

Ductal Carcinoma-in-situ Arising within Fibroadenoma of the Breast: A Case Report, Mammographic, Sonographic and Dynamic Contrast-enhanced Breast MRI Features

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(Received: July 20, 2020; Revised: December 22, 2020; Accepted: December 30, 2020)

บทคัดย่อ: มะเร็งเต้านมชนิด ductal carcinoma-in-situ เกิดในก้อนเนื้องอกชนิด fibroadenoma: รายงานผู้ป่วย, ลักษณะภาพแมมโมแกรม, อัลตราซาวด์ และ เอ็ม อาร์ ไอ

อัญญา ก้อนทอง พ.บ.

กลุ่มงานรังสีวิทยา โรงพยาบาลมะเร็งลพบุรี ตำบลทะเลชุบศร อำเภอเมือง จังหวัดลพบุรี 15000

บทคัดย่อ

ผู้ป่วยหญิงไทยอายุ 38 ปี ได้รับการวินิจฉัยมะเร็งเต้านมด้านซ้าย รักษาโดยการผ่าตัดและยาเคมีเมื่อ 1 ปีก่อน มาตรวจแมมโมแกรมและอัลตราซาวด์เต้านมประจำปี พบว่ามีการเปลี่ยนแปลงของก้อนเนื้อที่เต้านมด้านขวา เห็นเป็นหินปูนขนาดเล็กเพิ่มขึ้นในก้อนและพบว่ามีหลอดเลือดเข้าเลี้ยงในก้อนเนื้อ จึงได้ทำการเจาะตรวจชิ้นเนื้อโดยใช้อัลตราซาวด์เป็นต้นนำ (core needle biopsy under ultrasound guidance) ผลการตรวจทางพยาธิของชิ้นเนื้อพบว่าเป็นมะเร็งเต้านมชนิด ductal carcinoma in situ ร่วมกับก้อนเนื้องอกในเต้านมชนิดไม่ร้ายแรง (fibroadenoma) จากนั้นผู้ป่วยได้รับการตรวจเอ็ม อาร์ ไอ เพื่อประเมินรายละเอียดของก้อนและรอยโรคที่นำส่งสียในตำแหน่งอื่นๆ จากนั้นทำการผ่าตัดเต้านมด้านขวาออก ผลการตรวจทางพยาธิยืนยันเป็น ductal carcinoma in situ arising in fibroadenoma ซึ่งเป็นภาวะที่พบได้ยาก

คำสำคัญ: มะเร็งเต้านมชนิด ductal carcinoma in situ, เนื้องอกในเต้านมชนิดไม่ร้ายแรง (fibroadenoma), หินปูนขนาดเล็ก

Abstract

A 38-year-old woman was diagnosed with invasive ductal carcinoma in the left breast status, following left modified radical mastectomy and chemotherapy lasting 1 year. She had undergone annual surveillance mammography and ultrasonography. Mammography revealed developed fine pleomorphic calcification within the mass and correlated Color Doppler study demonstrated internal vascularity. Core needle biopsy was done and pathological report of ductal carcinoma in situ with fibroadenoma. Pre-operative MRI was obtained. Finally, pathological diagnosis after right simple mastectomy revealed ductal carcinoma in situ arising in fibroadenoma, that is rare disease.

Keywords: Ductal carcinoma in situ (DCIS), Fibroadenoma, Fine pleomorphic calcification

Introduction

Fibroadenoma is a common, benign fibroepithelial lesion of the breast arising from the stromal and epithelial components of the lobular terminal unit¹⁻³. It may present at any age, but is most frequent in women 20 to 30 years old¹. Patients may be asymptomatic or present with a palpable lesion or radiographic abnormality¹. This tumor is frequently non-operative; follow-up⁴ and occasional surgical excision depends on clinical contexts such as rapid growth, very large size, or patient concern.

