TUMOUR RECURRENCE OF METAPLASTIC SPINDLE CELL CARCINOMA BREAST

Rashi Vaish, Nishi Tandon, Andleeb Zehra, Akanksha Sharma, Mohd Ibrahim, Nirupma Lal

Department of Pathology

Era's Lucknow Medical College and Hospital, Era University, Sarfarazganj, Hardoi Road, Lucknow, U.P. India-226003

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Address for correspondence

Dr. Rashi Vaish
Department of Pathology
Era's Lucknow Medical College and Hospital, Era University, India-226003
Email: rashi.vaish@gmail.com
Contact no: +91-8303619062

ABSTRACT

Metaplastic carcinomas are malignant tumours of breast in which there is differentiation of epithelial components into non-glandular elements such as spindle cell, squamous, osseous and chondroid features. A 50-year-old woman presented with a complaint of a lump in her left breast, measuring 12 × 6 × 5 cm. She is a follow up case of left mastectomy which was done 1.5 years back followed by 6 cycles of adjuvant chemotherapy in view of carcinoma breast. Ultrasonography showed well defined lobulated heteroechoic space occupying lesion with significant internal vascularity in left chest wall likely BIRADS IV/V. Fine needle aspiration cytology showed Recurrence of malignant mesenchymal neoplasm with following differentials- Malignant phylloides tumour and metaplastic carcinoma.Excision and removal was done under general anaesthesia.The specimen was sent to the pathology department for histopathological analysis, which confirmed a diagnosis of recurrent metaplastic spindle cell carcinoma of the breast.

KEYWORDS: Tumour recurrence, Metaplastic, Breast, Spindle cell, Mastectomy.

INTRODUCTION

Metaplastic breast carcinoma is a rare and highly aggressive form of breast cancer, accounting for just 0.2–0.5% of all cases. It is associated with the poorest prognosis among breast cancer subtypes and plays a significant role in breast cancer-related mortality worldwide (1).Histologically, this subtype is characterized by the coexistence of multiple cellular components, typically involving epithelial and mesenchymal elements (2). Due to its rarity and aggressive behaviour, fully elucidating the molecular and genetic characteristics of this disease has been challenging. Metaplastic carcinomas are characterized by the presence of cell populations undergoing metaplastic differentiation in which glandular cells transform into non-glandular forms (3).These changes often involve carcinomatous features, such as squamous differentiation, as well as sarcomatous elements like spindle cell, chondroid, and osseous components (1).Additionally, these tumors show a higher propensity for both local and distant recurrence and display greater aggressiveness compared to invasive ductal carcinoma, even when adjusted for factors such as age, grade, and tumor stage (4).

Spindle cell carcinoma, an aggressive subtype of metaplastic carcinoma, is characterized by spindle-shaped cells exhibiting moderate to severe atypia.It is often associated with regions of necrosis and elevated mitotic activity. This variant can exhibit diverse architectural arrangements, with cells often forming wavy, interwoven, overlapping fascicular, or irregular "patternless" structures. While focal squamous differentiation may occur, it is not consistently observed (5)(6).

CASE REPORT

A 50-year-old woman visited Surgery OPD at Era's Lucknow Medical College and Hospital with a lump in the left breast, measuring 12 x 6 x 5 cm.The lump was hard and she complained of pain in the lump occationally.There was no history of nipple discharge or any change in the colour of breast.On general examination,CNS- Patient was conscious,oriented to time place person.GCS was 15/15 and all higher functions were normal, CVS- S1S2 present, RS- Bilateral air entry present, Per abdomen- Abdomen was distended,umbilicus in midline,inverted,no scars,sinuses,fistulas,no dilated veins,all quadrants move equally on respiration,She is a follow up case of left mastectomy which was done 1.5 years back followed by 6 cycles of adjuvant chemotherapy in

view of carcinoma breast. Ultrasonography showed well defined lobulated heteroechoic space occupying lesion with significant internal vascularity in left chest wall likely BIRADS IV/V. Fine needle aspiration cytology showed Recurrence of malignant mesenchymal neoplasm with following differentials- Malignant phylloides tumour and Metaplastic carcinoma.Excision and removal was done under general anesthesia and sample was forwarded to the pathology department for histopathological examination.

