

# Metaplastic carcinoma of the breast in a young female – an unusual presentation

## Abstract

Metaplastic breast carcinoma is very rare neoplasm which contains mixture of carcinomatous and sarcomatous elements in variable proportion. We report a rare case of metaplastic carcinoma in a 34year old female, who presented with an ill-defined mass in the right breast. Fine needle aspirate smears showed pleomorphic ductal cells admixed with atypical spindle cells. Modified radical mastectomy was performed and the tumor characteristically revealed definite areas of classic infiltrating duct carcinoma and focal areas of leiomyosarcoma with giant tumor cells. Tumour cells were immunoreactive for Vimentin, ER, PR and Her2/neu. Careful gross sampling, histopathology and immunoreactivity for mesenchymal and epithelial component are most useful to differentiate metaplastic carcinoma from malignant phylloides tumors and malignant adenomyoepithelioma.

**Keywords:** breast, met plastic carcinoma, histopathology, Immunohistochemistry

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## Introduction

Metaplastic carcinoma of the breast is a rare heterogenous malignant tumor comprising of ductal, squamous and/or mesenchymal tissues. It is generally characterized by a mixture of intraductal or infiltrating carcinoma and foci of carcinoma with extensive metaplastic differentiation to squamous, spindle cells and heterologous mesenchymal elements.<sup>1</sup>

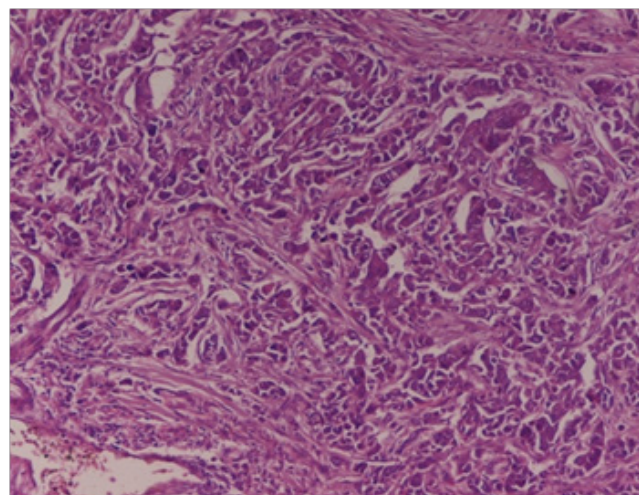
Metaplastic carcinoma of the breast accounts for 0.2% of all breast cancers.<sup>2</sup> Varied forms of metaplastic carcinomas are sarcomatoid carcinoma or carcinosarcoma, spindle cell carcinoma, carcinoma with osteoclast like giant cells and squamous cell carcinoma. We report this case because of its rarity and diagnostic dilemma, if the tumor is composed predominantly of sarcomatous components.

## Case summary

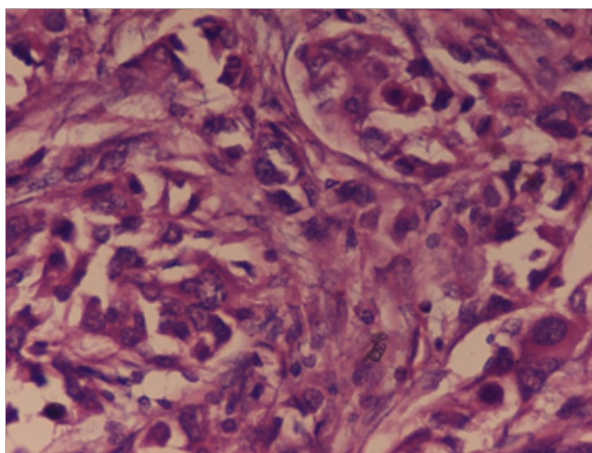
A female aged 34 years presented to the Surgical Clinics with ulcerated mass in the right breast for 5 months. On examination, a breast mass of 9x8cm in size was seen in the right upper quadrant, with an overlying ulceration on the skin surface. The swelling was hard in consistency, with well-defined margins and fixed to the underlying tissue and the skin. Multiple enlarged mobile lymph nodes were noted in the right axilla. General and systemic examination of the patient were normal. A clinical diagnosis of breast malignancy was made.

Fine needle aspiration cytology of the mass was performed, which revealed cohesive clusters of pleomorphic ductal cells with marked anisonucleosis and hyperchromatic nuclei with indistinct nucleoli. A cytological diagnosis suggestive of breast carcinoma was given. The patient underwent simple mastectomy with axillary lymph node dissection. Gross examination of specimen revealed a greyish white, irregular, hard growth of 4x2cm in the upper outer quadrant of the breast. Microscopic examination of the sections from the growth showed atypical tumor cells in nests and cords and singly arranged with areas of tumor cells depicting sarcomatous morphology

