Singapore Med J 2012; 53(11) : e240

Synchronous unilateral infiltrating ductal and lobular breast carcinoma

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ABSTRACT The incidence of synchronous bilateral infiltrating breast cancer has been reported to be 2%. However, synchronous unilateral infiltrating ductal carcinoma and infiltrating lobular carcinoma (ILC) are very rarely reported. We present a woman with palpable ILC who was later found to have synchronous well-circumscribed ductal carcinoma on further imaging. We also discuss the use of diagnostic approaches such as ultrasonography, mammography and histopathology. This case highlights the importance of careful assessment of concurrent lesions in the breast in the presence of an existing carcinoma.

Keywords: infiltrating breast carcinoma, imaging, mammogram, MRI breast, ultrasound
Singapore Med J 2012; 53(11): e240–e243

INTRODUCTION

The incidence of synchronous bilateral infiltrating breast cancer has been reported to be 2%.[1] However, synchronous unilateral infiltrating ductal carcinoma (IDC) and infiltrating lobular carcinoma (ILC) are very rarely reported. We present such a case and discuss the use of diagnostic approaches such as ultrasonography, mammography and histopathology.

CASE REPORT

A 63-year-old nulliparous Asian woman presented with a six-month history of a painful right breast lump. She did not give any history of being on oral contraceptives or hormone replacement therapy. There was no family history of breast carcinoma. However, her sister was diagnosed with carcinoma of the endometrium at the age of 60. On examination, there was a 5 cm x 6 cm palpable lump at the right lower outer quadrant with right axillary lymphadenopathy. The overlying skin was fixed and the nipple was retracted. Another 2 cm x 2 cm mobile lesion was palpated at the right upper inner quadrant.

Bilateral mammogram revealed two large spiculated, high-density lesions in the mid and lower inner quadrants, close to the chest wall with associated right axillary lymphadenopathy (Fig. 1). Supplementary ultrasonography of the right breast showed a large hypoechoic mass at the retroareolar region at the 6 o'clock position, with acoustic shadowing and infiltration of the underlying pectoralis muscle (Fig. 2). This was reported to be highly suspicious for carcinoma (BIRADS 5). Another well-defined hypoechoic mass with smooth margins measuring 1.7 cm x 1.3 cm was noted at the 12 o'clock position (Fig. 3). Although this smaller lesion appeared to be benign on ultrasonography, its spiculated appearance on mammogram was suspicious, and this lesion was considered to represent multifocal or metastatic disease. Trucut biopsy for the larger mass at 6 o' clock was performed and revealed as an ILC. The patient was staged as T4 N1 Mx, and a right mastectomy and an axillary clearance were performed. The mastectomy specimen was sent for histopathological confirmation.

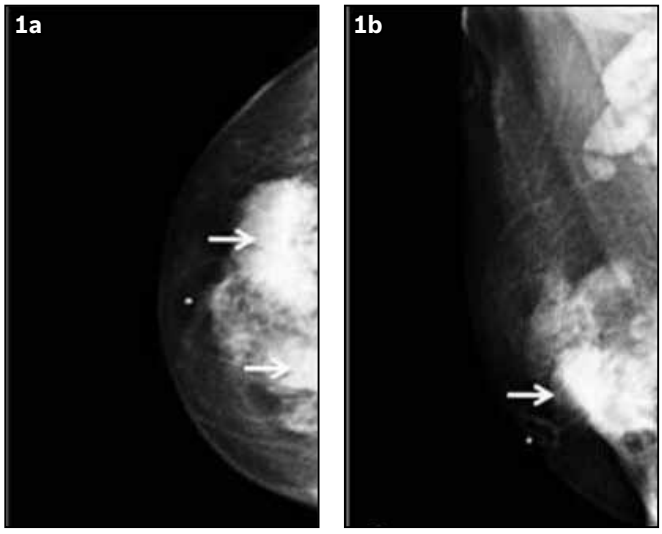

Fig. 1 Right mammogram (a) craniocaudal and (b) mediolateral oblique views show spiculated, high-density lesions with associated stromal distortion in the outer and inner quadrants (white arrows), and enlarged right axillary lymphadenopathy. No suspicious microcalcification was demonstrated.

