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Papillotubular carcinoma with an invasive micropapillary carcinoma component of the breast, characterized by a rapid increase in size due to intra-tumoral hemorrhage: A case report

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ABSTRACT

INTRODUCTION: Rapidly enlarging mammary tumors, including invasive breast tumors, are clinically rare. Invasive micropapillary carcinoma (IMPC) of the breast is known to have aggressive behavior and poor clinical course compared to invasive ductal carcinoma.
CASE PRESENTATION: An 87-year-old woman presented with a rapidly enlarging tumor of the right breast over the course of 3 weeks. Ultrasonography and computed tomography of the chest revealed a giant tumor located on the right chest wall, with heterogeneous parenchymal components and several cystic lesions. Emergency mastectomy was performed because of rapid tumor enlargement complicated by hemorrhage. Histopathological diagnosis confirmed a papillotubular invasive ductal carcinoma with an IMPC component. Tumor cells were negative for estrogen and progesterone receptors, and the human epidermal growth factor receptor 2 score was 2+.
DISCUSSION: There has been only one report of breast carcinoma with rapid enlargement caused by spontaneous intratumoral hemorrhage to date. IMPC is associated with a high incidence of axillary lymph node metastases, frequent local recurrence, and a poor clinical outcome. In the present case, the specific breast cancer type can be considered as potential factors responsible for hemorrhage induction within the tumor that further enhanced rapid tumor growth.
CONCLUSION: IMPC is a rare, clinically aggressive variant of invasive ductal carcinoma. Owing to its aggressive clinical behaviors, surgeons should readily recognize the morphology of IMPC.

1. Introduction

Rapidly enlarging mammary tumors are rare, and there has been only one report of breast carcinoma associated with rapid enlargement due to intratumoral hemorrhage to date [1]. Invasive micropapillary carcinoma (IMPC) and carcinoma with micropapillary carcinoma component, initially described by Fisher et al. in 1980 [2], is known to have a higher rate of lympho-vascular invasion, high nuclear grade, and a propensity for locoregional recurrence compared to invasive ductal carcinoma [3]. We herein present a case of papillotubular invasive ductal carcinoma with an IMPC component that showed a rapid increase in size due to intra-tumoral hemorrhage.

This work has been written in accordance with the SCARE criteria [4].

2. Case presentation

An 87-year-old woman presented with a rapidly enlarging tumor of the right breast over the course of a few weeks. Her past medical history was significant for hyperlipidemia, but she had no history of malignancy or thoracic injury. Before three weeks ago she did not realize the breast tumor at all, and she had used no drugs with anticoagulants or anti-platelets. Physical examination showed a tumor in the outer area of the right breast, measuring approximately 10 × 10 cm (Fig. 1). Laboratory data revealed mild anemia (hemoglobin level 10.3 g/dL), and elevated levels of carcinoembryonic antigen (8.0 ng/mL) and carbohydrate antigen 15-3 (40.9 U/mL). Ultrasonography showed a 15 × 12 cm tumor consisting of solid and cystic components with polygonal and well defined

Abbreviations: IMPC, invasive micropapillary carcinoma; ER, Estrogen receptor; PgR, progesterone receptor; HER2, human epidermal growth factor receptor 2; IDC, invasive ductal carcinoma.

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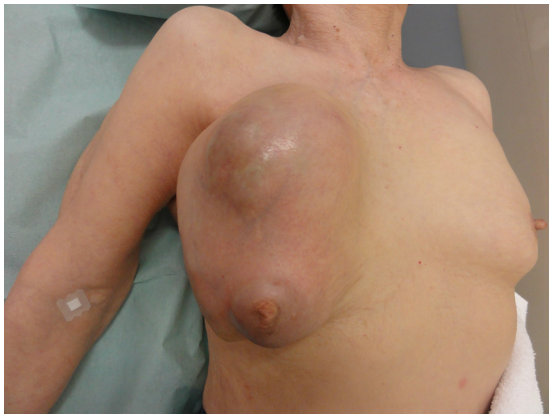

Fig. 1. A tumor measuring 10 × 10 cm located in the lateral upper quadrant of the right breast.

