



Case Report

Carcinosarcoma of the Breast - A Rare Presentation

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Abstract

Metaplastic carcinoma of the breast with mesenchymal differentiation (MCMD), previously known as carcinosarcoma, has been recently designated as a subtype of metaplastic breast carcinoma. It is a very rare and aggressive tumor that accounts for 0.08%–0.2% of all breast cancers reported in the literature. Histologically, MCMD is characterized by a biphasic pattern of malignant epithelial and sarcomatous components without evidence of a transition zone between the two elements. We herein describe a unique case of metaplastic carcinoma of the breast in a young lady, which on core biopsy showed features of a poorly differentiated malignancy. The differential diagnosis was given as poorly differentiated carcinoma and high-grade lymphoma. IHC was suggested to confirm the lineage. The mass was large and rapidly growing and showing signs of impending rupture. Patient therefore underwent an elective modified radical mastectomy with a very close margin confirmed on frozen sections and final diagnosis after extensive sampling as triple negative MCMD. There was involvement of ipsilateral axillary nodes. These tumors present with distal metastases, and have earlier local recurrence and poor prognosis compared with classic invasive breast cancer. Because of the rarity of MBC, the optimal treatment has not been well defined. Surgery is the main curative treatment modality since MBC has shown a suboptimal response to standard chemotherapy.

Keywords: *metaplastic breast carcinoma, carcinosarcoma, differentiation, mesenchymal.*

Introduction

Metaplastic carcinoma of the breast with mesenchymal differentiation (MCMD) is exceptionally rare ^[1] that has been recently classified as a subtype of metaplastic breast carcinoma (MCB) by WHO. The molecular pathogenesis of MCMD is poorly understood, but it

has not been proven unanimously that both epithelial and mesenchymal components originate from a single cell clone ^[2,14]. Risk factors for this pathology are unknown. We herein describe a unique case of MCMD of the breast in a young patient who presented with a large bosselated, rapidly growing mass and signs of impending rupture.

Case Presentation

A 35-year-old woman presented with chief complaint of a large rapidly growing bosselated left breast mass since six-months. She revealed that she had first noticed a small lump one year ago which for the last 6 months has rapidly increased in size. Physical examination revealed a giant bosselated left breast mass measuring approximately 20x18 cms (Fig. 1). There were 3x2cm firm palpable ipsilateral axillary, supraclavicular lymphadenopathy on palpation. Nipple areolar complex appears stretched with no peau d'orange". Overlying skin was pinchable, lump was mobile and not attached to the chest wall. Right breast and axilla were normal. BIRADS score was 4B by sonomammogram. Clinically, the tumor was diagnosed as malignant phyllodes. Contralateral breast and axilla were normal. Her past medical history was unremarkable and she had no family history of breast or ovarian cancer. A tru-cut needle biopsy showed features of a poorly differentiated malignancy and immunohistochemistry was suggested for confirmation. As the mass was rapidly increasing with signs of impending rupture, a left modified radical mastectomy with axillary node dissection was performed after a thorough preoperative evaluation. Mediastinal and hilar thoracic lymph nodes were negative by preoperative PET-CT. Gross examination revealed a grey white solid irregular mass with fleshy areas. The surgical margin was very close (0.2cm) from the tumor (Fig. 2). Ipsilateral axillary lymph nodes were involved by tumor. Histological examination was suggestive of metaplastic breast carcinoma with mesenchymal and high-grade epithelial components. There was moderate cytologic atypia and brisk mitosis. Interspersed areas of necrosis and hemorrhage were noted (Fig. 3). Surgical margins very close to the tumor. Extensive sampling was done to represent the entire tumor to rule out malignant phyllodes. However, glandular components entrapped within the stromal elements were not seen and there was a high proliferative index. Also, the clinical history of rapid increase in mass was against the diagnosis of phyllodes tumor. This ruled out phyllodes tumor

which was thought of as a differential initially. The tumor conferred to pT3 pN2aM0. Tumor cells were triple negative (ER, PR and HER-2(Fig. 5). Vimentin, EGFR was positive and Ki67 LI was approximately 60%. PAN CK was positive in the epithelial component and P63 was negative. IHC for AR, GATA3 were negative. The patient received adjuvant chemotherapy consisting of four cycles of Doxorubicin/cyclophosphamide followed by four cycles of Docetaxel plus trastuzumab and radiotherapy to the chest wall and the axilla. She is asymptomatic and free of disease, five months after surgery with follow-ups scheduled every 6 months.



Fig 1- Left Breast lump of size 20x18cm occupying the whole of left breast with stretched out skin and slight boss elated surface

