Case Report

DOI: 10.21276/APALM.2559

Metaplastic Carcinoma of the Breast- A report of two cases

Keerthini Ganesan*, Sandhya Sundaram and Leena Dennis Joseph

Department of Pathology, Sri Ramachandra Institute of Higher Education and Research, Porur, Chennai, Tamil Nadu, India\

ABSTRACT

Metaplastic carcinoma of the breast is a rare tumor which accounts for less than 1% of all the primary breast malignancies. It commonly occurs in women more than 50 years of age and are usually triple negative tumors with basal like subtype. Metaplastic carcinomas of breast have a very aggressive behaviour resulting in worse prognosis and a dismal disease free survival. However most metaplastic carcinomas express EGFR, therefore early and correct diagnosis benefits the patient to receive anti-EGFR drugs like cetuximab and geftinib. We are reporting two cases of metaplastic carcinomas, one with spindle cell differentiation and the other with squamous differentiation.

Keywords: *Breast, Metaplastic Carcinoma, Heterogenous Malignancy, Triple Negative Tumors.*

Introduction

Metaplastic carcinoma, accounting for less than 1% of all invasive breast cancers(1), includes a heterogenous group of neoplasms characterized by squamous differentiation or mesenchymal differentiation which includes spindle, osseous, chondroid and rhabdomyoid cells or mixture of both(2). They are usually triple negative tumors with a very aggressive behaviour. Therefore early and prompt diagnosis helps in proper and correct treatment planning. Here, we are reporting two cases of metaplastic carcinoma of the breast, one with spindle cell differentiation and the other with squamous differentiation.

Case Report

Case 1: 32 year old woman of reproductive age group presented with complaints of breast lump for 6 months which was initially small with sudden rapid increase in size. On clinical examination the lump was fixed to the pectoralis muscle. Mammogram showed Breast Imaging Reporting and Data System (BI-RADS) 4B lesion measuring 19.5 cm in greatest dimension involving all quadrants of the breast. Mastectomy specimen showed an infiltarive, firm, grey-yellow to grey-brown lesion measuring 18x17x10 cm. Histological examination showed a infiltrative spindle cell lesion composed of pleomorphic spindle cells arranged in long fascicles with indistinct cell borders and elongated irregular vesicular nuclei(Fig1, Fig2). There were numerous atypical mitotic figures. Focal areas also showed clusters of cells with epitheloid morphology(Fig 3). By immunohistochemistry, both the components were positive for Cytokeratin (Fig 4). 4 out of the 22 lymph nodes examined showed metastatic tumor deposits. A diagnosis of metaplastic carcinoma with epithelial and mesenchymal differentiation was made.

Case 2: A 61 year old post menopausal woman presented with complaints of painful breast lump for 4 months. On clinical examination the lump was firm, freely mobile and located in the central quadrant. Mammogram showed Breast Imaging Reporting and Data System (BI-RADS) 4A lesion measuring 4.1 cm in greatest dimension in the central quadrant. Mastectomy specimen showed a circumscribed, soft to firm lesion measuring 3.8x2.5x2 cm with solid and cystic areas with grey brown friable areas within the cyst. Histological examination showed nests and sheets of atypical squamous cell with distinct intercellular bridges (Fig 5), abundant eosinophilic cytoplasm, round to oval vesicular nuclei and prominent nucleoli (Fig 6). Immunohistochemistry for p63 showed nuclear positivity in the tumor cells (Fig 7). 21 lymph nodes were examined, none involved. A diagnosis of metaplastic carcinoma with squamous differentiation was given.

Discussion

Metaplastic carcinoma of breast represents 0.2% to 1% of all invasive breast cancers and contains both glandular and nonglandular patterns with epithelial and/or mesenchymal components.

It most commonly presents as a palpable mass in the breast affecting women older than 50 years and are characterized by large tumor size and rapid growth(3).