Histopathological examination revealed two different pathologies. The smaller tumour in the upper midline was confirmed to be an IDC measuring 2.0 cm x 2.0 cm x 2.0 cm on macroscopic examination (Fig. 4a). There was moderate tubule formation, moderate to severe nuclear pleomorphism and about 20 mitotic figures. It was categorised as Bloom-Richardson grade III, with evidence of lymphovascular permeation. The larger tumour at the lower outer quadrant (Fig. 4b), which measured 5.0 cm x 5.0 cm x 3.0 cm on gross examination, showed individual

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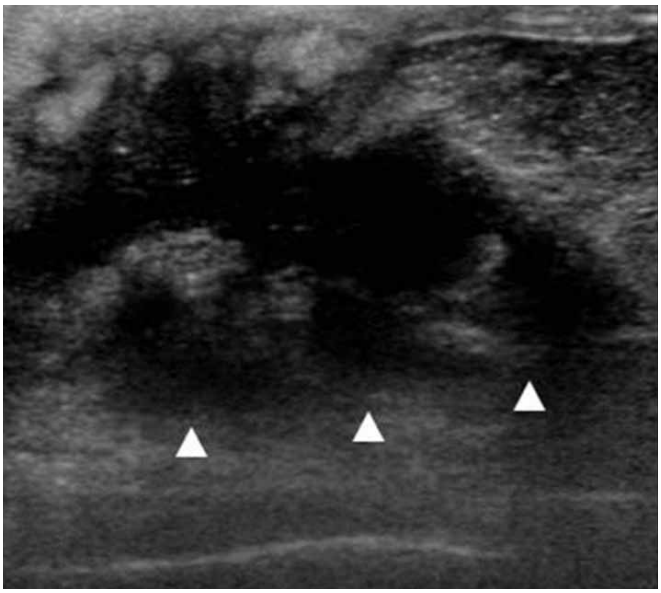

Fig. 2 Greyscale US image of the right breast shows an irregular hypoechoic lesion at the retroareolar region extending towards the 6 o'clock position and measuring 5.2 cm x 3.1 cm. The chest wall appeared to be infiltrated by this histologically proven infiltrating lobular carcinoma (white arrowheads).

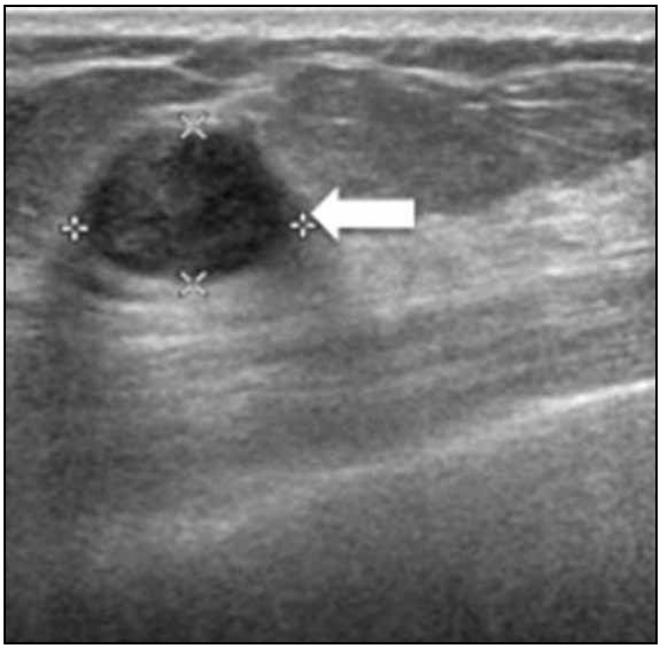

Fig. 3 Greyscale US image of the right breast shows a well-defined hypoechoic mass (white arrow) at the 12 o'clock position, measuring 1.7 cm x 1.3 cm. This lesion was proven to be an infiltrating ductal carcinoma.

malignant cells arranged in a single-file pattern and moderate nuclear pleomorphism with about 20 mitotic figures per 10 high-power fields (hpf). The E-cadherin stain was negative, except for a few benign entrapped glands seen that stained positive. This was diagnosed as ILC (pleomorphic variant). Hormone receptor statuses for both tumours were positive for oestrogen receptor, focal positivity (about 30%) for progesterone receptor and cerbB-2 was not overexpressed. Mastectomy specimens revealed both lesions to be approximately 5.0 cm apart, with infiltration of the lobular carcinoma into the chest wall

