

Successful Local Control With High-dose Palliative Radiation Therapy for Local Advanced Breast Cancer of Mucinous Carcinoma With Malignant Wound.

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Case report

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Abstract

Background: Patients with breast cancer who refuse standard treatment often suffer from malignant wounds due to the growth of local tumors. However, treatment strategies for patients with unresectable locally advanced breast cancer who have refused standard treatment have been unclear.

Case presentation: A 44-year-old female was diagnosed with breast cancer of mucinous carcinoma in the right breast. She refused standard treatment for her breast cancer for six years. She suddenly visited the emergency department because of acute bleeding from the right breast cancer with malignant wounds. Macroscopically, the tumor in the right breast measured over 20 cm in diameter. The tumor was exudative, exhibited ulceration and slight bleeding, and gave off an odor. Imaging findings showed multiple lymph node and bone metastases, and the final diagnosis was breast cancer of stage IV (cT4bN1M1). Although the surgeon recommended chemotherapy for the breast cancer, the patient refused to receive chemotherapy or other therapy due to concerns about complications during treatment. Considering the symptoms of advanced breast cancer with malignant wounds, she finally agreed to receive radiation therapy (RT). We performed RT of 70 Gy in 35 fractions over a period of 7 weeks. The tumor-associated symptoms were disappeared after RT. At three months after RT, the tumor had almost disappeared. We administered luteinizing hormone-releasing hormone agonists after RT. At two years after RT, she died due to multiple liver metastases and appearance of ascites; however, there was no disease progression in the right breast.

Conclusions: High-dose RT for local advanced breast cancer of MC with malignant wounds is therefore considered to be an effective therapeutic option.

Background

Patients with breast cancer have a high prevalence of malignant wounds. Malignant wounds occur with strong odors, bleeding, exudates or infections [1]. Systemic therapy, such as chemotherapy, is the first-line treatment for unresectable locally advanced breast cancer, but some patients refuse standard treatment for breast cancer [2–5]. Patients who refuse standard treatment often suffer from malignant wounds due to the growth of local tumors and their quality of life (QOL) is affected.

However, treatment strategies for patients with unresectable locally advanced breast cancer who have refused standard treatment have been unclear.

Case Presentation

Six years before presentation at our hospital, a 44-year-old female had a gradually growing tumor in her right breast. She was diagnosed with breast cancer in the right breast at a previous hospital. A core needle biopsy revealed mucinous carcinoma (MC), estrogen receptor-positive, progesterone receptor-positive, and human epidermal growth factor receptor 2-negative.

The patient had refused standard treatment for her breast cancer. she visited the emergency department of our hospital with the complaint of severe pain and acute bleeding from the right breast cancer six years after the initial diagnosis. She had 1500-2000 ml of exudation from the tumor per day and her weight loss was significant for a month. She had no medical history and no family history of breast cancer or ovary cancer. There was no history of drinking or smoking.

Macroscopically, the tumor in the right breast measured over 20 cm in diameter. The tumor was exudative, exhibited ulceration and slight bleeding, and gave off an odor (Fig. 1). A computed tomography (CT) scan revealed a huge mass in the right breast (Fig. 2). Metastasis of multiple lymph nodes was also observed, but there was no metastasis in the liver and lungs on CT. Bone scintigraphy showed uptake in some thoracic spines and ribs (Fig. 3). The final diagnosis was breast cancer, stage IV (cT4bN1M1).

Although the surgeon recommended standard therapy of chemotherapy for the breast cancer, the patient refused to receive chemotherapy due to concerns about complications during chemotherapy.

The patient initially refused radiation therapy (RT). We explained the risks after RT and the risks of tumor-associated symptoms such as pain, exudation, ulceration and bleeding, the patient finally agreed to receive RT. However, she didn't accept the hormone therapy before and during RT.

