

Metaplastic Breast Carcinoma and 4-month Changes in Imaging: A Case Report

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Metaplastic carcinoma (MPC), an uncommon but often aggressive breast cancer, can be challenging to differentiate from other types of breast cancer and even benign lesions based on the imaging appearance. These types of tumors are generally rapidly growing palpable masses. MPCs on imaging can present with imaging features similar to invasive ductal carcinoma and probably even benign lesion. Although many clinical and pathological findings have been reported, to the best of our knowledge, few imaging features have described changes in mammography over 4 months, as detailed in this report.

Index words: Metaplastic breast carcinoma; Sonography; Mammography

Introduction

Metaplastic carcinoma (MPC) of the breast is a rare form of breast cancer, accounting for < 5% of all breast cancer cases (1). The disease consists of a heterogeneous group of malignant neoplasms containing both glandular and non-glandular components with mixed epithelial and mesenchymal differentiation (2). The classification of MPCs according to various systems can be complex. In 2000, the World Health Organization (WHO) officially recognized metaplastic breast carcinoma as a distinct pathological entity. The updated WHO histologic guidelines suggest six types of

metaplastic carcinomas, including squamous cell carcinoma, spindle cell carcinoma, low-grade adenosquamous carcinoma, metaplastic carcinoma with mesenchymal differentiation, fibromatosis-like metaplastic carcinoma, and mixed metaplastic carcinoma (3, 4).

Involvement of the axillary lymph nodes is rare, with hematogenous metastasis occurring more commonly in cases of metaplastic carcinoma (5, 6). Metaplastic carcinoma has a poorer prognosis and a higher risk of recurrence than other breast cancer types (6). Given that it typically presents as triple-negative, the effects of hormone therapy are limited (6, 7). Due to the heterogeneity of metaplastic carcinoma and its increased complexity compared to the more common types of breast cancer, mixed chemotherapy regimens and dose schedules may be more effective and appropriate (8). Due to the distinction in surgical treatment and

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chemotherapy between metaplastic carcinoma and other breast cancers, correctly diagnosing the tumor is particularly important (8).

Although numerous clinical and pathological features have been reported regarding metaplastic carcinoma, to the best of our knowledge, few imaging features have described changes in mammography over four months, as detailed in this report.

Case report

An 80-year-old woman underwent mammography during a health checkup. She had undergone a total mastectomy 25 years ago for left breast cancer. At the time of the examination, she did not have a palpable mass on her breast. Mammography

revealed a circumscribed 2 cm-sized hyperdense mass with amorphous calcification in the right lower inner breast. Additionally, a circumscribed oval mass was observed in the subareolar portion of the right breast (Fig. 1). Ultrasonography was recommended, but she refused examination because she was old.

After 4 months, she noticed a hard, non-tender lump in the right lower inner breast and visited the outpatient clinic. Upon examination, a palpable lump, 3 cm in diameter, was found in the right lower inner breast. On mammography, the mass increased in size from 2.0 cm to 4.5 cm, and its shape and margin changed to irregular shape with microlobulated margin. However, the number and shape of the microcalcifications remained unchanged compared to the previous examination. Another mass in the right subareolar

