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INVASIVE DUCTAL CARCINOMA ARISING WITHIN A FIBROADENOMA: A CASE REPORT AND LITERATURE REVIEW

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ABSTRACT

Background: Invasive ductal carcinoma (IDC) is the most common form of breast cancer, frequently presenting independently. Rarely, IDC arises within a fibroadenoma, a benign breast tumor typically associated with younger women. This case report and literature review aim to highlight the diagnostic challenges and clinical implications of finding IDC within a fibroadenoma. **Case Presentation:** A 36-year-old female patient presented with a dolent palpable mass in the right breast. Initial mammography described normal fibroglandular structures without significant findings. However, subsequent imaging ultrasound identified an 18x14 mm oval formation at the 9 o'clock position in the right breast, categorized as BI-RADS 3. Further histopathological evaluation after a biopsy confirmed the presence of a fibroadenoma with invasive ductal carcinoma, classified as Grade III with perivascular and neural infiltration. **Discussion:** The coexistence of IDC within a fibroadenoma poses significant diagnostic challenges due to the benign appearance of fibroadenomas on standard imaging modalities. This case emphasizes the need for a thorough evaluation and possible biopsy of fibroadenomas that exhibit atypical features or changes over time. **Conclusion:** This report underscores the importance of vigilance and comprehensive diagnostic strategies in cases of fibroadenomas, especially in patients with unusual or evolving lesions. The review of literature confirms that although rare, the occurrence of IDC within fibroadenomas can have significant implications for treatment and prognosis.

KEYWORDS: Invasive Ductal Carcinoma, Fibroadenoma, Diagnostic Imaging, Breast Cancer Management.

INTRODUCTION

Fibroadenomas are typically painless, unilateral, and solid benign breast tumors, most commonly found in women aged 14 to 35 years, although they can occur at any age [(1)]. Meanwhile, breast cancer ranks as the most prevalent form of cancer diagnosed in women globally, accounting for over one-tenth of all new cancer cases annually and is the second leading cause of cancer-related deaths among women

worldwide, underscoring its critical impact on women's health [2]. According to some evidence, the estimated incidence of breast cancer among females in Albania stands at 30.8 cases per 100,000 population, highlighting a significant public health concern in the region [3]. In the context of diagnosing breast cancer, ultrasound, guided by the BI-RADS system, demonstrates satisfactory accuracy and increases in effectiveness with patient age, though consistent correlation with histopathological findings is essential for accurate diagnosis [4]. The presence of complex fibroadenomas and adjacent proliferative diseases slightly increases the risk of breast cancer, yet the biological behavior of carcinomas within fibroadenomas mirrors that of carcinomas arising independently in breast tissue [5,6]. A relevant study discussing the challenges and nuances of diagnosing invasive ductal carcinoma within fibroadenomas suggests that while ultrasound using BI-RADS is effective for breast imaging, it may not always suffice for conclusive diagnosis, particularly for detecting malignant transformations within fibroadenomas [7]. The complexity of these cases often necessitates histopathological examination after surgical excision to confirm malignancy. The aim of this study is to address the diagnostic challenges and clinical implications associated with the discovery of invasive ductal carcinoma (IDC) within a fibroadenoma, emphasizing the importance of thorough evaluation and comprehensive diagnostic strategies in such cases.

Case presentation

Patient History: A 36-year-old female patient presented with a palpable mass in the right breast. Her past medical history was clear, devoid of any significant ailments or conditions and her family history was negative for breast cancer.

Diagnostic Assessment: Physical examination of the right breast demonstrated a smooth, dolent and inflamed mass. Mammography showed normal fibroglandular structures without apparent abnormalities. However, further scrutiny via ultrasound at the hospital revealed an 18x14 mm oval formation with microcalcifications at the 9 o'clock position of the right breast, meriting a BI-RADS category 3 assessment. The ultrasound examination revealed also small reactive lymph nodes in both the right and left axillae, normal fibroglandular structures in the left breast without nodules or cysts, and clear supraclavicular fossae. (Figure 1)

