



Primary Invasive Ductal Carcinoma Arising in Axillary Accessory Breast: A Case Report

겨드랑이 부유방 조직에서 발생한 원발성 유방암: 증례 보고

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Ectopic breast tissue can develop along the mammary ridge from the axilla to the groin, and the most common site is the axillae. Primary carcinoma of ectopic breast tissue is extremely rare. We report a rare case of a 61-year-old woman with a palpable mass in her left axilla who had a history of surgical excision of accessory breast tissue in the same area. Mammography (MMG), including axillary tail view, ultrasound (US), and breast MRI were performed. We evaluated the extent and characteristics of the microcalcifications in the axillary tail view. A US-guided biopsy was done, and histopathology revealed an invasive ductal carcinoma. Enhanced abdominal CT revealed multiple hepatic masses consistent with metastases, and the patient received palliative chemotherapy. Herein, we present a rare case of breast cancer arising from accessory breast tissue in the axilla, best appreciated on the axillary tail view of the patient's MMG.

Index terms Breast Neoplasm; Axilla; Mammography; Ultrasound; Magnetic Resonance Imaging

INTRODUCTION

Ectopic breast tissue, or polymastia, is a common congenital variation in which accessory breast parenchymal tissues are found along the embryologic mammary streak from the axillary to inguinal areas (1). The morphology of ectopic tissue may vary, from

a small focus of the breast parenchyma to a complete breast structure, including a nipple-areola complex. Hormonal effects can influence ectopic breast tissue, resulting in benign and malignant neoplasms (1).

Primary carcinoma arising from the ectopic breast tissue is extremely rare and usually has a progressive clinical course. Herein, we report a case of invasive ductal carcinoma (IDC) arising from an accessory breast in the axilla with hepatic metastases.

CASE REPORT

A 61-year-old woman visited the outpatient breast surgery clinic with a palpable mass in the left axilla. Several years ago, she had undergone surgical excision of an accessory breast in the left axilla. Physical examination revealed a non-tender, palpable lump in the left axilla. She had no previous history of estrogen replacement therapy or a familial history of breast cancer. The laboratory test results were unremarkable.

Mammography (MMG), especially the axillary tail view, revealed a 4 cm extent asymmetry with fine pleomorphic microcalcifications and several enlarged lymph nodes at the left axilla (Fig. 1A). Ultrasound (US) revealed a 45-mm indistinct hyperechoic area with internal irregular hypoechoic nodules and increased vascularity in the subcutaneous layer of the left axilla (Fig. 1B). Seven suspicious lymph nodes were observed at levels 1–3 (Fig. 1C). MRI was performed for further evaluation. Contrast-enhanced T1 subtraction axial imaging revealed a 36-mm non-mass enhancement at the subcutaneous fat layer of the left axilla (Fig. 1D). Breast lesions were not observed.

US-guided core needle biopsy of the axillary mass was performed, and the findings indicated IDC (Fig. 1E). Further immunohistochemical analyses were done, including estrogen receptor (ER), progesterone receptor (PR), human epidermal growth factor receptor 2 (HER 2), and Ki 67. ERs were positive in 98% of the cells, PRs were positive in 20%, and HER 2 was positive with a score of 3+, while the Ki 67 proliferative index was 50%. Contrast-enhanced abdominal CT scan was performed to evaluate distant metastasis; this revealed multiple low-density masses in both lobes of the liver (Fig. 1F, left). The masses showed abnormal radioactive concentration with a maximum standard uptake value of 5.1 on PET-CT (Fig. 1F, middle). No other primary or occult tumors were observed. Therefore, the carcinoma was clinically staged as stage cT2N2M1.

