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SOLID PAPILLARY CARCINOMA OF THE BREAST – A RARE ENTITY

Pathology

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ABSTRACT

Solid Papillary Carcinoma (SPC) of the breast is a rare tumor accounting for less than 1% of all breast tumors. It mainly affects elderly females. It is morphologically characterized by well-defined nodules with low-grade nuclear features associated with fibrovascular cores and shows neuroendocrine differentiation. SPC can be in-situ or invasive but has a favorable prognosis. It is a morphological mimicker of some pre-malignant conditions leading to its frequent misdiagnosis. An appropriate immunohistochemical (IHC) panel workup helps in distinguishing this tumor from its various morphological mimics. In this report, we present one such case of SPC in a 60 year old female patient.

KEYWORDS

Carcinoma, Papillary Carcinoma, Breast Neoplasms.

INTRODUCTION

Solid papillary carcinoma (SPC) is a rare malignancy of elderly females accounting for less than 1% of all breast tumors.[1]The first case was reported by Maluf and Koerner in 1995.[2] The patients usually present with palpable, centrally located mass. Bloody nipple discharge may also be seen. These tumors are morphologically characterized by well-circumscribed nodules with fibrovascular cores along with the presence of low-grade ductal cells. The papillary nature of these tumors is often masked because of increased cellular proliferation.[2,3] It has been documented that these tumors originate from dilated or expanded ducts. Because of their association with other variants of ductal carcinomas and presence of neuroendocrine differentiation, it is suggested that the SPCs are probably hetrogenous tumors.[4]

Their microscopic appearance may often be misinterpreted for other lesions such as florid ductal hyperplasia, lobular neoplasia, intracystic papillary carcinoma, and low nuclear grade ductal carcinoma in situ (DCIS).[3] Its close resemblance to these lesions often leads to misdiagnosis. These tumors are currently described as in situ carcinoma under WHO classification.[5]However, there is uncertainty regarding its true nature as immunohistochemistry for myoepithelial cells in many SPCs reveal absence of myoepithelial cells along epithelial-myoepithelial interface. Thus, it's a matter of debate whether to consider these tumors as a form of solid nests of invasive carcinoma or in situ carcinoma.

This uncommon entity has a favourable prognosis with lower incidence of axillary lymph node metastasis. Local and distant metastasis and number of breast carcinoma-related deaths associated with SPCs are also low.[3]Here we present SPC in a 60 year old female.

Case Report

A 60-year old postmenopausal female presented with a palpable left retroareolar mass along with complaints of bloody nipple discharge. Trucut biopsy was performed and a diagnosis of infiltrating ductal carcinoma grade 2, no special type with mucinous component was made. Modified radical resection of the left breast was done. The specimen was sent for further histopathological examination. Grossly the specimen was 35 x 21 x 5.5 cm. The tumor was 3.5 x 3 x 2.5 cm, well-circumscribed, gray-white, and firm and with gelatinous areas. (Figure 1).

Figure 1: Gross features of a well circumscribed gray-white firm tumor with gelatinous areas in the left breast.

Multiple sections were taken and examined. On microscopic examination,there was monotonous population of neoplastic cells separated by fibrovascular cores in a solid pattern and no apparent papillary structure. Individual cells were spindle to polygonal shape with moderate amount of fine granular cytoplasm and hyperchromatic nuclei (Figure 2a). Extracellular mucin was present (Figure 2b). Mitotis was 4 -10/hpf. Atypical mitotic figures were not seen.

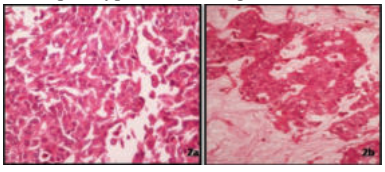

Figure 2: Histopathological picture showing (a) Monotonous population of neoplastic cells separated by fibrovascular cores (H&E 40x) (b) Tumour with mucinous areas (H&E 40x).

Immunohistochemistry was put and it revealed the tumor to be ER and PR positive. HER2NEU was negative. Ki67 was 30% (Figure 3).

