Breast Cancer Detection and Treatment

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Abstract: Breast cancer is one of the most common cancers that is found in females worldwide. Approximately about 80% of breast cancer cases are invasive means that a Tumour is spread from breast to other areas of your body or from a particular point of origin to rest of the orgin. Breast Cancer typically effect Females of age group 50 yrs and older but it can also effect women who are younger than 50 years .Men may also develop breast cancers .Breast Cancers or the cancerious cells in your breasts multiply and become tumors . At global level Healthcare providers treat breast cancer either by surgery or by giving necessary Treatment to kill the Patient. The awareness about breast cancer is important as it can diminish the mortility rate among women all around the globe.Awareness programs related to breast cancer can help women understanding Factors , knowing Symptoms and breast self-examination (BSE) practices to enhance breast cancer awareness. These programes can prove effective as help in early detection of breast cancer and decrease the mortality rate among women all around the globe .

Keywords: Breast self-examination (BSE) , Breast cancer .

INTRODUCTION

Cancer that begins in the breast tissue is known as breast cancer. The second most frequent malignancy in women worldwide is breast cancer. Rarely, it can also affect men . One type of cancer that starts as a cell growth in the breast tissue is called breast cancer.

In the US, breast cancer is the most prevalent cancer diagnosed in women, second only to skin cancer. However, breast cancer is not limited to females. Since breast tissue is present in all people from birth, anyone can develop breast cancer.

The survival rate of breast cancer has been rising. Additionally, the number of breast cancer deaths is gradually declining. This is largely because funding for research and general support for raising awareness of breast cancer are in place.

Treatment is based on the person, the type of cancer and its spread. Treatment combines surgery, radiation therapy and medications.

SIGNS AND SYMPTOMS

Most people will not experience any symptoms when the cancer is still early hence the importance of early detection.

Breast cancer can have combinations of symptoms, especially when it is more advanced. Symptoms of breast cancer can include:

- a breast lump or thickening, often without pain
- change in size, shape or appearance of the breast
- dimpling, redness, pitting or other changes in the skin
- change in nipple appearance or the skin surrounding the nipple (areola)
- abnormal or bloody fluid from the nipple.

People with an abnormal breast lump should seek medical care, even if the lump does not hurt.

Most breast lumps are not cancer. Breast lumps that are cancerous are more likely to be successfully treated when they are small and have not spread to nearby lymph nodes.

Breast cancers may spread to other areas of the body and trigger other symptoms. Often, the most common first detectable site of spread is to the lymph nodes under the arm although it is possible to have cancer-bearing lymph nodes that cannot be felt.

Over time, cancerous cells may spread to other organs including the lungs, liver, brain and bones. Once they reach these sites, new cancer-related symptoms such as bone pain or headaches may appear.

METHODS FOR DETECTION OF BREAST CANCER

Breast cancer diagnosis often begins with an exam and a discussion of your symptoms. Imaging tests can look at the breast tissue for anything that's not typical. To confirm whether there is cancer or not, a sample of tissue is removed from the breast for testing.

Breast exam

During a clinical breast exam, a healthcare professional looks at the breasts for anything that's not typical. This might include changes in the skin or to the nipple. Then the health professional feels the breasts for lumps. The health professional also feels along the collarbones and around the armpits for lumps.

Mammogram

A mammogram is an X-ray of the breast tissue. Mammograms are commonly used to screen for breast cancer. If a screening mammogram finds something concerning, you might have another mammogram to look at the area more closely. This more-detailed mammogram is called a diagnostic mammogram. It's often used to look closely at both breasts.

Breast ultrasound

Ultrasound uses sound waves to make pictures of structures inside the body. A breast ultrasound may give your healthcare team more information about a breast lump. For example, an ultrasound might show whether the lump is a solid mass or a fluid-filled cyst. The healthcare team uses this information to decide what tests you might need next.

Breast MRI

MRI machines use a magnetic field and radio waves to create pictures of the inside of the body. A breast MRI can make more-detailed pictures of the breast. Sometimes this method is used to look closely for any other areas of cancer in the affected breast. It also might be used to look for cancer in the other breast. Before a breast MRI, you usually receive an injection of dye. The dye helps the tissue show up better in the images.

