performed until the entire tumor and breast is cut, as well as the a layer formed on the wounded area. Thomas Willis (1621-1675), an English surgeon, was using an almost identical description of the tumor in relation to neoplasia to those used currently. Cancer, he claims, is a "disruption of growing primary tissue." Cells with unregulated, non-purposefully dividing cells were identified (5). andreas Vesalius (a Flemish anatomist) was a prominent figure during the renaissance. "DeHumanicorporisfabrica" was the foundation for modern science. mastectomy, as well as ligatures, is suggested as part of the study.

rather than cautery, (sutures) were used to stop the bleeding. The physician LeDran was the first to understand that cancer can transfer to the regional auxiliary nodes (lymph nodes under the arm).

(1685 – 1770) LeDran was most probably the first

to connect a bad prognosis with cancer. When cancer has spread to the lymph nodes, it's called lymphoma (5).

3-Epidemiological

Breast cancer is the most prevalent malignant tumor in women. In many nations, is the leading cause of death from cancer in women.

And according to data from many of the countries across the world, with the exception of Asia, With age, the prevalence and death rates rise. The largest prevalence is seen in women over 85, with an occurrence of over 350/100,000 women is 20. accounting for about one-third of all cancers in women. It's the second. only when it comes to lung cancer as a cancer cause It is the major cause of death in the world. for women between the ages of 40 and 60 in the United States also 55 (6).

A woman's average chance of contracting invasive breast cancer is 12.6%.In the United States, two out of every eight women will grow breast cancer. at a certain point in her life, she was diagnosed with breast cancer (7). Breast cancer mortality rates have been steadily decreasing over the last decade, and the prevalence has remained stable since 1988. after a roughly 50-year period of steady growth (8) .Women of breast cancer make up 25% to 30% of the population. Invasive breast cancer patients will succumb to their sickness.¹ However, as depressing as this number is, it still has a positive side.⁷⁰ to 75 percent of people have invasive breast cancer Anything that will cause breast cancer to fail. than the cancer of their breasts As a result, a diagnosis is made. Breast cancer, also invasive breast cancer, is a form of cancer that affects women. isn't really the dreaded "death penalty" a large number of women (and their insurance companies) Consider this: The youth (under 35) and the elderly (over 85) have the highest mortality rates (greater than age 75)(9).The very young tend to have much more severe illness, as well as the very elderly could not be handled vigorously enough. or having a comorbid condition that makes it worse Breast cancer has a high mortality rate. Since 60 to 80 percent of recurrences happen,The chances of recurrence are highest in the first three years. appears to exist for a period of up to 20 years (9).

4- Breast cancer etiology

Scientists are making significant progress in understanding how such DNA modifications can cause normal breast cells to become cancerous. DNA is the enzyme that contains the instructions for almost all our cells do. We usually mimic our ancestors because they are the source of our DNA. However, DNA has a greater impact than our physical being (8).

In some genes, there are rules for controlling when our cells multiply, fragment, and die (parts of DNA). Oncogenes are genes that enable cells to divide more easily. Tumor suppressor genes, for example, delay cell division or cause cell death at the appropriate time. Cancer is thought to be caused by DNA mutations (modifications) that "turned on" oncogenes and "turn off" tumor suppressor genes. Any genetic DNA differences will raise a person's cancer risk. who inherit them, and are responsible for the cancers that occur in certain families (8).

5- Pathologies

Since the breast is made up of epithelial cells, connective tissue, and fatty tissue, tumors that develop in the breast can be malignant or benign,

and they are cancers of specific tissues. Malignant breast tumors are most usually epithelial in nature (cancers).

Malignant breast cancers are classified in a variety of ways, but the two most common are the (WHO) World Health Organization classification and the Armed Forces Institute of Pathology classification (AFIP). Tumors may be non - invasive (cells do not reach the basement membrane) or invasive (malignant cells interfere with the basement membrane) (cell invade through the basement membrane). Invasive ductal carcinoma (over 80% of all breast cancers) is the most common pathohistological type of breast cancer, followed by invasive lobular carcinoma (10%). (5 percent). Medullary carcinoma is less common in older people than in younger people. Mucinous and papillary carcinomas are more common in older women, but they account for less than 10% of all breast cancers (10).

