

Atypical Presentation of Infiltrating Mucinous Carcinoma of the Breast

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Mammography and ultrasonography helped to identify a mass in this patient's breast, and histopathologic examination led to the diagnosis of an unusual breast cancer variant.

A 30-year-old woman without a family history of breast cancer presented to her primary care provider with a right breast lump that had been growing for one to two months. The primary care provider was aware of the lump, which had been present for the past two years, and had previously attributed it to fibrocystic disease. With the recent rapid growth of the lump, however, the primary care provider questioned this initial diagnosis and referred the patient for specialized assessment.

During this assessment, a physical examination revealed a mass approximately 2 cm in diameter. It was mildly tender, mobile, firm, and located at the 12 o'clock position about 5 cm from the nipple. There was no overlying skin abnormality.

Mammography and ultrasonography of the right breast were obtained. Cranial-caudal and medial lateral oblique mammographic views showed a dense mass in the region of palpable abnormality without suspicious clustered microcalcifications

(Figure 1). Ultrasound showed a hypoechoic, taller-than-wide mass with lobulated borders (Figure 2).

The patient received a right breast lumpectomy with sentinel node biopsy. Histopathologic examination of the carcinoma, which measured 4.2 cm in gross dimension, showed representative clusters of cells in lakes of mucin (Figure 3). The patient was diagnosed with well differentiated, infiltrating mucinous carcinoma of the breast. The sentinel lymph node demonstrated metastatic mucinous carcinoma measuring 2.5 cm in gross dimension. In addition, there were micrometastases within the lymph node center and in the subcapsular sinuses that measured less than 0.1 cm in gross dimension. The patient's estrogen receptor (ER)/progesterone receptor (PR) status was positive, and her human epidermal growth factor receptor 2 (Her-2/neu) status and BRCA-1 status both were negative.

Three weeks following the lumpectomy and sentinel node biopsy, the patient underwent a right axillary node dissection. Histopathologic examination revealed that none of the 19 dissected nodes were positive for carcinoma. Based on this finding, the patient was given a diagnosis of stage IIB infiltrating mucinous carcinoma of the breast. She then received both

chemotherapy and irradiation. Despite the presence of metastatic disease upon presentation, the patient's prognosis is good.

ABOUT THE CONDITION

Invasive mucinous carcinoma, also known as colloid carcinoma, is an unusual variant of breast cancer that comprises 1% to 6% of the cancer's diagnosed cases. As invasive mucinous carcinoma of the breast usually affects older women, the age of the patient described in this case report was atypical. The prevalence of the disease is less than 1% in women younger than 35 years,^{1,2} and a retrospective study of 61 patients with the disease showed that the median age at diagnosis was 60.2 years.³

It also has been observed that patients with a BRCA-1 mutation are at a slightly increased risk for invasive mucinous carcinoma,¹ and a diagnosis of a Her-2/neu-positive tumor may indicate a more aggressive carcinoma. In the case of the patient described here, the disease's increased rate of growth and its metastasis to the sentinel lymph node signalled an aggressive nature despite Her-2/neu and BRCA-1 negativity.

The prognosis for mucinous carcinoma generally is good, and the National Institutes of Health currently

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recommend breast conserving surgical therapy with adjunctive irradiation as a primary mode of treatment.⁴ In the case described here, the aggressive nature of the disease resulted in the recommendation of postoperative chemotherapy as well as irradiation.

A literature search revealed one previously reported case of infiltrating mucinous carcinoma of the breast. In this case, the cancer was a recurrent, pure mucinous carcinoma that occurred four years following simple mastectomy, axillary node dissection, and transverse rectus abdominis myocutaneous (TRAM) flap reconstruction. The tumor, which had invaded the mediastinum and great vessels, was noted to be ER positive, PR negative, and Her-2/neu positive. The authors of this case report attributed the aggressive nature of the carcinoma to the patient's Her-2/neu positivity.⁵

THE CHALLENGE OF DIAGNOSIS

The data available for mucinous carcinoma indicate that the disease can vary widely in its clinical, ultrasonographic, and mammographic presentation. Use of all three of these techniques, therefore, increases the probability of differentiating correctly between this relatively rare carcinoma and other, more common forms of breast disease. Even so, in atypical cases like the one described here, a definitive diagnosis may not be established until histopathologic examination of excised tissue. After the clinical examination, mammography, and ultrasound, the differential diagnosis of this patient included both benign and malignant conditions, including fibroadenoma, infiltrating ductal carcinoma, and medullary carcinoma.

