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Case Report

An Atypical Presentation of Superficial Breast Cancer: A Case Report and Review of the Literature

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Abstract: (1) Background: Retroareolar breast tumors are common, but they rarely progress to malignancy. This report presents a case of a 41-years-old woman with a superficial breast tumor, emphasizing the significance of considering a wide range of options when evaluating breast lumps. (2) Methods: The patient presented with a steadily growing, ulcerating superficial tumor in her left breast. To determine the nature of the tumor, a diagnostic assessment was conducted, which included a positron emission tomography (PET) scan and histological analysis. (3) Results: The diagnostic assessment confirmed the presence of a malignant Grade II superficial infiltrating ductal carcinoma. Following the diagnosis, the patient underwent a modified radical mastectomy under general anesthesia. Subsequently, she received four cycles of adjuvant chemotherapy, followed by taxol administrations. (5) Conclusions: This case report underscores the importance of conducting a thorough examination and maintaining a high index of suspicion for breast tumors. By documenting this case, the report contributes to the existing knowledge on various manifestations of breast cancer and highlights the necessity of early identification and aggressive treatment. This knowledge can be applied to identify and manage similar cases in the future, leading to improved patient outcomes.

Keywords: retroareolar breast tumor; superficial infiltrating ductal carcinoma; triple-negative breast cancers (TNBC); modified radical mastectomy; chemotherapy; taxol; case report

1. Introduction

Retroareolar breast tumors, also known colloquially as aberrant mammary glands, represent a distinctive medical condition in which additional mammary tissue, instead of undergoing the usual degenerative process during embryonic development, persists into adulthood [1]. This unique phenomenon, though prevalent, often evades the gaze of the medical and scientific community due to the relative infrequency of malignancies originating from these aberrant glands [2].

However, the discovery and subsequent exploration of such a case in a 41-years-old female patient is bringing this overlooked condition back into the scientific spotlight. This case, involving a superficial breast tumor, not only presents a unique clinical scenario but also provides a crucial opportunity for expanding our understanding of such complex cases. Consequently, this case report was developed with the specific intention of contributing valuable insights to the existing body of knowledge on the diagnosis and treatment of retroareolar breast tumors [3].

Retroareolar breast tumors remain a significant area of concern due to their potential implications for breast cancer. Although less common than their counterparts, malignancies originating from these aberrant mammary glands can pose severe health risks if left undiagnosed or untreated [4]. Therefore, it is crucial to bolster our understanding of such tumors to ensure early detection, accurate diagnosis, and effective treatment [5].

2. Case Presentation

A 41-years-old woman presented with a unique and evolving clinical scenario.

2.1. History of Past Illness

Notably, the woman had been controlling diabetes and hypertension, both of which are important factors to consider when assessing her overall health [6]. Her medical history was further complicated by the fact that she was in pharmacological menopause, a biological phase frequently associated with increased risks for several health disorders, including various types of cancer [7].

2.2. History of Present Illness

The primary concern leading to the patient's consultation was an enlarging, ulcerating superficial mass in her left breast. The mass first caught her attention approximately 9 months prior to her presentation at our facility. Initially, it was a relatively small anomaly, measuring approximately 1.0 cm x 1.5 cm. Over time, however, it exhibited significant growth and had, at the time of examination, expanded to the sizable dimension of 3.0 cm x 3.0 cm (Figure 1).



Figure 1. The mass on the left breast, which is 3.0 cm x 3.0 cm in size. The boundary is unclear, the shape is irregular and the mass is immovable.

2.3. Physical Examination

Upon physical examination, the mass was hard and immovable – traits suggestive of a potential malignancy. Moreover, the boundary between the mass and the surrounding skin was not clear-cut, further pointing towards a more severe diagnosis. Nonetheless, a silver lining was noted in the examination - the absence of any enlargement of the ipsilateral supraclavicular and subaxillary lymph nodes. These nodes often bear the burden of advanced cancers, acting as markers of the disease's progression [8]. The absence of such enlargement, therefore, provided a sliver of optimism amidst an otherwise concerning presentation.

It is critical to underscore that this clinical picture was evaluated in the context of the patient's overall wellbeing. Her physical and mental health status, as well as her comorbid conditions (diabetes and hypertension) were essential considerations in our approach. Furthermore, her induced menopausal status added an additional layer of complexity to her case, influencing both her risk profile and potential therapeutic options.

The patient's complex medical history and unique case presentation necessitated a personalized and nuanced approach to her care [9]. We understood that a holistic perspective, one that considered her total health profile and personal circumstances, would be paramount in devising an effective, tailored treatment plan. In the following sections, we detail the diagnostic processes undertaken, the interpretative challenges faced, and the treatment regimen developed in response to this intriguing case. Our aim is to provide a comprehensive case study that illuminates the complexity of diagnosing

and treating retroareolar breast tumors, especially in the context of patients with multifaceted medical backgrounds.