6- Breast cancer classification

Breast cancers can be classified using four different schemes. Each of these schemes categorizes cancers and has a particular purpose, depending on different criteria. Here are a few examples (11):

1- Invasive

- a) Invasive ductal carcinoma with a predominant intraductal component.
- b) Invasive lobular carcinoma.
- c) Invasive ductal carcinoma.
- d) Mucinous carcinoma.
- e) Papillary carcinoma.
- f) Medullary carcinoma.
- g) Adenoid cystic carcinoma.
- h) Tubular carcinoma.
- i) Secretory (juvenile) carcinoma.
- j) Metaplastic carcinoma.
- k) Apocrine carcinoma.
- l) Polymorphous carcinoma.
- m) Inflammatory carcinoma.
- n) Exceptional rare types and variants.

2- Noninvasive

- a) Lobular carcinoma in situ.
- b) Intraductal

3- Pagets disease of the nipple

Cancer that isn't invasive: Noninvasive (in situ) and invasive cancers are the two types of tumors. In situ carcinoma is a type of cancer that develops in the body described by ductal development without ductal penetration As a result, there are no ducts containing the stroma in the basement membrane. In situ carcinoma is classified into two types : DCIS(ductal carcinoma in situ) and LCIS (lobular carcinoma in situ)(12).

DCIS is classified as noncomedo or comedo based on the occurrence or absence of comedogenesis, the development pattern (solid, papillary, cribriform), and the nuclear classification. The slapstick the form is described by a growth pattern in which the cells in the middle expand at a faster rate than the cells in the periphery. The necrosis of the involving ducts has caused the surrounding viable cells to die. a nuclear grade that is really high. The central region of necrosis often exhibits calcification dystrophic (6). Endocrine ductal carcinoma in situ (EDC in situ) is a type of endocrine ductal carcinoma that has a distinct growth pattern. ductal carcinoma in situ is a type of ductal carcinoma in which the cells are arranged in a way that indicates an invasion. structure of the endocrine system This is a generic word with no clinical or medical connotations.significance for prognosis (6).

LCIS is defined by a population of uniform, discohesive cells with no nuclear pleomorphism, nucleoli, or mitotic involvement that distends lobular ducts. One's involvement Although a full lobule in a biopsy is necessary for diagnosis, Some people believe that the presence of the majority of the lobular ducts is sufficient. 'The' Since the lesion is neither palpable nor visible on mammography, Its diagnosis is typically based on its appearance near a clinically or anatomically important structure. A mammographically observable lesion is one that is visible on a mammogram. The term "lobular carcinoma in situ" refers to a form of lobular Usually multicentric and bilateral in nature. It should be regarded as a sign of a patient's elevated relative likelihood of developing invasive carcinoma (6).

Invasive carcinoma is described as a neoplastic invasion of the basement membrane of a duct including ductal carcinoma in situ, as well as the expansion of neoplastic cell aggregates into the surrounding tissue. the stroma of the mammary gland (6).

Ductal carcinoma: accounts for nearly 75% of all invasive breast cancer cases. The word "ductal carcinoma" refers to the assumption that this form of cancer starts in the ducts rather than the skin. lobules According to current theory, both ductal and lobular The terminal duct lobular unit is where invasive carcinoma begins (TDLU). Ductal carcinoma has been classified into two classes in several categorizations, such as the WHO classification, one of which is distinguished by, As a result, it's often referred to as cancer with reactive fibrosis. Fibrosis is productive. On the skin, this form occurs as a spiculated tumor. a mammogram is a form of mammography. The other subgroup is less fibrotic and has its own set of characteristics. in some other fields, It has a more regular outline and is rarely Circumscribed carcinoma, also known as ductal carcinoma with a boundary, is a type of cancer that has a border around it. intraductal part is the most common (6).

Invasive lobular carcinoma :is defined by an invasive carcinoma development pattern in which the tumor cells emerge in single-cell cords (so-called Indian files) In a concentric targetoid structure, the ducts are surrounded. cytoplasmic vacuolation can be linked to intracellular vacuolation in cells. mucin is a mucin derivative. Clinically or radiologically, the neoplasm can be impossible to identify. Since desmoplastic tissue is often sparse, mammography is often inconclusive. microcalcifications, as well as the lack of a response. This growth trend will coexist with ductal types of invasive carcinoma and be related to either lobular carcinoma in situ or ductal carcinoma in situ (6).

Mucinous (colloid) carcinoma: is described via an abundance of extracellular mucin that surrounds nests of carcinoma cells. These carcinomas are usually circumscribed and can be asymptomatic. have ductal carcinoma in situ in adjacent foci This cancerous development is called neoplasia. If you have this history, you have a good chance of having a good prognosis. that the mucinous growth trend accounts for almost all of the carcinoma (6).