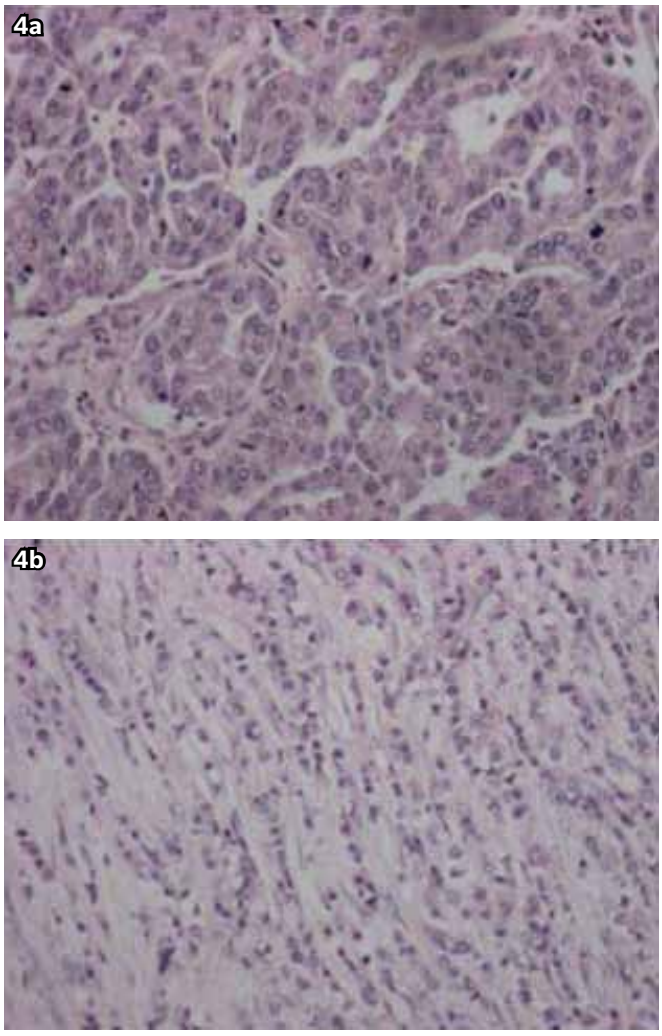

Fig. 4 Photomicrograph of (a) sections of the smaller tumour (in the upper mid quadrant) shows an IDC with moderate tubule formation and moderate to severe nuclear pleomorphism (Bloom-Richardson grade III) (Haematoxylin & eosin, x 10); (b) the larger tumour (in the lower outer quadrant) shows an ILC with individual malignant cells arranged in a single-file pattern, and moderate nuclear pleomorphism (Haematoxylin & eosin, x 10).
IDC: infiltrating ductal carcinoma; ILC: infiltrating lobular carcinoma

and metastatic carcinoma within the apical and axillary nodes.

DISCUSSION

Synchronous cancers are defined as the simultaneous occurrence of two or more cancers that are distinct from each other, i.e. of different histological types and where neither can originate from the metastasis of another tumour.[2] Our patient's condition was consistent with the abovementioned definition of synchronous cancer, and she had both primary cancers occurring in one breast.

The majority of infiltrating breast carcinomas are categorised as IDC, and they account for 65% of cases. The second most common histological subtype is ILC, which accounts for 10%–15% of cases. This case report details the rare occurrence of a synchronous unilateral IDC and an ILC in our patient. To the best of our knowledge, only one such case has previously been reported.[3]

This patient presented with two masses in a single breast. The larger mass, which was histologically proven to be an ILC, had the clinical characteristics of malignancy, such as nipple retraction and skin hardening. The smaller mobile mass, which was clinically indeterminate and had the sonographic appearance of a benign lesion, was eventually proven to be an IDC. Mammographically, both lesions presented as spiculated masses that were seen in both the craniocaudal and mediolateral oblique views (Figs. 1a & b). A comparative analysis done by Cornford in 1995[4] on the mammographic appearances of IDC and ILC showed that spiculated masses were the most common finding in both IDC and ILC. Architectural distortion and asymmetry are the next two most common manifestations of ILC in mammography,[5] and these were also seen in our patient. We also found no significant difference in the imaging features of masses in patients with ILC and IDC on mammography.[4]

The ILC lesion in our patient had the typical sonographic features of an irregular hypoechoic lesion (Fig. 2). Pleomorphic ILC, the histological subtype in this case, is typically seen as a shadowing mass (another feature that was also seen in our patient). A lobulated, well-circumscribed mass is likely to represent the signet ring, alveolar and solid subtypes of ILC.[6] In a large series of ILC patients reviewed by Butler,[6] 71 (88%) out of 81 tumours were visible sonographically. The most common ultrasonographic manifestation of ILC was an irregular mass with hypoechoic, heterogenous internal echoes and posterior shadowing – findings which were reported in 69% of cases. In 10 out of 71 cases (14%), the tumour appeared as a lobulated, well-circumscribed mass.