The World Health Organization classifies metaplastic carcinoma of breast into the following histological variants(4):

This work is licensed under the Creative Commons Attribution 4.0 License. Published by Pacific Group of e-Journals (PaGe)

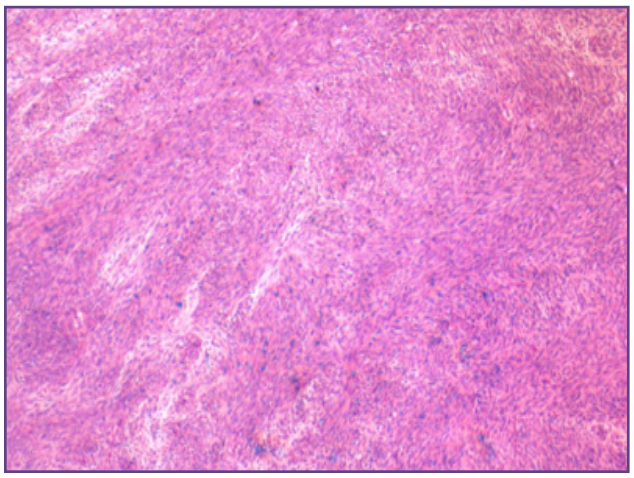

Fig. 1 : Mesenchymal component composed of spindle cells arreanged in fascicles (H & E, 40x).

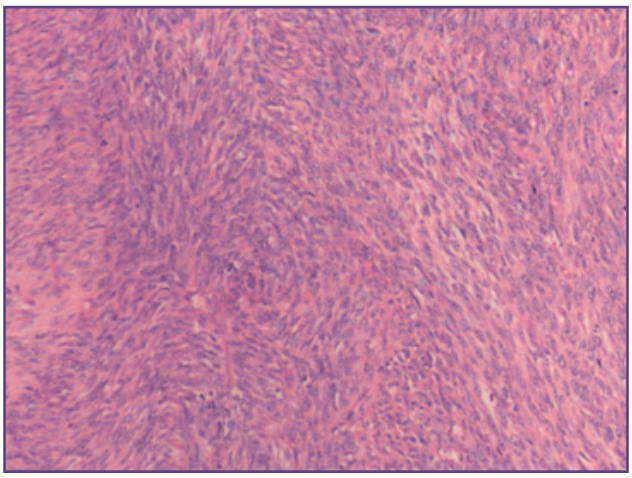

Fig. 2: Herring-bone pattern of spindle cells with elongated spindle shaped vesicular nuclei. (H & E, 200x).

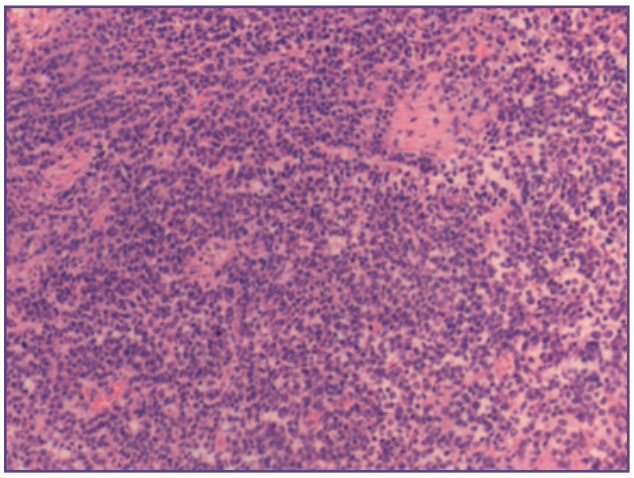

Fig. 3: Focal cell clusters with epitheloid morphology with round to oval nuclei. (H & E, 200x).