Medullary carcinoma: is a form of ductal carcinoma that invades the body's ducts with a circumscribed growth model, prominent nuclear polymorphism and mitotic behavior, a syncytial structure of the neoplastic cells, and a lymphocytic or plasma cellular infiltrate. (DCIS) is sometimes not apparent in combination with the neoplasm, and estrogen and progesterone receptor protein tests typically display unfavorable findings. Despite its violent microscopical nature, medullary carcinoma has a generally positive prognosis (6).

Papillary carcinoma : may refer to either a noninvasive or invasive carcinoma. The existence of carcinoma cells on fragile fibrovascular stalks induces the papillary growth cycle. The papillary lesion is found within a distended duct and is frequently connected to several sites on the duct wall of a noninvasive neoplasm. The neoplastic epithelium on the fibrovascular stalks is multilayered, sometimes fused with related epithelium on an adjacent stalk, and can show cribriform. Non-invasive carcinomas can be located in a subareolar duct, which can cause a bloody nipple discharge, or in a cystic duct somewhere in the breast, which can cause a mass lesion the final result (6).

Tubular carcinoma: is a form of invasive breast carcinoma that is well-differentiated. The carcinoma is typically associated with DCIS foci and is described microscopically via reasonably regulated angulated tight ducts that penetrate mammary stroma. The ducts are devoid of myoepithelial investment, are lined by cells with low nuclear pleomorphism, and are encircled by cellular connective tissue. Tubular carcinomas have a maximum diameter of less than 2 cm. Lymph nodal metastases are seen in around 15% of cases, though they typically contain less than three nodes. The neoplasm is linked to a favorable prognosis (6).

Adenoid cystic carcinoma: is a low-grade invasive cancer described by mucin-containing cylinders enclosed by myoepithelial cells and epithelial. That's the only type of invasive carcinoma in which myoepithelial involvement is normal (6).

Carcinoma with metaplasia: Although metaplastic shift foci are typical in invasive ductal carcinoma, certain tumors are mostly completely made up of this type of growth model. The bulk of these neoplasms are circumscribed and found in postmenopausal females. Metaplasia can different types, such as spindle cells, squamous cells, osteoid, chondroid, or even skeletal muscle growth patterns. Only a few foci of identifiable ductal carcinoma in situ or invasive ductal carcinoma are apparent in some cases, allowing distinction from a primary mammary sarcoma challenging. Immunohistochemistry for high - molecular - weight cytokeratin could be useful in addressing the above case (6).

Paget's disease: is a form of ductal carcinoma that affects women in their forties and fifties. It starts as a common intraductal cancer that emerges from the breast's major excretory ducts and spreads intraepithelial to areola tissue and the nipple. The skin of those that have been affected is often ulcerated, fissured, and oozing. Inflammatory hyperemia and edema are common side effects, as are bacterial infections. The penetration of the

epidermis by typical tumor cells known as Paget's cells is the histologic signature of this tumor. These cells are wide and hyperchromatic, with a light-stained circle around them that reflects the intracellular mucopolysaccharide deposit. Although the morphologic appearance is close to that of intraductal carcinoma, this cancer also has a stronger prognosis (13).

7- Risk Factors for Breast Cancer

A "risk factor" is something that makes it more likely for you to get breast cancer. Among the most significant breast cancer risk factors, such as family background, medical history, and age are beyond your influence. Specific risk factors, such as physical activity, alcohol consumption, and weight, are, however beyond your control.

Breast cancer risk factors and treatment are depicted in this illustration. The pyramid map depicts five significant risk factors for breast cancer: family history, age, lifestyle, reproductive factors, and estrogen. Breast cancer is currently avoided by testing (mammography and MRI), biological prevention (with Herceptin and pertuzumab), and chemoprevention (with SERMs and AIs). Immunotherapy medications called PD1/PDL1 inhibitors may be effective in treating TNBC (14).

- **Aging**

Aside from gender, age is among the most significant risk factors for breast cancer, as the prevalence of the disease rises with age. In 2016, women over the ages of 40 and 60 accounted for 99.3 percent and 71.2 percent of all breast cancer-related deaths in the U.S., however. As a result, women above the age of 40 should get a mammography test done ahead of time (15).

