

# Breast tumours

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

1. **benign** tumors;
2. **malignant** tumors.

## Benign breast tumors

 For more information see *Benign breast disease*.

## Malignant breast tumors

They are the most common malignant tumors of women in the Czech Republic, their incidence is still increasing.

### Epidemiology

- Incidence is rising, but mortality is not rising because they are diagnosed at earlier stages;
- peak incidence is around age 57;
- In men, it occurs at a ratio of 1:140.

### Etiology

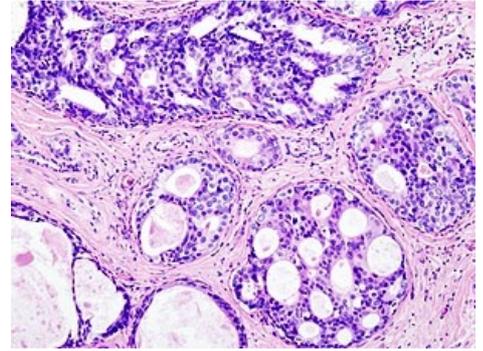
- Age is the most serious risk (incidence rises from 30 years of age, with 85% of tumors above 45 years of age);
- Sporadic carcinomas - dysplastic changes of epithelial cells (*carcinoma in situ*) occur until cancer develops;
- but also involves the activity of stromal cells, which produce proteolytic enzymes and angiogenic factors-facilitating growth and metastasis;
- hormonal effects - **long-term effects of estrogens**;
- genetic carcinomas - occurrence in direct relatives (mother, sister, daughter) or accumulation of tumors within syndromes (Li-Fraumeni syndrome - mutation of one p53 allele, Cowden syndrome - rare, associated with hamartomas);
- the gene **BRCA 1 and 2** is of greatest importance for the detection of genetic susceptibility;
  - a woman with a BRCA 1 mutation has a lifetime risk of 55-85% for cancer (15-45% for ovarian cancer);
  - common in the Jewish population;
  - male BRCA carriers are in turn at risk for prostate cancer and colorectal cancer;
  - hereditary cancer is often bilateral;
  - BRCA 2 positive carcinoma is usually very poorly differentiated, aggressive.

### Risk factors: =

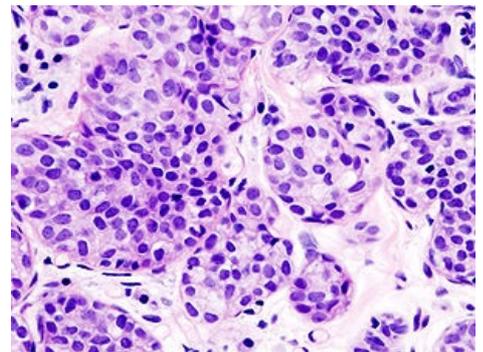
1. length of exposure to estrogens - early menarche, late menopause, nulliparity;
2. other breast disease - cystic adenomas, ductal papillomas (risk of missed carcinoma);
3. effects of ionizing radiation - also mammography;
4. obesity, increased fat intake and lack of exercise;
5. the effect of smoking, chemicals, hormonal contraceptives has not been clearly documented.

### Clinical manifestations

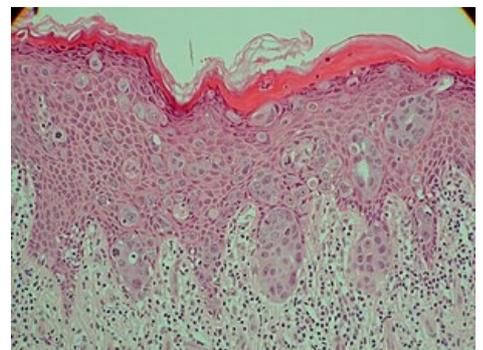
- Most commonly, it is a **palpable, painless lump** in the breast (in 75% it is the first manifestation of the disease);
- Optimally, however, a non-palpable lesion should be found on mammography;
- other symptoms (less common) - **breast pain** (5%), **breast enlargement** (1%), **skin or nipple retraction** (5%), **discharge** (2%), **superficial changes on the nipple** (1%);
- enlargement of axillary nodes - regional spread;
- at advanced stage - bone pain, weight loss,...



Ductal carcinoma of breast



Lobular carcinoma of breast



Paget's carcinoma of breast



Paget's carcinoma of breast

- paraneoplasia - dermatomyositis, neuromuscular syndrome, acanthosis nigrans, hypercalcemia in bone metastases.

## Diagnosics

### Clinical examination:

- Careful personal, family and gynecological medical history;
- appearance - symmetry of the breasts, symmetry with breathing, nipple regularity, skin color, vein enlargement may indicate tumor activity;
- palpation - systematically all quadrants, size of resistance, mobility, border, consistency;
- frequency of findings of carcinomas in each quadrant - most often HZK (47%), nipple (22%) and HVK (14%), lower quadrants few;
- palpation of nodes axillary, above the germ.



