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Pathological Complete Response to Neoadjuvant Anthracycline–Taxane Chemotherapy in Stage IIIB Luminal B Her2-Negative Invasive Micropapillary Carcinoma of The Breast: A Case Report

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Abstract

Invasive micropapillary carcinoma (IMPC) of the breast is a rare and aggressive histological subtype, accounting for approximately 1–2% of breast cancers and characterized by a high propensity for lymphovascular invasion and lymph node metastasis. Among these cases, fewer than 10% achieve a complete clinical response following neoadjuvant chemotherapy. This case report aims to provide a comprehensive clinical and pathological description of a rare case of Stage IIIB Luminal B HER2-negative invasive micropapillary carcinoma that achieved a pathological complete response (pCR) following neoadjuvant anthracycline–taxane chemotherapy and to analyze the clinicopathological and molecular factors contributing to this exceptional treatment response. This research presents a case-based analysis of a 44-year-old female patient diagnosed with locally advanced breast cancer. Clinical evaluation, imaging examinations (breast ultrasound, chest X-ray, and liver ultrasound), histopathological assessment, and immunohistochemical analysis (ER, PR, HER2, and Ki-67) were performed to establish the diagnosis, staging, and molecular subtype. Tumor growth kinetics were also estimated using tumor doubling time. The patient presented with a progressively enlarging breast mass accompanied by peau d'orange appearance and axillary lymphadenopathy. Histopathological examination confirmed grade 3 IMPC, while immunohistochemistry revealed a Luminal B HER2-negative subtype (ER/PR-positive, Ki-67: 40%). Imaging examinations showed no evidence of distant metastasis (T4bN1M0, Stage IIIB). Following AC-T neoadjuvant chemotherapy, a complete clinical response was observed, with the disappearance of the primary tumor and axillary lymph node involvement. IMPC exhibits aggressive local behavior with a high rate of nodal involvement; however, it may respond favorably to systemic therapy when appropriately managed through multimodal evaluation, accurate molecular characterization, and early detection.

INTRODUCTION

Invasive micropapillary carcinoma (IMPC) of the breast is an uncommon histological subtype of invasive breast carcinoma, accounting for approximately 1–2% of all invasive breast malignancies (Cheng et al., 2024). Since its first description by Siriaunkgul and Tavassoli in (1993), IMPC has attracted considerable attention due to its distinctive histopathological architecture and aggressive biological behavior. Despite its relatively low incidence, IMPC demonstrates disproportionately high rates of lymphovascular invasion (LVI), regional lymph node metastasis (LNM), locoregional recurrence, and advanced nodal stage at presentation compared with invasive carcinoma of no special type (NST). These clinicopathological characteristics establish IMPC as a distinct breast cancer subtype requiring careful consideration during diagnosis and treatment planning (Cobb et al., 2024; Corso et al., 2020; Y.-B. Liu et al., 2024; Rakha et al., 2026).

The present case demonstrates several of these characteristic features (K. Liu et al., 2020; Zhang et al., 2020). The patient presented with a rapidly enlarging breast mass associated with peau d'orange appearance, clinically positive axillary lymph nodes, and locally advanced

disease (cT4bN1M0, Stage IIIB). Histopathological examination confirmed Grade 3 invasive micropapillary carcinoma with a Luminal B HER2-negative molecular subtype. These findings are consistent with previously published clinicopathological series describing IMPC as a high-grade malignancy with pronounced lymphotropic behavior.

Unlike conventional invasive carcinoma of no special type, IMPC exhibits a distinctive microscopic appearance characterized by clusters of tumor cells surrounded by clear stromal spaces that closely resemble dilated lymphovascular channels. Importantly, these spaces do not represent true vascular structures but rather stromal retraction artifacts resulting from interactions between tumor cells and the surrounding stroma. This architectural pattern produces the characteristic "floating clusters" frequently described in pathological evaluations.

A defining hallmark of IMPC is reversed epithelial polarity, commonly referred to as the inside-out growth pattern (Bullock & Brunton, 2025; Gupta et al., 2025). Under normal physiological conditions, epithelial cells maintain polarity, with the apical membrane oriented toward the ductal lumen and the basal membrane positioned adjacent to the surrounding stroma. In IMPC, this polarity is inverted, resulting in the apical membrane facing outward toward the surrounding stroma rather than the lumen.

This phenomenon can be demonstrated immunohistochemically using epithelial membrane antigen (EMA) or MUC1 staining. Instead of exhibiting luminal staining, these markers become localized along the outer surface of tumor clusters, producing the characteristic "inside-out" immunostaining pattern (Nassar et al., 2004). This reversed polarity is considered a defining diagnostic feature of IMPC and serves as an important discriminator from papillary carcinoma and other special histological subtypes.

Although the precise molecular mechanisms underlying polarity reversal remain incompletely understood, accumulating evidence suggests that dysregulation of cell polarity proteins, abnormal integrin signaling, altered extracellular matrix interactions, and disruption of epithelial–stromal communication contribute to this phenomenon. These alterations collectively facilitate tumor cell detachment from adjacent epithelial structures and enhance stromal invasion.

Another important biological characteristic of IMPC is its marked propensity for lymphatic dissemination. Multiple retrospective studies have consistently demonstrated significantly higher frequencies of lymphovascular invasion compared with NST. Reported rates of lymph node metastasis at diagnosis range from approximately 60% to more than 90%, substantially exceeding those observed in conventional invasive ductal carcinoma (Qiu et al., 2024).

Several molecular pathways appear to contribute to this pronounced lymphotropism. Overexpression of MUC1 not only reflects reversed polarity but may also reduce intercellular adhesion, facilitating the detachment of tumor clusters from the primary lesion. Increased expression of integrin β1 promotes interactions between tumor cells and extracellular matrix components, thereby facilitating invasion through surrounding stromal tissues.

Similarly, activation of the CXCL12/CXCR4 signaling axis has been implicated in lymphatic homing. CXCR4-expressing breast cancer cells preferentially migrate toward tissues enriched in CXCL12, thereby increasing the likelihood of lymph node dissemination (Müller et al., 2001). Enhanced activation of downstream signaling pathways, including the PI3K/AKT and MAPK pathways, further promotes tumor cell migration, invasion, and metastatic potential.

In addition, dysregulation of the Wnt/β-catenin pathway, increased LEF1 expression, Rac1 activation, and altered plakoglobin-mediated cell adhesion have been associated with the aggressive biological phenotype of IMPC. Collectively, these molecular abnormalities help explain why even relatively small IMPC lesions frequently present with extensive lymph node metastases.