Breast cancer arising within a fibroadenoma is rare; the incidence ranges from 0.002% to 0.125% in fibroadenoma specimens⁵⁻⁷. Pathology of cancer is mostly either ductal carcinoma in-situ (DCIS) or lobular carcinoma in-situ (LCIS). Invasive cancers are reported extremely rarely⁸.

This paper reports a case of ductal carcinoma

in-situ arising within a fibroadenoma of a 38-year-old patient, found on an annual follow-up mammography, ultrasonography with further MRI Study, and pathological confirmation.

Case Report

A 38-year-old woman with underlying mental retardation was diagnosed with invasive ductal carcinoma in the left breast status, following left modified radical mastectomy and chemotherapy last 1 year. She had no symptoms and had undergone annual surveillance mammography and ultrasonography.

Mammography was performed by Selenia Dimension® Hologic mammography system in standard dual projections of craniocaudal and mediolateral oblique views. Additional spot magnification views were obtained to evaluate microcalcification. Following this, ultrasonography was done by a 12-MHz hand-held linear-

array real-time transducer (Logiq E9: GE Healthcare).

Mammography (figure 1) revealed an unchanged size of oval-shaped isodensity mass in the right inner periareolar region, measuring about 20 mm. in size that had developed fine pleomorphic calcification within the mass. Correlated sonography (figure 2) showed an oval-shaped hypoechoic mass, with a microlobulated margin at the medial aspect with internal microcalcifications. Color Doppler study demonstrated internal vascularity at the medial aspect associated with microcalcifications and a microlobulated margin area.

Core needle biopsy was performed promptly in the same session using a 14-gauge needle with a spring-activated biopsy device under ultrasound guidance. Three core tissues were obtained and send for diagnosis. The pathological diagnosis of ductal carcinoma in situ in few ducts and part of fibroadenoma.