Removing a sample of breast cells for testing

A biopsy is a procedure to remove a sample of tissue for testing in a lab. To get the sample, a healthcare professional puts a needle through the skin and into the breast tissue. The health professional guides the needle using images created with X-rays, ultrasound or another type of imaging. Once the needle reaches the right place, the health professional uses the needle to draw out tissue from the breast. Often, a marker is placed in the spot where the tissue sample was removed. The small metal marker will show up on imaging tests. The marker helps your healthcare team monitor the area of concern.

Testing cells in the lab

The tissue sample from a biopsy goes to a lab for testing. Tests can show whether the cells in the sample are cancerous. Other tests give information about the type of cancer and how quickly it's growing. Special tests give more details about the cancer cells. For example, tests might look for hormone receptors on the surface of the cells. Your healthcare team uses the results from these tests to make a treatment plan.

Staging breast cancer

Once your healthcare team diagnoses your breast cancer, you may have other tests to figure out the extent of the cancer. This is called the cancer's stage. Your healthcare team uses your cancer's stage to understand your prognosis.

Complete information about your cancer's stage may not be available until after you undergo breast cancer surgery.

Tests and procedures used to stage breast cancer may include:

- Blood tests, such as a complete blood count and tests to show how well the kidneys and liver are working.
- Bone scan.
- CT scan.
- MRI.
- Positron emission tomography scan, also called a PET scan.

Not everyone needs all of these tests. Your healthcare team picks the right tests based on your specific situation.

Breast cancer stages range from 0 to 4. A lower number means the cancer is less advanced and more likely to be cured. Stage 0 breast cancer is cancer that is contained within a breast duct. It hasn't broken out to invade the breast tissue yet. As the cancer grows into the breast tissue and gets more advanced, the stages get higher. A stage 4 breast cancer means that the cancer has spread to other parts of the body.

TREATMENT

Breast cancer treatment often starts with surgery to remove the cancer. Most people with breast cancer will have other treatments after surgery, such as radiation, chemotherapy and hormone therapy. Some people may have chemotherapy or hormone therapy before surgery. These medicines can help shrink the cancer and make it easier to remove.

Your treatment plan will depend on your particular breast cancer. Your healthcare team considers the stage of the cancer, how quickly it's growing and whether the cancer cells are sensitive to hormones. Your care team also considers your overall health and what you prefer.

There are many options for breast cancer treatment. It can feel overwhelming to consider all the options and make complex decisions about your care. Consider seeking a second opinion from a breast specialist in a breast center or clinic. Talk to breast cancer survivors who have faced the same decision.

Breast cancer surgery typically involves a procedure to remove the breast cancer and a procedure to remove some nearby lymph nodes. Operations used to treat breast cancer include:

Removing the breast cancer. A lumpectomy is surgery to remove the breast cancer and some of the healthy tissue around it. The rest of the breast tissue isn't removed. Other names for this surgery are breast-conserving surgery and wide local excision. Most people who have a lumpectomy also have radiation therapy.

Lumpectomy might be used to remove a small cancer. Sometimes you can have chemotherapy before surgery to shrink the cancer so that lumpectomy is possible.

Removing all of the breast tissue. A mastectomy is surgery to remove all breast tissue from a breast. The most common mastectomy procedure is total mastectomy, also called simple mastectomy. This procedure removes all of the breast, including the lobules, ducts, fatty tissue and some skin, including the nipple and areola.

Mastectomy might be used to remove a large cancer. It also might be needed when there are multiple areas of cancer within one breast. You might have a mastectomy if you can't have or don't want radiation therapy after surgery.

Some newer types of mastectomy procedures might not remove the skin or nipple. For instance, a skin-sparing mastectomy leaves some skin. A nipple-sparing mastectomy leaves the nipple and the skin around it, called the areola. These newer operations can improve the look of the breast after surgery, but they aren't options for everyone.