We performed RT of 70 Gy in 35 fractions over a period of 7 weeks. The patient received initial irradiation of 50 Gy in 25 fractions for the right breast without hormone therapy. The response of RT after 50 Gy was relatively good; however, the symptoms such as pain, exudative, exhibited ulceration and slight bleeding were remained. We therefore decided to add the boost. After the initial irradiation of 50 Gy, the patient received a sequential boost of 20 Gy in 10 fractions for the breast cancer (Fig. 4). RT was delivered with 6-10 megavoltage equipment via a multiple leaf collimator by three-dimensional RT. Gross tumor volume (GTV) was defined as the primary tumor without lymph node and bone metastases based on pretreatment examination by CT. The clinical target volume (CTV) was defined as GTV plus 0.5-cm margins. The planning target volume (PTV) was CTV plus 1.0-cm margins. According to the cumulative dose-volume histograms, the ipsilateral lung volume receiving more than 20 Gy was 15 %.

An acute side effect of grade 2 dermatitis according to the National Cancer Institute Common Terminology Criteria for Adverse Events version 4.0. occurred after RT, but there was no acute or late complication of more than grade 3. The tumor-associated symptoms such as pain, exudation, ulceration and bleeding were disappeared after RT. At one month after RT, the tumor regressed gradually and had almost disappeared three months after RT (Fig. 5). After improving the local tumor of the right breast, the patient agreed to receive hormone therapy. We could administer the luteinizing hormone-releasing hormone agonists. At two years after RT, she died due to metastatic lesions in liver and appearance of ascites; however, there was no symptom and disease progression in the right breast (Fig. 6).

Discussion And Conclusions

It has been reported that some patients with breast cancer may refuse recommended follow-up of tests or standard treatment. A retrospective study of 2694 women with breast cancer showed that 7.2% of the patients refused provider follow-up advice [3]. According to a retrospective review of the Surveillance Epidemiology and End Results (SEER) database between 2004 and 2013, the rate of surgery refusal was 0.64%. It was also suggested in that review that age, ethnicity, marital status, disease stage, and lack of insurance are associated with higher risk of refusal of surgery [2]. Although our patient did not refuse RT, Aizer et al. reported that 2113 (0.9 %) of 232,189 patients with malignancy refused RT despite recommendations by their physicians [4]. Considering these reports, it is notable that our unique point was that we were able to use RT for the patient despite the fact that the patient had refused standard therapy.

Patients with advanced breast cancer often have malignant wounds. Malignant wounds are associated with a symptomatic burden [1]. Palliative therapy, such as chemotherapy or low-dose radiation therapy, is performed for unresectable locally advanced breast cancer with malignant wounds [6]. Additionally, Mohs paste or intratumoral hydrogen peroxide with radiation therapy has been used for such patients with malignant wounds. Their use has become widespread for the primary purpose of improving QOL [7][8]. However, the efficacy of Mohs paste or intratumoral hydrogen peroxide for breast cancer is unclear.

The National Comprehensive Cancer Network guideline and previous reports recommend that a single fraction of 8–10 Gy or 20 Gy in 4–5 fractions for patients with poor performance status (PS), and 30 Gy in 10 fractions or 50 Gy in 25 fractions for patients with good PS [6][9][10]. On the other hand, some studies have suggested that aggressive local treatment is associated with improved survival [11][12].

In the present case, although local control itself was not a true endpoint for palliative treatment, we were able to achieve successful local control with high-dose RT of 70 Gy for local advanced breast cancer. It is not surprising that local advanced breast cancer is controlled by surgery or chemotherapy; however, there have been few reports on successful treatment with RT without surgery or chemotherapy. In addition, we think that low-dose radiation therapy less than 50 Gy and hormone therapy might achieve similar symptom palliation for the patient. However, it was difficult to use the hormone therapy in our case because the patient refused to receive hormone therapy before and during RT.

We described the effects of palliative radiation therapy alone on locally advanced breast cancer, but this degree of the effect of radiotherapy might be not rare in usual breast cancer. Nakamura et al. reported the outcome of the palliative radiation therapy for breast cancer patient with skin invasion[10]. On the other hand, the report doesn't recommend changing the radiation dose by pathological diagnosis. However, the pathology of the present case was probably associated with our outcome of local advanced breast cancer. The pathology in the present case showed that the breast cancer was MC. The incidence of MC is 1-6% of all breast malignancies. The prognosis of MC has been reported to be better than the other breast malignancies [13]. Pure MC is less likely than other types of invasive ductal carcinoma to spread to lymph nodes [14]. Our patient had less lymph node metastases despite the advanced stage. MC patients were reported to have high expression levels of hormone receptors and a low expression level of human

epidermal growth factor receptor 2 (HER2). Our patient with MC had high expression levels of hormone receptors and a low expression level of HER2. Adjuvant hormone therapy have prevented recurrence of the local breast cancer in our patient. In addition, the patient had a huge tumor of more than 20 cm in diameter in her right breast, but tumor size may not be a significant factor because mucin comprises most of the tumor volume [15].

