



COMPARATIVE DESCRIPTION OF RADIOLOGICAL IMAGES IN BREAST CANCER BY IMMUNOHISTOCHEMICAL PHENOTYPES

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ABSTRACT

Breast cancer is indeed one of the most common types of cancer among women worldwide. This disease has a significant impact on women's health and is a major concern in the field of public health. Breast cancer ranks first among women in terms of incidence compared to other diseases. According to GLOBOCAN (2022), "...more than 2.2 million new cases of breast cancer are diagnosed worldwide each year...". This accounts for 11.7% of all cancer cases, causing more than 680,000 female deaths per year.

Relevance. Breast cancer is indeed one of the most common types of cancer among women worldwide. This disease has a significant impact on women's health and is a major concern in the field of public health. Breast cancer ranks first among women in terms of incidence compared to other diseases. According to GLOBOCAN (2022), "...more than 2.2 million new cases of breast cancer are diagnosed worldwide each year...". This accounts for 11.7% of all cancer cases, causing more than 680,000 female deaths per year. Efforts in the diagnosis, prevention, and treatment of breast cancer play a critical role in reducing deaths from this disease. Breast cancer is the most common type of cancer among women worldwide. From an economic point of view, it is much more beneficial to treat patients with early detection of SBS: the treatment of patients in Stage III of SBS is 15-30 times more expensive than the treatment of those in stage I, while only 5% of the funds are spent on diagnosis, and 95% - on the treatment of patients. SBS has been shown to reduce mortality rates by 17% in women aged 40-49 and by 30% in women over 50. When the tumor is less than 1 cm in diameter and the lymph nodes are not affected, treatment can be limited to organ-preserving surgery without expensive chemotherapy components.

Materials and methods. A set of methods was used to conduct the study, depending on the tasks set: radiation diagnostic methods, morphological and statistical methods. Analyzing mammograms for breast cancer detection is an important step, taking into account the shape and contours of the tumor shadow, as well as radiological signs such as microcalcifications, asymmetric density, skin thickening, and other changes. These signs help the doctor determine the nature of the changes in the mammary gland and suspect the presence of a malignant tumor process (Table 1).

Table 1.

Frequency of occurrence of radiographic mammographic signs in patients

X-ray signs	Mammary gland cancer (n=55)		Safe derivatives (n=65)	
	a bs.	(M±m) %	a bs.	(M±m) %
Shadow shape	7	12,7±3,1	4 6	70,7±9,4
Round or oval	1 5	27,3±3,8	1 1	16,9±8,5
Fragmented	2 5	45,5±4,3 ***	5	7,7±5,8
Irregular	8	14,5±2,1	3	4,6±5,8
Asymmetric density				
Shadow contours	4	7,3±2,1	4 1	63,1±8,5 ***
Clear	1 0	18,2±3,2	9	13,8±5,8
Uncertain and/or uneven	2 8	50,9±4,5	5	7,7±8,5
Spiculate	13	23,6±4,1 ***	-	-
R-intensity of the shadow				
Weak intensity	2	3,6±3,2	3 8	58,4±8,5 **
Moderate intensity	1 3	23,6±4,1	2 1	32,3±9,2
High intensity	4 0	72,7±4,5 **	6	9,2±8,5
Microcalcifications in the background of the node				
Present	9	16,3±2,1	4 1	63,1±3,2
Dangerous	6	10,9±4,4	-	-
Good quality	-	-	3 1	47,6±3,2 ***
Intermediate (amorphous)	3	5,5±3,5	1 0	15,4±8,5
Absent	4 6	83,6±4,5	2 4	36,9±9,2
Additional signs				
Thickening of the skin	2	3,6±2,5	-	-

		**		
Subcutaneous fat deformation	2	3,6±2,5	-	-
		**		
Arxitektonikaning buzilishi	1	23,6±3,9	4	6,2±9,2
	3	**		
Note: * indicates the reliability of the data between groups (* - R<0,05; ** - R<0,01; *** - R<0,001);				

According to the data presented in the table, the specific radiological signs of breast cancer (SBS) are: Uncertain, uneven, and spiculated contours of the lesion - these signs are characteristic of malignant tumors, and/or the presence of a spiculated contour of the lesion. Irregular shape: An irregular or asymmetrical shape of the tumor shadow may be a sign of a pathological process. Malignant tumors can have a much more irregular structure and shape than benign tumors. High shadow intensity: Areas with high shadow intensity on a mammogram may indicate a dense tumor structure or the presence of heterogeneous components. Thickening of the skin and deformation of the subcutaneous fat layer. Although these changes are less common, they are associated with the spread of the tumor to the skin and surrounding tissues, which can also be a clear sign of breast cancer.

Research results. In 2 cases of our study, fibroadenomas have a false form and irregular contours, which, in our opinion, are due to their intracanalicular development, as well as the presence of proliferative changes in the surrounding tissue layered in the shade of the tumor, which is confirmed by pathomorphological data. In 1 case, thickening of the skin was observed against the background of a deformed subcutaneous fat layer in fibroadenoma, which made it difficult to interpret the radiological image. In 9 cases, false negative results in mammography were characterized by the correct shape of tumor nodes with flat and clear contours in visualization, moderate density of intensity, no additional signs of SBS in clinical presentation (deformation of the subcutaneous fat layer above formation and thickening of the skin), and were assessed as fibroadenoma. Morphologically, breast cancer was detected in these cases. The sensitivity of SBS in diagnosing metastatic involvement of regional lymph nodes in patients with SBS was 67.6%. Thus, mammography showed true positive (TP) results in 61 cases, true negative (TN) results in 23 cases, false positive (FP) results in 7 cases, and false negative (FN) results in 9 cases. Accordingly, the sensitivity of mammography in distinguishing between SBS and benign tumors was 87.1%, specificity was 76.7%, and diagnostic accuracy was 84.0%.

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