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Case Report

Pure acinic cell carcinoma of the breast in an 80-year-old Japanese woman

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Acinic cell carcinoma of the breast is an uncommon neoplasm. Since the first case of this rare variant of breast carcinoma was reported in 1996, only 10 cases have been reported in the English-language literature. Reported herein is the first case of primary acinic cell carcinoma of the breast in a Japanese woman. To the naked eye, the tumor appeared well circumscribed and the cut surface was grayish-pink and hemorrhaging. Microscopically, the tumor was predominantly made up of a monotonous proliferation of cells with a finely granular cytoplasm, resembling acinic cells of the parotid gland. Some neoplastic cells had a clear cytoplasm. In spite of extensive sampling, no common histological patterns of breast carcinoma such as *in situ* and invasive ductal carcinoma were recognized in the present case, indicating that the present case was pure acinic cell carcinoma. In addition, the immunohistochemical profile of this tumor was identical to that of the acinic cell carcinoma of the salivary gland: estrogen receptor, progesterone receptor, HER2 and cytokeratin (CK)20 were negative and amylase and CK7 were positive. The patient has been well for 22 months since the wide local excision of the tumor and no signs of salivary neoplasm are evident to date.

Key words: acinic cell carcinoma, breast tumor, cytokeratins, immunohistochemistry, pure type, salivary gland

Primary acinic cell carcinoma of the breast is rare. Although it is listed in the new World Health Organization (WHO) classification of tumors of the breast, only 10 examples have been reported in the English-language medical journals.[1–6] Here we report a pure acinic cell carcinoma in an 80-year-old Japanese woman. To the best of our knowledge, this is the first reported case of acinic cell carcinoma in Japan. Furthermore, the patient is the oldest to develop this rare breast neoplasm.

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CASE REPORT

The patient, a Japanese woman, was 80 years old when she consulted her physician about the breast tumor. Two weeks earlier she had noticed a lump in her right breast. There was no pain. A nodule was palpated in the upper outer quadrant of the right breast, which measured approximately 3 cm in diameter. Skin retraction was observed. Sonography showed a hypoechoic nodule with a smooth surface, measuring 2.0 cm × 2.3 cm. Mammography revealed a well-demarcated mass without microcalcifications (Fig. 1a). The axillary lymph nodes were enlarged.

An aspiration cytology examination tested positive. The cytology showed a monotonous cell population with abundant coarse granular cytoplasms and round nuclei arranged in 3-D clusters (Fig. 1b). A mastectomy was performed, during which a frozen section examination confirmed negative sentinel lymph node metastasis.

Pathological findings

Macroscopically, the tumor was a well-defined solid mass with lobulated configuration. The mass was 2.1 cm × 1.4 cm in diameter, pinkish gray and slightly hemorrhaging (Fig. 1c). The tumor was well defined but not encapsulated microscopically. It was composed predominantly of neoplastic cells with faintly vacuolated and abundant cytoplasms resembling serous acinic cells of the major salivary glands (Fig. 1d). The