Since this study was a case study, it is difficult to define the indication for local advanced breast cancer of MC with malignant wounds. Moreover, only the progress of two years could be observed in this patient. However, it is possible that patients with local advanced breast cancer of MC with malignant wounds were treated only by palliative surgery, chemotherapy or low-dose RT with hormone therapy despite being potential candidates for high dose RT. High dose RT for local advanced breast cancer of MC with malignant wounds is therefore considered to be an effective therapeutic option in refusal of standard therapy.

Abbreviations

CT: computed tomography

CTV: clinical target volume

GTV: gross tumor volume

HER2: human epidermal growth factor receptor 2

MC: Mucinous carcinoma

PTV: planning target volume

QOL: quality of life

RT: radiation therapy

Declarations

Ethics approval and consent to participate

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional research committee. For this type of study, formal consent is not required.

Consent for publication

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

Availability of data and materials

The data include individual patient data, but the data are available from the corresponding authors upon reasonable request.

Competing interests

The authors declare that they have no competing interests.

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Authors' Contributions

All listed authors contributed to the original manuscript. YI is the main radiation oncologist of this case and wrote the manuscript draft. RU and KJ coordinated and completed the manuscript. TY, NT, KT and US supported radiation therapy management. All authors have read and approved the manuscript of this case report.