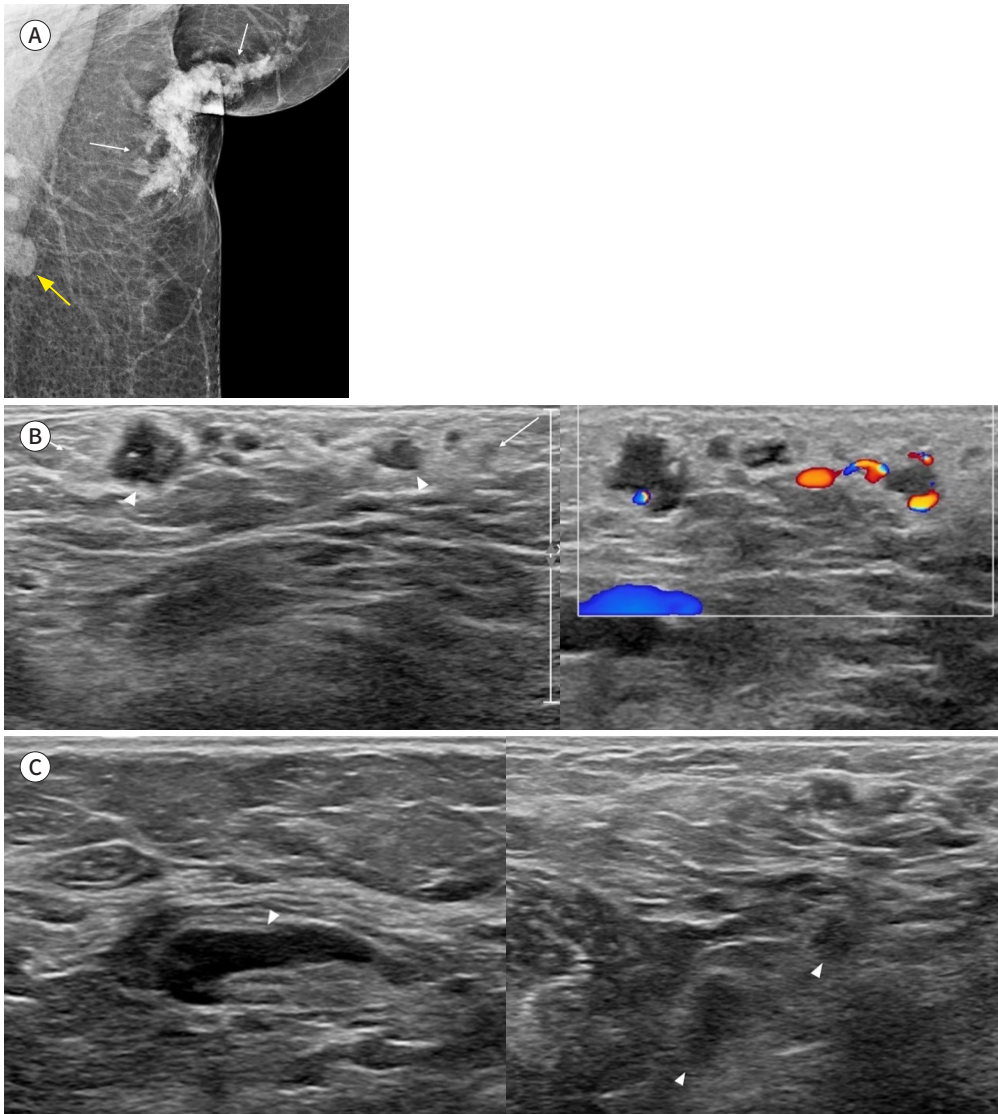
The patient underwent palliative chemotherapy. A repeat abdominal enhanced CT scan during her 6-month follow-up revealed a decrease in the size of the multiple hepatic lesions (Fig. 1F, right).

This study was approved by the Institutional Review Board of Kyungpook National University Chilgok Hospital (IRB No. 2023-02-002). Written informed consent was obtained for the publication of this case report and the accompanying images.

DISCUSSION

An accessory mammary gland, also known as an aberrant mammary gland, is characterized by ectopic breast tissue along the embryological mammary streak. During embryogene-

Fig. 1. A 61-year-old woman with invasive ductal carcinoma arising from an accessory breast in the axilla.
A. The left axillary tail view shows a 45-mm asymmetry with fine pleomorphic microcalcifications (white arrows) and suspicious lymph nodes in the left axilla (yellow arrow).
B. Ultrasound shows a 45-mm indistinct hyperechoic area (left, arrows) with internal irregular hypoechoic nodules (left, arrowheads) in the subcutaneous fat layer of the left axilla. Color Doppler scanning reveals lesional peripheral vascularity (right).
C. Several suspicious lymph nodes are visible in the axilla (arrowheads) on ultrasound.



sis, six to eight primordial breasts, distributed bilaterally from the axillae to the inguinal glands, gradually degenerate, except for the pair in the thoracic region. Ectopic breast tissue originates from incompletely regressed mammary primordia. It occurs most frequently in the axillae but may appear outside the mammary ridge, including the face, mid-back, buttocks, posterior neck, chest, vulva, hip, flank, lateral thigh, shoulder, and upper extremities (1).

