

AbstractID: 13458 Title: The study of AAA algorithm and PBC algorithm of intensity modulated radiation therapy for breast cancer

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Objective To compare AAA with PBC in the IMRT after breast-conserving surgery in regard to the homogeneity of dose in the target area, ipsilateral lung dose and irradiation volume, and cardiac dose and irradiation volume. **Methods** Ten breast cancer patients with inverse IMRT plans and ten breast cancer patients with forward IMRT plans were allotted. Prescription dose was 50Gy in breast volume with X-ray. Their plans were separately calculated by Analytical Anisotropic Algorithm (AAA) and Pencil Beam Convolution (PBC). Plan Target Volume (PTV), ipsilateral lung and heart were evaluated with dose-volume histograms (DVH) in two plans, with the Paired-Sample T Test taken with SPSS 13.0. **Results** In inverse IMRT plan the above prescription dose of PTV with AAA were equal to the dose with PBC. The mean PTV dose with AAA were lower than the PBC by 73.91cGy, the uniformity higher than the PBC by 2.5%, V20 of ipsilateral lung higher than the PBC by 2.53%, the mean heart dose lower than the PBC by 53.39cGy, but there were no significance for all of them. The conformity index of PTV with AAA were significantly higher than the PBC by 5.71%. In forward IMRT plan the above prescription dose of PTV with AAA were higher than the PBC by 8.53%, the mean PTV dose higher than the PBC by 91.03cGy, the uniformity higher than the PBC by 10.08%, the heart mean dose higher than the PBC by 3.37cGy, but there were no significance for all of them. The conformity index of PTV with AAA were significantly higher than the PBC by 5.94%. V20 of ipsilateral lung with AAA were significantly higher than the PBC by 0.91%.

Conclusions The conformity of PTV with AAA is better than the PBC in breast cancer in IMRT plan, but the V20 of the ipsilateral lung is higher than the PBC.