2.4. Multidisciplinary Expert Consultation

Our diagnostic assessment commenced with the use of positron emission tomography (PET) [10]. This non-invasive imaging technique was instrumental in revealing a dense nodule situated in the subcutaneous tissue of the left breast. The border between the nodule and the surrounding tissue was ambiguous, with portions of the nodule protruding to the skin's surface - a presentation frequently observed in malignant conditions [11]. The quantitative measure obtained from the PET, the standardized uptake value (SUV) max level, was recorded at 9.0 [12]. This heightened SUV indicated abnormal metabolic activity within the nodule, supporting the suspicion of a malignant tumor. However, in a promising sign, no enlarged lymph nodes were observed during this imaging process, suggesting the malignancy may not have metastasized extensively.

The diagnosis was solidified by conducting a histopathological examination. This detailed microscopic investigation of the tissue sample confirmed our suspicions: the patient was suffering from a Grade II superficial infiltrating ductal carcinoma [13]. This form of breast cancer originates from the milk ducts and invades surrounding tissues, which was congruent with our PET scan findings [14].

Further clarity about the nature of the tumor was provided by the immunohistochemical examination. This diagnostic tool revealed that the tumor was negative for estrogen receptor (ER-), for progesterone receptor (PR-) and for human epidermal growth factor receptor-2 (HER2-), and exhibited Ki67 positivity in approximately 30% of the cells.

It was also decided to perform a genetic analysis to search for mutations on the BRCA1 and BRCA2 genes, which revealed the presence of a pathogenetic variant of the BRCA1 gene.

2.5. Final Diagnosis

Grade II superficial infiltrating ductal carcinoma.

2.6. Treatment

Once the diagnosis was confirmed and contraindications were carefully ruled out, our multidisciplinary team decided on a surgical approach, specifically, a modified radical mastectomy under general anesthesia [16]. The surgery consisted of a bilateral mastectomy (justified by mutations in the BRCA1 gene) with left lymphadenectomy up to the second level to assess the extent of disease spread and to reduce the risk of recurrence. The histological examination confirmed that the right breast and the 24 axillary lymph nodes were disease-free (0/24).

After the tumor and associated structures were successfully removed, the surgical site was thoroughly irrigated and meticulously dressed to prevent post-operative complications. Additionally, two drains were placed, one in the axillary region and the other near the surgical site. These drains are essential to prevent fluid accumulation and to facilitate healing.

2.7. Outcome and Follow-Up

The patient demonstrated remarkable resilience, making an uneventful recovery post-operatively. She was discharged 3 days following her procedure, reporting minimal discomfort. Notably, no post-operative complications such as infection or hematoma were observed, signaling a successful surgical intervention.

Two months after surgery, the patient started four cycles of adjuvant chemotherapy with epirubicin and cyclophosphamide, followed by twelve weekly taxol administrations. Moreover, she underwent adjuvant radiotherapy.

An integral part of her care involved regular follow-up appointments scheduled every 3 months to 6 months. These visits allowed us to closely monitor her recovery and promptly detect any signs of recurrence or metastasis [17]. To our relief and the patient's, no such signs were observed during

the follow-up period, indicative of a positive response to the treatment and surgical intervention. This case underscores the importance of personalized, comprehensive care and diligent post-operative follow-up in managing complex breast cancer cases [18].

3. Discussion

This particular case brings to light the unique and rare manifestation of a superficial breast tumor. Diagnosing such a condition is challenging, requiring a broad and comprehensive differential diagnosis that includes benign breast conditions like fibroadenomas or cysts, infections, and an array of other malignancies.

Undergoing a detailed pathological analysis and rigorous immunohistochemical examinations were of paramount importance in determining the nature of this unusual breast lump. These investigative procedures allowed us to confirm the diagnosis, demonstrating the significance of such tests in clinical practice [19].

The primary mode of intervention in this case, as is common in such scenarios, was surgical, which was followed by an adjuvant therapy customized according to the results from pathological and immunohistochemical examinations [20]. Although such cases are infrequent, they underscore the need for meticulous examination and a heightened degree of suspicion towards any abnormalities or lumps in the breast, regardless of whether they are found in the typical mammary region or in retroareolar breast tissue.

Early detection plays a critical role in managing cases such as these. Timely intervention can potentially inhibit disease progression and metastasis, thereby improving patient outcomes.

The typical treatment regimen for breast cancer often comprises surgery, chemotherapy, radiation therapy, and targeted therapy, with the specific course of treatment being highly dependent on the staging of the cancer and the patient's overall health condition [21].

The imperative role of pathological examinations in such cases cannot be overstated, as they not only aid in confirming the diagnosis but also provide valuable insights about the tumor's molecular characteristics, which can significantly impact the chosen course of treatment [22].

For example, the molecular characteristics of a tumor can dictate the use of targeted therapy options, such as hormone therapy for hormone receptor-positive breast cancers or monoclonal antibodies for HER2-positive breast cancers [23]. The immunohistochemical analysis in our case revealed a triple-negative breast cancer (TNBC), necessitating an aggressive chemotherapy regimen due to the lack of targeted therapy options [24].

