

ONSET, RARE DIAGNOSIS OF MUCINOUS CARCINOMA IN A POST-MENOPAUSAL WOMAN

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Abstract

Breast cancer is the most common cancer among women worldwide, often originating in the ductal epithelium. Among its diverse histological types, mucinous breast carcinoma is a rare subtype characterized by extracellular mucin production, accounting for approximately 2% of all breast cancers and presenting a more favourable prognosis compared to other invasive breast cancers. This case discusses a 57-year-old post-menopausal woman with a two-month history of a progressively enlarging, painless swelling in her left breast. Clinical examination revealed a firm, non-mobile lump, and imaging, coupled with biopsy, confirmed mucinous carcinoma. The patient underwent a left modified radical mastectomy, with postoperative histopathology confirming pure mucinous carcinoma, grade 2, classified as pT2 pN0. She had an uneventful recovery. The tumour was ER and PgR positive, HER2 negative. Mucinous carcinoma has a favourable prognosis with a 90% survival rate at 10 years. Accurate differentiation between pure and mixed mucinous carcinomas is crucial due to prognostic differences, with the pure type ($\geq 90\%$ mucinous tissue) having better outcomes. Early detection through mammographic screenings and personalized treatment plans, including surgery and hormone therapy, are essential for improving outcomes. This case highlights the significance of thorough clinical and histopathological evaluation in diagnosing and treating mucinous carcinoma, emphasizing the importance of early detection and individualized treatment for favourable prognosis.

Keywords: Mucinous Carcinoma, Breast Cancer, Post-menopausal, Histopathology, Immunohistochemistry, ER Positive, PgR Positive, HER2 Negative, Mastectomy, Prognosis.

INTRODUCTION

Breast cancer is the most common cancer diagnosed in women and the second most common cause of death from cancer among women worldwide. [1] The breasts are paired glands of variable size and density that lie superficial to the pectoralis major muscle.[2]

Breast cancer most commonly arises in the ductal epithelium (i.e., ductal carcinoma) but can also develop in the breast lobules (i.e., lobular carcinoma). Several risk factors for breast cancer have been well described. Breast cancer is diagnosed through physical examination, breast imaging, and tissue biopsy.

Treatment options include surgery, chemotherapy, radiation, hormonal therapy, and, more recently, immunotherapy. Factors such as histology, stage, tumour markers, and genetic abnormalities guide individualized treatment decisions. [1]

There were approximately 2.3 million new breast cancer cases and 685,000 breast cancer deaths worldwide in 2020. Its incidence and mortality varied among countries, with the age-standardized incidence ranging from the highest of 112.3 per 100,000 population in Belgium to the lowest of 35.8 per 100,000 population in Iran, and the age-

standardized mortality from the highest of 41.0 per 100,000 population in Fiji to the lowest of 6.4 per 100,000 population in South Korea. [3]

Developing countries have the highest incidence of breast cancer, making it the most common form of malignancy in these regions. The numerous histologic kinds of this entity not only exhibit distinct histologic characteristics, but also encompass clinical and biochemical elements.

Mucinous breast carcinoma is a distinct form of breast cancer characterised by the presence of a significant quantity of mucin outside the cells. The primary subtypes of this are classified into two categories: the pure type and the mixed type (4). The differentiation between these subcategories is determined by the measurement of cellularity. The proportion of the tumour that consists of the mucoid component might range from 30% to more than 90%.

The precise threshold for diagnosing mucinous carcinoma based on a certain percentage is presently not definitively established. Consensus among pathologists is that the term "pure mucinous breast carcinoma" should only be used for tumours that consist of at least 90% mucinous tissue (6).

The pure type mostly consists of tumour tissue that produces extracellular mucin, whereas the mixed subtype includes an invasive ductal epithelial component without mucin. Mucinous breast carcinoma is a rare kind of breast tumour, accounting for only 2% of all malignant breast neoplasms (5). The prognosis of this condition is more favourable compared to invasive breast cancer of no special type (6,7).

