

Metaplastic carcinoma of breast - Review of three cases

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Abstract

Metaplastic carcinoma is a very rare type of invasive breast carcinoma, the incidence being 0.2 to 1 % of all invasive breast carcinoma. Histopathological distinctive feature of this tumor is invasive breast carcinoma with areas of metaplasia like squamous, spindle, osseous or chondroid metaplasia. The diagnosis is based on histopathological features and immunohistochemistry patterns. We present three cases of metaplastic carcinoma of breast to highlight distinctive histopathological features and immunohistochemistry profile as well as biological behaviour.

Keywords: Breast carcinoma, Invasive, Immunohistochemistry profile, Metaplastic carcinoma.

Introduction

Metaplastic carcinoma is a rare type of invasive breast cancer and was introduced in 1973 by Huvas et al as invasive breast carcinoma with mixture of epithelial and sarcomatoid component (1,2). Origin of this tumor is controversial either as a single cell line or from myoepithelial cells, as these tumors show high expression of p63 (3).

We report three rare cases of metaplastic carcinoma of breast to highlight its clinicopathological patho logical presentation with review of literature.

Case report

Case 1

A 65 years old female patient presented with rapidly increasing lump in right breast. Sono mammography revealed right breast lump measuring 4.8 x 3.1 x 2.8 cm with infiltrating borders and no areas of calcification. Chest X ray and ultrasonography of abdomen and pelvis revealed no metastatic focus.

Fine needle aspiration cytology of the lump revealed scattered spindle shaped to pleomorphic neoplastic cells with bizarre nuclei and scanty cytoplasm. The diagnosis given was malignant spindle cell tumor.

Patient underwent right modified radical mastectomy with right axillary clearance. On gross examination the tumor measured 4.5 x 4.2 x 3.8 cm. Cut section was grey white. Nine axillary lymph nodes were dissected, largest measuring 1 x 0.8 x 0.3 cm.

On microscopic examination tumor showed purely spindle shaped neoplastic cells scattered singly as well as seen in loose clusters.

Neoplastic cells showed bizarre nuclei with high mitotic activity and scanty cytoplasm. Extensive sampling did not reveal foci of invasive breast carcinoma. Two out of the nine axillary lymph nodes showed metastatic foci.

Immuno his to chemistry profile of tumor was ER, PR, Her- 2 neu, GATA 3 negative.

Tumor cells were positive for CK and P63. Considering these features diagnosis given was spindle cell carcinoma of right breast grade 3 with metastasis in two out of nine axillary lymph nodes.



Fig 1: A) Gross photograph showing grey white.

Fig 1: B) FNAC photomicrograph showing spindle shaped tumor with irregular borders neoplastic cells with bizarre nuclei (100 X Giemsa).

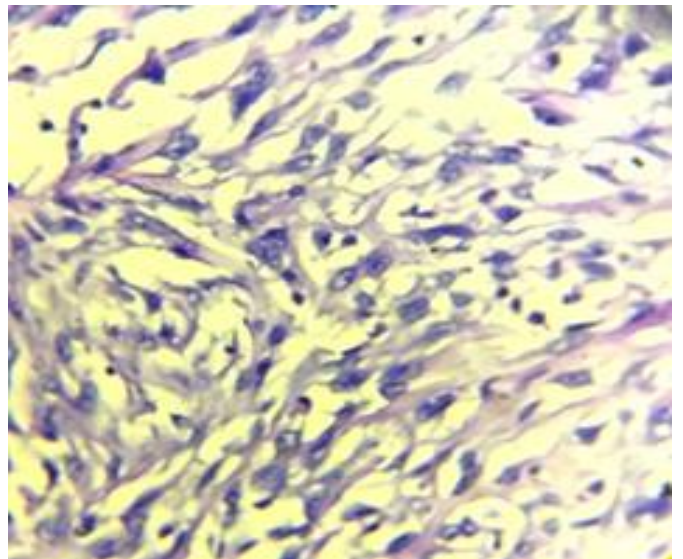


Fig 2: Histopathological features showing neoplastic spindle shaped cells with pleomorphic nuclei (400x H & E).

