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(CASE REPORT)

Encapsulated papillary carcinoma of the Breast: A Case Report and Literature review

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Abstract

Encapsulated papillary carcinoma (EPC) of the breast is an uncommon variant of papillary neoplasm, constituting approximately 0.5–2% of all breast cancers (1). This carcinoma is histologically distinct, marked by a prominent fibrous capsule encasing a densely cellular structure supported by fibrovascular stalks. A notable feature is the absence of myoepithelial cells within this thick capsule, and EPC is most frequently observed in postmenopausal women, typically between the ages of 55 and 67 (2,3). Clinically and radiologically, EPC often mimics a benign mass. On mammography, it typically appears as a well-circumscribed lesion located in the retroareolar region, whereas ultrasound commonly reveals a cystic mass with solid components. Although usually asymptomatic, the lesion may be detected through self-examination or screening mammography, and a bloody nipple discharge is a commonly reported symptom. Given its generally indolent behavior, EPC is often managed as an in-situ disease. Nevertheless, rare cases of high-grade EPC exhibiting aggressive histological and clinical features have been documented. Overall, EPC is considered a low-risk cancer, with an approximate 5% risk of local recurrence and a generally favorable prognosis (4).

We report the case of a 72-year-old woman who presented with two masses in her left breast. An echo mammogram was performed followed by a biopsy, which confirmed the diagnosis of encapsulated carcinoma in the left breast. The patient subsequently underwent a wide double lumpectomy of both lesions, with pathology confirming a diagnosis of non-invasive EPC. This was followed by radiotherapy and adjuvant hormonal therapy.

Keywords: Breast Cancer; Encapsulated Breast Cancer; Radiotherapy Of Breast Cancer; Core Needle Biopsy; Hormonal Receptors

1. Introduction

Encapsulated papillary carcinoma (EPC) of the breast is an uncommon papillary neoplasm, representing only 0.5–2% of all breast cancers. It typically manifests as a well-circumscribed malignant papillary mass enclosed by a thick fibrous capsule, most frequently affecting postmenopausal women aged between 55 and 67 years. Generally regarded as a low-risk malignancy, EPC exhibits a local recurrence rate of approximately 5% and overall favorable outcomes. Although there is ongoing debate regarding whether EPC should be classified as an in situ or invasive carcinoma, its indolent clinical behavior has led to its management being more commonly aligned with in situ disease.

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2. Case Presentation

A 72-year-old female patient (6G-6P, G8 score 15 ; IMC 24,97) presented with a l lump in the left breast for 6 months which was increasing in size gradually. The patient had no history of malignancy or family history of breast cancer. Physical examination found two mass well-defined and freely mobile, the first situated at the upper quadrant junction measuring 3cm, the second at the junction of the outer quadrant measuring 2cm, no nipple discharge or skin changes. No axillary nodes were palpable. Routine laboratory investigations were within normal limits. The tumor was classified CT2N0Mx according to TNM classification

Ultrasonography and mammography showed a 2.9 × 1.7 × 2.5 cm lump in the the upper quadrant junction and a 1.8 × 1.2 × 1.7 in junction of the outer quadrant, which was categorized as Breast Imaging-Reporting and Data System (BIRADS) 4, without lymph node involvement.

Core needle biopsy revealed an encapsulated papillary carcinoma with 100% estrogen receptor positivity and 100% progesterone receptor positivity, and Ki-67 proliferation rate was 12%.

The patient underwent a large double lumpectomy, as it was decided with the multidisciplinary tumor board of the hospital.

Final histology concluded to a two lesions of EPC measuring 2.5x1.5 cm and 2x1.3 cm respectively, with moderate nuclear grade, without invasion, the margins were negatives and sufficient.

Our patient underwent adjuvant radiotherapy at a total dose of 42gy in 15 fractions of 2.8gy per fraction for 3 weeks on the left breast with a boost to the tumour bed of 11.2gy in 3 fractions of 2.8gy per fraction.

Figure 1 RC3D treatment plan with fields, dose distribution, BEV and DVH

We prescribed a hormone therapy with aromatase inhibitors for 5 years, a pre-hormone therapy assessment has been carried out.

Regarding the follow-up of the patient, a history and physical examination was planned every 3 months for 2 years, and after that 2 times per year for 3 years and then, every 12 months. Mammography was scheduled to be done annually. An active lifestyle, a balanced diet, and maintaining a healthy weight were all recommended to the patient.

