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C A S E   R E P O R T

# Mammary gland anatomy and the role of mammography and ultrasonography in the early diagnostics of breast cancer. A case report

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*Progress in imaging techniques has brought a solution to the problem of the early diagnosis of breast cancer. An interesting case of breast cancer is presented here, pictures of the malignant tumour are demonstrated and the usefulness of new diagnostic methods analysed. The presentation of this case may contribute to greater effectiveness in early breast cancer detection.*

**key words: breast cancer, mammography, mammosonography, breast cysts**

## INTRODUCTION

Changes in the structure of the mammary gland are related to age, hormonal stage and medicine intake. This variety of factors contributes to the difficulties in the diagnosis of breast disease and requires proper additional investigation by means of imaging. The introduction of mammography as a screening test in breast cancer has diminished mortality by 30%. The development of the ultrasound examination has helped enhance the sensitivity of mammography by 10% [6].

Changes in grades T0 and T1 are most often clinically "mute" and their detection is possible only by using methods of imaging examination, which become a main baseline diagnostic in early breast cancer. The method of choice is mammography. This presents a great variety in sensitivity in different age groups. Its sensitivity among young women with a high density in the structure of mammary glands and among older women with adipose structure is 30% and 80% respectively [5].

The aim of the study was to reveal the great value of ultrasound of the mammary gland as an additional examination next to mammography in the diagnostics of breast cancer.

## CASE REPORT

An alteration (8 mm) was disclosed in mammography performed on a patient aged 68. Two experienced radiologists described it as a benign, well-separated lesion with a cyst feature (Fig. 1, 2), and it was not considered as potentially malign. Mammosonography was performed as a routine investigation (Fig. 3) and this disclosed a well-separated, hypoechogenic lesion. Thin needle aspiration biopsy (BACC) was performed. Cytological examination of the aspirated fluid revealed neoplastic cells. The patient was operated on and *ca ductale invasivum mammae sin.* was found in the post-operative histopathological examination.

## RESULTS AND DISCUSSION

This case report indicates the important role of new imaging examinations, the great progress made in methods of diagnosis and the increase in their
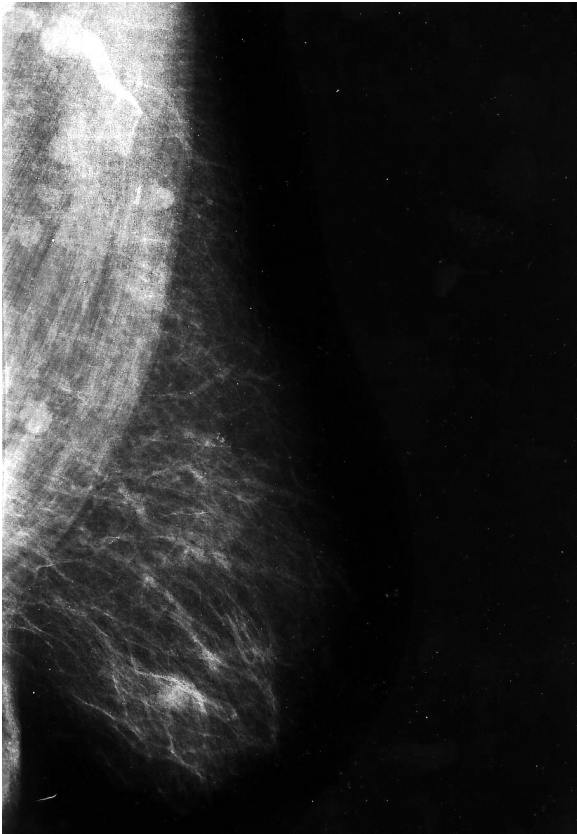
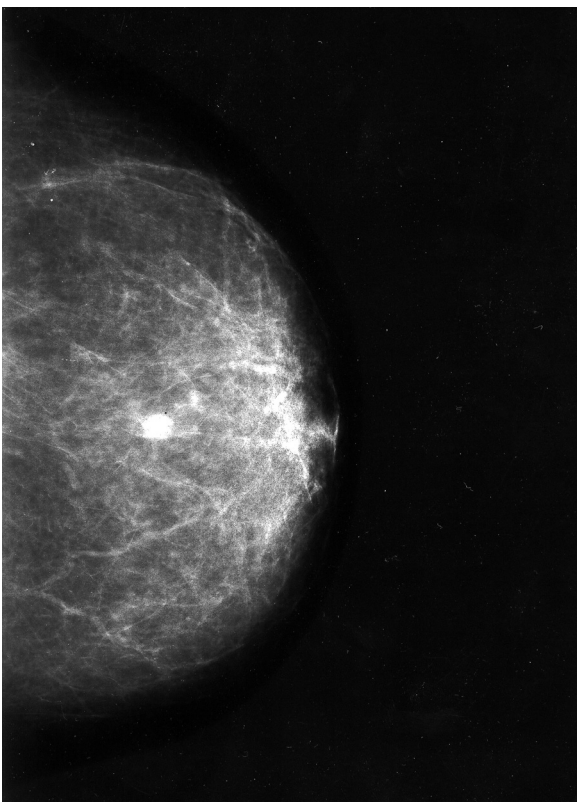Figure 1. Patient's mammography (MLO projection).

