CASE REPORT

A case of lobular carcinoma *in situ* presenting as a solid mass¹X ZHANG, ¹N HANAMURA, ¹M YAMASITA, ¹Y KASHIKURA, ¹T OGAWA and ²S TAIZO¹Department of Breast Surgery and ²Department of Pathology, Mie University Hospital, Japan

ABSTRACT. A patient presented with a 2 cm lump in the lower outer quadrant of the left breast. Mammogram and ultrasonography showed a solid mass with a microlobulated contour, partially irregular border and microcalcifications. MRI showed an irregular mass with early enhancement and high signal intensity, and the late-phase image demonstrated a partial washout pattern. These findings suggest that the tumour was a malignant invasive carcinoma. Non-invasive ductal carcinoma was diagnosed after a fine needle aspiration and core needle biopsy followed by a partial breast excision and sentinel lymph node (SLN) biopsy. A pathological examination of the lesion displayed characteristic small monomorphic cells, solid proliferation and massive distension within the lobular unit. The tumour was immunohistochemically negative for E-cadherin and pure lobular carcinoma *in situ* (LCIS) was diagnosed. Pure LCIS is very rare and there have been no previous reports of pure LCIS forming a solid mass.

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In 1999, Frykberg reported lobular carcinoma *in situ* (LCIS) was found in 1.3% of all breast malignancies [1]. LCIS was historically thought to lack any corollary signs of mass or calcification on mammography [1–3]); however, recent studies indicate that LCIS foci can be detected on mammograms with associated calcifications [4–6]. Histologically, the lesions frequently show multifocal LCIS in a background of atypical lobular hyperplasia, ductal carcinoma *in situ* and/or invasive carcinoma. Admittedly, pure LCIS is rare and there have been no previous reports of pure LCIS forming a solid mass. Here we report a case of pure LCIS presenting as a 20 mm solid mass detected by mammography, ultrasonography and MRI.

Case report

The patient was a 64-year-old female whose screening mammograms revealed a solid mass in the left breast. A physical examination revealed a hard mass of almost 2 cm in diameter, but there was no evidence of abnormal nipple discharge, skin changes or axillary lymphadenopathy. A mammogram demonstrated a high-density mass with a microlobulated contour, partially irregular margins and microcalcifications. The mass was located in the lower outside quadrant of the left breast, and was scored as breast imaging reporting and data system (BI-RADS) Category 4 (Figure 1). An ultrasonographic evaluation showed a lobulated, non-homogenous internal echo, an irregular border and highly echogenic spots (Figure 2). The MRI showed a lobulated mass 20 mm in diameter with early enhancement high signal intensity and a washout pattern in the late-phase image, which

suggested that the tumour was a malignant invasive carcinoma (Figure 3). A fine needle aspiration and core needle biopsy were performed, and non-invasive ductal carcinoma was diagnosed.

Subsequently, the patient underwent a breast partial resection and sentinel lymph node (SLN) biopsy. Complete dissection of the axillary lymph nodes was not performed because no metastasis was found in the SLN. Macroscopically, a whitish nodular mass measuring approximately 27 × 15 mm in diameter was observed in the centre of the cut surface of the resected specimen (Figure 4). The cut margin of the specimen was negative. Upon histological examination, HE staining of the lesion revealed extensive LCIS characterised by a solid proliferation of small uniform cells with massive distension within the lobular unit. The tumour cells had indistinct cytoplasmic borders, but had clear circular nuclei (Figures 5). Immunohistochemical staining for E-Cadherin was negative. E-cadherin testing is commonly positive in ductal carcinomas but negative in lobular carcinomas and, therefore, the morphological and immunohistochemical findings were consistent with the diagnosis of pure LCIS of the breast. Immunohistochemical reactivity was diffusely positive for oestrogen receptors and progesterone receptors and absent for the expression of human epidermal growth factor receptor type 2 (HER-2).

Discussion

LCIS was first described as a distinct pathological entity by Foote and Stewart in 1941 [7]. Traditionally, LCIS does not present as a mass nor does it contain any microcalcifications on radiological imaging, and the mammography and ultrasound findings do not appear to play a role in prospectively diagnosing LCIS [1–3]. There are no characteristic macroscopic features of LCIS

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Figure 1. Mammography reveals a high-density mass with a microlobulated contour and partially irregular margin with microcalcification in the left breast. The mass was judged to be Category 4.

to guide tissue sampling, and the diagnosis of LCIS is often made as an incidental, microscopic finding after a breast biopsy for other indications. Consequently, the true incidence of LCIS in the general population is unknown and, presumably, many asymptomatic women go undiagnosed.

Although it has long been thought that LCIS is not associated with any specific mammographic findings, recent data indicates that finely stippled clusters of calcifications detected on mammography are often

associated with LCIS [4–7]. Furthermore, calcifications are seen in 21% to 67% of LCIS cases [8, 9]. Owing to the increased use of mammography and core needle biopsy, the incidence rate of LCIS has increased 2.6-fold from 1980 to 2001, 1.3-fold over the past 10 years and 1.1-fold over the past 5 years [10]. Sapino et al observed that in ten cases of LCIS detected on mammograms, nine were non-palpable and radiologically identified by the presence of calcifications [5]. In only one case, a spiculated mass was observed in a different quadrant than the one containing the calcifications, and the case was histologically diagnosed as multiple foci of LCIS associated with an invasive component. Georgian-Smith et al evaluated six cases of LCIS and observed that no mass or architectural distortion was associated with the LCIS calcifications on mammography [3]. Philpotts et al evaluated five cases of LCIS diagnosed by core needle biopsy of which two masses were detected on mammogram and three patients had calcifications [11]. Excision

Figure 2. Ultrasonography of the left breast showed a non-homogenous internal echo, which was a solid mass 18 × 14 mm in diameter with a lobulated shape, irregular borders and high echogenic spots.

Figure 3. The MRI showed a 20 mm lobulated mass with irregular margins and early enhancement high signal intensity. The late phase image demonstrated a washout pattern.

Figure 4. A macroscopic perspective of the cut surface of the tumour revealed a whitish mass with an almost clear margin border measuring approximately 27 × 15 mm in diameter in the breast tissue.

Figure 5. Histopathological findings of lobular carcinoma in situ (haematoxylin/eosin stain, × 400). The focal necrosis presented within the centre of the lobular unit. The lobular carcinoma *in situ* cells were monomorphic and evenly spaced, with unclear borders and round to oval nuclei. The cells displayed a lack of cohesion.

biopsies of the two mass lesions revealed one case of LCIS admixed with ductal carcinoma *in situ* and another case of atypical lobular hyperplasia. The other cases with associated calcifications were diagnosed as LCIS.

The diagnosis of LCIS is most common in women aged 40 to 50 years [10]. Women of this age have abundant mammary tissue, and the background parenchymal features are heterogeneous, which may obscure the lesion. In our case, the patient's glandular tissue had diminished and was replaced by fatty tissue and, therefore, the pure LCIS lesion was clearly displayed as a solid mass on mammography.

According to our research, there has been only one case report of LCIS presenting as a 9 mm nodule by mammography and ultrasonography. However, this case was not a pure LCIS, which is defined as a mass consisting primarily of LCIS with foci of DCIS [12]. There have been no reported cases of pure LCIS manifesting as a mass lesion [1, 2, 4, 13].

In conclusion, we have described the first case of a solid mass identified by mammography, ultrasonography and MRI that was considered to correlate with pure LCIS.

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