

Bilateral breast cancer with a unilateral carcinoma within a fibroadenoma: A case report

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Abstract. Fibroadenomas are a type of benign tumor that occur in young women below the age of 35 years old. The tumors are the second most common type of tumor after fibrocystic disease. The chance of carcinoma arising in a fibroadenoma is extremely low. To date, <130 such cases have been reported. Previous studies have reported that fibroadenomas can evolve into a number of different types of malignancy. The present study is the first to describe a case of bilateral primary breast cancer with a unilateral invasive ductal carcinoma within a fibroadenoma. The current study presents a case of a 48-year-old female who presented with 2 stiff lumps on bilateral breasts, diagnosed as bilateral breast carcinoma, with a unilateral invasive ductal carcinoma within a fibroadenoma in the right breast. The patient underwent a bilateral mastectomy and subsequently received 4 cycles of chemotherapy (epirubicin, 60 mg/m² and cyclophosphamide, 600 mg/m²) every 21 days, followed by 4 cycles of docetaxel chemotherapy (100 mg/m²) every 21 days. The patient then received maintenance endocrine therapy (tamoxifen, 20 mg, twice daily) for 19 months. The patient was followed up every 3 months, and at the last follow-up examination in May 2015, the patient exhibited no signs of recurrence.

Introduction

Breast cancer is the leading cause of cancer-associated mortality among females worldwide, accounting for ~1.7 million cases and 521,900 mortalities in 2012 (1), and invasive ductal carcinoma is the most common pathological type (1). The relative five-year survival rate of invasive ductal carcinoma ranges from 12% in parts of Africa to ~90% in the United States, Australia and Canada (2). At Hubei Cancer Hospital (Wuhan, China), the patients with breast cancer often present with a painless mass

in the breast and the most commonly used examination method is mammary ultrasonography. Currently, the therapeutic methods used for breast cancer include surgery, chemotherapy, radiotherapy, endocrine therapy and targeted therapy (3). Fibroadenomas are a type of benign tumor that occur in younger women below the age of 35 years old. The tumors are the second most common type of tumor after fibrocystic disease (4). The chance of a carcinoma arising in a fibroadenoma is 0.1-0.3% (5). Previous studies have reported that fibroadenomas can evolve into different types of malignancy, such as lobular intraepithelial neoplasia, lobular carcinoma *in situ*, malignant phyllodes tumors and microinvasive lobular carcinoma (4,6-9). However, to the best of our knowledge, the present study is the first to report a case of bilateral primary breast cancer with a unilateral invasive ductal carcinoma within a fibroadenoma. Lumpectomy is the most frequent treatment for fibroadenoma, with a good prognosis in most cases (10-12). The current case of breast carcinoma within a fibroadenoma is indeed a rare mammary tumor. Written informed consent was obtained from the patient for the present study.

Case report

A 48-year-old female presented with a 3.0-cm palpable, well-circumstanced, rough, stiff lump in the upper outer quadrant of the left breast, and a 2.0-cm palpable, smooth and mobile lump in the upper inner quadrant of the right breast. Clinical examination for other palpable masses in the breasts was negative, and there was no axillary lymphadenopathy. Breast ultrasonography revealed a poorly-defined palpable solid lesion (3.0 cm in diameter) in the left breast with the sonographic features of a malignant tumor, and a well-defined solid lesion (2.0 cm in diameter) with the sonographic features of a hypoechoic mass and calcification in the right breast (Fig. 1). The patient underwent surgery, during which the lesions were removed, and the frozen tissue sections were pathologically examined. Gross examination of the mass of the right breast revealed a smooth mass with a clear capsule, with the traits of a benign tumor (Fig. 2). The intraoperative histopathology revealed bilateral breast carcinoma; therefore, a bilateral mastectomy was performed and the axillary lymph nodes of each side were excised. The final pathological report revealed an invasive 2x3-cm² lobular carcinoma of the left breast, without metastasis to the axillary lymph nodes (0/14). According to the American Society of Clinical Oncology/College of

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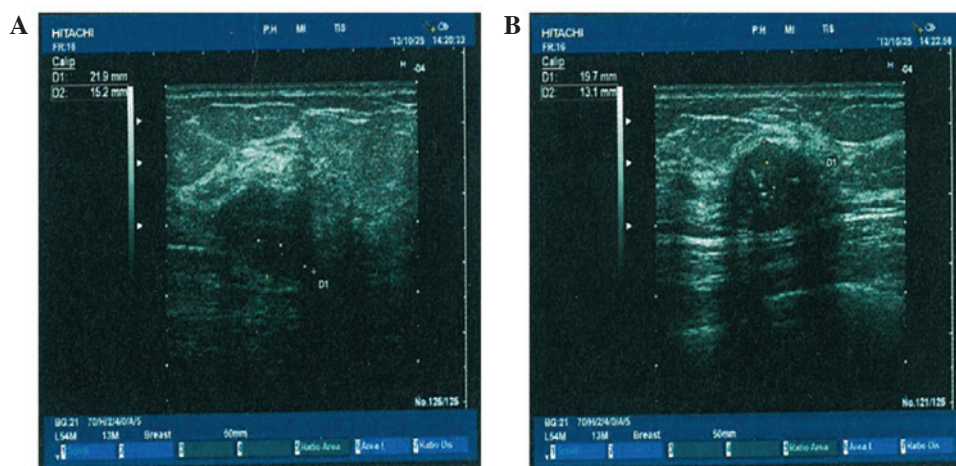


Figure 1. Breast ultrasonography showing the presence of masses within (A) the left breast and (B) the right breast.