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Figures

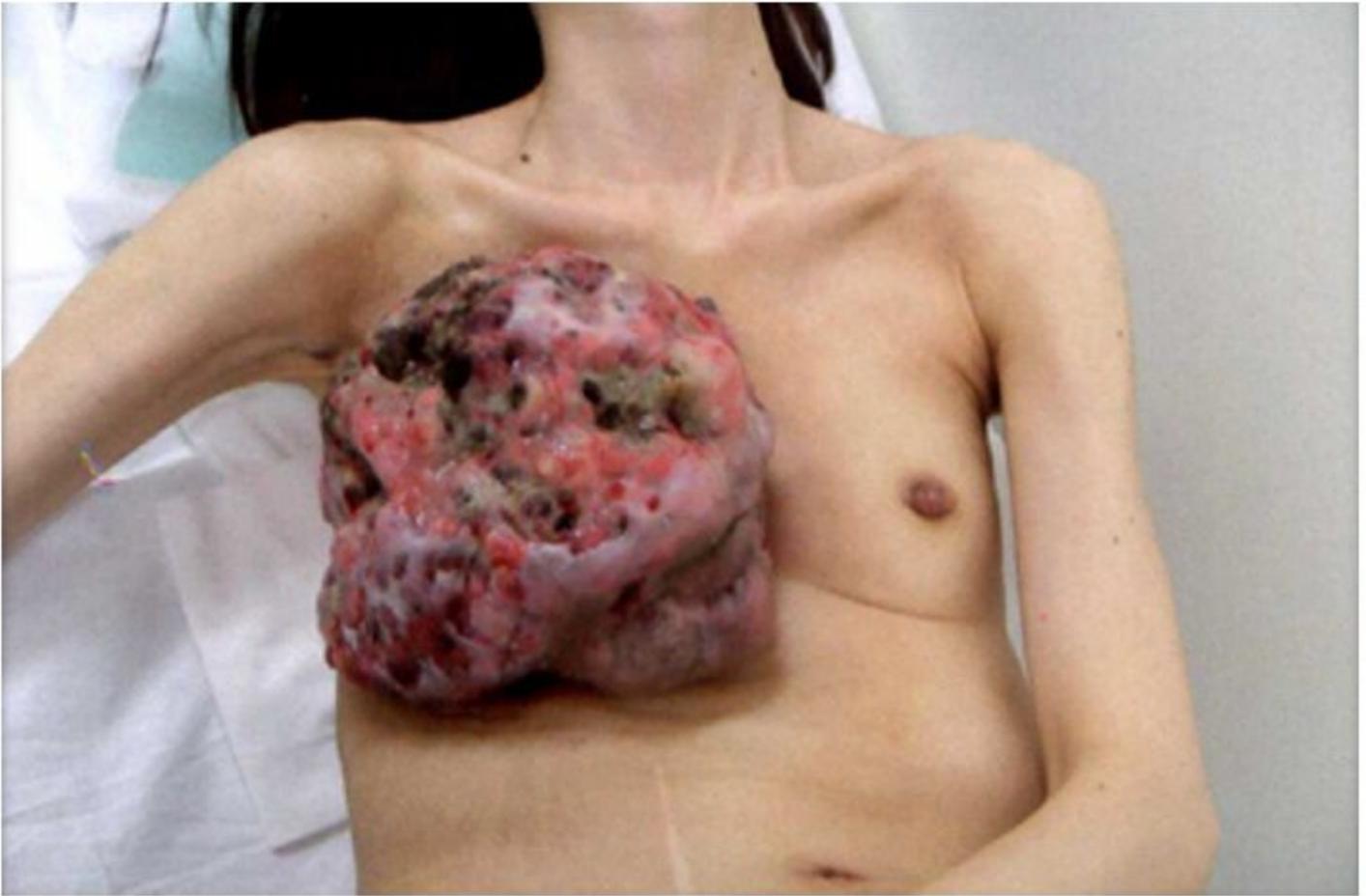


Figure 1

Macroscopical findings revealed a tumor of over 20 cm in size in the right breast. The tumor was exudative, exhibited ulceration and bleeding, and gave off an odor. The patient had difficulty in raising her right arm.



Figure 2

Axial enhanced computed tomography scan images of the thoracic region showed a tumor that had spread from the right chest wall to outside of the skin. The lesion had not invaded rib bone. Slight pleural effusion was observed in the right lung.

