

Encapsulated Papillary Carcinoma of the Breast: A Case Report

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Encapsulated papillary carcinoma of the breast reveals a well-circumscribed mass on mammography, and a complex solid and cystic mass and intracystic nodules or thick septations on ultrasound. Magnetic resonance imaging also reveals complex cystic mass with enhancing intracystic nodules in a breast. Pathological findings appear as papillary protrusions surrounded by a thick fibrous capsule, with loss of myoepithelial cell layer. This paper reports the radiological and histopathological findings of encapsulated papillary carcinoma.

Index words: Breast; Breast neoplasm; Ultrasonography; Magnetic resonance imaging

Introduction

Encapsulated papillary carcinoma of the breast is a rare subtype of ductal carcinoma, with an excellent prognosis. Imaging features are often nonspecific, with classic appearance being a complex solid and cystic mass on ultrasonography (USG), warranting a BIRADS-4 suspicious designation and prompting image guide biopsy. We report a case of encapsulated papillary carcinoma in the breast. We reviewed its radiological findings of USG, magnetic resonance imaging (MRI) and histopathologic findings of the encapsulated papillary carcinoma..

Case Report

A 67-year-old woman presented with a 6-year

history of a painful, gradually enlarging tumor in her left breast. The tumor was first detected 6 years earlier, but the patient refused treatment at that time. Physical examination showed a large palpable hard mass involving the left breast. Mammography demonstrated a 7cm multi-lobulated hyperdense mass in left breast upper outer quadrant (Fig. 1a). Breast USG was performed on EPIC (Philips, Netherlands), using a linear probe of 4-18 MHz. USG demonstrated a 7x6 cm irregular hypoechoic multiseptated cystic mass with intracystic echogenic solid nodules at the left breast upper outer quadrant (Fig. 1b). Bilateral small benign axillary lymph nodes were noticed. Right breast parenchyma was normal. The breast USG was graded as BIRADS category 4C. USG-guide 14G core needle biopsy was performed. MRI of the breast was performed on a 3.0 Tesla MR system (Ingenia 3.0 T CX, Philips, Netherlands) using a dedicated 16-channel breast coil. Axial T2-weighted fat-suppressed MRI scan demonstrated a heterogenous signal intensity of large irregular septated multi-cystic lesions with

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low signal intensity mural nodules (arrow) (Fig. 1c). Axial T1-weighted fat-suppressed contrast-enhanced MRI with subtraction scan demonstrates irregular thick walled multiseptated cystic masses with enhancing mural nodules (arrow) (Fig. 1d). Core needle biopsy results confirmed a diagnosis of papillary carcinoma. The patient underwent mastectomy and sentinel lymph node biopsy. Postoperative histologic diagnosis was encapsulated papillary carcinoma with focal invasive papillary carcinoma. Axillary lymph node metastasis was not seen. Photomicrography (hematoxylin-eosin stain, original magnification, X 12.5) demonstrated a lobulated and circumscribed encapsulated papillary carcinoma, surrounded by a thick fibrous capsule (arrow) (Fig. 1e). This encapsulated papillary carcinoma was also associated with small foci of invasive papillary carcinoma. Immunohistochemical stains demonstrated the lack of a myoepithelial cell enclosure at the stroma/ epithelial interface (arrows). (Fig. 1f).

Discussion

The latest WHO Classification of Breast Tumors (5th edition) classified each tumor entity listed in the category of papillary neoplasms: intraductal papilloma, papilloma with atypical ductal hyperplasia (ADH)/ductal carcinoma in situ (DCIS), papillary DCIS, solid papillary carcinoma in situ, solid papillary carcinoma with invasion, invasive solid papillary carcinoma, encapsulated papillary carcinoma and encapsulated papillary carcinoma with invasion (1). Among these papillary breast lesions, encapsulated papillary carcinoma is a rare histologic subtype of papillary neoplasm, constituting approximately 0.5%–1.0% of all breast carcinomas (2). It is characterized by fine fibrovascular stalks covered by neoplastic epithelial cells of low or intermediate nuclear grade, typically manifesting within cystic spaces surrounded by a fibrous capsule. Its gross specimen commonly

manifests as a complex cystic and solid mass, and the tumor tends to enlarge with a cystic growth pattern (3). Upon clinical and radiological evaluation, encapsulated papillary carcinoma commonly appears as a benign lump and is associated with an excellent prognosis (4). Complete surgical excision of the lesion with a sampling of the surrounding area is essential for proper staging and treatment. Our current understanding is that encapsulated papillary carcinoma is a self-contained indolent invasive carcinoma with a prognosis similar to that of intermediate nuclear-grade ductal carcinoma in situ (5). Encapsulated papillary carcinoma has a favorable prognosis with low rates of local recurrence (5). Axillary and distant metastases have been described but are rare. Encapsulated papillary carcinoma shows excellent long-term survival even when associated with invasive disease (5).

