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Case Report

CASE REPORT

Metaplastic carcinoma of breast: a report of two cases

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Abstract

The pathogenesis of metaplastic breast carcinoma (MBC) is still debatable and it has been hypothesized that MBC develops as a result of transformation of epithelial cells into mesenchymal cells along with formation of a favorable tumor microenvironment. This favorable tumor microenvironment helps the transformed cells to undergo further mutations and clonal expansion. Case 1 was a 42-year old female with a 1-year history of a right breast fungating mass which was histologically confirmed to be matrix-producing type of MBC. Case 2 was a 47-year old female who presented with a recurrent left breast mass. Histologically, the tumor was confirmed to be carcinosarcomatous type of MBC. MBC is a rare, heterogeneous tumor with poor prognosis due to its aggressive behavior. It is more likely to mimic other benign breast conditions, therefore contributing to delay of diagnosis as it was for both of our patients herein presented.

INTRODUCTION

Nonepithelial tumors of the breast generally are rare including benign and malignant types [1]. Metaplastic breast carcinoma (MBC) encompasses various types including those with mesenchymal-only and combined mesenchymal and epithelial components, and its prevalence is less than 1% of all breast cancers [2]. The vast majority of the types of MBC are usually triple negative for ER, PR and HER-2 implying poor prognosis [3].

CASE REPORTS

Case 1

A 42-year old female presented with a 1-year history of a right beast mass. The mass was fixed to the underlying tissue with ill-defined margins. Incisional biopsy was done and was reported as pleomorphic liposarcoma. Baseline chest and abdominal CT scan revealed normal lungs and intrabdominal organs. Then toilet mastectomy was done. The tumor was extensively necrotic, and it measured 14 × 9 × 11 cm. Seven lymph nodes were dissected from the axillary tail. Histologically, the tumor was composed of areas of epithelial components with almost no tubular formation (Fig. 1A), areas of mesenchymal and epithelial components separated by a thick fibrous strand (Fig. 1B) and diffuse proliferation of atypical spindle cells with marked pleomorphism and hyperchromasia (Fig. 1C). Increased cellularity, atypical nuclei with binucleation of the malignant chondrocytes (Fig. 1D) and mitotic count of 40 per 10 high power field were also seen. All the seven axillary lymph nodes and the surgical margins were free of the tumor. Pathologic TNM stage T4aN0M0 and Bloom–Richardson grade 3 were given. Immunohistochemistry staining for ER/PR and HER-2 were all negative. Cytokeratin (CK5/6) was focally positive.

The postoperative period of the patient was uneventful. The patient started chemoradiotherapy 2 months after being discharged. After she had completed the three cycles of the chemotherapy regimen (doxorubicin, vincristine and cyclophosphamide), she remained uneventful for about 6 months, then