Case 2

A 58-year-old female patient presented with lump in left breast which was rapidly increasing in size and was painless. Sono mammography revealed a mass measuring 5 x 4 x 3.3 cm in left breast – BIRADS 4 C. On fine needle aspiration cytology tumor revealed cellular smears showing spindle shaped neoplastic cells with bizarre atypical nuclei arranged in sheets with osteoclastic giant cells.

X- ray chest and ultrasonography of abdomen did not reveal metastatic foci. Left modified radical mastectomy was done with left axillary clearance. Gross examination of tumor revealed 6.5 x 6 x 5 cm mass in upper inner quadrant, cut section of which was grey white and variegated showing areas of hemorrhage, tumor necrosis and cystic degeneration. Microscopy from tumor tissue showed features of invasive breast carcinoma with differentiation of epithelial component into mesenchymal elements. Carcinomatous component was ductal carcinoma insitu showing solid, come do and cribriform pattern. Mesenchymal component was in the form of spindle shaped neoplastic cells arranged in loose clusters showing marked nuclear atypia. Few areas revealed osteoid and chondroid differentiation. All the axillary lymph nodes were free from tumor. Immuno his to chemistry profile of tumor was ER, PR and Her 2 neu negative and tumor cells were positive for CK, CK 7. The diagnosis offered was metaplastic carcinoma of left breast with mesenchymal differentiation.

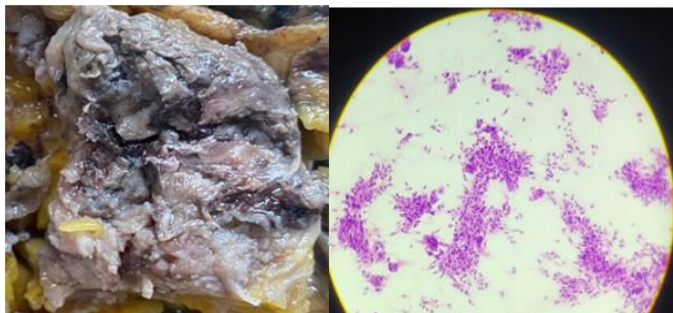


Fig 3: Gross examination shows grey white.

Fig 4: FNAC – neoplastic cells with tumor with hemorrhage and tumor necrosis. Bizarre atypical nuclei and osteoclastic giant cells (100 X Leishman)

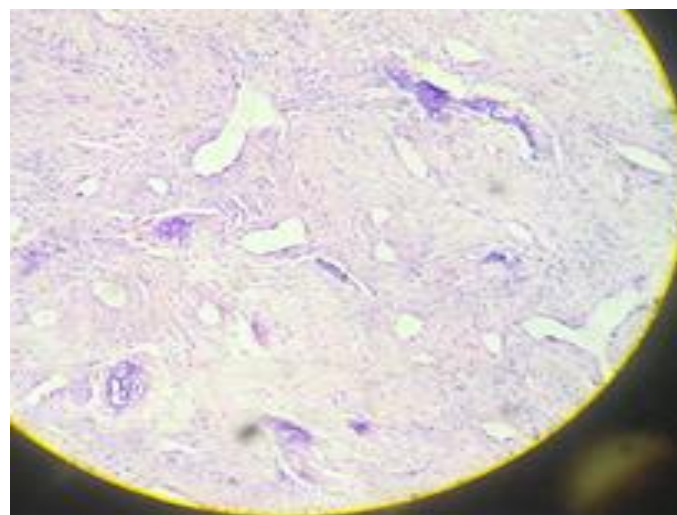


Fig 5: Microscopy showing osteoid and chondroid differentiation along with neoplastic spindle cells (100 x H & E)