3. Discussion

3.1. Epidemiology

Encapsulated papillary carcinoma (EPC) represents a rare form of breast cancer, accounting for only 1–2% of cases in women (5). Moreover, when there is no evidence of invasiveness, the prognosis remains excellent (6). The most frequently affected demographic is postmenopausal Caucasian women between the ages of 55 and 67 (7,8), with the average age at diagnosis being around 67 years (9,10). In contrast, EPC cases that exhibit invasive characteristics tend to be diagnosed at an average age of 59.3 years, which is relatively younger (5). Additionally, male patients constitute approximately 2–7% of EPC cases (5,11)

3.2. Pathologic Features

Morphologically, the papillary architecture forms a network in which branches of fibrovascular cores are lined by neoplastic epithelial cells (12). At the periphery, EPC is distinguished by a capsule made up of fibers of varying thickness (12). Within this capsule, there is proliferation of luminal epithelial cells alongside delicate fibrovascular cores, and a myoepithelial layer is notably absent from both the papillary structures and the capsule (13).

Occasionally, EPC is found in association with ductal carcinoma in situ (DCIS) and/or invasive ductal carcinoma (14). Invasion is defined by the presence of abnormal neoplastic cells that penetrate the stroma by breaching the fibrous capsule (12), with DCIS observed in the surrounding breast tissue in 28.6–70% of cases (5, 12).

Despite these associations, several factors support the classification of EPC as non-invasive, including its excellent prognosis, very low rates of metastasis, minimal lymphovascular invasion, and rare relapse events (15). Nonetheless, there are instances of invasive EPC, where the tumor extends beyond the fibrous capsule and exhibits lymph node metastasis (15).

According to the WHO Classification of Tumors of the Breast (2019), EPC without invasion and with low or moderate nuclear grade is regarded similarly to DCIS—a categorization that applied to our patient. Molecular studies indicate that EPC shares more characteristics with DCIS than with invasive carcinoma (16).

In terms of receptor expression, EPC generally shows a diffuse positivity for hormonal receptors. Most cases are positive for both estrogen (ER) and progesterone (PR) receptors, while human epidermal growth factor receptor-2 (HER2neu) is typically negative (5, 12, 13). A 2018 clinicopathologic study by Li et al. involving 49 EPC cases, with an average diagnostic age of 68.5 years, found that 95.9% of tumors were ER- and PR-positive, and only eight cases exhibited HER2 1+ immunoreactivity (17).

3.3. Diagnosis

- Gross Examination : Encapsulated papillary carcinoma (EPC) is generally a sizable tumor (averaging around 2 cm) that develops within an expanded cystic duct (5). Clinically, it typically presents as a painless breast lump that may have been present for several years (5). A frequent symptom is bloody nipple discharge; however, it is often asymptomatic and discovered during routine screening mammography (5). On gross inspection, EPC appears as a well-demarcated, tan-white, intracystic, and friable mass.

- MMG (Mammography) : On mammography, EPC is characterized as a well-circumscribed, dense mass with an oval or circular shape, and it usually lacks calcifications (5, 14). In cases where invasive carcinoma is present, about 50% of the lesions show less distinct margins in the invaded areas, which typically present with spiculated edges (18, 19). Calcifications are uncommon, reported in only approximately 13% of cases (14).

- US (Ultrasound) : Ultrasound evaluation of EPC may reveal either a solid mass or a heterogeneous lesion composed of both cystic and solid components (5, 14). While the margins are often well-defined, there are instances where the lesion exhibits loosely defined borders or is surrounded by multilobulated contours, a feature that may suggest malignancy (5, 18). Internal echoes, frequently resulting from septations within the cystic component, are also observed (5). The assessment of vascularity is typically performed using Doppler imaging (20, 21).

- MRI : Magnetic Resonance Imaging does not offer any features that are exclusively specific to EPC (5). Nonetheless, two main characteristics on MRI include the presence of an enhancing complex cyst and a multicystic lesion with a solid central component (22). Differentiating malignant from benign breast lesions can sometimes be challenging with standard imaging modalities, making MRI a valuable tool in such distinctions (23).

3.4. Core Needle Biopsy

Identifying the histological features of EPC via core needle biopsy is critically important (24). Although this procedure can classify papillary lesions as benign or malignant, it falls short in distinguishing between invasive and non-invasive tumors (9). This limitation is due to the potential presence of adjacent in situ or invasive disease that might not be captured during biopsy; therefore, it is essential to include the tumor wall, where the lack of myoepithelial markers can be observed (14). Ultimately, while this diagnostic pathway is challenging, a definitive diagnosis is often achieved only through the examination of resection specimens (24).

