

Case Report

Breast cancer metastasis to the contralateral neck 22 years remote from initial diagnosis: a case report

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Abstract: In this paper, we reported a case of an 84-year-old woman with a right neck (a huge solid and cystic mass) metastasis of the left breast, after more than 22 years following her initial breast cancer diagnosis. After surgical operation, the patient recovered well. This case represents the longest interval between primary breast cancer and neck recurrence in the literatures to date. Regardless of the rare occurrence of metastatic lesions to the right neck 22 years far from the radical mastectomy (left side), the tumor metastasis way should be taken into consideration. For this exceedingly rare case, it requires further studies of mechanisms, and early diagnosis and treatment of this kind metastatic breast cancer. The case report is as followed.

Keywords: Breast cancer, metastasis, recurrence

Introduction

Breast cancer is one of the most common malignant tumors in women and its incidence has been increasing steadily, accounting for around 29% of all new cases of cancer in women [1]. Approximately 19% of cancers in Chinese women are breast cancers [2]. The greatest harm to patients of breast cancer is metastasis. Breast cancer metastasis can present in any organ, mainly bones, lungs, liver, adrenal glands and pleura. Breast cancer metastasis to the contralateral supraclavicular area is extremely rare, and few patients experience metastasis more than 20 years after surgery. We reported a patient who was suspected having thyroid neoplasm before surgery, underwent thylectomy, and diagnosed with breast cancer metastasis.

Case presentation

An 84-year-old woman came to the Department of General Surgery, which hospital, with a complaint of swelling on the right side of the neck for 8 months. The swelling was gradually increasing in size, and there were no other subjective symptoms. The patient had been diag-

nosed with estrogen receptor and progesterone receptor positive breast cancer in her left breast 22 years ago, and had undergone mastectomy and axillary lymph node dissection, followed by adjuvant chemotherapy (doxorubicin for four cycles, followed by cyclophosphamide, methotrexate, and 5-fluorouracil for six cycles). Due to economic difficulty, a 10 mg oral citric acid hydrochloric acid tamoxifen tablet was taken twice per day for more five years. She had no evidence of metastatic disease for nearly 22 years. The huge swelling was present on the right side of the neck, measuring about 90×80 mm in size, which was smooth, soft, and had no tenderness. Moreover, borders of swelling were clear. The mass moved up and down with swallowing. Computed tomograph (CT) showed a huge cystic and solid mass on the right side of the neck (**Figure 1**). The ultrasound showed that the right thyroid was obviously cystic degeneration with the exudation or bleeding of the capsule, and the mass was considered a nodular goiter (the right side). It could not rule out other properties of the lesions. The tumor marker carcinoembryonic antigen (CEA), CA15-3 and NCC-ST439 were within normal limits. After a thorough clinical examination, no swelling was found in the breast, and no metastatic

Breast cancer metastasis to the contralateral neck



Figure 1. Computed tomograph (CT) imaging showing a huge cystic and solid mass in the right neck.

