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Invasive micropapillary carcinoma of the male breast: Case report and review of the literature

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Abstract
Background: Invasive micropapillary carcinoma (IMPC) of the breast is a rare and aggressive variant of invasive ductal carcinoma. IMPC has been reported to account for 3–6% of all breast cancers, and these tumors have been associated with a strong tendency to invade lymphatics with early spread to regional lymph nodes.
Patients and methods: We present a case of this rare type of breast cancer diagnosed in a male patient and summarize the current literature to date.
Results: Review of the literature on invasive micropapillary breast carcinoma revealed 27 retrospective cohort studies and case series. Significant heterogeneity of inclusion criteria and follow up data prevented meta-analysis. Tumors with an IMPC component demonstrated an early and high rate of lymphatic metastasis compared to invasive ductal carcinoma, however, no significant association was found between IMPC and decreased overall survival.
Conclusions: The IMPC data currently available indicates a strong trend towards a higher initial stage at diagnosis and possibly an increased risk of loco-regional recurrence, but remains underpowered to elucidate the prognostic effect of IMPC phenotype on survival. Further studies are warranted to establish the potential of this unique histologic phenotype to serve as a prognostic indicator and guide tumor-specific oncologic therapy.

1. Introduction

Invasive micropapillary carcinoma (IMPC) is a rare variant of invasive ductal carcinoma of the breast first described as a

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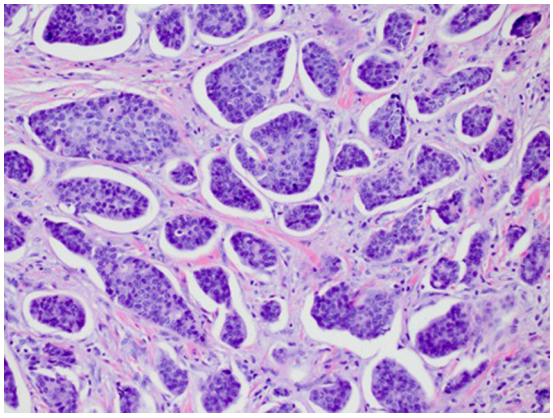

Figure 1 High power view of breast tissue from our patient demonstrating invasive ductal carcinoma with micropapillary differentiation showing neoplastic cells surrounded by loose fibrocollagenous stroma.

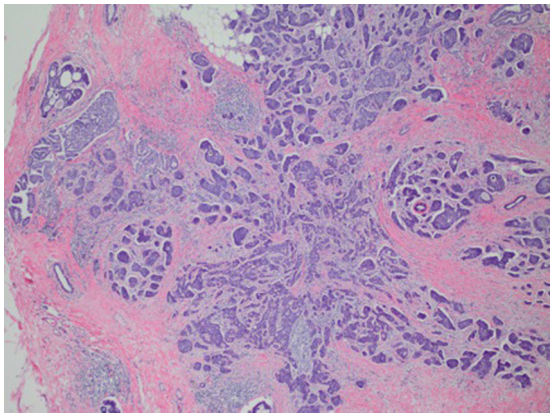

Figure 2 Low power view of breast tissue from our patient demonstrating invasive ductal carcinoma with micropapillary differentiation and lymphovascular invasion.

distinct histologic subtype by both Petersen [1] and Siriaunkgul [2] in 1993. Further evidence suggests it may constitute a distinct entity from invasive ductal carcinoma at the molecular genetic level as well [3]. Histopathologically, IMPC is characterized by neoplastic cells in a nested papillary pattern within clear spaces resembling lymphatic vessels (Figure 1). The most common histology associated with IMPC in mixed cases is invasive ductal carcinoma. Rarely, IMPC can occur in a pure form or can be associated with other types of breast cancer. IMPC has been reported to account for 3–6% of all breast cancers [4], and these tumors have been associated with a strong tendency to invade lymphatics with early spread to regional lymph nodes (Figure 2).

IMPC in males is very rare, and to date there have been nine case reports of this tumor phenotype in male patients. Three of these reports are available in the English literature [5–7]. The IMPC case series currently available have included a total of 15 male patients [8–13] accounting for only 0.005% of invasive breast cancer cases. We present a case of this rare type of breast cancer diagnosed in a male patient and review the current literature to date.

2. Case report

The patient is a 67-year-old Caucasian man who noted a mass in his left breast. He had a history of 0.4 mm melanoma of the left neck treated with a wide and deep excision several years prior to presentation. There was no history of familial breast cancer or other types of malignancies, and he denied use of hormonal medications. He consumed alcohol in moderation and did not smoke. On physical exam, bilateral gynecomastia was present and more pronounced on the left side. Palpation of the left breast revealed an approximately 2 cm firm subareolar mass with indistinct borders. Subtle retraction of the left nipple was noted without spontaneous or expressible discharge. No significant lymphadenopathy was present in the cervical, supraclavicular, and axillary regions bilaterally. Ultrasound and mammography of the left breast were performed which demonstrated a 1.7 cm density. An ultrasound guided core biopsy of the area revealed a moderately differentiated invasive ductal carcinoma with micropapillary features. The patient underwent a left total mastectomy with sentinel node biopsy. Two of two sentinel nodes were positive for carcinoma and a left axillary level I and II lymph node dissection was subsequently performed.

Histopathological examination revealed a multifocal invasive ductal carcinoma (2.1 cm, 0.5 cm, 0.3 cm) with areolar involvement and negative surgical margins. The tumor was moderately differentiated (histologic grade 2, nuclear grade 2, mitotic score 2), with 30% of the tumor demonstrating micropapillary features and extensive lymphovascular invasion associated with microcalcifications. Nineteen out of 25 lymph nodes were positive for carcinoma, with the largest deposit measuring 1.2 cm and demonstrated significant extracapsular invasion. TNM stage was pT2N3a. Immunohistochemical staining was estrogen receptor (ER) positive (100%), progesterone receptor (PR) positive (80%), HER2/Neu negative (0%), and the proliferation index (Ki-67) was 10%. Post-operatively, the patient had a positron emission tomography/computed tomography (PET/CT) which did not reveal further disease spread (M0).

The patient started adjuvant chemotherapy with paclitaxel followed by doxorubicin plus cyclophosphamide. Afterward, he received hormonal therapy with tamoxifen. He will also receive axillary radiation given the extensive axillary node metastases and evidence suggesting that invasive micropapillary carcinoma is associated with an increased risk of locoregional recurrence. The patient declined genetic testing to determine if he has a BRCA mutation.

3. Discussion

Review of the literature on invasive micropapillary breast carcinoma revealed 27 retrospective cohort studies and case series [2,8–32]. These studies were not amenable to meta-analysis due to significant heterogeneity among inclusion criteria and data points reported. Table 1 lists the characteristics of the studies included and Table 2 summarizes the pathologic characteristics reported.

The overall incidence of invasive micropapillary carcinoma among the retrospective cohort studies was found to be 1297 out of 331,486 cases (0.4%) of invasive breast cancer. This