

Synchronous Breast Cancer, Rare Subtypes

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Synchronous and metachronous breast cancer usually occur in patients with a previous history of breast cancer and positive family history of breast cancer. Self-examination and screening programs significantly helped in increasing the detection rates and improving the prognosis in such cases. The most common pathology found in synchronous bilateral breast cancer is infiltrating ductal carcinoma.

We report a case of a sixty-seven-year-old female with a lump in the right breast of one-month duration. Mammogram and ultrasound (US) of both breasts were performed and showed bilateral synchronous breast malignant lesions (BI-RADS 5). Ultrasound guided biopsy was performed for both lesions and the pathology was medullary carcinoma in the right breast and mucinous carcinoma in the left breast.

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The incidence rate of bilateral synchronous and metachronous breast cancer was 0.8% to 3% and 7.0%, respectively, which was less common than the overall incidence of bilateral breast cancer^{1,2}.

Synchronous breast cancer is mostly defined as two tumors diagnosed within 1, 2, 3 and 6-month intervals. Metachronous breast cancer is diagnosed after 6 months of the primary diagnosis. However, few studies suggested that synchronous breast cancer is detected within one-year^{1,3}.

Synchronous and metachronous breast cancer usually have a worse prognosis and are commonly associated with local lymph node invasion and lymphatic spread, and hematogenous metastasis to the lungs, bones and liver^{1,2}. A positive history of previous breast cancer significantly increases the risk of occurrence of contralateral breast cancer⁴. Screening and breast self-examination play a major role in the early detection and treatment of bilateral breast cancer¹.

The aim of this report is to present a case of a sixty-seven-year-old female with bilateral synchronous breast malignant lesions.

THE CASE

A sixty-seven-year-old female, known case of Diabetes Mellitus (DM) and hyperlipidemia, presented with right breast hard swelling which she noticed since one month. It was associated with breast asymmetry, the right being larger than left. Clinical examination revealed a firm mass in right the breast, measuring approximately 11 cm, partially adherent to the skin, seen at 2 to 6 o'clock position. The nipples and areolas were normal. The patient had a positive family history of dermatological malignancy, but no family history of breast cancer.

Mammogram and ultrasound breast were performed. The mammogram revealed right lower inner quadrant (LIQ) rounded dense, spiculated mass with surrounding distortion measuring 9.3x10 cm, no overlying microcalcification. It was associated with multiple enlarged right axillary lymph nodes with dense cortex. The left breast upper outer quadrant (UOQ) at 3 o'clock position revealed a dense, irregular spiculated outline lesion suggestive of malignancy. The mammogram revealed BI-RADS 5, highly suggestive of malignancy, see figure 1 (A and B).

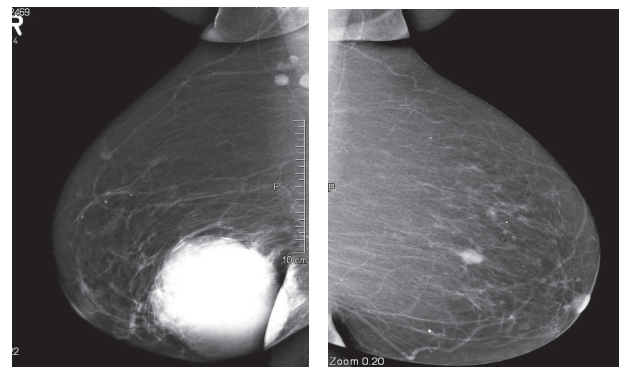


Figure 1 (A)

Figure 1 (B)

Figure 1 (A-B): Mammogram of the Right and Left Breast (A) Mammogram of the Right Breast in MLO View Reveals Right LIQ Rounded Dense Spiculated Mass Surrounded by Distortion, the Mass is Abutting the Pectoralis Major Muscle, measuring 9.3x10 cm, associated with Multiple Enlarged Right Axillary Lymph Nodes with Dense Cortex (BI-RADS 5) (B) Mammogram of the Left Breast in MLO View Reveals an Irregular Spiculated Outline Dense Mass Seen at 3 O'clock Position Suggestive of Malignancy (BI-RADS 5).

