Multidisciplinary Approach of Breast Cancer. Case Reports

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Introduction: Breast cancer is still the world's most common cancer in women. Multidisciplinary approach represents the gold standard in diagnosis.
Case presentation: In order to emphasize the importance of this issue, we present three of our cases. In these cases of invasive carcinoma, in women ranged from 42 to 54 years, the diagnosis tools were clinical examination, mammography, ultrasound and histopathology. Minimal invasive breast biopsy and preoperative localisation procedures, under ultrasound and stereotactic guidance contributed to preoperative planning.
Conclusions: Interdisciplinary approach in diagnosis provides optimal management of breast cancer.

Keywords: breast cancer, multidisciplinary, breast team, diagnosis

Introduction

It is well known, worldwide, that 1 in 8 women will develop breast cancer during her lifetime. Modern approach in the diagnosis of breast cancer is based on the concept of multidisciplinarity. Nowadays, the gold standard is represented by the triple assessment: clinical, imaging and pathological [1,2,3,4].

Mammography and/or ultrasound (US) are the first methods of choice in the diagnosis of breast cancer. Both allow performing guided biopsy or preoperative wire localisation of impalpable lesions with one-step accurate excision [4].

We would like to underline the importance of multidisciplinary teamwork presenting three of our cases of correctly diagnosed breast cancer.

Case presentation

Three malignant suspicious cases BI-RADS (Breast Imaging Reporting and Data System) classified as categories 4 and 5, in three female patients aged 42 to 54 years old, were evaluated from mammographical, sonographical, surgical and pathological point of view. Diagnosis was established by core needle biopsy and/or preoperative wire localization under US or stereotactic guidance, followed by surgery and histopathological evaluation. All surgical specimens were X-rayed in order to determine the presence of lesions and microcalcifications.

Equipment: conventional mammography system with dedicated stereotactic device, ultrasound machine equipped with 12.5-MHz linear array transducer, core needle biopsy instruments (14-G biopsy needles and automatic gun), and wire localisation of breast lesions under mammographic or ultrasound guidance.

In all three reported cases, invasive carcinomas were diagnosed (2 unifocal and 1 multicentric), with clinically palpable mass encountered only in one case. Mammographically, all lesions presented as spiculated images (one as spiculated architectural distorsion with radiolucent center, and the other two with associated microcalcifications). Two of the three patients had dense breasts. The sonographic appearance of lesions also showed spiculated architectural distortion or mass. The size of lesions was small, ranged between 6.4–15 mm.

The histological findings demonstrated malignancy in all cases. The patients underwent conservative surgical procedures or mastectomy with complete axillary lymph node dissection.

Case 1

A 55 year-old woman without family history of breast cancer, with clinically occult breast lesion, presented for a routine mammographic examination which revealed a small

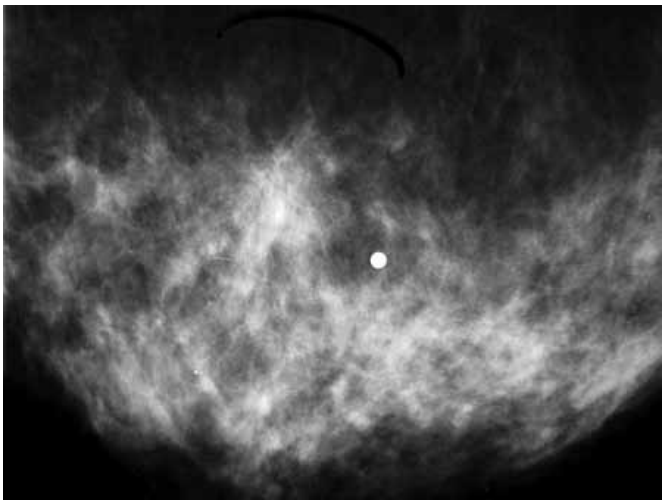

Fig. 1. Mammography: stellate opacity within dense breast.

Fig. 2. Ultrasonography: small architectural distorsion with hypoechoic mass.

unifocal stellate opacity of 10/15 mm in size, within the dense breast parenchyma background (BI-RADS 5). There were no associated microcalcifications (Figure 1).

On subsequent US examination, an 8.6/6.4 mm small architectural distortion with hypoechoic mass and moderate posterior acoustic shadowing (BI-RADS 4) was displayed (Figure 2).