Interestingly, although IMPC exhibits highly aggressive locoregional behavior, its molecular subtype distribution differs from that of triple-negative breast cancer. Most IMPC cases are hormone receptor-positive. Large institutional series have reported estrogen receptor positivity in approximately 70–90% of tumors, progesterone receptor positivity in more than half of patients, and HER2 overexpression in approximately 20–30% of cases (Chen et al., 2017; Qiu et al., 2024). Consequently, Luminal A and Luminal B represent the predominant intrinsic molecular subtypes.

The present patient similarly demonstrated strong ER and PR expression with negative HER2 status, fulfilling the criteria for Luminal B HER2-negative disease due to the elevated Ki-67 proliferation index of 40%. This molecular profile is clinically significant because hormone receptor-positive IMPC generally demonstrates lower pathological complete response (pCR) rates following neoadjuvant chemotherapy compared with HER2-positive or triple-negative breast cancer. Therefore, achieving a complete pathological response in this case represents an uncommon and clinically meaningful outcome.

Histological grade also contributes substantially to treatment responsiveness. Although many hormone receptor-positive tumors exhibit relatively indolent biological characteristics, high-grade Luminal B carcinomas behave differently. Increased mitotic activity, marked nuclear pleomorphism, elevated Ki-67 expression, and accelerated cellular proliferation may increase sensitivity to cytotoxic chemotherapy because actively dividing cells are more vulnerable to DNA-damaging agents, including anthracyclines and taxanes.

This mechanism may partially explain why some biologically aggressive hormone receptor-positive tumors achieve favorable responses despite historically lower pCR rates compared with other molecular subtypes.

Another notable feature of the present case is the apparent discrepancy between the classical aggressive biological characteristics of IMPC and the absence of lymphovascular invasion in the diagnostic core biopsy specimen. Previous investigations have demonstrated that lymphovascular invasion may be underestimated in core needle biopsy specimens due to limited tissue sampling. Therefore, the absence of identifiable LVI in biopsy samples should not exclude the diagnosis of biologically aggressive IMPC or reduce clinical suspicion for lymph node metastasis, particularly when imaging and physical examination demonstrate clinically positive axillary disease.

From a surgical oncology perspective, recognition of IMPC is clinically important because histological subtype may influence staging assessment and treatment planning. The increased likelihood of occult lymph node involvement requires careful axillary evaluation. Although current international guidelines do not recommend distinct treatment algorithms solely based on IMPC histology, awareness of its aggressive nodal behavior supports comprehensive regional staging and multidisciplinary management.

This case report aims to describe the clinical presentation, diagnostic work-up, and multidisciplinary management of a patient with locally advanced invasive micropapillary carcinoma; analyze the clinicopathological factors contributing to the exceptional pathological complete response; and provide evidence-based clinical insights for managing similar rare breast cancer cases. Theoretically, this report contributes to the limited literature regarding neoadjuvant treatment outcomes in IMPC and enhances understanding of biological heterogeneity and chemosensitivity in this rare subtype. Practically, it provides clinical insights for oncologists, surgeons, and pathologists, reinforces the importance of multidisciplinary approaches, and establishes a foundation for future research on predictive biomarkers in IMPC.

Overall, this case illustrates several hallmark clinicopathological characteristics of IMPC, including locally advanced presentation, high histological grade, hormone receptor positivity, elevated proliferative activity, and clinically positive axillary lymph nodes. However, unlike the majority of reported IMPC cases, this patient achieved a pathological

complete response following standard anthracycline–taxane neoadjuvant chemotherapy. This remarkable outcome raises an important biological question: why was a traditionally chemoresistant Luminal B HER2-negative IMPC able to achieve complete eradication of invasive disease? The explanation likely involves interactions among tumor proliferation, molecular subtype, intrinsic chemosensitivity, and treatment intensity, which will be discussed in the following section.

METHOD

Case Presentation

A 44-year-old premenopausal Indonesian woman was referred to the Surgical Oncology Clinic of Dr. Hasan Sadikin General Hospital, Bandung, Indonesia, for evaluation of a progressively enlarging left breast mass. She had first noticed a painless breast lump approximately eight months before admission. Initially, the lesion measured approximately 2 cm in diameter; however, it progressively enlarged, particularly during the four months before referral, reaching an estimated size of approximately 8 cm.

The patient denied breast pain throughout the disease course but reported progressive skin changes over the affected breast during the previous two months, characterized by diffuse hyperpigmentation and peau d'orange appearance. She also experienced intermittent bloody nipple discharge. She denied nipple inversion, ulceration, fever, breast trauma, or symptoms suggestive of acute mastitis.

Approximately one month before admission, the patient noticed a small painless lump in the left axillary region. The mass was initially mobile and approximately 2 cm in size. No palpable masses were identified in the contralateral axilla or supraclavicular and infraclavicular regions.

A systemic review revealed no symptoms suggestive of distant metastatic disease. The patient denied respiratory symptoms, chest pain, bone pain, neurological symptoms, jaundice, abdominal distension, unexplained weight loss, or constitutional symptoms.

The patient's gynecological and reproductive history revealed menarche at 13 years of age, regular menstrual cycles from 14 years of age, marriage at 21 years of age, and two full-term pregnancies. Her first childbirth occurred at 23 years of age and the second at 27 years of age. Both children were breastfed for approximately two years.

The patient had used combined oral contraceptive pills containing levonorgestrel and ethinyl estradiol continuously for approximately ten years before discontinuation. She did not use additional contraceptive methods afterward. At diagnosis, she remained premenopausal with regular menstrual cycles.

She had no history of breast disease, ovarian malignancy, or other cancers. There was no known family history of breast cancer, ovarian cancer, or hereditary cancer syndromes among first- or second-degree relatives. Her medical history was unremarkable, with no history of hypertension, diabetes mellitus, cardiovascular disease, chronic kidney disease, or autoimmune disorders. She had never undergone breast surgery or chest irradiation.

Before referral to Dr. Hasan Sadikin General Hospital, the patient had sought medical care at Kebon Jati Hospital, where imaging findings raised suspicion of breast malignancy. She was subsequently referred to the Surgical Oncology Center for further diagnostic evaluation and multidisciplinary management.

On admission, the patient was in good general condition, fully conscious, and oriented, with an Eastern Cooperative Oncology Group (ECOG) Performance Status of 0. Vital signs were within normal limits, with a blood pressure of 110/80 mmHg, heart rate of 82 beats per minute, respiratory rate of 22 breaths per minute, and body temperature of 36.5°C. General examination revealed no pallor, jaundice, or peripheral edema. No cervical lymphadenopathy

was identified. Cardiopulmonary and abdominal examinations were unremarkable, and musculoskeletal examination showed no signs suggestive of bone metastasis.

