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Resolving of mammographically visible though clinically undetectable lesions suspicious for breast cancer

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The results of active screening for breast cancer are presented. The study included 60 women with mammographically detected breast lesions which were clinically not palpable, though their mammographical findings were suspicious for breast cancer. In all 60 women, localization of the breast lesion was performed by means of a wire according to the Franken's method. Breast cancer was established in 16 patients (26.6 %), 7 of which (43.7 %) had non-invasive and 9 (56.3 %) invasive cancer, whereas benign dysplasia was found in 44 women (73.4 %).

Key words: breast neoplasms-diagnosis; mammography

Introduction

Nowadays, breast cancer detection is based on two essential diagnostic methods: 1) clinical examination (CE) and X-ray imaging of the breast, i.e. mammography (MG). The findings of both examinations require additional microscopic verification. Clinically detectable (palpable) breast lesions can be best explained by fine needle aspiration biopsy (FNB). According to the recommendations of the European Breast Cancer Study Group (EBCSG), active screening for early breast cancer should be carried out in women without symptoms of breast cancer. Thus, asymptomatic women over 50 years of age should be subjected to regular mammographic examinations in 2–3 year intervals. Such an approach is expected to contribute to a significant decrease in breast cancer mortality.[1] Regardless the fact that mammography is a method that can detect breast cancer at a stage when it is not assessable by any other available method, the diagnosis is regarded incomplete without a clinical examination. Up to 63 % rate of false negative mammographic findings in women under 35 years of age reported in the literature can be attributed to the density of parenchyma in young women, whereas in women over 35 years of age mammography fails to discover up to 15 % of clinically detectable tumors.[2]

Mammographically detected changes suspicious for breast cancer require further explanation. According to the recommendations of EBCSG, such changes should be marked by radiologist to facilitate their exact positioning at surgery. Surgically removed part of the breast is then again X-rayed in order to make sure that the suspicious tissue has been actually removed; at the same time the lesion is marked

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for better and more effective histopathologic examination.[3, 4, 5]

The lesion can be easily marked by means of a thin stainless-steel wire with a hooked tip.[6] In this way both the change and the mark can be easily imaged on mammography, thus facilitating the interpretation of mammographical finding and positioning of the lesion on surgery.

The surgeon orientates the removed breast tissue by marking its front and upper edge and sends it to the radiologist for X-ray examination (Figure). During the procedure the tissue sample is placed on a Petri dish filled with paraffin. The dish with the specimen is placed into a special device which enables marking of the suspicious lesion for fast and accurate histologic examination.[7]

Material and methods

In the years 1986 to 1992, changes suspicious for breast cancer were localized in 60 women in the age of 36–69 years. Mammographically suspicious though clinically undetectable changes were as follows: asymmetrical breast structure, accentuated tissue density, the presence of stellate formations, a cluster of 5 or more microcalcinations appearing alone or associated with the above mentioned changes, and finally, a mammographically evident tumor.

The size of localized changes ranged from a hardly perceptible cluster of microcalcinations to a tumor with the diameter of 2 cm.

In the case of a mammographically detected suspicious breast lesion, further diagnostic and therapeutic procedures were agreed upon by both the surgeon and the radiologist. Surgery was performed either on outpatient basis, when no major intervention had been expected, or the patient was admitted to the ward a day before surgery taking into account possible need for radical surgery.

Mammography was repeated again prior to surgery and premedication. Approximate positioning of the lesion was done by means of a special localization plate. The inserted wire was fixed with a piece of adhesive tape and the puncture site protected with sterile gauze. The patient was operated on within two hours after the localization procedure.

The breast tissue severed on surgery was X-rayed by means of a special device equipped with coordination system which helped us to find the removed lesion; the surgeon was immediately informed about the outcome of the procedure. For the needs of radiologic investigation the removed breast tissue was placed on a Petri dish filled with paraffin which enabled localization of the lesion by means of injection needles. Thus prepared specimen was again X-rayed. The method has been named "sample mammography" (SM). During sample taking procedure, the radiologist assisted the pathologist by explaining the SM image in order to enable him to determine the most suitable site for sample taking.

