

A TWO-YEAR EXPERIENCE OF USING MODERATE DEEP INSPIRATION BREATH-HOLD FOR PATIENTS WITH EARLY-STAGE BREAST CANCER AND DOSIMETRIC COMPARISON

Chia-Hui Lin, Li-Ching Lin, Jenny Que, Kuei-Li Lin, Yu-Wei Lin

Department of Radiation Oncology, Chi Mei Medical Center

Purpose : We present our two-year experience of using moderate deep inspiration breath-hold (mDIBH) with an active breathing control (ABC) device for patients with early-stage breast cancer and dosimetric comparison to evaluate the benefit of mDIBH on the heart, lung, and liver.

Materials and Methods : We retrospectively reviewed all patients with newly diagnosed breast cancer and having clinical stage Tis, I, or II disease treated between November 2010 and July 2012. Among the 81 patients included in this study, 24 patients were treated with mDIBH and 57 patients were treated with free breathing. Dosimetric analysis was performed to compare dose distribution in the heart, lung, and liver between the two treatment groups.

Results : There was no significant difference in the distribution of stage, tumor site, age, clinical target volume (CTV) V_{50} and volume of CTV, heart, and liver between the non-ABC and ABC group. For all 81 patients, there was a significantly lower ipsilateral lung V_{10} , ipsilateral lung V_{20} , mean ipsilateral lung dose, whole lung V_{10} , whole lung V_{20} , mean whole lung dose, liver V_{30} , and mean liver dose in the ABC group. For 37 patients with a left-sided breast tumor, significantly lower ipsilateral lung V_{10} , ipsilateral lung V_{20} , mean ipsilateral lung dose, heart V_{30} , heart V_{40} , mean heart dose, and mean liver dose were observed in the ABC group. For 44 patients with a right-sided breast tumor, significantly lower ipsilateral lung V_{20} , mean ipsilateral lung dose, mean heart dose, liver V_{30} , and mean liver dose were observed in the ABC group.

Conclusions : For early-stage breast cancer patients, mDIBH reduces not only the heart dose but also the lung and liver doses. The routine integration of mDIBH using an ABC device may decrease radiation-induced toxicity in the heart, lung, and liver.

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Key words: Moderate deep inspiration breath-hold, Active breathing control, Early stage breast cancer