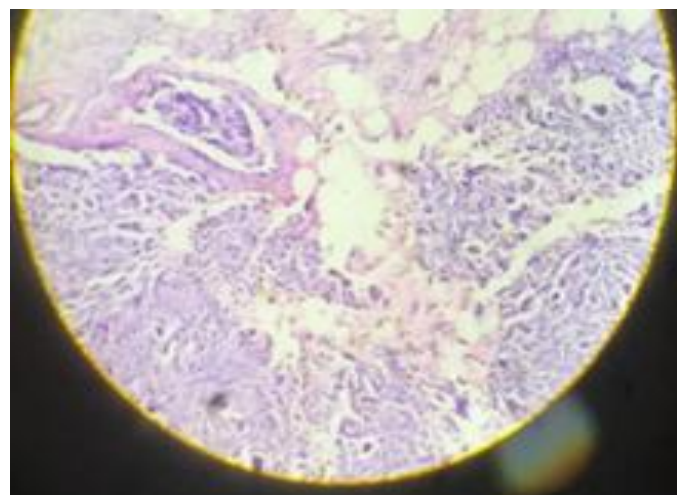


Fig 6: Microscopy showing Invasive Ductal Carcinoma and tumor emboli (100 x H & E).

Case 3

A 35-year-old female presented with lump in left breast since 4 months. Sono mammography revealed a lesion measuring 1.9 x 1.1 cm having macro lobulations, angulations and spiculations at places – BIRADS 4 C. Chest X- ray and ultrasonography of abdomen and pelvis were within normal limits.

Fine needle aspiration cytology of the lump revealed large neoplastic cells having round pleomorphic nuclei with coarse chromatin, indistinct nucleoli and scant to

moderate amount of eosinophilic cytoplasm. At places bizarre morphology of neoplastic cells and tumor giant cells were seen. Diagnosis offered was high grade malignancy.

Patient underwent wide excision of left breast lump with left axillary clearance. On gross examination the tumor measured 2.4 x 2.3 x 1.1 cm. Cut section was grey white. 13 axillary lymph nodes were dissected, largest measuring 1 x 0.5 x 0.2 cm.

Immuno his to chemistry profile of tumor was ER, PR, Her 2 neu, GATA3, PAX 8 negative. Tumor cells were positive for CK, CK 7 (focal). SOX 10, mammaglobin and Ki 67 was 75 %.

Considering these features diagnosis of metaplastic carcinoma, biphasic – epithelial and sarcomatoid, grade 3 with extensive tumor necrosis and tumor emboli with no metastasis to axillary lymph nodes was given.



Fig 7: Wide excision showing grey white tumor.

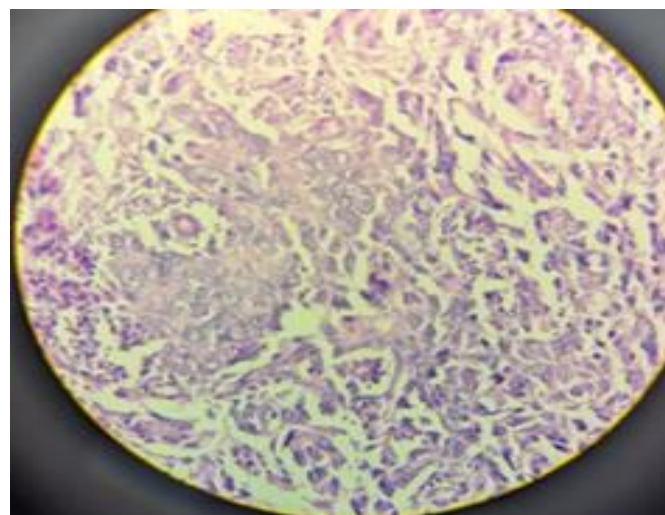


Fig 8: Microscopy showing spindle shaped to pleomorphic neoplastic cells with atypical nuclei admixed with infiltrating duct carcinoma (100 X H & E).