Core needle biopsy (CNB) under US guidance, followed by surgical excision after preoperative wire localization demonstrated an invasive ductal carcinoma (IDC) not otherwise specified (NOS) histologic grade II, associated with ductal carcinoma in situ (DCIS), nuclear grade I (Figure 3).

Case 2

A 42 year-old woman with family history of breast cancer (sister) presented with a unifocal architectural distortion

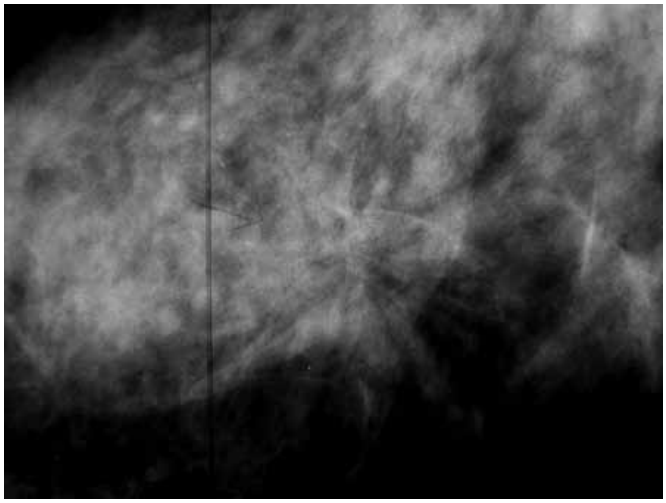

Fig. 4. Mammography (mediolateral oblique projection), detail: "black star" appearance.

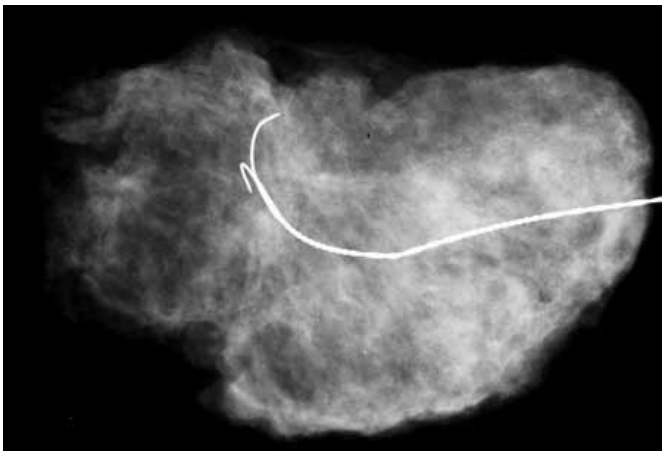

Fig. 3. Specimen radiography: wire localisation of the lesion.

(BI-RADS 4) within the upper-internal quadrant of the left breast, stable on mammographical and US examination for the past two years. The pacient had no history of previous biopsy, surgery or trauma. On mammography, the small 10 mm non-palpable lesion had a "black star" appearance, with radiolucent centre and long fine radiating spicules; two microcalcifications in the periphery of the lesion were shown (Figure 4).

The ultrasound appearance of the lesion also corresponded to a small 8.6/10 mm architectural distortion with spiculated aspect (Figure 5).

We recommended wire localisation under stereotactic guidance and surgical excision of the lesion. Guided quadrantectomy with X-rayed surgical specimen was perfomed (Figure 6 a, b and c). Histology demonstrated a radial scar associated with tubular carcinoma histologic grade I.

Case 3

A 54 year-old woman was admitted to surgical department for a palpable mass in the upper-external quadrant of her left breast, in order to undergo conservative breast surgery. She did not have family history of breast cancer or any other personal history.

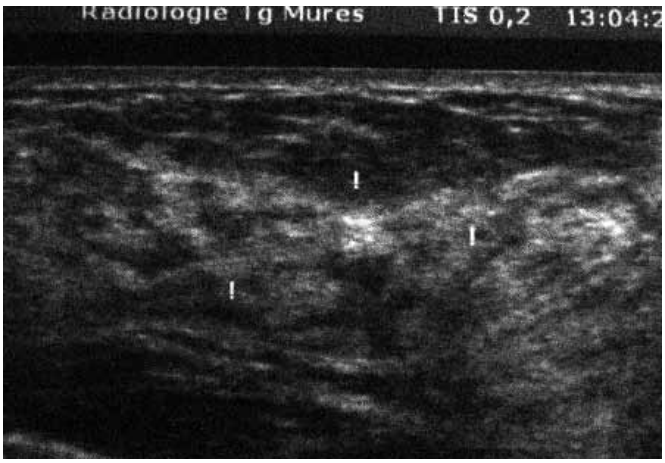

Fig. 5. Ultrasonography: small architectural distortion with spiculated aspect.

