AbstractID: 1177 Title: Evaluation of Dose Uniformity with Forward Intensity Modulated Radiation Therapy in Breast Cancer

Forward intensity modulated radiation therapy(fIMRT) techniques for tangential breast irradiation were evaluated in terms of dose uniformity in the treated breast volume, contralateral breast dose and reduce acute toxicity. Dose distribution of whole breast radiation therapy for ten patients with breast cancer under radiation treatment was planned using 3D conformal radiation therapy(3D CRT) with wedges and fIMRT. Separate MLC segments were constructed to conform to the beam's eye view projections of the 3D isodose surfaces in 5% increments. Using the beam weight optimization utility, the MLC segment weights were the determined to deliver the most uniform dose to reference. The accuracy of the dose calculation, contralateral breast dose and resultant IMRT delivery was verified with film and TLD dosimetry. For each patient, the dose uniformity within the breast tissue was evaluated with dose volume histogram and normal tissue complication probability. Compared to 3D CRT techniques, fIMRT with static MLC segments resulted in smaller hot spots and a lower maximum dose while maintaining similar coverage of the treatment volume. A median of only 0.1% of the treatment volume received above 110% of the prescribed dose when using fIMRT versus 10% with 3D CRT with standard wedges. fIMRT produced 50% less contralateral breast dose than the 3D CRT with two wedges technique. The use of fIMRT with static MLC technique for breast cancer is an efficient and effective method for achieving uniform dose throughout the breast