

Breast Tumors

It is one of the most common tumors ever. They form two basic groups:

1. **Benign**tumor;
2. **Malignant**tumor.

Benign breast tumors

Find more information on Benign breast disease.

Malignant tumors of the breast

They represent the most common malignant tumors in women in the Czech Republic, their incidence is still rising.

Epidemiology

- Although the incidence is increasing, the mortality is not, because they are diagnosed at earlier stages;
- Maximum incidence is around 57 years;
- In men it occurs in a ratio of 1:140.

Etiology

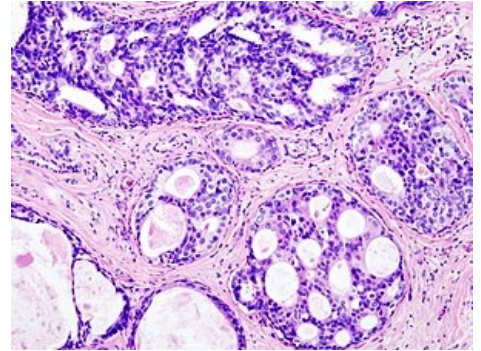
- The most serious risk is age (from the age of 30 the incidence rises, over 45 years represent 85% of tumors);
- sporadic carcinomas – dysplastic changes of epithelial cells occur (carcinoma in situ) up to the development of cancer;
- The activity of stromal cells is also applied, which produce proteolytic enzymes and angiogenic factors - they facilitate growth and metastasis ;
- Hormonal influences – long-term effect of estrogens ;
- Genetically determined cancers – occurrence in direct relatives (mother, sister, daughter) or cumulation of tumors within syndromes (Li-Fraumeni syndrome – mutation of one p53 allele , Cowden syndrome – rare, associated with hamartomas);
- BRCA 1 and 2 genes are of greatest importance for the detection of genetic conditions ;
 - a woman with a BRCA 1 mutation has a lifetime risk of cancer of 55-85% (for ovarian cancer 15-45%);
 - common in Jewish population;
 - male BRCA carriers are in turn at risk of prostate and colorectal cancer ;
 - hereditary carcinoma is often bilateral;
 - BRCA 2 positive cancer is usually very poorly differentiated, aggressive.

Risk factors:

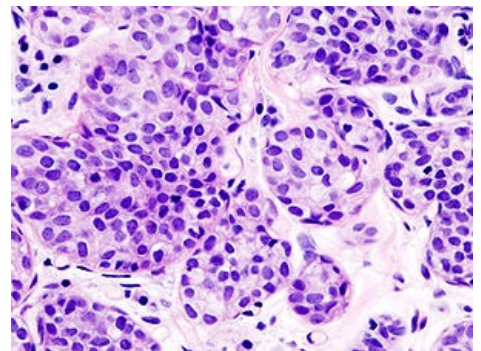
1. Length of exposure to estrogens – early menarche , late menopause , nulliparity;
2. Other breast diseases – cystic adenomas , ductal papillomas (risk of overlooking cancer);
3. Effects of ionizing radiation – including mammography ;
4. Obesity , increased fat intake and lack of exercise;
5. The influence of smoking, chemical substances, hormonal contraception has not been clearly documented.

Clinical manifestations

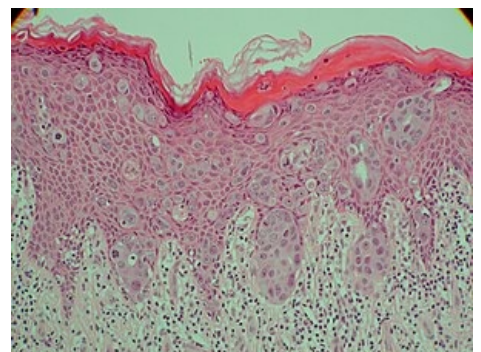
- Most often it is a **palpable painless lump** in the breast (in 75% it is the first manifestation of the disease);
- However, it would be optimal to find a non-palpable lesion on mammography;
- Other symptoms (less often) – **breast pain** (5%), **breast enlargement** (1%), **indentation of the skin or nipple** (5%), **discharge** (2%), **surface changes on the nipple** (1%);
- Enlargement of axillary nodes - regional spread;
- At an advanced stage – bone pain, weight loss,...
- Paraneoplasia – dermatomyositis , neuromuscular syndrome, acanthosis nigrans , hypercalcemia in bone metastases.



Ductal carcinoma of the breast



Lobular carcinoma of the breast



Paget disease



Paget disease

Diagnostics

Clinical examination:

- Careful personal, family and gynecological anamnesis ;
- Look - symmetry of the breasts, movements with breathing, regularity of the nipple, color of the skin, expansion of the veins can indicate the activity of the tumor;
- Palpation – systematically all quadrants, magnitude of resistance, mobility, boundaries, consistency;
- Frequency of cancer findings in individual quadrants – most often HZK (47%), nipple (22%) and HVK (14%), lower quadrants only a few;
- Palpation of nodes axillary, above the clavicle.