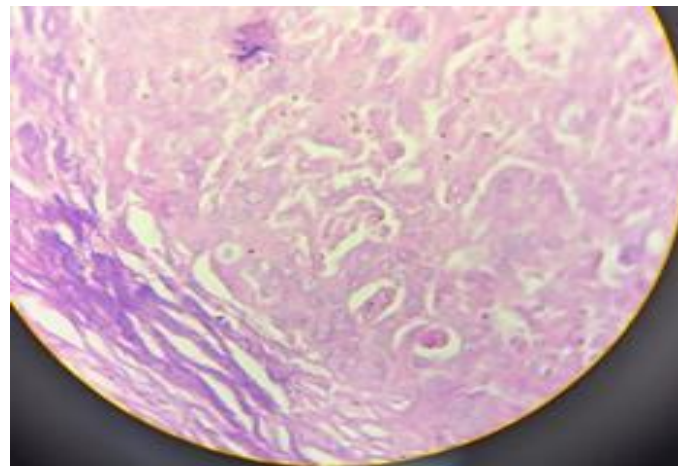


Fig 9: Microscopy showing epithelial component in the form of tubules and nests (100 x H & E)

Discussion

Metaplastic carcinoma is a term used for invasive breast carcinoma which shows differentiation towards epithelial component into non glandular elements like squamous differentiation or mesenchymal differentiation. WHO 2012 has classified metaplastic carcinoma of breast as a special type of breast carcinoma which includes following categories (4,5).

1. Metaplastic carcinoma with mesenchymal elements (chondroid, osseous and other mesenchymal

differentiation). Mesenchymal component may appear relatively well differentiated or shows sarcomatous counterpart. There may be gradual transition from carcinomatous to mesenchymal component or separation is abrupt.

2. Spindle cell carcinoma – it is composed of atypical spindle cells. It is a very rare variant of metaplastic carcinoma forming 0.1 % of invasive breast cancers. These tumors reveal pure or 4hiopdominant population of spindle cells with other elements like ductal carcinoma, squamous or sarcomatoid component (6,7).

3. Fibromatosis like metaplastic carcinoma – these tumors show bland spindle cells with little or no cytologic atypia.

4. Metaplastic carcinoma with osteoclastic giant cells – In these tumors osteoclast like giant cells are seen in the stroma of invasive breast carcinoma and lacks mesenchymal differentiation.

5. Squamous cell carcinoma – These tumors represent squamous metaplasia with invasive breast carcinoma.

6. Low grade Aden squamous carcinoma – It is a well differentiated tumor with dual glandular and squamous differentiation.

Differential diagnosis for metaplastic carcinoma of breast includes

1. Fibromatosis which reveal positivity for vimentin, B – catenin and negative expression for P63 and high molecular weight CK (6,8).

2. Nodular fasciitis which reveals positive immuno stain for SMA and vimentin (9).

3. Malignant phyllode tumor, primary low-grade sarcoma and myoepithelial carcinoma include in differential diagnosis of pure spindle cell carcinoma (5,10).

Immunohistochemistry plays important role in diagnosis of metaplastic breast carcinoma. These tumors are ER, PR, Her 2 neu negative. Positive immuno stain are high molecular weight cytokeratin, CK 5/6 and P63. P63 is a specific marker for epithelial cell proliferation. Myo epithelial markers are SMA and CD 10 (8). Common age of presentation of this tumor is average 55 years. These tumors present with large size, micro calcifications are uncommon in spindle cell carcinoma. Similar findings were noted in our case (3).

Meta plastic carcinoma of breast spreads by Hema to logical route rather than lymphatic spread. Out of three cases in our study only one revealed axillary metastasis. Radiological studies does not reveal characteristic findings for definitive diagnosis of this tumor and his to patho logical examination with immuno his to chemistry is needed for diagnosis.

Survival is less in metaplastic carcinoma compared to invasive ductal carcinoma of breast and other triple negative breast cancers (11,12).

Conclusion

Metaplastic carcinoma is a rare type of invasive breast carcinoma. The diagnosis, treatment and outcome of the tumor are very challenging. Definitive diagnosis depends on histopathological examination with immuno his to chemistry.

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