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Ductal carcinoma in situ (DCIS) and invasive ductal carcinoma (IDC) in patients with breast lesion marked by the localized needle

Rak wewnątrzprzewodowy, a rak naciekający u chorych z rakiem piersi usuniętym po oznakowaniu igłą lokalizacyjną

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Summary

Background: Early diagnosis of a breast cancer is very important and challenging aspect in imaging the lesion in the breast. The small lesions visible in imaging exams, in majority of cases are not palpable in clinical testing.

The aim of the work is to make a comparison between the clinical features and radiological image in patients with impalpable breast cancer in clinical testing.

Material/Methods: 338 operating procedures of the breast tumors removal were conducted after preliminary marking them by the localized needle. The lesion in the breast was shown in the mammography or ultrasonography exam.

Results: In histopathology exam the breast cancer was confirmed in 131 women. The ductal carcinoma in situ (DCIS) occurred in 41 (31 %) women and the invasive ductal carcinoma (IDC) in 91 (69 %) women. Microcalcifications find out to be characteristic for the DCIS. The shape of the spicular lesion is characteristic for the invasive carcinoma. DCIS in mammography exam is bigger than invasive carcinoma.

Conclusions: 1. The mammography exam is the basic method for the detection of the breast cancer and the best method for the detection of DCIS, which is often visible in the form of microcalcifications.

2. The average size of the DCIS in mammography exam is twice as large than in ultrasonography and three times larger than in histopathology exam.

3. Size of the lesion in microscopic and macroscopic exam is equal with size of the lesion in ultrasound exam and the diameter of the solid center in the mammography and because of that reason, presence of the processes around the malignant tumor, which is visible in mammography exam should not have influenced the qualification for the surgical treatment.

Key words: intraductal breast carcinoma • invasive beast carcinoma • microcalcifications

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Background

A breast cancer is one of the most frequently occurring malignant neoplasm in women in the world as well as in Poland.

According to the data from Epidemiology Department, in Poland 10 thousand new incidences are registered yearly and this number constantly increases.

Early diagnosis of a breast cancer is very important and challenging aspect in imaging the lesion in the breast. The small lesions visible in imaging exams, in majority of cases are not palpable in clinical testing.

The only way of diminishing the number of deaths caused by the breast cancer is generalization of mammography exam, because this is the only test, that allows to detect the breast cancer impalpable in clinical testing.

An invasive ductal carcinoma is about 65–80% of malignant breast cancers. That kind of cancer may occur in image exam as the irregular or blurred tumor, or as well limited tumor with high density.

The ductal carcinoma in situ biologically includes a heterogenic lesion group with the changeable malignancy potential. Unfortunately, the international DCIS classification does not exist [1, 2, 3].

The aim of the study

The aim of the work is to make a comparison between the clinical features and radiological image in patients with impalpable breast cancer in the clinical testing.

Materials and methods

In the period from 1995 to 2004, 338 operating procedures of the breast tumors removal were conducted after preliminary marking them by the localized needle. The lesion in the breast was shown in the mammography or ultrasonography exam.

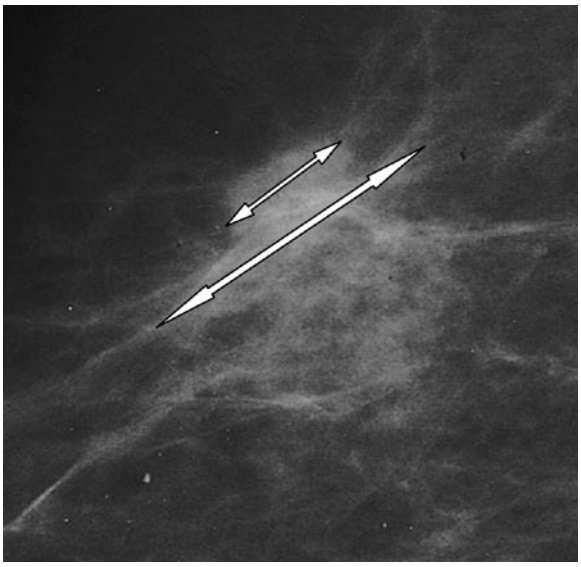

Figure 1. Diameter of the focal lesion and diameter of the lesion with processes. Diameter of the lesion with processes (big arrow). Diameter of the central part in the lesion with processes (small arrow).