IDCs are typically identified as an irregular spiculated mass or as a new focal asymmetry on mammography and ultrasonography.[7] Distortion of the breast parenchyma and malignant microcalcifications are the other commonly reported features.[7] It is very rare that IDC presents as a well-circumscribed mass, as seen in our patient (Fig. 3).[7] Only 2% of well-circumscribed lesions have been shown to be malignant.[7] This is usually a feature of medullary, tubular or mucinous carcinomas.[7] However, the lesion in our patient was spiculated in nature in the corresponding mammography, thus favouring a malignant diagnosis. Histopathology, which was the final approach in obtaining a definitive diagnosis in our patient, confirmed the two primary cancers. Due to the extensive nature of the lobular carcinoma on core biopsy, a mastectomy was performed in our patient. It was only on histological examination of the mastectomy specimen that the presence of a second malignancy was revealed. It is important to note that in the presence of an existing carcinoma, any other lesion in the breast needs careful assessment. If these lesions display any suspicion of being atypical, then a biopsy of these lesions are warranted. In these instances, assessment with contrast-enhanced breast magnetic resonance (MR) imaging in addition to conventional imaging may prove useful.

Contrast-enhanced MR imaging of the breast has been shown to be more accurate than mammography in determining the extent of the disease in patients with IDC.[8] In patients with ILC, mammography and sonography have limited abilities in detecting lobular carcinomas and often underestimate the extent of the disease. In view of this limitation, MR imaging was indicated to investigate the extent of the disease and to exclude multifocal or multicentric lesions. MR imaging has a reported sensitivity of 95% in detecting ILCs. In addition, MR imaging is also helpful in detecting contralateral breast cancer and additional ipsilateral malignant findings, which can occur in up to 30% of cases of ILC. It has also been shown that surgical management of patients with ILC has been altered in 28% of patients who underwent MR imaging.[5] In breast MR imaging, the analysis of the lesion signal intensity on non-enhanced T2-weighted images, determination of enhancement pattern and kinetic curve assessment can help to differentiate benign from malignant breast lesions.[9] The description of the margin of a focal breast mass is the most predictive feature.[10] Irregular or spiculated margins have a positive predictive value of 84%–91%. Other features associated with malignancy include rim-like enhancement (positive predictive value 84%), heterogenous internal enhancement and enhancing internal septa. The specificity of breast MR imaging is improved when morphological and kinetic features are considered in the interpretation.[10]

Qualitative assessment of the enhancement kinetic curve is obtained by plotting the signal intensity values in breast tissue intensity over time after contrast material injection. Three enhancement patterns can be identified based on the signal intensity-time curve. Type I curve is a progressive enhancement pattern usually associated with a benign finding (83% benign, 9% malignant). Its sensitivity and specificity of a benign lesion are 52.2 % and 71%, respectively.[11] The type II curve is a plateau pattern with a sensitivity and specificity of 42.6% and 75%, respectively, for the detection of malignancy.[11] The type III curve is a rapid early uptake and delayed washout pattern. In 76% of cases, type III curve pattern is associated with cancer.[11]

Histologically, malignant cells in a ductal pattern with tubule formation is diagnostic of IDC, which is further graded according to the Bloom-Richardson criteria. The characteristic appearance of ILC consists of small, uniform tumour cells with round nuclei and scanty neoplasm arranged in a single-file pattern. Our patient had a pleomorphic subtype of ILC, which had a diffuse growth pattern in which the cells contain more abundant eosinophilic cytoplasm and have high grade atypia. She eventually had a mastectomy due to the aggressiveness (Bloom-Richardson grade III) and multicentricity of the disease.

We conclude that synchronous unilateral IDC and ILC are recognised presentations in patients with invasive breast carcinoma. Imaging with sonography, mammography and MR would be required for diagnosis and delineating the extent of the disease. Histopathological diagnosis would be confirmatory.

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