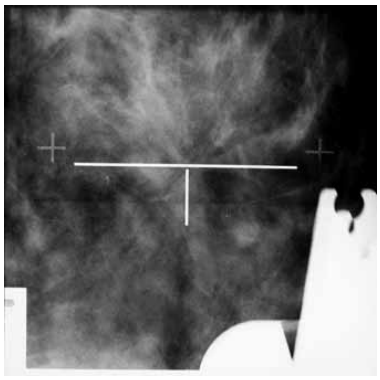

Fig. 6a. Preoperative localization: stereotactic image.

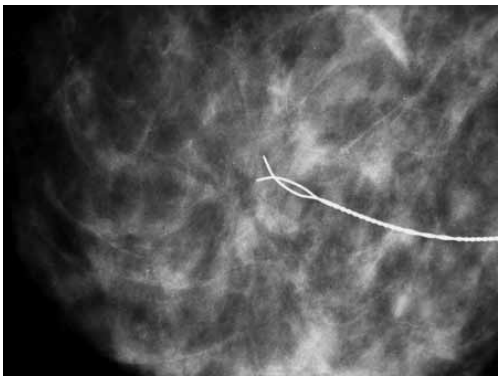

Fig. 6b. Mammography: control of wire localization under stereotactic guidance.

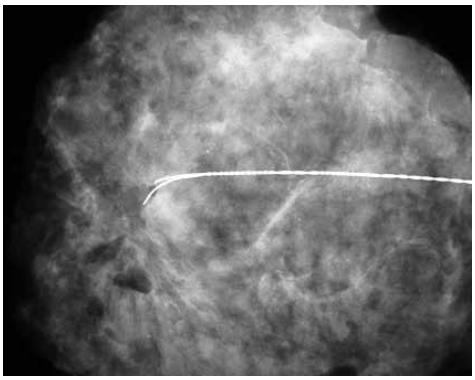

Fig. 6c. Surgical specimen radiography.

The first mammograms performed in another department depicted a single lesion in the upper-external quadrant of the left breast. The mammographic re-examination performed in our department disclosed at least 3–4 irre-gular (partially lobulated and partially spiculated) masses, sized between 5–15 mm, situated at more than 4 cm distance from each other, in different quadrants. The impalpable profound mass situated at the junction of upper quadrants associated a focus of microcalcifications (BI-RADS 5) (Figures 7 and 8). Homolateral axillary suspicious lymph nodes were seen.

US also demonstrated the multicentric disposal of lesions. The patient underwent mastectomy with complete axillary lymph node dissection (ALND). Histologically, the mastectomy specimen contained multiple foci of ductal invasive and in situ carcinoma.

Discussions

Early detection and diagnosis represent the main objectives in the management of breast cancer. Insuring the quality of the medical act in the diagnosis of breast cancer is based on interdisciplinary collaboration. Teamwork is the key to success, meaning good cooperation between breast pathology experts: radiologist, surgeon and pathologist [1,2,3,4].

Breast cancer surgery, based on single examination, either clinical or imaging (especially US), ignoring the possibility of associated clinically occult lesions or suspicious microcalcifications, is a mistake.

Imaging is an important tool in assessing the stage and extent of the disease. Mammographic and/or sonographic breast evaluation has to be a part of preoperative planning, as they are the primary imaging tools of diagnosis [5].

It is known that mammography has limitations in dense breasts. The sensitivity of mammography may decrease significantly, with 23.7% up to 62%, in women with dense breasts, because of a masking effect [6,7].

Conversely, radial scar can be better identified mammographically in dense breasts because of its well known appearance as "black star", due to the fibroelastotic core. Although the radial scar is a benign lesion, literature reports described its association with malignancy in 0–40% of the cases (tubular carcinoma, invasive or ductal carcinoma in situ) [8]. In order to exclude false negative results of CNB, surgical excision of the lesion is recommended [8,9].

US is a useful imaging modality adjunct to mammography. The sensitivity of US in dense breasts may be about 75% but, combined with mammography the sensitivity may increase to 97% [10]. US can also improve the specificity of diagnosis in breast cancer [11].

