Metaplastic Carcinoma of the Breast: A Diagnostic Dilemma

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ABSTRACT

Metaplastic carcinomas of the breast are malignant neoplasms composed of a mixture of epithelial and mesenchymal elements. They are rare with incidence of lesser than 1% of invasive breast carcinoma. The present case of metaplastic breast carcinoma in a 47-year-old lady is reported since it posed a diagnostic dilemma at histopathology and also highlights the importance of immunohistochemistry to rule out various differentials. Identification of this rare entity is of significance in view of the varied prognostic implication.

Key words: Histopathology, immunohistochemistry, metaplastic carcinoma

INTRODUCTION

Carcinoma of breast arises from the mammary glandular epithelium and usually exhibits the features of adenocarcinoma. However, in some cases glandular epithelium differentiates into non-glandular mesenchymal tissue by a process called metaplasia.[1] Metaplastic changes include squamous cell, spindle cell and heterologous mesenchymal differentiation mixed with the component of adenocarcinoma which may be minimal or even absent and hence the distinctive terminology “metaplastic carcinoma (MC)” came into existence. MCs of the breast are rare with incidence of less than 1% of invasive breast carcinoma.[1,2] The variety of histopathological patterns pose diagnostic dilemma and ambiguity. Identification of this rare entity is of significance in view of the varied prognostic implication. The present case highlights the diagnostic dilemma at histopathology and the importance of immunohistochemistry (IHC) to arrive at a precise diagnosis.

CASE REPORT

Here we describe a case of a 47-year-old female patient who presented to our surgical out-patient department with a subareolar lump in the left breast. The patient had no other systemic complaints. On examination, the lump was firm, ill-defined, measuring 3 cm × 3 cm. The patient was subjected to fine needle aspiration cytology and a diagnosis of breast carcinoma was made. Patient underwent modified radical mastectomy (MRM) with axillary clearance. Prior preoperative investigations were unremarkable. On receipt of the MRM specimen, serial sectioning showed a greyish, well-circumscribed subareolar lesion measuring 3 cm × 2 cm. Adjacent breast tissue showed fibrous areas. Axillary pad dissection identified nine lymph nodes. Representative sections were taken, processed, sectioned and subjected to histopathological examination. Microscopy revealed an encapsulated tumor with nodules of tumor cells having pushing margins arranged in sheets and syncytial pattern.
Individual cells were pleomorphic round to oval and at places spindly with high N/C ratio, irregular hyperchromatic nuclei and moderate eosinophilic cytoplasm. Mitotic figures were noted. Adjacent breast tissue exhibited fibrocystic changes. No vascular tumor emboli and all nine lymph nodes were free of tumor. Medullary carcinoma, malignant phylloides tumor and other non-epithelial tumors like malignant fibrous histiocytoma (MFH) were thought of as differentials. Further sampling of the tumor was done which unveiled the same tumor cells being arranged in glandular pattern at the periphery of the lesion, in addition to spindle cells. IHC showed estrogen receptor, progesterone receptor and HER2 neu-negative. Vimentin, pan-cytokeratin (CK), CK 5/6 and S100 were positive. This vimentin and CK positivity was seen in both spindle and glandular cells. Considering all the above features we arrived at the final diagnosis of MC breast carcinosarcoma with a minimal glandular component-pT2, pN0, pMx-stage 2A.

DISCUSSION

Metaplastic breast carcinoma is a rare but interesting neoplasm constituting lesser than 1% of all invasive breast carcinomas. The term describes a range of cancers of mixed epithelial and mesenchymal differentiation, which is affirmed by immunohistochemical staining for mesenchymal cells (vimentin), epithelial cells (CK) and myoepithelial cells (S-100 protein, actin and high-molecular-weight CK). The entity has been known by many historical terms such as adenosquamous, spindle-cell sarcomatoid carcinoma,
carinosarcoma and matrix producing carcinoma.\(^2,3\)

Nevertheless, Wargotz and Norris suggested four variants of MC which include matrix-producing carcinoma, spindle-cell carcinoma, squamous cell carcinoma and carcinosarcoma.\(^4\) Oberman categorized them as MC of the breast despite the presence of overlapping microscopic features.\(^5\) Oberman and Pitts reported lack of correlation between microscopy and prognosis.\(^5,6\) However, some of the authors observed poor prognosis in those with carcinosarcoma. The etiology for this rare tumor is unknown, however a study carried out by Nottingham reported five cases of MC seen to arise in complex sclerosing lesion.\(^7\)

The median age of presentation of MC in a series of 19 patients and another series of 14 cases was 48 years and 50.5 years respectively. These tumors commonly present as large firm nodular tumors measuring up to 5 cm in diameter and in a series of 19 patients studied, the median tumor size was 9 cm with 15% of 3 years disease free survival.\(^8,9\) In the present case, the patient was 47 year-old and presented with tumor size of 3 cm × 2 cm. Microscopically, the tumor exhibited a pure spindle-cell pattern or mixed epithelial and mesenchymal pattern. The epithelial component is often a ductal carcinoma, but various non-specific patterns of squamous, apocrine, medullary or mucinous carcinomas can coexist. Mesenchymal elements are usually fibrosarcoma, but bone, cartilage, muscle and vascular components may be seen.\(^10\) In the present case owing to the synecytic pattern of cells and also spindle-cells, differential diagnosis of medullary carcinoma, malignant phyllodes and MFH was thought. However, considering the IHC results, vimentin and CK positivity a definitive diagnosis of MC was made.

Without further sampling, if the diagnosis of malignant phyllodes tumor was offered follow-up would suffice and the other differential medullary carcinoma supposedly has a good prognosis with a 5 year survival rate of more than 50%.\(^1,2\)

The present case exemplifies the fact that thorough sampling and IHC support helps in arriving at a final diagnosis, which further enables clinicians to give appropriate therapy.

MCs of the breast are very aggressive form of breast carcinoma associated with a poor outcome; the overall 5 year survival rate being less than 60%. It is treated just as any form of breast cancer. Though lymph node metastasis may not be observed, a complete treatment protocol is required to avoid distant metastasis. MCs are usually negative for hormone receptors. Few authors say patients with MC are candidates for breast conservation surgery followed by tumor bed irradiation to reduce the risk of local recurrence. Preoperative chemotherapy also plays a role in the treatment of this entity. MCs have early distant metastasis to lungs, bone, liver, brain and mediastinum.\(^1,2,5,8,9\) In the present study, the patient underwent MRM and owing to hormone receptor, negativity was subjected to chemotherapy. Follow-up for a period of 6 months showed no local recurrence or distant metastasis.

**CONCLUSION**

MCs belong to a group of neoplasms which pose diagnostic dilemma at every step and existence of this rare entity should be considered in differentials. Extensive tissue sampling and immunocytochemistry with appropriate panel help rule out other differentials. This enables clinicians to select pertinent modality of treatment to increase the survival rate and avoid complications.

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