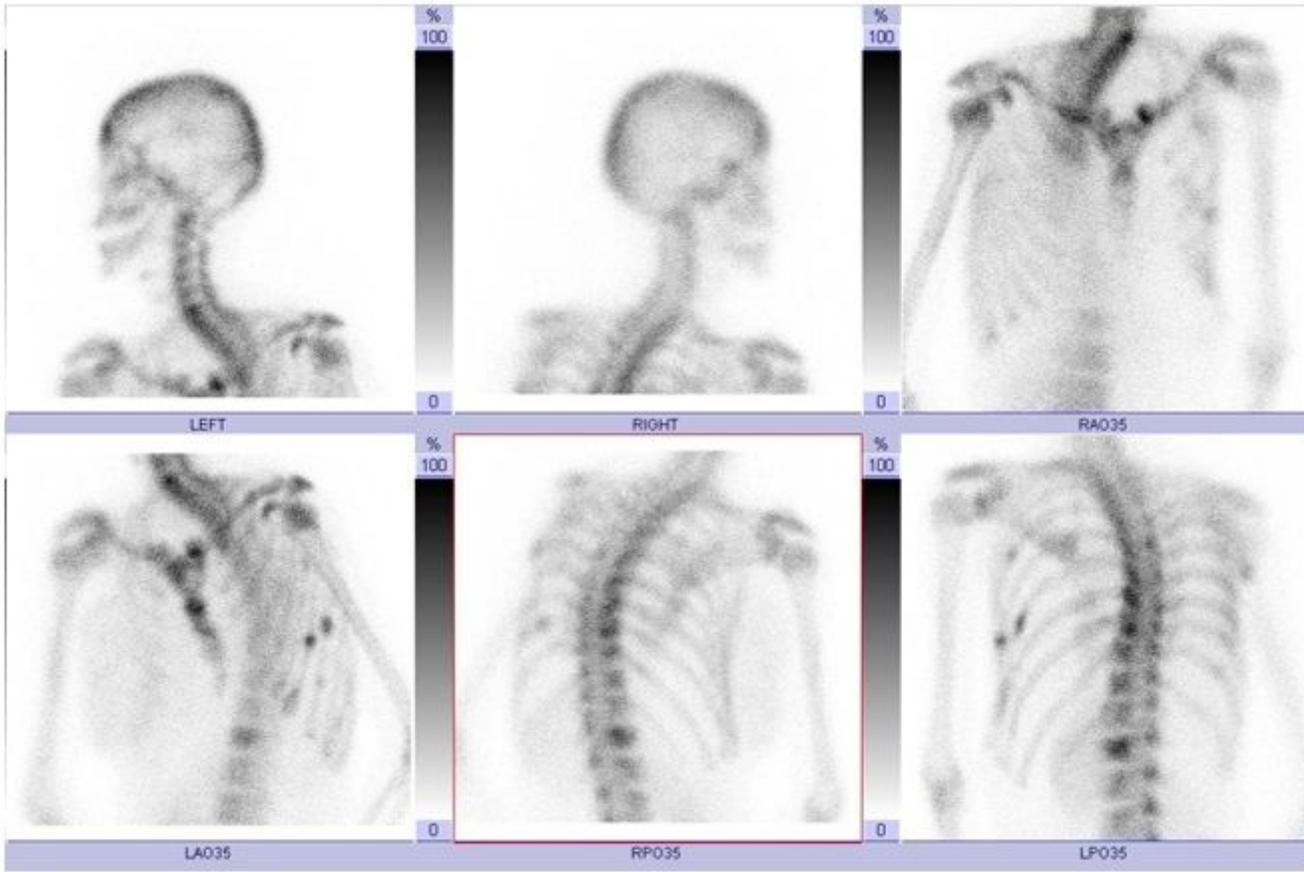


Figure 3

Bone scintigraphy showed increased tracer uptake in some thoracic spines and ribs.

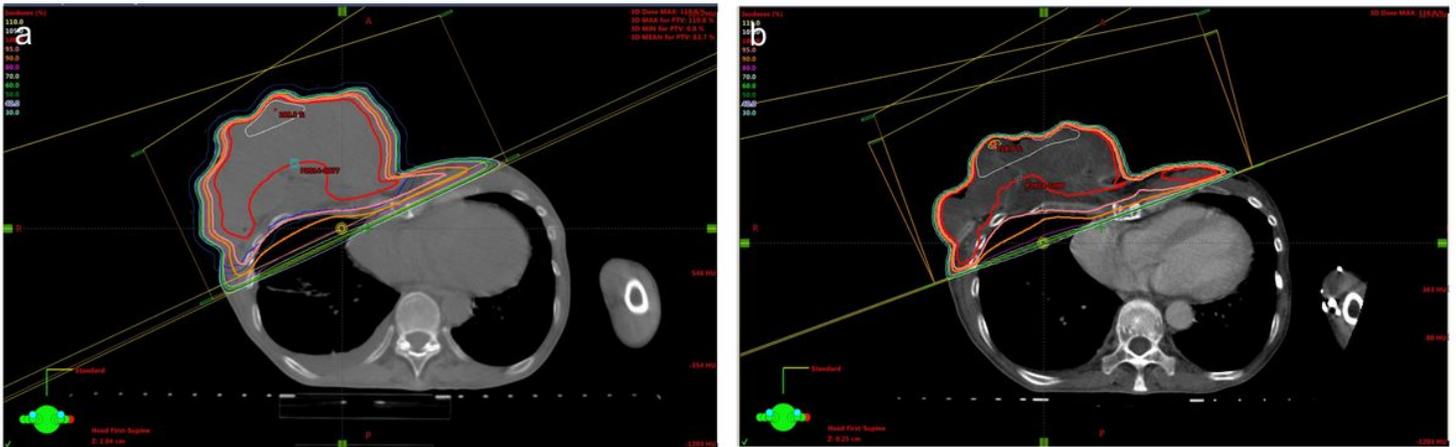


Figure 4

Dose distribution of radiation therapy. The primary tumor in the right breast was treated with 50 Gy (a) and boost radiotherapy with 20 Gy (b).

