CASE REPORT

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A Giant Invasive Papillary Breast Carcinoma : A Rare Case Report

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ABSTRACT

Introduction: Invasive papillary carcinoma represents a rare subtype of breast cancer, constituting about 0.5% of all invasive breast cancers and mainly occurring in postmenopausal women. Because most information comes from limited case reports and small retrospective analyses, awareness of this tumor remains low, posing challenges for clinical management. There are distinct pathological characteristics and biological behaviors seen in invasive papillary carcinoma, according to the research. One reason for its generally good prognosis is because it is seldom involved with lymph nodes and is classified as a luminal subtype. [1, 2].

Case Presentation: We report a rare case of Invasive Papillary Breast Carcinoma in a 48-year-old premenopausal woman who presented with a gradually enlarging, painless retroareolar mass in her right breast, persisting for four months. The patient previously underwent an incisional biopsy at another hospital, and the histopathology results showed invasive papillary breast carcinoma. The patient has undergone a chest CT-scan for diagnostic confirmation and surgical guidance. The patient underwent a right-sided modified radical mastectomy, and histopathological examination of the specimen confirmed the diagnosis of Invasive Papillary Carcinoma. Immunohistochemical analysis further validated this diagnosis.

Conclusion: Although the treatment of Invasive Papillary Breast Carcinoma generally aligns with that of more common breast cancers, its protocol remains unclear due to the condition's rarity. We chose to present this Invasive Papillary Breast Carcinoma case because of the disease's uncommon nature, the severity of the symptoms, and the need for urgent intervention.

Keywords: invasive papillary breast carcinoma, modified radical mastectomy, uncommon type of breast cancer.
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INTRODUCTION

Breast papillary neoplasms include a variety of proliferative lesions, from benign and unusual types to cancerous tumors. Fewer than three percent of breast anomalies are these lesions.[3,4] Recent World Health Organization (5th edition) breast tumor classifications classify papillary neoplasms as either benign or malignant.[5] The benign types, often known as intraductal papillomas, are commonly seen in women who have had multiple pregnancies and are generally regarded as having low potential for malignancy [6]. However, even though these papillomas remain confined to the breast ducts, they carry an increased risk of breast cancer development. This risk is especially significant in women with multiple papillomas and is estimated to be 1.5 to 2 times higher in women with a single papilloma as well [7,8].

Some examples of malignant papillary neoplasms include invasive papillary carcinoma (IPC), solid papillary carcinoma (SPC), encapsulated papillary carcinoma (EPC), and papillary ductal carcinoma in situ (DCIS).[8] IPC predominantly affects postmenopausal women, particularly those of non-Caucasian background, usually between 60 and 80 years of age[9,10]. In a study comparing 284 IPC cases with 300 invasive ductal carcinoma (IDC) cases, a notably higher percentage of IPC patients (79.23%) were diagnosed after age 50, compared to 39.00% of IDC patients. Furthermore, the majority of IPC patients (74.30%) were postmenopausal, whereas only 35.00% of IDC patients fell into this category[11].

CASE PRESENTATION

A painless tumor placed retroareolarly in the right breast that was steadily growing in size was reported by a 48-year-old woman who was not yet menopausal., persisting for four months. On physical examination, breast asymmetry was noted, with the nipples positioned at differing heights (**Fig. 1A**). The tumor encompassed the entire right breast, measuring 17.5 × 14 × 9 cm, and exhibited a firm texture, poorly defined margins, and restricted mobility (**Fig. 1B**). The overlying skin appeared erythematous and edematous, with evident dehiscence (**Fig. 1C**). No palpable lymph nodes were found in either axilla or in the supraclavicular and infraclavicular regions, and there was no evidence of skin dimpling. The patient had previously undergone an incisional biopsy at another hospital, which revealed invasive papillary breast carcinoma on histopathological examination. A chest CT scan was performed to aid in diagnostic confirmation and surgical planning. The patient subsequently underwent a

right-sided modified radical mastectomy, and histopathological evaluation of the surgical specimen confirmed the diagnosis of invasive papillary carcinoma. Immunohistochemical analysis further supported this diagnosis.