Certain mucinous breast carcinomas, particularly those of the mixed type, are linked to lobular or ductal neoplasia, whether in situ or invasive. Additionally, some of these carcinomas have neuroendocrine differentiation. Mucinous breast cancer with lobular neoplasia components appears to be a unique subpopulation with a high likelihood of reduced cell adhesion, loss of cell polarity molecules, and absence of neuroendocrine development. This paper presents the case of a 57-year-old lady who underwent a core-needle biopsy of her left breast, revealing the presence of pure mucinous carcinoma.

CASE

A 57-year-old female presented to the outpatient department with a two-month history of a progressively enlarging, painless swelling in her left breast, which she had noticed while bathing. She reported no associated nipple discharge, no history of similar complaints, and no swellings in the opposite breast.

On clinical examination, asymmetry between the breasts was evident, with the left breast appearing raised compared to the right. Palpation of the left breast revealed a firm, non-mobile, non-fluctuant lump measuring 4x3 cm, located from the 1 to 4 o'clock positions.

The overlying skin was pinchable, with no warmth, tenderness, or discharge noted. The nipple-areolar complex was regular, and there were no palpable axillary lymph nodes bilaterally.

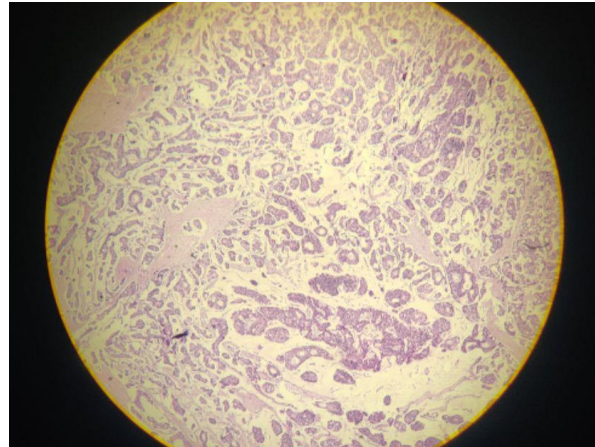


Figure 1: Nest And Clusters of Tumour Cells Floating in Extracellular Pools of Mucin

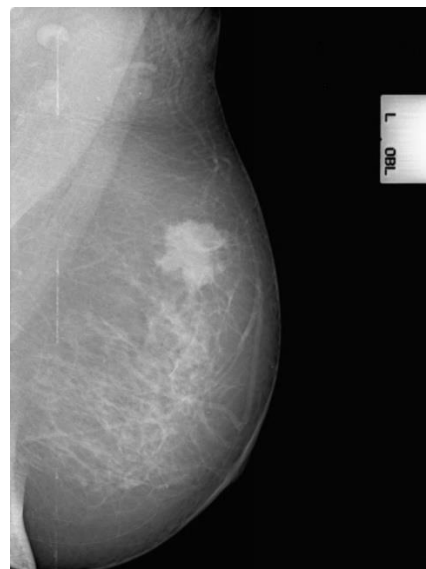


Figure 2: Ill-defined Irregular Shaped High Dense Lesion With Mild Spiculated Margin Noted In Upper Outer Quadrant of Left Breast Measuring 4 X 3 Cm

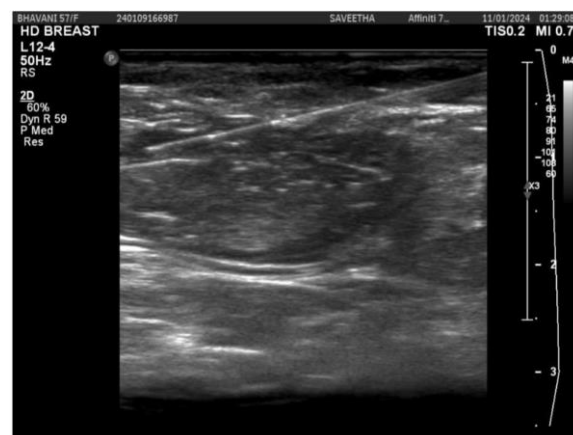


Figure 3: An Ill-Defined Irregular Shaped High Dense Lesion With Mild Spiculated Margin Noted In The Upper Quadrant Of Left Breast As Described Birads Iv

