

AbstractID: 13463 Title: A dosimetric comparison of conventional intensity-modulated radiotherapy and volumetric modulated arc radiotherapy for left-breast cancer after breast-conserving surgery

Objective To compare the dosimetric differences of forward intensity-modulated radiotherapy, inverse intensity-modulated radiotherapy and volumetric modulated arc radiotherapy (VMAT) for left-breast cancer after breast-conserving surgery. **Methods** Ten patients with left-breast cancer receiving breast-conserving surgery were enrolled in the study. Three treatment techniques including forward intensity-modulated radiotherapy (f-IMRT), inverse intensity-modulated radiotherapy (IMRT) and volumetric modulated arc radiotherapy (VMAT) were designed for each patient. The dose distribution in the target, the dose to the organs at risk, total MU and delivery time were compared. **Results** All three plans met the clinical requirement. VMAT plans showed the best conformity in target and IMRT plans were better than f-IMRT plans. f-IMRT plans showed the best homogeneity in target, no statistically significant differences were observed between VMAT and IMRT plans. For the V_5 and V_{10} in left lung, f-IMRT and VMAT plans were statistically significant lower than IMRT plans, and f-IMRT plans showed the lowest value. For the V_{20} and V_{30} in left lung, the IMRT and VMAT plans were statistically significant lower than f-IMRT plans, and the VMAT plans showed the lowest value. The maximum dose and V_{40} in heart were lowest for the VMAT plans, and VMAT plans showed statistically significant lower for the mean dose in heart versus IMRT plans. The V_5 , V_{10} and the mean dose in right lung, and the mean dose to the contra-lateral breast were lowest for f-IMRT plans. No statistically significant differences were observed in these indexes for IMRT versus VMAT plans. The maximum dose to the contra-lateral breast was lowest for VMAT plans. For the number of MU, IMRT and f-IMRT plans showed the highest and lowest value respectively. The VMAT plans reduced the delivery time by 84.6% and 88.23% compared to f-IMRT and IMRT plans. **Conclusions** Compared to f-IMRT and IMRT plans, the VMAT plans showed a better conformity in target, reduced the irradiated volume of high dose region in the left lung and heart as well as significantly decreased the delivery time.