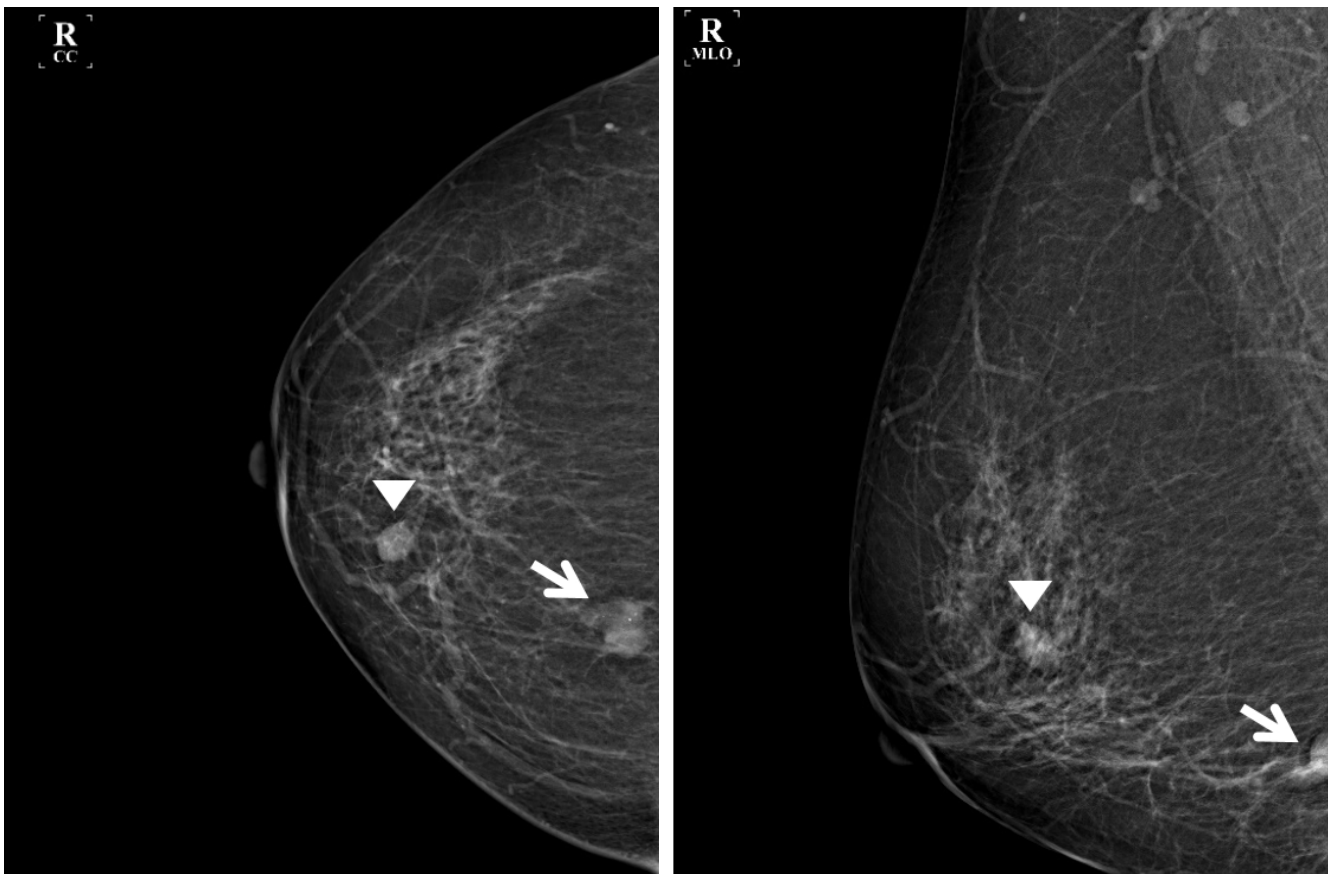


Fig. 1. Mammography shows a 2 cm-sized circumscribed hyperdense mass with amorphous calcification in the right lower inner breast (arrow). In addition, a circumscribed oval mass is observed in the subareolar portion of the right breast (arrowhead).