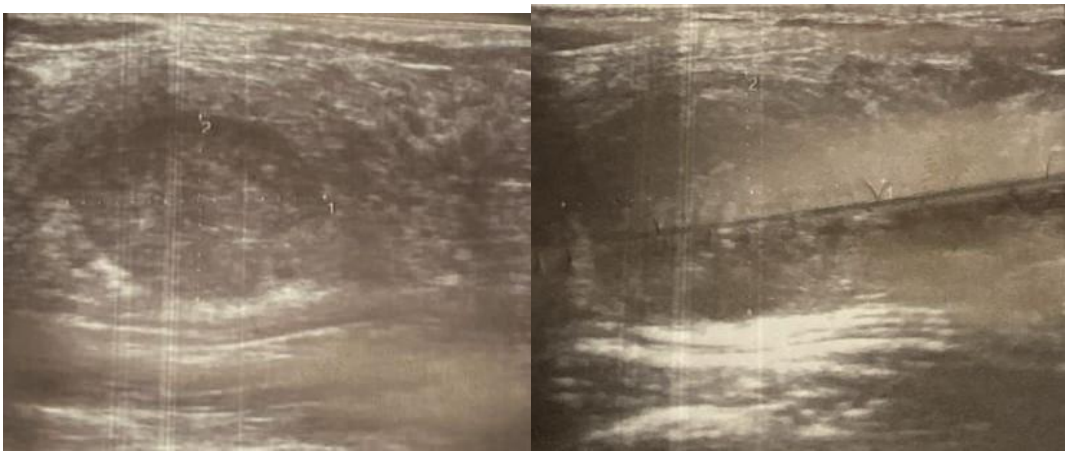

Figure 1 *(Mammary gland ultrasound showing an 18x14 mm oval formation.)*

Therapeutic Intervention and "Gold Standard" diagnosis: The lump was resected surgically and sent it for histopathological examination. A biopsy performed on the 1st of March 2024 yielded a specimen that histopathologically confirmed the presence of a fibroadenoma containing Grade III invasive ductal carcinoma, characterized by perivascular and neural infiltration. The lesion is identified away from the diffuse adenosis zone. Lesion extends approximately 0.2cm from the edge of the coagulum in some sections. It is recommended correlating clinical-imaging findings with hormonal status. In the context of breast cancer markers, a study from Albania has highlighted a complex interplay between estrogen receptor (ER) levels and progesterone receptor (PgR) and Ki67 markers, suggesting that investigating these correlations can not only clarify the diagnosis but also assist in tailoring the treatment of this disease [8].

DISCUSSION

This complex presentation highlights the challenge of diagnosing IDC within fibroadenomas, which often appear benign in typical imaging studies. The rarity and potential severity of such findings underscore the necessity for comprehensive diagnostic approaches, including the correlation of clinical-imaging findings with hormonal status, as well as careful consideration of any unusual or evolving lesions in the breast.

Fibroadenoma is associated with an elevated long-term risk of breast cancer, particularly in women who have complex fibroadenomas, exhibit proliferative disease, or have a familial history of breast cancer [9]. The incidence of carcinoma developing within a fibroadenoma has traditionally been reported as extremely low, ranging from 0.002% to 0.0125%, however, recent evidence suggests that these rates may be increasing [10]. If the surgical margins are clear of cancer, a lumpectomy alone may be adequate, while the broader management strategy should be tailored based on the stage of the cancer and the extent of metastasis, whether local or distant [11,12].

Radiological and sonographic studies may reveal suspicious features suggestive of carcinoma within fibroadenomas, showing irregular borders and hypoechogenic shadowing on ultrasound, which is preferred for precise tumor sizing due to its high-resolution capabilities; however, mammography, despite showing indistinct borders and microcalcifications, often falls short in definitively diagnosing carcinomas within fibroadenomas, necessitating surgical intervention for accurate diagnosis [11,13,14].

This case is a poignant reminder of the complexities involved in breast cancer diagnostics, especially in cases where carcinomas develop within fibroadenomas—a phenomenon that may not significantly alter the typical biological behavior of the cancer compared to IDCs not associated with fibroadenomas, yet presents unique challenges in detection and management. The combination of advanced imaging techniques, detailed histopathological analysis, and careful clinical follow-up is crucial for accurate diagnosis and effective treatment planning, emphasizing the importance of a meticulous, multi-disciplinary approach in breast health care.

CONCLUSION

In conclusion, this case report and review of the literature on invasive ductal carcinoma (IDC) arising within a fibroadenoma highlight the critical need for vigilant and thorough diagnostic processes.

Despite the benign nature typically associated with fibroadenomas, the emergence of IDC within such lesions underscores the complexity of breast cancer diagnostics and the importance of comprehensive evaluation. This includes the integration of advanced imaging techniques, meticulous histopathological analysis, and thoughtful consideration of clinical findings. Effective management of such cases requires a nuanced understanding of the interplay between the tumor's biological behavior and the diagnostic challenges it presents, ensuring that treatment strategies are accurately tailored to the individual's specific condition.

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