Secretory Carcinoma of Breast in a Patient Treated for Differentiated Thyroid Carcinoma—A Diagnostic Dilemma

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Abstract Secretory carcinoma of the breast is a rare entity accounting for less than 1 % of all infiltrating breast carcinomas. Though initially considered as “juvenile breast carcinoma”, due to its occurrence predominantly in pediatric population, it was later found to present in other age groups as well. We report a case of secretory carcinoma breast in a middle aged woman who had undergone treatment for papillary carcinoma of thyroid previously. The uniqueness of this malignancy and the diagnostic dilemma due to patient’s past medical history, are discussed in detail.

Keywords Secretory carcinoma breast · Papillary carcinoma thyroid

Introduction

Secretory carcinoma of the breast, otherwise known as juvenile breast carcinoma is considered to be a rare type of infiltrating carcinoma, with fewer than 120 cases reported in the English literature world over. The patient who is being discussed here had already undergone surgical resection for papillary carcinoma of thyroid and was on regular follow up. The diagnostic dilemmas involved in the frozen section examination in the background of such medical history and the extent of radicality required in terms of surgical management of secretory carcinoma are discussed. The literature reporting

breast conservation surgery in this group of patients is also sparse.

Case Report

This 40 year old premenopausal lady underwent right hemithyroidectomy for a solitary nodule of the thyroid, followed by completion thyroidectomy for pathologically proven papillary carcinoma in November, 2002. Low dose iodine scan done post operatively did not reveal residual disease or metastasis and she had been on regular follow up since then. Her thyroglobulin levels remained within normal limits throughout.

In Jan 2012, she presented with a painless lump of 2 months duration in her left breast. Clinical examination revealed a well circumscribed mass in the left lower inner quadrant. Mammogram showed a single BIRADS 4 lesion in her left breast at 4 o’clock position. Fine needle aspiration was done from the lesion and cytological examination showed monomorphous population of atypical cells with eosinophilic cytoplasm and eccentric nuclei with fine chromatin in nests, cords and clusters with acinar/ductal pattern in areas. This was reported as suspicious of carcinoma and further biopsy or frozen section was advised for confirmation. Her metastatic workup including chest X-ray and ultrasound abdomen were normal. Options of treatment were discussed with the patient and she was planned for wide excision of the lesion under frozen control with a plan to proceed for breast conservation surgery if positive for malignancy.

She underwent wide excision of the lesion as planned in Feb 2012. Specimen was subjected to frozen section and microscopic examination. There was a neoplasm with cells arranged in cystic, follicular, papillary and solid patterns. There was also eosinophilic secretory material within the lumina which mimicked colloid (Fig. 1). The cells were

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Fig. 1 **a** Photomicrograph of intraoperative frozen section from breast mass showing cells arranged in follicular and microcystic pattern (H&E X100). **b** Photomicrograph of papillary carcinoma thyroid (H&E X 400). For comparison

having uniform vesicular nuclei. However the finer nuclear details could not be appreciated. In view of her being a known case of papillary carcinoma of thyroid, there arose a diagnostic dilemma whether the lesion was a secretory carcinoma of breast or a metastatic lesion from papillary carcinoma thyroid. Because of this difficulty in differentiating between the two without further tests, only a wide local excision of the lesion with negative margins was planned and executed under frozen section control. The tumour bed was marked with ligaclips and axillary clearance was deferred.

The specimen was sent for routine processing. Size of the tumour was 1.7×1.6×1.5 cm. Multiple paraffin embedded sections showed a neoplasm with microcystic, follicle like, tubular and solid patterns (Fig. 2). There was intracellular and extracellular eosinophilic secretory material which was PAS positive and diastase resistant. Mitotic activity was sparse. Negative staining of thyroglobulin immunostain completely excluded the possibility of metastatic thyroid carcinoma. A confirmatory diagnosis of secretory carcinoma of the breast was thus made based on these reports. The neoplastic cells were found to be positive for estrogen and progesterone receptors as well, which is a rare entity in secretory carcinoma breast. There was no amplification of HER2neu protein.

