IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 23, Issue 3 Ser. 6 (March. 2024), PP 26-28
www.iosrjournals.org

A Rare Encounter-Neuroendocrine Carcinoma Of The Breast-A Case Report

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Abstract:
Background*: Neuroendocrine carcinoma of the Breast is a rare subtype of Breast cancer, comprising less than 1% of all breast malignancies. Due to its rarity, there is limited data on optimal management strategies, including the role of radiotherapy. Here we present a case report of a 68 year old female presented with a palpable lump initially suspected to be a benign lesion. However subsequent imaging and histopathological analysis revealed features consistent with neuroendocrine carcinoma, characterized by neuroendocrine variant. . Our patient underwent a multidisciplinary treatment approach, including surgery and adjuvant therapy, leading to a favorable outcome. This case underscores the significance of accurate diagnosis and tailored treatment strategies in managing neuroendocrine carcinoma of the breast.*
Conclusion: *Adjuvant radiotherapy plays a potentially important role in the management of neuroendocrine carcinoma of the breast, although its exact indications and benefits warrant further investigation. Our case report highlights the successful utilization of adjuvant radiotherapy in a patient with neuroendocrine carcinoma of the breast and emphasizes the need for additional research to better define its role in this rare malignancy.*
Key Word: *Primary neuroendocrine carcinoma breast, breast lump.*

Date of Submission: 18-03-2024 Date of Acceptance: 28-03-2024

I. Introduction

Primary neuroendocrine breast tumors are very rare. They account for less than 0.1% of all breast cancers and less than 1% of all neuroendocrine tumours. Immuno-histochemical staining for synaptophysin and chromogranin on whole sections from 1232 consecutive cases showed a neuroendocrine differentiation in 10.4% of tumours in a recently published retrospective analysis.[1] Chromogranin and synaptophysin have shown to be the most specific and sensitive neuroendocrine markers. A definitive diagnosis is made with core needle biopsy or with surgical specimen itself.[2]

Differential diagnoses include neuroendocrine tumors metastatic to the breast, Merkel cell carcinoma, lymphoma, and melanoma. Analysis has shown that an associated DCIS component gives more credit to the primary nature of the tumor.[3] Appropriate imaging, such as a chest and abdomen computed tomography (CT) scan must be used. Positron emission tomography (PET)-CT with gallium-labelled somatostatin analogs also may be useful to exclude a different primary sitefor well-differentiated neuroendocrine carcinomas, whereas 18-fluorodeoxyglucose PET-CT could be used in the case of poorly differentiated neuroendocrine carcinoma with a high proliferation rate.[4] In particular, a larger tumor, with no in situ component, the negativity of estrogen and progesterone receptors, and axillary nodal metastasis point towards the likelihood of a metastasized tumor.[5]

II. Case Presentation

This 68 year old female with known case of Hypertension on regular medications, presented with lump in the left breast since 1 month, evaluated for the same and diagnosed as Carcinoma Left Breast. Subsequently patient underwent necessary investigations, biochemical parameters are normal.

Bilateral mammogram and ultrasound imaging modality showed irregular mass lesion measuring 3.5x2.6 cm noted in upper outer quandrant of the left breast with no significant bilateral axillary or evidence of bilateral retropectoral lymphadenopathy.

PET CT scan showed FDG avid irregular ill defined enhancing mass lesion measuring 3.4x2.7x2.5 cm in the upper outer quandrant of left breast with non FDG avid lymph nodes are seen at Level I axilla with no evidence of distant metastases.

Underwent ultrasound guided core biopsy of the breast mass, showed invasive carcinoma with areas of focal intracellular mucin. She later underwent Left Breast conservation surgery and SLNB (sentinel lymph node biopsy) under general anesthesia.

Post op HPE report suggestive of Neuroendocrine tumor of the left breast with tumor size measuring 2.5x2.5x2 cm with all surgical margins free of tumor. Lymphovascular invasion-present with necrosis present with no perineural invasion not seen. Pathological staging-pT2N0M0