Rycina 1. Średnica centrum zmiany i średnia zmiany z wypustkami. Średnica zmiany z wypustkami (duża strzałka). Średnica litego centrum zmiany z wypustkami (mała strzałka).

The mammography exam was assessed on the base of the BIRADS (Breast Imaging Reporting and Data System), which was worked out by ACR (American Radiology Society). The following data was taken into consideration: type of the breast structure, side on which the

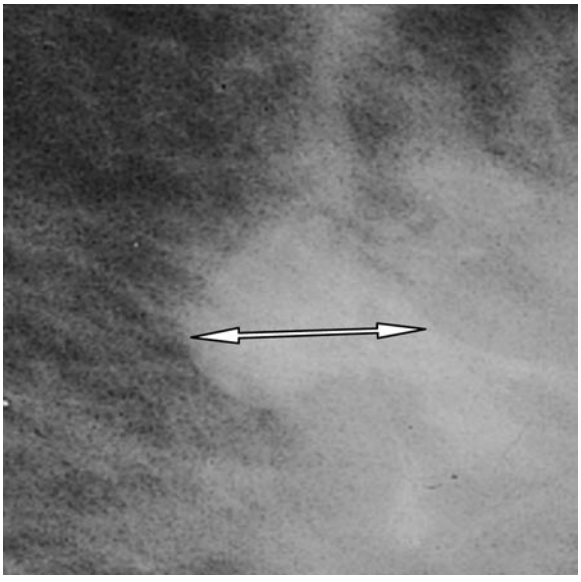

Figure 2. Diameter of a well limited lesion.

Rycina 2. Średnica zmiany dobrze ograniczonej.

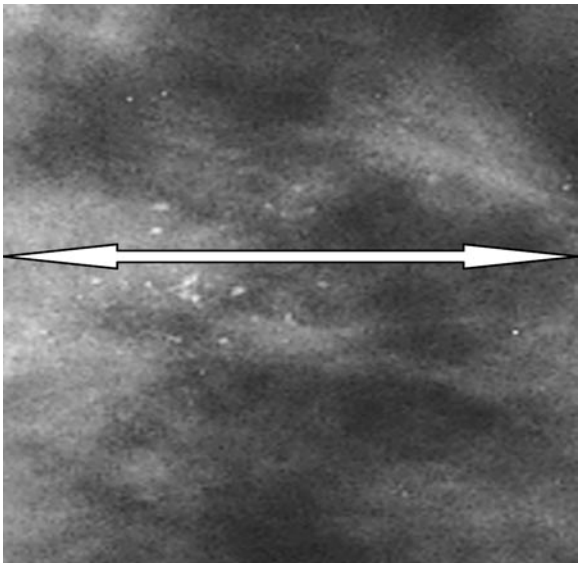

Figure 3. Diameter of the lesion without solid center – microcacifications (the longest one).

Rycina 3. Średnica zmiany bez litego centrum – mikrozwapnienia (najdłuższy wymiar).

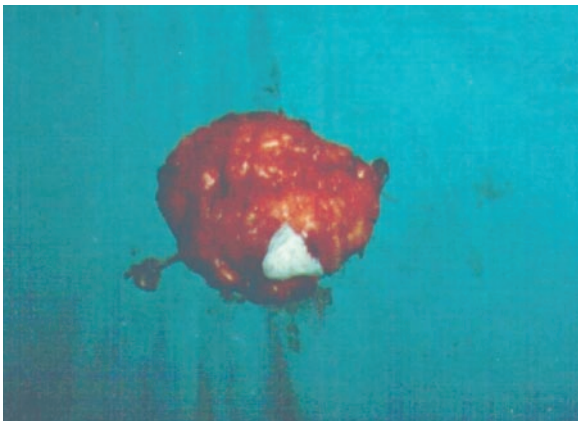

Figure 4. Surgical sample.
Rycina 4. Preparat operacyjny.