- Removing a few lymph nodes. A sentinel node biopsy is an operation to take out some lymph nodes for testing. When breast cancer spreads, it often goes to the nearby lymph nodes first. To see if the cancer has spread, a surgeon removes some of the lymph nodes near the cancer. If no cancer is found in those lymph nodes, the chance of finding cancer in any of the other lymph nodes is small. No other lymph nodes need to be removed.

- Removing several lymph nodes. Axillary lymph node dissection is an operation to remove many lymph nodes from the armpit. Your breast cancer surgery might include this operation if imaging tests show the cancer has spread to the lymph nodes. It also might be used if cancer is found in a sentinel node biopsy.

- Removing both breasts. Some people who have cancer in one breast may choose to have their other breast removed, even if it doesn't have cancer. This procedure is called a contralateral prophylactic mastectomy. It might be an option if you have a high risk of getting cancer in the other breast. The risk might be high if you have a strong family history of cancer or have DNA changes that increase the risk of cancer. Most people with breast cancer in one breast will never get cancer in the other breast.

Complications of breast cancer surgery depend on the procedures you choose. All operations have a risk of pain, bleeding and infection. Removing lymph nodes in the armpit carries a risk of arm swelling, called lymphedema.

You may choose to have breast reconstruction after mastectomy surgery. Breast reconstruction is surgery to restore shape to the breast. Options might include reconstruction with a breast implant or reconstruction using your own tissue. Consider asking your healthcare team for a referral to a plastic surgeon before your breast cancer surgery.

Radiation therapy

Radiation therapy

Radiation therapy treats cancer with powerful energy beams. The energy can come from X-rays, protons or other sources.

For breast cancer treatment, the radiation is often external beam radiation. During this type of radiation therapy, you lie on a table while a machine moves around you. The machine directs radiation to precise points on your body. Less often, the radiation can be placed inside the body. This type of radiation is called brachytherapy.

Radiation therapy is often used after surgery. It can kill any cancer cells that might be left after surgery. The radiation lowers the risk of the cancer coming back.

Side effects of radiation therapy include feeling very tired and having a sunburn-like rash where the radiation is aimed. Breast tissue also may look swollen or feel more firm. Rarely, more-serious problems can happen. These include damage to the heart or lungs. Very rarely, a new cancer can grow in the treated area.

Chemotherapy

Chemotherapy treats cancer with strong medicines. Many chemotherapy medicines exist. Treatment often involves a combination of chemotherapy medicines. Most are given through a vein. Some are available in pill form.

Chemotherapy for breast cancer is often used after surgery. It can kill any cancer cells that might remain and lower the risk of the cancer coming back.

Sometimes chemotherapy is given before surgery. The chemotherapy might shrink the breast cancer so that it's easier to remove. Chemotherapy before surgery also might control cancer that spreads to the lymph nodes. If the lymph nodes no longer show signs of cancer after chemotherapy, surgery to remove many lymph nodes might not be needed. How the cancer responds to chemotherapy before surgery helps the healthcare team make decisions about what treatments might be needed after surgery.

When the cancer spreads to other parts of the body, chemotherapy can help control it. Chemotherapy may relieve symptoms of an advanced cancer, such as pain.

Chemotherapy side effects depend on which medicines you receive. Common side effects include hair loss, nausea, vomiting, feeling very tired and having an increased risk of getting an infection. Rare side effects can include premature menopause and nerve damage. Very rarely, certain chemotherapy medicines can cause blood cell cancer.

Hormone therapy

Hormone therapy uses medicines to block certain hormones in the body. It's a treatment for breast cancers that are sensitive to the hormones estrogen and progesterone. Healthcare professionals call these cancers estrogen receptor positive and progesterone receptor positive. Cancers that are sensitive to hormones use the hormones as fuel for their growth. Blocking the hormones can cause the cancer cells to shrink or die.

Hormone therapy is often used after surgery and other treatments. It can lower the risk that the cancer will come back.
If the cancer spreads to other parts of the body, hormone therapy can help control it.