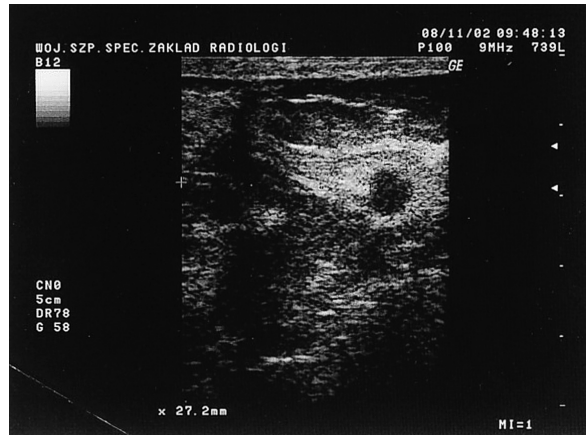

Figure 2. Patient's mammography (C-C projection).



Figure 3. Patient's ultrasonography.

sensitivity. There are attempts to enhance the sensitivity of mammography by additional examination, as, for example, mammosonography. A system of evaluating x-ray images by two radiologists independently (double reading) has been introduced, which has increased perception in cases of small foci of micro calcification and thus enhanced the detectability of breast cancer by 10% [6]. The next step in the improvement of the diagnostics of breast cancer has been the development of a computer-aided detection system (CADS) [7], which has also enhanced cancer detectability by 10.5–19.5%. The diagnostic value of digital mammography (DW) has not yet been assessed [4].

It seems that the latest diagnostic methods for breast cancer, such as resonance-magnetic mammography (MRM) and positron emission tomography (PET), will soon be commonly available. MRM is a dynamic examination, which distinguishes neoplastic lesions from others by analysing the degree of signal amplification after contrast administration (Gd-DPTA). After 1-minute malignant tumors undergo great augmentation and then the contrast is very quickly removed from the neoplastic focus [2]. This method can be used in the detection of an alteration above 3 mm with greater vascularisation (which results in contrast accumulation) than benign changes [3]. However, in the case of neoplasm in situ or that of small invasive cancer this method is not sufficient. MRM is mainly used to evaluate the extent of a primary neoplastic process, for example infiltration of the thoracic wall or metastasis to the lymphatic nodes. This information is essential in qualifying a patient for a sparing operation.

Positron emission tomography (PET), like MRM, is also a dynamic method and is based on the increased uptake of 18 F-fluorodeoxyglucose (FDG)

contrast in cells of malignant neoplasm. This method can detect a primary neoplasmatic focus as well as metastases to the lymph nodes and to other organs. Unfortunately, due to the high costs of this examination, it is not commonly available [1]. PET, along with computer tomography or nuclear magnetic resonance, may constitute a breakthrough in the early diagnostic of breast cancer [1].

The development of new improved diagnostic methods in breast cancer totally changes the therapeutic process and prognosis. As a result of these new techniques there is hope for a complete cure or a prolongation of life.

## REFERENCES

1. Brix G, Henze M, Knopp MV, Lucht R, Doll J, Junkermann H, Hawighorst H, Haberkorn U (2001) Comparison of pharmacokinetic MRI and [18F] fluorodeoxyglucose PET in the diagnosis of breast cancer: Initial experience. Eur Radiol, 11: 2058–2070.
2. Friedrich M (1998) MRI of the breast: state of the art. Eur Radiol, 8: 707–725.
3. Imbriaco M, Del Vecchio S, Riccardi A, Pace L, Di Salle F, Di Gennaro F, Salvatore M, Sodano A (2001) Scintimammography with 99mTc-MIBI versus dynamic MRI for non-invasive characterization of breast masses. Eur J Nucl Med, 28: 56–63.
4. Lewin J (2001) Digital mammography faces off with film. Diagnostic Imaging Supplement.
5. Mandelson MT, Oestreicher N, Porter PL, White D, Finder CA, Taplin SH, White E (2000) Breast density as a predictor of mammographic detection: comparison of inteval- and screen-detected cancers. J Natl Cancer Inst, 92: 1081–1087.
6. Studniarek M, Bianek-Bodzak A (2002) Rola technik obrazowych w wykrywaniu wczesnych postaci raka piersi. Współczesna Onkologia, 2: 76–80.
7. Taft R, Taylor A (2001) Potential improvement in breast cancer detection with a novel computer-aided detection system. Appl Radiol, 30: 25–28.