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Ultrasound right breast revealed a left inner quadrant (LIQ) large partially defined irregular spiculated outline cystic mass with thick irregular septations and irregular lobulated polypoidal soft tissue component within it; the septations and the solid component showed high vascularity as well within the septa, the lesions measured approximately 11.0x10.0 cm (BI-RADS 5), see figure 2 (A-D).

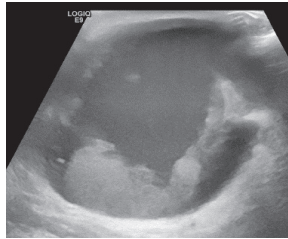


Figure 2 (A)

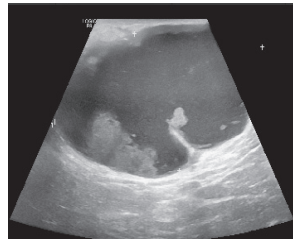


Figure 2 (B)

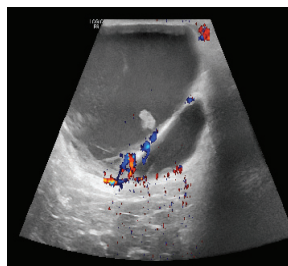


Figure 2 (C)

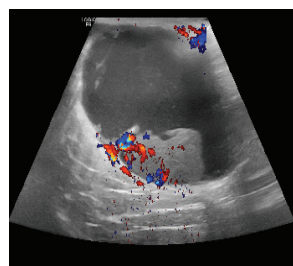


Figure 2 (D)

Figure 2 (A-D): Right Breast Ultrasound Revealed a Large Irregular Septated Cystic Mass with Irregular Lobulated Polypoidal Soft Tissue Component, on Color Coated Doppler Imaging the Septations and the Solid Component Showed High Vascularity (BI-RADS 5)

Ultrasound left breast revealed an irregular spiculated outline isoechoic oval-shaped solid mass at 3 o'clock position close to the areola, measuring 1.2x1.7 cm (BI-RADS 5), see figure 3.

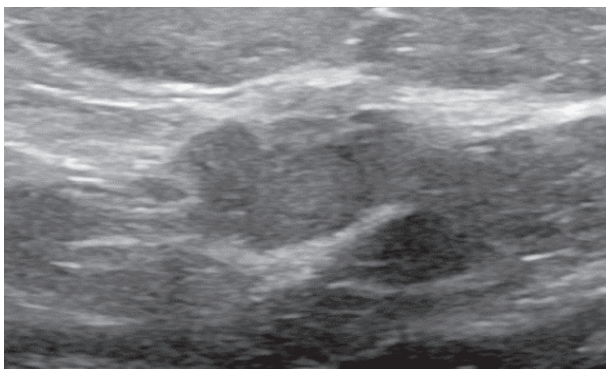


Figure 3: Left Breast Ultrasound Showed an Irregular Spiculated Outline Isoechoic Oval Shaped Solid Mass at 3 O'clock Position Close to the Areola (BI-RADS 5)

Ultrasound-guided core biopsy was performed. Fluid aspiration of the right breast lesion was performed for cytology. Bone scan, CT chest, abdomen and pelvis revealed no metastatic deposits.

The fluid aspiration cytology showed positive malignant cells, consistent with carcinoma of the breast. Histopathology of right

breast revealed medullary breast cancer, no in-situ disease and negative ER, PR and human epidermal growth factor receptor 2 (HER-2) genes. Tumor proliferative index, Ki-67 was 25-35%. No perineural invasion or lymphovascular invasion. The right axillary lymph nodes biopsy suggested reactive lymph nodes. Left breast revealed mucinous carcinoma. No in-situ disease was found, positive PR and ER and negative HER-2 genes. Tumor proliferative index, Ki-67 was 0-15%. No perineural invasion. However, it was positive for the metastatic lymph node.

The patient had a bilateral mastectomy and was then referred to chemotherapy and radiotherapy for further treatment.