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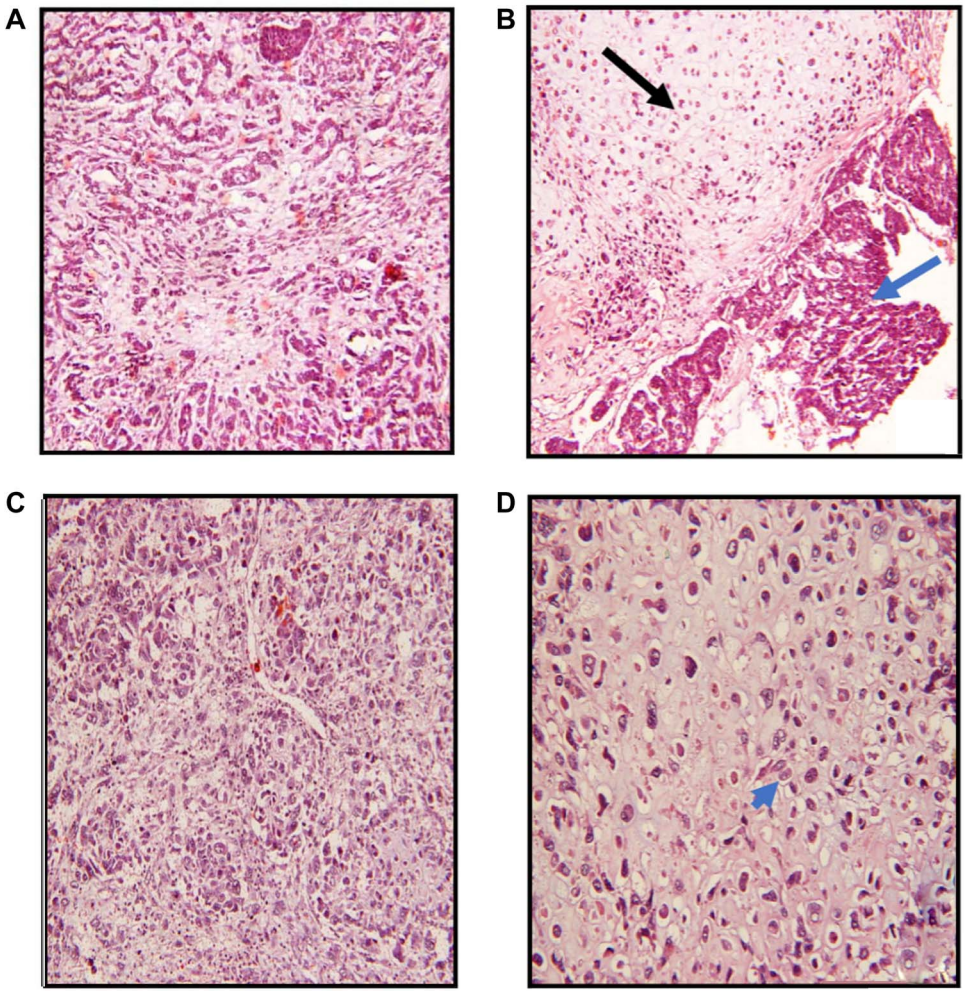

Figure 1: (**A**) Diffuse infiltration of the tumor cells with almost no tubular formation (H & E stain, ×100), (**B**) both epithelial (blue arrow) and mesenchymal (black arrow) areas of the tumor are shown (H & E stain, ×100), (**C**) high-power magnification showing pleomorphic spindle tumor cells with marked hyperchromasia (H & E stain, ×200) and (**D**) high-power magnification showing the malignant chondroid matrix. There is increased cellularity, atypical nuclei and binucleation of the tumorous chondrocytes (head arrow) (H & E stain, ×400).

she developed pleural effusion, wasting and generally worsening of her condition and she died after being confirmed with lung metastasis which was confirmed by chest CT scan. However, cytological analysis of the pleural fluid was not done due to the debilitating condition of the patient.

Case 2

A 47-year old female presented with a left breast mass for more than 10 years. She reported that she had had lumpectomy done 6 months ago; unfortunately, the excised lump was not sent for histological examination. The patient started experiencing pain from the same breast followed by appearance of a mass not more than 6 weeks after lumpectomy. On physical examination, the left breast was swollen with inverted nipple and ulcerated overlying skin. Baseline CT scan survey of chest and abdomen for metastasis was normal. Radical mastectomy with dissection of three palpable axillary lymph nodes was done. Grossly, the tumor measured 10.5 × 6 × 3 cm and was extensively necrotic.

Histologically, the tissue sections revealed a diffuse, infiltrating tumor composed of atypical spindle cells with extensive necrosis (Fig. 2A). The tumor cells had marked hyperchromasia and pleomorphism (Fig. 2B). Brisk mitotic figures (Fig. 2C) and count of approximately 50 mitoses per 10 high-power field and giant tumor cells were also seen (Fig. 2D). The conclusion was carcinosarcomatous type of MBC. Pathologic TNM staging of pT4bN0M0 and Bloom–Richardson grade 3 were given. ER, PR and HER-2 all were negative. CK5/6 was positive in areas with carcinomatous component.