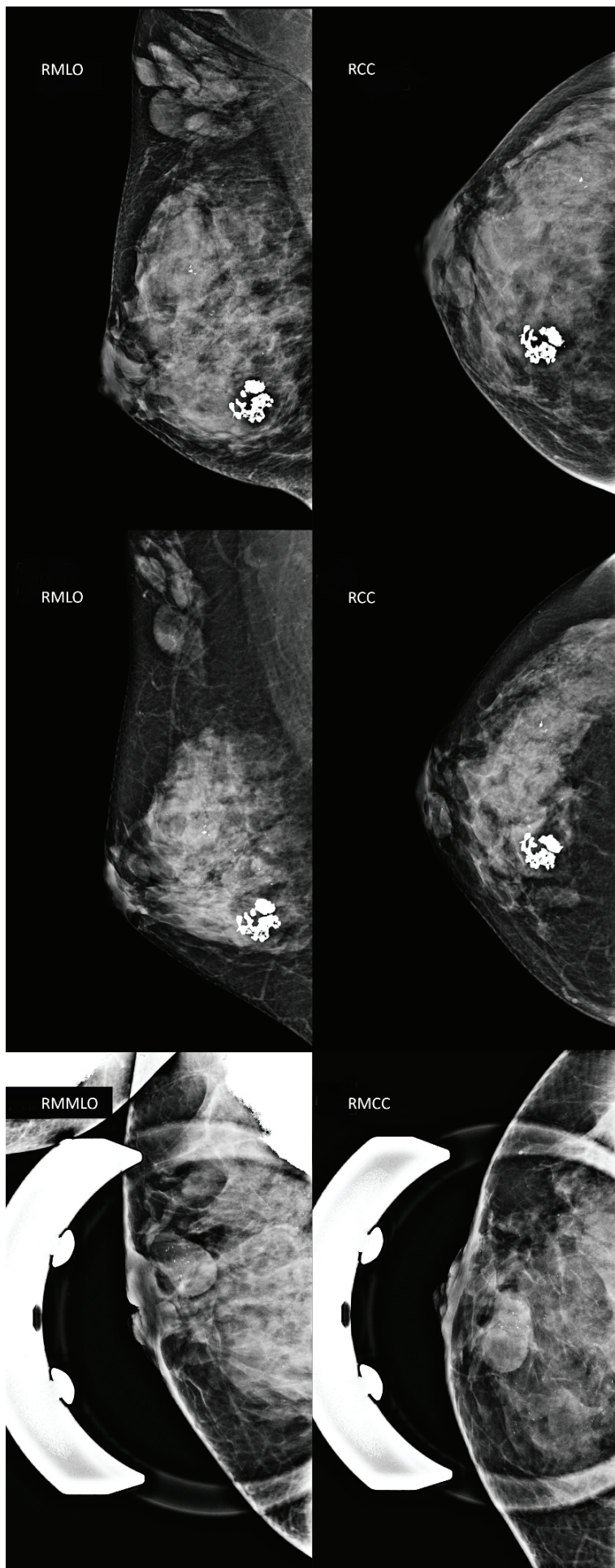


Figure 1: Prior mammography (panels A, B) showed a 20-mm, circumscribed, oval-shaped, isodensity mass in the upper-inner quadrant of the right breast on the routine mediolateral oblique and craniocaudal views (arrow).

The next annual surveillance mammography (panels C, D) showed the mass had developed microcalcifications, visible as fine pleomorphic calcifications on spot magnification images (panels E, F) microcalcifications.

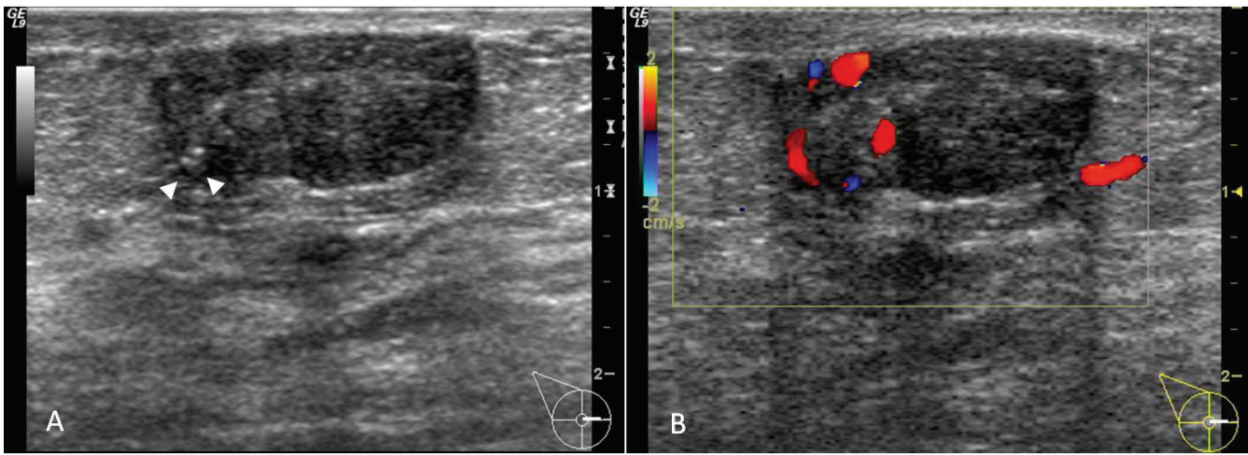


Figure 2: Gray-scale ultrasonography (panel A) showed an 18-mm, oval-shape hypoechoic mass with microlobulated margins at the medial aspect and echogenic foci consistent with calcifications (arrowheads). Color doppler study (panel B) showed focal internal vascularity at the medial aspect correlated with the area of microlobulated margins on the gray-scale image.

MRI of the breast (figure 3) reveals an 18-mm lobulated T2-hypointense mass with medial part of enhancement, which persisted from the initial phase

through the delayed phase in the inner periareolar region of the right breast on dynamic contrast-enhanced images.