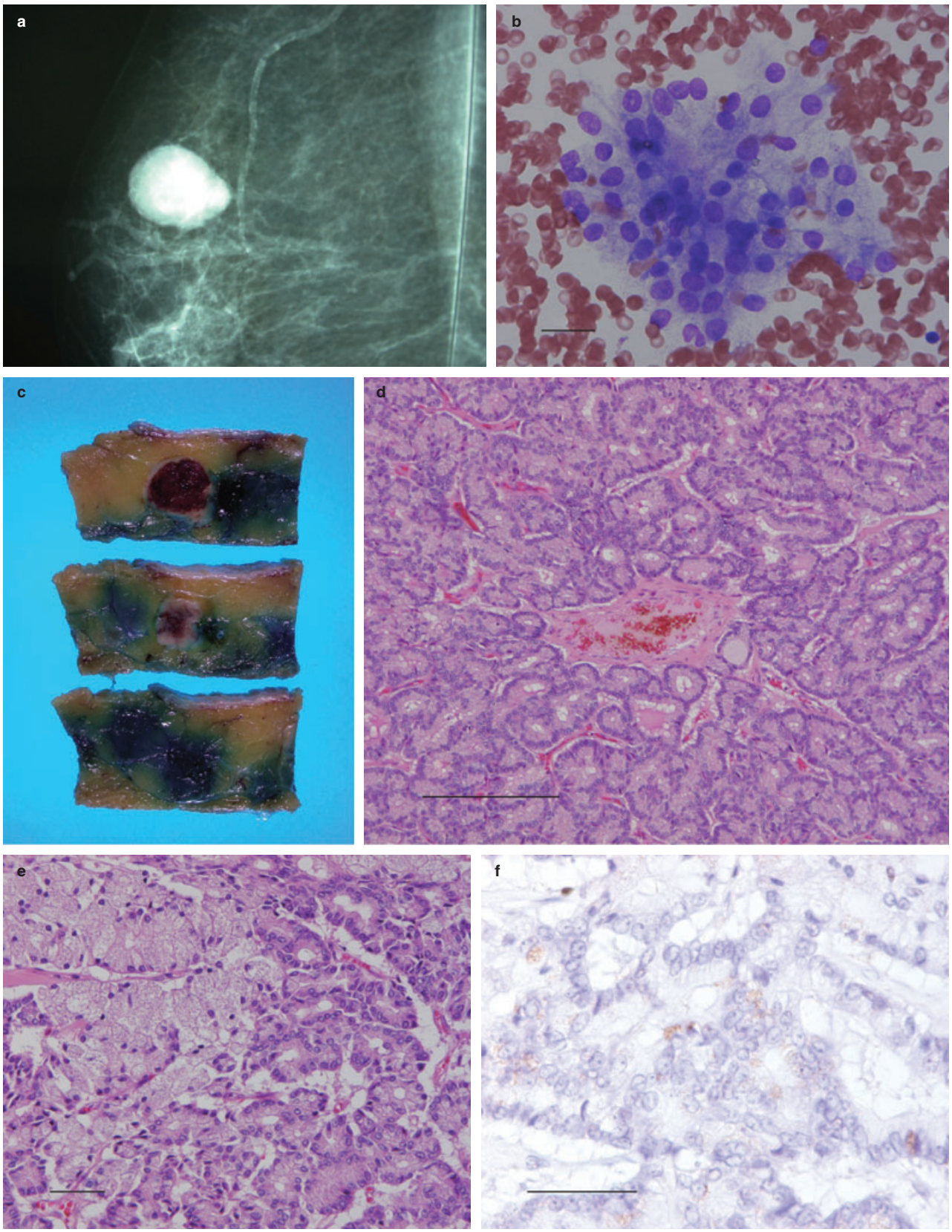

Figure 1 (**a**) Mammographic findings. Mammography revealed a well-demarcated mass without microcalcifications. (**b**) Cytological findings of the Giemsa stain. Cytology showed a monotonous cell population with an abundant coarse granular cytoplasm and round nuclei arranged in 3-D clusters (bar, 25 μm). (**c**) Gross findings of the tumor. The tumor was well-defined, pinkish gray and hemorrhaging slightly. (**d**) Histopathological appearance of the tumor (HE). Histologically, the tumor was composed of neoplastic cells with faintly basophilic and abundant cytoplasms resembling serous acinic cells of the major salivary glands (bar, 200 μm). (**e**) Histological findings of the neoplastic cells (HE). The tumor was predominantly made up of a monotonous proliferation of cells resembling acinic cells with a finely granular cytoplasm. Some neoplastic cells had a clear cytoplasm. These two types of neoplastic cells were intermixed in some portions (bar, 50 μm). (**f**) Immunohistochemistry. Neoplastic cells are positive with anti-amylase (bar, 50 μm).

Table 1 Sources and dilutions of primary antibodies

Antibody to	Clone	Manufacturer	Dilution	Pretreatment	Results
ER	1D5	Dako, Glostrup, Denmark	1:100	Autoclave	–
PgR	PgR636	Dako, Glostrup, Denmark	1:400	Autoclave	–
Her2	PN2A	Dako, Glostrup, Denmark	1:50	Autoclave	–
CEA	II-7	Dako, Glostrup, Denmark	1:100	None	–
CK7	OV-TL 12/30	Dako, Glostrup, Denmark	1:100	Autoclave	+
CK20	Ks20.8	Dako, Glostrup, Denmark	1:50	Autoclave	–
Synaptophysin	SY38	Dako, Glostrup, Denmark	1:50	Autoclave	–
GCDFP-15	23A3	Japan Tarner, Tokyo, Japan	1:100	Autoclave	–
Cytokeratin	AE1/AE3	Dako, Glostrup, Denmark	1:200	None	+
S-100	Polyclonal	Dako, Glostrup, Denmark	1:200	None	–
Chromogranin A	Polyclonal	Dako, Glostrup, Denmark	1:100	None	–
P63	4A4	Dako, Glostrup, Denmark	1:50	Autoclave	–
Amylase	Polyclonal	Genetex, San Antonio, TX, USA	1:500	None	+
Lysozyme	Polyclonal	Dako, Glostrup, Denmark	1:1000	None	–
HMW cytokeratin	34βE12	Dako, Glostrup, Denmark	1:100	None	–