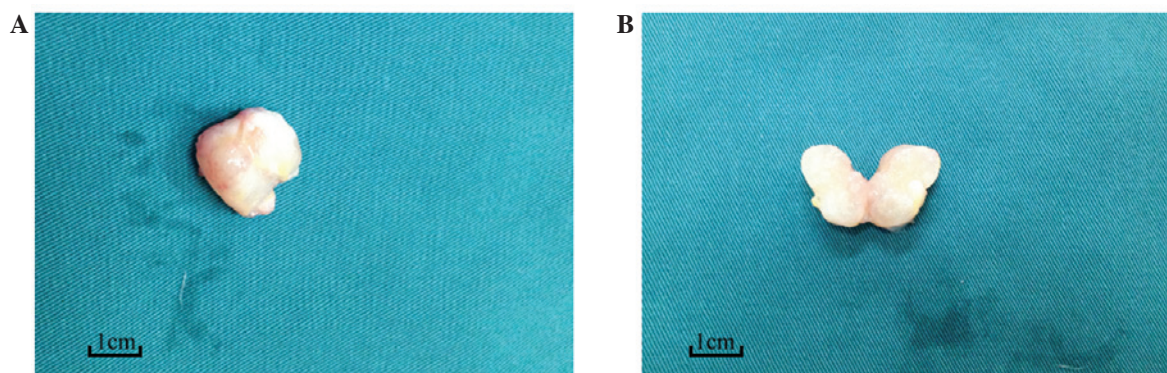


Figure 2. Gross examination of the right-sided breast mass. (A) Gross appearance, a smooth mass with a clear capsule. (B) Cut surface, bulging with a whorled appearance.

American Pathologists Guideline Recommendations for Immunohistochemical Testing (13,14), immunohistochemical assay of the tumor in the left breast revealed the following: Estrogen receptor (ER)(-), progesterone receptor (PR)(-), human epidermal growth factor receptor 2 (HER2)(3+) and a Ki-67 labeling index (LI) of 60%. However, a 1.5x2-cm² carcinoma was present within a fibroadenoma on the right breast (mixed with invasive ductal carcinoma, grade II, without metastasis to the axillary lymph nodes) (0/16). Microscopically, the elements of fibroadenoma and carcinoma could be observed in the pathological tissue slides (Fig. 3). A second immunohistochemical assay of the tumor in the right breast showed the following: ER(+), PR(+), HER2(+) and a Ki-67 LI of 50%. The patient received 4 cycles of chemotherapy (epirubicin, 60 mg/m² and cyclophosphamide, 600 mg/m²) every 21 days and then following four cycles chemotherapy of docetaxel (100 mg/m²) every 21 days. The patient then received endocrine therapy (tamoxifen, 20 mg, twice daily) as maintenance for 19 months. The patient had follow-up reviews once every 3 months, and has not exhibited any signs of recurrence up to the latest follow-up appointment on May 10, 2015.

Discussion

Carcinoma arising within a fibroadenoma is a rare and unique subtype of mammary cancer, which was reported by

Buzanowski-Konakry *et al* in 1975 (15). To date, <130 cases have been reported in the literature (16-19).

According to the known diagnostic criteria, the present case conforms to the diagnosis of synchronous bilateral primary breast cancer. However, the case is particularly unusual, as unilateral breast invasive ductal carcinoma arising within a fibroadenoma also occurred. Compared with the cases reported in the above-mentioned literature that included carcinoma *in situ* and invasive lobular carcinoma arising within a fibroadenoma (9,15,16), the current case presented invasive ductal carcinoma arising within a fibroadenoma with contralateral invasive lobular carcinoma. To the best of our knowledge, no such case has been reported previously in the literature. In the present case, two mutually separated cancerous nodes existed in the bilateral breast, and each possessed different pathological traits. While the tumor on the left was an invasive lobular carcinoma, the tumor on the right was a carcinoma within a fibroadenoma mixed with invasive ductal carcinoma. Gross examination revealed that the mass on the right possessed most of the traits of a benign tumor, which was misdiagnosed as fibroadenoma by a clinical doctor. Therefore, the breast masses could not be identified by physical and gross examinations alone. Further imaging tests and an excision were necessary to obtain a clear diagnosis. The patient was administered routine therapy regimens, which is the same treatment method as that used for the other breast cancer