Treatments that can be used in hormone therapy include:

- Medicines that block hormones from attaching to cancer cells. These medicines are called selective estrogen receptor modulators.
- Medicines that stop the body from making estrogen after menopause. These medicines are called aromatase inhibitors.
- Surgery or medicines to stop the ovaries from making hormones.

Hormone therapy side effects depend on the treatment you receive. The side effects can include hot flashes, night sweats and vaginal dryness. More-serious side effects include a risk of bone thinning and blood clots.

Immunotherapy

Immunotherapy is a treatment with medicine that helps the body's immune system to kill cancer cells. The immune system fights off diseases by attacking germs and other cells that shouldn't be in the body. Cancer cells survive by hiding from the immune system. Immunotherapy helps the immune system cells find and kill the cancer cells.

Immunotherapy might be an option for treating triple-negative breast cancer. Triple-negative breast cancer means that the cancer cells don't have receptors for estrogen, progesterone or HER2.

DISSCUSSION

1. Interpretation of Key Findings

The results of this study highlight [summarize the main findings], which suggest significant advancements in the early detection and treatment of breast cancer. Our study demonstrates that [mention any novel diagnostic method, treatment, or findings] has potential to [discuss the specific impact—early detection, reduced mortality, improved patient outcomes, etc.].
The detection method [e.g., mammography, MRI, molecular biomarkers, AI-based methods] was found to be [mention sensitivity, specificity, accuracy], aligning with previous studies by [cite other

researchers], but with [mention any improvements or deviations].

2. Comparison with Previous Studies

Compared to existing research, our findings offer [highlight similarities or differences with earlier studies]. For instance, [compare a specific method or treatment from your study with those from other research]. While [mention any diagnostic or therapeutic technique] has been widely studied, our research uniquely shows [explain how your results differ or enhance the understanding of a particular aspect].

Several studies, including those by [author/year], have reported [specific findings] in breast cancer detection. Our research, however, expands on this by [mention new insights, larger dataset, longer follow-up period, or different technology applied].

3. Clinical Implications

Our findings have several important clinical implications. The ability to [mention early detection or improved treatment] can significantly reduce [mortality rates, recurrence, cost, etc.]. Additionally, the use of [specific technologies, such as AI or precision medicine] could streamline clinical workflows, allowing for faster diagnosis and tailored treatment approaches for individual patients.

The integration of [mention any new therapeutic method] into current treatment regimens could enhance patient survival, particularly for those with [mention high-risk categories, like HER2-positive or triple-negative breast cancer].

4. Limitations

Despite the promising results, several limitations need to be acknowledged. Firstly, [mention sample size or geographical limitations] may limit the generalizability of the findings. Additionally, while [mention diagnostic tool or treatment] showed high efficacy in this study, further research is required to evaluate its effectiveness in a broader and more diverse population. The study's retrospective nature also introduces inherent biases, which could affect [mention possible impact].

5. Future Research Directions

Future studies should focus on [mention areas that need further investigation—e.g., validation in diverse populations, long-term effects of treatment, combination therapies, etc.]. Moreover, the development of [novel diagnostic tools, personalized medicine approaches, etc.] holds promise for further reducing the global burden of breast cancer. Research into [specific biomarkers, genetic factors, or machine learning algorithms] could lead to more targeted and efficient treatment options, potentially improving survival rates and reducing side effects.

CONCLUSION

In conclusion, this study provides critical insights into the advancements in breast cancer detection and treatment. Our findings demonstrate that innovative methods, such as [mention key diagnostic or treatment approaches from the study], can significantly improve early detection rates and enhance treatment outcomes. By comparing these approaches with existing research, we have highlighted areas where our study offers novel contributions, particularly in terms of [mention any unique aspect, such as improved accuracy, sensitivity, or a new therapeutic technique]. While the results are promising, there are still limitations that need to be addressed, including the need for further validation in diverse populations and the long-term efficacy of certain treatments. Future research should continue to explore personalized and precision medicine approaches, aiming to further reduce mortality and improve the quality of life for breast cancer patients. Ultimately, this research underscores the importance of continuous innovation and rigorous evaluation in the fight against breast cancer, paving the way for more effective, targeted, and accessible healthcare solutions.

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