

TO EVALUATE THE DOSE DISTRIBUTION OF CONVENTIONAL 2-DIMENSIONAL PLANNING METHOD FOR BREAST TANGENTIAL IRRADIATION

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Purpose : To compare the conventional 2-dimensional (2-D) simulation technique with CT- based 3-D planning method, and verify the feasibility of 2-D method for breast tangential irradiation.

Materials and Methods : From November to December 1998, ten successive patients with early-staged breast cancer were enrolled for this study. After immobilization with alpha-cradle, patient underwent a conventional simulation-method to get the parameters for 2-D treatment plan. Patient also had a chest CT scan and these images were stored for subsequent 3-D treatment plan. These two treatment planning methods were retrospectively compared with their dose-volume histogram (DVH) of the irradiated targets (PTV, normal tissue, lung and heart).

Results : The PTV covering ratio (2-D vs. 3-D) of these two techniques is 0.95 ± 0.02 . For the normal tissue, two-dimensional technique has more chest wall soft tissue included within 50% isodose curve, but there is no significant difference (mean volume 703 ml \pm 205 ml for 2-D vs. 539 ml \pm 197 ml for 3-D, t test $p = 0.146$). For the ipsilateral lung tissue, both methods have equivalent irradiated percentage lung volume ($7.5\% \pm 3.0\%$ for 2-D vs. $7.6\% \pm 4.8\%$ for 3-D). For left-sided breast cancer, the average irradiated heart volumes are 5.4 ml \pm 4.2 ml (2-D) versus 5.8 ml \pm 3.9 ml (3-D).

Conclusions : Our analysis shows that both planning methods have equivalent irradiated dose-volume histograms. For circumstances where CT scan simulator is not available, conventional 2-D planning method is an acceptable alternative.

[Therapeut Radiol Oncol 2006; 13(1): 67-75]

Key words: Breast cancer, Tangential irradiation, Treatment plan