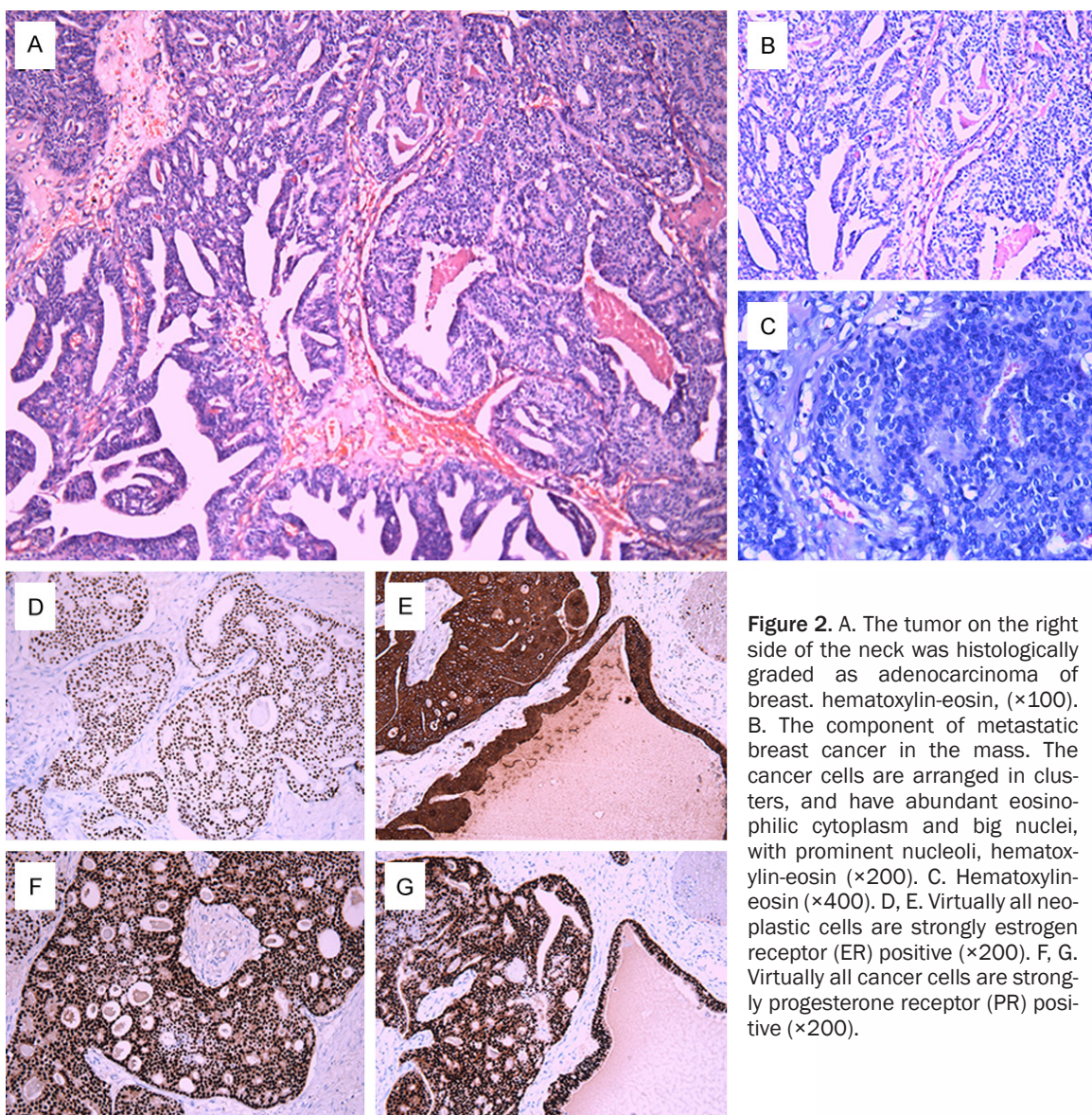


Figure 2. A. The tumor on the right side of the neck was histologically graded as adenocarcinoma of breast. hematoxylin-eosin, ($\times 100$). B. The component of metastatic breast cancer in the mass. The cancer cells are arranged in clusters, and have abundant eosinophilic cytoplasm and big nuclei, with prominent nucleoli, hematoxylin-eosin ($\times 200$). C. Hematoxylin-eosin ($\times 400$). D, E. Virtually all neoplastic cells are strongly estrogen receptor (ER) positive ($\times 200$). F, G. Virtually all cancer cells are strongly progesterone receptor (PR) positive ($\times 200$).

lesions were found in axillary and subclavian lymph nodes. With a preoperative diagnosis of

suspected thyroid tumor, surgery was performed.

During the surgery, the tumor was completely removed. The tumor was 90×80 mm in diameter, and envelop of the tumor was complete. Immunohistostaining revealed that the cells were CK7(+), CK20(-), ER(+), PR(+), AE1/AE3(+), EMA(+), S-100(+), CD56(-), Syn(-), CgA(-), TTF-1-, C-erbB-2(0), Ki-67(+, 1-3%) and p53(-). Histopathological sections revealed poorly differentiated adenocarcinoma. Final pathology showed metastatic carcinoma, similar to previous breast cancer with positive estrogen receptor and progesterone receptor immunostaining (**Figure 2**).

After surgical excision of metastasis, the patient recovered well. Further endocrine therapy and chemotherapy after surgery were not conducted, which was due to economic reasons, and not from our original intention. The patient was free of disease for more than 18 months.

Discussion

Breast cancer continues to pose a tremendous disease burden, as both the most common malignancy and the most common cause of cancer death in women worldly today. The breast cancer can metastasize anywhere in the body, primarily to the local lymph nodes, bones, lungs, and liver [3, 4]. Although breast cancer metastasis to the neck is common, the tumor metastasis to the contralateral neck, 22 years after initial diagnosis is exceedingly rare. To our knowledge, this is the first case of contralateral neck metastasis from breast cancer. In addition, the patient survived well after cervical mass resection, indicating that the neck mass dissection was timely and effective for neck metastases in breast cancer.

Breast cancer usually recurs within 5 years after surgery, and the frequency of recurrence begins to decrease in the 10th postoperative year. Takeuchi *et al.* reported that only 12 (4.4%) of the 284 patients had recurrence more than 10 years after surgery [5]. Recurrence occurs much less frequently twenty or more years after surgery. Hasegawa *et al.* reported a recurrence rate of only 0.1% [6]. Ipsilateral, late, characteristically, locoregional recurrence (such as metastasis to the supraclavicular lymph nodes, axillary lymph nodes, or ipsilateral chest wall) accounts for the majority (74%) of all recurrences, and distant metastasis

accounts for a small proportion of all recurrences [6]. Takeuchi *et al.* reported that lymph node metastases were found at the initial surgery in 10 of 12 patients with late recurrence [5], indicating that lymph node metastasis at the initial presentation of breast cancer is closely associated with late recurrence. In this case, the supraclavicular mass with pathology of breast metastatic carcinoma is similar to the initial lesion, illustrating the recurrence of previous tumor. This is the first case of contralateral neck recurrence from breast cancer, 22 years after initial diagnosis.