Display methods:

Find more detail on Diagnostic display methods in senology.

- Mammography has a dominant position – the yield is up to 90%;
 - Finding – microcalcifications are often visible, a solid deposit with jagged edges;
 - USG – usually complementary to mammography, has high sensitivity (95%) but limited specificity, is preferred in women under 40;
 - CT , MRI , less – ductography , PET .



Macroscopically visible lump on the breast, deformity and indentation of the nipple

Biochemical examination:

- standard - liver tests , urea , creatinine , electrolytes, ...
- tumor markers – CEA, CA 15-3, TPA;
- **Determination of hormonal receptors** is of particular importance - immunohistochemically in a tissue section; the effect of estrogen and progesterone on tumor growth is assumed
- Molecular biology – mainly determination of HER-2/neu – causes increased proliferative activity (prognostic and predictive significance);
- Biopsy - fine needle aspiration (FNA) - more important for distinguishing between cystic and solid formation;
- Histology is only possible with a self-cutting needle (core biopsy) under anesthesia (local or general).

Screening:

- early diagnosis is the basis of successful treatment;
- mammographic screening **for women aged 45 and over (once every two years)**^[1].

Histopathology

- Cancer most often arises from the terminal lobules of the gland or from the ducts (TDLU - terminal ductal lobular unit);
- It is usually preceded by a non-invasive form – *carcinoma in situ* .

Carcinoma in situ

- **Lobular carcinoma in situ** - from the cells of the mammary lobules, proliferation of cells in the lobules that dilate;
 - Not detectable mammographically (unlike the previous one);
 - It often arises multicentrically, even in the contralateral breast;
 - More common in premenopausal women.
- **Ductal carcinoma in situ** – proliferation of ductal epithelium without crossing the basement membrane, can create microcalcifications (detected mammographically), can turn into invasive ductal carcinoma;
 - A special form is **Paget's carcinoma of the nipple** - when tumor cells from the ducts invade the nipple, more often in postmenopausal women.

Invasive forms of carcinomas

- There are different forms, infiltrating is divided into 2 forms - lobular and ductal.

Lobular

- About 10%, often in the HZK (upper outer quadrant);
- It often metastasizes to the serous membranes, meninges, to the ovary, retroperitoneally.

Ductal

- The most common (75%), it often has a tubular arrangement, it is accompanied by reactive fibrosis – the tumor has a so-called scirrhous form, when it is hard as a rock;
- Metastasizes to bones, liver and lungs;

Inflammatory (erysipeloid) carcinoma

- Rarely (1–3%), the most aggressive form;
- Infiltration of the entire breast, diffuse erythema, induration of the skin (typical orange peel appearance);
- 50-70% of tumors have nodal metastases at the time of diagnosis.

Therapy

The definitive treatment procedure is the result of a joint decision of the multidisciplinary team.

Surgical treatment

- Since 1882, radical mastectomy with exenteration of the axilla has been performed (pectoral muscles, nerves, etc. were removed);
- Today, a modified radical mastectomy is performed more often - the breast is separated from the pectoral muscle fascia, the nodes are removed from the superficial layers, the nodes below the pectoralis minor muscle are usually not removed;
- Another option – sentinel node ;
- conservative procedures – ***quadrantectomy, tumorectomy*** ;
 - It is necessary to supplement with radiotherapy , reconstructive surgery is performed;
- Also as a modality of hormonal treatment – ovariectomy ;
- In BRCA, surgery can also be used as prophylaxis.

Radiotherapy

- Carcinoma has limited radiosensitivity;
- It is indicated after conservative operations, the result is then the same as ablation;
- It is therefore given adjuvantly;
- ***Brachyradiotherapy*** – application of iridium wires;
- Palliative treatment – for bone metastases.

Chemotherapy

- Breast cancer is relatively sensitive to a number of cytostatics , mainly a combination is used;
- The basic combination is **CFM** – cyclophosphamide, methotrexate, 5-FU, or a combination with anthracyclines;
- ***Monotherapy*** – in elderly women with limited marrow reserve;
- Adjuvantly - before menopause, always when the nodes are affected, it is not given for carcinoma in situ or for tumors smaller than 1 cm;
- Neoadjuvant – for extensive tumors;
- Palliation – the main treatment method for disseminated disease, can greatly extend survival time.

Hormonal treatment

- Adjuvantly, neoadj. also palliatively;
- In premenopausal – castration – surgical or pharmacological.
- SERM - Tamoxifen
- Aromatase inhibitors - reduction of the synthesis of female sex hormones

Biological treatment

- Inhibition of membrane receptors – **Ig against HER-2/neu receptors- Herceptin.**

Links

related articles

- Breast
- Hereditary tumor syndromes
- Benign breast disease
- Classification of breast tumors according to Tabár
- classification of breast tumors
- Diagnostic imaging methods in senology
- Infiltrating mammary carcinoma (preparation)

External links

BENEŠ, Jiří. *Study materials* [online]. [cit. 2018-01-06]. <<http://jirben2.chytrak.cz/>>.

Reference

