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CASE REPORT

Carcinosarcoma of Breast- A Diagnostic Challenge

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Abstract

Carcinosarcoma of the breast is a rare malignancy with two distinct cell lines described as a breast carcinoma of ductal type with a sarcomatous component. We present a rare case of a 34-year young female with a lump in left breast and contralateral axillary lymphadenopathy which on FNAC was reported to be a poorly differentiated malignant epithelial tumor with metastatic deposits in lymph node. On histopathology was diagnosed Carcinosarcoma and immunohistochemistry clinched the diagnosis.

Key Words

Carcinosarcoma, Metaplastic, Sarcoma

Introduction

Metaplastic breast carcinoma (MBC) a.k.a carcinosarcoma was not formerly recognized as a distinct pathologic entity until 2000 when it was classified by World Health Organization (WHO).

However, despite its increased recognition the reported incidence of this specific histologic subtype still remains less than 1% of all breast malignancies.[1] MBC when compared to invasive ductal carcinoma of breast shows more aggressive biological parameters and have high histological grade which drives a more aggressive treatment. Rate of mastectomy are higher due to large tumor size at the time of presentation despite having a lower incidence of axillary lymph node involvement. These tumors are typically negative for ER, PR, Her2neu (triple negative) and hence carry a poorer prognosis due to lack of hormonal therapy. We present a rare case of a 34 year young female who presented with a lump in left breast and contralateral axillary lymphadenopathy and discuss the clinic-pathological features.

Case Report

A 34-year-old woman presented with a complaint of a lump in the left breast of 3 months duration. During this time period, the mass gradually increased in size. The patient's past medical history showed no significant surgical history and her family history was not significant for malignancies in any first-degree relatives. On physical examination, an irregular shaped mass, firm on palpation, measuring 2 x 2 cm was found in the upper outer quadrant of the left breast. Bilateral axillary examination revealed left sided axillary lymphadenopathy measuring 1.5 x 1.5 cm in the past 1 week. Subsequent mammography and ultrasound examination of the left breast revealed a hyperdense 1.6 × 1.5 × 1.1 cm mass, with ill-defined and angulated borders, assessed as a BIRADS category 4c. FNAC was done and reported as Malignant Epithelial tumor- Poorly differentiated with metastatic deposits in lymph node.

The patient underwent left sided mastectomy with left sided axillary lymph node dissection. The histopathology revealed Carcinosarcoma consisting of Grade 3 epithelial component along with high grade mesenchymal component. Sections showed multinucleated tumor giant cells.

Epithelial areas with a ductal nature were determined to be of histologic grade III with a total score of 9 (according

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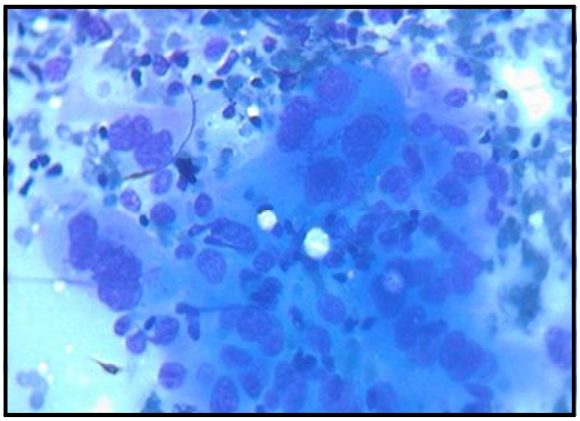

Fig-1. 40x view- FNAC Breast showing cellular smear consisting of cells with high nucleus to cytoplasmic ratio, hyperchromatic, prominent nucleoli, irregular nuclear membrane

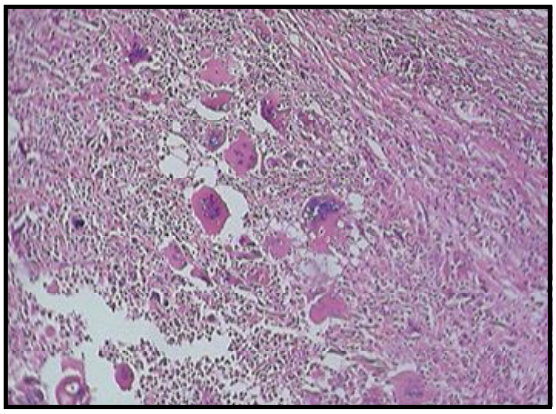

Fig -2-10X view: Histopathology showed multinucleated tumor giant cells, malignant epithelial cells in with high nucleus to cytoplasmic ratio, hyperchromatic, prominent nucleoli, irregular nuclear membrane.

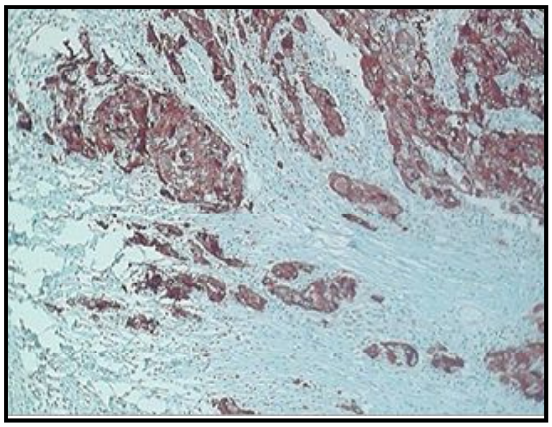

Figure 3a- 10x view: Immunohistochemistry shows CYTOKERATIN- Positive.