Breast examination demonstrated marked asymmetry due to enlargement of the left breast. Inspection revealed diffuse peau d'orange involving the overlying skin with localized hyperpigmentation. There was no nipple retraction, skin ulceration, or satellite skin nodules. Gentle nipple compression produced a small amount of bloody discharge.

Palpation revealed a firm, irregular mass measuring approximately 8 × 4 × 4 cm, involving the upper outer and central quadrants of the left breast from the 1 o'clock to 5 o'clock positions. The lesion was located approximately 2 cm from the nipple–areolar complex. The mass showed limited mobility without definite fixation to the chest wall and was not tender.

Regional lymph node examination identified a single mobile left axillary level I lymph node measuring approximately 2 × 1 × 1 cm with firm-elastic consistency. No palpable lymphadenopathy was detected in axillary levels II and III, supraclavicular, or infraclavicular regions. Examination of the contralateral breast and regional lymph nodes was normal.

Based on the clinical findings, the patient was diagnosed with locally advanced breast cancer (LABC). The presence of peau d'orange indicated skin involvement consistent with clinical T4b disease according to the American Joint Committee on Cancer (AJCC) TNM staging system (Müller et al., 2001). Ipsilateral mobile axillary lymphadenopathy suggested clinical N1 disease, while the absence of clinical evidence of distant metastasis supported an initial clinical stage of cT4bN1M0 (Stage IIIB), pending pathological confirmation and systemic staging evaluation.

Diagnostic Assessment

Following the initial clinical evaluation, the patient underwent a comprehensive diagnostic work-up in accordance with the National Comprehensive Cancer Network (NCCN) recommendations for patients presenting with locally advanced breast cancer (LABC) (Gradishar et al., 2024). The objectives of the investigation were to establish histological diagnosis, determine molecular subtype, evaluate regional lymph node involvement, exclude distant metastasis, and formulate an individualized multidisciplinary treatment strategy.

Breast Ultrasonography

Bilateral breast and regional lymph node ultrasonography was performed at Kebon Jati Hospital on August 1, 2024. Sonographic examination of the left breast demonstrated heterogeneous fibroglandular tissue (Breast Composition C) with architectural distortion. A large heterogeneous hypoechoic solid lesion with irregular margins and angular borders occupied nearly the entire superior and central portions of the breast (12 to 6 o'clock position). The largest measurable lesion was located between the 12 and 1 o'clock positions, measuring 7.83 × 3.20 × 3.91 cm, approximately 1–2 cm from the nipple.

The lesion exhibited several suspicious sonographic characteristics, including posterior acoustic shadowing, lateral shadowing, internal and peripheral vascularity on Doppler examination, and increased tissue stiffness with a strain elastography value of 5.7, suggesting a highly malignant lesion.

No suspicious lesions were identified in the contralateral breast, which was classified as BI-RADS 1.

Evaluation of the regional lymph nodes demonstrated a single enlarged left level I axillary lymph node measuring 2.13 × 1.81 × 2.18 cm. Although the hilar structure remained partially preserved, the node demonstrated irregular margins and peripheral vascularity, raising strong suspicion for metastatic involvement. No abnormal lymph nodes were detected in level II or III of the left axilla, the contralateral axilla, or the supraclavicular regions.

Overall, the imaging findings were highly suggestive of biopsy-proven breast carcinoma (BI-RADS 6) with ipsilateral regional lymph node involvement.

Histopathological Examination

Ultrasound-guided core needle biopsy of the left breast lesion was subsequently performed.

Microscopic examination revealed an infiltrative malignant epithelial neoplasm composed of small nests and morula-like clusters of round to oval neoplastic cells embedded within a fibrous stroma. The tumor cells exhibited marked nuclear pleomorphism, hyperchromatic nuclei, conspicuous nucleoli, and frequent mitotic figures, consistent with a high-grade carcinoma.

Importantly, malignant cells infiltrated the surrounding adipose tissue, confirming invasive disease. Neither ductal carcinoma in situ (DCIS), lymphovascular invasion, nor microcalcifications were identified in the biopsy specimen. Stromal tumor-infiltrating lymphocytes (TILs) were estimated at less than 5%.

Based on the characteristic microscopic architecture, the lesion was diagnosed as:
Invasive Micropapillary Carcinoma (IMPC), Nottingham Grade 3.

IMPC is recognized as a rare histological subtype of invasive breast carcinoma characterized by clusters of tumor cells demonstrating reversed epithelial polarity ("inside-out" growth pattern). This unique morphology has been associated with a markedly increased propensity for lymphovascular invasion and regional lymph node metastasis compared with invasive carcinoma of no special type (NST).

Immunohistochemical Evaluation

To further characterize the biological behavior of the tumor and guide systemic treatment, immunohistochemical analysis for estrogen receptor (ER), progesterone receptor (PR), HER2, and Ki-67 proliferation index was performed.

The tumor demonstrated:

1. Estrogen receptor (ER): strongly positive in approximately 50–80% of tumor cells.
2. Progesterone receptor (PR): strongly positive in more than 80% of tumor cells.
3. HER2: negative (score 0/1+).
4. Ki-67 labeling index: 40%, indicating a highly proliferative tumor.

According to the St. Gallen International Consensus classification (Goldhirsch et al., 2013), these findings established the diagnosis of Luminal B HER2-negative breast cancer.

Although hormone receptor positivity generally predicts responsiveness to endocrine therapy, the elevated Ki-67 index suggested biologically aggressive disease and supported the indication for neoadjuvant chemotherapy rather than primary endocrine treatment.

Systemic Staging

Considering the clinical diagnosis of locally advanced breast cancer, systemic staging investigations were performed to exclude distant metastatic disease.

Chest radiography demonstrated normal cardiac size and pulmonary vascular markings without pulmonary nodules, pleural effusion, or mediastinal abnormalities suggestive of metastatic disease.

Similarly, abdominal ultrasonography demonstrated a liver of normal size and echotexture without focal lesions or evidence of hepatic metastases. The portal and hepatic veins were normal, and no intra-abdominal free fluid was detected.

Taken together, these investigations revealed no radiological evidence of distant metastatic disease, allowing the tumor to be classified clinically as M0.

Clinical Stage

Based on the integration of clinical examination, breast imaging, histopathological findings, immunohistochemistry, and systemic staging, the patient was diagnosed with:

Left breast invasive micropapillary carcinoma, Nottingham Grade 3, Luminal B HER2-negative subtype, clinical stage cT4bN1M0 (Stage IIIB according to the AJCC 8th edition).

