

# Breast Cancer Combined with Contralateral Neck Lymph Node Metastasis. Case Report

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## Case Report

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# Abstract

**Background:** Contralateral neck lymph node metastasis is rare for primary breast cancer. Its clinical stage and treatment principles are lack of authoritative guidelines. A 30-year-old breast cancer patient with contralateral neck lymph node metastasis is presented. The clinical treatment is discussed combined with current research.

**Case presentation:** A 30-year-old woman presented with a right breast mass for 5 months and left neck lymph node enlargement for 5 days. The mammography showed a 33mm\*14.3mm mass in the inner quadrant of right breast. The ultrasound showed several hypoechoic nodules on the left side of the neck. Rapid intraoperative pathological examination diagnosed right breast malignant tumor and poorly differentiated carcinoma of the left cervical lymph nodes. Then the right mastectomy was performed immediately. The patient was scheduled to administer chemotherapy, molecular targeted therapy, radiotherapy and endocrinotherapy after operation. The long-term efficacy remains to be seen.

**Conclusion:** The infrequent presentation of breast cancer with metastasis to the contralateral neck lymph node can be challenged for standard therapies.

## Background

Breast cancer is the commonest malignant tumor among women. The regional lymph nodes of breast cancer refer to the axillary, supraclavicular, infraclavicular and intramammary lymph nodes on the affected side [1, 2]. The contralateral neck lymph nodes are obviously beyond the category of the regional lymph nodes, which could be considered as distant metastasis, belonging to stage IV. The exact drainage pathway of such metastasis is still controversial. Contralateral neck lymph node metastasis is rare for primary breast cancer and its clinical stage and treatment principles are lack of authoritative guidelines. At present, domestic scholars have no consensus on whether cervical lymph node dissection should be performed at the same time as radical mastectomy for such patients. The patients with distant lymph node metastasis were once considered as surgical contraindication [3]. But according to Hong Pan et al. [4], patients with distant lymph node metastases (DLNM) had similar breast cancer-specific survival (BCSS) and overall survival (OS) with patients with ipsilateral supraclavicular lymph node metastases (ISLM) and locoregional therapies were significantly associated with improved overall survival for patients with DLNM. We herein present a case of breast cancer with contralateral neck lymph node metastasis of a 30-year-old woman, exhibit its clinical, morphological, pathological and immunohistochemical characteristics and discuss its treatment combined with current research.

## Case Presentation

A 30-year-old woman was admitted to department of breast and thyroid surgery, third Xiangya hospital affiliated to central south university (hereinafter referred to as our hospital) on December 10th, 2020. The complaint was a right breast mass for 5 months and left neck lymph node enlargement for 5 days. The

patient presented a right breast mass with the size of an egg without pain or other discomfort 5 months ago which was not treated and had not been significantly enlarged. The lymph node of left neck was found 5 days ago and there was no pain or discomfort. Ultrasonography revealed hypoechoic nodules in her left neck which was considered to be lymphadenoid tissue lesion. The patient was admitted to our hospital for further diagnosis and treatment.

Physical examination: the vital signs were normal; the neck was soft; the jugular veins were not inflated; the trachea was in the middle and the thyroid was not enlarged. There were two palpable hard and enlarged lymph nodes about 1.5cm\*1.0cm in size in the left neck, which showed poor activity. The appearance of both breasts was normal and no "orange peel" appearance and "dimple sign" were observed on the skin. A 3.0cm\*2.5cm hard mass was palpable in the right breast which was irregular in shape, unclear in border, poor in motion and without tenderness. There was no palpable mass in the left breast. Bilateral axillary lymph nodes were not enlarged.

Laboratory examinations: blood routine test, liver and kidney function, tumor markers and thyroid function were normal. Ultrasound of breast showed a hypoechoic nodule about 29mm\*20mm\*29mm in size in the right breast (BR-4a). Ultrasound of the neck showed no obvious abnormal sonography of the thyroid gland. Several hypoechoic nodules on the left side of the neck were found, among which two nodules without lymphatic hilums were located in cervical area III, with sizes of 20mm\*6mm and 17mm\*9mm respectively. Ultrasonography of supraclavicular lymph nodes showed no obvious swelling. The mammography showed a 33mm\*14.3mm slightly dense mass in the inner quadrant of the right breast with fine spotty calcification (BR-4c). MRI showed a mass of 28.8mm\*23.5mm\*28.9mm in the upper inner quadrant of the right breast (BR-5) and multiple lymph nodes in the right axilla. PET-CT (Fig. 1) showed: two nodules with increased glucose metabolism were detected in the left chest wall of the manubrium which were considered as metastases; several small lymph nodes in the left neck (region IV) accompanied by abnormal increase in glucose metabolism were considered to be multiple lymph node metastases. The diagnoses were: 1. right breast carcinoma; 2. lymph nodes metastatic carcinoma of the left neck.