A mammogram of the left breast revealed an ill-defined, irregularly shaped, high-density lesion with mild spiculated margins in the upper outer quadrant, measuring 4x2 cm. Subsequent ultrasound-guided biopsy classified the lesion as BIRADS IV. Core-needle biopsy and histopathological examination confirmed the presence of invasive carcinoma of no special type (ductal) with mucinous features, histologic grade 1. Immunohistochemistry results indicated positive oestrogen receptor (ER) and progesterone receptor (PgR) statuses, and HER2-negative (score 0).

The patient underwent a left modified radical mastectomy, and histopathological examination of the resected specimen confirmed mucinous carcinoma (Type B), grade 2, classified as pT2 pN0. The patient had an uneventful postoperative recovery.

DISCUSSION

Mucinous carcinoma of the breast is a seldom encountered condition in clinical settings, accounting for approximately 4% (ranging from 1% to 7%) of all cases of invasive breast cancer (5, 7, 8). This particular form of tumour has a more favourable prognosis, with a 90% survival rate at 10 years. It is also more commonly found in women who are in the perimenopausal and post-menopausal age ranges (9). The prevalence of mucinous breast cancer in women aged below 35 is less than 1% (7). Mucinous breast cancer is a neoplasm that grows slowly, with a growth rate estimated to be one third of invasive breast cancer of no unique type. This cancer also has a lower number of axillary lymph node metastases. Conventional pure mucinous carcinomas have a metastatic rate of less than 15% (12). While there is no precise percentage required to diagnose mucinous carcinoma, it is generally agreed upon that a tumour should be classified as a pure mucoid, paucicellular carcinoma only if it consists of at least 90% mucinous component. It is crucial to accurately differentiate between pure mucinous carcinomas and "mixed" mucinous carcinomas, which consist of a combination of mucinous and non-mucinous components, as the prognosis for pure mucinous carcinoma appears to be more favourable. The overall survival rate of patients with mucinous carcinoma is similar to that of age-matched individuals in the general population. Recent research (11) has indicated that a specific group of individuals diagnosed with mucinous carcinoma do not experience positive results. Some writers have proposed that some subtypes of pure mucinous carcinoma, specifically those exhibiting a micropapillary pattern, exhibit a much poorer prognosis. Barbashina et al (11) discovered that over 50% of individuals with this specific pattern exhibited vascular invasion and synchronous axillary lymph nodes (11,12). The size of the tumour may not be a relevant determinant in the staging method due to the predominance of mucin in the tumour volume (14). Some mucinous breast carcinomas exhibit neuroendocrine differentiation, which is characterised by cytoplasmic argyrophilia or sensitivity to markers such as synaptophysin, chromogranin, and neuronal specific enolase (13,14). While one study found that neuroendocrine differentiation was linked to a positive histology and a favourable prognosis (15), other studies did not see this correlation (16). Mucinous breast cancer with a lobular component is a unique subset that often exhibits reduced cell-to-cell adhesion, loss of cell polarity molecules, and absence of neuroendocrine development. Furthermore, within this specific group of tumours, it is quite probable that the neoplastic cells exhibiting signet-ring characteristics will be present. Although uncommon, calcifications observed in conjunction with mucinous tumours often correspond to the invasive ductal component of the disease in a mixed mucinous tumour (10).

CONCLUSION

Mucinous carcinoma of the breast, though rare, presents distinct histological and clinical features that differentiate it from other types of breast cancer. This case of a 57-year-old woman highlights the importance of thorough clinical and histopathological evaluation in diagnosing and treating mucinous carcinoma. The favourable prognosis associated with mucinous carcinoma, particularly the pure type, underscores the effectiveness of surgical intervention and hormone therapy. Early detection through mammographic screenings can further improve outcomes, allowing for breast-conserving therapy and individualized treatment plans.

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