

Metaplastic Carcinoma and Invasive Lobular Carcinoma of Breast: Rare Collision Tumor of Breast With Review of Recent Literature

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Abstract- Collision tumors are type of tumors where two histologically distinct type of tumors occur at the same anatomic location. Breast collision tumors comprising carcinoma and lymphoma or invasive ductal carcinoma with invasive lobular carcinoma are relatively common. However, a collision tumor between metaplastic breast carcinoma (MBC) and invasive lobular carcinoma (ILC) is extremely rare. Here, we report a case of collision tumor in breast comprising MBC and ILC. A 60-year-old female patient presented in outdoor department with palpable painless firm mass in left breast. FNAC diagnosis of class V smears was made. Wide local excision was done and specimen sent for frozen section analysis. On frozen section, diagnosis of malignant neoplasm was made and suspicion of malignant phyllodes and MBC was raised. All margins were reported free as free of the tumor. Further sectioning revealed another tumor, 0.1 cm away from main tumor. Sections from this tumor showed a malignant neoplasm arranged in cords with tumor cells having eccentric nuclei and moderate amount of cytoplasm. Immunohistochemical (IHC) analysis showed spindle cell tumor with profile favoring MBC while IHC analysis of second tumor was consistent with the diagnosis of ILC. Final diagnosis of collision tumor was made.

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Introduction

Breast cancer is the most frequent cancer in women and is one of the leading causes of tumor related mortality (1). Collision tumors are type of tumors where two histologically distinct type of tumors occur at the same anatomic location. They can be tumors originating in the same organ or between metastases from other sites. Collision tumors are reported in various sites and most of these collisions are between carcinoma with sarcoma or lymphoma (2). Breast collision tumors comprising carcinoma and lymphoma or invasive ductal carcinoma with invasive lobular carcinoma are relatively common (3,4). However, a collision tumor between metaplastic breast carcinoma (MBC) and invasive lobular carcinoma (ILC) is extremely rare (5). Here, we report a case of collision tumor in breast comprising MBC and ILC.

Case Report

A 60-year-old female patient presented in outdoor department with palpable painless firm mass in left breast. A clinical differential diagnosis of fibroepithelial lesion versus carcinoma was made. Radiological studies were inconclusive. FNAC of the mass was done which showed singly scattered and clusters of atypical cells with high N/C ratio. Mucin like material was noted in the background. Diagnosis of class V smears was made, while suspicion of mucinous carcinoma was raised. Wide local excision was planned with request of frozen section for margin status and diagnosis of the lesion. We received a wide local excision specimen of left breast (13 x 10.5 x 4.6 cm) with tan brown unremarkable ellipse of skin (10.2 x 7.5 cm) (Figure 1A). Cut section revealed a white mass (5.5 x 3.5 x 2.5 cm) with infiltrative margins and a central area of haemorrhage (Figure 1B). Grossly the tumor was 2.2 cm away from the closest resection margin.

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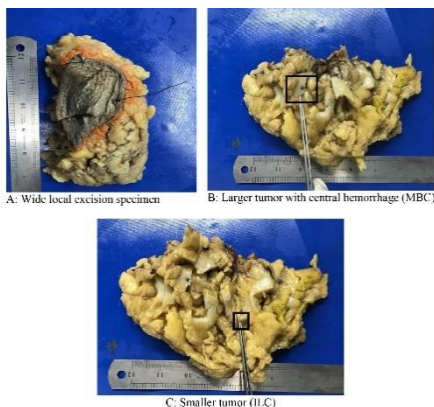


Figure 1. Gross examination

Touch imprints of tumor were made and two representative sections were submitted for histopathological evaluation. Touch imprints showed singly scattered atypical cells (Figure 2A) with enlarged nuclei. Few atypical spindle shaped cells were evident

(Figure 2B), while few singly scattered cells with eccentrically placed nuclei and intracytoplasmic mucin were seen (Figure 2C). A few loosely cohesive clusters of atypical epithelial cells were seen (Figure 2D).

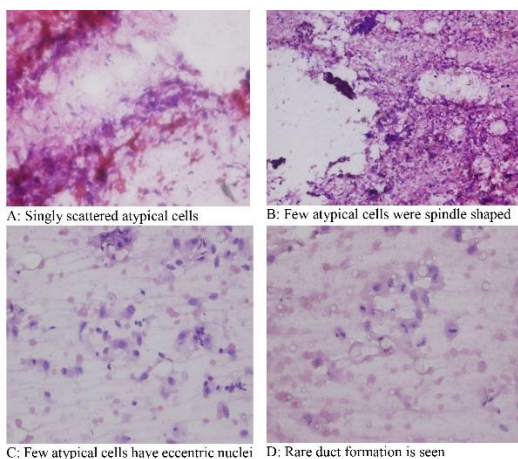


Figure 2. Touch imprints

Sections from the tumor taken for frozen section analysis showed a neoplasm predominantly arranged in sheets and whorling pattern (Figure 3A). Increased mitotic activity was noted. Few ducts lined by cells showing irregular membranes and high N/C ratio were

also seen. On frozen section, a diagnosis of malignant neoplasm was made and suspicion of malignant phyllodes and MBC was raised. All margins were reported free as free of the tumor.