The preoperative preparation was completed after admission and the biopsy of the excised right breast mass as well as the left cervical lymph nodes was carried out. Rapid intraoperative pathological examination diagnosed right breast malignant tumor and poorly differentiated carcinoma of the left cervical lymph nodes. Then the right mastectomy and the sentinel lymph node biopsy of the right axilla were performed immediately. Rapid intraoperative pathological examination confirmed that there was no tumor metastasis in the right sentinel lymph node, so that right axillary lymph node dissection was not performed. Postoperative pathology report (Fig. 2) showed: grade III invasive ductal carcinoma of right breast and isolated tumor cells were found at the extracapsular vessel of one lymph node in group 1 of sentinel lymph node (the number of tumor cells was less than 200). No cancer metastasis was found in group 2, 3 and 4 sentinel lymph nodes (0/3). Left neck lymph node carcinoma presented metastases (2/2). No certain intravascular cancer embolus was found. Immunohistochemical examination showed ER (40%+), PR (5%+), Her-2 (3+), Ki67 (40%) of the breast tumor cells and the carcinoma cells of the left

cervical lymph node were ER (70%+), PR (20%+), Her-2 (3+), Ki67 (40%). The patient was scheduled to administer chemotherapy, molecular targeted therapy, radiotherapy and endocrinotherapy after operation.

## Discussion

### **Anatomical basis and staging of breast cancer with contralateral neck lymph node metastasis.**

Breast cancer with contralateral neck lymph node metastasis is very rare, and the exact drainage pathway is still controversial. The possible pathways reported in the literatures include: 1. drainage to the posterior intercostal lymph nodes near the rib head through the cutaneous branch of intercostal vessels, and then to the thoracic duct [5, 6]; 2. skip metastasis to the contralateral axillary lymph nodes through subcutaneous lymphatic vessels in front of the sternum, through deep lymphatic vessels under thoracic fascia, or through substernal lymphatic vessels [7, 8]. The possibility of occult breast cancer (OBC) should be excluded while skip metastasis of breast cancer is considered. OBC should be screened through ultrasound, mammography, MRI and even PET-CT. Final diagnosis still depends on pathological and immunohistochemical diagnosis of metastatic tumor. Although the incidence of breast cancer with contralateral cervical lymph node metastasis is relatively low, breast cancer is still considered as one of the most common primary malignant tumors to metastasize to cervical lymph node [5, 9].

According to American Joint Committee on Cancer (AJCC)(Eighth Edition) and Guidelines and Norms for Breast Cancer Diagnosis and Treatment of Chinese Anti-Cancer Association (2019 Edition)[1, 2], regional lymph nodes refer to the axillary, supraclavicular/ infraclavicular and intramammary lymph nodes on the affected side. The contralateral cervical lymph nodes are obviously beyond the category of regional lymph nodes and the metastatic carcinoma of contralateral lymph nodes could be considered distant metastasis, belonging to stage IV.

### **Treatment of breast cancer with contralateral neck lymph node metastasis**

Breast cancer combined with contralateral neck lymph node metastasis is clinically advanced stage and was once considered as surgical contraindication [3] because of its high rate of blood metastasis to distant organs, which is the main cause of postoperative death [10]. At present, domestic scholars have no consensus on whether cervical lymph node dissection should be performed at the same time as radical mastectomy for such patients. Zhang Dianzhong et al. [10] believed indications for cervical lymph node dissection for breast cancer included: feasible local surgical treatment of breast cancer; no distant organ metastasis;intraoperative axillary lymph node metastasis but the axillary vein was not involved; no postoperative residual and good cervical lymph node activity without fixed fusion.

Hu Ming [11] and Nie Mengliang [12] et al. believed that the existence of primary lesions was undoubtedly the root cause of distant metastasis and increased the probability of further metastasis. Therefore, surgical treatment of a certain range should be performed as early as possible, which could reduce the tumor load and conduce to better therapeutic effects of radiotherapy and chemotherapy [11, 12]. The guidelines for diagnosis and treatment published by National Comprehensive Cancer Network (NCCN)

[13] point out that for stage  $\geq$  breast cancer patients, appropriate systemic treatment should be performed according to their molecular types. And the efficacy and opportunity of surgical resection of primary tumors are still being studied and individual plans are necessary. For some patients who respond well to initial treatment, local treatment such as breast operation and/or radiotherapy may be considered.

Standard electrochemotherapy (ECT) has proven to be an effective treatment of solid tumors. A literature [14] reported that lower electric field strength (LVHF ECT) and bleomycin therapies applied to recurrent breast cancer patients with neck lymph node metastasis had shown successful results of local control of metastatic lymph nodes and reduction of their size, avoiding secondary surgery and reducing the adverse reactions of standard ECT. Its good efficacy, safety and tolerability make it a new treatment option for this breast cancer patients with neck lymph node metastasis, especially for patients who try to avoid secondary neck lymph nodes dissection after radical mastectomy.