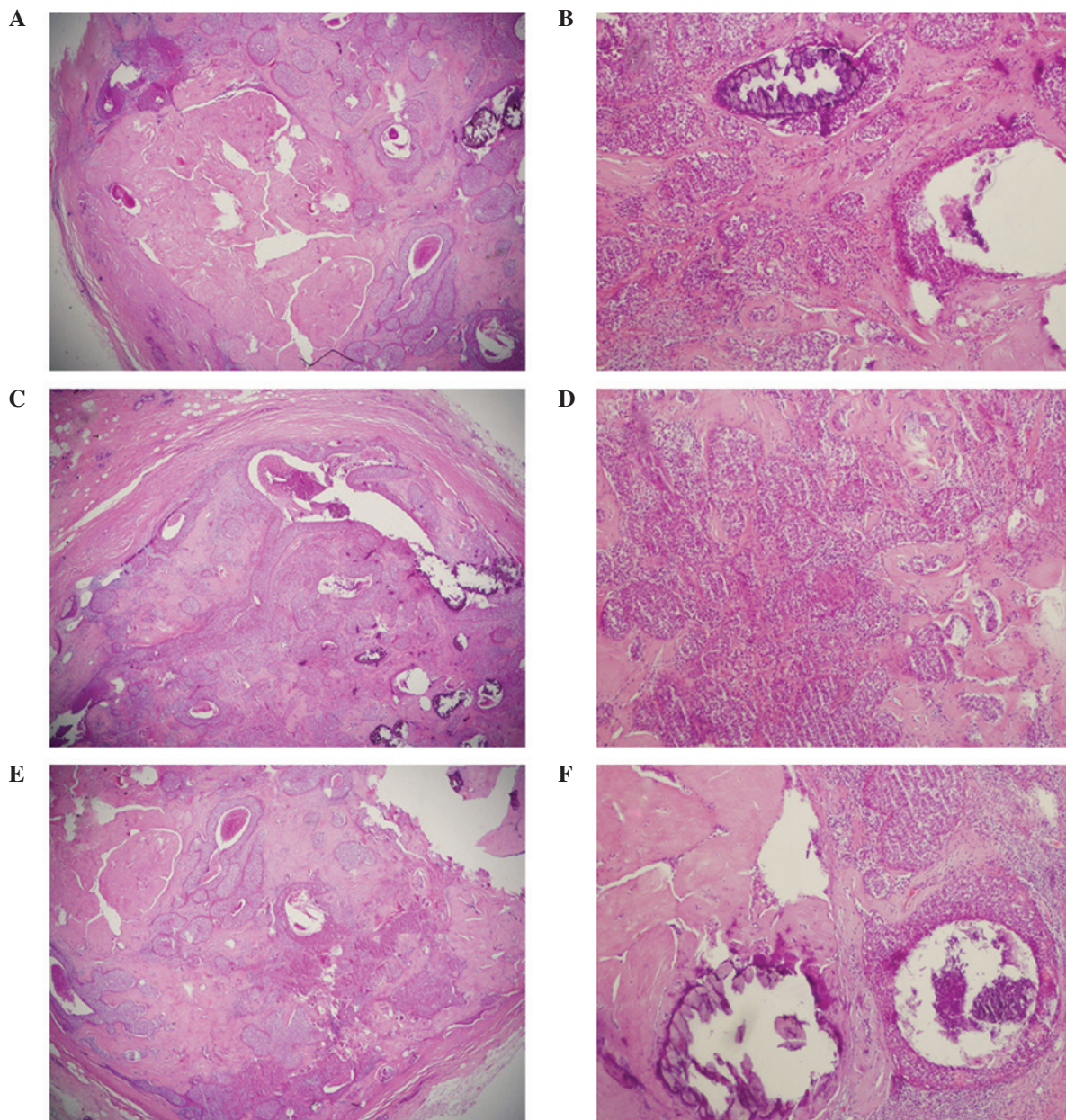


Figure 3. Microscopic examination of the carcinoma within the fibroadenoma. (A) Invasive ductal carcinoma with focal comedo necrosis and fibroadenoma (magnification, x100). (B) Infiltrating islands of malignant ductal epithelial cells and fibroadenoma (magnification, x200). (C) Fibrous connective tissue capsule and carcinoma (magnification, x100). (D) Infiltrative ductal carcinoma and inflammatory cells in the stroma (magnification, x200). (E) Widespread and dense invasive ductal carcinoma with numerous calcified bodies overlapping between fibroadenoma and invasive ductal carcinoma (magnification, x100). (F) Cancer cell nests, composed of invasive ductal carcinoma, evolved from fibroadenoma (magnification, x200).

patients. Few studies have reported the prognosis of this type of breast cancer (20). The present patient has been closely followed up for 19 months and has not exhibited any signs of recurrence.

There are no rules guiding the therapy of a carcinoma within a fibroadenoma. Thus, it is essential to accumulate further case studies like the present study in order to be able to treat such cases with evidence-based medicine.

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