- **History of the family**

Family history is linked to about a percent of the cases of breast cancer. Breast cancer is more likely in women whose sister or mother has the condition. Women with one first-degree parent of breast cancer have a 1.75-fold greater chance of contracting the disease than women without any affected families, according to a cohort analysis of over 113,000 women in the United Kingdom. Furthermore, women who have two or more breast cancer-affected first-degree relatives face a 2.5-fold or greater chance. Breast cancer sensitivity is inherited in part due to mutations in BRCA1 and BRCA2 are breast cancer-related genes. (16).

- **Conditions that influence reproduction**

Breast cancer risk can be raised by fertility causes such as late menopause, early menarche, poor parity, late age at first birth. Per year that menopause is delayed raises the risk of breast cancer by 3%. Breast cancer risk is decreased by 5% to 10% for each year that menarche is postponed or for each additional child born . According to a new Norwegian cohort report, the danger ratio (HR) between late (35 years) and early (20 years) age at first birth is 1.54. Reproductive factors are closely related to ER rank, with variations in the odds ratios (OR) for parity (0.7 vs. 0.9 for 3 births vs. nulliparae) and age at first birth (1.6 vs. 1.2 for age 30 vs. 25 years) for ER+ and ER- breast cancer (17).

- **Estrogen is a hormone that is formed by the female**

Estrogens, both exogenous and endogenous factors, have been attributed to the incidence of cancer. In premenopausal women, the ovary produces endogenous estrogen, and ovariectomy can decrease the breast cancer risk (18). Oral contraception and hormone replacement therapy are the most common causes of exogenous estrogen (HRT).

Since the 1960s, oral contraceptives have been commonly available, and formulations have also been improved to minimize negative effects. Nonetheless, the OR for African - Americans and Iranian communities is also greater than 1.5. (19). Oral contraceptives, on the other hand, may not raise the breast cancer risk in females who have stopped using them for more than ten years (20). For postmenopausal or menopausal females, HRT requires the treatment of exogenous estrogen or other hormones. The use of hormone replacement therapy (HRT) has been attributed to an elevated risk of breast cancer in many trials. The UK's Million Women Research found a 1.66 relative risk (RR) between active HRT consumers and others who have never used it (21). After 4 and 8 years of HRT use, HRs of 1.48 and 1.95 were observed in a cohort sample of 22,929 Asian women . However, after two years of no HRT, the incidence of breast cancer has been found to be greatly diminished(22). Breast cancer patients who take HRT have a high recurrence risk, with an HR of 3.6 on a new breast tumor. Because of the decline in the use of HRT after the publication of the negative impacts of HRT in 2003, focusing on the Women's Health Initiative randomized clinical trial, the prevalence rate of breast cancer in the United States has declined by almost 7%. (23)

8- style of life

Increased consumption alcohol and a high dietary lipid eating are two modern lifestyle factors that may boost breast cancer risk. Alcohol intake may cause an increase in estrogen-related hormones in the bloodstream, as well as the activation of estrogen receptor mechanisms. A meta-analysis of 53 epidemiological tests have revealed that drinking 35-44 grams of alcohol each day raises the possibility of cancer by 32%, with an extra 10 grams of alcohol each day rising the risk by 7.1 percent (23). Excess fat consumption, specific fructose, is related to mortality (RR=1.3) and debilitating disease in women with cancer in the modern western diet (24). While the correlation between breast cancer risk and smoking is still discussed, mutagens from cigar smoke have been identified in non-lactating women's breast liquid(25). Breast cancer risk is also raised in people who consumes alcohol and smokes (RR=1.54). Until now, mounting research has shown that smoking, particularly at a young age, increases breast cancer risk (26-27).

9- Disease Diagnostic

Anamnesis, physical inspection, and mammography are the most common techniques for identifying breast cancer. However, for a precise diagnosis, a biopsy for the pathological examination should be done. Pathological material is obtained using a variety of methods, but the following two are the most common: 1. intraoperative biopsy with histologic examination of the frozen portion .2- the cytological examination of the breast drainage, i.e. the material aspirated from the breast; The first procedure is particularly useful for determining the best cure for breast cancer based on histological confirmation of the malignant cells' relationship if the cancer is invasive or non-invasive is determined by how close it is to the basal membrane. Self-test (easy to study, harmless, and free), physical examination, anamnesis, ultrasound, native mammography, and new diagnostic techniques such as MRI (Magnetic Resonance Imaging), CAD (computer-aided diagnosis), optical mammography, SPECT (single photon emission imaging and computed tomography) tomography, PET (positron emission