The patient started chemoradiotherapy 2 weeks after being discharged. After she had completed the three cycles of the chemotherapy regimen (doxorubicin, vincristine and cyclophosphamide), she became stable. Three months later, chest and abdominal CT scan was done to evaluate for possible metastasis and was found to be normal. Six months post operation, the condition of the patient is stable without metastasis or local recurrence.

DISCUSSION

MBC is histologically classified into five subtypes including spindle cell, squamous cell, matrix-producing, carcinosarcoma and osteoblastic types [2, 4]. The differential histological

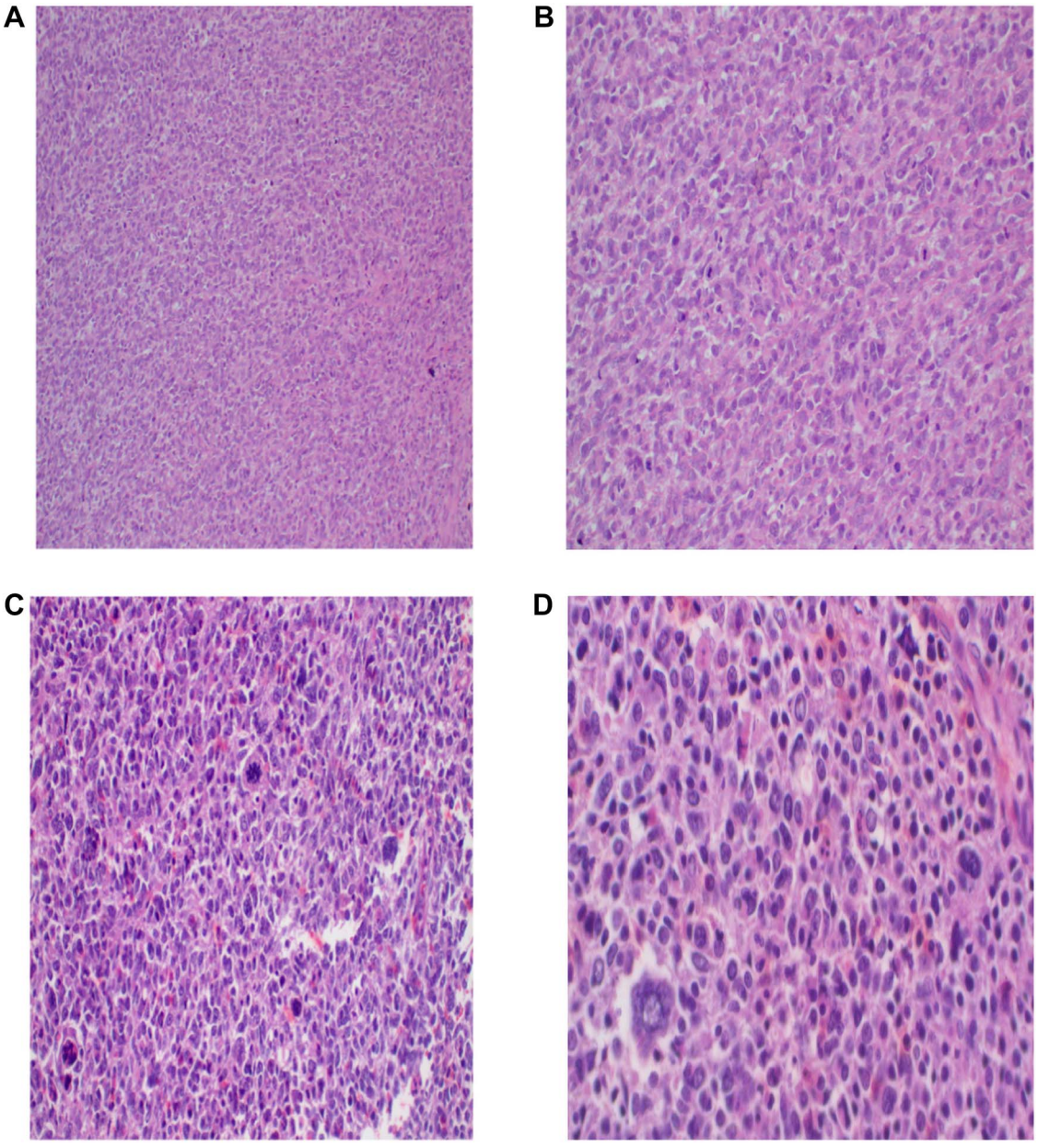

Figure 2: (**A**) Diffuse infiltration of atypical spindle tumor cells (H & E stain, ×40), (**B**) spindle tumor cells which are hyperchromatic with marked nuclear pleomorphism (H & E stain, ×100), (**C**) high-power magnification showing pleomorphic epithelial spindle and ovoid tumor cells and brisk mitoses (H & E stain, ×400) and (**D**) high-power magnification showing the malignant ovoid and spindle tumor cells with giant tumor cells (H & E stain, ×400).

diagnoses of MBC include myoepithelial carcinoma, myofibroblastic tumors, malignant phyllodes tumors, pleomorphic adenoma and adenomyoepithelioma [2]. The median age at presentation for patients with MBC ranges from 48 to 59 years [3, 5]. Patients with MBC present clinically with rapidly growing masses usually greater than 2 cm, and such masses are fixed to the underlying tissue [3]. Zavadil et al. reported that, over 20% of patients with MBC in their study had tumors measuring more than 3.5 cm and fixed to the underlying tissue [4]. Rarely patients with MBC present with axillary lymph node metastasis, and the incidence has been reported to range from 6 to 26% [6]. Studies have shown that accurate diagnosis for MBC is low. Li et al. and Zhang et al. reported that only 11.8 and 20% of the patients in their studies had accurate diagnosis before mastectomy [7, 8].