She was taken up for left axillary clearance in April 2012. A total of 23 nodes were harvested and sent for further histopathological examination. All nodes were reactive in nature. In view of the good prognostic nature of the disease, adjuvant chemotherapy was not planned. She was started on Tamoxifen 20 mg OD because of estrogen and progesterone receptor positivity. As part of the breast conservation protocol, she was planned for adjuvant radiation to her breast at dose of

50 Gy in 25 fractions and a boost to the tumour bed at a dose of 10 Gy in 5 fractions which she completed uneventfully. She is on regular follow up since then and is disease free.

Discussion

Secretory breast carcinoma is a rare breast cancer with indolent clinical behavior. McDivitt and Stewart [1] in 1966 recognized an uncommon variety of mammary carcinoma in children, which they designated as ‘juvenile carcinomas’. Subsequently in 1980, Tavassoli and Norris [2] reported 19 cases in patients ranging in age from 9 to 69 years old. Based on this they recommended replacing the term ‘juvenile carcinoma’ with the descriptive term ‘secretory carcinoma’. Secretory breast carcinoma has distinctive features that differ from other ductal carcinomas of breast, such as the presence of large amounts of intracellular and extracellular secretory material. These neoplasms can have late local recurrences but is generally associated with prolonged survival, even with axillary lymphnode involvement [3, 4]. Immunohistochemically, the tumor usually shows strong reactivity for S-100 but is negative for estrogen receptor (ER), progesterone receptor (PR) and HER2 neu protein [5–7]. In 2002, Tognon et al. [8] reported that secretory breast carcinoma expressed the ETV6-NTRK3 gene fusion in 12 out of 13 of their cases, which is now considered to be a differentiating factor from other basal—like breast cancers.

Clinically, most patients with secretory carcinoma of the breast present with early-stage disease, though up to 30 % of cases have been associated with axillary lymphnode metastases [9]. On mammography, secretory carcinoma usually appears as

Fig. 2 Microscopy of the breast mass- cells arranged in microcystic, follicular and tubular pattern (**a** H&E X100, **b** H&E X200)

a discrete, solitary mass with irregular borders. Sonographic findings are nonspecific, typically presenting as a hypoechoic mass, often mimicking a juvenile fibroadenoma. Grossly, these carcinomas are usually circumscribed and lobulated owing to the presence of fibrous septa within the tumor. Morphologically it is a compact tumor with solid, papillary, tubular, and microcystic areas. Though most secretory breast carcinomas express basal-like markers, it is thought that aggressive treatment should be avoided in view of their indolent nature [10].

Though the management of secretory breast carcinoma is surgical, there is no consensus regarding the optimal extent of surgery that should be performed. There are case reports of chest wall recurrence after local excision, and hence mastectomy with axillary lymph node sampling has been advocated as standard therapy. While long established as a standard therapy for invasive ductal and lobular carcinoma, the role of breast conserving surgery and radiotherapy have not been defined with secretory carcinoma. No chemotherapy data is included in the SEER database; therefore no information on patterns of care regarding chemotherapy use can be determined at present [11, 12]. A meta-analysis demonstrated improved breast cancer-specific survival with the addition of radiation therapy to breast conserving surgery in invasive carcinoma breast, at the expense of increased non-breast cancer-specific mortality [13]. Perhaps due to its rare presentation, the utility of adjuvant radiation in the treatment of secretory carcinoma of the breast has not previously been studied and the data available through the SEER database do not provide information regarding rates of recurrence in this group of patients treated with or without radiation.

Conclusion

The current case illustrates an unusual presentation of this rare type of breast carcinoma along with diagnostic dilemma because of past history of papillary carcinoma of thyroid in this patient. The biological indolence of the tumour with ER, PR positivity in our case was the deciding factor for avoiding

chemotherapy and proceeding with adjuvant hormonal and local radiation therapy.

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