tomography), and diaphanous tomography are examples of indirect Physical inspection of the breasts by mammography and a healthcare worker the two most widely used diagnostic techniques may give an estimate of the probability that a lump is cancer and can even identify such a plain cyst is an example of a lesion. While these tests are incomplete, a sample of the lump's fluid may also be taken for microscopic examination by a healthcare professional (fine-needle aspiration, or fine-needle aspiration and cytology, FNAC) to better determine the diagnosis. A healthcare provider's office or laboratory may conduct needle aspiration. To ease pain during the treatment, a local anesthetic can be used to calm the breast tissue, but if the lump isn't under the surface, it may not be required. Clean fluid indicates that the lump is unlikely to be cancerous, but bloody fluid can be examined under a microscope for the cancer cells. Breast cancer can be diagnosed with a high degree of accuracy using a combination of physical examination, mammography, and FNAC. Another biopsy alternative is a core biopsy or vacuum-assisted breast biopsy, which removes a part of the breast lump, or an excisional biopsy, which removes the whole lump. The conclusive diagnosis and main treatment is excisional biopsy The results of a physical examination by a healthcare professional, mammography and additional tests that may be done in special circumstances (such as imaging by MRI or ultrasound) are often used to support the treatment. (28-29).

10- Therapy for Breast Cancer

Treatment for breast cancer is interdisciplinary. The percentage of women who are recommended for a mastectomy or breast-conserving surgery with radiotherapy after early-stage breast cancer. Both methods should not vary in terms of the probability of recurrence on a local level or the likelihood of survival. Breast cancer treatment success is based on early detection and a well-organized, multidisciplinary approach to healthcare.

- **Surgical procedures**

The most popular method of regional and local breast cancer treatment is surgical. Female cancer patients in the first half of the twentieth century were often treated with a radical mastectomy, as William Stewart Halsted first described in 1894. Fischer et al. and Veronesi et al. established breast conservation surgery (BCS), stating that survival with radiation and lumpectomy was equal in the treatment of early breast cancer with a mastectomy. The implementation of a localization method for surgical care was necessitated by increased breast cancer screening, which culminated in nonpalpable cancer diagnosis (30).

- **Oncology (Medical)**

Breast cancer can also be treated with endocrine therapy, systemic chemotherapy, and HER2-directed therapy. Systemic chemotherapy, endocrine therapy, or HER2-directed therapy is recommended based on the tumor products and the nature of the disease. In early-stage breast cancer, these characteristics include ER, PR, and HER2 status, lymph node involvement, and tumor size. The most important factors in stage IV disease are the receptor status and the locations of metastatic sites (31).

- **Chemotherapy** is a method of medicine that is used to cure for those with a higher risk of complications, adjuvant chemotherapy

following definitive surgery is usually advised. Chemotherapy can be suggested by the clinicopathologic features mentioned below: ER-, PR-, HER2-positive, and HER2-negative; positive lymph nodes, and greater tumor size;. RNA-based genomic tests can be used to help predict the likelihood of a patient's remote recurrence with ER-positive tumors and negative lymph nodes, and as well as to distinguish patients who will benefit the most from treatment with chemo. After SNLB or axillary dissection, patients with a limited amount of positive lymph nodes can benefit from genomic testing to determine if chemotherapy is necessary. Cytotoxic treatment for patients with high-risk illness should include both an anthracycline and a taxane. Anthracyclines are frequently ignored in cases of low-risk illness. Chemotherapy should be selected by evaluating the possible survival advantage against comorbidities of the patient and the risk of complications (32).

- **Services for radiotherapy**

In both preventive and palliative conditions, radiation therapy in the prevention of breast cancer, medication is helpful. Radiating the breast following breast conservation surgery has oncologic effects that are close to those of a mastectomy of early-stage cancer. In the ipsilateral breast, adjuvant radiation reduces the chance of local recurrence by two-thirds. Adjuvant locoregional radiation to the chest wall and area lymph nodes lowers the risk of locoregional and remote recurrence with a cancer-specific cumulative survival advantage of advanced-stage disease. When risk factors such as node positivity, young age, triple-negative, lymphovascular invasion, molecular markers, and high-grade carcinoma are present, the advantage is greater. However, as radiation doses are raised to include regional cancer, the risk of toxicities, especially to the lungs and heart, rises (33).