3.5. Management

Therapeutic recommendations for EPC remain somewhat controversial (5). When there is no evidence of invasion, EPC is classified and managed as an in situ lesion (14). Conversely, if invasive features are identified, treatment decisions are made in line with protocols for invasive carcinoma (14).

According to the 2019 WHO Classification of Tumors of the Breast, non-invasive EPC with low or moderate nuclear grade should be staged and treated as ductal carcinoma in situ. In these cases, complete surgical excision with clear margins is typically sufficient. The necessity of axillary surgery is still debated; some experts argue against it due to the tumor's low metastatic rate and the potential morbidity associated with axillary lymph node dissection (1–25).

Many institutions also support the use of adjuvant radiotherapy and hormonal therapy, although their impact on improving outcomes in pure EPC cases is not conclusively established (26,27,28). Radiotherapy is generally recommended for patients who opt for breast-conserving surgery (1).

For patients with positive receptor status and invasive disease, hormonal therapy—using agents such as tamoxifen or letrozole—is commonly advised (29).

3.6. Prognosis

EPC is well known for its excellent prognosis, with 10-year survival rates nearing 100% (5). One of the largest studies, involving 917 EPC patients in California, reported relative cumulative survival rates of 96.8% for EPC alone and 94.4% for EPC associated with invasive cancer (28). In the absence of concurrent ductal carcinoma in situ (DCIS) or invasive ductal carcinoma (IDC), EPC typically exhibits very low rates of lymph node metastasis and no disease-related deaths (30).

4. Conclusion

Encapsulated papillary carcinoma is a rare tumor that predominantly affects post-menopausal women and generally has an excellent prognosis. The presence of a solid component within a cystic breast lesion should raise clinical suspicion for malignancy, and it is crucial to ensure that core biopsies target this solid area. Surgical excision with negative margins is usually adequate for managing EPC, although the role of axillary surgery remains a subject of debate. For patients undergoing breast-conserving surgery, adjuvant radiotherapy is recommended, while hormonal therapy may be beneficial for those with receptor-positive tumors.

Compliance with ethical standards

Disclosure of conflict of interest

All authors have no conflict of interest to declare.

Statement of ethical approval

This case report was conducted in accordance with ethical guidelines.

Statement of informed consent

The patient provided informed consent for the publication of this case report.

References

[1] Fayanju OM, Ritter J, Gillanders WE, et al. Therapeutic management of intracystic papillary carcinoma of the breast: the roles of radiation and endocrine therapy. Am J Surg. 2007; 194: 497-500.

[2] Cox KL, Korourian S, Klimberg VS. Unusual tumors of the breast. Curr Probl Surg. 2009; 46(7): 514-590.

[3] Muttarak M, Somwangprasert A, Chaiwun B. Intracystic papillary carcinoma of the breast. Biomed Imaging Intervention J. 2005; 1(1):e5.

[4] .Wynveen CA, Nehhozina T, Akram M. Intracystic papillary carcinoma of the breast: an in situ or invasive tumor? Results of immunohistochemical analysis and clinical follow-up. Am J Surg Pathol. 2011; 35: 1-14.

[5] Steponavičiene L, Gudavičiene D, Briediene R, Petroška D, Garnelyte A. Diagnosis, treatment, and outcomes of encapsulated papillary carcinoma: a single institution experience. ActaMedicaLituanica. (2018) 25:66–75. 10.6001/actamedica.v25i2.3759

[6] Al Reefy S, Kameshki R, Al Sada Dh, El Elewah A, Awadhi A, Al Awadhi K. Intracystic papillary breast cancer: a clinical update. Ecancermedi- calscience. (2013) 7:286. 10.3332/ecancer.2013.286

[7] Salem A, Mrad K, Driss M. Carcinomepapillairemammaireintrakystique. J Radiol. (2009) 90:515–8. 10.1016/S0221-0363(09)74015-6

[8] Muttarak M, Samwangprasert A, Chaiwun B. Intracystic papillary carcinoma of the breast. Biomed ImagInterv J. (2005) 1:52–3. 10.2349/biij.1.1.e5

[9] Mogal H, Brown DR, Isom S, Griffith K. Howard-McNatt M. Intracystic papillary carcinoma of the breast: a SEER database analysis of implications for therapy. Breast. (2016) 27:87–92. 10.1016/j.breast.2016.01.003

[10] Grabowski J, Salzstein SL, Sadler GR, Blair S. Intracystic papillary carcinoma: a review of 917 cases. Cancer. (2008) 113:916–20. 10.1002/cncr.23723

[11] George K, Anna Z, Evanthia K, Vassilios K. Encapsulated papillary carcinoma of the breast: an overview. J Cancer Res Ther. (2013) 9:564–70. 10.4103/0973-1482.126448

