



A Rare Case of Bilateral Synchronous Male Breast Cancer: A Multimodality Approach

Cihan Özgür¹, Baran Serdar Sunal², Nermin Tunçbilek²

¹Clinic of Radiology, Bulanık State Hospital, Bulanık, Muş, Turkey

²Department of Radiology, Trakya University Faculty of Medicine, Edirne, Turkey

ABSTRACT

Breast cancer is a rare entity in men, accounting for less than 1% of all breast cancers. Contralateral breast cancer diagnosed within 12 months of the prior breast cancer is known as bilateral synchronous breast cancer. Bilateral, synchronous male breast cancer is extremely rare and consequently there are few publications describing imaging findings of synchronous bilateral male breast cancer. We aim to raise awareness about this rare entity by presenting the clinical and pathologic findings of a 64-year-old male case with synchronous bilateral breast cancer using multimodality imaging techniques including magnetic resonance imaging. Increasing awareness of the disease will prevent delays in diagnosis and treatment.

Keywords: Breast cancer; breast ultrasonography; magnetic resonance imaging; mammography; male breast cancer; synchronous neoplasms

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Key Points

- Mammography is the first-line method and is highly sensitive and specific for breast cancer in males, similar to female breast cancer.
- Magnetic resonance imaging can be used successfully in the assessment of the male breast and its use should be recommended, especially in cases where initial imaging is indeterminate.
- Increasing awareness of male breast cancer will prevent delays in diagnosis and treatment.

Introduction

Breast cancer is a rare entity in men, accounting for less than 1% of all breast cancers (1). Contralateral breast cancer diagnosed within 12 months of the prior breast cancer is known as bilateral synchronous breast cancer (2). Bilateral synchronous male breast cancer is extremely rare, constituting 0.5% to 2.5% of male breast cancers (3, 4). Bilateral synchronous involvement is less common than metachronous involvement (5). Risk factors include positive family history, increasing age, black race, BRCA2 mutations, radiation exposure, hyperestrogenic conditions (liver diseases, obesity, alcoholism, and estrogen treatment), hypoandrogenic and testicular conditions (Klinefelter's syndrome, undescended testis, orchitis, orchiectomy), and hyperprolactinemia (6). To the best of our knowledge, there are few publications describing imaging findings in bilateral synchronous male breast cancer. Here, the aim is to raise awareness about this rare entity by presenting the clinical, pathological, and radiological features of a 64-year-old male case with bilateral synchronous breast cancer.

Case Presentation

A 64-year-old male patient was admitted with complaints of swelling in both breasts and a painless palpable mass. The patient had no family history of breast cancer. Physical examination revealed increased volume in both breasts, bilateral hard immobile masses on palpation, and nipple retraction. The patient was referred for mammography (Selenia full field digital mammography system, Hologic, Bedford, MA, USA) and breast ultrasonography (US) (PLT-1005BT linear array transducer 5.0-14.0-MHz, Aplio 500 unit, Toshiba Medical Systems, Tokyo, Japan) examinations. Mammography showed a spiculated mass lesion in the retroareolar region of the right breast. An irregularly shaped and

Corresponding Author:
Cihan Özgür; cihanozguritf@gmail.com

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199

irregularly contoured mass with segmental, malign microcalcifications extending from the retroareolar region to the lower and inner quadrants was seen in the left breast (Figure 1). Left axillary and left interpectoral lymphadenopathy was noted. The mass lesions in both breasts were solid on US examination. The masses had multilobulated contours and a hypoechoic internal structure. The masses and both lymphadenopathies were found to be hypervascular on Doppler US (Figures 2 and 3).



Figure 1. Mediolateral oblique mammography shows mass lesions in both breasts and left axillary and interpectoral lymphadenopathy (arrows)

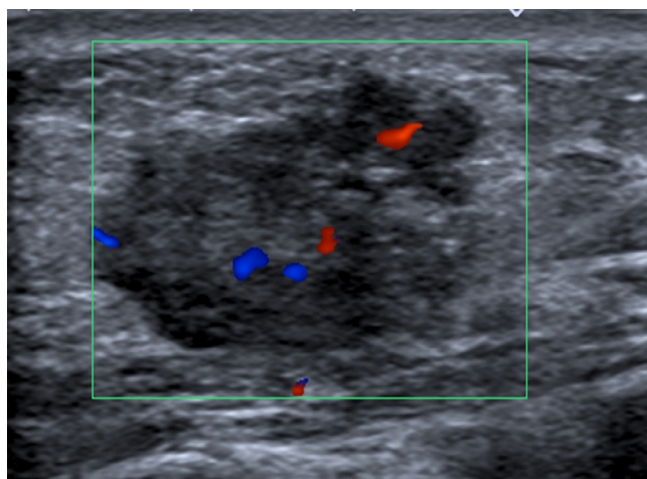


Figure 2. The mass lesion in the left breast was multilobular, hypervascular and had partly indistinct borders