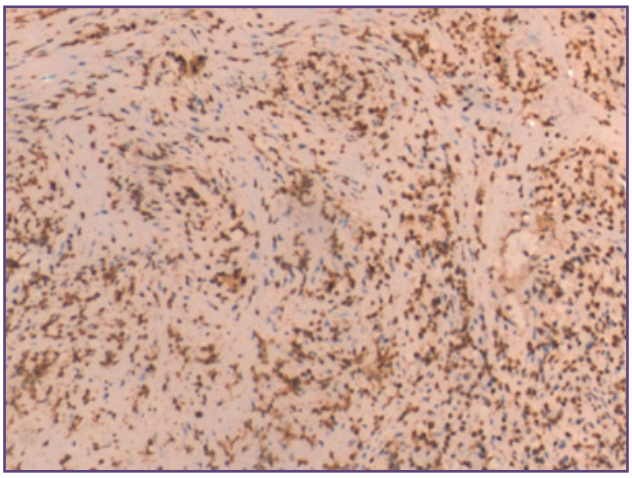

Fig. 4: Immunohistochemical stain for cytokeratin showing positivity in the spindle cell component, 200x.

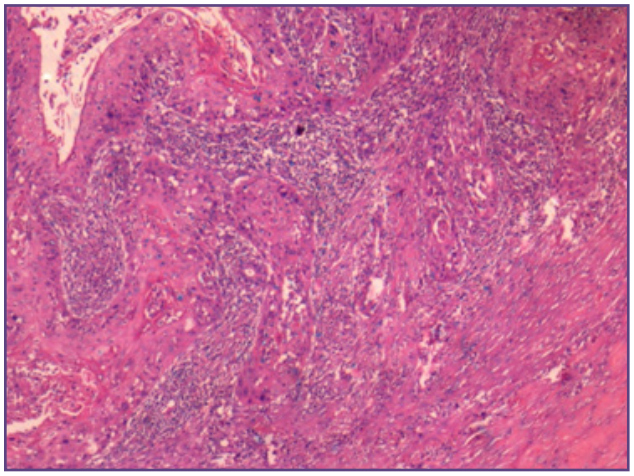

Fig. 5: Tumor showing squamous differentiation (H & E, 40x)

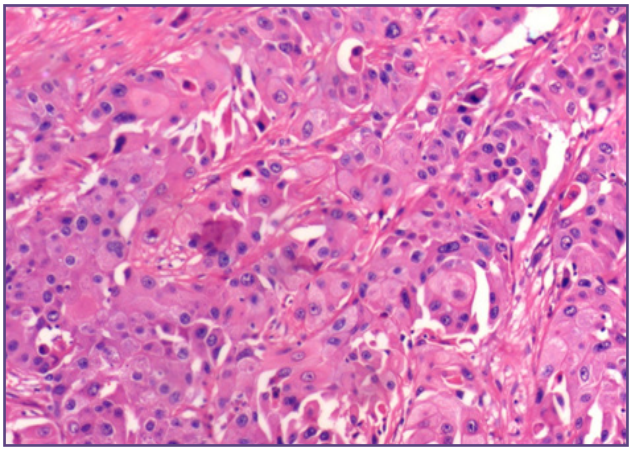

Fig. 6: Neoplastic cells arranged in sheets showing distinct cell border with abundant cytoplasm and round to oval nucleus and prominent nycleoli. (H & E, 200x)

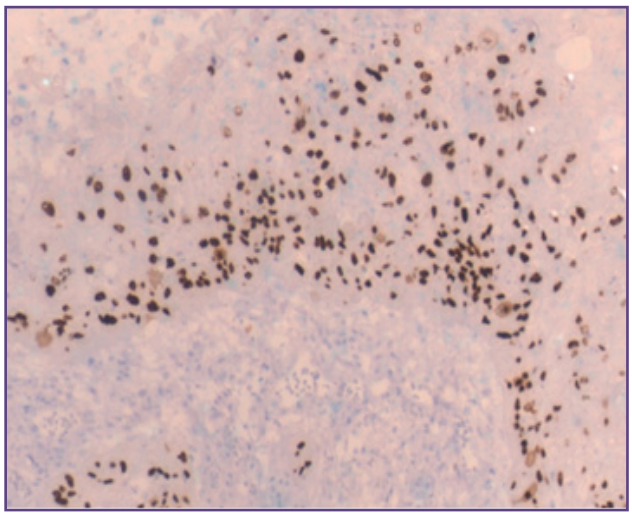

Fig. 7: Immunohistochemistry for p63 showing nuclear positivity in the tumor cells. 200x.

