

AbstractID: 10699 Title: Evaluation of the Dynamic Conformal Arc Therapy as an alternative to Intensity-Modulated Radiation Therapy in prostate, brain, head-and-neck, and spine tumors

Purpose: To evaluate the dynamic conformal arc therapy (DAT) dose distribution and clinical applicability in comparison to intensity-modulated radiotherapy (IMRT) in different types of tumors and locations. **Methods and Materials:** Twelve patients with prostate cancer with no node involvement and three patients with single tumors in the pituitary, in the neck, and in the thoracic spinal region, treated with IMRT, were retrospectively planned with DAT using Eclipse (V8.1). The prostate cases were also planned with three-dimensional static conformal technique (3DST). Dose distributions were evaluated through comparisons in dose-volumetric histograms and in-house IMRT protocol constraints for all the involved techniques. A dose measurement system was used to evaluate the accuracy of calculated dose distributions. **Results:** DAT plans for prostate showed a statistically comparable achievement of tumor conformity and dose sparing for bladder and rectum when compared to IMRT. Dose on femoral heads were similar to those achieved using 3DST. DAT could be planned with close results to those obtained in IMRT for the dose constraints of the defined structures by using a 360°-arc for the brain lesion and several arcs including non-coplanar ones for the head-and-neck and spinal tumors. The accuracy of experimental validation of the calculated dose distributions with DAT was similar to that of IMRT. The average number of monitor units for our DAT plans were 5 times lower than IMRT. **Conclusions:** The dose distribution evaluation showed that DAT is a reasonable alternative to IMRT for single tumors, accomplishing many of the IMRT constraints used in standard protocols. Moreover, the significant fewer number of monitor units used in DAT compared to IMRT reduce both the planning and the treatment times, providing not only cost savings but also better opportunities of more accurate results of treatment delivery.

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