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Matrix-producing metaplastic breast carcinoma – a rare malignancy

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Patient: Female, 33
Final Diagnosis: Matrix-producing metaplastic breast carcinoma
Symptoms: —
Medication: —
Clinical Procedure: Operative
Specialty: Oncology

Objective: Rare disease
Background: Metaplastic breast carcinomas are ductal carcinomas that undergo metaplasia into non-glandular growth patterns. They are very rare, accounting for less than 1% of all invasive breast carcinomas.
Case Report: A 33-year-old female patient presented with a lump in her left breast. Axillary lymph nodes were not palpable. FNAC of the lump was positive for malignant cells. The patient underwent modified radical mastectomy with axillary clearance. The histopathological report was matrix-producing carcinoma with infiltrating duct carcinoma. The tumor was positive for immunohistochemical markers keratin, EMA (Epithelial Membrane Antigen), and S100, thus confirming it to be matrix-producing carcinoma breast. After surgery, the patient recovered uneventfully.
Conclusions: Matrix-producing breast carcinoma is a rare type of metaplastic carcinoma characterized by a ductal carcinomatous element with direct extension to areas showing cartilaginous or osseous differentiation, lacking an interspersed spindle cell component. It has better prognosis than metaplastic carcinoma. Immunohistochemically, they are positive for keratin, EMA (Epithelial Membrane Antigen), and S100. The tumor, which is matrix-producing, is S100 reactive and nonreactive for cytokeratin. They are usually ER- and PR-negative. The average age of these patients is approximately 58 years. Surgery remains the mainstay of therapy, using either mastectomy or local excision.

Key words: matrix producing • breast carcinoma • metaplastic

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Background

Metaplastic breast carcinomas are ductal carcinomas that undergo metaplasia into non-glandular growth patterns. They are very rare, accounting for less than 1% of all invasive mammary carcinomas. Most patients present with a rapidly enlarging palpable mass that appears on mammography as a well-defined mass [1].

Case Report

A 33-year-old female patient presented with a lump that appeared 5 months before in her left breast. On examination, a single 5×3 cm lump was palpable in the left breast in the upper outer quadrant. The lump was nontender, firm, and mobile, with skin involvement present. Axillary lymph nodes were not palpable. Systemic examination results were within normal limits, with no clinical evidence of distant metastasis. Results of hematological investigations, biochemistry profiles, and metastatic workup were normal.

FNAC of the lump was positive for malignant cells. The patient was staged as T4 N0 M0 as per the TNM classification system. The patient underwent modified radical mastectomy with axillary clearance. The histopathological report showed matrix-producing carcinoma with infiltrating duct carcinoma. The tumor was positive for the immunohistochemical markers keratin, EMA (Epithelial Membrane Antigen), and S100, thus confirming it to be matrix-producing breast carcinoma. Axillary lymph nodes were negative for malignant cells. After surgery, the patient recovered uneventfully.

Discussion

Matrix-producing breast carcinoma is a rare type of metaplastic carcinoma, characterized by a ductal carcinomatous element with direct extension to areas showing cartilaginous or osseous differentiation, and lacking an interspersed spindle cell component. It has better prognosis than metaplastic carcinoma [2].

Matrix-producing carcinoma accounts for less than 1% of all neoplastic breast lesions. Their presentation and mammographic appearance is similar to invasive mammary carcinomas. They are firm-to-hard, nodular, and circumscribed. Immunohistochemically, they are positive for keratin, EMA (epithelial membrane antigen), and S100. Matrix-producing tumors are S100 reactive and nonreactive for cytokeratin [1]. They are usually ER- and PR-negative [2].

Approximately 70–80% of metaplastic breast carcinomas over-express the epidermal growth factor receptor (EGFR), about

Figure 1. Matrix producing metaplastic breast carcinoma with infiltrating duct carcinoma breast (Stain: Hematoxylin and Eosin [H and E], magnification: 10×).

Figure 2. Matrix producing metaplastic breast carcinoma at high magnification (Stain: Hematoxylin and Eosin [H and E], magnification: 40×).

28% harbor EGFR amplification, and they lack estrogen receptor. Therefore, some patients might benefit from novel therapies targeting EGFR, such as EGFR tyrosine kinase inhibitors [3].

The average patient age is 58 years. Surgery remains the mainstay of therapy, either mastectomy or local excision [4]. Axillary lymph node metastasis varies from 6% to 25%. The 5-year survival rate for patients following mastectomy is 70% and for local excision it is 50% [4]. The overall 5-year survival rate for metaplastic breast carcinoma is 38% to 65%. Radiotherapy and chemotherapy are of limited effectiveness [4]. They have better 5-year survival rate and less frequent nodal metastasis [2].

Conclusions

Poor prognostic factors include large tumors, nodal metastasis, poorly differentiated tumors, diffuse cellularity of the stromal matrix, and atypical cartilaginous metaplasia [1,4]. The prognosis of metaplastic breast carcinoma is worse than the same stage no special type (NST) breast carcinoma [5].

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