1. Squamous cell carcinoma
2. Spindle cell carcinoma
3. Adenosquamous carcinoma
4. Fibromatosis-like
5. Metaplastic carcinoma with mesenchymal differentiation
6. Mixed metaplastic carcinoma

Grossly, these tumors have a varied appearance – from well circumscribed to indistinct or irregular border. Cystic areas are usually seen in squamous cell carcinoma. Generally the metaplastic carcinomas tend to be of larger size when compared to invasive carcinomas, NST.

Each variant has a specific histological picture. Adenosquamous carcinoma shows a well developed glands admixed with squamous cells arranged in solid nests and in cords. Squamous component may contain squamous pearls or cyst formation. Squamous cell carcinoma which usually presents as a cystic lesion shows neoplastic cells arranged in sheets, nests or cords infiltrating in to the stroma. Spindle cell carcinomas are characterised by spindle cells with atypia arranged in fascicles or herring bone or storiform pattern. Metaplastic carcinoma with mesenchymal elements can contain chondroid, rhabdomyoid, osseous or neuroglial components admixed with carcinomatous areas.

More than 90% of these cancers are negative for estrogen receptor(ER), progesterone receptor(PR) and HER2(5). However the epithelial component express CK5/6 and p63.

The most common mutation is found in p53 followed by loss of CDKN2A and overexpression and amplification of EGFR (6)characterized by the presence of neoplastic cells showing differentiation towards squamous epithelium and/or mesenchymal elements. Here we sought to define whether histologically distinct subgroups of MBCs would be underpinned by distinct genomic and/or transcriptomic alterations. Microarray-based copy number profiling identified limited but significant differences between the distinct MBC subtypes studied here, despite the limited sample size (n = 17. Less commonly mutations of PIK3CA and Wnt signalling pathway occur.

The differential diagnosis includes phyllodes tumor, adenomyoepithelioma, myoepithelial carcinoma and fibromatosis.

Conclusion

Metaplastic carcinomas of the breast are rare but aggressive malignancies. Early diagnosis is very important as these tumors over-express EGFR and can benefit from anti-EGFR therapies.

References

1. Cooper R, Rajak R, Valentine K, Bhargava V. Metaplastic carcinoma of the breast. Diagnostic Histopathol. 2018;24(2):83–5.
2. Tse GM, Tan PH, Putti TC, Lui PCW, Chaiwun B, Law BKB. Metaplastic carcinoma of the breast: a clinicopathological review. J Clin Pathol. 2006 Oct 1;59(10):1079–83.
3. Böler DE, Kara H, Sağlıcan Y, Tokat F, Uras C. Metaplastic carcinoma of the breast: A case series and review of the literature. J Oncol Sci. Elsevier; 2016 Aug 1;2(2–3):38–42.
4. WHO Classification of tumors of the breast, 2012. 2012. p. 2–63.
5. Iqbal B, Kumar H, Kambale T, Baravkar A. Triple-negative metaplastic breast carcinoma with extensive squamous differentiation in a 55-year-old woman: A rare entity. Clin Cancer Investig J. Medknow Publications and Media Pvt. Ltd.; 2017;6(4):194.
6. Piscuoglio S, Ng CKY, Geyer FC, Burke KA, Cowell CF, Martelotto LG, et al. Genomic and transcriptomic heterogeneity in metaplastic carcinomas of the breast. NPJ breast cancer. Nature Publishing Group; 2017;3:48.

***Corresponding author:**
Dr G. Keerthini, 18A/43, Altius Apartments, Flat 1B, Venkatesapuram Colony, South street, Ayanavaram, Chennai-600023, Tamil Nadu, India
Phone: +91 9952057927
Email: keerthiniganesan@yahoo.com

Financial or other Competing Interests: None.