Diagnosis of inflammatory breast cancer

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Abstract. Diagnosis of edematous changes in the breast without clearly identifiable tumor is a challenging task. Differential diagnosis should include cancer and mastitis of various etiologies. The results of breast ultrasound, mammography, computed tomography and magnetic resonance imaging can be uninformative. Thorough examination of regional lymph nodes must be performed: presence of metastases in them, combined with clinical changes in the breast, confirms diffuse breast cancer. Any suspicious areas are subject to a biopsy. Echographic determined asymmetrical thickening of the skin over 3mm pathological evidence of edema.

Keywords: inflammatory breast cancer; ultrasound diagnostic, x-ray mammography, CT, MRI, multipoint vacuum− assisted biopsy.

Introduction. The breast cancer takes the first place among malignant tumors at women in Russia and European countries [5].

There are nodal and edematous forms of breast cancer. The development and clinical manifestations of inflammatory breast cancer are different from nodular breast cancer. Inflammatory breast cancer is characterized as a diffuse growing tumor mass, and it is difficult to prescribe anticancer therapy. At inflammatory breast cancer is an edematous affection with skin changes like “peau d'orange” and palpable lesion in the breast without clear boundaries. On a cut the inflammatory breast cancer looks like white-yellow thick strands or infiltrate which occupies the most part of breast or all it entirely [2].

Features of clinical manifestation of “diffuse” breast cancer with mastitis symptoms can lead to diagnostic errors and delay to initiation of treatment. This is extremely dangerous for patients with this form of breast cancer. For the diagnosis of inflammatory breast cancer we usually use medical imaging techniques: US, digital x-ray mammography, CT, MRI, biopsy under X-ray or ultrasound

guidance.

Each method of diagnostics has the restrictions of visualization the tumors connected with properties of a breast tissue and character of a tumor. It is considered that mammography is more informative method it patients older than 40 years, because of the fatty tissue and involutive process in breasts. Young women have high-density tissue hyperplasia of the glandular component and fabric, so the lesion could be occult in the breast tissue and using of X-ray mammography in these cases is reduced. In this situation, ultrasound is more informative [6].

CT in comparison with US and mammography in patients with inflammatory breast cancer allows detecting tumors in space under a breast and evaluating a degree of distribution of a tumor on a chest wall and skin changes in a breast, increasing in size of affected breast compared with the other. Using mammography is more precisely in cases when we need to appreciate the structure of breast tissue surrounding a tumor and vascularity of a breast. CT concedes mammography in detection preclinical breast cancer forms, therefore CT do not use in cases of nonpalpable breast cancer [10,11,12]. The MRI has high indicators of sensitivity (100 %) and specificity (90 %). MRI carry out on a system with intensity of a magnetic field of 1,0 Tl. The typical MRI examination produces after intravenous introduction of a contrast preparation. The patient put on a stomach; breast put in mammographic «coil» and creates a necessary compression of gland.

The diagnosis of breast cancer setting up after detection a lesion which drawing intensively and diffuse amplifies within two minutes after introduction of a contrast agent [9]. Specific signs of the inflammatory form of a breast cancer are not present [6].

Unlike other imaging techniques such as US, biopsy performance under MRI-guidance is technically more difficult and is applied in small numbers of clinics. This method is much more expensive and difficult.

At research “diffuse” breast cancer difficulties directed by the diagnosis because of bad visualization of volume formations. It extends the period of inspection and detains the beginning of necessary treatment. The increasing in number of out-patient visitings promotes additional financial expenses of medical institution.

Materials and methods.

The study involved 22 patients who applied to Herzen Moscow Institute of Cancer Research with complaints of discomfort and "feeling pressure" in the chest, as well as external changes of the breast. The age of all patients was 35-72 years (middle age was 51,4 years). Menstrual function was kept at 12 (54,5 %) patients, 10 (45,4 %) patients were in menopause.