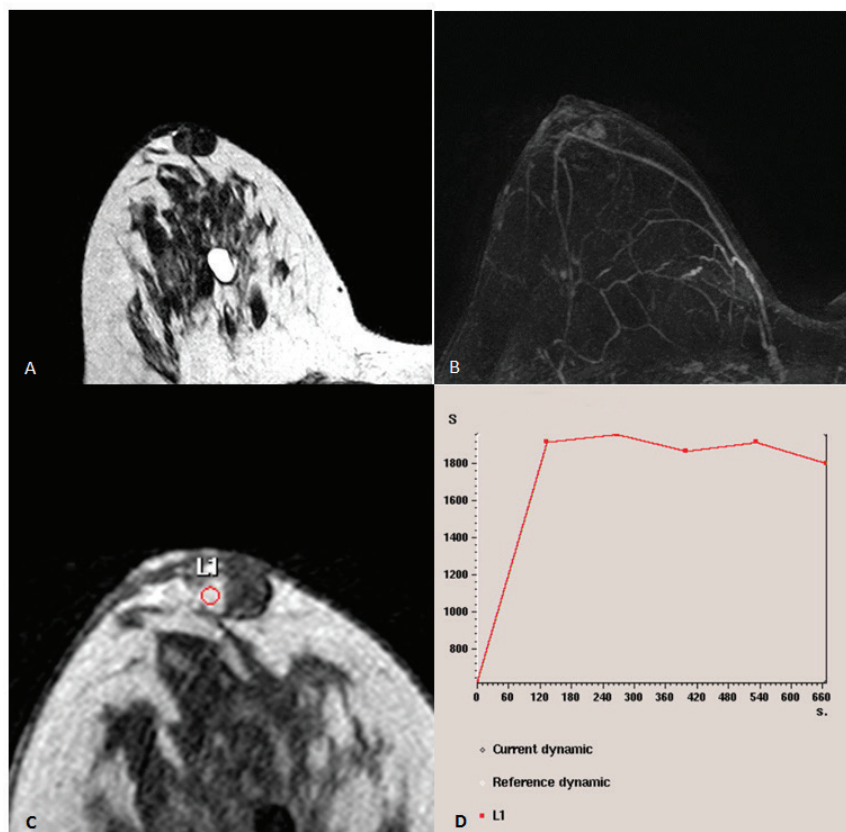


Figure 3: MRI image of the breast with dynamic contrast enhancement shows an 18-mm lobulated T2-hypointense mass (panel A) with the medial part of persistent enhancement in the inner periareolar region of the right breast on axial contrast material-enhanced subtraction MR image (panel B). The superimposed kinetic curve (panel D) derived from measurement in a selected region (red circle in panel C) within the lesion, shows a gradual increase in signal intensity that persists from the initial phase through the delayed phase of enhancement.

The patient underwent simple mastectomy, despite no contraindication for breast-conserving surgery, that inconvenience for clinical follow-up an post modified radical mastectomy of the left breast.

Gross pathology of excisional specimen (figure 4) showed a lobulated mass with gray-white cut surface. Microscopic examinations (figures 5) showed a circumscribed mass consisting of long attenuate ducts. Most ducts were lined by benign cuboidal cells. There was a cluster of ducts at the medial side that contained the proliferation of neoplastic cells — large, cuboidal

to round cells with enlarged hyperchromatic nuclei and some nucleoli, arranged as solid sheets, and with a cribriform pattern. Focal necrosis was noted in some ducts with calcific foci. These findings indicate ductal carcinoma in situ (Van Nuys classification index = 3) arising in fibroadenoma at the medial side. The size of fibroadenoma was 16-mm and the size of ductal carcinoma in situ was 7-mm. Immunohistochemical study showed negative ER, negative PR, positive cerb B2, and positive Ki67. Sections of dissected axillary lymph nodes revealed no metastasis in all samplings of 8 nodes.