Case 1:

Patient M.V., born 1952, patient record no. 3105/82, has been referred to our Institute because of the enlarged right axillary lymph nodes. FNAB revealed the presence of light-cell carcinoma. The site of primary tumor could not be found. The patient underwent mammography, though the obtained mammograph showed only a dense homogeneous shadow which was diagnostically irrelevant owing to the patient's breast type (Wolfe DY). On the other hand, this type of the breast, which is known to be rather unyielding to mammography, is associated with the highest incidence of breast cancer. As the radiologist found a suspicious density in the lower inner quadrant of the breast, a blind biopsy of that site was performed. On pathological examination no evidence of malignoma could be found in the surgical specimen. Taking into account the possibility that formerly diagnosed light-cell carcinoma could originate from the kidney, intravenous urography was performed as well; the findings, however, were within normal limits. The radiologist who carried out the procedure reviewed previous radiograms, and discovered a cluster of microcalcinations suspicious for breast cancer in the outer upper quadrant of the right breast. After consultation

with surgeon, he carried out localization of the microcalcinations. Postoperative sample mammography confirmed that the changes had been removed. Pathomorphological examination of the removed breast tissue revealed the presence of an infiltrative ductal light-cell carcinoma; it was moderately differentiated, with strongly expressed fibrous stroma. The tumor was of the same structure as previously discovered lymph node metastases. Subsequently, the patient underwent radical mastectomy.

Case 2:

Patient N.M., born 1923, pat. record no. 2643/86, was asymptomatic. She decided to undergo breast examination because her niece, a medical nurse, advised her so.

She had always been healthy. She got menarche at the age of 14 and had been postmenopausal for 15 years already. She gave birth twice and had one abortion.

Clinical examination showed evidence of normal involutive breast. On mammography a small stellate formation suspicious for breast cancer was imaged in the outer upper quadrant of the left breast.

Localization was done by means of a wire (Figures 1 and 2). The removed part of the breast was X-rayed (Figure 3) again, and the suspicious lesion in the sample marked. Pathomorphological diagnosis was intraductal infiltrative carcinoma of the breast, 7 mm of size; this finding corresponded to the so-called "minimal breast cancer" which is considered curable.

Results

We have performed 60 localizations of suspicious breast lesions. Of these 16 (26.6%) turned out to be breast cancer, whereas benign displasias were found in 44 cases (73.4%) (Table 1).

There were 7 (43.7%) noninvasive and 9 (56.3%) invasive breast cancers (Table 2).

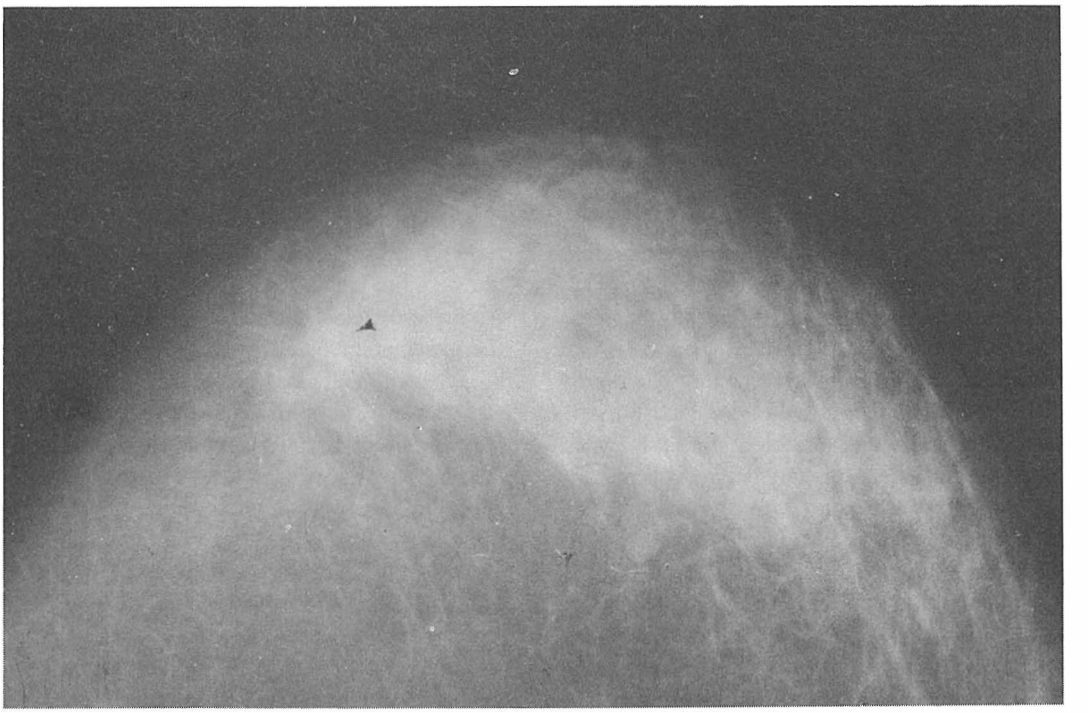

Figure 1. Craniocaudal plane. Wire hook is in the immediate vicinity of the lesion.