Surgery is the main stay of treatment of MBC. Chemotherapy and radiotherapy may also be used based on the stage of the disease. Adjuvant radiotherapy has been found to decrease both the rate of recurrence and mortality rate [4]. Single institution retrospective studies and genomic profiling reported that MBCs are highly chemoresistant [9]. Because of being almost triple negative and at the same time chemoresistant, MBCs have very poor prognosis [10]. In one study, the 5-year overall survival for MBC compared to IDC-not specified type was 67.9% and 88.9%, respectively [5]. The presence of benign heterologous element, absence of intervening stroma and predominating

carcinomatous component are good prognostic factors, whereas the presence of sarcomatous metaplastic elements including chondroid, osteoid and intervening spindle cells along with lymph node metastasis and tumor size are poor prognostic factors [10].

The importance of reporting these two cases in this paper is that the two cases have shown that MBC is more likely to occur in females who are below the median age (over 50 years). Additionally, the presentation of MBC in our cases should always be considered as it was that initially, the disease was presenting as benign, which contributed to the delay of diagnosis in both cases.

CONCLUSION

MBC carries a very poor prognosis due to its aggressive biological behavior accompanied with resistance to chemotherapy, increased chances of recurrence and metastasis.

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CONFLICTS OF INTEREST STATEMENT

The authors declare that there is no conflict of interest to be disclosed.

ETHICAL APPROVAL

Ethical approval was provided by the Institution Review Board of the School of Biomedical Science which is under Makerere College of health Sciences. A reference number CR-IRB-0091/20 was provided.

INFORMED CONSENT

We confirm that we obtained a written informed consent from the patients for publication of the case details and any accompanying images. A copy of this consent is available upon request by the editor-in-chief of this journal for review purposes.

GUARANTOR

Dr James J. Yahaya is the guarantor of this paper.

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