Both methods, mammography and US, allow performing guided minimal invasive breast biopsy in order to limit the number of unnecessary open biopsies or second surgical excisions. Imaging-guided CNB is an accurate

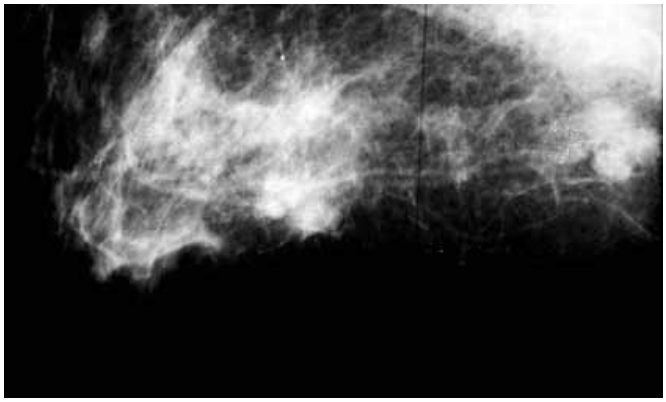

Fig. 7. Mammography (mediolateral oblique projection): left breast, irregular masses, associated microcalcifications.

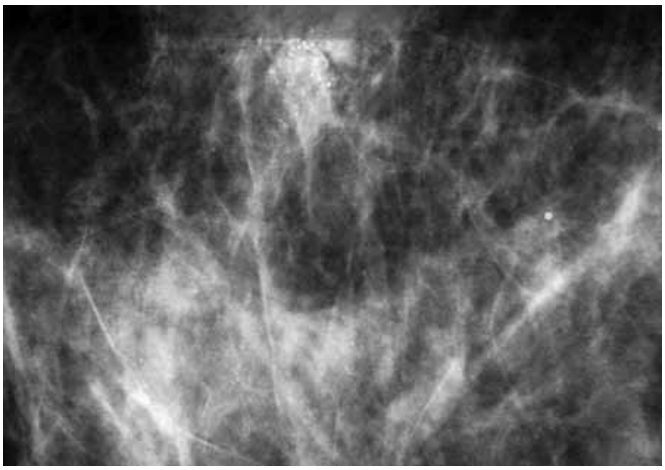

Fig. 8. Mammography (craniocaudal projection): same breast, irregular masses, associated microcalcifications.

sampling procedure which can offer an initial non-operative diagnosis, thus facilitating preoperative planning [4,12,13,14]. CNB allows the assessment of nuclear grade and type of the carcinoma (in situ or invasive), the assessment of estrogen/progesterone receptors (ER/PR) and HER-2/neu gene (human epidermal growth factor receptor 2) status [15]. If the lesion is visible on US, it is recommended to perform the biopsy under real-time sonographic guidance and, to use 14-G biopsy needles, as we did, in order to obtain representative samples [11,16]. CNB under US guidance can diagnose the malignancy with a sensitivity of 99.2% in palpable breast lesions and 93% in non-palpable lesions [16].

The preoperative wire localization of non-palpable breast lesions, such as small micracalcification foci, small suspected masses (especially with internal microcalcifications) or architectural distortions (i.e. radial scar) ensure successful surgical excision at first operation and good cosmetic outcome. Mammography or US preoperative localisation, followed by radiography of the specimen permit the complete surgical excision of the lesion [4,17,18,19,20].

Considering these, all three presented cases were clinically, mammographically and US evaluated. The lesions were identified on both imaging methods. In the first case, the biopsy and the subsequent wire localisation of the lesion were performed under US real-time visual control. Histology revealed an IDC-NOS histologic grade II, associated with DCIS, nuclear grade I.

On the other hand, in the second reported case we recommended the excision of the lesion, because the mammographic appearance of the radial scar is indistinguishable from carcinoma. We preferred to locate the lesion under stereotactic guidance prior to surgical excision. This may provide lower histological errors than CNB. A radial scar with associated tubular carcinoma was found.

Literature reports have revealed that 10–12% to 30-75% of all breast carcinomas are multifocal/multicentric, depending on the screening, and about 11% of these patients have axillary lymph node involvement [21,22].

Careful reevaluation of the third case led to the correct decision of mastectomy with ALND instead of breast conserving surgery. Histologically, multiple foci of ductal invasive and in situ carcinoma were found.

Conclusions

We strongly recommend multidisciplinary collaboration among experienced breast cancer specialists. Interdisciplinary team is the most important factor in achieving the maximum benefit in breast cancer diagnosis and management.

Acknowledgements

This paper is partially supported by the Sectoral Operational Programme Human Resources Development, financed from the European Social Fund and by the Romanian Government under the contract number POSDRU/89/1.5/S/60782.

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