

Mucinous Micropapillary Carcinoma (Mucinous Carcinomas with Micropapillary Pattern) of the Breast: A Case Report and a Literature Review

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Abstract

The current study presents a mammary carcinoma characterized with both micro papillae and mucinous feature in a 43-year-old female. The patient presented with a six-month history of growing painless mass in the right breast. The patient underwent mastectomy with the ipsilateral axillary dissection and was followed-up for 10 months without any evidence of metastasis and recurrence. Except for the abundance of extracellular mucin, the current example shows a diffuse architectural pattern equivalent to the pattern seen in invasive micro papillary carcinoma. Up to now, the essence of the special subtype and the classification of the rare breast carcinoma are still controversial.

Keywords: Breast neoplasms; Mucinous carcinoma; Micro papillary

Introduction

Invasive micro papillary carcinomas (IMPC) of the breast are highly angioinvasive tumors with poor prognosis [1-3], while the mucinous carcinomas of the breast have a much better prognosis [2,3]. Extracellular mucin present in mucinous carcinoma of the breast may serve as an hindrance to lymphovascular permeation and lymph node metastasis [4]. Different architectural patterns may be formed by the tumor cells and special attention is being paid to the micro papillary pattern as which can be seen in invasive micro papillary carcinoma [5-10]. It remains unclear whether the micro papillary architecture in mucinous carcinoma represents the mucinous counterpart of invasive micro papillary carcinoma or is a genuine micro papillary variant of mucinous carcinoma. To date, less than 200 cases of mucinous micro papillary carcinoma / mucinous carcinomas with micro papillary pattern have been documented in the published literature [5-10]. Their ages ranged from 36 years to 80 years, and the sizes of tumors varied from 1.0 cm to 6.0 cm in greatest dimension [5-10]. The current study presents a case of mammary carcinoma with diffuse micro papillary tumor cells floating in abundant extracellular mucin, along with a review of the literature. Written informed consent was obtained from the patient.

Case Report

On July 29th, 2014, a 43-year-old female presented to outpatient department of the First Affiliated Hospital of Dalian Medical University (Liaoning, China) with a growing painless swelling in the right-sided breast of six months' duration. The patient underwent ultrasound examination, which showed a cm irregular lesion in the superior outer quadrant of the right breast (Figure 1). With a diagnosis highly suggestive of malignancy (BIRADS V). The ipsilateral axillary lymph nodes were movable and palpable with the diameter of the largest one is 1cm. Mammography, magnetic resonance imaging and preoperative diagnostic biopsy were not performed and an intraoperative fast-frozen section was then performed in September 19th, 2014. An unregular 40 × 40 × 22 mm mass was observed. The ill-defined mass has a tan/white surface with mucinous appearance. Histologic features of diffuse micro papillary tumor cells, and the spaces around these papillae are large and filled with mucin (Figure 2). After the intraoperative fast-frozen diagnosis of breast carcinoma, a wide mastectomy with the ipsilateral axillary dissection was performed subsequently. Immunohistochemistry showed that the tumor cells showed reverse polarity for EMA (Figure 3). The cells have mild nuclear grade and the mitotic count measured much less than 1 per 10 high-power fields. One axillary lymph node was infiltrated by the micro papillary pattern tumour cells (Figure 4).

Stains for Her-2/neu was negative. Therefore, the patient was diagnosed with mucinous micro papillary carcinoma (mucinous carcinomas with micro papillary pattern) of the breast, clinical stage 1b (pT1bN0M0). The patient was managed with surgery and had an uneventful clinical course after a follow-up of 10 months.

Discussion

Invasive micro papillary carcinomas of the breast have been associated with aggressive behavior [1,11,12], morphological features with micro papillary clusters of tumor cells isolated by empty spaces and sclerotic fibrous stroma. Immunohistochemical stains with EMA show a reverse polarity staining pattern, proving its true micro

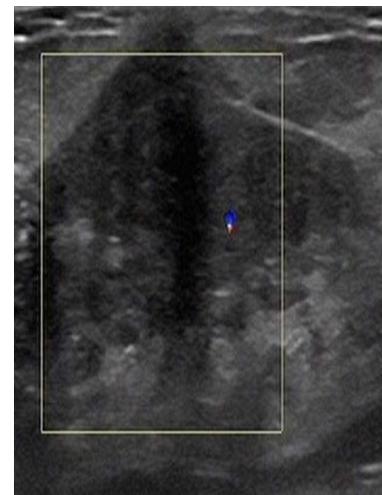


Figure 1: Ultrasonography image of the right breast demonstrates a mixed echogenicity mass, the border of which was unclear.

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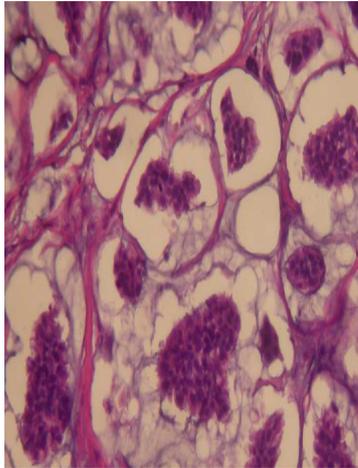


Figure 2: Low-power histological appearance showing tumor cells arranged in micropapillary pattern floating in pools of extracellular mucin (hematoxylin and eosin, x100).