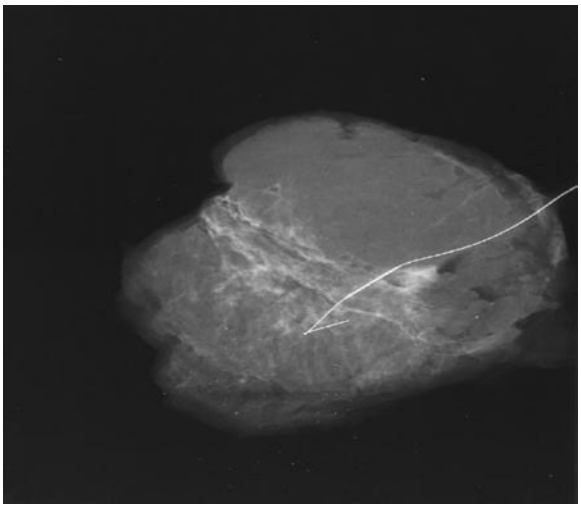

Figure 5. Mammography of the surgical sample.
Rycina 5. Zdjęcie preparatu operacyjnego.

lesion is located in mammography, the location of the lesion, depending on the quadrant, the tumor shape, external outline of the lesion, size of the tumor in millimeters (diameter of the lesion's center and diameter of lesion with processes) (fig. 1, 2), presence and the type of microcalcifications (the longest diameter of microcalcifications) (fig. 3). The age and the medical history of the patient's illness were taken into consideration. Also the following population factors were assessed: labors, breast feeding, miscarriages, relation to the menopause as well as family factors. Localized needle was administered under the mammography and/or USG control. The mammography's image of surgical specimen was executed after the surgical procedure (fig. 4, 5).

Results

In histopathology exam the breast cancer was confirmed in 131 women. DCIS occurred in 41 (31%) women and the IDC in 91 (69%) women. The average age for women with DCIS comes to 56 years and with IDC 54.7 years. The observation's time for patients with DCIS comes to 19.8 months and for patients with IDC comes to 19.7 months.

From the table 1 it follows that in patients with DCIS the microcalcifications were affirmed in 34 (83%) patients and lack of microcalcifications was affirmed in 7 (17%) patients. However, in patients with IDC the microcalcifications were affirmed in 36 (39%) patients and lack of the microcalcifications was affirmed in 55 (61%). On the base of material's analysis, we may state that the microcalcifications are characteristic for the DCIS (P from chi – square test comes to 0,0000).

The lesions with processes in mammography exam occurred in 8 women (35%) with DCIS, however, in 70(82%) in women with IDC (P from Chi – square test comes to P = 0,00001), which proved that the shape of the spicular lesion is characteristic for IDC (table 2).

Table 1. Correlation between microcalcifications in CDIS and IDC.
Tabela 1. Porównanie mikrozwapnień w CDIS I IDC.

P=0,0000	Present		Lack of calcifications		Total
Microcalcifications	Number of patients	%	Number of patients	%	Number of patients
DCIS	34	83	7	17	41
IDC	36	39	55	61	91
Total	70		62		132

Table 2. Shape of the lesion in DCIS and IDC in mammography.
Tabela 2. Kształt zmian w badaniu mammograficznym w DCIS i IDC.

	Lack of the center	Oval	Lobulated	With processes	Architectonics disorder	Total
Ductal carcinoma in situ	**21 49%**	6 **15%**	3 **4%**	**8 35%**	**3 5%**	41
Invasive ductal carcinoma	**6 2,5%**	**2 2%**	12 **10%**	70 **82%**	**1 1%**	91
Total	27	8	15	78	4	132

In the mammography exam the average size of the tumor with processes for DCIS comes to 23,6 mm and for the IDC 26,3 mm. However, the average size of the tumor without processes for the DCIS comes to 20,6 mm and for the IDC 14,3 mm. There is also statistically significant feature (P from the chi- square test comes to 0,0000). DCIS in mammography exam is bigger than IDC (table 3).

In the ultrasonography exam the average size of the tumor in women with affirmed DCIS comes to 10,5 mm and IDC 12,1 mm. These values are similar. In histopathology exam the average size of the tumor for DCIS comes to 8,39 mm and for IDC 12,6 mm (table 4).

Non of the population features is statistically significant either for DCIS or IDC. Also the type of breast structure in mammography exam proved to be statistically insignificant.

