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Case Report

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A Rare Case of Metaplastic Breast Carcinoma with Squamous Differentiation in Young Female: A Case Report

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Keywords

Metaplastic breast carcinoma, Histopathology, Squamous differentiation

Abstract

Background. Metaplastic breast carcinoma is a very rare breast cancer, only about 0.2-1% of all invasive breast carcinomas. The prognosis of these cancer is poor and aggressive, reported to have lower response rates to conventional adjuvant chemotherapy and a worse clinical outcome after chemotherapy than other forms triple-negative breast carcinomas. Histopathologically, metaplastic breast carcinoma has distinct patterns with different outcomes. Among the types of metaplastic carcinoma, squamous cell, high grade spindle cell and high grade adenosquamous carcinoma are associated with the worst prognosis. We report one case of metaplastic breast carcinoma with squamous differentiation in young patient.

Methods. We examined the breast tumor tissue of a female patient, evaluated the macroscopic and microscopic features and asked the patient about the clinical course of the disease. Inform consent was obtained from the patient for publication of this case report and accompanying images.

Results. We reported a young female patient with final diagnosis of pathology Mixed Infiltrating Duct Carcinoma of No Special Type Grade 3 and Metaplastic Breast Carcinoma with Squamous Differentiation (30%) that has invaded fat tissue with Ductal Carcinoma Insitu of High Nuclear Grade 3 with basis of the operation is still positive for the tumor mass. Patients lost follow-up and did not continue therapy.

Conclusion. Morphology of metaplastic breast carcinoma are important factors influencing patient outcome. Early diagnosis and wide local excision of the squamous-type metaplastic breast carcinoma mass can make a better prognosis.

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Introduction

Metaplastic breast carcinoma (MBC) is a heterogeneous group of invasive breast carcinomas (IBCs).¹ MBC was first described as a mammary carcinoma with mixed epithelial and sarcomatoid components by Huvos et al in 1973.² MBC is characterized by variable portion of the glandular epithelial cells comprising the tumor have undergone transformation into alternate cell types, either a non-glandular epithelial cell type (e.g., squamous cell) or a mesenchymal cell type (e.g., spindle cell, chondroid, osseous, and myoid).

Metaplastic carcinoma accounts for 0.25% to 1% of annual breast malignancies diagnoses. Clinical and radiographic characteristics are not specific, and tumors are usually estrogen receptor (ER)-, progesterone receptor (PR)-, and human epidermal growth factor receptor 2 (HER2)-negative (Triple Negative).³

MBC is commonly diagnosed in women >50 years of age. Young age of patient with mostly high-grade tumors, larger tumor size and higher rates of lymph node metastasis. Patients 60 years of age or older at diagnosis were found to have an increased disease free survival. Treatment for metaplastic breast carcinoma is relatively unknown because of the rarity of the disease, but studies suggest that the removal of the tumor and adjuvant radiation therapy has the greatest impact. In this paper, we report a case of metaplastic breast carcinoma with squamous differentiation in young female (20 years old).

Case Report

A 20-years old female patient had a 6 months history of left breast mass, with no family history of cancer, no lesions on the skin and no lumps in the axillary lymph nodes. Imaging information is not available. Physical examination revealed a malignant tumor with a palpable mass sized 4x3x3 cm. She underwent mastectomy; the specimen was submitted for histopathology examination.

On gross examination, the mastectomy measured 10x9x8 cm, with cystic area diameter 4 cm. On microscopic examination, the tumor mass consists of tumor cells with insular and trabecular structures, some have squamous cell differentiation (30%), with polygonal cell shapes, keratinized masses appear (figure 1a, 1b, 1c, 1d). Mitosis found 33/10Hp. Also seen are large cells with bizzare nuclei (figure 1e, 1f) and ductal carcinoma in situ grade 3 (Groups of tumor masses with an intact basement membrane and a central portion of necrotizing comedones; figure 1g).

The connective tissue between the tumors appears mostly extensive necrosis, filled with inflammatory cells of lymphocytes and histiocytes, accompanied by dilatation and engorgement of blood vessels. Tumor cells invasion to mature fat tissue, connective tissue and basis of operation. No invasion to lymphovascular structure (figure 1h). After the results of the anatomical pathology came out, the patient did not continue further examination and did not continue therapy.

