

AbstractID: 4392 Title: Parameters study for the severity acute radiation induced skin reaction for the breast cancer patients

Purpose: Radiation induced skin reaction is a common side effect for the breast cancer patient undergoing radiotherapy (RT). Severe acute radiation skin reaction (ARSR) not only brings distress to the patient, it may also cause an unexpected treatment delay and consequently reduce the treatment efficacy. It is important to understand the factors that cause ARSR and eventually to prevent or minimize it.

Method and Materials: A retrospective study was conducted to 154 breast cancer patients who received a whole breast external photon beam treatment at source-to-axis distance (SAD) setup with 6MV or 6MV combined with 18MV photon energy at our hospital between 2003 and 2005. The relation between ARSR, the source-to-surface distance (SSD) and treatment technique was evaluated in this study. The treatment techniques included conformal three-dimensional (3D) treatment and intensity-modulated radiation therapy (IMRT). These techniques were further classified into: (1) 3D open field, (2) 3D with cerrobend block, (3) 3D with MLC, (4) IMRT sliding window, and (5) IMRT step-and-shoot. Receiver operating characteristic (ROC) curve and p-value were applied for the statistic analysis.

Results: Out of total 154 patients, 21 (13.6 %) patients developed ARSR. The results showed that ARSR was sensitive to SSD variation when the patient was treated with 3D MLC and IMRT sliding window treatment techniques ($Az=0.9\pm 0.12$ with p-value=0.014, and $Az=0.8\pm 0.08$ with p-value=0.017, respectively). And ARSR was non-sensitive to the SSD variation when patient treated 3D open field and 3D block field treatment techniques ($Az=0.37\pm 0.16$ with p-value=0.67 and $Az=0.66\pm 0.13$ with p-value=0.19, respectively). There was not distinction in the development of ARSR observed between each of the treatment techniques (p-value>0.08).

Conclusions: SSD was found to be a sensitivity factor to predict ARSR for the patient undergoing RT with 3D MLC and IMRT sliding window treatment. A larger SSD should decrease the risk of ARSR.