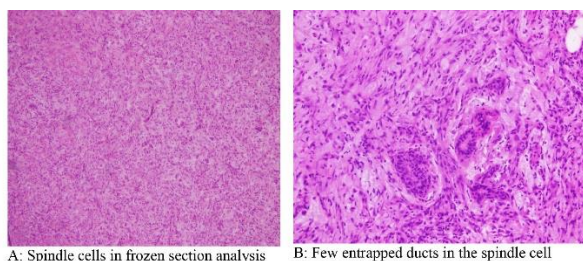


Figure 3. Frozen section

Axillary dissection was performed. After formalin fixation, additional sections were taken from the tumor and normal breast. After careful gross inspection, another small mass (1.7 x 1.5 x 1.1cm) was noted in the breast 0.1 cm superficial to the main tumor (Figure 1C). Sections from this mass along with intervening area were also submitted for histopathologic evaluation. Histological examination of the sections from the larger main tumor revealed predominantly atypical spindle cells arranged in whorls and fascicles (Figure 4A and 4B) with tumor cells infiltrating into adjacent breast parenchyma and adipose tissue. The neoplastic cells show moderate to marked nuclear pleomorphism, eosinophilic cytoplasm and high N/C ratio. Entrapped breast ducts showing ductal hyperplasia were also noted.

At some places tumor was arranged in duct like structures. The stroma was extensively desmoplastic and at places showed myxoid change. Sections from the smaller mass revealed a tumor with cells arranged in trabeculae, cords and Indian filing pattern (Figure 4C). The neoplastic cells had eccentric pleomorphic nuclei and moderate amount of eosinophilic cytoplasm. Extensive areas of lobular carcinoma in situ were seen (Figure 4D). Intervening area between two tumors revealed fat and benign breast tissue (Figure 4E). Sections from normal breast showed a few dilated ducts filled with papillary proliferation (Intraductal papilloma, Figure 4F). Areas of adenosis and apocrine change were also seen.

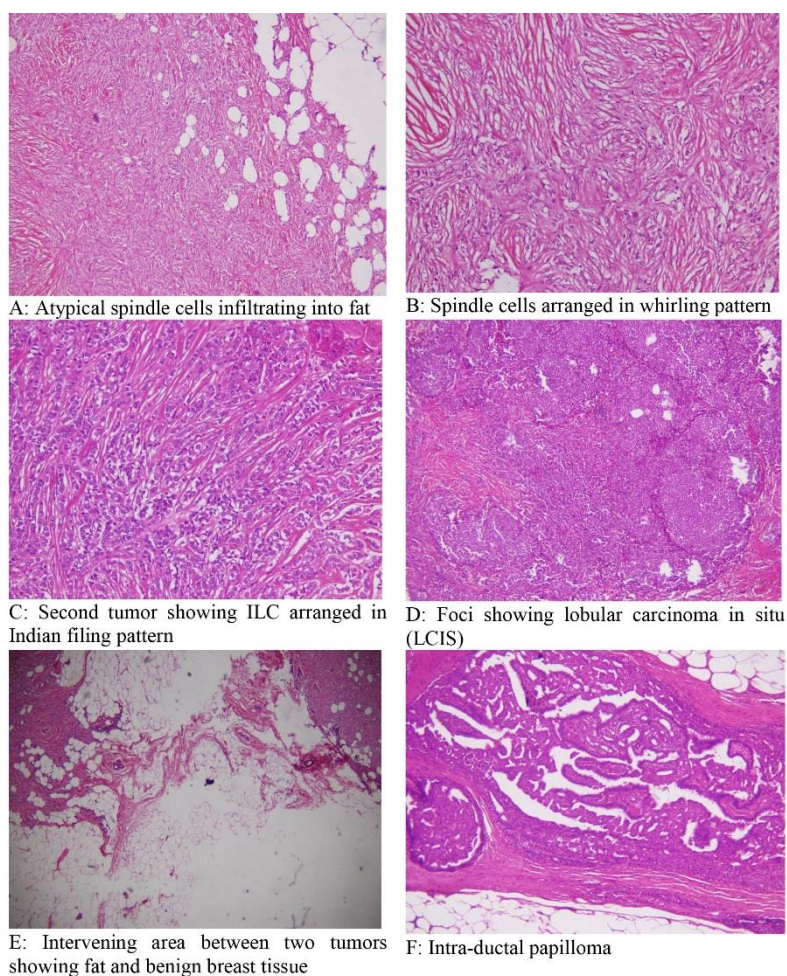


Figure 4. Permanent sections

Immunohistochemical analysis of the main tumor showed tumor cells positive for CK AE1/AE3, high molecular weight keratin (CK5/6), p-63 and weakly

positivity for E-cadherin. This tumor was negative for estrogen receptor (ER), progesterone receptor (PR) and Her-2. Tumor cells from smaller mass were positive for

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CK AE1/AE3 and negative for E-cadherin, p-63 and CK 5/6. This tumor was strongly positive for ER and PR

while Her-2 was negative (1+). MBC was also positive for p-53.