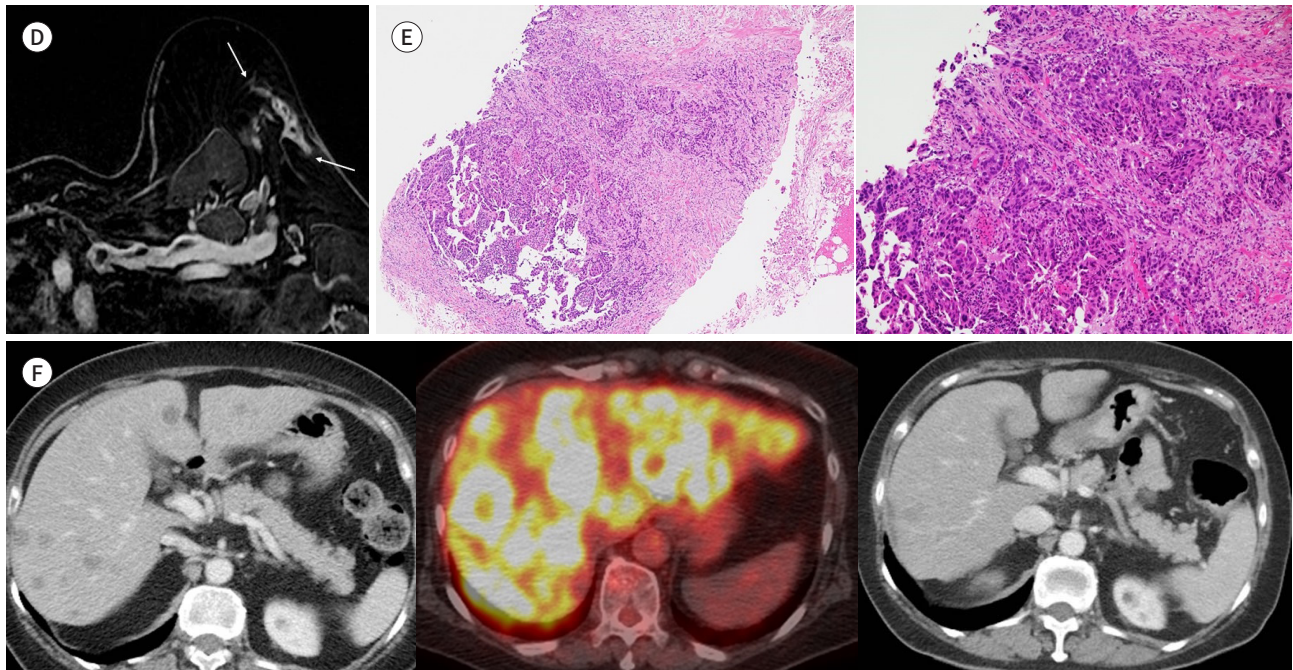
Copeland and Geschickter (2) classified ectopic breast tissue into two types: supernumerary breasts, characterized by the presence of glandular tissue and a nipple-areola complex; and aberrant breasts, which consist only of mammary tissue without the nipple-areola complex.

Fig. 1. A 61-year-old woman with invasive ductal carcinoma arising from an accessory breast in the axilla.

D. Contrast-enhanced T1 subtraction axial imaging reveals a 36-mm non-mass enhancement in the subcutaneous fat layer of the left axilla (arrows).

E. Photomicrography (hematoxylin and eosin stain, left: $\times 40$, right: $\times 100$) shows an infiltrative tumor with a high nuclear grade without tubule formation, suggestive of invasive ductal carcinoma.

F. An axial view of the patient's enhanced abdominal CT scan reveals multiple, ill-defined, poorly enhancing masses in both lobes of the liver, suggestive of hepatic metastases (left). The hepatic masses show abnormal radioactive concentration with a maximum standard uptake value of 5.1 on PET-CT (middle). Follow-up abdominal enhanced CT scan six months after chemotherapy demonstrates a decrease in the size of the hepatic metastases (right).



Ectopic breast tissue is subject to undergo the same physiological and pathological changes as in normal breast tissue. The most common tumor arising in the ectopic breast is fibroadenoma; several cases of phyllodes tumor and mammary carcinoma have been described (3). Carcinoma in accessory breast tissue is extremely rare, comprising 0.3%–0.6% of all breast cancers, and the most common site is the axilla (4). The most common pathology is IDC (72%–79%), but there have also been a few case reports of medullary, lobular, and phyllodes (3). The tumors are often located in the superficial layer of the axillae but may occasionally protrude onto the skin surface.

Differential diagnoses of axillary accessory breast cancer include lymph node metastases, axillary tail breast cancer, lymphomas, metastatic carcinomas, and benign entities, such as fibroadenomas, hidradenitis, and lymphadenopathies (4). It is difficult to distinguish accessory breast cancer from axillary tail breast cancer, axillary lymph node metastasis, axillary sweat gland adenocarcinoma, and axillary lymphoma. Therefore, these lesions should be excluded before diagnosing axillary accessory breast cancer.

Accessory breast cancer arises from the breast tissue outside the normal pectoral breast. In contrast, axillary tail breast cancer specifically refers to breast cancer that occurs in the tail portion of the normal breast (5). Although both accessory and axillary tail breast cancers demonstrate easier lymph node metastasis, they present distinct diagnostic challenges in their di-

agnosis (6). Accessory breast cancer can arise in the subcutaneous layer of the axillae, showing discontinuity with the normal pectoral breast, leading to potential misdiagnosis as a skin lesion. On the other hand, axillary tail breast cancer could be obscured by the pectoralis muscle or plastic reconstruction, leading to its potential detection at a later stage (6). Furthermore, prophylactic mastectomy in patients with BRCA mutations warrants careful consideration because of the potential risk of recurrence in the form of axillary tail carcinoma.