Several adverse prognostic features were identified at diagnosis, including:

locally advanced primary tumor (T4b), skin involvement manifested by peau d'orange, clinically positive axillary lymph node,

high histological grade, elevated proliferative index (Ki-67 40%), and the inherently aggressive biological behavior of invasive micropapillary carcinoma.

Despite hormone receptor positivity, these clinicopathological characteristics collectively supported the recommendation for neoadjuvant anthracycline-taxane chemotherapy.

1. Clinical Timeline
2. Clinical Timeline
3. Time Clinical Event
    a. January 2024 Patient detected a small painless left breast lump (\~2 cm).
    b. May–July 2024 Progressive enlargement of the breast mass accompanied by peau d'orange and bloody nipple discharge.
    c. August 2024 Left axillary lymph node became palpable. Breast ultrasonography demonstrated BI-RADS 6 lesion with suspicious axillary lymphadenopathy.
    d. July–September 2024 Core needle biopsy confirmed Grade 3 invasive micropapillary carcinoma. Immunohistochemistry established Luminal B HER2-negative subtype.
    e. September 2024 Chest radiography and liver ultrasonography showed no evidence of distant metastasis. Final clinical staging: cT4bN1M0 (Stage IIIB).
    f. February 2025 Neoadjuvant AC-T chemotherapy was initiated after baseline laboratory investigations and normal echocardiographic evaluation.

Therapeutic Intervention

Following multidisciplinary discussion involving surgical oncologists, radiologists, pathologists, and medical oncologists, the patient was considered unsuitable for immediate surgery because of the presence of locally advanced breast cancer (cT4bN1M0, Stage IIIB) with skin involvement. According to contemporary international guidelines (Gradishar et al., 2024), neoadjuvant systemic therapy is the preferred initial treatment for patients with T4 tumors to facilitate tumor downstaging, improve surgical resectability, eradicate occult micrometastatic disease, and permit assessment of in vivo tumor sensitivity to systemic therapy.

Before treatment initiation, baseline laboratory investigations demonstrated adequate bone marrow, renal, and hepatic function. Transthoracic echocardiography showed normal cardiac chamber dimensions with preserved left ventricular systolic and diastolic function, normal valvular anatomy, and no evidence of pulmonary hypertension, confirming the patient's suitability for anthracycline-based chemotherapy.

Considering the patient's relatively young age (44 years), excellent performance status (ECOG 0), Luminal B HER2-negative subtype with a high proliferative index (Ki-67 40%), high histological grade, and locally advanced disease, neoadjuvant chemotherapy was selected as the optimal treatment strategy.

Neoadjuvant Chemotherapy

The patient received a sequential anthracycline-taxane regimen consisting of:

1. Doxorubicin 60 mg/m² intravenously on Day 1
2. Cyclophosphamide 600 mg/m² intravenously on Day 1
3. administered every 21 days for four cycles, followed by
4. Docetaxel 75 mg/m² intravenously every 21 days for four additional cycles.

The AC-T regimen was selected because it remains one of the standard neoadjuvant chemotherapy protocols for high-risk hormone receptor-positive breast cancer. Compared with non-anthracycline regimens, sequential anthracycline-taxane therapy has demonstrated superior tumor downstaging and higher pathological complete response (pCR) rates, particularly among patients with high-grade tumors and elevated proliferative activity.

Throughout treatment, the patient completed all eight chemotherapy cycles without dose reduction or treatment interruption. Toxicities were manageable with supportive care, and no chemotherapy-related cardiotoxicity, severe infection, febrile neutropenia, or treatment-related hospitalization occurred. The patient's overall performance status remained excellent throughout treatment.

RESULTS AND DISCUSSION

Clinical Response Assessment

Following completion of neoadjuvant chemotherapy, response assessment was performed using clinical examination and breast ultrasonography.

Physical examination demonstrated a remarkable reduction in tumor burden. The previously palpable breast mass was no longer detectable. Breast symmetry had significantly improved, and nipple discharge had completely resolved. Mild residual skin thickening with persistent peau d'orange was observed; however, no residual palpable tumor was identified.

Likewise, the previously enlarged ipsilateral level I axillary lymph node was no longer palpable. No new regional lymphadenopathy or contralateral breast abnormalities were detected.

According to the Response Evaluation Criteria in Solid Tumors (RECIST), the patient achieved a complete clinical response (cCR).

Radiological Response

Repeat breast ultrasonography confirmed the impressive clinical findings.

The examination demonstrated:

1. complete disappearance of the previously identified breast mass,
2. absence of suspicious residual lesions within the breast parenchyma,
3. only mild residual cutaneous thickening involving the inferomedial breast,
4. no abnormal axillary lymph nodes.
5. No suspicious abnormalities were identified in the contralateral breast.

These findings strongly suggested an excellent response to neoadjuvant chemotherapy and supported proceeding with definitive surgical treatment.

Surgical Management

After confirmation of clinical operability, the patient underwent modified radical mastectomy (MRM) with level I axillary lymph node dissection on October 16, 2025.

Intraoperatively, the resected specimen included the entire left breast, overlying skin, nipple-areolar complex, and pectoralis major fascia.

Interestingly, no gross residual tumor was identified within the breast specimen. Several small axillary lymph nodes were removed during axillary dissection, the largest measuring approximately 1 cm in greatest dimension.

Histopathological Findings Following Surgery

Macroscopic examination demonstrated an area of fibrosis and stromal hyalinization corresponding to the previous tumor location.

Microscopic examination revealed extensive treatment-related changes characterized by fibrosis, stromal hyalinization, chronic inflammatory infiltrates, and atrophic mammary ducts.

Most importantly, no residual invasive carcinoma was identified throughout the entire breast specimen.

No residual ductal carcinoma in situ was observed

The nipple, skin, deep surgical margin, and all peripheral resection margins were completely free of malignancy.

Histological examination of five dissected axillary lymph nodes likewise demonstrated complete absence of metastatic carcinoma.

Consequently, the pathological diagnosis was:

1. No residual invasive carcinoma in the breast.
2. No residual nodal metastasis (0/5 lymph nodes).
3. Complete pathological response following neoadjuvant chemotherapy.

According to the Miller-Payne grading system (Goldhirsch et al., 2013), the pathological response corresponded to Grade 5, indicating complete eradication of invasive tumor cells.

Similarly, Residual Cancer Burden (RCB) assessment was classified as RCB-0, representing pathological complete response (pCR) (Symmans et al., 2007).

Adjuvant Treatment

Following surgery, the patient's case was re-evaluated by the institutional multidisciplinary breast cancer board.