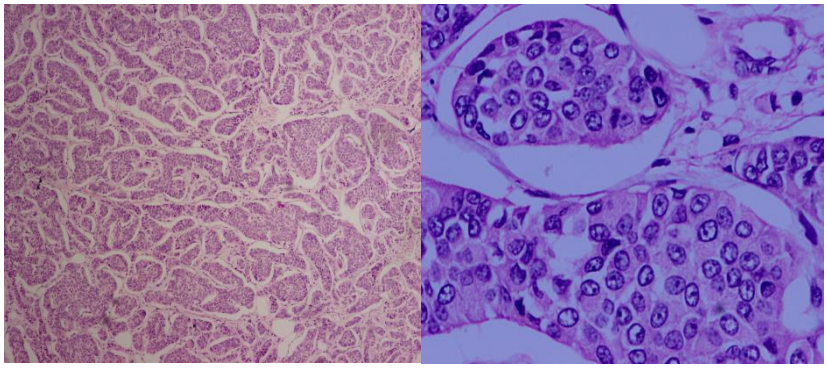

Fig 1: showing neuroendocrine histology and presence of necrosis on H&E staining

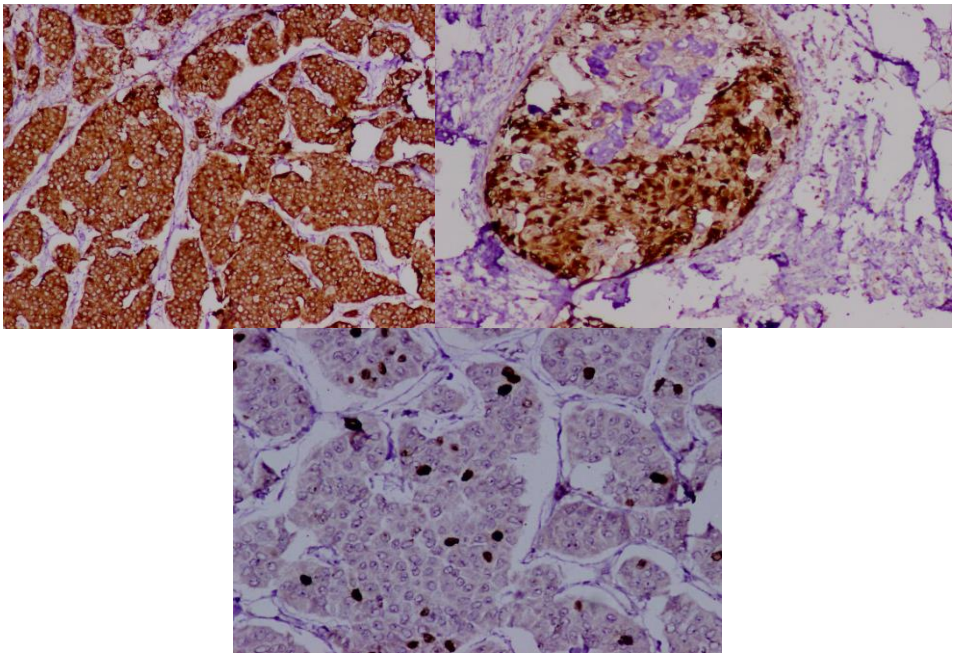

Fig 2: Tumor cells shows strong expression of Synaptophysin, Ki 67 positivity and variable expression of chromogranin.

IHC (Immunohistochemistry) -Tumor cells shows strong and diffuse expression of synaptophysin. Variable expression of chromogranin seen with 10% Ki67 proliferation index. ER and PR intepretation positive and HER2 is negative.

Then patient has been referred to Radiation oncology department 3 weeks after surgery for further treatment. Patient is been planned for adjuvant radiotherapy. After explaining diagnosis treatment outcomes acute and late side effects and consent is taken for Radiotherapy. Technique used is 3D conformal technique (3DCRT). Patient was planned and was treated to the planned target volume (Left breast) to a dose of 40 Gy/15 fractions with tumor bed boost to the dose of 10Gy in 5 fractionsalong with adequate PTV margins. Patient tolerated the treatment well without significant Radiation toxicities.

Adjuvant chemotherapy was adviced followed by radiotherapy. The positive response to treatment is encouraging and follow up is essential to montor patients progress and address any emerging concerns.

Adjuvant radiotherapy plays a potentially important role in the management of neuroendocrine carcinoma of the breast, although its exact indications and benefits warrant further investigation. Our case report highlights the successful utilization of adjuvant radiotherapy in a patient with neuroendocrine carcinoma of the

breast and emphasizes the need for additional research to better define its role in this rare malignancy.

III. Discussion

Neuroendocrine differentiation in breast carcinomas was first described by Feyrter and Hartmann in 1963, based on positive silver staining in mucinous carcinomas of the breast. The primary NEC of the breast is under-recognized owing to the lack of established consensus on the degree of neuroendocrine differentiation required for the diagnosis. Two histogenesis theories such as arising from pre-existing endocrine cells and differentiation processes within the breast have been postulated regarding the origin of such tumors in the breast. An association of these tumors with mucinous histology, solid papillary growth pattern and invasive lobular carcinoma has been reported in the literature.[6]

The diagnosis is complex due to the absence of characteristic clinical and image findings. The most common sites include the lungs and gastrointestinal tract, however, occurrence in the breast is rare. The first case series on carcinoid tumors of the breast was published by Cubilla and Woodruff in 1977. There is no significant difference in clinical presentation and usually occurs in the elderly age group. Tang et al reported that neuroendocrine differentiation was missed in up to 69% (51 of 74) of breast carcinomas. The radiological findings are not typical and may look similar to one of the other types of breast tumors. Neuroendocrine differentiation in breast carcinomas is often overlooked in routine practice.[7]

The presence of ductal carcinoma in situ adjacent to the tumor can strongly establish and reconfirm the primary origin of the breast.[8] Before designating a case as NEC of the breast, utmost care must be taken to rule out the possibility of metastatic cancer from the lung, gastrointestinal tract (GIT), pancreas, and cervix as histomorphology of both primary and metastasis remain similar.[9]

ER and PR can be positive in both primary and metastatic disease. IHC markers such as mammaglobin and GCDFP help in specifically identifying primary carcinoma of the breast. GATA3, mammaglobin, and GCDFP15 serve as the most specific markers in establishing the primary origin of the breast. Based on the size of the tumor and lymph nodal status, the management of such an entity is usually surgery. The benefits of adjuvant therapy have not been demonstrated in the literature because of the low occurrence of the disease but invariably all the patients with primary NEC of the breast are treated with routine chemotherapy cycles.[10]

IV. Conclusion

In conclusion, NEBC is a very rare breast malignancy with unclear histogenesis, which is associated with a more aggressive clinical course compared to other types of invasive breast cancer. Due to the rarity of the tumor the optimal treatment has not been clearly defined and is currently treated similarly to conventional breast cancer. Surgery is the mainstay of treatment. The distinction of primary from metastatic neuroendocrine breast tumors is crucial as these two entities require different therapeutic approaches. Further research is needed to understand the molecular profile of the tumor and identify novel targeted therapy.

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