CK, cytokeratin; ER, estrogen receptor; GCDFP-15, gross cystic disease fluid protein-15; HMW, high molecular weight; PgR, progesterone receptor;

nuclei were dark, round, small and eccentrically situated and regular in size and shape. Some of them had a clear cytoplasm with similar nuclei. These two types of cells were intermixed in some portions (Fig. 1e), and in spite of extensive sampling, no ordinary invasive or *in situ* ductal carcinoma was identified. There were no abnormalities in the surrounding normal breast tissue. We performed immunohistochemical studies using the Envision detection system (Dako, Glostrup, Denmark) using 3–3′ diaminobenzidine as the chromogen. Table 1 lists the sources and the dilutions of primary antibodies used in the present study, with their results. Gross cystic disease fluid protein-15 (GCDFP-15; Japan Tarner, Tokyo, Japan), estrogen receptor (ER; Dako), progesterone receptor (PgR; Dako) and HER2 (Dako) were negative. However, no basal cell phenotype or myoepithelial differentiation was seen. With regard to the markers for salivary gland tumors, amylase (Genetex, San Antonio, TX, USA) was positive but lysozyme (Dako) was negative (Fig. 1f). As to cytokeratins, CK7 (Dako) and AE1/AE3 (Dako) were positive.

DISCUSSION

The first case of primary acinic cell carcinoma of the breast was reported in 1996.[1] Since then, only 10 cases have been reported in the English-language literature.[2–6] To the best of our knowledge, this is the first reported Japanese case of pure acinic cell carcinoma of the breast.

According to previous reports, all acinic cell carcinoma have occurred in women. Their ages ranged from 35 to 80 years, with the present patient being the oldest. The tumor sizes were 2–5 cm in diameter. Lymph node metastasis has been observed in three cases. The prognosis of mammary acinic cell carcinoma was generally reported to be favorable, although cases of recurrence and multiple distant metastasis exist. The present patient had no sentinel lymph node metastasis and remained well after conservative surgery.

The clinical images of the mammary acinic cell carcinoma are characterized by a well-defined mass. The differential diagnosis includes medullary carcinoma, intracystic carcinoma, and metaplastic carcinoma.

According to the previous reports, some cases of mammary acinic cell carcinoma lack a fibrous capsule and often infiltrate into the surrounding breast tissue. In the present patient the tumor was well demarcated and showed no infiltration into the surrounding tissue although no true fibrous capsule was formed. Some cases of mammary acinic cell carcinoma contained intraductal carcinoma with comedo-type necrosis, but no intraductal component was observed in the present patient.

As to the markers commonly expressed in breast malignancies, ER, PgR and HER2 were negative. These results generally agreed with those of previous reports on mammary acinic cell carcinoma. The immunohistochemistry suggests that mammary acinic cell carcinoma is different from the common mammary carcinoma in histogenesis. Recently, a cluster analysis based on gene expression pattern suggests that breast carcinoma is classified into three types: ER positive, HER2 positive and basal-like.[7] The latter group is characterized by the negative expression of ER, PgR and HER2, and positive expression of keratins that are more typical of myoepithelial cells or potential breast progenitor cells. However, the present acinic cell carcinoma lacked either 34βE12 (Dako) or myoepithelial marker p63 (Dako). The neoplastic cells were positive for amylase (Fig. 1f) but negative for lysozyme. In the previously published reports, almost all the cases were positive for amylase and lysozyme. In ordinary breast carcinoma, tumor cells were negative for anti-amylase antibody. These results suggest that acinic cell differentiation does occur in breast carcinomas. Cytokeratins 7 and 20 have been used for the differential diagnosis of various adenocarcinomas. The present tumor had a CK7+/CK20– pattern. However, CK7 and CK20 are not useful for differentiating mammary from salivary acinic cell carcinoma because 80–90% of mammary carcinomas and all salivary acinic cell carcinomas have a CK7+/CK20– pattern.[8,9] Further studies are needed to elucidate the histogenesis of the mammary acinic cell carcinoma.

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