[12] Tariq M, Idress R, Qureshi M, Kayani N. Encapsulated papillary carcinoma of breast; a clinicopathological study of 25 cases and literature review with emphasis on high grade variant. Ann Diagnost Pathol. (2020) 49:151613. 10.1016/j.anndiagpath.2020.151613

[13] Hashmi A, Iftikhar S, Munawar S, Shah A, Irfan M, Ali J. Encapsulated papillary carcinoma of breast: clinicopathological features and prognostic parameters. Cureus. (2020). 10.7759/cureus.11282

[14] Bonnet S, Carter G, Berg W. Encapsulated papillary carcinoma of the breast:imaging features with histopathologic correlation. J. Breast Imag. (2020) 2:590–7. 10.1093/jbi/wbaa068

[15] Kato H, Naiki-Ito A, Yamada T, Suzuki S, Yamashita Y, Inaguma S, et al. The standard form of CD44 as a marker for invasion of encapsulated papillary carcinoma of the breast. Pathol Int. (2020) 70:835–43. 10.1111/pin.13001

[16] Wei S. Papillary lesions of the breast: an update. Arch Pathol Lab Med. (2016) 140:628–43. 10.5858/arpa.2015-0092-RA

[17] Li X, Xu Y, Ye H, Qin S, Hou F, Liu W. Encapsulated papillary carcinoma of the breast: a clinicopathological study of 49 cases. Curr Probl Cancer. (2018) 42:291–301. 10.1016/j.currproblcancer.2018.03.005

[18] Eiada R, Chong J, Kulkarni S, Goldberg F, Muradali D. Papillary lesions of the breast: MRI, ultrasound, and mammographic ap- pearances. AJR Am J Roentgenol. (2012) 198:264–71. 10.2214/AJR.11.7922

[19] Speer ME, Adrada BE, Arribas EM, Hess KR, Middleton LP, Whitman GJ. Imaging of intracystic papillary carcinoma. Curr Probl Diagn Radiol. (2019) 48:348–52. 10.1067/j.cpradiol.2018.05.001

[20] Dogan BE, Whitman GJ, Middleton LP, Phelps M. Intracystic papillary carcinoma of the breast. AJR Am J Roentgenol. (2003) 181:186. 10.2214/ajr.181.1.1810186 21.Cox KL, Korourian S, Klimberg VS. Unusual tumors of the breast. Curr Probl Surg. (2009) 46:514–90. 10.1067/j.cpsurg.2009.03.003

[21] Yoo JL, Woo OH, Kim YK, Cho KR, Yong HS, Seo BK, et al. Can MR Imaging contribute in characterizing well-circumscribed breast carcinomas? Radio Graphics. (2010) 30:1689–702 10.1148/rg.306105511

[22] Lam W, Tang A, Tse G, Chu W. Radiology-pathology conference: papillary carcinoma of the breast. Clin Imaging. (2005) 29:396–400. 10.1016/j.clinimag.2005.02.002

[23] Hashmi A, Faraz M, Rafique S, Adil H, Imran A. Spectrum of papillary breast lesions according to world health organization classification of papillary neoplasms of breast. Cureus. (2020). 10.7759/cureus.11026

[24] Visscher D, Collins LC, O'Malley F, Badve S, Reis-Fiho JS. Solid papillary carcinoma. In: SR Lakhani, IO Ellis, SJ Schnitt, PH Tan, MJ Vijver, eds. WHO Classification of Tumours of the Breast. IARC Press; 2012: 108-109.

[25] Rakha EA, Gandhi N, Climent F, et al. Encapsulated papillary carcinoma of the breast: an invasive tumor with excellent prognosis. Am J Surg Pathol. 2011; 35: 1093-1103.

[26] Carter D, Orr SL, Merino MJ. Intracystic papillary carcinoma of the breast. After mastectomy, radiotherapy or excisional biopsy alone. Cancer. 1983; 52(1): 14-19.

[27] Solorzano CC, Middleton LP, Hunt KK, et al. Treatment and outcome of patients with intracystic papillary carcinoma of the breast. Am J Surg. 2002; 184(4): 364-368.

[28] Grabowski J, Salzstein SL, Sadler GR, Blair S. Intracystic papillary carcinoma: a review of 917 cases. Cancer. 2008; 113(5): 916-920.

[29] Reefy S, Osman H, Chao C, Perry N, Mokbel K. Surgical excision for B3 breast lesions diagnosed by vacuum-assisted core biopsy. Anticancer Res. 2010; 30(6): 2287-2290.