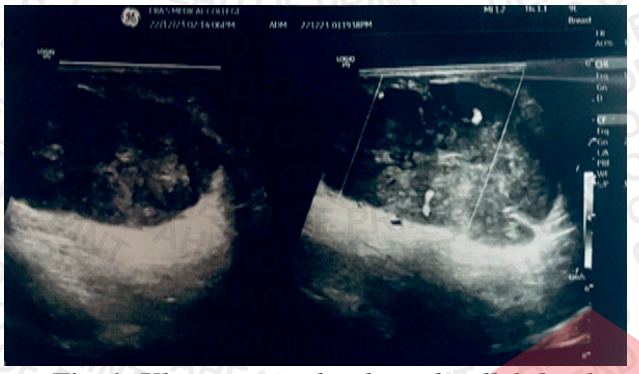

Fig. 1: Ultrasonography showed well defined lobulated heteroechoic space occupying lesion with significant internal vascularity in left chest wall likely BIRADS IV/V.

PATHOLOGICAL FINDINGS

Gross- Received a yellowish white tissue piece partially covered with skin measuring 15x10x5 cm. Overlying skin ellipse separately measures 14.5x2.5 cm. Outer surface is gray white to gray brown and smooth with attached fat. Cut surface shows gray-brown to gray-black solid and hemorrhagic areas.(Representative Sections Taken)

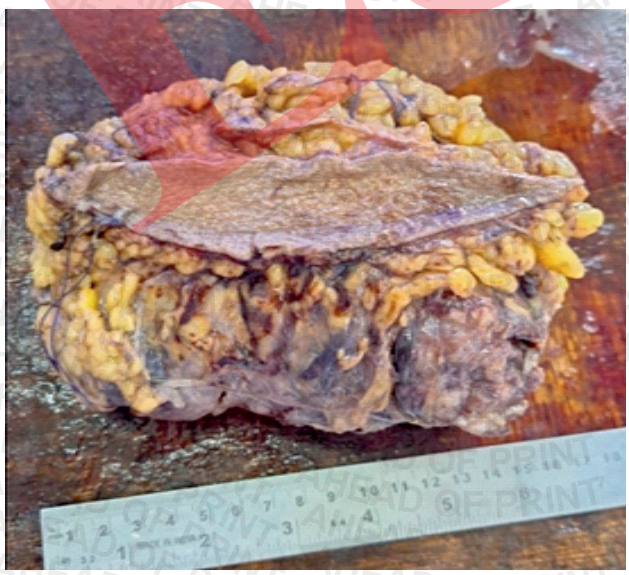

Fig. 2: Outer surface of the Breast with skin Ellipse

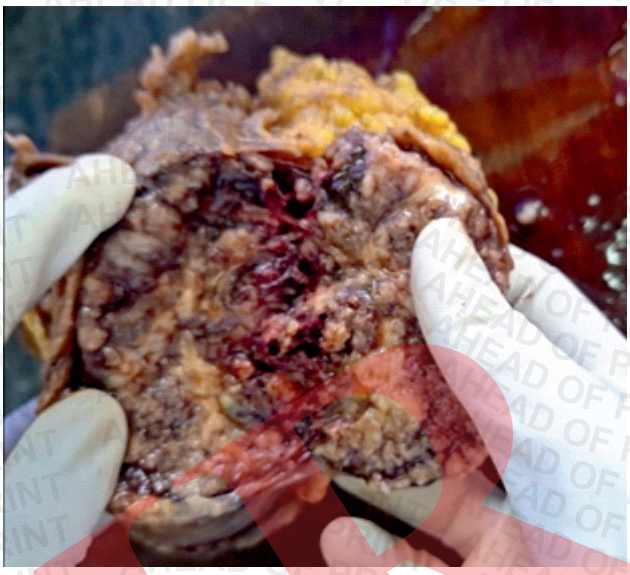

Fig. 3: Cut surface of the Breast Showing Solid and Hemorrhagic Areas.

MICROSCOPY

The tissue section reveals an invasive tumor consisting of atypical spindle cells arranged in a storiform pattern.These atypical cells have high nuclear cytoplasmic ratio, prominent nuclear pleomorphism, open chromatin, plump, elongated and amphophilic cytoplasm. Areas of necrosis and hemorrhage are also seen. The section includes skin with both epidermal and dermal layers; the epidermis is covered by stratified squamous epithelium, while the dermis contains mild chronic inflammatory infiltrates composed of lymphocytes and plasma cells. All surgical margins are involved. Immunohistochemical evaluation shows that the tumor is ER and PR negative but Her2/neu positive.