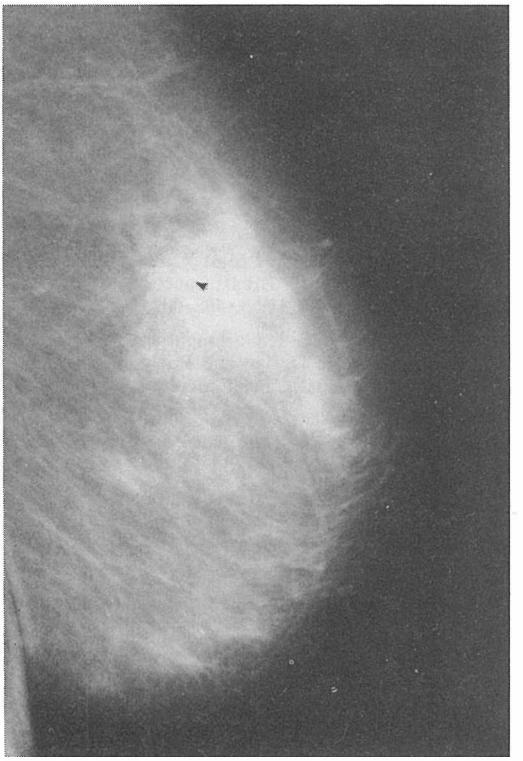

Figure 2. Mediolateral plane. Wire hook is in the immediate vicinity of the lesion.

Noninvazive lobular breast cancer was found in 2 women, and initial ductal carcinoma in 5. Of invazive breast cancers, 4 originated from the ducts, whereas another 4 were lobular and one was of mixed type (lobular and ductal).

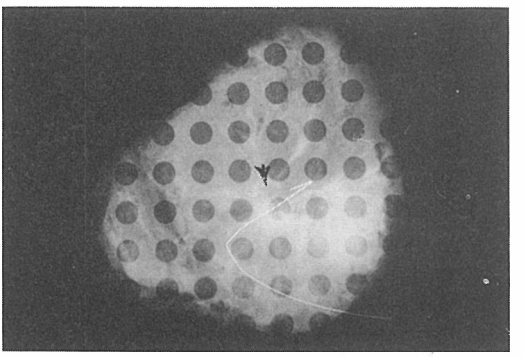

Figure 3. Sample mammography. A stellate formation can be seen in the removed tissue sample. Holes in the device enable precise positioning of the site for bioptic sample taking. (See Case 2. Intraductal infiltrative breast cancer, 7 mm of size.)

Table 1. Suspicious breast lesions.

Surgically treated patients n = 60 (100 %)	
Diagnosed	
breast cancers n = 16 (22.6 %)	benign dysplasias n = 44 (73.4 %)

Table 2. Established breast cancers.

Diagnosed breast cancers n = 16 (100 %)	
Noninvazive n = 7 (43.7 %)	Invazive n = 9 (56.3 %)

Discussion

Localization of changes in the breast is a simple, fast and reliable method which helps to resolve mammographically evident lesions suspicious for breast cancer. The diagnosis of cancer was confirmed in more than one fourth of our patients. According to the reports from literature, about 20–40 % of cancers in surgically treated patients are discovered by the help of this method. The rate of established cancers vs benign displasias depends on the criteria used by the radiologist when assessing a change as suspicious for breast cancer. Undoubtedly, with respect to a high rate of established breast cancers these criteria must be very strict. A question remains, however, how many initial (noninvazive) breast cancers failed to be detected owing to a too restrictive approach. In our report, almost a half of the established cancers were noninvazive (7/16). This undoubtedly proves that our selection criterium was relatively good.

Self-evidently, initial cancer, particularly when situated deep in the breast, is not accessible to clinical examination. It seems also justified to question why tumors as large as 2 cm

need to be localized. But everyone who is involved in the diagnostics of breast diseases should be aware of the fact that every now and then enormously large breast can be seen. When, apart from their size, such breasts are also clinically difficult to assess, it seems quite logical that – though exceptionally – even a relatively large tumor can be easily overlooked on clinical examination.

Conclusion

Mammography of the breast still remains the method of choice for the detection of very small changes that cannot be evidenced by clinical examination. Both mammographical and clinical findings must be microscopically confirmed in order to serve as a basis for treatment selection.

Localization of mammographically evident changes suspicious for breast cancer is a fast, simple and reliable method which facilitates the surgeon to determine the correct site for sample taking. Surgically removed tissue should be again radiographically examined so that the site of bioptic sample taking can be determined.

All these findings have been confirmed by the results of our study.

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