Magnetic resonance imaging (MRI) was undertaken with T2, diffusion-weighted, precontrast and dynamic contrast-enhanced subtraction T1-weighted images with fat suppression sequences. MRI (1.5T MRI unit, Aera, Siemens Medical Systems, Erlangen, Germany) demonstrated bilateral malignant masses that had decreased signal intensity on the T2W image. The lesions demonstrated a malignant type of enhancement after administration of contrast material, with avid, early enhancement and a following uptake plateau (Figures 4 and 5). In addition, the mass in the right breast extended to the pectoral muscle. However, there was no signal change suggesting pectoral muscle invasion (Figure 6).

The patient subsequently underwent bilateral ultrasound-guided core needle biopsy (16 G Estacore Automatic Biopsy Needle, Geotek, Ankara, Turkey), revealing pathology consistent with the lesions to be moderately differentiated invasive ductal carcinoma. Immunohistochemical examination revealed a progesterone receptor-positive (70%), estrogen receptor-positive (90%) carcinoma with Ki-67 index of 30%. Human epidermal growth factor receptor 2 (HER-2) status of the tumor was equivocal (score +2). Preoperative genetic testing revealed the patient to be negative for mutations in the breast cancer 1 (*BRCA1*) and breast cancer 2 (*BRCA2*) genes. The

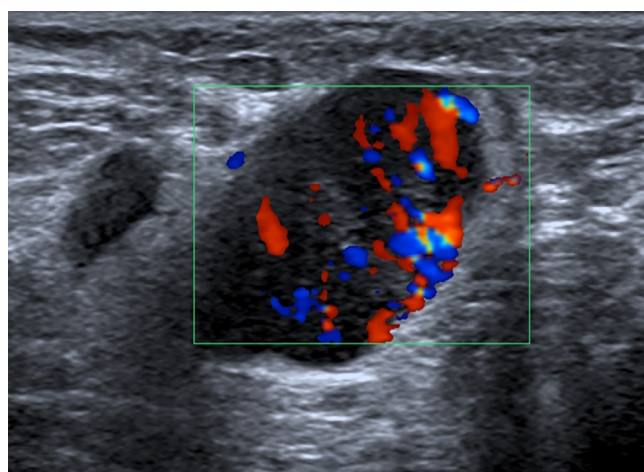


Figure 3. On Doppler ultrasonography, axillary lymphadenopathy was hypervascular

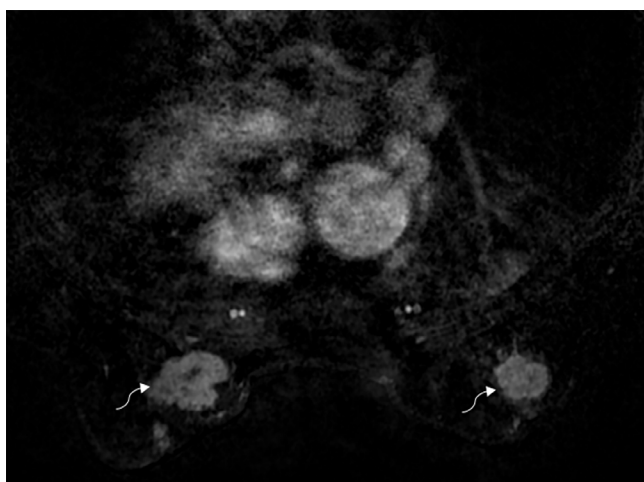


Figure 4. Hypervascular mass lesions are evident on dynamic, contrast-enhanced subtraction T1-weighted magnetic resonance images with fat suppression (curved arrows)

patient underwent bilateral mastectomy and axillary dissection after neoadjuvant chemotherapy. Neoadjuvant chemotherapy response was evaluated with contrast-enhanced MRI (not shown because imaging was performed at another center), and a complete response in the right breast and a partial response in the left breast was observed. Complete response was obtained in the right breast and axilla after neoadjuvant chemotherapy and no tumor focus was detected on subsequent postoperative histopathological examination. A tumor focus of 6 mm in diameter was seen in the left breast with a Ki-67 index of 4%. However, the focus was strongly positive for both progesterone receptor (90%) and estrogen receptor (90%). Metastasis was detected in one lymph node in the left axilla. Adjuvant external radiation therapy and tamoxifen were given. The patient was followed up with US and thoracoabdominal computed tomography (CT). The patient was disease-free during one-year of follow-up.