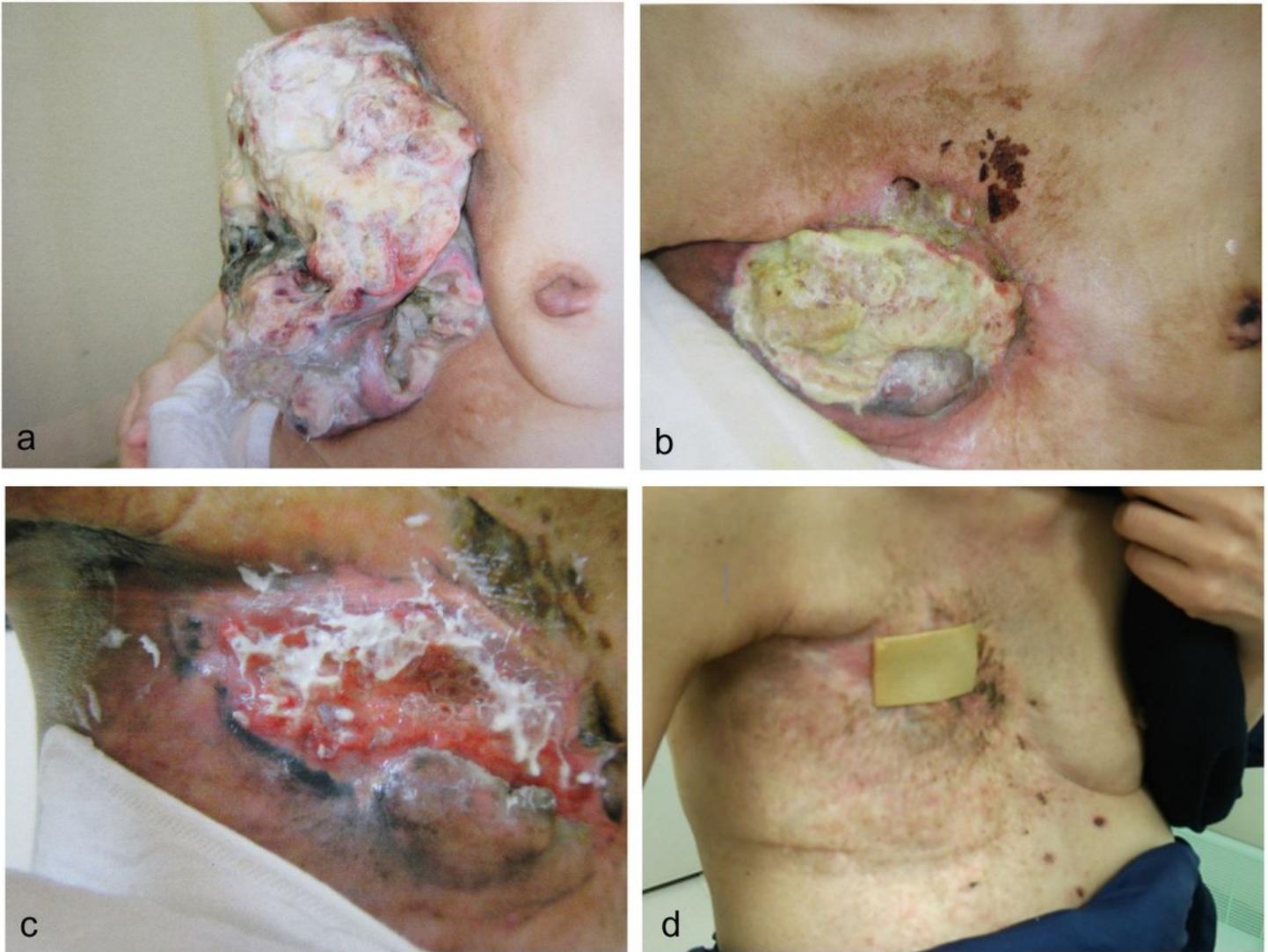


Figure 5

Macroscopical findings showed tumor regression one week after radiation therapy (a). The tumor had almost disappeared two months after RT, but the necrosis lesion remained in the right breast (b). The wound gradually healed over a period of three months (c). The wound was almost completely covered with skin four months after RT. Some pigmentation remained after radiation therapy (d).