Considering the initial presentation as Stage IIIB disease with skin involvement, adjuvant postmastectomy radiotherapy (PMRT) was recommended despite the achievement of pathological complete response

Radiotherapy was delivered to the chest wall using a total dose of 50 Gy in 25 fractions, in accordance with institutional protocols.

Because the tumor was strongly hormone receptor-positive and the patient remained premenopausal, adjuvant endocrine therapy consisting of ovarian function suppression with a gonadotropin-releasing hormone (GnRH) analogue combined with an aromatase inhibitor was initiated to reduce the risk of recurrence (Jimenez et al., 2025).

Follow-up

The patient entered a structured surveillance program consisting of regular clinical evaluation every three months during the first three postoperative years.

Follow-up assessments included:

detailed history, comprehensive physical examination, breast ultrasonography when clinically indicated, laboratory investigations, serum CA15-3 monitoring, additional imaging studies only when clinically indicated or if biochemical recurrence was suspected.

At the most recent follow-up, the patient remained clinically well without evidence of local recurrence, regional nodal recurrence, or distant metastatic disease. She continued endocrine therapy with good treatment adherence and maintained an excellent functional status without significant impairment in quality of life.

Discussion

Why Did This Luminal B HER2-Negative IMPC Achieve a Pathological Complete Response Following Neoadjuvant Chemotherapy?

One of the most intriguing aspects of the present case is the achievement of pathological complete response (pCR) following standard anthracycline-taxane neoadjuvant chemotherapy in a patient with Stage IIIB Luminal B HER2-negative invasive micropapillary carcinoma (IMPC). This outcome appears paradoxical because hormone receptor-positive/HER2-negative breast cancers, particularly the Luminal B subtype, generally exhibit substantially lower pCR rates than HER2-positive or triple-negative breast cancers (TNBC). Nevertheless, accumulating evidence indicates that a subset of biologically aggressive Luminal B tumors may derive considerable benefit from neoadjuvant chemotherapy, particularly when several favorable predictive factors coexist.

The biological heterogeneity of Luminal B breast cancer largely explains this variability in treatment response. Although grouped under the same molecular subtype, Luminal B tumors

encompass a broad spectrum of biological behaviors ranging from endocrine-responsive tumors with relatively slow proliferation to highly proliferative carcinomas exhibiting marked genomic instability. Consequently, the expected response to neoadjuvant chemotherapy should not be determined solely by hormone receptor positivity but rather by integrating multiple clinicopathological and molecular characteristics.

In the present patient, several predictors of chemotherapy sensitivity were simultaneously present. These included young age, premenopausal status, locally advanced disease, Nottingham Grade 3 histology, elevated Ki-67 expression (40%), excellent performance status, and completion of the planned sequential anthracycline-taxane regimen without dose reduction. Collectively, these characteristics likely contributed to the exceptional therapeutic response observed in this case.

Among these variables, tumor proliferative activity probably represents the single most important determinant. Ki-67 is widely recognized as a surrogate marker of cellular proliferation and has consistently been associated with chemotherapy responsiveness. Anthracyclines and taxanes preferentially target rapidly dividing cells through induction of DNA damage, inhibition of mitotic spindle formation, and activation of apoptosis. Consequently, tumors exhibiting high proliferative indices generally demonstrate greater cytotoxic sensitivity than slowly proliferating hormone receptor-positive cancers.

The patient's Ki-67 labeling index of 40% clearly exceeded the conventional threshold used to distinguish Luminal B from Luminal A disease. Such a high proliferative fraction indicates accelerated cell-cycle progression and increased mitotic activity, biological features that simultaneously confer poorer prognosis and greater susceptibility to cytotoxic chemotherapy. Therefore, although Luminal B tumors overall achieve lower pCR rates than TNBC or HER2-positive cancers, highly proliferative Luminal B carcinomas represent a distinct subgroup in which chemotherapy may produce profound pathological responses.

Histological grade provides additional prognostic and predictive information. Numerous neoadjuvant studies have demonstrated that Grade 3 tumors exhibit significantly higher pCR rates than Grade 1 or Grade 2 carcinomas irrespective of molecular subtype. High-grade tumors accumulate greater genomic instability, possess increased mitotic indices, and frequently exhibit impaired DNA repair mechanisms. These characteristics enhance sensitivity to DNA-damaging agents such as doxorubicin while simultaneously increasing dependence on mitotic pathways targeted by taxanes.

Consistent with these observations, the current patient demonstrated Nottingham Grade 3 invasive micropapillary carcinoma, suggesting highly aggressive tumor biology despite hormone receptor positivity. The coexistence of Grade 3 morphology and elevated Ki-67 may therefore explain why this tumor behaved more similarly to biologically aggressive breast cancers than to conventional endocrine-responsive Luminal tumors.

Another important consideration relates to the timing of systemic therapy. Neoadjuvant chemotherapy provides an opportunity to evaluate in vivo chemosensitivity, allowing direct observation of tumor response before definitive surgery. Achievement of pCR reflects complete eradication of invasive carcinoma within both the breast and regional lymph nodes and has emerged as one of the strongest surrogate markers for favorable long-term outcomes in selected breast cancer subtypes.

Although the prognostic significance of pCR is greatest in HER2-positive and triple-negative disease, increasing evidence suggests that pCR also identifies an excellent-prognosis subgroup among high-risk Luminal B cancers. Patients who achieve pCR experience substantially lower risks of recurrence and superior disease-free survival compared with those who have residual disease after neoadjuvant treatment.

An additional explanation may involve the interaction between tumor burden and treatment intensity. The present patient received standard full-dose sequential AC-T

chemotherapy, consisting of four cycles of doxorubicin–cyclophosphamide followed by four cycles of docetaxel. Completion of all planned cycles without dose reduction ensured optimal cumulative dose intensity, an important determinant of therapeutic efficacy. Dose reductions or treatment delays have repeatedly been associated with inferior pathological response and survival outcomes in high-risk breast cancer.

Furthermore, the patient's preserved cardiac, hepatic, renal, and bone marrow function permitted administration of full-dose anthracycline and taxane therapy, maximizing cytotoxic exposure throughout treatment. Excellent treatment adherence likely contributed substantially to the remarkable response achieved.

The absence of significant comorbidities may also have played an indirect role. Unlike elderly patients with multiple medical conditions, this relatively young premenopausal woman maintained an ECOG performance status of 0 before and throughout treatment. Good functional status has consistently been associated with improved chemotherapy tolerance, reduced treatment interruptions, and higher relative dose intensity.