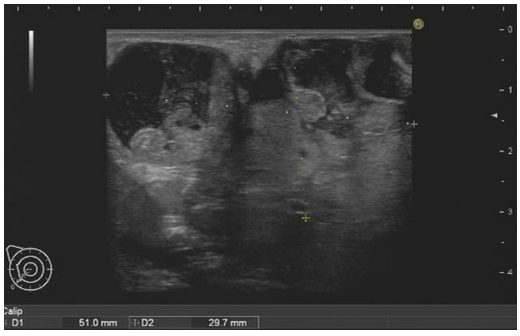

Fig. 2. Ultrasonography of the right breast showing a tumor intermingled with heterogeneous parenchymal parts and several cystic lesions.

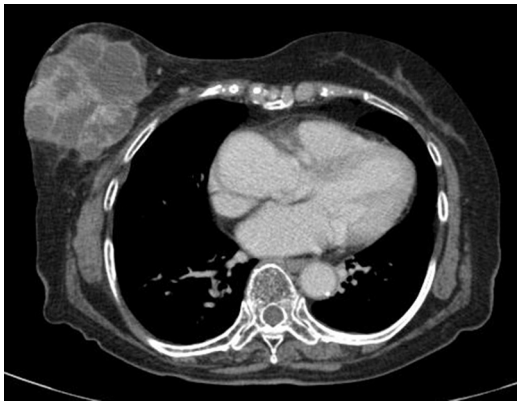

Fig. 3. Computed tomography of the chest showing a giant tumor consisting of heterogeneous parenchymal parts and several cystic lesions.

but rough borders (Fig. 2). Parenchymal components showed mixed ecogenicity. Cystic lesion showed a fluid–fluid level, suspicious of intracystic hemorrhage. Enlarged axillary lymph node was not identified. Mammography was not performed because of the size of tumor and suspicion of intratumor hemorrhage. Computed tomography of the chest revealed a giant tumor located on the right chest wall, with heterogeneous parenchymal components and several cystic lesions (Fig. 3). Fine-needle aspiration of the cystic lesion was performed, and 300 mL of old blood was drained. Core needle biopsy of the tumor was performed, but the specimen showed no malignant findings. Four days later, urgent mastectomy was performed because of rapid tumor enlargement complicated by hemorrhage. Fascia of pectoralis major was removed with the tumor, and lymph node dissection was not performed because of

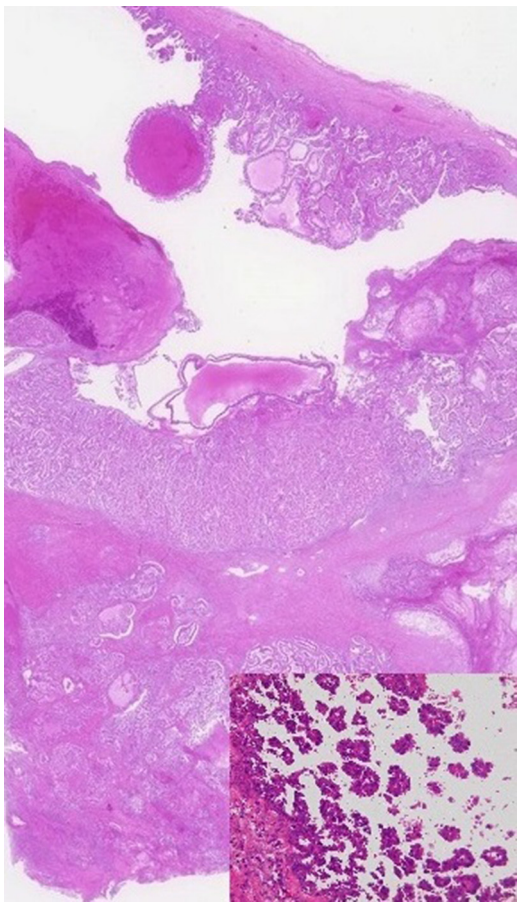

Fig. 4. The histopathological specimen showing mucus production and hemorrhage in the cyst lumen and around the alveolar structures. The inset image shows the micropapillary components consisting of small, free clusters of tumor cells in the lumen.

no lymph node swelling. The skin was directly sutured because it had sufficient extensibility.

