

Purpose: To evaluate the effectiveness, taking into consideration breathing motion and patient setup errors, of a technique for skin sparing in Tomotherapy breast-cancer treatments in which a 1-cm wide structure surrounding the skin is used to control hot spots. **Method and Materials:** 4DCT datasets were evaluated to assess the magnitude of breast skin motion. Tomotherapy plans were generated on the two subsets exhibiting opposite breathing phases. A PTV encompassing the whole breast, minus 5 mm from the skin, was prescribed 50.4 Gy in 25 fractions. A “flash-PTV” starting at the outer-most edge of the PTV and extending 5 mm past the skin was prescribed 44 Gy. For each 4DCT dataset, one subset was used as the primary plan, and the other (at the opposite breathing phase) as phantom to evaluate the effect of breathing motion on dose distributions near the skin. Also, past patient treatments were evaluated to assess the magnitude of the uncorrected setup error for breast cancer patients treated with the Tomotherapy machine by comparing the daily MVCT to the planning CT images to obtain the magnitude of mismatch at the skin throughout treatment. Dosimetric measurements with TLD on anthropomorphic phantom and in-vivo will be performed. **Results:** The magnitude of breathing motion was found to be on average 3 mm in the anterior/posterior directions. The magnitude of patient setup error was found to be 5 mm on average. Analysis of the plans generated using the opposite breathing phase as phantom showed that a 1-cm skin-sparing structure provided adequate compensation for skin movement. **Conclusion:** The technique provides skin sparing while delivering homogeneous dose distribution to the entire breast, with little effect from breathing motion. Care must be taken when positioning the patient. **Conflict of Interest (only if applicable):** This work was partially supported by a grant from Tomotherapy, Inc.