Macroscopically visible breast lump, deformity and nipple retraction

### Imaging methods:

 For more information see *Diagnostic imaging methods in senology*.

- mammography is dominant - the yield is up to 90%;
  - finding - microcalcifications are usually visible, solid lesion with serrated edges;
  - ultrasound - usually complementary to mammography, has high sensitivity (95%) but limited specificity, preferred in women under 40 years of age;
  - CT, MRI, less so ductography, PET.

### Biochemical testing:

- standard - liver tests, urea, creatinine, electrolytes,
- tumor markers - CEA, CA 15-3, TPA;
- of particular importance is the determination of **hormone receptors** - by immunohistochemistry in tissue sections; the influence of estrogen and progesterone on tumor growth is assumed
- molecular biology - especially determination of HER-2/neu - causes increased proliferative activity (prognostic and predictive significance);
- biopsy - fine needle aspiration (FNA) - more important to differentiate between cystic and solid masses;
- histology is only possible with a self-cutting needle (core biopsy) under anaesthesia (local or general).

### Screening:

- early diagnosis is the basis for successful treatment;
- mammography screening **for women 45 and older (once every two years)**<sup>[1]</sup>.

## Histopathology

- Carcinoma most commonly arises from the terminal ductal lobular unit (TDLU);
- It is usually preceded by a non-invasive form - *carcinoma in situ*.

### Carcinoma in situ

- **Lobular carcinoma in situ** - from mammary lobule cells, proliferation of cells in lobules that dilate;
  - not detectable mammographically (unlike the previous one);
  - 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, may form microcalcifications (detectable mammographically), may progress to 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 carcinoma

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

#### Lobular

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

#### Ductal

- the most common (75%), often tubular, accompanied by reactive fibrosis - the tumor has a form where it is hard as a stone;

- metastasizes to bone, liver and lungs;

### Inflammatory (erysipeloid) carcinoma

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

## Treatment

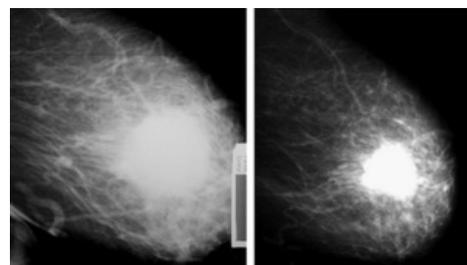
The final treatment is the result of a joint decision by a multidisciplinary team.

### Surgical treatment

- Since 1882, radical mastectomy with exenteration of the axilla (pectoral muscles, nerves, ...) has been performed;
- Nowadays, modified radical mastectomy is more commonly performed - the breast is separated from the pectoralis fascia, the nodes are removed from the superficial stages, the nodes below the m. pectoralis minor are usually not removed;
- another variant - sentinel node;
- salvage procedures - **quadrantectomy, tumorectomy**;
  - necessary to complement radiotherapy, reconstructive surgery is performed;
- also as a modality of hormonal treatment - **ovarectomy**;
- for BRCA, surgery can also be used as prophylaxis.

### Radiotherapy

- Carcinoma has limited radiosensitivity;
- it is indicated after salvage surgery, the result is then identical to ablation;
- it is therefore given adjuvantly;
- **brachyradiotherapy** - application of iridium wires;
- palliative treatment - for bone metastases.



Neoadjuvant chemotherapy for breast Ca (mammography before and after)

### Chemotherapy

- Breast cancer is relatively sensitive to a range of cytostatics, and combinations are mainly used;
- the basic combination is **CFM** - cyclophosphamide, methotrexate, 5-FU, or combination with anthracyclines;
- **monotherapy** - in older women with limited marrow reserve;
- adjuvantly - before menopause always when lymph nodes are involved, not given for carcinoma in situ or for tumors under 1 cm;
- neoadjuvant - for large tumors;
- palliation - the main treatment method for disseminated disease, can significantly prolong survival.

### Hormone Therapy

- Adjuvant, neoadjuvant and palliative treatment;
- in premenopausal - castration - surgical or pharmacological.
- SERM - Tamoxifen
- Aromatase inhibitors - reduction of female sex hormone synthesis

### Biological treatments

- Membrane receptor inhibition - **Ig against HER-2/neu receptors - Herceptin.**

## Links

### Related articles

- Breast
- Hereditary cancer syndromes
- Benign breast disease
- Tabar classification of breast cancer
- Breast Cancer Classification BI-RADS
- Diagnostic Imaging in Senology
- Infiltrating Mammary Carcinoma (slide)

### External links

### Reference

1. Česká republika. Vyhláška 3/2010 Sb. o stanovení obsahu a časového rozmezí preventivních prohlídek. 2010. pp. 10 §4 písm. i. Available from <<http://www.mamo.cz/res/file/legislativa/vyhlaska-3-2010.pdf>>.

## Source

- ws:Nádory prsu
- image source: <https://www.wikiskripta.eu/w/Soubor:Neoadjuvantn%C3%ADCHT.png>