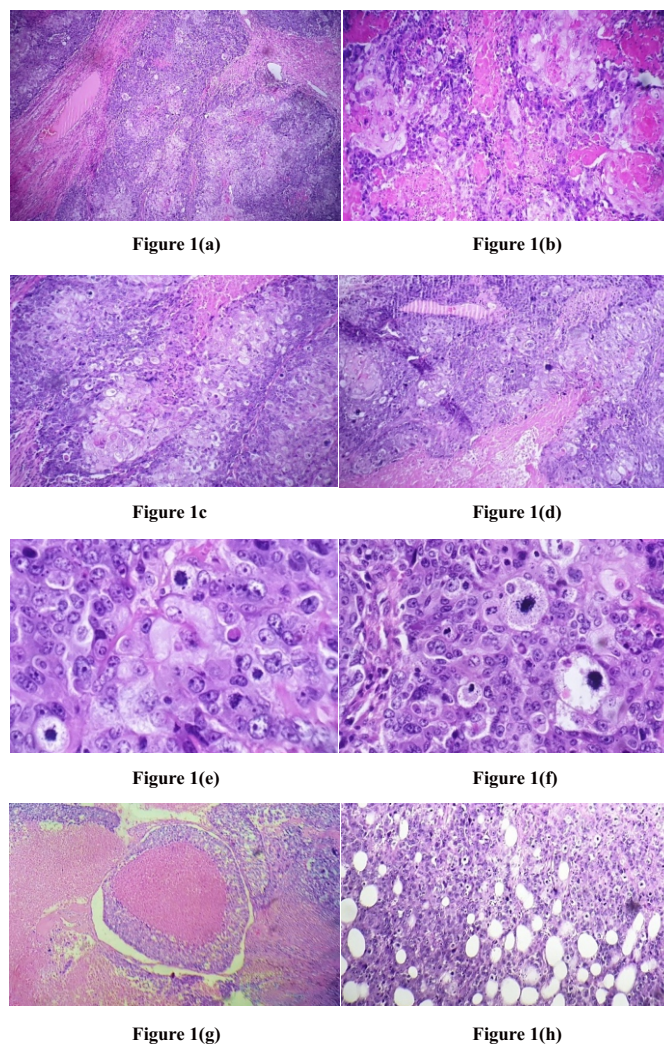


Figure 1. Photomicrographs of a metaplastic breast carcinoma with squamous differentiation. (a,b,c,d) Low magnification showing a solid trabecular and insular tumor exhibiting keratin pearls and infiltrating the desmoplastic stroma (H&E, x40). (e,f) High magnification shows nests of cohesive, large polygonal cells with eosinophilic cytoplasm, and large nuclei with prominent nucleoli (H&E, x200). (g) Ductal carcinoma in situ grade 3 with comedo necrosis (H&E, x40). (h) Tumor cells invasion to mature fat tissue (HE, x40).

Discussion

Metaplastic breast carcinoma is a rare entity. It is categorized under 3 categories: first, metaplastic carcinoma of no specific type that includes low-grade adenosquamous carcinoma, squamous cell carcinoma, spindle cell carcinoma, and fibromatous-like metaplastic carcinoma; second, metaplastic carcinoma with mesenchymal differentiation that includes chondroid differentiation, osseous differentiation, and other types; and third, the mixed type. In this case, we diagnosed as mixed type cause microscopic feature consist invasive ductal carcinoma and squamous differentiation (30%). When the squamous cell component (SCC) predominates by more than 90%, they are pure squamous cell carcinoma and tend to be

more aggressive and treatment refractory.³ For confirmation of a diagnosis of primary SCC of the breast, the following three criteria must be fulfilled: absence of an associated primary SCC in a second site, the absence of skin involvement, and a clear predominance (>90%) of areas with SCC at histologic examination.⁴ Depending on the cellular behavior, it can be either low-grade tumors (low-grade adenosquamous carcinoma or low-grade spindle cell carcinoma) or high-grade tumors (high-grade squamous cell or high-grade spindle cell).

There are different hypotheses to explain the histogenesis of squamous cell carcinoma of the breast. It may arise de novo from epithelium lining of the breast or present as a small foci in preexisting adenocarcinoma or deep-seated epidermal cyst.⁵ Some authors suggest that it originates from squamous metaplasia which is found in the epithelium of the cyst, fibroadenomas, phyllodes tumors, or papillomas or chronic abscess whereas others believe that it arises from myoepithelial cells.⁶

These tumors have unique pathological features, as their glandular component may be partially or totally replaced by a nonglandular component(s), which may differentiate along squamous, spindle, chondroid, and other lineages. In this case report, it can be seen that the glandular component has changed to become squamous by 30%. The most common histopathological subtypes are squamous cell carcinoma and metaplastic carcinoma with mesenchymal differentiation.⁷

Since MBC are very uncommon, there are no separate recommendations regarding therapy. Consequently, MBC management is the same as the treatment of ductal cancer. The standard regimen involves surgery combined with adjuvant therapy. There are no definite evidence-based data on the efficacy of radiotherapy. In view of poor or absent expression of steroid receptors, hormone therapy is of marginal importance as a treatment option.⁷

Lower degree of estrogen and progesterone receptor expression, and HER2 expression, and higher Ki-67 and p-53 scores compared to ductal cancers. Genetic profiling shows deregulation of BRCA1, PTEN and TOP2A pathways (molecular targets of doxorubicin), which may account for the lower proclivity of MBC for forming metastases in the lymph nodes, resistance to chemotherapy and, possibly, sensitivity to radiotherapy.⁸

The incidence of lymph nodal metastases from metaplastic carcinoma is lower than the usual infiltrating duct carcinoma, as was seen in our case. Purely spindle/sarcomatoid tumors have a significantly lower rate of nodal metastases than conventional ductal and lobular carcinomas.⁹

The MBC patients presented with a larger tumor size, more distant metastases at the first diagnosis, higher histologic grade, fewer estrogen receptor (ER), and progesterone receptor (PR) positivity, and higher Ki-67 expression, compared to the invasive ductal carcinoma group (IDC). MBC patients also experienced more disease recurrence and poorer overall survival compared to triple negative-IDC patients, as reflected by aggressive pathological features.^{10,11} Patients with metaplastic breast cancer, especially those who are young, may be good candidates for innovative therapeutic regimens.

Conclusion

In conclusion, metaplastic breast carcinoma is a rare, aggressive, and poor prognosis. Morphology of metaplastic breast carcinoma are one of important factors influencing patient outcome. Early diagnosis and wide local excision of the squamous-type metaplastic breast carcinoma mass can make a better prognosis.

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