# MODERN RESEARCH METHODS FOR SUSPECTED BREAST CANCER

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**Abstract**

The high incidence of diseases of the mammary glands is considered one of the most the main factors that have a significant impact on the health status of women. Number of new cases of breast cancer detected annuall in various countries of the world, today the period has exceeded 1 million and is 10% of all malignant tumors of various localizations.

Despite the successes in treatment and the increase in the diagnostic capabilities of this pathology, the mortality rate from breast cancer remains significant. This is primarily due to the late diagnosis of this pathology in conjunction with the untimely recruitment of patients, andIn addition, there is a lack of highly sensitive methods for determining the early stages of breast cancer, and insufficient clear diagnosis of metastases to regional lymph nodes

**Keywords**: Breast cancer, estrogen and progesterone receptors, mammography, breast ultrasound.

## Introduction

If there are clinical suspicions, it is necessary to confirm the diagnosis using instrumental examination methods with general and biochemical blood tests (see section 2.1. "Diagnostics"). Morphological (histological or cytological) examination of the primary tumor with determination of ER, RP, HER2 and Ki67 should be performed in all cases of newly diagnosed metastatic breast cancer, as well as in all possible cases in metastatic and recurrent lesions during progression after primary treatment of early and locally advanced breast cancer. In addition, to select the optimal method of drug therapy. It is currently believed that up to 5% of breast cancer cases are hereditary. Over the past decade, molecular genetics technologies have made it possible to identify some genes that are responsible for the occurrence, course and prognosis of hereditary forms of breast cancer. Genes with high penetrance include BRCA 1 and 2 (Breast Cancer Associated). Mutations in these genes increase the individual risk of developing breast cancer over a patient's lifetime by more than 100 times..The presence of mutations in low-penetrance genes, such as PTEN, P53, ATM, increases the individual risk of developing breast cancer by less than 2 times. There are also genes of medium penetrance, for example CHEK2 and NBS1, mutations in which increase the individual risk of developing breast cancer from 2 to 10 times [6]. Among oncological diseases, breast cancer

(BC) ranks first in women and is one of the most common causes of death in women from cancer.According to the World Health Organization (WHO), over 2.2 million cases were reported in 2020. It is believed that every twelfth woman will develop breast cancer during her lifetime. Breast cancer occurs in the epithelial cells of the ducts (85%) or lobules (15%) of the glandular tissue of the mammary gland. At first, tumor growth is limited to a duct or lobule (preinvasive cancer, "carcinoma in situ" - in situ, stage), where it does not cause any symptoms and very rarely metastasizes. Over time, cancer in situ grows and becomes invasive breast cancer, and then can spread to nearby lymph nodes (regional metastasis), and then to other organs (distant metastasis. There are many advantages to modern ultrasound performed on expert equipment. Firstly, there is no radiation exposure - ultrasound can be performed on young women, during lactation, and even on pregnant women.Ultrasound can be performed quite often - at least every month. Secondly, ultrasound can detect even minimal nodular formations (from 3–4 mm) in patients with high mammographic density. That is why it is recommended to perform an ultrasound in women with body types C and D according to MG. The combination of two methods for diagnosing the mammary glands - MG and ultrasound - is today the most effective diagnostic algorithm.

**Materials and Methods:**
The research material was literature data presented in scientific articles, textbooks, and magazines.

**Results:**
Early detection of mutations in the described genes has important diagnostic significance. For example, germline mutations of one of the alleles of the BRCA1 genes cause the manifestation of breast cancer by the age of 50 - in 75% of cases, by the age of 70 - in 90%. It is important to highlight that approximately 1% of all cases of breast cancer, according to the opinion of A. V. Bykov, are required in men. In carriers of Gennady BRCA 2, the possibility of clinical manifestation is about 6% (almost 200 times higher than in the general population). In women with this gene, the risk of developing cancer pathology in the mammary glands is 50–85%, and in the ovaries – 10–15%. The most commonly used diagnostic method is mammography. It allows you to detect suspicious areas of the snow chain in premature stages of formation for the purpose of their further, most detailed study (biopsy).

But this method makes it possible to detect lesions no less than 5–10 millimeters in size, which, due to their rather large volumes, are not always characterized by a positive prognosis . An acute problem arises regarding the selection of an effective set of research events in the presence of doubtful local formations in mammograms. Until recently, there were two key approaches: performing an excisional biopsy (sectoral removal) and dynamic monitoring, but the second version is quite capable of ending in a late diagnosis of cancer. Presently, about fifty percent of all biopsies are for benign lesions. The effectiveness of MG studies in patients with UMP is unacceptably low and is about 50%. And the fatty type of the structure of the mammary glands looks dark, and any changes are clearly visible against its background - the effectiveness of mammography is high and reaches 99–100%. Dense breast tissue is quite common: about 43% of women of screening age (after 40 years) have patchy or extremely dense breasts.

**Conclusion:** Early detection of breast cancer is difficultand an important problem of modern medicine. It seemed b, what can be difficult in the diagnosis of dairyglands, but the individual structure of the glands for anywomen and a huge variety of pathologicalchanges make the work of

a diagnostician extremely difficult.In specific cases, benign and malignant formations are similar to each other, and in order toIn order not to miss cancer, the doctor is obliged to have severaldiagnostic methods - to be a multimodal specialis

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