One of the critical aspects highlighted by this case is the importance of patient education and awareness. Regular self-breast examinations should be encouraged among women, and they should be advised to seek medical assistance promptly if they notice any abnormal changes, regardless of location [25].

The rarity and peculiar superficial location of the tumor serve to enhance the prevailing understanding of the diverse presentations of breast cancer, spotlighting the necessity for clinical vigilance and an inclusive differential diagnosis in the initial assessment of breast lumps [26].

In our case, the growing and ulcerating mass raised substantial concerns, often indicative of an aggressive or advanced disease.

After an objective examination and consultation of the patient's findings, it was decided not to proceed with a lymph node biopsy but with axillary dissection up to the second level in the Breast Unit case discussion. However, the absence of lymph node involvement, typically associated with cancer spread, provided a glimmer of hope in an otherwise severe situation.

A recurring theme underscored by this case is the indispensability of diagnostic tools, such as pathological and immunohistochemical examinations. In this instance, these tools were critical in verifying the diagnosis of a Grade II superficial infiltrating ductal carcinoma and in unraveling its molecular characteristics [27]. Regrettably, the tumor presented a triple-negative profile, eliminating certain targeted therapy options and rendering disease management more complex [28].

Management of this case required a personalized and comprehensive approach, considering the patient's comorbidities (diabetes and hypertension) and her menopausal status. These conditions

have been proven to influence the progression of the disease and the patient's overall prognosis, as well as their response to treatment [29].

Early detection played a vital role in this case and remains paramount in managing such conditions. The imperative for public education and awareness about regular self-breast examinations cannot be overstated. Breast cancer's various manifestations necessitate that any new breast lump be promptly and thoroughly evaluated. Moreover, clinicians should maintain a high level of suspicion for breast cancer, even in atypical presentations or in patients with complicating comorbid conditions. As demonstrated in this case, early diagnosis and appropriate management are crucial in improving patient outcomes [30].

This report adds to the existing body of literature on breast cancer's varied presentations and the effects of underlying health conditions and menopausal status. It is hoped that this added knowledge will prove instrumental in identifying and managing similar cases in the future, thereby improving patient care and outcomes. However, the report is not without its limitations. Being a single-case study, our findings might not apply universally to all similar instances. More comprehensive research or case series are necessary to corroborate our findings. Furthermore, our interpretation of results might be subject to clinicians' subjective experiences and biases.

Recent literature has highlighted the complexity of breast cancer metastases, particularly in the liver and brain. This understanding of intratumoral heterogeneity and the immunosuppressive microenvironment could guide the development of more effective immunotherapy strategies for patients with breast cancer metastasis in these sites [31]. Given the advancements in the field, clinicians must continuously adapt and incorporate emerging findings to provide the best possible care for their patients.

4. Conclusion

This comprehensive case report has highlighted the clinical significance of taking into consideration superficial breast tumors as possible malignant entities [32]. Although the occurrence of superficial breast tumors in aberrant mammary glands is unusual, it is paramount for medical practitioners to remain open to such potentialities. This necessitates the maintenance of a broad differential diagnosis when assessing patients who present with breast masses, irrespective of their unusual location or other atypical characteristics [33].

Reiterated throughout this case is the paramount importance of diagnostic tools such as histopathological and immunohistochemical examinations. These assessments not only facilitated the definitive diagnosis for our case but also steered us towards the appropriate treatment regimen: the inherent limitations in treatment options in this case of TNBC bolstered the necessity for a more aggressive treatment plan [34].

As the landscape of oncology evolves with continued advancements, so too does the management of breast cancer. Yet, even in light of significant strides in diagnosis and treatment modalities, the emergence of rare cases such as ours highlights the enduring necessity for continued research. Gathering and analyzing more data related to such unique presentations is crucial for a more nuanced understanding of their biology, prognosis, and optimal treatment strategies.

The clinical scenario outlined in this report will enhance the existing body of knowledge about breast cancer and its rare manifestations. This, in turn, will provide valuable insights that can aid clinicians in the diagnosis and management of such atypical cases in the future. However, the conclusions drawn in this report should be considered in the light of certain limitations. The single-case nature of this report means that our findings may not be universally applicable. Moreover, the subjectivity of clinical observations may have introduced bias into our interpretation of the results. Nonetheless, this report contributes valuable information to the ongoing conversation about breast cancer, its presentations and potential treatment approaches.

To conclude, maintaining a high index of suspicion, promoting early detection, and providing appropriate treatment are the cornerstones of improving prognosis and quality of life for patients diagnosed with breast cancer, including its rarest forms [35]. As we delve deeper into the intricacies of oncology, it becomes evident that every piece of information, no matter how small, has the

potential to significantly impact patient care. This is especially true for breast cancer, a disease that presents in diverse forms and requires a complex interplay of diagnostic and therapeutic strategies.

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