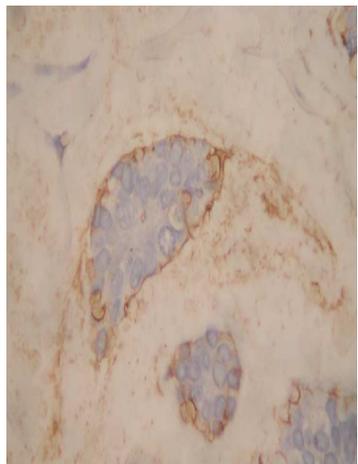


Figure 3: Immunostaining for EMA showing characteristic reverse-polarity staining pattern wherein only peripheral borders of cells stain positive (x400).

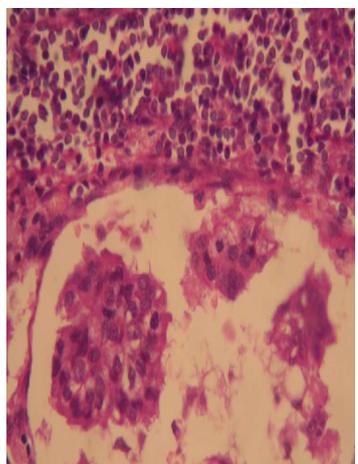


Figure 4: Histologic section of an ipsilateral axillary lymph node showing foci of metastatic carcinoma. Note the preservation of micropapillary architecture even in the lymph node metastasis (hematoxylin and eosin, x100).

papillary nature. The mechanism underlying the aggressive behavior in IMPC has not been fully elucidated. Mucinous carcinoma is characterized by tumor cells floating in large amount of extracellular mucin, and has a better prognosis [2,3] than invasive micro papillary carcinoma. The differentiation between pure and mixed mucinous carcinomas lies in the different proportions of mucinous and non-mucinous components. Different architectural patterns, such as cords, trabeculae, cribriform structures, and solid lobules. may be formed by the tumor cells, Mucinous carcinoma with tumor cells having diffuse micro papillary pattern, morphologically equivalent to the architecture of invasive micro papillary carcinoma was first reviewed by Wai-Kuen [5]. Subsequently, mammary carcinoma with the micro papillary arrangement in the mucoid background captured researchers' attention and only a limited number have been reported since then [6-10,13,14].

Wai-Kuen [5] reviewed five patients with the micro papillary pattern of pure mucinous breast carcinoma. Because the inside-out growth arrangement (with EMA staining outlining the periphery of tumor micro papillae rather than the central pseudolumen) that is noted representatively in invasive micro papillary carcinoma of the breast was not seen easily, and better prognosis were identified in it compared with that of invasive micro papillary carcinoma. The author suggested that it might stand for a special subtype of mucinous carcinoma accordingly. Amanjit et al. [6] observed 6 cases of mucinous carcinomas possess micro papillary pattern without any lymph node metastasis. The author also showed consistent opinion with Wai-Kuen. However, another study by Madur et al. [7] has described mucinous carcinoma with micro papillary pattern as mucinous variant of IMPC. In their study, both mucinous carcinoma with micro papillary pattern and IMPC had similar nuclear grade 3. They have concluded that mucinous carcinoma with micro papillary architecture and IMPC belong to the same spectrum of breast carcinoma. Aditi Ranade et al. [8] noted that 60% of the lymph node positive pure mucinous carcinoma had a micro papillary pattern. A 68 cases study reported by Shet [10] demonstrating that 86% of mucinous carcinomas were mucinous variants of the angioinvasive infiltrating micro papillary carcinomas. Given this, they recommend axillary staging in a mucinous micro papillary carcinoma (mucinous carcinomas with micro papillary pattern) irrespective of tumour size, followed by axillary dissection if needed, to identify the more aggressive lesions and plan further therapies. The plentiful extracellular mucin present in pure mucinous carcinoma may prevent to lymph node metastasis [4], however, it is still ambiguous whether this inclination for nodal metastasis in mucinous carcinoma is associated with the micro papillary growth pattern, and further study of larger series of patients may give the better interpretation.

Recently, a large cohort retrospective study of pure mucinous carcinoma of breast showed that the frequency of invasive micro papillary mucinous carcinoma was 25.2%, and the morphology of the micro papillary pattern in the mucinous carcinoma was an independent unfavorable predictor [13]. They raised a different point of view that IMPC may represent a subset of breast carcinomas with prognosis between pure mucinous carcinoma and IMPC. As the IMPC and mucinous carcinoma of breast shows obviously different biological behavior, it is essential for pathologists to distinguish them for the optimal treatment for the patient. Morphologically, IMPC overlap between invasive micro papillary carcinoma and mucinous carcinoma, i.e. the micro papillary pattern seen in the mucinous background, varied from focal to diffuse distribution in the reported literature. Within mucin lakes stroma, the clusters of neoplastic cells form pseudoacinar patterns. However, the immunostaining of EMA outlining the periphery of tumor micro papillae rather than the central pseudolumen

that is observed characteristically in invasive micro papillary carcinoma of the breast was not seen readily. The age ranged from 36 years to 80 years [5-10]. The tumour size varied from 1.0 cm to 6.0 cm in greatest dimension [5-10]. Low to high nuclear grade was observed and the incidence of lymph node positivity was 0-60% [5-10]. Her-2 expression was (3+) [8], while the negative staining was also reported by some researchers [6].

In conclusion, the present study describes a case of mammary carcinoma with diffuse micro papillae in the abundance of extracellular mucin background. The existence of the micro papillary pattern needs special attention for it may be associated with nodal metastasis. Fourteenth of the axillary lymph node was infiltrated in the present study, which is concordant with some reports [5,8,10]. The micro papillary pattern in the mucinous background is worthy of being paid more attention. The patients should be followed up closely. More cases should be studied to interpret the nature of the rare tumor.

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