## Conclusions

The neck lymph nodes of the patient in this case were removed during the operation. Due to the lack of intraoperatively immunohistochemical diagnosis, it was not certain whether the neck metastasis was from the breast. Cervical lymph node dissection was not performed immediately. Postoperative immunohistochemical results indicated that the left neck lymph node metastasis of the patient originated from breast cancer and mammography, ultrasound, MRI and PET-CT showed no suspicious images in the left breast. Therefore, the possibility of occult breast cancer in the left breast was temporarily ruled out. In this case, only one right sentinel lymph node was found isolated tumor cells micrometastasis and no metastases were observed in the right axillary lymph node, supraclavicular lymph node and contralateral axillary lymph node. The contralateral cervical lymph node metastasis was considered as skip metastasis, which might be caused by metastasis to the contralateral area through subcutaneous lymphatic circulation or bypass lymphatic drainage pathways in the right breast. There is no evidence of evidence-based medicine to support whether the patient should undergo left neck lymph node dissection again. At present, the patient has been given adjuvant systemic chemotherapy, bi-target therapy, regional radiotherapy and endocrine therapy. The long-term efficacy remains to be observed.

## Abbreviations

DLNM

distant lymph node metastases

## Declarations

### Ethics approval and consent to participate

The need for ethics approval and consent was waived, since a consent for publication was obtained from the patient.

## Consent for publication

Written informed consent for publication of the clinical details and/or clinical images was obtained from the patient. A copy of the consent form is available for review by the Editor of this journal.

## Availability of data and materials

All data generated or analyzed during this case are included within the article.

## Competing interests

The authors declare that they have no conflicts of interests.

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## Authors' contributions

Xiaoxiao Zhong and Fengjiao Ding draft the manuscript and assisted with clinical data collection and interpretation. Boni Ding and Liyuan Qian performed surgery and participated in the revised version. Wei Wu and Yanguang Wen contributed to the physical examination, pathological examination and diagnoses. All the authors read and approved the final manuscript.

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Not applicable.

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## Figures

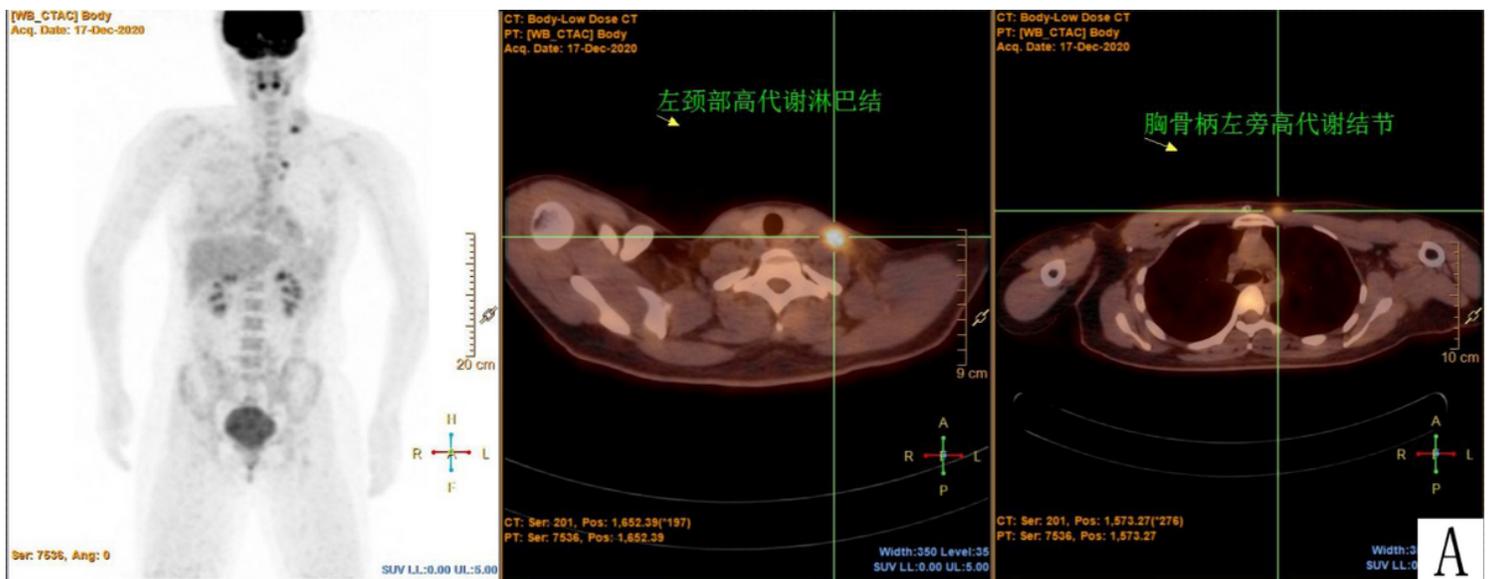


Figure 1

Whole body PET-CT: There are high metabolic lymph nodes in the left neck and high metabolic nodules on the left side of the sternum stem.



## Figure 2

Surgery pathological section of right breast (HE stain  $\times 200$ ): invasive ductal carcinoma, grade III, no clear intravascular tumor thrombus was seen (A: Well differentiated; B: Poorly differentiated). Pathological section of left neck lymph node surgery (C: HE stain  $\times 100$ ; D: HE stain  $\times 200$ ): cancer metastasis can be seen.

## Supplementary Files

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