

Case Report

Mixed metaplastic carcinoma of the breast: a case report

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Abstract

A 68-year-old woman with no significant medical history discovered a lump incidentally in her left breast. The patient's initial imaging revealed a 4.6-cm irregular mass at 11:00 categorized as a BI-RADS 5 as well as an enlarged axillary lymph node and an area of 2.5 cm of heterogeneous calcifications in the 3 o'clock position. The 4.6-cm lesion was revealed to be infiltrating ductal carcinoma with a squamous component, mixed metaplastic carcinoma, which was strongly ER (100+)/PR (100+) positive, HER-2/Neu negative on FISH. The 2.5-cm calcifications were ductal carcinoma *in situ*. The patient completed neoadjuvant chemotherapy, and had an excellent response. After further discussion, the patient elected for breast conservation therapy and underwent a left wireless localized partial mastectomy with a left axillary dissection. Surgical pathology revealed a near complete pathologic response with only 8-mm residual tumour as well as a negative conversion of the clipped axillary node.

INTRODUCTION

Metaplastic carcinoma of the breast (MpBC) is a rare group of malignancies that accounts for 0.2–5% of breast cancers [1]. Currently, there is no consensus on the standardized treatment, and physicians rely on case reports to help guide their understanding to help formulate optimal treatment options for patients. The following case consists of MpBC with biopsy proven squamous axillary disease and includes multidisciplinary treatment of MpBC consisting of neoadjuvant chemotherapy (NAC) that resulted in a near complete pathologic response on surgical pathology. Thus, we present a rare case of mixed metaplastic breast carcinoma with metastatic disease and confirming the utility of NAC in these patients.

CASE PRESENTATION

A 68-year-old Caucasian woman with no past medical history presented due to self-palpated left breast mass. She had no history of routine breast screenings or breast biopsies. For nine months, she noted a new 'bluish/purplish' discoloration overlying the mass and sought evaluation with her primary care physician. She was referred for diagnostic imaging. Imaging revealed multiple abnormalities of the left breast and axilla including a 4.6-cm irregular mass at 11:00, a suspicious, enlarged axillary lymph node, and an area of 2.5 cm of heterogeneous calcifications in the 3 o'clock position. She was given a BI-RADS 5. She underwent an ultrasound-guided core needle biopsies of the 11:00 lesion and the axillary lymph node and a stereotactic core needle biopsy of the 3:00 calcifications. The 11:00 biopsy revealed grade 3 infiltrating ductal carcinoma (IDC) with a minor squamous component. It

was ER+ (100%), PR+ (100%), her-2/Neu negative on FISH. The Ki-67 was 95% and p53 was 100%. The lymph node showed metastatic breast carcinoma, mostly keratinizing squamous cell type and a minor component resembling the breast tumour at 11:00. The node was ER 5%, PR- and her-2/Neu negative on FISH. Ki-67 was 80% and p53 was 95%. A scant area DCIS was present in the biopsied calcifications. No prognostics were performed.

Without NAC, the surgical plan was left modified radical mastectomy, given her extensive disease, so the patient elected to undergo chemotherapy. Prior to initiation of NAC, staging scans revealed no distant metastasis. Post 1 month after initial diagnosis, the patient began adriamycin and cyclophosphamide every 14 days for four cycles followed by weekly Taxol for 12 cycles. She completed NAC without delay with the last cycle administered 5 months post-initiation. Throughout NAC, the patient was followed via physical exam that demonstrated a reduction in the primary tumour and lymph node after the first cycle. The final physical exam and post-chemotherapy diagnostic imaging results of the breast and axilla supported a possible complete pathologic response.

Due to the NAC response, the patient was a candidate for a left localized partial mastectomy at 12:00 and 3:00 with targeted axillary lymph node dissection. The day prior to surgery, the patient had wireless localization reflectors placed at both breast sites and the clipped node. Her surgery was successful with no complications. Intraoperative frozen pathology revealed four sentinel lymph nodes (SLN), including the prior biopsied node, that were negative for metastasis. Intraoperative specimen radiographs revealed two partial mastectomy specimens with biopsy clips centred and reflectors in place.

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Final surgical pathology revealed a residual 8-mm IDC with negative margins at the 11:00 location. The four SLN were negative. SLN #2 contained the biopsy clip and showed scarring. Surgical pathology at the 3 o'clock position revealed no residual carcinoma. Lobular carcinoma in-situ was noted with all negative margins. The patient's final pathologic stage was ypT1bypN0/STAGE IA breast carcinoma. She completed adjunct radiotherapy and continues antiestrogen therapy.

DISCUSSION AND CONCLUSIONS

Metaplastic breast carcinoma (MpBC) is a heterogeneous group of malignancies characterized by a non-glandular differentiation of breast tissue, including osseous, sarcomatous or squamous histology [1, 2]. Several classifications exist under the WHO Classification of breast tumours, including epithelial, sarcomatoid, and mixed metaplastic carcinomas [3]. MpBC, which typically occurs as a triple-negative tumour, is shown to have a worse prognosis than other triple-negative breast cancers likely due to the biology of MpBC and poor chemotherapy response [1–9]. It typically presents as a larger, higher-grade tumour at diagnosis [1, 3].

Due to its rarity, MpBC evidence is based on case reports, case series and retrospective analysis. Although there are instances of partial or complete response, many patients have no response and disease progression [1, 4, 7, 8, 10, 11]. However, literature is limited by low sample sizes. Due to the low reported response to NAC, and possible disease progression, treatment recommendations include early surgical resection and adjuvant therapy—except in tumours <0.5 cm in size with no nodal or metastatic disease [12].

Because these are typically large, high-grade tumours occurring at a later stage, surgical resection often entails mastectomy [2, 13]. The addition of adjuvant radiation has been shown to improve survival [1, 13]. Chemotherapy also has a survival benefit, though this is debated in patients with operable disease, and little evidence exists comparing adjuvant to NAC [1, 13, 14]. Additionally, NAC rates of complete pathological response are low with MpBC. Evidence shows similar overall survival between neoadjuvant and adjuvant chemotherapy in patients with node positive disease consistent with our patient [13].

Despite low response rates compared to other breast cancers, patients with MpBC have higher likelihood of response or disease stability with NAC vs progression [7, 8, 10, 11]. Administration of NAC prior to surgical intervention could lead to tumour regression, which results in less invasive surgery, with evidence indicating breast conservation has similar outcomes to mastectomy [13]. Additionally, NAC allows for in-vivo chemo-responsiveness to aid in adjuvant therapy planning and potential nodal regression thus avoiding complete axillary node dissection.

Our patient, with node positive MpBC, had a near complete pathologic response demonstrating the benefits of initiating a NAC approach. Though current recommendations indicate early surgical resection, node positive MpBC patients may benefit from NAC. This approach could allow for decreased morbidity without increased mortality.

AUTHORS' CONTRIBUTIONS

Dr. Amelia Tower conducted the treatment plan and the surgical intervention for the patient, wrote the introduction and case presentation, and performed the final edits. Dr. Jonathan Hughes synthesized the clinical timeline, wrote the discussion

and conclusion, and contributed to the literature review. Kumaraman Srivastava coordinated the case report, managed logistics and contributed to the abstract, background, case presentation, and compiled all information required for the case report. Lauren Moore contributed to the literature review and discussion/conclusion.

CONFLICT OF INTEREST STATEMENT

None declared.

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DATA AVAILABILITY

All data and materials can be found in the article. No other data or materials were used.

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