

Male breast cancer

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Male breast cancer is a relatively rare cancer in men that originates from the breast. As it presents a similar pathology as female breast cancer, assessment and treatment relies on experiences and guidelines that have been developed in female patients.^{[1][2][3]} The optimal treatment is currently not known.^[4]

Male breast cancer	
<i>Classification and external resources</i>	
ICD-10	C50 (http://apps.who.int/classifications/icd10/browse/2010/en#/C50)
ICD-9	175 (http://www.icd9data.com/getICD9Code.ashx?icd9=175),175.0 (http://www.icd9data.com/getICD9Code.ashx?icd9=175.0),175.9 (http://www.icd9data.com/getICD9Code.ashx?icd9=175.9),
OMIM	114480 (http://omim.org/entry/114480)
MedlinePlus	000913 (http://www.nlm.nih.gov/medlineplus/ency/article/000913.htm)
eMedicine	radio/115 (http://www.emedicine.com/radio/topic115.htm#)
MeSH	D001943 (http://www.nlm.nih.gov/cgi/mesh/2013/MB_cgi?field=uid&term=D001943)

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Incidence

About one percent of breast cancer develops in males.^[4] It is estimated that about 2,140 new cases are diagnosed annually in the US and about 300 in the UK, and the number of annual deaths is about 450 in the US.^{[2][3]} In a study from India, eight out of 1,200 (0.7%) male cancer diagnoses in a pathology review represented breast cancer.^[5] Incidences of male breast have been increasing which raise the probability of other family members developing the disease. The relative risk of breast cancer for a female with an affected brother is approximately 30% higher than for a female with an affected sister.^{[6][7][8]} The tumor can occur over a wide age range, but typically appears in men in their sixties and seventies. Known risk factors include radiation exposure, exposure to female hormones (estrogen), and genetic factors. High estrogen exposure may occur by medications, obesity, or liver disease, and genetic links include a high prevalence of female breast cancer in close relatives.^[3] Chronic alcoholism has been linked to male breast cancer.^[9] The highest risk for male breast cancer is carried by men with Klinefelter syndrome.^[7] Male BRCA mutation carriers are thought to be at higher risk for breast cancer as well, with roughly 10% of male breast cancer cases carrying BRCA2 mutations, and BRCA1 mutation being in the minority.^{[10] [11]}

Pathology

As in females, infiltrating ductal carcinoma is the most common type. While intraductal cancer, inflammatory carcinoma, and Paget's disease of the nipple have been described, lobular carcinoma in situ has not been seen in men.^[1] Breast cancer in men spreads via lymphatics and blood stream like female breast cancer. Accordingly, the TNM staging system for breast cancer is the same for men and women.^[1]

Size of the lesion and lymph node involvement determine prognosis; thus small lesions without lymph node involvement have the best prognosis. Estrogen receptor and progesterone receptor status and HER2/neu gene amplification need to be reported as they may affect treatment options. About 85% of all male breast cancers are estrogen receptor–positive, and 70% are progesterone receptor–positive.^[1]

Diagnosis

Typically self-examination leads to the detection of a lump in the breast which requires further investigation. Other less common symptoms include nipple discharge, nipple retraction, swelling of the breast, or a skin lesion such as an ulcer. Ultrasound and mammography may be used for its further definition. The lump can be examined either by a needle biopsy where a thin needle is placed into the lump to extract some tissue or by an excisional biopsy where under local anesthesia a small skin cut is made and the lump is removed. Not all palpable lesions in the male breast are cancerous, for instance a biopsy may reveal a benign fibroadenoma. In a larger study from Finland the average size of a male breast cancer lesion was 1.8 cm.^[9] Beside the histologic examination estrogen and progesterone receptor studies are performed. Further, the HER2 test is used to check for a growth factor protein. Its activity can be increased in active cancer cells and helps determine if monoclonal antibody therapy (i.e. Trastuzumab) may be useful.^[3]

Male breast cancer can recur locally after therapy, or can become metastatic.