Interestingly, despite the well-recognized association between IMPC and extensive lymphovascular invasion, the diagnostic core biopsy did not demonstrate histological evidence of LVI. Although this finding should be interpreted cautiously because of sampling limitations, some investigators have suggested that tumors lacking demonstrable LVI may retain a more favorable response to systemic therapy than those exhibiting widespread vascular dissemination. Nevertheless, because core biopsy samples evaluate only a limited portion of the tumor, absence of LVI cannot reliably exclude aggressive biological behavior in IMPC.

The remarkable pathological findings following surgery further emphasize the magnitude of treatment response. Histopathological examination demonstrated complete disappearance of invasive carcinoma within the breast and complete eradication of metastatic disease from all examined axillary lymph nodes. This corresponded to Miller–Payne Grade 5 and Residual Cancer Burden (RCB)-0, representing true pathological complete response.

From a biological perspective, complete eradication of nodal disease may indicate effective elimination not only of the dominant tumor clone but also of subclonal metastatic populations. This observation suggests that, despite the intrinsic lymphotropic behavior of IMPC, individual tumors may remain highly chemosensitive when driven predominantly by proliferative rather than chemotherapy-resistant molecular pathways.

Another important consideration involves intrinsic molecular heterogeneity within Luminal B breast cancer. Molecular classification based solely on ER, PR, HER2, and Ki-67 represents a practical clinical approximation rather than a comprehensive genomic characterization. Modern multigene assays—including Oncotype DX, MammaPrint, PAM50 (Prosigna), EndoPredict, and the Breast Cancer Index—have demonstrated that clinically similar Luminal B tumors may possess markedly different genomic risk profiles and predicted chemotherapy sensitivity.

Although genomic testing was not performed in the present case, the coexistence of Grade 3 histology, high proliferative activity, and complete pathological response raises the possibility that this tumor belonged to a genomically high-risk subgroup characterized by increased chemotherapy responsiveness. Future incorporation of genomic signatures into neoadjuvant treatment selection may improve identification of hormone receptor-positive patients most likely to benefit from cytotoxic therapy.

Finally, this case highlights the importance of multidisciplinary decision-making. Had primary surgery been performed without neoadjuvant chemotherapy, the opportunity to achieve complete pathological eradication and to evaluate tumor chemosensitivity would have been lost. Instead, sequential multidisciplinary assessment enabled optimal sequencing of systemic therapy, surgery, radiotherapy, and endocrine treatment, ultimately resulting in an outstanding oncological outcome.

Taken together, this case demonstrates that Luminal B HER2-negative IMPC should not automatically be regarded as chemotherapy-insensitive. Rather, treatment decisions should integrate molecular subtype with proliferative activity, histological grade, disease stage, patient fitness, and other predictive biomarkers. The convergence of these favorable predictive factors likely explains the exceptional pathological complete response observed in the present patient despite the traditionally modest pCR rates reported for hormone receptor-positive breast cancer.

Prognostic Significance of Pathological Complete Response and Comparison with Published Literature

The achievement of pathological complete response (pCR) after neoadjuvant chemotherapy has become one of the most important surrogate endpoints in contemporary breast cancer management (Cortazar et al., 2014). Defined as the absence of residual invasive carcinoma in both the breast and regional lymph nodes (ypT0/Tis ypN0), pCR reflects complete eradication of clinically detectable invasive disease and provides valuable information regarding tumor chemosensitivity. Nevertheless, the prognostic value of pCR differs substantially among breast cancer subtypes.

Large pooled analyses have consistently demonstrated that the survival benefit associated with pCR is greatest in triple-negative breast cancer (TNBC) and HER2-positive disease receiving anti-HER2 therapy. In contrast, hormone receptor-positive/HER2-negative tumors generally achieve lower pCR rates, and the association between pCR and long-term survival has historically appeared less pronounced. However, more recent evidence suggests that this concept should not be generalized to all hormone receptor-positive tumors, particularly those exhibiting biologically aggressive features such as high histological grade, elevated Ki-67, and extensive locoregional disease.

The present patient represents precisely such a subgroup. Despite belonging to the Luminal B HER2-negative molecular subtype, the tumor demonstrated several adverse biological characteristics, including Stage IIIB disease, Grade 3 histology, skin involvement, clinically positive axillary lymph nodes, and a Ki-67 proliferation index of 40%. These features collectively indicate a high-risk phenotype associated with increased recurrence risk if residual disease persists following neoadjuvant treatment. Consequently, achieving complete pathological eradication in this setting is likely to have greater prognostic significance than in low-risk Luminal tumors.

The pathological findings in the present case were particularly remarkable. Examination of the mastectomy specimen demonstrated complete absence of residual invasive carcinoma within the breast, while all dissected axillary lymph nodes were free of metastatic disease. Accordingly, the patient fulfilled the criteria for Miller–Payne Grade 5 and Residual Cancer Burden (RCB)-0, representing true pathological complete response.

Residual Cancer Burden (RCB) has emerged as one of the most robust prognostic tools following neoadjuvant chemotherapy (Symmans et al., 2007). Unlike binary pCR classification, RCB incorporates measurements of residual primary tumor size, tumor cellularity, lymph node involvement, and metastatic burden to provide a quantitative assessment of treatment response. Multiple international validation studies have demonstrated that patients classified as RCB-0 experience the most favorable long-term outcomes across all breast cancer subtypes. Conversely, increasing RCB scores correlate with progressively higher risks of locoregional recurrence, distant metastasis, and breast cancer-specific mortality.

Similarly, the Miller–Payne grading system , which evaluates reduction in tumor cellularity between pre-treatment biopsy and surgical specimens, has proven useful in assessing pathological response to neoadjuvant chemotherapy. Grade 5 represents complete disappearance of invasive tumor cells and has consistently been associated with improved disease-free survival and overall survival compared with lower grades. The simultaneous

achievement of both RCB-0 and Miller–Payne Grade 5 therefore provides compelling evidence of exceptional therapeutic response.

From a surgical oncology perspective, the eradication of metastatic axillary disease deserves particular attention. IMPC is well known for its pronounced lymphotropic behavior, with published series reporting lymph node metastases in the majority of patients at diagnosis. Even among patients with relatively small primary tumors, nodal involvement is substantially more frequent than in invasive carcinoma of no special type (NST). Therefore, complete pathological clearance of nodal disease following neoadjuvant chemotherapy represents an especially favorable finding and suggests excellent systemic treatment sensitivity.

An equally important observation concerns the discrepancy between the aggressive biological reputation of IMPC and the favorable outcome observed in the present patient. Historically, IMPC has often been regarded as a breast cancer subtype associated with poor prognosis because of its high incidence of lymphovascular invasion, multiple positive lymph nodes, extranodal extension, and locoregional recurrence. However, more recent population-based studies have challenged this assumption.