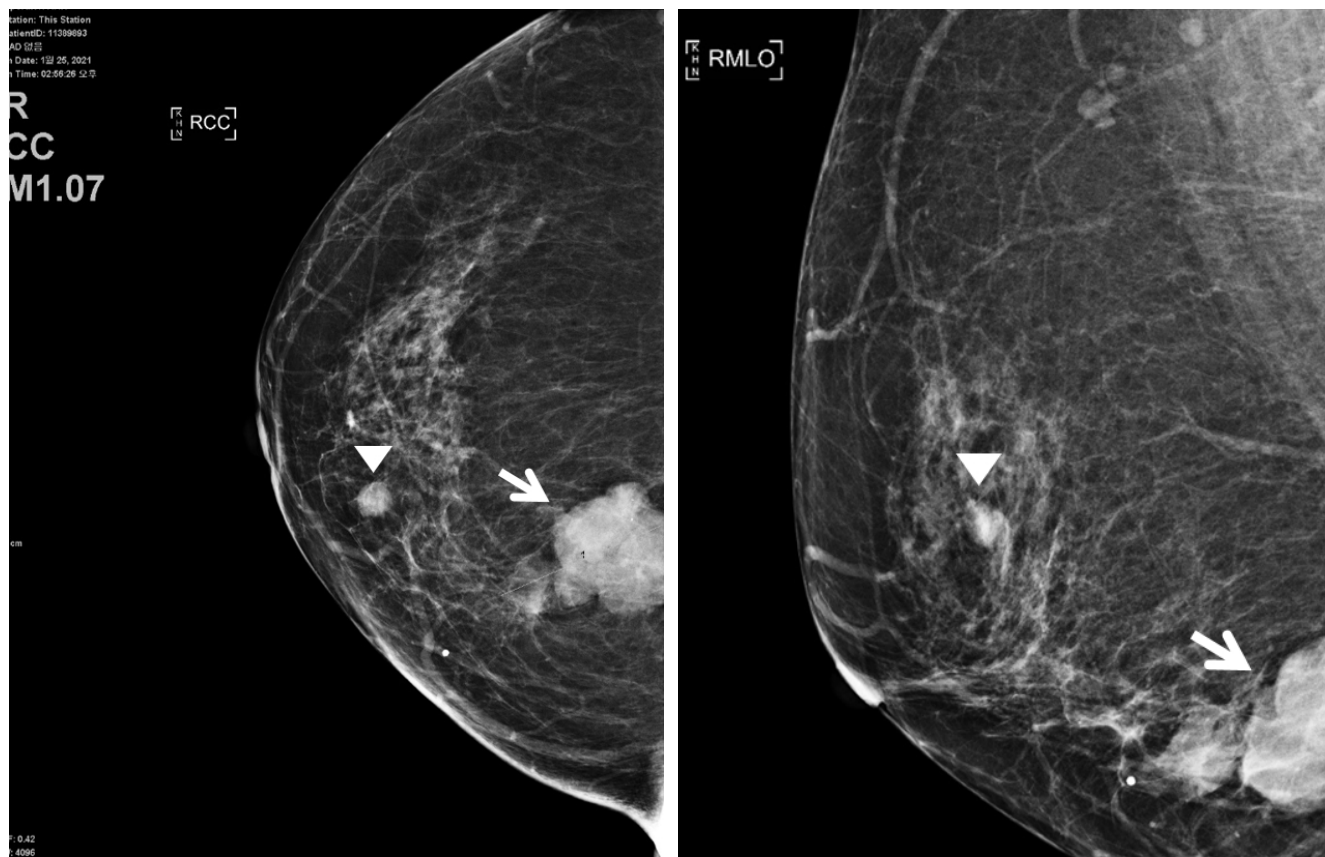


Fig. 2. After four months, the mass increases in size from 2.0 cm to 4.5 cm and it shows irregular shape and microlobulated margin (arrow). The number and shape of the microcalcifications remain unchanged compared to the previous study. Another mass in the right subareolar portion also remains stable in shape or size (arrowhead).

region showed no change in shape and size (Fig. 2). Ultrasonography revealed a microlobulated, irregular, hypoechoic mass measuring 4.1 × 2.8 cm in the right lower inner breast (Fig. 3). No blood flow was observed entering the mass. Additionally, a microlobulated, hypoechoic mass measuring 0.7 cm was found in the right upper inner breast, with no microcalcifications or blood flow which correlated with the mass in the right subareolar region on mammography.

The patient underwent an ultrasound-guided core needle biopsy of the right lower inner and upper inner breasts.

The diagnostic core biopsy from the right lower inner breast revealed a malignant tumor with a predominantly sarcomatous component and a focal atypical epithelial component. Another core biopsy