Imaging studies, including MMG, US, and breast MRI, are essential for evaluating axillary accessory breast cancer. In MMG, characteristic microcalcifications associated with breast cancer may not be observed because of the position of the tumor. Under these circumstances, an axillary tail view may be helpful. This view allows imaging of the axillary tail of the breast and has been used to evaluate the lateral tissue of the breast. The axillary tail view revealed fine pleomorphic microcalcifications suggestive of breast cancer and provided a more precise assessment of the tumor extent. On US, when irregular hypoechoic masses in the axilla are surrounded by normal hyperechoic breast tissue, it is strongly suggestive of invasive carcinoma arising in ectopic breast tissue in the axillae.

In our case, we also presumed that the hyperechoic area on the US was normal breast tissue and that the irregular hypoechoic masses were invasive tumors. Moreover, fine pleomorphic calcifications extending over 4 cm were identified on MMG and were presumed to be in situ components. On MRI, the lesions appeared as focal non-mass enhancements, and the extent of the lesion was well identified.

Establishing the prognosis of accessory breast carcinoma is challenging because of the lack of follow-up data and the small sample size. Zhang et al. (7) reported that ectopic breast cancer carries a poorer prognosis than pectoral breast cancer due to its being located near the axillary lymph nodes, resulting in early metastasis to these nodes; therefore, ectopic breast cancer is more prone to develop distant metastasis than breast cancer in general.

Similar to primary breast cancer, surgical treatment with neoadjuvant or adjuvant chemotherapy, radiotherapy, and hormonal therapy are the treatments of choice for accessory breast carcinoma. However, surgical management remains controversial. Although radical or modified radical mastectomy of the ipsilateral breast has been recommended, Cogswell and Czerny (8) reported that this does not improve the prognosis. Wide local excision of the tumor with overlying skin and regional lymph node dissection is the preferred treatment (4). Axillary lymph node dissection is performed only in patients with axillary lymph node metastasis. However, in patients who meet the ACOSG Z0011 criteria, axillary lymph node dissection can be safely avoided in patients with 1–2 positive lymph nodes (9). Systemic adjuvant or neo-adjuvant chemotherapy, such as anthracyclines or taxanes, is administered to patients with accessory breast cancer based on the same principles as primary breast cancer. Endocrine therapy should be administered to patients with receptor-positive disease (4). Postoperative radiotherapy of the tumor site must be performed; however, targeting the ipsilateral breast is strongly discouraged (10).

Owing to the underreporting of accessory breast lesions, clinicians often lack awareness of cancerous conditions. This condition is simply regarded as a normal accessory breast tissue, which can have potentially dangerous implications because it is prone to metastasis. However, using the axillary tail view, the prompt recognition of breast carcinoma arising from ectopic

breast tissue by radiologists can help clinicians provide appropriate interventions in a timely manner.






Author Contributions

Conceptualization, P.S.Y., L.J., P.J., K.H.J.; data curation P.S.Y., P.J.Y., K.G.C., C.J.G.; formal analysis, P.S.Y.; investigation, P.J.; methodology, P.S.Y., L.J.; supervision, P.S.Y., K.H.J.; writing—original draft, P.S.Y.; and writing—review & editing, P.S.Y., K.H.J.

Conflicts of Interest

The authors have no potential conflicts of interest to disclose.

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겨드랑이 부유방 조직에서 발생한 원발성 유방암: 증례 보고

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이소성 유방조직은 겨드랑이에서 사타구니 선까지 유방 능선을 따라 발생할 수 있으며 가장 일반적으로 발생하는 부위는 겨드랑이이다. 이소성 유방조직에서 발생하는 원발성 암종은 극히 드물다. 왼쪽 겨드랑이에 부유방조직을 절제한 병력이 있는 61세 여성이 왼쪽 겨드랑이에 만져지는 종괴로 내원하였고 종괴의 평가를 위해 액와미부 촬영을 포함한 유방촬영술, 초음파 및 유방 MRI를 시행하였으며 특히 액와미부 촬영으로 왼쪽 겨드랑이의 특징적인 악성 미세석회화의 양상과 범위를 평가하였다. 초음파 유도하 생검술을 통해 이 병변은 침윤성 유방암으로 진단되었고 조영증강 복부 CT에서 다발성 간전이 확인되어 환자는 이후 고식적 항암요법을 받았다. 저자들은 겨드랑이 부유방 조직에서 발생한 드문 원발성 유방암에 대해 액와미부 촬영을 시행한 증례를 보고하고자 한다.

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