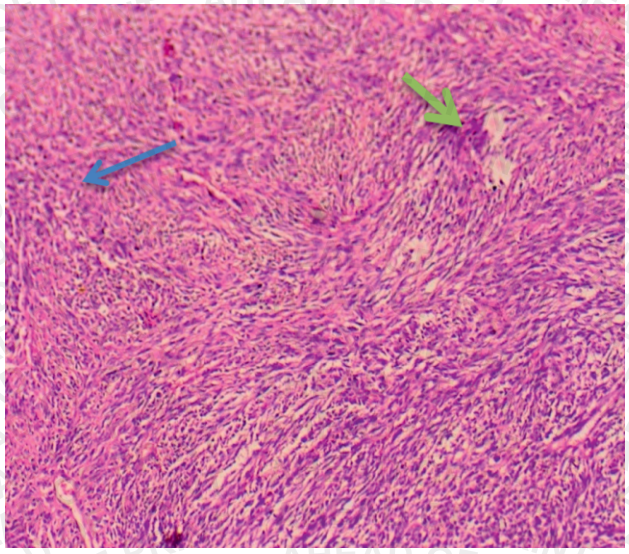

Fig. 4: Malignant Neoplasm with Pleomorphic oval to spindle shaped Nuclei (black arrow)(100x)

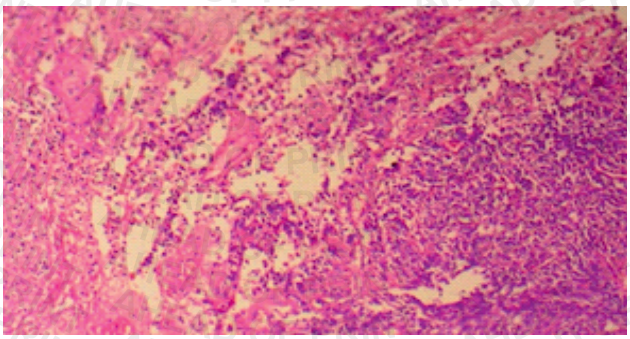

Fig. 5: Atypical spindle cells with hemorrhage (green arrow) and necrosis (blue arrow) (100x)

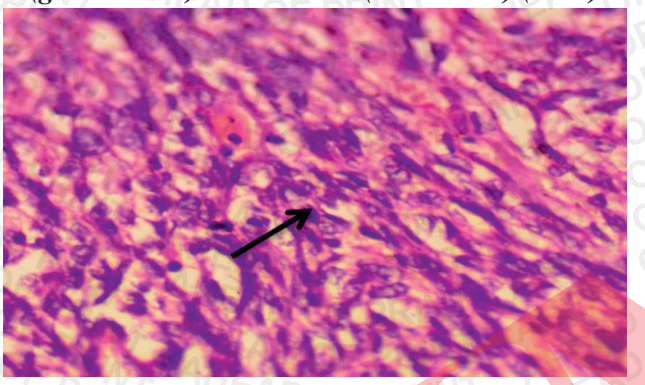

Fig. 6: Malignant Neoplasm with Pleomorphic oval to spindle shaped Nuclei (black arrow) (400x)