Providing radiotherapy to patients with MBC has been found to be effective in many cases. When surgical resection is not necessary, palliative radiation may assist with local management of dermal recurrence or localized disease. To preserve or enhance the quality of life, radiotherapy is often used to cure brain metastases or to palliate other locations such as the bone. local-regional or Local radiation used to be administered over the span of 5 years, 5 days a week (for a total of around 25 treatments), and it also included a boost to the tumor bed following lumpectomy. Most centers have introduced hypofractionated regimens in recent years, which limit the number of breast fractionation sessions to about 15; this saves healthcare costs and makes it much easier for patients to finish (34).

- **Mastectomy**

The most popular options for patients undergoing mastectomy include total mastectomy (simple mastectomy), skin-sparing mastectomy, and nipple areolar-sparing mastectomy. After a full mastectomy, the breast parenchyma, nipple-areolar complex, and excess skin are separated from the chest wall, leaving just enough skin to close the incision. It's often used while a patient isn't scheduled for surgery right away. The breast parenchyma and nipple-areolar complex are separated after a skin-sparing mastectomy, leaving skin as tissue expander/implant, a normal envelope for an autologous flap, allowing for rapid reconstruction (35).

- **Radiation after a mastectomy**

When pathologic or clinical conditions indicate a 10% chance of local-regional recurrence (intermediate to high risk) in women who have had a mastectomy, radiation is prescribed as adjuvant therapy. In this subgroup of women, randomized prospective trials have demonstrated that postmastectomy radiation decreases local–regional recurrence and increases longevity. Women with a reduced chance of local–regional recurrence the following mastectomy, on the other hand, may not need radiation. Patients with 4 or more positive axillary nodes, T3 tumor size, positive axillary nodes, and locally advanced or inflammatory breast cancer are all indicators of locally advanced or inflammatory breast cancer. are typically treated with postmastectomy radiation. Patients with 1–3 positive lymph nodes and other local-regional recurrence risk factors, such as young age, lymphovascular invasion hormone receptor-negative breast cancer, or high-grade tumors, should be treated with radiation (36).

- **Treatment for endocrine disorders**

Tamoxifen is a powerful estrogen receptor modulator (SERM) that attaches to the estrogen receptor and has both antagonist and agonist properties, which means that its main mode of action is promoted by its attachment to the estrogen receptor and inhibition of estrogen's hematopoietic actions mostly on the mammary epithelium, The gold standard for breast cancer therapy is tamoxifen 20 mg tablets. According to studies, using Tamoxifen Reduces the chance of ER+ breast cancer recurrence by 50% and the possibility of recurrence by 50%. On the other side, it has been discovered that endocrine treatments such as Tamoxifen can amplify the agonistic effects of xenoestrogens on transmutated Estrogen Receptors, which have been related to drug resistance and refractoriness. in postmenopausal women, aromatase is the primary estrogen source. In postmenopausal women (especially in ER+breast cancer), third-generation aromatase inhibitors such as anastrozole, letrozole, and exemestane are frequently used as Tamoxifen replacements. These nonsteroidal compounds suppress the aromatase enzyme, which converts androstenedione to estrone and testosterone to estrogen, in a reversible manner. reduces morbidity by 28%, regardless of menopausal or lymph node status. The medications were shown to have improved good outcomes in postmenopausal women, as well as a greater body resistance than previous hormone therapies (37).

- **Antibodies that are monoclonal**

Trastuzumab is a clinically active ,A humanized monoclonal antibody that inhibits HER2's extracellular domain IV. For HER2/neu positive breast cancer patients, it has boosted survival rates. This monoclonal antibody has been clinically stable and efficient when used in a three-week regimen, as well as when used in conjunction with gemcitabine, paclitaxel , carboplatin or vinorelbine(38).

- **Chemotherapy (neoadjuvant)**

NAC was first designed to make breast cancer that is locally progressed and inoperable be resected. NAC has recently, it's been used to treat breast and axillary in inoperable tumors, the aim of promoting preservation of the breasts and, in certain cases, preventing ALND. Several randomized experiments have looked at the oncologic efficacy and survival effects of NAC. A meta-analysis of treated patients with NAC and surgery

accompanied by treatment with chemo found no variations in survival or LRR with NAC, as well as a 17 percent lower risk of mastectomy in NAC patients. Since all of the women participating in these studies were applicants for BCT at the time of the display of therefore could not benefit from NAC, the figure of 17% is a low estimate. Women with unicentric cancer that is large in relation to the size of their breast, as well as whose breast cancer is triple-negative or HER2-positive, are more likely to benefit from NAC (39).

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