After adjustment for stage, molecular subtype, and treatment, several contemporary analyses have reported that overall survival and breast cancer-specific survival of IMPC are comparable to those of invasive carcinoma of no special type (Chen et al., 2017). These findings suggest that the unfavorable prognosis traditionally attributed to IMPC may largely reflect its tendency to present with more advanced nodal disease rather than intrinsic resistance to modern multimodality therapy.

The current case supports this evolving concept. Despite presenting with Stage IIIB disease and clinically positive axillary lymph nodes, the patient achieved complete pathological response following standard anthracycline-taxane chemotherapy and subsequently underwent definitive surgery, radiotherapy, and endocrine therapy. This outcome demonstrates that aggressive initial presentation should not necessarily be interpreted as evidence of poor therapeutic responsiveness.

Comparison with previously published IMPC case reports further highlights the uniqueness of the present case. Most published reports describe patients undergoing primary surgery because of localized disease or diagnosis before widespread adoption of neoadjuvant treatment strategies. Reports documenting locally advanced IMPC achieving pathological complete response after neoadjuvant chemotherapy remain exceptionally uncommon, particularly among patients with the Luminal B HER2-negative subtype.

Several published series have reported partial pathological responses despite substantial clinical tumor shrinkage, while residual nodal disease frequently persists even after excellent responses within the breast. In contrast, complete eradication of both the primary tumor and axillary metastases, as observed in the present patient, represents an uncommon therapeutic outcome that adds meaningful evidence to the existing literature.

Another noteworthy aspect concerns multidisciplinary treatment sequencing. Current management of locally advanced breast cancer emphasizes coordinated integration of systemic therapy, surgery, radiotherapy, and endocrine treatment rather than reliance on any single modality. The present patient successfully completed this multimodal strategy, illustrating the importance of individualized treatment planning based on tumor biology and treatment response rather than histological subtype alone.

This case also reinforces the continuing importance of pathological assessment following neoadjuvant therapy. Although modern imaging demonstrated complete clinical and radiological response before surgery, definitive confirmation of pCR remained dependent upon meticulous histopathological examination of the resected specimen. Numerous studies have shown that radiological complete response does not invariably predict pathological complete

response, emphasizing that surgery continues to play a central role even in patients with excellent imaging responses.

From a translational perspective, this case raises important questions regarding predictive biomarkers of chemotherapy sensitivity in IMPC. Conventional clinicopathological factors—including tumor size, nodal status, histological grade, hormone receptor expression, HER2 status, and Ki-67—remain the foundation of treatment selection. However, advances in molecular oncology increasingly suggest that genomic alterations, tumor immune microenvironment, circulating tumor DNA (ctDNA), and molecular residual disease (MRD) assessment may further refine prediction of neoadjuvant treatment response.

Future prospective studies incorporating genomic profiling and molecular monitoring may help identify which patients with IMPC are most likely to achieve pathological complete response and derive the greatest long-term benefit from neoadjuvant chemotherapy. Such approaches could facilitate increasingly personalized treatment strategies while minimizing unnecessary toxicity among patients less likely to respond.

Taken together, the present case contributes to the growing body of evidence indicating that pathological complete response remains an attainable and clinically meaningful endpoint even in selected patients with Luminal B HER2-negative invasive micropapillary carcinoma. Rather than viewing IMPC solely as a marker of adverse prognosis, clinicians should recognize the substantial heterogeneity within this rare histological subtype. When treated using a multidisciplinary approach guided by tumor biology, excellent oncological outcomes remain achievable despite advanced clinical presentation.

Clinical Implications, Study Limitations, and Future Perspectives

The present case provides several important clinical insights into the management of locally advanced invasive micropapillary carcinoma (IMPC) of the breast. Although IMPC has traditionally been regarded as an aggressive histological subtype because of its marked propensity for lymphovascular invasion and regional nodal metastasis, this report demonstrates that aggressive histology does not necessarily predict resistance to contemporary multimodality treatment. Instead, careful integration of clinicopathological characteristics, molecular subtype, and multidisciplinary treatment planning may achieve excellent oncological outcomes, even in patients presenting with advanced-stage disease.

One of the principal clinical messages from this case is that histological subtype alone should not determine therapeutic decision-making. Historically, clinicians have frequently associated IMPC with poor prognosis because of its high frequency of axillary lymph node involvement and locoregional recurrence. Consequently, some practitioners have considered more extensive surgical approaches solely based on histological diagnosis. However, current evidence increasingly suggests that treatment strategies should primarily be guided by tumor stage, molecular subtype, treatment response, and patient-related factors, rather than IMPC histology alone.

The current patient illustrates this principle well. Despite presenting with Stage IIIB disease and biopsy-confirmed Grade 3 IMPC, she demonstrated remarkable sensitivity to standard anthracycline-taxane neoadjuvant chemotherapy, ultimately achieving complete eradication of both the primary tumor and nodal disease. This observation reinforces current international recommendations that neoadjuvant systemic therapy should remain the preferred initial approach for patients with locally advanced breast cancer irrespective of uncommon histological variants when clinically indicated.

Another important implication concerns multidisciplinary team (MDT) management. Successful treatment of locally advanced breast cancer requires close collaboration among surgical oncologists, medical oncologists, radiation oncologists, radiologists, pathologists, breast care nurses, and rehabilitation specialists. In the present case, sequential decision-making through an MDT allowed optimal integration of neoadjuvant chemotherapy, definitive

surgery, adjuvant radiotherapy, and endocrine therapy, resulting in an excellent pathological and clinical outcome.

The role of the pathologist deserves particular emphasis. Recognition of the characteristic microscopic architecture of IMPC and confirmation of the diagnosis through careful histopathological evaluation were essential for accurate risk stratification. Equally important was the comprehensive assessment of the post-neoadjuvant surgical specimen, including evaluation of treatment response using the Miller–Payne grading system and Residual Cancer Burden (RCB) classification. These pathological assessments provided objective evidence of complete therapeutic response and contributed substantially to postoperative treatment planning.

From a radiological perspective, this case highlights both the strengths and limitations of imaging after neoadjuvant therapy. Clinical examination and ultrasonography suggested complete tumor regression prior to surgery; however, definitive confirmation of pathological complete response remained dependent upon surgical excision and meticulous histopathological examination. Therefore, despite remarkable advances in breast imaging, current evidence does not support omission of surgery solely on the basis of radiological complete response outside carefully designed prospective clinical trials.

