

CASE REPORT

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# Hyperbaric oxygen therapy for a refractory skin ulcer after radical mastectomy and radiation therapy: a case report

Mitsuhiro Enomoto<sup>1\*</sup>, Kazuyoshi Yagishita<sup>1,2</sup>, Kae Okuma<sup>3</sup>, Takuya Oyaizu<sup>1</sup>, Yasushi Kojima<sup>1</sup>, Atsushi Okubo<sup>1</sup>, Takuma Maeda<sup>1</sup>, Satoko Miyamoto<sup>1</sup> and Atsushi Okawa<sup>4</sup>

## Abstract

**Background:** Radiation therapy is performed as an adjuvant therapy when indicated following surgical resection of malignant tumors. However, radiation exposure induces acute or chronic dermatitis, depending on the radiation dose, interval, tissue volume, or irradiated area of the body. Radiation-induced skin ulcers and osteomyelitis of the underlying bone are intractable late-stage complications of radiation therapy, and often require reconstructive surgery to cover exposed tissue. Hyperbaric oxygen therapy has been suggested as a treatment for delayed radiation injury with soft tissue and bony necrosis.

**Case presentation:** A 74-year-old Japanese female underwent left radical mastectomy for breast cancer (T3N3M0, stage IIIB) in 1987. Radiation therapy was initiated 6 weeks after the surgery. She received telecobalt-60 in a total dose of 50 Gy with 25 fractions to the left supraclavicular, parasternal and left axillary regions, and electron treatment (9 MeV) in a total dose of 50 Gy in 25 fractions to the left chest wall. After irradiation, her skin became thinner and more fragile on the left chest wall, but no severe infections were observed. She noticed a small ulcer that repeatedly healed and recurred in 2000. She visited the hospital where she received radiation therapy and was treated for a skin ulcer on the left chest wall in December 2012. A fistula developed and then pus was discharged in January 2013. She was referred to the hyperbaric medical center in February 2013, and the fistula (1.5 × 3 cm) with pus discharge was observed. She was diagnosed with a late-onset radiation-induced skin ulcer that developed 25 years after radical mastectomy. HBO<sub>2</sub> (2.5 atmospheres absolute with 100% oxygen for 60 minutes) was indicated for the refractory ulcer and osteomyelitis of the ribs. The patient was treated with HBO<sub>2</sub> a total of 101 times over the course of 1 year and completely recovered.

**Conclusions:** Hyperbaric oxygen therapy can be performed safely for even more than 100 sessions in patients with radiation-induced skin ulcers and osteomyelitis. Hyperbaric oxygen therapy can be considered as an alternative, conservative treatment when surgical resection for late-onset, radiation-induced skin ulcers is not indicated because of fragile skin in the irradiated areas.

**Keywords:** Mastectomy, Radiation injury, Refractory skin ulcer, Hyperbaric oxygen therapy

\* Correspondence: enomorth@tmd.ac.jp

<sup>1</sup>Hyperbaric Medical Center, University Hospital of Medicine, Tokyo Medical and Dental University, 1-5-45 Yushima Bunkyo, Tokyo 113-8519, Japan  
Full list of author information is available at the end of the article