Hyperbaric oxygen treatment for symptomatic breast edema after radiation therapy

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Carl UM, Hartmann KA. Hyperbaric oxygen treatment for symptomatic breast edema after radiation therapy. Undersea Hyper Med 1998; 25(4):233–234.—A 54-yr-old woman with a pT2pN0 breast cancer developed a long-standing symptomatic breast edema after lumpectomy and radiation therapy. The breast edema did not respond to non-steroidal anti-inflammatory drugs (NSAIDs) and manual lymph drainage of her arm. Three years after completion of radiation therapy, hyperbaric oxygen (HBO₂) treatment was initiated. Fifteen HBO₂ sessions were performed at a pressure of 240 kPa over 90 min in a multiplace chamber. At the end of treatment, breast discomfort had subsided completely, and 5 mo. after completing HBO₂ therapy the patient is still free of complaints. We conclude from this observation that the value of HBO₂ in the management of symptomatic radiation-induced breast edema should be investigated in a clinical study, because other effective treatment options are not available for this condition.

breast edema, radiation therapy, irradiation, hyperbaric oxygen

Breast edema is a common complain after breast-conserving therapy and irradiation. In a patient self-assessment study by McCormick et al. (1), breast edema was noted by almost one third of the patients. Two years after completion of treatment, breast edema was the symptom that most often influenced daily activities. In observer-based studies, persistent breast edema is less frequently recorded, indicating that this problem might be underestimated by most clinicians (2). The incidence of breast edema after radiation therapy is related to performance status, technique of axillary dissection, whether the axillary lymph nodes were irradiated, and the dose of irradiation (3). In most cases the breast swelling resolves without further treatment. In some instances, however, the swelling persists for years and can impair the patient's quality of life. Assuming that inflammatory processes play a role, we used non-steroidal anti-inflammatory drugs (NSAIDs) in symptomatic patients, which relieves pain but has hardly any effect on the breast edema itself. In the last few years, we accumulated experience in treating various radiation sequela with hyperbaric oxygen (HBO₂). We report on HBO₂ treatment for a long-standing breast edema after radiation therapy.

CASE REPORT
A 54-yr-old woman was irradiated after breast-conserving surgery and axillary dissection of a pT2pN0 ductal carcinoma in May and June 1994. X-ray therapy consisted of external beam irradiation to the right breast using 8 MV photons to a total dose of 50 Gy in 2 Gy fractions. A boost dose of 10 Gy was delivered to the site of the primary tumor using 10 MeV electrons. The loco-regional lymph nodes were not irradiated. The patient developed a tender breast swelling during radiation treatment. Breast discomfort persisted after the end of radiotherapy, and twice-yearly control mammograms for detection of breast recurrence showed breast edema to a similar extent as depicted in Fig. 1 top. The breast edema did not respond to NSAIDs and manual lymph drainage to the right arm. In June 1997, 3 yr after completion of radiation therapy, the patient still complained about general breast discomfort and tenderness in the anterior axillary line. On clinical examination, the right breast was swollen and enlarged. The skin showed some signs of mild subcutaneous fibrosis with a small area of telangiectasis in the processus axillaries of the breast. There was no clinical evidence for an intramammary recurrence or locoregional lymph node involvement. The mammogram taken a week before HBO₂ treatment showed diffuse increased density. This density would not permit the visualization of recurrent tumor and would thus render mammography inadequate as a modality for patient follow up (Fig 1 top).

Hyperbaric oxygen as a treatment option was discussed with the patient. After informed consent, 15 HBO₂ sessions
DISCUSSION

To our knowledge, this is the first report of a successful HBO₂ treatment for symptomatic breast edema after radiation therapy. The etiology of such delayed edema is not fully clear. In general, it has been reported as cellulitis, infectious in etiology and responsive to antibiotics. The use of antibiotics, however, has not been proven to be beneficial in the treatment of radiation-induced breast edema. The fact that the incidence of breast edema is related to the treatment of the axillary lymph nodes makes an insufficient fluid drainage as a cause more likely (3). This is consistent with mammographic findings showing diffuse edema of the breast parenchyma (Fig. 1 top).

Results and indications of HBO₂ therapy were recently reviewed (4,5). Thermal burns are an indication for which HBO₂ therapy may be helpful. A postulated mechanism of the beneficial effect is decreased edema due to hyperoxic vasoconstriction. Assuming that HBO₂ therapy can decrease edema from other causes, we treated a patient with a long-standing breast edema after radiation therapy. It seems that the beneficial effect is more than temporary. When used according to standard protocols, HBO₂ therapy seldom has toxic side effects and seems to be justified for patients who have discomfort from their breast edema after a wait-and-see policy and for whom NSAIDs have failed. We have planned a randomized crossover study comparing hyperbaric air and oxygen for patients with symptomatic breast edema 1 yr or more after radiation therapy.

REFERENCES