Supraclavicular metastasis of breast cancer is rare (2.3-4.3%) [7, 8] and can occur months to years after diagnosis of the primary tumor [9]. Lymph drains from the breast by three principal routes: axillary, transpectoral, and internal mammary pathways [10]. The lymph vessels from medial breast tissue perforate the pectoral and intercostal muscles and enter the internal mammary lymph nodes. The skin, nipple, and lactiferous tubules drain into a subareolar plexus and on to the axillary nodes, but the plexus can be bypassed directly to the axilla [11]. From the axilla, the lymphatics travel along the axillary and subclavian vein and into the jugulosubclavian confluence. Most first relapses occurred in the supraclavicular lymph nodes, followed by the areas in the subclavicular and axilla, among the pectoralis and beside the sternum. The survival rate of breast carcinoma patients with supraclavicular lymph node metastasis at five years was about 20-33.6% [9, 10]. Kocic B *et al.* reported that breast carcinoma patients with supraclavicular lymph node metastases account for about 8% when they are diagnosed [12], while 3-8.7% of patients complicated with axillary lymph node metastasis develop supraclavicular lymph node metastases within five years after surgery [13-15]. Yu *et al.* reported that skipping metastasis of the supraclavicular lymph nodes was observed in 3.8% of patients [16]. Chen *et al.* reported that patients without supraclavicular lymph node metastasis underwent resection, 13% of patients among them were found with recessive metastasis, demonstrating that supraclavicular lymph node metastasis frequently occurred in breast carcinoma and operative recurrence, but its occurrence is a sign of advanced cancer stage. Previously enlargement of the supraclavicular lymph nodes was considered as retro-

grade metastasis, as supraclavicular lymph nodes belong to the profound neck group, and additionally their lymphatic output tubes and subclavian lymphatic output tubes flow into thoracic or right lymphatic ducts which converge into veins. Recently it has been discovered that output tubes of internal mammary lymph nodes and subclavian lymph nodes as well as upper lymph vessels in the breast converge into the supraclavicular lymph nodes; therefore, the lymph node metastasis has been identified as N3 instead of distant metastasis, but it belongs to the late clinical stage [17-19]. Furthermore, other studies have indicated that tumor cells may induce lymphangiogenesis, some form of lymphatic sprouting, or hyperplasia in close proximity to the periphery of the tumors [20]. It may form a new way of metastasis from breast to supraclavicular nodes. For ipsilateral supraclavicular lymph metastasis of breast cancer, retrograde metastasis of neck lymph nodes may be taken into account to explain its occurrence. However, contralateral neck metastasis of breast cancer reported in this case is exceedingly rare. the mechanism remains unclear giving hints on a new route of breast cancer metastasis.

In the present case, the metastatic breast cancer in the single lymph has similar features to the thyroid tumor or other metastatic tumor. It is important to distinguish between metastatic cancer to select the optimal management and to determine their prognosis. Breast cancer patients managed by radical mastectomy are also at risk for delayed recurrence at distant metastatic sites. For these postoperative patients with neck masses, the possibility of breast cancer recurrence should be first took into consideration. For this case, the neck mass resection and supraclavicular lymph nodes dissection should be performed as soon as possible, to avoid the hematogenous metastasis of cancer cells through the right lymphatic duct and loss of optimal surgical opportunity. Chen *et al.* [17] reported that the 5-year overall survival after supraclavicular lymph node metastasis, distant metastasis, and local relapse, were 33.6%, 9.1% and 34.9%, respectively. In this case, further chemotherapy and radiotherapy after the operation were not conducted, because the patient refused radiotherapy, chemotherapy, or targeted therapy. The duration of surveillance for breast cancer in remission is

controversial. This case report cited here supports long term, even indefinite follow-up, with hopes of finding metastatic disease as early as possible. For this exceedingly rare case, early diagnosis and treatment are required. Additionally, surgical resection achieves good local control for these patients with supraclavicular metastasis.

Conclusion

Breast cancer metastasis to the contralateral neck 22 years remote from initial diagnosis is quite rare. They usually present with symptoms similar to thyroid mass, causing a delayed diagnosis and treatment. Careful examination is required. The neck mass dissection should be timely and effective for neck metastases in breast cancer.

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Disclosure of conflict of interest

None.

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