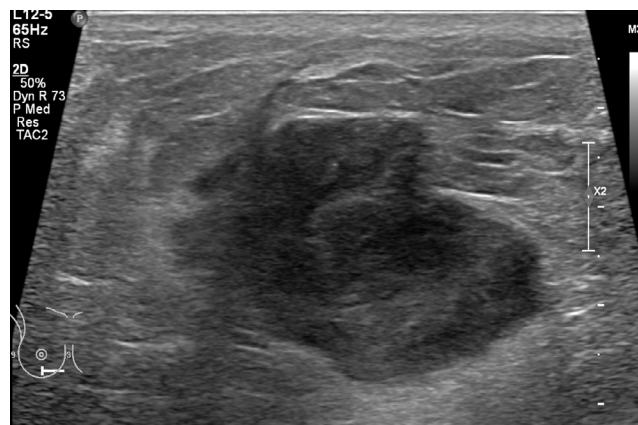


Fig. 3. Ultrasonography shows a microlobulated irregular hypoechoic mass measuring 4.1×2.8 cm in the right lower inner breast.

from the right upper inner breast revealed a stromal fibrosis.

A partial mastectomy was performed, and the

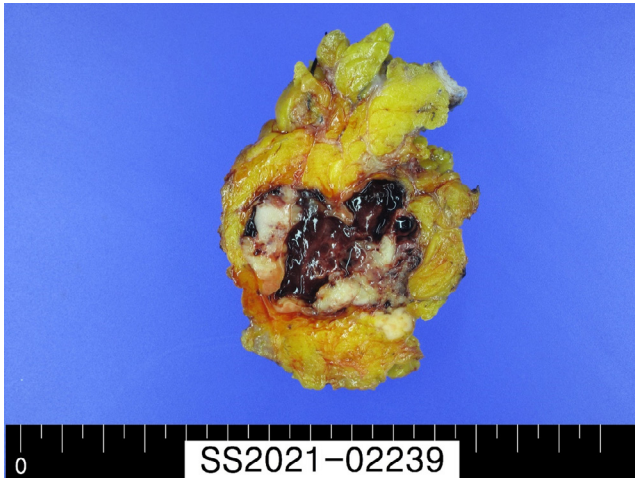


Fig. 4. Specimen shows a lobulated tumor with hemorrhagic necrosis.

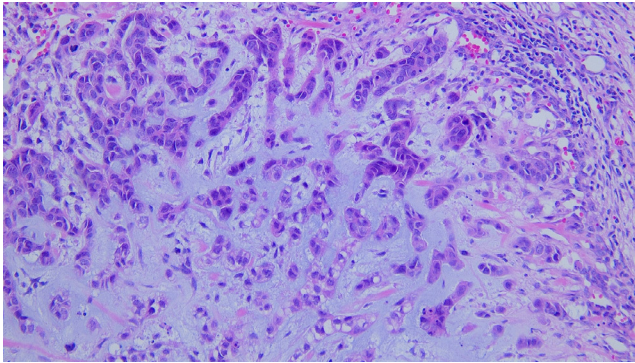


Fig. 5. Histopathological examination of the resected specimen shows highly atypical tumor cells with a trabecular pattern in the chondromyxoid stroma (H-E, $\times 200$)

specimen showed a lobulated tumor mass with hemorrhagic necrosis (Fig. 4). Histopathologic examination of the resected specimen showed highly atypical tumor cells with a trabecular pattern in the chondromyxoid stroma (Fig. 5) leading to a diagnosis of metaplastic carcinoma with heterologous mesenchymal differentiation. Immunohistochemistry for cytokeratin revealed epithelial differentiation (Fig. 6), and the tumor was negative for estrogen receptor (ER), progesterone receptor (PR), and human epidermal growth factor receptor 2 (HER2).

Additionally, a mass excision of the right lower inner breast was performed to diagnose fibrosis with

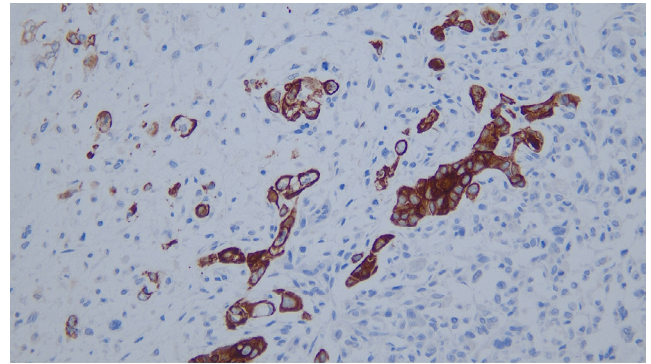


Fig. 6. Immunohistochemistry for cytokeratin shows epithelial differentiation ($\times 200$)

periductal lymphocytic infiltration.