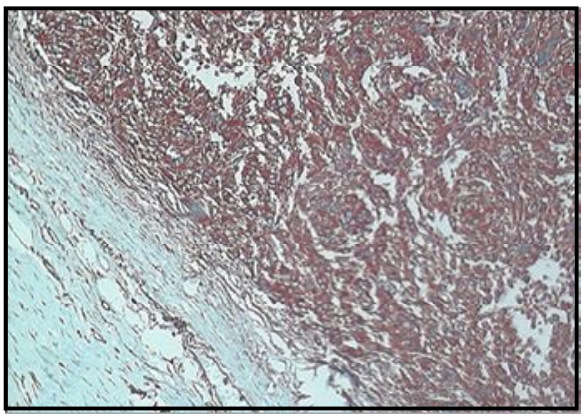

Figure 3b- 10X View- Immunohistochemistry- VIMENTIN- Positive

to the Nottingham modification of Bloom-Richardson grading) consisting of 3 for tubule formation, 3 for nuclear pleomorphism, and 3 for mitotic rate. All surgical margins were negative for malignancy. Axillary lymph nodes showed 10/20 lymph nodes involved by the tumor. Rest showed features of Reactive Lymphadenitis.

Immunohistochemical staining revealed both an epithelial (carcinomatous)component which stained positive for Cytokeratin and a mesenchymal (sarcomatous) component that was positive for vimentin. Desmin was found to be negative. Hormone receptor assay revealed the tumor to be negative for estrogen, progesterone receptors, and HER-2/neu.

Discussion

Carcinosarcoma of the breast is defined as a tumor of malignant epithelial tissue (carcinoma) mixed with malignant cells of mesenchymal origin (sarcoma) with apparent histological and cytological features present on light microscopy and immunohistochemical testing. It is anaggressive but rare neoplasm that has been reported to account for 0.08-0.2% of all breast malignancies. The tumor components may be homogeneously adenosquamous or heterogeneously epithelial (adenocarcinoma) and mesenchymal (matrix, spindle cell and sarcomatous) in origin.[2]

The histogenesis of breast carcinosarcoma is still a matter of debate. A single totipotent cell with biphasic differentiation has been proven to be attributed to the development of carcinosarcoma.

Myoepithelial cells and myofibroblastic metaplasia are also thought to be responsible for the origination of carcinosarcoma.[3]

The age at primary diagnosis ranges from 32 to 77 as per the literature.[4] Our patient was diagnosed at the age of 34 which falls in the range, as per the literature.

The observation that metaplastic breast cancers (MBC)

seem to represent a subset of tumors enriched in Epithelial Membrane Transition and cancer stem-cell (CSC) characteristics, may account for their resistance to therapy and propensity to metastasize. Like tumors that arise from

CSCs, MBC display high activation of phosphoinositide 3-kinase (PI3K) pathway components and commonly carry mutations in PI3K or loss of phosphatase and tensin homolog (PTEN).

MBCs also show strong correlation with a CSC-derived genomic profile that is heavily weighted for PI3Kactivity. Like CSC-derived tumors, most MBCs also display high levels of angiogenesis and commonly express VEGF and HIF-1?.

Mammography, sonography and magnetic resonance mammography are frequently used breast imaging techniques in the diagnosis of breast neoplasms. However, all 3 techniques have unsatisfactory specificity in the diagnosis of breast carcinosarcoma.[5] Fine needle biopsy or core biopsy are frequently used techniques in the preoperative diagnosis of breast neoplasms.

However, presurgical diagnosis can be challenging.[6] Most metaplastic tumors of the breast are poorly differentiated have a high grade, and are highly cellular with mitotically active pleomorphic spindle cells. The majority are estrogen and progesterone receptor negative, and her2-neu negative by immunohistochemistry.[7] Our case also showed similar findings of ER, PR, Her2 neu negativity along with Cytokeratin and Vimentin positivity.

Treatment strategies of breast carcinosarcoma correspond to those of other common pathological types of breast cancer. Modified radical mastectomy is an efficient and practical choice in the treatment of breast carcinosarcoma. The axillary nodes are one of the typical sites of metastasis

(incidence 26%) from either the carcinomatous or sarcomatous component of the primary site. Thus, mastectomy coupled with axillary dissection is often performed in the surgical treatment of breast carcinosarcoma.[8]

The prognosis of breast carcinosarcoma is poor. The cumulative 5-year survival rate is 49%. As neoplastic cells often extend into the perivascular tissue and beyond the tumor capsule, local recurrence is common.

Hematogenous spread is the most common route of metastasis, and lung and pleura are the most common locations of distant metastasis. If the recurrence is resectable, the prognosis can be improved, but due to the aggressive nature of the neoplasm, relapse can occur rapidly. Accordingly, careful periodic follow-up after the initial treatment is strongly recommended to detect metastasis and recurrence early.[9]

Conclusion

Carcinosarcoma of the breast is rare and there are a few numbers of published cases. Research investigating the development of novel systemic therapeutic regimens is paramount. In order to gain insight into the similar and different characterizing aspects of breast cancer, diagnosed cases should be reported with a literature review and this rare entity should be kept in mind.

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