Macroscopically, the tumor was 14 × 12 × 6 cm in size, and consisted of a combination of solid lesions and multi-lobulated cysts. Microscopical examination revealed mucus production and hemorrhage in the cyst lumen and around the alveolar structures. The tumor cells were growing in cribriform, tubular, papillary, and solid alveolar patterns. In some parts of the lumen, micropapillary components consisting of small, free clusters of tumor cells were observed (Fig. 4). Histopathological diagnosis confirmed an invasive ductal carcinoma composed of a papillotubular carcinoma with an IMPC component. The margin of the resected specimen was free from cancer cells, and no filtration was observed with the fascia. Tumor cells were negative for the estrogen receptor (ER) and progesterone receptor (PgR), and the human epidermal growth factor receptor 2 (HER2) score was 2+. Ki-67 proliferation index was 22%. The patient's postoperative course was uneventful and she was discharged on the eighth postoperative day. She refused all adjuvant treatments with hormone therapy and radiation therapy. Ten months later, right axillary lymph node swelling was found, and she was underwent lymph node dissection. She has remained free from relapse for one year after the second operation.

3. Discussion

A rapidly enlarging breast tumor is clinically rare, and more likely to be a phyllodes tumor rather than a breast carcinoma. There has been only one reports of breast carcinoma with rapid enlarge-

ment caused by spontaneous intratumoral hemorrhage to date[1], except for bleeding due to trauma.

IMPC is a distinct histological sub-type of breast carcinoma that was initially described by Fisher et al. [2] in 1980. Morphologically, this tumor is characterized by delicate pseudopapillary structures that lack fibrovascular cores and float freely in empty, clear spaces formed by a stromal, fibrocollagenous, sponge-like network—a pattern that mimics extensive lymphatic permeation [5]. IMPC is associated with a high incidence of axillary lymph node metastases, frequent local recurrence, and a poor clinical outcome [6]. Shi et al. reported that overall survival and recurrence free survival were poorer in the IMPC group than in the invasive ductal carcinoma(IDC) group [7], and Chen et al. found that IMPC patients have poorer recurrence-free survival and loco-regional recurrence-free survival than IDC patients [8].

Pathologically, a pure IMPC is rare, and the amount of micropapillary architecture in a tumor required for the diagnosis of IMPC has not yet been well established [9]. The 2003 World Health Organization classification of breast tumors listed IMPC as a subtype of invasive carcinoma; however, no specific percentage of the IMPC component within the breast tumor has been proposed as a criterion for the IMPC diagnosis [6,10].

Breast cancer has been characterized by 5 intrinsic molecular subtypes (luminal A, luminal B, HER2-enriched, Basal, and Normal-like) [11]. Generally, ER and PgR positive status is associated with an improved differentiation of tumors and improved clinical outcome [9]. HER2 over-expression is known to have a poor prognosis in breast tumors [12]. Although IMPC has an aggressive behavior, many studies have reported that IMPC is characterized by higher rates of ER and PgR expression compared to other breast cancer types [6–10]. However, this is controversial as other reports have mentioned a low rate of ER expression in IMPC [13]. In our case, the tumor was negative for the ER and PgR receptors, and positive for HER2. Although our case was different from more frequent IMPC intrinsic type, the examined tumor had an aggressive behavior as it was HER2-enriched. The exact etiology of intratumoral hemorrhage is unknown, but the malignant behavior of the IMPC component is considered to be the cause of a rapid tumor growth that is enhanced by hemorrhage with in the tumor.

4. Conclusion

Rapidly enlarging breast tumors are clinically rare, and only one case of breast carcinoma with rapid enlargement caused by intratumoral hemorrhage has been reported to date. IMPC is known to have an aggressive behavior compared to invasive ductal carcinoma. This type of malignancy may have caused a rapid tumor growth due to hemorrhage in our case. Owing to the aggressive clinical behaviors of IMPC, in addition to pathologists, surgeons should also be able to directly recognize the morphology of IMPC; in this way, treatment will be provided in an earlier disease stage.

Conflict of interest

There are no conflicts of interest to declare.

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Ethical approval

Our institution does not require ethical approval for a case report that are deidentified and collected retrospectively.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images.

Author contribution

Motonobu Watanabe contributed to operation and writing the manuscript.

Ryota Matsuoka contributed to histological examination.

Yukako Ichimura, Toshiro Takagaki, and Yasushi Iitsuka reviewed the work.

Registration of research studies

This is a case report, and no database approval was applied.

Guarantor

Motonobu Watanabe.

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