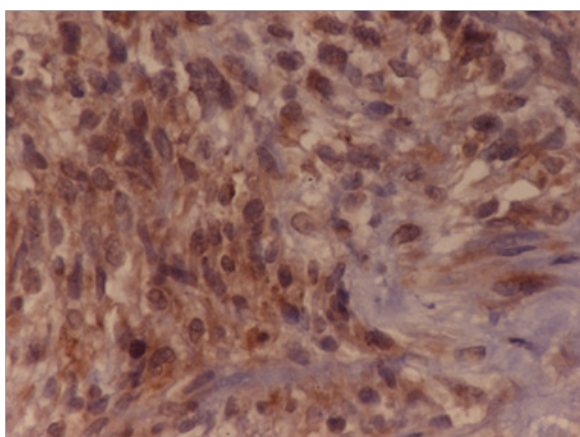
resembling malignant fibrous histiocytoma with scattered mononuclear and bizarre tumor cells (Figures 1), (Figure 2). Many abnormal mitosis were also seen with extensive areas of necrosis and moderate desmoplasia. On immunohistochemistry, the tumor cells were immunoreactive for Vimentin (Figure 3), ER, PR and Her2/neu. The adjoining breast tissue showed fibrocystic change. All surgical resection margins, nipple and areola and sampled lymph nodes were not involved by the tumor cells. Based on the immune-histological features, a diagnosis of Metaplastic Carcinoma with high grade spindle cell component was given. Adjuvant 6 cycles of taxane based chemotherapy was administered. Our patient died after 12 months of follow up.



**Figure 1** The atypical tumor cells formed nests and cords with areas of tumor cells depicting sarcomatous morphology resembling malignant fibrous histiocytoma with scattered mononuclear and bizarre tumor. Hematoxylin and Eosin x 10X.



**Figure 2** High power of Figure 1.



**Figure 3** On immunohistochemistry, the tumour cells showed cytoplasmic immunoreactivity for Vimentin. IHC Vimentin x40X.

## Discussion

Metaplastic carcinoma is an uncommon tumor of the breast, which consists of infiltrating ductal carcinoma contiguous or subtly merged with highly cellular, mitotically active pleomorphic and bizarre spindle cells.<sup>3,4</sup> Metaplastic breast carcinoma is very rare neoplasm of high-grade nature.

Breast carcinomas showing extensive metaplastic change to squamous cells, spindle cells and heterologous mesenchymal elements are well recognized.<sup>5,6</sup> The diagnosis of metaplastic carcinoma is difficult to establish, by clinicopathological examination.<sup>2</sup> However, in most tumors, small foci of infiltrating ductal carcinoma are present with transition to metaplastic elements. Our case showed varying proportions of carcinomatous and pseudosarcomatous elements in a desmoplastic stroma. The usual sarcoma like elements may resemble malignant fibrous histiocytoma, chondrosarcoma, osteosarcoma, rhabdomyosarcoma or a combination of these.<sup>4</sup> In the present case, the sarcomatous element resembled malignant fibrous histiocytoma with presence of bizarre giant cells; very similar to the findings of Bilgen et al.<sup>7</sup>

Most metaplastic carcinomas are sporadic. But metaplastic spindle

cell carcinoma are known to arise from pre-existing lesions, including papillomas and complex sclerosing adenomas.<sup>8,9</sup> Metaplastic or spindle cell carcinomas arising from such lesions can show a varying degree of malignancy, ranging from low to high grade.<sup>10</sup> This type of lesion should also be differentiated from the so-called reactive spindle cell nodule, which is believed to be benign and may also complicate pre-existing lesions such as papillomas or complex sclerosing lesions.<sup>11</sup>

Metaplastic carcinoma is probably derived from myoepithelial cells. These myoepithelial cells have the propensity to differentiate into epithelial as well as mesenchymal elements.<sup>5</sup> The incidence of lymph nodal metastasis from metaplastic carcinoma is lower than the usual infiltrating duct carcinoma, as was seen in our case. Purely spindle/sarcomatoid tumors have significant lower rate of nodal metastasis than conventional ductal and lobular carcinomas.<sup>6</sup> The reported case differs from the previous case reports by Joshi et al, is that it did not show any malignant squamous differentiation.<sup>2</sup>

An aggressive course has been seen in metaplastic carcinomas-sarcomatoid type as compared to the matrix producing metaplastic carcinomas, which have a favourable course.<sup>12</sup> Most metaplastic carcinomas are negative for ER and PR & HER2/neu and are managed by radical mastectomy followed by radiation and chemotherapy.<sup>12</sup> Our patient was administered 6 cycles of taxane based adjuvant chemotherapy, but she died after 12 months of follow up.

Immunohistochemistry plays a major role in the evaluation of tumors that lack clear cut evidence of carcinoma. The sarcoma like elements of these tumors are usually vimentin and S-100 positive, but occasional focal cytokeratin positive epithelial tumor cells may be seen.<sup>13,14</sup> The combined use of AE1/AE3 and CAM5.2 shows a higher sensitivity than each marker alone.<sup>15</sup>

The presence of biphasic tumor cells; atypical spindle cells admixed with poorly differentiated carcinoma cells and squamous carcinoma cells with giant cells may provide clues for the fine needle aspiration diagnosis of metaplastic carcinomas.<sup>2</sup> When a pathologist encounters a breast tumor with sarcomatous differentiation, careful gross sampling, histopathology and immunoreactivity for mesenchymal and epithelial component should be performed to differentiate metaplastic carcinoma from malignant phyllodes tumors and malignant adenomyoepithelioma.<sup>4</sup>

## Acknowledgements

None.

## Conflict of interest

The author declares no conflict of interest.

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