DISCUSSION

Synchronous and metachronous breast cancer occur in women of similar age group, menopausal status, tumor type and genetic predisposition (HER2/neu expression). However, history of invasive breast carcinoma, positive family history of breast cancer, development of primary breast cancer at a younger age, nulliparity, environmental carcinogens, tumor stage and grade, local or distant metastasis significantly increase its occurrence^{1,2,4,8}. According to several studies, bilateral breast cancer has a worse prognosis compared to unilateral breast cancer. In view of this, screening program and early detection are essential for the early diagnosis and treatment⁷⁻¹⁰.

The most common pathology in synchronous bilateral breast cancer is infiltrating ductal carcinoma, and studies showed that it was compatible in both breasts⁹. Moreover, infiltrating lobular carcinoma subtype is also associated with bilateral and multifocal breast cancer¹¹.

Contralateral breast tumor can be either a second primary tumor or metastasis from the first primary tumor. Various studies proposed a differentiation criteria to help in diagnosing independent primary breast cancer or metastatic spread from the existing primary tumor. The criteria were as follows: a history of in-situ disease in one of the breasts, carcinoma with different histological types and grades, and absence of local or distant metastasis.

Recently, screening programs have increased the rate of detection of synchronous breast cancer. Contralateral breast cancers appear to be smaller in size and some may have ductal carcinoma in situ (DCIS) compared to primary cancer. Moreover, some studies showed that bilateral breast cancer has similar findings on mammogram in terms of location; however, other studies reported that bilateral breast cancer has different major features. Proper mammographic and ultrasound evaluation is essential for the detection and diagnosis of synchronous breast cancer⁵.

The role of MRI in the detection of bilateral breast cancer is mainly in young patients or who are planning to undergo breast conservative surgery. It is performed to exclude multifocal or multicentric lesions³. Contrast-enhanced MRI of the breasts has high sensitivity and specificity of 99% and 89%, respectively. It has been found that contrast-enhanced MRI has a high detection rate of non-palpable contralateral breast cancer lesions which are not seen in ultrasound or mammogram.

Furthermore, ductal carcinoma in-situ is usually diagnosed by contrast-enhanced breast MRI⁶.

In our case, the right breast showed medullary cancer and the left breast showed mucinous carcinoma. Medullary breast cancer is a rare subtype of breast cancer. A review study between medullary breast cancer and infiltrating ductal carcinoma found higher histological grading, yet, negative estrogen and progesterone receptor and negative HER-2 (triple-negative breast cancer).

The medullary breast cancer has shown less local invasion than infiltrating ductal carcinoma¹². On the other hand, mucinous breast cancer is usually detected in women between 55 to 60 years of age. It accounts for approximately 1-4% of malignant breast cancer. Mucinous breast cancer is seen as a well-circumscribed lesion on imaging. It is considered low-grade if associated with hormone receptors (estrogen in 91–94%, progesterone in 79–81%), or negative HER2. Lymph nodes involvement is less frequently seen with this type of cancer, although in our case, positive metastatic lymph node was detected. Medullary breast cancer and mucinous breast cancer have an overall good prognosis compared to infiltrating ductal carcinoma^{12,13}.

Treatment options of synchronous breast cancer are usually chosen based on the primary tumor that shows high-risk characteristics, such as tumor size, tumor grade, lymphovascular invasion, hormone receptor status, etc¹. Synchronous breast cancer patients frequently undergo bilateral mastectomy instead of breast conservative surgery, despite some reports finding that less invasive procedures had better efficacy in the management of bilateral breast cancer. Nevertheless, most of the patients with synchronous or metachronous breast cancer are treated with radical surgery. Other therapeutic options include adjuvant hormonal therapy, which is based on the prevention or control of a secondary primary bilateral breast cancer¹⁰.

CONCLUSION

Family history of breast cancer increases the risk of developing unilateral and synchronous breast cancer. In our case, the patient had negative family history of breast cancer. Mammogram screening programs, adequate radiological evaluation and routine self-examination are very essential in the early detection and management of synchronous breast cancer.

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