Staging

In addition to TNM staging surgical staging for breast cancer is used; it is the same as in female breast cancer and facilitates treatment and analysis.^[12]

- Stage I refers to invasive breast cancer with the tumor not exceeding 2 cm and absence of lymph node involvement.
- Stage II: Includes stages IIA and IIB

Stage IIA: One of the following applies:

T0 or T1, N1 (but not N1mi), M0: The tumor is 2 cm or less across (or is not found) (T1 or T0) and either:

It has spread to 1 to 3 axillary lymph nodes (N1a), but not to distant sites (M0), OR Tiny amounts of cancer are found in internal mammary lymph nodes on sentinel lymph node biopsy (N1b), but not in distant sites (M0), OR. It has spread to 1 to 3 axillary lymph nodes, and tiny amounts of cancer are found in internal mammary lymph nodes on sentinel lymph node biopsy (N1c), but not to distant sites (M0). OR

T2, N0, M0: The tumor is larger than 2 cm across and less than 5 cm (T2), but it hasn't spread to the lymph nodes (N0) or to distant sites (M0). Stage IIB: One of the following applies: T2, N1, M0: The tumor is larger than 2 cm and less than 5 cm across (T2). It has spread to 1 to 3 axillary lymph nodes and/or tiny amounts of cancer are found in internal mammary lymph nodes on sentinel lymph node biopsy (N1). It has not spread to distant sites (M0). OR T3, N0, M0: The tumor is larger than 5 cm across but does not grow into the chest wall or skin (T3). It has not spread to lymph nodes (N0) or to distant sites (M0).

- Stage III is divided into three subcategories:
 - In IIIA there is breast cancer with axillary lymph nodes clumped together or attached to other structures.
 - In IIIB the tumor has spread to the chestwall or skin, and may have involved lymph nodes of the axilla and/or breastbone.
 - In IIIC the tumor has spread to the chest wall or skin and lymph nodes below or above the collar bone are affected.
- Stage IV is applied to metastatic breast cancer; typically lungs, liver, bone, or brain are involved.

Differences from female breast cancer

There are significant differences between male and female breast cancer. Lesions are easier to find in men due to the smaller breast size; however, lack of awareness may postpone seeking medical attention. The presence of gynecomastia may mask the condition. The diagnosis is made later in men—at age 67 on average—than in women with their average at 63.^[6] Lesions are less contained in men as they do not have to travel far to infiltrate skin, nipple, or muscle tissue.^[3] Thus, lesions in men tend to be more advanced.^[9] Indeed, almost half of male breast cancer patients are stage III or IV.^[7] In familial cases, male BRCA2 carriers are at risk, rather than BRCA1 carriers.^[7] With the relative infrequency of male breast cancer, randomized studies are lacking.^[7]

Treatment

Treatment largely follows patterns that have been set for the management of postmenopausal breast cancer.^[9] The initial treatment is surgical and consists of a modified radical mastectomy with axillary dissection or lumpectomy and radiation therapy with similar treatment results as in women.^[3] Also, mastectomy with sentinel lymph node biopsy is a treatment option.^[7] In men with node-negative tumors, adjuvant therapy is applied under the same considerations as in women with node-negative breast cancer. Similarly, with node-positive tumors, men increase survival using the same adjuvants as affected women, namely both chemotherapy plus tamoxifen and other hormonal therapy.^[3] There are no controlled studies in men comparing adjuvant options. In the vast majority of men with breast cancer hormone receptor studies are positive, and those situations are typically treated with hormonal therapy.

Locally recurrent disease is treated with surgical excision or radiation therapy combined with chemotherapy.^[1] Distant metastases are treated with hormonal therapy, chemotherapy, or a combination of both. Bones can be affected either by metastasis or weakened from hormonal therapy; bisphosphonates and calcitonin may be used to counterbalance this process and strengthen bones.

Chemotherapeutic and hormonal options in male breast cancer

Chemotherapeutic options include:

- Cyclophosphamide plus methotrexate plus fluorouracil (CMF).
- Cyclophosphamide plus doxorubicin plus fluorouracil (CAF).
- Trastuzumab (monoclonal antibody therapy).

Hormonal options include:

- Orchiectomy.^[*citation needed*]
- Gonadotropin hormone releasing hormone agonist (GNRH agonist) with or without total androgen blockage (anti-androgen).^[*citation needed*]
- Tamoxifen for estrogen receptor–positive patients.
- Progesterone.^[*citation needed*]
- Aromatase inhibitors.

Prognosis

Adjusted for age and stage the prognosis for breast cancer in men is similar to that in women.^[7] Prognostically favorable are smaller tumor size and absence or paucity of local lymph node involvement.^[13] Hormonal treatment may be associated with hot flashes and impotence.

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