Hormone-Negative, Her2-Positive Male Breast Cancer with a Poor Prognosis: A Case Report

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Abstract
We experienced a case of HER2-positive male breast cancer with a poor prognosis. A 64-year-old man visited our hospital due to general malaise, a left breast mass, and neck edema. The patient was diagnosed with HER2-positive breast cancer after needle histology. Weekly paclitaxel and trastuzumab therapy was started. However, the patient experienced lightheadedness and dizziness, and developed brain metastasis. After whole-brain irradiation, the condition worsened, and the patient died. HER2 type male breast cancer has a poor prognosis. There are many cases that are difficult to diagnose, but it is necessary to take immediate measures such as treatment decisions.

Keywords
Male breast cancer, HER2 type

Abbreviations
HER2: Human Epithelial Growth Factor Receptor Type 2; MBC: Male Breast Cancer; CT: Computer Tomography; FDG-PET: Fluorodeoxyglucose-Positron Emission Tomography; CEA: Carcinoembryonic Antigen; CA15-3: Cancer Antigen 15-3; BRCA: Breast Cancer Susceptibility Gene; PARP: Poly ADP-Ribose Polymerase

Introduction
Male breast cancer (MBC) is rare, accounting for 0.5-1.0% of all breast cancer cases, and is mostly hormone-dependent luminal type. The proportion of HER2 type of hormone-negative and HER2-positive cancer is extremely rare among patients with MBC (0.6-1.2%) and the prognosis is reportedly poor in many patients (1-4). We here in report our experience with a case of advanced hormone-negative, HER2-positive MBC.

Case
A 64-year-old man was referred from a local doctor for a left breast mass, left neck swelling and general malaise. The patient had a height of 162 cm and body weight of 64 kg. A mass with a size of 15 mm was observed in the left upper outer quadrant. Computed tomography (CT) revealed a mass with a size of 70 mm in the right thoracic cavity along with mediastinal lymph node (LN) enlargement, bilateral cervical LN enlargement, right axillary LN enlargement, and left breast mass (Figure 1 and Figure 2). Positron emission tomography with FDG showed accumulation of maximum standardized uptake value of 14 at sites consistent with the lesions on CT (Figure 3 and Figure 4). In the blood test, tumor markers were high (CEA, 22 ng/mL; CA 15-3, 125 U/mL). On the same day, after core needle biopsy, the patient was diagnosed with invasive ductal carcinoma (solid-tubular carcinoma; ER (-), PgR (-), HER2 (3+), nuclear grade III, ki-67 90% and T3N3M1 Stage IV). Although cerebellar metastasis was suspected on magnetic resonance imaging of the brain, we started weekly paclitaxel and trastuzumab therapy considering the possibility that treatment opportunity might be lost due to the worsened general condition. After completion of one cycle, dizziness and lightheadedness were reported. Thus, whole brain irradiation was performed with glycerol and steroid for the prevention of brain edema. However, the patient’s condition worsened, and he died approximately 3 months after the diagnosis.

Discussion
Male breast cancer is rare, accounting for 0.5-1.0% of all
Figure 1: Chest CT shows mediastinal lymphadenopathy (arrow).

Figure 2: Chest CT (sagittal cut) shows neck and mediastinal lymph nodes (arrows).

Figure 3: FDG-PET shows mediastinal lymphadenopathy with high SUV value (arrow).
are few reports of HER2-positive MBC and no data support the difference in treatment between men and women, it was considered appropriate to refer to such clinical studies in the present case.

Furthermore, genetic breast cancer accounts for 5-10% of breast cancer, and the proportion of BRCA mutation-positivity is reportedly higher in MBC than in female breast cancer [7,8]. BRCA mutation-positive patients are generally HER2 negative. It is believed that both HER2 loci are missing because they are close to the BRCA-1 gene. However, 8-10% of patients are reported to be HER2-positive [9]. Unlike anticancer drugs, PARP inhibitors [10], which can be currently used for patients with BRCA mutation-positive advanced cases, are relatively easy to use even in poor general condition. If there are not many alternative drugs to be used like in the present case, BRCA mutation testing could have been an option for us to consider their use. In addition, in the future, exploration of treatment with gene panel tests [11] will be included as one of the study items.

Conclusion

HER2 type male breast cancer has a poor prognosis. There are many cases that are difficult to diagnose, but it is necessary to take immediate measures such as treatment decisions.

Declarations

Availability of data and materials

All data generated or analyzed during this study are included in this published article.

Ethics approval and consent to participate

All procedures used in this research were approved by the Ethics Committee of Asahikawa Medical University.
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**Consent for publication**

Written informed consent was obtained from the patient for the publication of this case report and any accompanying images. A copy of the written consent form is available for review by the Editor-in-Chief of this journal.

**Competing interests**

The authors declare that they have no competing interests.

**Authors contribution**

MK have operated this case and analyzed all data. SY, MA, NY, SO, KI did the assistant of chemotherapy.

All authors read and approved the final manuscript.

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