Mucinous carcinoma of the breast typically grows slowly. Physical examination often reveals a soft and well circumscribed lesion on palpation. In the case of the patient presented

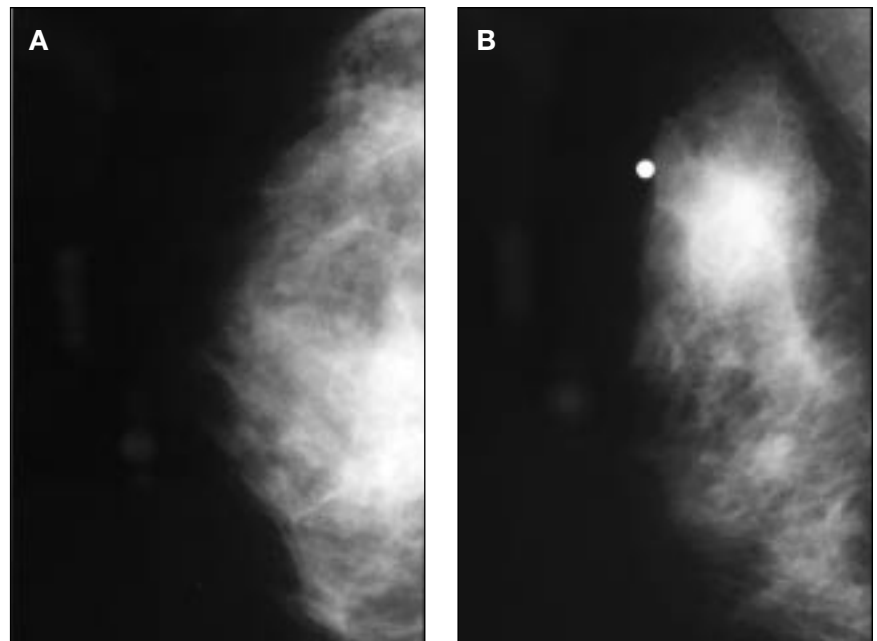


Figure 1. The patient's cranial-caudal (A) and medial lateral oblique (B) mammographic views, demonstrating a mass in the region of concern (labeled by a palpable marker on image B).

here, the lesion was firm, rather than soft, and it grew more rapidly over the previous one to two months than is typical for this cancer.

Although mammography of patients with the disease may show suspicious clustered microcalcifications, it often does not. Therefore, the absence of suspicious microcalcifications on mammography in the patient described here is not atypical for the disease. A lack of this finding should not eliminate infiltrating mucinous carcinoma of the breast from the differential diagnosis.

Lam and colleagues analyzed the mammographic and ultrasonographic features of 33 histologically diagnosed cases of mucinous carcinoma of both the pure (tumor cells with excessive extracellular mucin) and mixed (infiltrating disease with a paucity of extracellular mucin) types.² Mammographic features were documented according to the Breast

Imaging-Reporting and Data System, and it was noted that only 78.8% of images displayed a mass. Of the masses displayed on mammography, 53.8% were classified as oval, 38.4% as lobular, and 7.7% as irregular. The margins of the masses were stratified as 30.7% circumscribed, 38.5% microlobulated, 19.2% indistinct, and 11.5% spiculated. This study demonstrated that only 15.4% of the masses contained calcifications.²

The same study found that mucinous carcinoma presented as a mass on ultrasonography in 97% of cases. Of this group, 40.6% were classified as oval, 40.6% as lobular, 6.3% as round, and 12.5% as irregular. The margins of the masses were stratified as 6.3% circumscribed, 56.3% microlobulated, and 37.5% indistinct. The echogenicity of the masses were noted to be hypoechoic in 6.3% of cases, isoechoic in 12.5%, heteroechoic in 43.8%, and mixed cystic and solid in