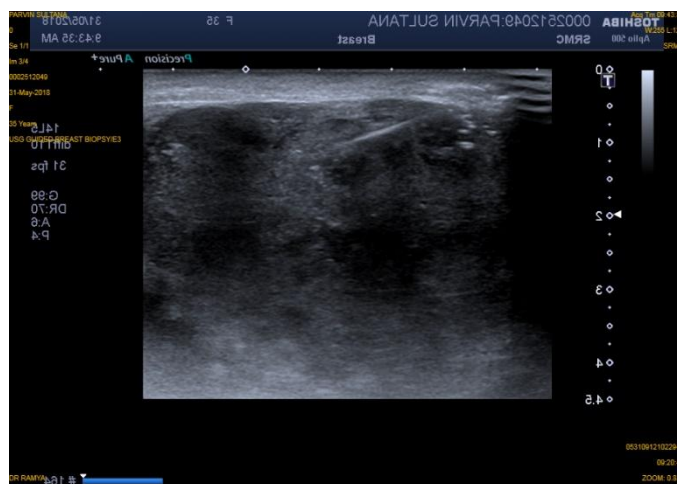


Fig 2- Sonographic features show a large heterogeneous cystic-solid lesion



Fig 3- Gross appearance of specimen showing large variegated mass

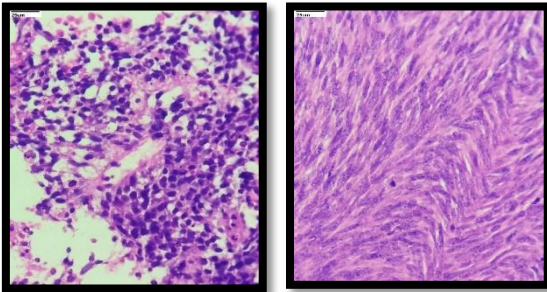


Fig 4 - Microscopic examination showing poorly differentiated carcinoma with sarcomatoid differentiation

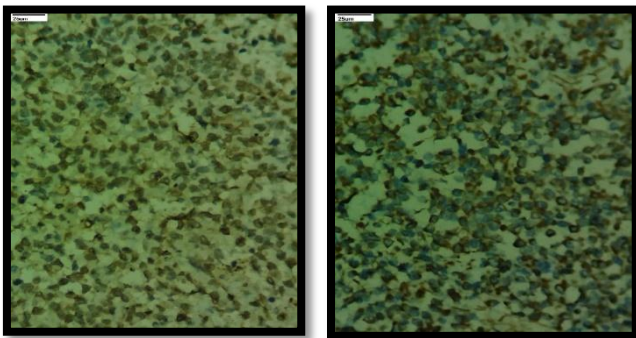


Fig 5. Immunohistochemistry: (a)High Ki67 labelling index (b)Pan-Ck Positive

Discussion

According to epidemiologists from the American Cancer Society, 279100 new cases of breast cancer will occur in 2020 in the USA.^[1] MBC is rare, accounting for 0.25%–1% of breast cancers diagnosed annually, or approximately 700–2790 new cases.^[2,3] Meta-plastic breast cancer is

classified as a distinct pathologic entity by the WHO and characterized by mixed epithelial and sarcomatoid histology.^[4]

In our institute, 356 cases of Invasive Mammary carcinomas have been reported in SRMC & RI, with only 2 cases of Metaplastic Carcinoma, in the last year. Carcinosarcoma / metaplastic breast carcinoma is a sarcomatoid metaplasia of malignant epithelial cells. It is a rare, locally aggressive disease comprising only 0.08-0.2% of all malignant breast lesions.^[5]

The cell of origin is unknown, but the hypothesis is that myoepithelial cells originate from a single stem cell like spindle-cells. The carcinomas have been reported to develop from existing cystosarcoma phyllodes, fibroadenoma and cystic backgrounds. A rapidly growing breast mass is the most common manifestation.^[2,14]

Accurate diagnosis can be clinched from the histopathology images. These entities are usually triple negative and lymph node involvement is less.^[6,8,13] Histology demonstrates Sarcomatous component which resembles fibromatosis; the epithelial component can reveal osteoclast-like giant cells too. The tumors are often cystic structures with lining composed of squamous cell carcinoma.

Different imaging methods can be used to diagnose MBC. Magnetic resonance imaging (MRI) features show a T2 hyperintense, irregular mass that may show spiculated margins. The mass is irregular and/or spiculated margins on mammograms. Sonographically a heterogeneous mass with both solid and cystic components present with complex echogenicity is appreciated.^[5,9]

Treatment in many reported cases was usually surgical resection with sentinel lymph node biopsy or axillary node dissection, followed by postoperative chemotherapy and radiation therapy. The treatment protocol is not standardized due to low incidence and variability in presentation.^[6] Main modalities are surgery and chemotherapy with radiation; however, traditional treatment regimens used for IDC have shown variable responses in MBC.^[7,10,11] Mastectomy is usually required due to the large size of tumor at presentation, but breast

conservation therapy shows no significant change in disease free survival when compared with mastectomy.^[10] The tumor has been shown to be resistant to conventional breast cancer therapy. The most common sites of metastatic disease are the lungs and pleura^[15], whereas brain, hepatic and skeletal metastases are uncommon.^[16] Due to the nature of MBCs, a multidisciplinary approach should always be considered. Participation of patients in clinical trials incorporating agents targeting PI3K and EMT pathways should be considered.^[12,17] Intensive follow-up of patients with MBC is mandatory due to the aggressive clinical course of the tumor.

Conclusions

Because of the rarity of the tumor, there are not enough data and standard guidelines for the optimal treatment and information about management and prognosis is based on small retrospective studies rather than randomized trials. Surgery is the main curative approach. An intensive follow-up is required for the detection of an early recurrence of the disease.

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List of Abbreviations

MBC- Metaplastic breast carcinoma, MCMD- Metaplastic carcinoma of the breast with mesenchymal differentiation, MRI- Magnetic resonance imaging, IDC- Invasive ductal carcinoma, ER- Estrogen receptor, PR- Progesterone receptor, WHO- World Health Organisation