Case Report of a Tall Cell Variant of Invasive Papillary Breast Carcinoma

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Introduction

A new type of breast tumor has recently been described as resembling the tall cell variant of papillary thyroid carcinoma. There have only been around 30 cases of this neoplasm reported in the literature [1,2]. The breast is an uncommon site for any metastasis, with an incidence of up to 2% of breast tumors being identified as metastasis, and about 5% of all metastases to the breast being of thyroid origin [1]. Therefore, it is imperative to accurately differentiate tall cell variant of papillary thyroid carcinoma as primary tumors of the breast from a breast metastasis of thyroid carcinoma. In this article, we describe an additional case of this rare type of breast tumor resembling papillary thyroid carcinoma (BTRPTC).

Case Report

A 47-year-old female presented to the clinic with a growing right breast mass for the last four years, with no axillary adenopathy upon clinical evaluation. Recent screening mammography showed growth of the right breast mass from 1 cm to 2 cm over the last four years, and a new left breast mass measuring 2.6 cm (Figure 1). Ultrasound-guided core biopsy of the right breast mass showed triple negative invasive carcinoma of the tall cell papillary variant. Left breast core biopsy showed benign breast tissue with fibroadenomatoid nodules. Due to the papillary variant, thyroid immunohistochemical markers TTF1 and thyroglobulin were measured and found to be negative. A thyroid ultrasound was negative for malignancy, ruling out a primary thyroid process. The patient opted to undergo bilateral lumpectomies with a reduction pattern incision and a right sentinel lymph node biopsy. Final pathology confirmed triple negative invasive carcinoma of the tall cell variant measuring 1.5cm in size. Histologic sections of the right breast demonstrated negative staining for myoepithelial markers p63 and SMMHC (Figure 2). Immunohistochemical stains for vascular markers D2-40 and CD31 demonstrated no evidence of vascular invasion. Stains for CK5/6 and ER demonstrated patchy positivity in foci of usual ductal hyperplasia. Right sentinel lymph node was negative for malignancy. Patient is now scheduled to receive adjuvant Doxorubicin and Cyclophosphamide followed by Paclitaxel.

Figure 1 – Diagnostic mammogram

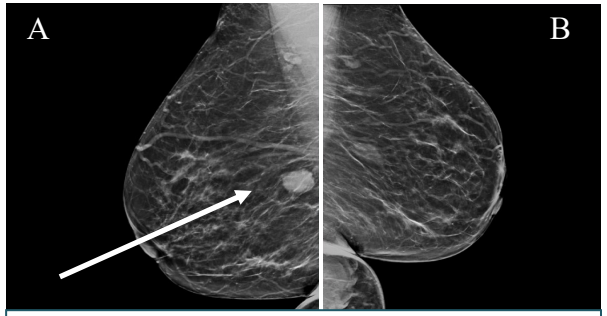

Figure 1 (A) Right breast - 2 cm round equal density irregular mass in the slight lower outer breast located 4 to 5 cm posterior to the nipple which is adjacent to the chest wall in this patient. (B) Left breast – there is a 2.3 cm oval partially obscured mass in slight upper outer breast 5 to 8 cm posterior to the nipple, near the chest wall.

Figure 2 – Histological Slides

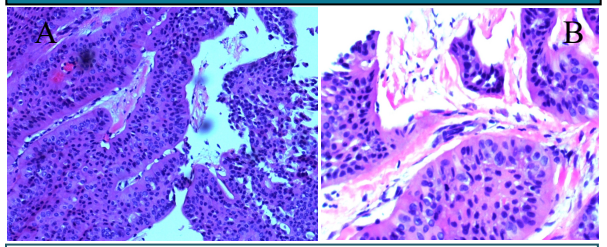

Figure 2 Histopathological features of tall cell carcinoma of the breast. (H&E; (A) 100x; (B) 200x). Tumor cells stained positive for CK7, CK5/6, and GATA3. TTF and thyroglobulin are negative. P63/CKC and SMMHC staining was negative, showing absence of myoepithelial cells.

Discussion

BTRPTCs are an invasive carcinoma composed of papillary structures lined by eosinophilic columnar cells rich in mitochondria with nuclear grooves and pseudo-inclusions [2,3]. These histopathological characteristics resemble tumors of thyroid origin, however, the tumors are found to be negative for papillary thyroid carcinoma markers thyroid transcription factor – 1 (TTF-1) and thyroglobulin [2,3]. Although the exact origin of BTRPTCs is uncertain, Bhargava et al proposed a close kinship with intraductal papilloma [4]. This was due to the concomitant presence of a papilloma in the patients in his study, as well as similar molecular features seen in patients with BTRPTCs and patients with intraductal papilloma [4]. In our patient, there was prior history of an excised intraductal papilloma three years prior to her current breast lesion, indicating that there might be an underlying correlation between intraductal papilloma and BTRPTCs. Triple negative invasive breast carcinomas (TNBC) are highly aggressive cancer types with 46% of patients developing distant metastasis with a median survival time of 13.3 months [4]. BTRPTCs, while a form of TNBC, are of indolent nature with a low threshold for metastasis [3,4] This is because BTRPTCs, along with other tumors such as micro glandular adenosis, atypical micro glandular adenosis and acinic cell carcinoma, are low grade TNBCs with little to no metastatic potential [4]. Due to favorable clinical outcomes, tall cell variants of breast papillary carcinoma tumors are often treated with breast conservation surgery, with systemic adjuvant chemotherapy and locoregional radiotherapy being utilized less frequently [3,4].

Conclusion

Due to the infiltrative growth patterns of tall cell variants of breast papillary carcinoma tumors and lack of myoepithelial cells, coupled with the growing number of cases reporting lymph node metastasis, further studies are warranted to provide sufficient evidence of the metastatic potential of this tumor type.

References

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