The patient has a history of an incisional biopsy in January 2025, which revealed invasive papillary breast carcinoma. A contrast-enhanced chest CT scan performed in February 2025 showed a semisolid mass infiltrating the pectoralis major muscle. The mass measured 17.5 × 14 × 9 cm, with imaging features consistent with invasive papillary breast carcinoma.

Laboratory tests conducted in February 2025 indicated a hemoglobin level of 10.3 g/dL and a mean corpuscular volume (MCV) of 77.9 fL. The white blood cell count was within normal limits at 6.9 × 10^9/L, while the platelet count was elevated at 520 × 10^9/L. Biochemical analysis revealed a urea concentration of 29 mmol/L and a creatinine level of 0.7 µmol/L. The patient underwent a modified radical mastectomy to remove the tumor along with axillary lymph nodes, aiming to minimize the risk of metastasis and local recurrence. Due to the tumor's extensive involvement of the entire breast, the surgery entailed substantial excision of adjacent skin and tissue.

The specimen exhibited a wrinkled surface with two fissures measuring approximately 15 × 10 cm and 12 × 10 cm, respectively (**Fig. 4A**). Within the capsule and along the luminal wall, there were dark-brown blood clots and large regions of necrosis (**Fig. 4B**). Tissue samples were gathered from various areas for immunohistochemistry (IHC) and Hematoxylin and Eosin (HE) staining in order to precisely identify the tumor type and histopathological characteristics.

Following the modified radical mastectomy, the patient received ketorolac 30 mg every 8 hours for pain management and ampicillin-sulbactam 1.5 g every 12 hours as antibiotic prophylaxis. The patient showed good recovery during a two-day hospital stay. Once postoperative pain subsided, the patient's condition stabilized, and drain output decreased to less than 50 cc, the drain was removed, and the patient was discharged. A follow-up appointment was scheduled at the Surgical Oncology Clinic.

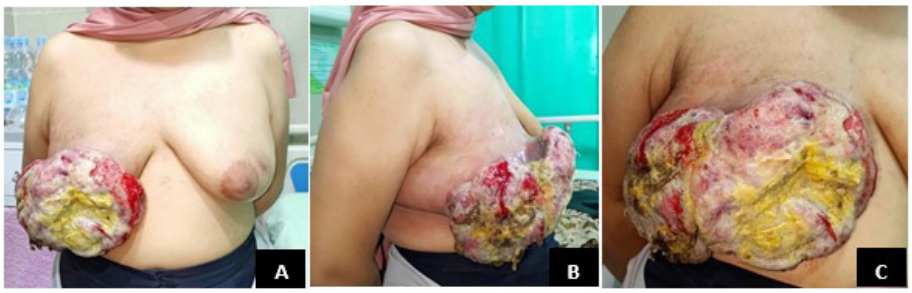

Figure 1. Physical examination revealed asymmetrical breasts, with the nipples positioned at different levels (A). The tumor involved the entire right breast, measuring 17.5 × 14 × 9 cm, and was characterized by firm consistency, ill-defined margins, and limited mobility (B). The overlying skin appeared erythematous and edematous, with evident dehiscence (C). Published with permission.