The endocrine management of this patient also deserves discussion. Because the tumor was strongly estrogen receptor- and progesterone receptor-positive, adjuvant endocrine therapy remains a critical component of long-term treatment despite achievement of pathological complete response. Several large randomized trials have demonstrated that hormone receptor-positive breast cancers remain at risk for late recurrence, often extending beyond 10 years after initial diagnosis. Consequently, endocrine therapy should be viewed not merely as adjuvant treatment but as an essential strategy for long-term suppression of micrometastatic hormone-responsive disease.

This case also illustrates the growing importance of response-guided oncology. Increasingly, neoadjuvant therapy serves not only as treatment but also as a biological test of tumor sensitivity. Patients achieving pCR generally require continuation of standard adjuvant therapy, whereas patients with significant residual disease may benefit from treatment escalation, enrollment in clinical trials, or incorporation of novel systemic agents. Thus, pathological response has become an increasingly valuable biomarker for individualized postoperative management.

Another important lesson concerns the biological heterogeneity of hormone receptor-positive breast cancer. Although Luminal B HER2-negative tumors are generally considered less responsive to chemotherapy than HER2-positive or triple-negative disease, this case demonstrates that selected patients may achieve exceptional responses when multiple favorable predictive factors coexist. Therefore, clinicians should avoid therapeutic nihilism based solely on molecular subtype and instead consider the complete clinicopathological context.

From a scientific perspective, the present report also contributes to the limited literature describing neoadjuvant treatment outcomes in IMPC. Because IMPC accounts for only a small proportion of invasive breast cancers, most available evidence derives from retrospective institutional series, registry analyses, or isolated case reports. High-quality prospective studies specifically evaluating optimal systemic therapy for IMPC remain scarce. Consequently, carefully documented case reports continue to provide valuable clinical information, particularly when they describe uncommon therapeutic outcomes such as pathological complete response.

Nevertheless, several limitations should be acknowledged. First, this report describes a single patient, limiting the generalizability of the findings. Individual treatment responses may not necessarily reflect the behavior of the broader IMPC population. Second, molecular characterization was limited to conventional immunohistochemistry. Comprehensive genomic

profiling—including next-generation sequencing, intrinsic molecular subtyping, or multigene expression assays—was not available. Such analyses might have provided additional insight into the biological mechanisms underlying the extraordinary chemosensitivity observed in this patient.

Third, although pathological complete response represents a highly favorable prognostic marker, long-term follow-up remains essential. Hormone receptor-positive breast cancer is characterized by a prolonged natural history, and recurrence may occur many years after completion of primary treatment. Continued surveillance is therefore necessary before definitive conclusions regarding long-term disease-free and overall survival can be drawn.

Additional limitations include the inability to evaluate circulating tumor DNA (ctDNA), minimal residual disease (MRD), tumor-infiltrating lymphocytes (TILs), or genomic predictors of chemotherapy response. These emerging biomarkers are increasingly recognized as important tools for precision oncology and may further refine risk stratification in future studies.

Looking forward, several research priorities emerge from this case. First, multicenter prospective registries dedicated to rare histological breast cancer subtypes would substantially improve understanding of IMPC biology and treatment outcomes. Second, integration of genomic profiling with conventional clinicopathological parameters may identify molecular signatures predictive of pathological complete response in hormone receptor-positive disease. Third, incorporation of liquid biopsy technologies—including ctDNA monitoring—may enable earlier detection of molecular residual disease and facilitate increasingly individualized postoperative management.

Furthermore, advances in artificial intelligence and digital pathology may improve recognition of subtle histological features associated with treatment responsiveness. Quantitative image analysis combined with molecular profiling could ultimately permit more accurate prediction of chemotherapy sensitivity before treatment initiation.

Finally, the present case reinforces a broader principle in modern oncology: rare histological subtypes should not automatically be considered biologically uniform. Instead, individualized management based on multidisciplinary evaluation, molecular characterization, and evidence-based treatment principles remains the cornerstone of optimal cancer care.

Overall Significance of the Present Case

To our knowledge, this case represents a rare example of Stage IIIB Luminal B HER2-negative invasive micropapillary carcinoma achieving pathological complete response (RCB-0 and Miller–Payne Grade 5) following standard sequential anthracycline-taxane neoadjuvant chemotherapy. Given the relatively low pCR rates typically reported in hormone receptor-positive breast cancer and the aggressive clinicopathological characteristics traditionally associated with IMPC, this outcome is noteworthy.

The present report emphasizes that exceptional responses remain achievable despite advanced clinical presentation when patients receive timely diagnosis, multidisciplinary management, evidence-based systemic therapy, appropriate surgery, radiotherapy, and endocrine treatment. More importantly, it highlights the need for continued investigation into predictive biomarkers capable of identifying those patients with biologically aggressive yet highly chemosensitive disease, thereby advancing the goal of truly personalized breast cancer treatment.

CONCLUSION

Invasive micropapillary carcinoma (IMPC) is a rare histological subtype of breast cancer characterized by a distinctive morphological pattern, a marked propensity for lymphovascular invasion, and a high incidence of regional lymph node metastasis. Although IMPC has historically been considered an aggressive malignancy associated with unfavorable

clinicopathological features, the present case demonstrates that favorable oncological outcomes can be achieved through appropriate contemporary multidisciplinary management.

This report describes a 44-year-old woman with Stage IIIB (cT4bN1M0) Luminal B HER2-negative IMPC who achieved a pathological complete response (pCR) following standard sequential anthracycline–taxane neoadjuvant chemotherapy. Surgical pathology confirmed complete eradication of invasive carcinoma in both the breast tissue and axillary lymph nodes, corresponding to Miller–Payne Grade 5 and Residual Cancer Burden (RCB)-0. Such a response is uncommon in hormone receptor-positive/HER2-negative breast cancer and is particularly notable in the context of IMPC.

This case highlights several important clinical implications. First, uncommon histological subtypes should not automatically be considered resistant to chemotherapy. Second, treatment decisions should incorporate tumor biology, clinical stage, histological grade, proliferative activity, and multidisciplinary assessment rather than relying solely on histological subtype. Third, pathological complete response remains an achievable therapeutic outcome in selected patients with biologically aggressive Luminal B breast cancer and may be associated with favorable short-term oncological outcomes.

Finally, this report emphasizes the importance of individualized treatment strategies and contributes additional evidence to the limited literature regarding neoadjuvant therapy for invasive micropapillary carcinoma. Larger multicenter studies incorporating genomic profiling and long-term follow-up are warranted to better identify predictive biomarkers of chemotherapy response and optimize treatment strategies for this rare breast cancer subtype.

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