Subsequently, the patient received radiation therapy. However, the patient did not receive adjuvant chemotherapy due to her old age. The patient was free of recurrence during the 2 years of follow-up.

Discussion

MPC of the breast is a rare form of ductal carcinoma that exhibits metaplastic transformation of glandular epithelium into non-glandular mesenchymal tissue (5, 6). Numerous studies have reported that MPC of the breast may originate from myoepithelial tissue (9). Typically, metaplastic carcinoma affects women aged > 50 years and often presents as a rapidly growing palpable mass; therefore, most patients present with larger palpable masses compared to invasive ductal carcinoma (7, 10).

MPC exhibits various biological behaviors compared to invasive ductal carcinoma. In our study, histopathological examination revealed metaplastic carcinoma with mesenchymal differentiation. It demonstrates a decreased tendency to involve the axillary lymph nodes (9). MPC spreads hematogenously to the lungs and bones rather than through the lymphatic system (6). Despite its poor prognosis, the involvement of the

axillary lymph nodes is limited (5, 6, 10).

The mammographic appearance of MPC has been described as a high-density mass with circumscribed, obscured, spiculated, or circumscribed with partially spiculated margin. Compared to invasive ductal carcinoma, MPC has a more benign appearance on mammography, including a round or oval shape and circumscribed margins of a mass (10). The lesions are noncalcified. The pattern is amorphous, coarse, punctate, or pleomorphic if calcifications are present. The patient also showed a circumscribed hyperdense mass on mammography when she first visited our hospital.

Sonographically, MPC appears as a heterogeneous or hypoechoic mass or a mixed cystic and solid mass. The mass is oval, round, or irregular shape with circumscribed, microlobulated, or indistinct margins. MPC has more benign features, such as oval or round hypoechoic masses with circumscribed or indistinct margins, than invasive ductal carcinoma (10). MPCs often demonstrate posterior acoustic enhancement compared to posterior shadowing, often seen with invasive ductal carcinoma.

The mammographic and sonographic imaging characteristics of metaplastic breast carcinomas can be similar to those of invasive ductal carcinomas and benign lesions and are, therefore, subject to misinterpretation. Overlapping findings prevent the complete differentiation of such tumors on imaging. Awareness of the overlapping imaging findings and clinical features can assist in diagnosing these malignancies.

Metaplastic breast carcinomas should be differentiated from invasive ductal carcinomas and primary breast sarcomas to determine the appropriate treatment options and management. Preoperative diagnosis of metaplastic breast carcinoma by core needle biopsy may be possible; however, in most cases, transition foci of metaplastic elements are observed after excision biopsy. Therefore, extensive sampling, such as excision biopsy, should be performed to avoid misleading

results from small samples.

The present case of metaplastic breast carcinoma illustrates the changes in mammography over four months. Although initial mammography showed benign features, the mass grew rapidly and the mammographic findings have evolved to demonstrate features suggestive of malignancy. Therefore, multimodal imaging studies with immunohistochemical and pathological analyses are necessary to accurately diagnose metaplastic breast carcinoma.

Therefore, multimodal imaging studies with immunohistochemical and pathological analyses are necessary to accurately diagnose metaplastic breast carcinoma.

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화생성 유방암과 4개월 영상 변화: 증례 보고

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화생성 유방암 (Metaplastic carcinoma, MPC)은 드물지만 자주 공격적인 유방암으로, 영상 소견만으로는 다른 유방암이나 심지어 양성 병변과 구별하기 어려울 수 있습니다. 이 종양은 일반적으로 빠르게 성장하는 만져지는 종괴입니다. 영상에서 MPC는 침윤성 관암종과 유사한 소견을 보일 수 있으며, 심지어 양성 병변과도 유사할 수 있습니다. 많은 임상 및 병리학적 소견이 보고되고 있지만, 본 보고서에 자세히 설명된 바와 같이, 4개월에 걸친 유방촬영술 변화를 기술한 영상 소견은 거의 알려져 있지 않아 보고하고자 합니다.

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