Figure 4: Gross pathology of mass excision (tumor site), including the nipple, shows a lobulated mass with gray-white cut surface (white arrowhead).

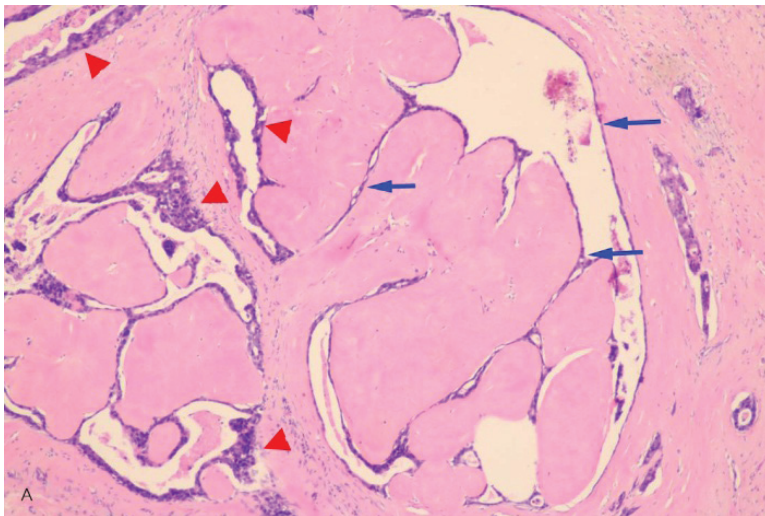
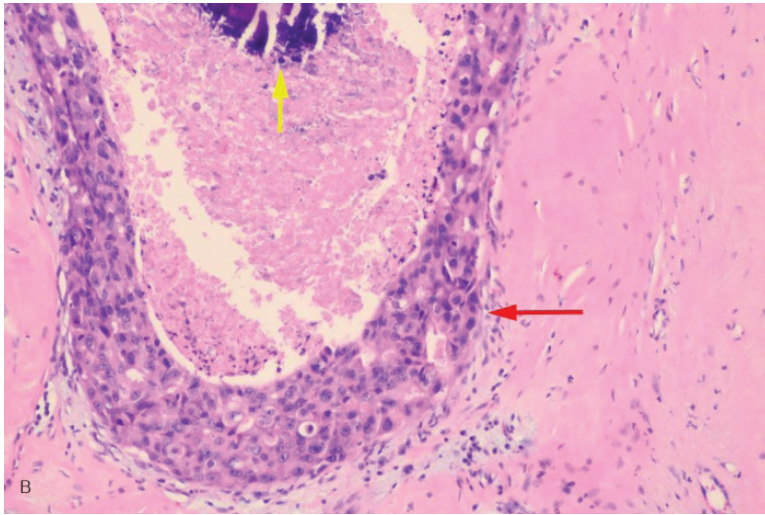


Figure 5: Photomicrograph (original magnification, $\times 10$; H&E stain); panel A shows benign ducts of fibroadenoma (blue arrows) and malignant ducts (DCIS) arising in fibroadenoma (red arrowheads) and panel B (original magnification, $\times 200$ H&E) shows comedo-pattern DCIS (red arrow) and calcific focus among necrotic material (yellow arrow).

The patient received tamoxifen after surgery and had no evidence of recurrence at the 12-month follow-up.

Discussion

Fibroadenoma is a common, benign lesion of the breast that is not considered a risk factor for breast cancer. Generally, regular breast examinations or imaging follow-ups to make sure the fibroadenomas are not growing is sufficient. If the fibroadenoma is extremely large, growing, or causes symptoms, surgical excision is indicated.

