

Radiofrequency-Hyperthermia in Combination with Chemo and Radiotherapy in Palliative Treatment of Breast Cancer: A Case Report

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Citation

L Kronberger, P Wagner, M Puchinger, H Stranzl, P Kohek. *Radiofrequency-Hyperthermia in Combination with Chemo and Radiotherapy in Palliative Treatment of Breast Cancer: A Case Report*. The Internet Journal of Surgery. 2003 Volume 5 Number 2.

Abstract

In March 1999, a 35 yr. old female patient presented with a palpable mass in the left breast and positive axillary lymph nodes. Invasive ductal carcinoma (IDC) was diagnosed after core cut biopsy. Receptors were negative and a skin probe was free of malignant infiltration. Preoperative chemotherapy (PCT) was given and because of complete remission breast-conserving therapy performed in May. The specimen showed a small residual tumor of IDC only. Under continued PCT a local relapse appeared on the same side within one month postoperatively. A triple therapy consisting of PCT, Radiofrequency-Hyperthermia (RF-HT) and Radiotherapy (RTX) was given when by end of August 1999 the area of the local malignant inflammation has exceeded 100 cm². The recurrent disease completely disappeared. RF-HT in combination with PCT and RTX seems to be an excellent tool in patients with recurrent breast cancer.

INTRODUCTION

Manifest recurrent disease in breast cancer can effectively be controlled in only about 50% of patients. Despite the recent positive reports¹, RF-HT is controversially discussed in the therapy concept of recurrent breast cancer. This is due to the absence of standardized methods of describing the temporally and spatially variant temperature distribution observed during RF-HT. Because of its tremendous progression under running chemotherapy this special case has demanded all out efforts available and had to be treated outside of every available protocol.

MATERIAL AND METHOD

In March 1999, a 35 yr. old female patient presented with a palpable mass of 3 x 3 x 3 cm in the lateral quadrants of the left breast, palpation of axillary and supra-clavicular lymph nodes was positive (Figure1).

Figure 1



Standardized photodocumentation -front torso, left breast frontal and oblique 45°- is seen as a standard of quality assessment and was performed before each treatment onset.

Open skin and core cut biopsy were performed. Histopathology of the frozen and permanent section showed an invasive low differentiated ductal carcinoma combined with intraductal carcinoma (pTxL1G3). Estrogen and Progesterone receptor were negative. The skin probes did not reveal any malignant infiltration or lymphangiosis carcinomatosa.

Preoperative treatment consisted of three courses of Epirubicin ($75\text{mg}/\text{m}^2$) and Taxotere ($75\text{mg}/\text{m}^2$) every third week between March and May 99. Under this therapy the palpable mass in the outer quadrants completely disappeared. Neither a palpable nor an ultrasound detectable mass could be found and therefore we could not perform a guide wire which is needed for exact dissection of the former tumor.

By the end of May 1999 breast conserving therapy was performed including the lateral quadrants of the left breast and axillary dissection of level 1 and 2. The pathological assessment revealed a small residual invasive cancer including mucinous component and an in situ carcinoma. Summarizing the diagnosis of all specimen the final classification was ypT1a N1biii R0 G3. In June 99 chemotherapy was continued with one cycle Epirubicin ($75\text{mg}/\text{m}^2$) and Taxotere ($75\text{mg}/\text{m}^2$).

Beginning July 99 a fast growing erythema appeared on the same breast medially of the excision. By skin biopsy it was diagnosed as a local relapse. At the end of July one cycle MCT with Caelyx ($45\text{mg}/\text{m}^2$) was given.

When by end of August 1999 the local malignant inflammation has exceeded 100 cm^2 (picture 1) the patient underwent chemotherapy and RF-HT (BSD-2000, BSD, Salt Lake City, UT, USA) once a week. Five days a week concomitant radiotherapy was administered.

Chemotherapy consisted of Ifosfamid $750\text{ mg}/\text{m}^2$ given prior to RF-HT and Cisplatin $30\text{ mg}/\text{m}^2$ during RF-HT. RF-HT was administered with a MA 120 applicator (Dual Feed, side loaded) over 90 minutes with max. 200 W (range 90-200), frequency 915 MHz. Temperature was measured by three Bowman probes (1 central, 2 mapping), temperature of water bolus was 40°C and highest measured skin temperature was 43°C . Estimated temperature of the target area was $42^\circ\text{--}44^\circ\text{C}$.

The chest wall and lymphatics (axilla, parasternal and ipsilateral supraclavicular lymph nodes) were irradiated with photon fields (6 MV) up to a total dose of 56 Gray (Gy), 2 Gy daily, 5 days a week. The parasternal region received 30 Gy with photons followed by an electron field (9 meV) with 26 Gy in 2 Gy fractions.

RESULT

An impressive response as shown above could be observed and the recurrent disease completely disappeared (Figure 2).

But within one month after triple modality treatment has ended, this aggressive form of breast cancer unfortunately progressed outside of the radiation and HT fields. Finally the patient died in spring 2000.

Figure 2



CONCLUSION

The literature ^{2, 3} is mostly inconsistent and there are published only small uncontrolled trials using triple therapy ^{4, 5, 6}. Unfortunately they do not demonstrate to be effective because of the complexity and heterogeneity of the patients being studied. On the other side the heterogeneity of the devices used to produce hyperthermia and the lack of standardized methods to measure a thermal dose are also hindering to prove the effectiveness of hyperthermia. As early as in 1992 Bornstein and co-workers ⁷ used a triple modality in patients with locally or regionally recurrent or advanced breast cancer. They could observe an overall complete response rate of 53%. One has not to forget that for patients with a recurrent tumor who are mostly excellent informed about their current status, the “cosmetic non-appearance” of a recurrent disease may be more important than the idea of being healed. And as in our case - despite the rapid progression after therapy- it could be shown that RF-HT in combination with PCT and RTX seems to be an excellent opportunity in patients with recurrent breast cancer.

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