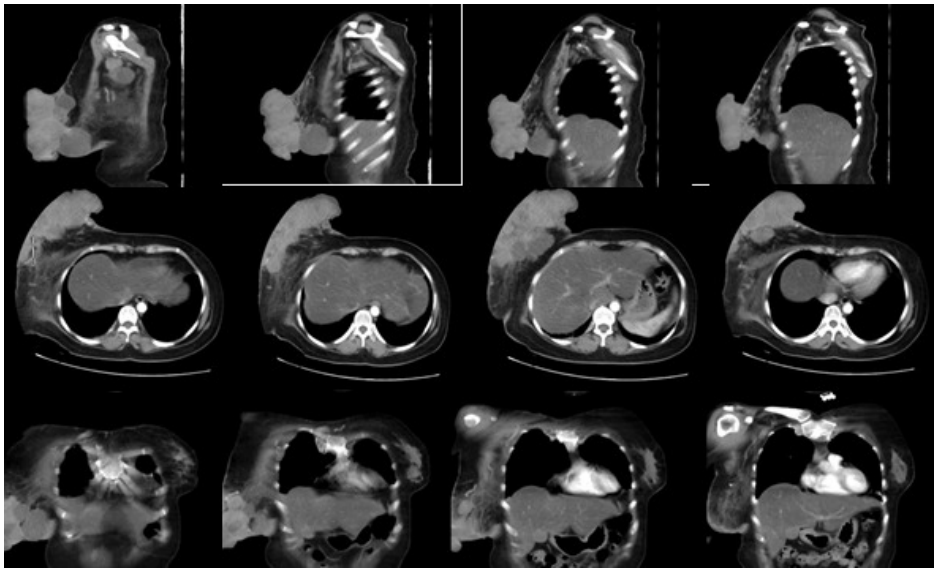

Figure 2. Enhancing Partially Necrotic Right Chest Wall Mass in Largest Dimension 45 cm × 35 cm × 25 cm.

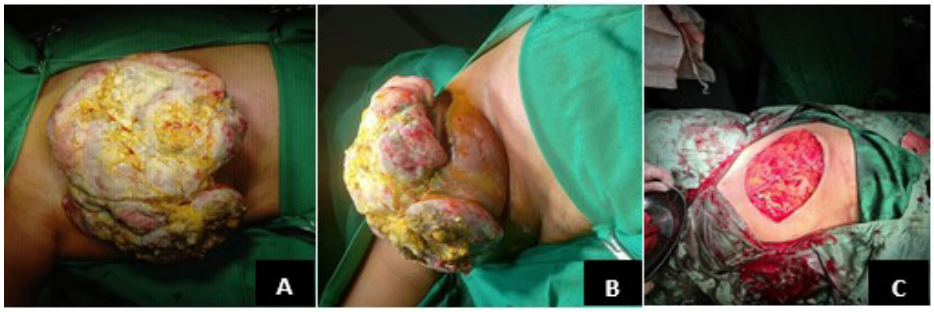

Figure 3. Intraoperative : Initial incision design of above view (A); Initial design incision of side view (B); Defects after modified radical mastectomy (C). Published with Permission.

DISCUSSION

Breast papillary neoplasms are classified in a wide range of ways according to the 5th edition of the World Health Organization's Classification of Breast Tumors. These include benign papillomas, intraductal papillary carcinomas, and more aggressive types like invasive papillary carcinoma, solid papillary carcinoma, and encapsulated papillary carcinoma. [12]. Among these, IPC is the least common subtype and is characterized by a dominant

papillary invasive growth pattern comprising over 90% of the tumor mass[8, 14, 15]. This subtype shows distinct clinical presentations and histopathological characteristics compared to other papillary tumors. Nonetheless, the lack of extensive epidemiological data complicates accurate diagnosis and effective treatment planning for IPC [16].

A 48-year-old premenopausal woman presented with a mass affecting all quadrants of her right breast, sometimes accompanied by pain. Both preoperative imaging and postoperative gross pathology showed multiple cystic-solid lesions that had merged within the breast tissue. Tumors containing cystic areas can complicate diagnosis because their overall size may lead to an overestimation of tumor spread. Thus, careful evaluation of the solid portions is essential to ensure precise diagnosis and optimal treatment planning.

As far as we know, this is the first study to highlight three significant features of invasive papillary carcinoma (IPC). First, with a diameter of more than 17.5 cm, it records the biggest IPC tumor ever. Furthermore, there was zero indication of metastasis to the axillary lymph nodes, despite the patient's protracted illness course, a sizable tumor mass, and extensive skin involvement. This discovery highlights the usually beneficial biological and pathophysiological features of IPC.

Microscopically, invasive papillary breast carcinoma is characterized by an infiltrative pattern where papillary structures constitute over 90% of the invasive tumor area [17,18]. These papillary formations feature fibrovascular cores that are lined by proliferating luminal epithelial cells (see **Fig. 5**). In comparison, solid papillary carcinoma (SPC) exhibits a denser and more compact structural arrangement, with a thicker fibrovascular core [19]. The epithelial cells in SPC tend to be closely packed, have pale cytoplasm, and show minimal mitotic activity. Based on the Nottingham Histologic Grading system, the majority of SPC cases are designated as grade 2 tumors[20].