Breast cancer arising within a fibroadenoma is rare, with the incidence ranging from 0.002% to 0.125% in fibroadenoma specimens⁵⁻⁷ distributed equally between LCIS and DCIS⁹. Microinvasive ductal carcinoma arising within a fibroadenoma⁸ and invasive ductal carcinoma within a fibroadenoma of the breast¹⁰ are rarely reported. There have been more reported cases of DCIS arising

in fibroadenoma over the past two decades¹¹⁻¹⁶, but nevertheless, fewer than 130 cases have been reported worldwide¹¹.

Radiographic findings of DCIS arising in fibroadenoma may be indistinguishable from common benign fibroadenoma, and histologic diagnosis may be unexpected. Several findings that raise suspicion lesion. On a mammography, DCIS can be detected as microcalcification for 62-98 % and mass or asymmetry for 2-13% of DCIS lesion^{17,18}. When calcifications are identified on a mammogram, an ultrasound (US) can be used to help evaluate invasive component and act as a guide for biopsy.

The US findings of DCIS are subtle and nonspecific, but it is helpful to divide DCIS in two groups according to the presence or absence of calcification. In calcified DCIS, harmonic imaging improves contrast resolution and reduces artifacts, and calcification algorithms have been

designed to improve the visualization of calcification. Doppler color study is useful to evaluate internal vascularity. Elastography showed an overlap in elastic value between benign and malignant lesions¹⁸.

There is overlap between the US appearance of calcified DCIS and benign entities such as fibroadenoma, sclerosing adenosis, atypical ductal hyperplasia, intraductal papilloma, and ductal epithelial hyperplasia¹⁸.

In non-calcified DCIS, there are heterogeneous findings. The mass is often hypoechoic and irregularly shaped, and the margin is often microlobulated and indistinct. Occasionally, a pseudomicrocystic appearance is observed. Therefore, the possibility of a new mass mimicking clustered microcysts, especially in menopausal patients, should be a concern for the possibility of DCIS. The US appearance of DCIS can overlap with fibrocystic change, microcysts, apocrine metaplasia, papillary duct hyperplasia, adenosis, and secretory changes¹⁸.

DCIS can be hypo- to iso-intense on precontrast T1-weighted and fat-saturated T2-weighted images¹⁹. On contrast-enhanced MR imaging, DCIS could appear as nonmasslike enhancement (NME), mass and focus, in which the most common finding of DCIS is clumped nonmasslike enhancement in a ductal, linear, segmental, or regional distribution^{17, 19, 20}.

When DCIS manifests as enhancing mass, there are various findings of shape, margin, and internal enhancement patterns. The shape of the mass is most frequently irregular (14%–83% of cases) and is less commonly oval, round, or lobular (1%–25%, 0%–25%, and 0%–25% of cases), respectively¹⁷. The margin features include irregular (14%–92% of cases), spiculated (0%–92%

of cases), and smooth mass margins (4%–8% of cases). The most common internal enhancement patterns of DCIS are heterogeneous (9%–67% of cases), followed by homogenous (9%–25% of cases) and rim (0%–8% of cases) enhancement¹⁷.

There are various, not specific, kinetic patterns of DCIS, and there is no significant correlation between various grades of pure DCIS lesions^{17, 20}. The most common kinetic pattern in the initial phase is early enhancement^{17, 19, 20}, and the pattern in the delayed phase is the variable, which most commonly plateau, followed by the washout or progressive enhancement, respectively^{17, 19}. When compared to mammography, MRI breast can provide either an accurate assessment or an overestimation of DCIS disease extent¹⁷.

This case presentation aims to increase familiarity with this uncommon disease and to correlate histopathologic findings with the radiologic imaging features of the tumors. On follow-up imaging, a cautious evaluation of each lesion should be performed, despite previous observation of typically benign features. If any minor change or suspicious feature is detected, early pathological proven should be considered.

Conclusion

The present case was reported in order to increase awareness that fibroadenomas in patients with a risk factor for contralateral breast cancer can harbor cancer. Early intervention for tissue diagnosis in lesions showing suspicious features or interval imaging surveillance might be indicated.

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