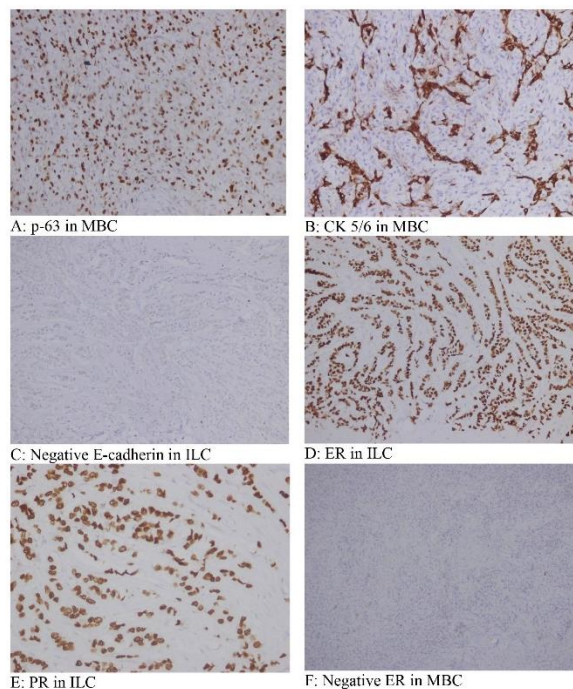


Figure 5. IHC analysis of both tumors

A final diagnosis of collision tumor comprising, MBC and ILC was made. All nine isolated lymph nodes from axillary tail were free of tumor.

Discussion

MBC is a rare subtype of breast carcinoma, first recognized in 2000 as separate entity, comprising 0.25-1% of all breast cancers. They present as rapidly increasing mass with less predilection of axillary lymph node involvement and poor response to chemotherapy. They rarely overexpress hormone receptors and HER2 and generally have basal-like immunophenotype. The WHO classifies MBC into epithelial type and a mixed type. Another classification advocated by Norris *et al.*, classifies MBC as spindle cell, squamous cell, matrix-producing, carcinosarcoma, and MCB with osteoclastic giant cells. Compared to patients with invasive ductal carcinoma (IDC), patients with MCB have worse outcomes in 5-year survival rates, ranging from 49% to 68% (6,7,8). Our case was of spindle cell variety and showed basal like features established by positivity for CK 5/6.

ILC comprises about 5-15% of total breast cancers and presents as larger tumor size and late stage.

However, these tumors have better prognosis and are generally positive for estrogen receptors (ER) and progesterone receptors (PR). Classic form of ILC is characterized by Indian filing pattern (9,10). In our case, tumor cells were arranged in Indian filing pattern and was strongly positive for ER and PR.

Collision tumors are type of tumors where two histologically distinct type of tumors occur at the same anatomic location. They can be tumors originating in the same organ or between metastases from other sites. The occurrence of these tumors in the breast is extremely rare. Most of them include IDC with ILC or IDC with lymphoma or fibroepithelial neoplasm. Majority of breast collision tumors are reported in fourth to sixth decade of life and majority are seen in females (2,3).

Most of the collision tumors reported in breast include; primary squamous cell carcinoma and invasive lobular carcinoma, inflammatory breast carcinoma and malignant phyllodes tumor, IDC and breast extra-nodal marginal zone lymphoma, chronic lymphocytic leukemia and lactating adenoma, IDC and B cell lymphoma (3,5,11,12). After extensive review of literature, we were able to find only single case report involving MBC and ILC, depicting rarity of such tumor. In that case MBC was of epithelial variety (squamous

cell carcinoma) (5). However, in our case, it comprises predominantly of spindle cell component.

Some studies have raised the possibility of association between intraductal papilloma and MBC (13). Pagnon *et al.*, reported a case of spindle cell MBC in association with intraductal papilloma (14). Our case also showed intraductal papilloma in close proximity of MBC.

Immunohistochemistry (IHC) in metaplastic component of tumor was typical of MBC showing positivity for pan-CK, CK 5/6 and p-63 while was also triple negative. ILC component was strongly positive for ER and PR while negative for p-63 and CK 5/6. This tumor was also positive for p-53, depicting its high grade nature (15).

The treatment of collision tumors lack standardization. The prognosis of these collision tumors depends on the histopathologic subtype and pathologic stage of the more aggressive tumor component. Chemotherapy is the only systemic treatment available for triple negative breast cancer (TNBC) (11). The treatment options for ILC are multimodal including hormonal therapy, chemotherapy and targeted therapy. In our case, the aggressive component was MBC, which is triple negative, ousting hormonal therapy as treatment option.

We suggest that standardized treatment options should be tailored for such collision tumors. Multimodal treatment option including surgery along with chemotherapy and radiotherapy should be considered.

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