At survey all patients had a typical clinical picture of edematous breast cancer: the breast

became larger, indurate and edematous. There were more expressed pigmentation and the strengthened venous drawing of a skin. All patients had a change in the skin, like an orange peel (peau d'orange), and in a half of cases (12 patients) it was combined with warmth and edema. Palpably we estimated lesion consistence and lesion was non-uniform, nodal formations was not defined. Some patients had a pain in the breast. In the beginning of inspection all patients were spent US and mammography. Results were negative in most cases, because volume formations in breast are not revealed. Metastases of a breast cancer are found out in half of patients (12 persons) in axillary lymph nodes. The diagnosis of a breast cancer was verified by using a fine needle aspiration biopsy under US-guidance. Accessory of a breast tumor was confirmed by immunophenotyping of metastasis cells and by additional surveys (repeated US, CT, biopsies of suspicious areas of the breast, looking at histological material under the microscope).

The patients without regional metastasis also made CT and MRI as an obligate part of medical inspection. At revealing of suspicious sites in these patients we spent repeated US, fine needle aspiration biopsy and large core biopsy or vacuum− assisted biopsy under US- guidance. Despite of precision and repeated biopsies we did not achieve the results in 5 patients. We applied to multipoint vacuum− assisted biopsy for removing samples of the breast tissue. Only 3 patients with red and edematous skin were being exposed to surgical biopsy of a skin for histologic research. Cancer cells are revealed only in 1 patient in this subgroup of patients. All patients established clinical diagnoses. A breast cancer was diagnosed in 20 patients (under the histologic form - ductal, lobular, ductal and lobular combination) and in 2 patients - a chronic mastitis. All diagnoses are confirmed by operation with histologic research and supervision not less than 1 year.

US- picture of “diffuse” breast cancer

In the B-mode the US- picture of inflammatory breast cancer is similar to the US- picture of a mastitis or fibrosis (picture 1).

Picture 1. US examination by using a linear transducer. The skin is thickened to 10 mm (1). Visible tissue section has a hypoechogenic heterogeneous structure similar to a tumor with irregular indistinct outlines. Histological research after biopsy identified fibrosis tissue.

All 22 patients had edematous skin. The skin thickness was varied from 3 to 10 mm. On the border of the skin and subcutaneous tissue revealed extensive lymphatic ducts and vessels as hypoechoic tubular structures from 1.2 mm to 2.6 mm. Breast tissue of increased echogenicity and heterogeneity, with significant attenuation of the echo signal. Adipose tissue in the affected breast is

hyperechoic compared to fatty tissue contralateral (healthy) breast. The described US semiotics was not very informative for differential diagnosis between “diffuse” form of breast cancer and a benign lesion. The detection of metastases in lymph nodes in the armpit we considered as an objective US criterion for breast cancer.

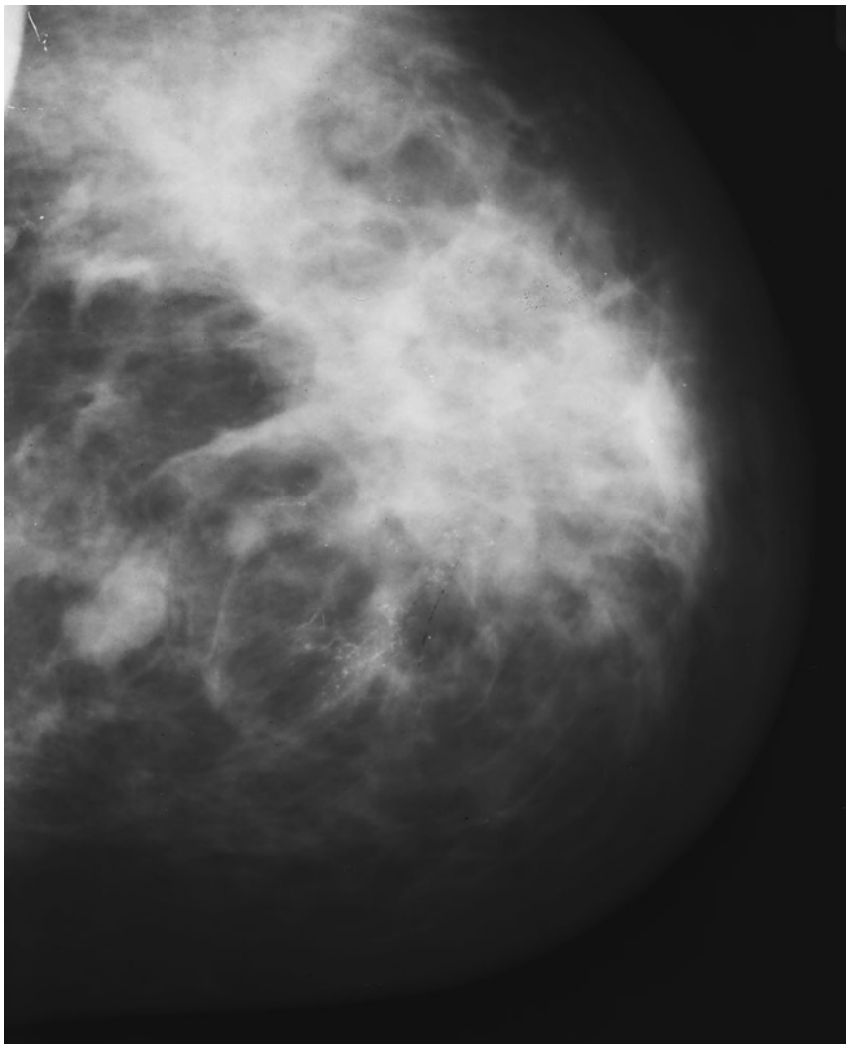
To evaluate the difficulties of differential diagnostic between “diffuse” forms of breast cancer and fibrosis we present the following observation.