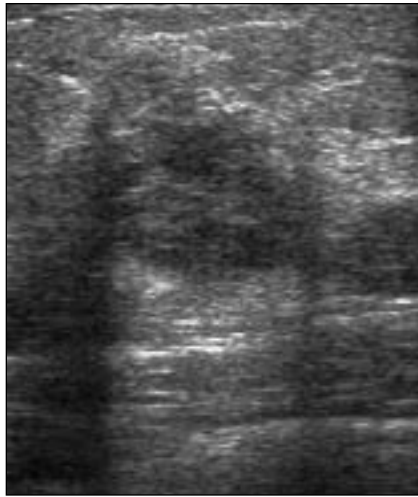


Figure 2. The patient's sonogram, showing a 1.4- x 1.8- x 1.5-cm, hypoechoic, taller-than-wide mass with lobulated borders at the 12 o'clock position in the right breast, about 5 cm from the nipple.

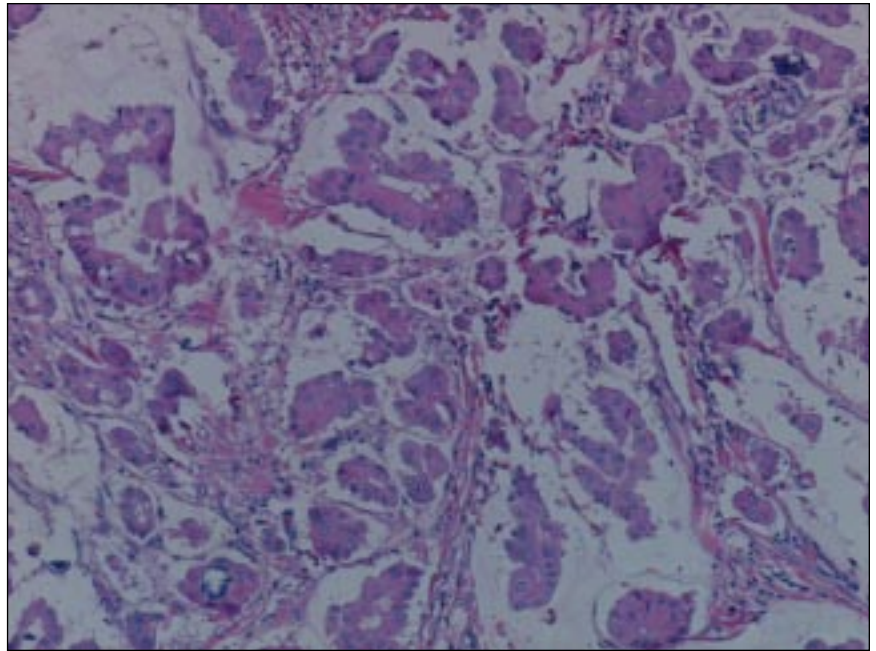


Figure 3. Histopathologic image from the patient's excised lesion, showing representative clusters of cells in lakes of mucin.

40.6%. Additionally, vascularity was present in 34.3% of the cases, shadowing in 3.1%, and enhancement in 43.8%.²

Microscopic examination of this carcinoma usually reveals aggregation of neoplastic cells with large amounts of mucinous material. Many single neoplastic cells also can be found within the mucinous material. The neoplastic cells may display minimal anisonucleosis to severe atypia.⁶

CONCLUSION

This case demonstrates the imaging and histopathologic findings of an atypical presentation of invasive mucinous carcinoma of the breast in a 30-year-old woman. Specifically, the age of the patient and the aggressive nature of the tumor were atypical of this disease. Given the variation of clinical, mammographic, and ultrasonographic findings possible with this disease, clinicians need to maintain their suspicion and use multiple diagnostic modalities to arrive at an accurate diagnosis. ●

Author disclosures

The authors report no actual or potential conflicts of interest with regard to this article.

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