USG of encapsulated papillary carcinoma reveals complex cystic and solid masses with increased vascularity in the solid area. They can associate ductal dilation with intraductal solid mass (6). Limited experience is available for MRI of invasive papillary carcinoma. On MRI, papillary carcinomas may appear as irregular enhancing nodules or enhancing complex cysts. Morphological features, as well as kinetic curves of invasive papillary carcinoma, are variable on MRI. MRI cannot help to diagnose a papillary carcinoma definitively, and it can be of value in the preoperative mapping of multiple papillary lesions, thereby facilitating optimal surgical planning (7).

Fine needle aspiration cytology reveals atypical cells in the smear. USG-guided vacuum-assisted core biopsy is a much better option than aspiration cytology. However, the gun biopsy mainly hits the solid center of the tumor and the invasive component can only be recognized at the periphery of the tumor, so excisional biopsy of papillary lesions is an effective approach to demonstrating invasion (8). Papillary breast lesions are segregated into benign and malignant based on

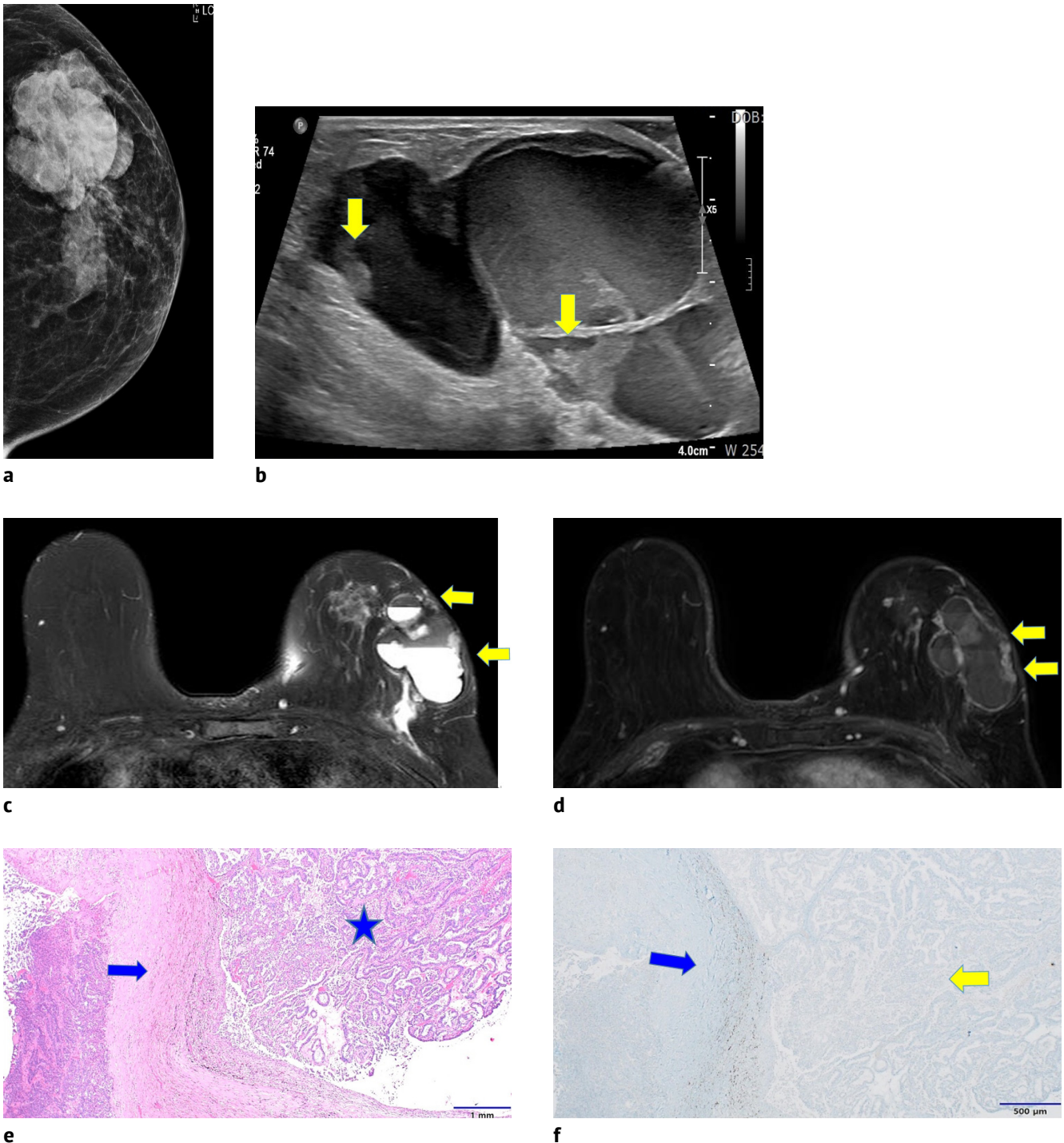


Fig. 1. 67-year-old woman diagnosed with encapsulated papillary carcinoma. (a) Mammography CC view demonstrates a 7 cm multilobulated hyperdense mass in left breast upper outer quadrant. (b) Ultrasonography demonstrates irregular multiseptated multilobulated heterogeneous hypoechoic mass and intracystic solid mural nodules (arrows). (c) Axial T2-weighted fat-suppressed MRI scan demonstrates a large heterogeneous multicystic mass with mural nodules with low T2 signal intensity (arrow). (d) Axial T1-weighted fat-suppressed contrast-enhanced MRI with subtraction scan demonstrates irregular thick rim enhanced multiseptated cystic mass with intense enhancement of mural nodules (arrow). (e) Photomicrograph (hematoxylin-eosin stain, 200 x magnification) demonstrates a circumscribed atypical proliferation of epithelial cells with indistinct papillary cores (star) surrounded by a thick fibrous capsule (arrow). This encapsulated papillary carcinoma was also associated with small foci of invasive papillary carcinoma. (f) P-63 Immunohistochemical staining demonstrates loss of nuclear myoepithelial staining both in the center of the papillary core (yellow arrow) and at the periphery (blue arrow).