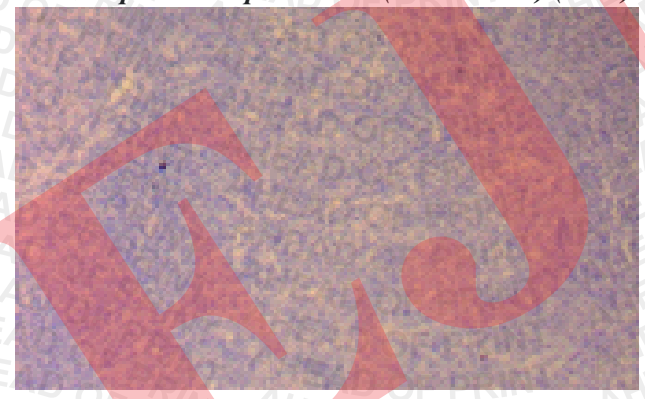

Fig. 7: **ER Negative(100x)**

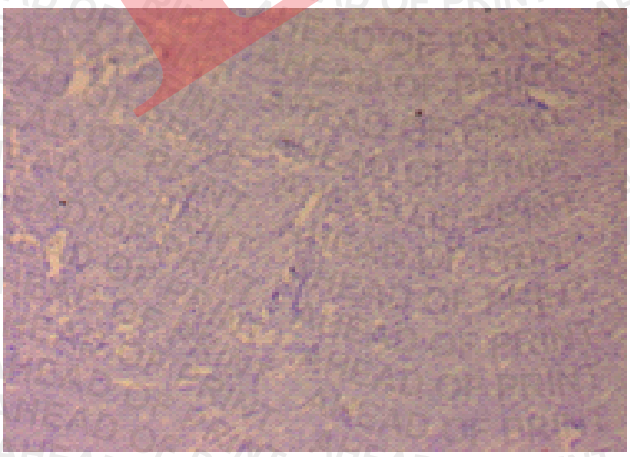

Fig. 8: **PR Negative (100x)**

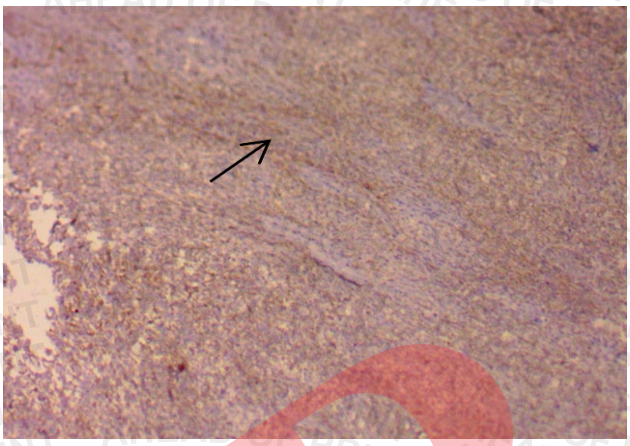

Fig. 9: **Her 2/neu Positive (Black Arrow (100X)**

FINDING

Histomorphology is suggestive of tumour recurrence (metaplastic spindle cell carcinoma- left breast).

DISCUSSION

Metaplastic breast cancer is a rare and aggressive tumor with the worst prognosis among breast cancer subtypes. Spindle cell carcinoma is considered an exceptionally aggressive variant of metaplastic carcinoma. The differential diagnosis includes phyllodes tumor, fibromatosis-like metaplastic carcinoma as well as primary and metastatic sarcomas (7).

Immunohistochemical staining is pivotal in confirming the diagnosis (5,8). Spindle cell carcinoma has highly aggressive behaviour and poorer prognosis. Its distinctive histopathological features, particularly the spindle cell morphology, are associated with higher recurrence rates. A study by Rakha et al. (2017) underscores that the diverse cellular composition and elevated mitotic activity in spindle cell carcinoma correlate with increased tumor aggressiveness and recurrence risk (9). The molecular landscape of spindle cell carcinoma often includes mutations in genes related to cell proliferation and survival, such as TP53, PIK3CA, and PTEN. These genetic abnormalities drive tumor development and contribute to treatment resistance. Research by Weigelt et al. (2014) highlighted that these mutations in spindle cell carcinoma are linked to its poor therapeutic response and higher recurrence rates (10).

MSCC often displays a biphasic pattern comprising both epithelial and mesenchymal elements, which can make diagnosis challenging. Immunohistochemical staining is crucial, with markers such as cytokeratin, vimentin, and p63 aiding in distinguishing MSCC from other spindle cell lesions. (Jung et al. (2020)) emphasized the importance of comprehensive histological evaluation and immunohistochemistry in accurate diagnosis(11). Achieving clear surgical margins during tumor resection is

critical in preventing local recurrence. However, the infiltrative growth pattern of MSC makes it challenging to obtain clean margins. Chen et al. (2016) observed that incomplete removal of the tumor is a major contributor to local recurrence in patients with MSC. This emphasizes the necessity of employing meticulous surgical methods and potentially integrating adjuvant therapies to address any remaining microscopic disease (12). Factors influencing the likelihood of recurrence in metaplastic spindle cell carcinoma (MSC) include lymph node involvement, tumour size and histological grade. Rayson et al. (2020) noted that larger tumours and higher histological grades are linked to an elevated risk of recurrence. Moreover, lymph node involvement serves as a key indicator of distant metastasis and overall patient survival (13).

CONCLUSION

Metaplastic breast cancer is an uncommon and highly invasive malignancy characterized by a significant risk of recurrence. Even with comprehensive treatment, such as mastectomy and adjuvant chemotherapy, recurrence poses a significant challenge in managing this disease. Accurate diagnosis relies on detailed histopathological evaluation supported by immunohistochemical analysis to differentiate it from other spindle cell lesions. Ensuring negative surgical margins and establishing rigorous follow-up strategies are crucial in reducing recurrence rates. Advancing our knowledge of the molecular and genetic features of metaplastic breast cancer, along with the creation of targeted therapies, is essential for enhancing patient outcomes and reducing mortality rates.

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Orcid ID:
Rashi Vaish - https://orcid.org/0009-0001-4192-5320
Nishi Tandon - https://orcid.org/0000-0002-3710-2743
Andleeb Zehra - https://orcid.org/0000-0002-7547-0360
Akanksha Sharma - https://orcid.org/0009-0004-0497-3587
Mohd Ibrahim - https://orcid.org/0009-0001-9860-9476
Nirupma Lal - https://orcid.org/0000-0001-9615-5426

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