Discussion and Conclusion

The lifetime risk for breast cancer in men is about 1:1000 (7). Male breast cancers differ from female breast cancers in some aspects. The mean age at diagnosis is 67 years, which is 5 years older than women. The mean tumor size is usually greater, and nodal involvement,

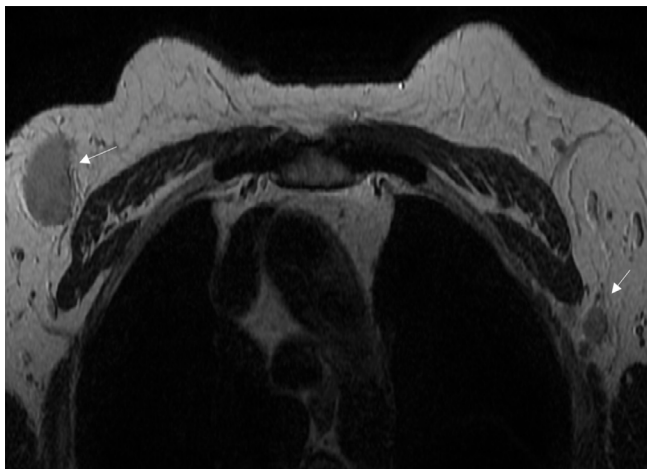


Figure 5. Bilateral axillary lymphadenopathies are seen on the T2-weighted magnetic resonance image

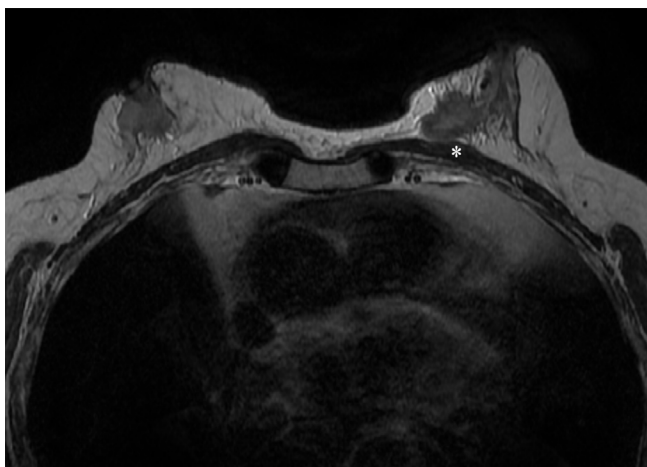


Figure 6. Although the right breast mass extended posteriorly to the pectoral muscle, there was no signal change, suggesting an absence of muscle invasion (asterisk)

androgen, and estrogen receptor positivity are more common in male breast cancers (8-10). The most common type of breast cancer is invasive carcinoma, and the most common histological type is invasive ductal carcinoma (11). Survival is lower in patients who are elderly at the time of diagnosis, have advanced disease, and have triple-negative cancer than in those who do not have these characteristics (12). Painless retro-areolar mass, nipple retraction, bloody nipple discharge, skin ulceration, and palpable axillary lymphadenopathy are the most common signs in male breast cancer (13). Imaging findings in male breast cancers are similar to those of females. However, the literature on the use of MRI in male cases is limited. The imaging findings in our case were compatible with the literature. Although the routine use of MRI in male breast cancer cases is not recommended, it may provide significant benefit in selected cases, especially in cases with axillary lymphadenopathy in which US and mammography are negative, in the evaluation of neoadjuvant chemotherapy, chest wall involvement, and postoperative residual evaluation (14). Since randomized prospective studies have not been conducted due to the rarity of the disease, treatment approaches are based on the treatment approaches in female breast cancer cases. Unlike breast-conserving approaches in female patients with early-stage breast cancer, the tendency to perform mastectomy and axillary lymph node dissection/sentinel lymph node biopsy are more common in male breast cancer cases (15). In contrast to earlier reports, our case highlights the role of neoadjuvant chemotherapy in male breast cancer treatment. Breast cancer in males is diagnosed at a later stage due to factors including a lack of screening programs due to non-cost-effectiveness, low awareness, and less breast tissue in men compared to women (6). Increasing awareness of the disease among clinicians will prevent delays in diagnosis and treatment.

Informed Consent: It was obtained from the patient.

Peer-review: Externally peer-reviewed.

Authorship Contributions

Concept: C.Ö., N.T.; Design: C.Ö., N.T.; Data Collection and/or Processing: B.S.S.; Analysis and/or Interpretation: N.T.; Literature Search: C.Ö., B.S.S.; Writing: C.Ö.

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