Case report.

Patient M., 34 years old.

Diagnosis: cancer of the left breast stage IIIC, T4b N3 M0, inflammatory form (during the pregnancy). From the history: in October 2010, being at the 7th month of pregnancy of the third child she find her left breast increasing in size with a local lesion. The patient was being diagnosed a mastitis. In the immediate postpartum period the symptoms increased. Breasts were несимметричны. The left breast was red and swollen with hyperpigmentation on a skin. The patient was treated with herbal remedies and she has been prescribed to take Bromocriptine to suppress lactation as a recommendation of doctors who suspected mastitis. The treatment was not effective. The patient was suspected of breast cancer and she was sent to the Oncological Clinic. In a survey in Hertsen Moscow Oncological Research Institute we diagnosed breast cancer in the left breast - stage IIIb T4bN3M0, infiltrative-edematous form. On examination the left breast was edematous, increased in size (large than the other breast) with red skin, thickened areola and nipple retraction. Palpably at the boundary of the outer quadrants of the breast we defined a lesion without clear boundaries with approximate size of 3x3 cm. Also we found swollen lymph nodes in the armpit (1.5 cm in size).

The mammography picture: there was a lesion without clear borders about 8.0 cm in size in the outer parts. The differential diagnosis was between breast cancer and mastitis with fibrosis (picture 2).



Picture 2. Mammography picture of the left breast

(Pic. 3). The US- picture: edema of the skin and subcutaneous fatty tissue. The structure of the mammary glands was diffuse hyperechoic without clear boundaries. The skin was thickened to 10 mm. The nodulus or tumor were not visualized. Conclusion: infiltrative-edematous form of breast cancer.

CT scan showed a picture of a nodular tumor of the left breast, metastasis in lymph node in the left subclavian and axillary regions.

Histological examination of biopsy specimen revealed an infiltrative ductal carcinoma, lobular with the structures of cancer in situ. Receptor status: reaction with estrogen receptors was positive- 8 points, the progesterone receptors was negative - 0 points, reaction with Her2/neu receptors – 2 + (FISH amplification was not detected).

The patient carried out a comprehensive scheme of treatment: chemotherapy - surgery - radiotherapy - chemotherapy - hormone therapy. At follow-up examination one year after the operation revealed the generalization process (metastasis spread to the lungs and liver).

Conclusion.

Diagnosis of “diffuse” changes in the breast without clearly identifiable mass is a challenging task. Differential diagnosis should include breast cancer, fibrosis, fibroadenomatoid mastopathy and mastitis of various etiologies. The results of breast US, mammography, CT and MRI can be inconclusive. Thorough examination of regional lymph nodes must be performed: presence of metastases in them, combined with clinical changes in the breast, confirms “diffuse” form of breast cancer. Any suspicious areas are subject to a biopsy. In a clinical presentation suggestive on a “diffuse” form of a breast cancer, an accurate diagnosis should be sought in view of severe consequences of errors and delays in diagnosis. The most informative and effective method of detection skin thickness is US. US may show thickened skin in comparison with the skin of the other breast. Skin that thickened more than 3 mm is considered as a symptom of edema.

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