Apocrine metaplasia or apocrine secretions are also commonly observed in association with these histological features. While most breast carcinomas with a papillary architecture are ER positive and HER2 negative, there are a few unusual subtypes that deviate from this rule, including mucinous cystadenocarcinoma and tall cell carcinoma with reversed polarity [21, 22]. The hallmarks of classic invasive papillary carcinoma (IPC) are low Ki-67 proliferative index, high immunoreactivity for ER and PR, and the lack of HER2 gene amplification.[1, 22]. Notably, in this case, no signs of local recurrence or distant metastasis were observed during the one-year follow-up period.

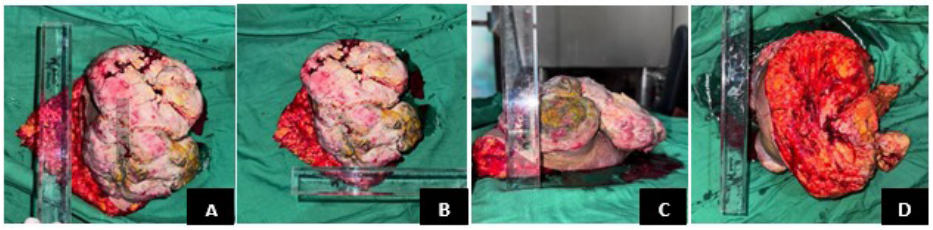

Figure 4. Images of the breast specimen show measuring 17.5 cm in length (A), Images of the breast specimen show measuring 14.0 cm in width (B) the lesion occupied the entire breast show measuring 10.0 cm in height (C), and the tumor base exhibited both cystic and solid components (D). Published with Permission.

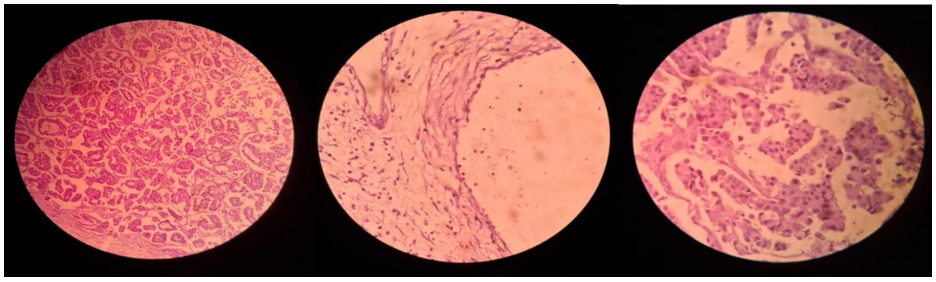

Figure 5. Broad papillary structure with a central fibrovascular core (HE stain, ×200 original magnification).

Treatment approaches for invasive breast carcinoma are generally divided into local and systemic strategies. Local treatments focus on removing or controlling the tumor at its origin and commonly include surgery and radiation. Surgical procedures may involve a lumpectomy or various forms of mastectomy—partial, total, or modified—depending on the case. Radiation therapy is typically recommended after breast-conserving surgeries, like lumpectomy or partial mastectomy, to lower the chances of cancer recurrence in the same area [24]. On the other hand, systemic treatments—such as chemotherapy, hormone therapy, and targeted therapies—aim to address cancer cells that may have spread throughout the body [24]. Papillary breast carcinomas often show positive expression for estrogen and progesterone receptors, making them suitable candidates for hormone-based treatments. Most of these tumors are low-grade and slow-growing, with a generally good prognosis and high survival outcomes. They tend to have limited invasive characteristics and seldom spread beyond their initial site [25].

CONCLUSION

Invasive papillary carcinoma of the breast is a rare histological variant distinguished by unique pathological and biological characteristics, and it is typically associated with a favorable clinical outcome. Accurate histopathological diagnosis and the avoidance of overtreatment are paramount to ensuring optimal clinical outcomes. Given the limited body of evidence and the lack of standardized treatment guidelines, clinical decision-making should be approached with caution and individualized based on patient-specific factors. We propose that modified radical mastectomy constitutes a viable and effective treatment option for invasive papillary carcinoma. To the best of our knowledge, this report is the first to

document the successful management of invasive papillary breast carcinoma with modified radical mastectomy, performed without postoperative complications.

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