An Unusual Breast Tumor Identical to Solid Papillary Carcinoma

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Abstract
Diagnosis of papillary breast lesions is challenging for most pathologists, and these lesions pose problems for patient management. I encountered an unusual breast tumor identical to solid papillary carcinoma. The histological and cytological features with immunohistochemical characteristics of this tumor are described.

Keywords: Breast carcinoma; Solid papillary; Spindle cell; Neuroendocrine differentiation; Immunohistochemistry

Introduction
Solid papillary carcinoma (SPC) is a distinctive type of intraductal papillary carcinoma, characterized by the presence of a cluster of small, round, oval and solid tumor nodule, first described by Maluf and Hoerner [1]. These features include a solid-papillary growth pattern, low-grade cellular atypia, neuroendocrine differentiation, with intracellular or extracellular mucinous component. This tumor is rare, accounting for <1% of all breast tumors. I encountered a breast tumor identical to solid papillary carcinoma. Herein, I describe the histological and cytological features with immunohistochemical characteristics of this tumor.

Case Report
A 76-year old woman visited our out-patient clinic because of the nipple discharge. On physical examination, a breast lump was found on her right breast. A mammography was performed, and revealed a nodule, 1.9 cm in its greatest dimension (Figure 1). She underwent a fine needle aspiration biopsy followed by a core needle biopsy.

Cytology and Histopathology
The smears showed hypercellularity with many cohesive papillary clusters of epithelial cells and many isolated cells, in a clean background. The tumor cells exhibited round to oval nuclei with mild nuclear pleomorphism. Their chromatins were finely granular. Some isolated cells were spindle in shape with obvious fibrils. Their chromatins likewise were finely granular (Figure 2). In the absence lack of evident cytologic criteria of malignancy, the diagnosis of papilloma was rendered, and histological verification was suggested. The patient received a core needle biopsy which showed multiple nodules, each representing a duct filled by proliferating neoplastic cells. The cells grow in a solid pattern with spindle cell predominating (Figure 3a and b). Mitotic figures were uncommon. Immuno-histochemical staining using anti-smooth muscle antibody showed absence of myoepithelial cells around each nodule. Using anti-pancytokeratin, the neoplastic cells were strongly positive. The tumor was interpreted as spindle cell carcinoma. The sentinel lymph node dissection was carried out using methylene blue dye. It was negative for metastasis. Subsequently, the patient underwent a partial mastectomy. A well circumscribed grayish white tumor was found, measuring 1.9 cm in its greatest dimension. The histological examination displayed a similar morphology as that of biopsy specimen. More immune-histochemical stainings were performed, the results were as follows; ER2+, diffuse; PR 3+, diffuse; Her2/neu, 2+, diffuse; Ki 67:5%, CK 5/6, and vimentin, negative; Synaptophysin, strongly positive; chromogranin, focally positive (Fig 4. a.b.c.d.). The special stain for mucin was negative.

Discussion
In the literature, there were few cytological studies on SPC [2-5]. The cytological specimens reported in the literature could be clearly divided into malignant and benign features. The malignant features included hypercellularity, numerous isolated cells, and absence of oval naked nuclei of myoepithelial cells. The benign features were clean background without necrosis or inflammation. In addition, the tumor cells consisted of small and bland nuclei, a low nuclear cytoplasmic ratio, finely granular chromatin and inconspicuous nucleoli. In my case, the findings of the needle aspiration biopsy confirmed the coexistence of both benign and malignant features. It is worth mentioning that many patients reported in the literature, including mine, had clinical symptoms of nipple discharge, yet, the background of the cytological smears were clean, and showed no evidence of blood tinge. Given the

Figure 1: Mammogram demonstrating a well circumscribed solid nodule.

Figure 2: Low-power fine needle aspirate showing a high cellular smears with Papilla-like clusters of epithelial cells and many isolated cells, in a clean background. 100x, diff quick stain. Insert a: Some isolated cells showing fibrils diff, quick stain, 200x. Insert b: High magnification showing epithelial cells with round to oval and bland nuclei, finely granular chromatin. Pap stain, 400x.

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biphasic features in the FNA smears, the differential diagnosis ranges from benign to malignant lesions including metaplastic carcinoma, spindle cell ductal carcinoma in situ, phyllodes tumor, florid ductal hyperplasia [6]. Histologically, the tumor appeared as multiple nodules, each representing a duct filled by proliferating epithelial cells with intermingled fibrovascular network [7]. The growing pattern is identical to solid papillary carcinoma (SPC) with neuroendocrine differentiation. However, there was neither mucinous material nor plasmacytoid cells demonstrated [1].

According to WHO classification of tumors of the breast, SPC is classified as in situ carcinoma, synonym to neuroendocrine DCIS [8]. To ascertain the presence of invasion of breast tumor, the presence or absence of myoepithelial at the periphery of the tumor has been routinely used by pathologists [9]. In my case, the periphery of the nodule was stained negative for myoepithelial cells using anti-smooth antibody; however, this tumor should be considered as in situ carcinoma, according to WHO classification. They further stated that “When there is in doubt about the presence of invasion, solid papillary carcinoma should be regarded for staging purpose as a form of in situ carcinoma (Tis)” [1]. Nevertheless, many authors have challenged this concept [10-12]. Because the rarity of this tumor, its clinical behavior and the optimal treatment is still debated.

In conclusion, I described the cytologic and histologic features with immunohistochemical characteristics of an unusual breast tumor identical to the category of WHO classification of the breast tumor as SPC [8]. The tumor may represent a variant of SPC.

References