Discussion

The clinical material's analysis was conducted on 338 women, in whom the removal of the breast tumor was performed, after preliminary marking by localized needle. In our tested material breast cancer was diagnosed in 132 women. The ductal carcinoma in situ occurred in 41 women and in the remaining 91 women the invasive ductal carcinoma was affirmed.

The earlier diagnosis of the breast cancer is a very important challenge for radiologist. The small changes are mostly impalpable in clinical testing. In women with the breast cancer below 10 mm the possibility of recurrence of the diseases within 20 years comes to 14%.

The invasive ductal carcinoma comes to about 65–80% of malignant breast tumors. In mammography exam it can be seen as the blurred and limited density or as strongly saturated tumor with an equal outlines [4, 5, 6].

The breast cancer in the imaging exams may appear as spicular tumor in 16% of cases and as an architectonic disorder of the glandular parenchyma in 20% cases. The spicular tumor is the most typical for cancer of the breast gland. Mostly spicular tumor corresponds with the invasive ductal carcinoma. In mammography exam the spicular lesion appears in the form of a dense irregular center encircled by the ring of processes. The cancer, which grows in the parenchyma of the breast gland causes the reaction of becoming fibrous from the connective tissue, creating at the same time the spicular lesion. Microscopic center of the lesion is created by the numerous cancer's and connective's tissues. The higher number of processes in the lesion the more connective tissues and less cells can be found in the lesion [7, 8, 9, 10].

The ductal carcinoma in situ constitutes 20% of detected by mammography preclinical cancers of the breast. DCIS most frequently manifests itself as microcalcifications – 72%, or microcalcifications with the association of incorrect image with texture of 12%. About 12% there are also lesions without the microcalcifications (diameter of density, architectonic disorders and asymmetry of texture) [11, 12, 13, 14].

Table 3. Size of the lesions with processes and without processes in DCIS and IDC in mammography.
Tabela 3. Wielkość guza z wypustkami i bez wypustek w badaniu mammograficznym.

	DCIS	IDC	p
Tumor with processes	**23,6**	**26,3**	**0,5834**
Tumor without processes	**20,6**	**14,3**	**0,0000**
Lesion without center	**25,1**	**21,0**	**1,0000**

Table 4. Comparison between size of lesion in macroscopic, ultrasound and mammography examination in DCIS and IDC.
Tabela 4. Porównanie wielkości guza w badaniu mikroskopowym, ultrasonograficznym i w badaniu mammograficznym w DCIS i IDC.

Exam	Size in mm	DCIS	IDC
MGR	**With processes**	**23,6**	**26,3**
	Without processes	**20,6**	**14,3**
USG		**10,5**	**12,1**
HIST- PAT		**8,4**	**12,6**

The pleomorphic microcalcifications are typical for DCIS. According to the literature's data DCIS is visible in the form of the branched microcalcifications in the shape of the letters V & Y. The quantities of microcalcifications in the cluster and microcalcifications' saturations control the malignancy of the tumor. The pleomorphic microcalcifications sometimes occur in the following benign changes: parenchyma fibrosis, intraductal proliferation or urethral proliferation connected with becoming fibrated. In these cases microcalcifications differ imperceptibly on saturation, location or shape. The differentiation between benign and malignant lesions cannot be made on the bases of mammography exam alone, histopathology exam is dominant in these cases [15, 16].

According to the literature's data about 50% of IDC are manifested in the form of microcalcifications [17, 18].

Ultrasonography exam of high resolution allows to define the size of the tumor, its echogenicity, whether the lesion is solid or cyst-like. If the lesion is solid, the ultrasonography allows to define the outline of the lesion. This testing shows the tumor only in one projection. In the ultrasonography exam the microcalcifications are not able to be seen [19, 20].

Conclusions

On the base of the material's analysis the following conclusions can be stated:

1. The mammography exam is the basic method for the detection of the breast cancer and the best method for the detection of DCIS, which is visible often in the form of microcalcifications.

2. The average size of IDC in mammography exam is twice as large than in ultrasonography and three times larger than in histopathology exam.
3. Size of the lesion in microscopic and macroscopic exam is equal with size of the lesion in ultrasound exam and the diameter of the solid center in the mammography and because of that reason, presence of the processes around the malignant tumor, which is visible in mammography exam should not have influenced the qualification for the surgical treatment.

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