the presence or absence of myoepithelial cells in the papillary cores. All malignant papillary lesions of the breast lack an intact myoepithelial cell layer within the papillae or at the periphery of the tumor (9). Immunohistochemistry is very useful in the assessment of myoepithelial cells and basement membrane for the diagnosis of invasive cancers. The myoepithelial cells are absent in invasive cancers. There are many known myoepithelial markers such as S-100, Calponin, CD 10, smooth muscle myosin heavy chain, alpha-smooth muscle actin, P63, and high molecular weight Cytokeratin with different sensitivities and specificities. Of these P63 and smooth muscle, myosin is more specific. A special myoepithelial marker P63 stains the cell muscles only (10).

The overall prognosis of encapsulated papillary carcinoma is better than other breast malignancies such as infiltrating ductal carcinoma. Treatment options are wide local excision, with or without adjuvant radiotherapy or chemotherapy.

Radiologic imaging features are often nonspecific, with classic appearance being a complex solid and cystic mass on USG, warranting a BIRADS-category 4 suspicious designation and prompting image guide biopsy. MRI can help in making a diagnosis and it can be value in the preoperative mapping of multiple papillary lesions, there by facilitating optimal surgical planning.

Conclusion

In conclusion, encapsulated papillary carcinoma is a rare subtype of breast cancer, with an excellent prognosis. Imaging features are often nonspecific, with classic appearance being a complex solid and cystic masses on ultrasound, warranting a BI-RADS-category 4 "suspicious" designation and prompting image guided biopsy. MRI can be of

value in the preoperative mapping of multiple papillary lesions, thereby facilitating optimal surgical planning. Immunohistochemical staining for myoepithelial cell markers helps in its proper management.

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피막형 유두상암의 영상 소견: 증례 보고

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피막형 유두상암 (Encapsulated papillary carcinoma)은 드문 유방암이며 예후가 좋은 유방암이다. 유방촬영술에서 경계가 좋은 종괴로 보이고 초음파에서는 낭종내 결절이나 두꺼운 격막이 있는 낭종 형태로 보이거나 유관을 따라 자라는 형태로 보인다. 자기공명영상에서는 불규칙한 두꺼운 격막이 있는 낭종과 조영증강되는 낭내 종괴가 보인다. 병리 소견은 확장된 유관 내에 유두상 돌기형으로 보이며 근상피세포층 소실이 나타난다. 이에 저자들은 피막형 유두상암의 영상의학적 소견과 조직병리학적 소견을 보고하고자 한다.

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