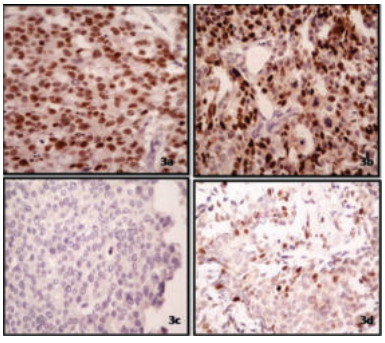

Figure 3: Immunohistochemistry showed the tumor cells (a) ER Positive (b) PR Positive (c) HER2NEU Negative (d) Ki67 30% positive.

Based on these features, a diagnosis of solid papillary carcinoma with mucinous differentiation was rendered.

DISCUSSION

Papillary carcinomas are low grade neoplasms. Only a few cases have been reported so far. Clinically, the patients present with palpable, centrally located masses with bloody nipple discharge. They are unilateral in almost 95% of the cases. This rare tumour is mainly seen in postmenopausal females.[1-3]

On histolopathological examination reveals that the tumourcells form multiple circumscribed nodules separated by thin fibrovascular cores. These nodules are composed of monomorphic cells with a low to intermediate nuclear grade. Spindle shaped cells and plasmacytoid

cells with granular eosinophilic cytoplasm and eccentrically-placed nuclei may be seen in some cases. The papillary features many a times are masked by the dense cellular proliferation. Microcystic pattern, pseudorosette formation, nuclear palisading around stromal coresand mucinous differentiation can be seen.[1,3-5]Intracellular mucin is seen in SPC and such cases needs to be differentiated from mucinous carcinoma. Mucinous carcinoma with less mucin and large sheets of tumor cells along with neuroendocrine features are often confused with SPC.[6]

Other differential diagnoses to consider are atypical ductal hyperplasia (ADH) and intracystic papillary carcinoma andlow-grade DCIS.[7]Fibrovascular cores are seen in SPC and its not found in ADH. Intracystic papillary carcinoma has presence of papillary fronds involving a cystically dilated duct and the lining cuboidal cells have high nuclear grade. These are not seen in SPC.SPC shows monotonous population of cells and thesecells may be plasmacytoid or spindle cell in appearance along with presence of mucin andbranching fibrovascular stroma. These features are not described in low-grade DCIS.[7]

Another recently described entity which may be confused with SPC is invasive lobular carcinomas (ILC) with a solid-papillary growth pattern, also known as invasive lobular carcinoma with solid and encapsulated papillary carcinoma growth pattern.[8] There is focally merged areas of solid and papillary features with classic invasive lobular carcinoma at the periphery, coupled with the presence of in situ lobular carcinoma. However, neuroendocrine differentiation is not seen.

On immunohistochemistry, SPCs show estrogen and progesterone receptor positivity and Her2 negativity (luminal phenotype).[5]Similar immunohistochemical findings were observed in our case.

It has been reported that SPC and classic lobular components have a common CDH1 mutation and a number of copy number alterations. Also, 20q gain and 1p loss have been documented in SPC and solid variant of invasive lobular carcinoma, highlighting a common clonal ancestry of these two entities.[9]Apart from these, loss of chromosome 16q and gain of chromosomes 1p and 16p has also been reported in SPC. SPC with neuroendocrine differentiation has shown expression of RET, ASCL1 and DOC7 genes.[9]

There is no well-established protocol for treatment of SPC and it depends upon the extent of invasion. The various modalities include breast-conserving surgery or mastectomywith or without adjuvant endocrine/chemotherapy. Adjuvantchemotherapy is indicated in node-positive tumors. Adjuvant endocrine therapy for smaller tumor size SPC (pT1-T3) without lymph node involvement or pN1mi is being considered as perthe National Comprehensive Cancer Network (NCCN) guidelines.[10]

CONCLUSION

Solid papillary carcinoma has been found to be associated with a favorable prognosis. Lymph node metastasis is seen only in cases with invasion. The difficulty in diagnosis arises because of its morphological resemblance to various benign and malignant lesions. However, proper histopathological examination alongwith the use of appropriate immunohistochemical markers are helpful in making the correct diagnosis of this rare entity.

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