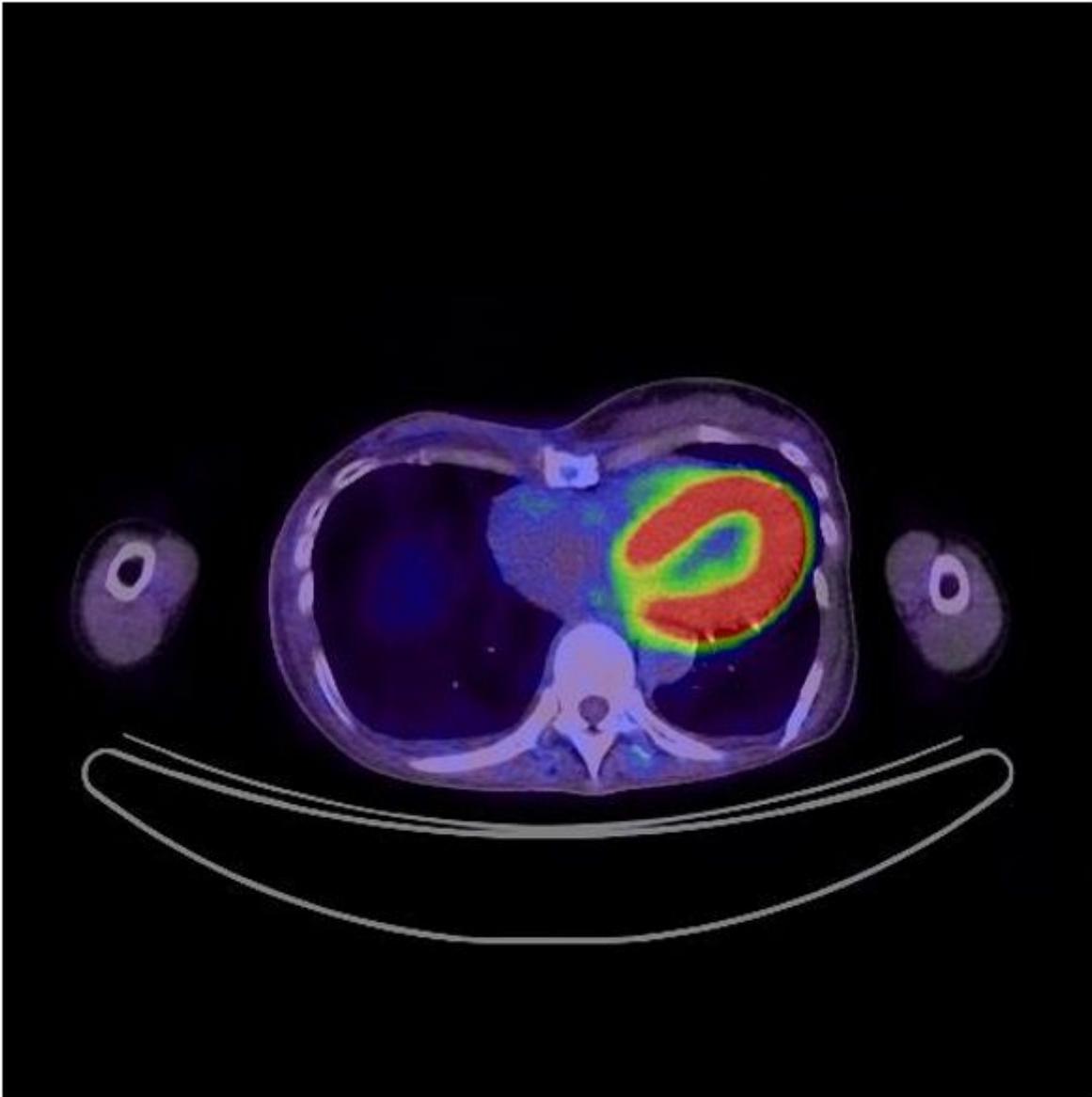


Figure 6

Positron emission tomography one year after radiation therapy (RT). RT resulted in the disappearance of fluorodeoxyglucose in the right breast.

Supplementary Files

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