

AbstractID: 5820 Title: Clinical feasibility of jaw-only IMRT plan for prostate cancer

Purpose: To investigate the feasibility of inverse IMRT plans generated with jaw only, compared to IMRT plans with multi-leaf collimator (MLC) for patients with the prostate cancer.

Method and Materials: For five patients, two different planning techniques were used to generate inverse IMRT plans. One was the aperture-based IMRT planning using MLC (MLC plans) and the other used jaw only (JO plans), available in a commercial planning system. The conventional 7 beams were employed. The planning goal was to deliver 72 Gy to > 95% of the PTV while keeping 10% of the rectum and 15% of the bladder receiving < 60 Gy and mean dose of the bulb < 30 Gy. For the JO plans, four different numbers of apertures/beam (3, 4, 5, and 6) were tested, compared to the MLC plans set to 3 apertures/beam. All plans (one MLC and four JO plans) for each patient were analyzed using conformal index (COIN), defined endpoint doses to the sensitive structures, total number of segments, and total delivered monitor unit. For each patient, planning dose constraints were kept the same for MLC and JO plans.

Results: The COIN values for JO plans were generally increased as the number of apertures/beam increased, up to the same value as the MLC plans. The number of total segments for the JO plans was gradually increased (21, 27, 34, 40) as the number of apertures/beam increased (3, 4, 5, 6), compared to 21 segments for the MLC plans. However, the delivered MU values and doses to sensitive structures were patient-specific and independent of the number of apertures/beam in JO plans.

Conclusion: For centers without MLC collimator, it is possible to deliver inverse planned IMRT plans using jaws only for patients with prostate cancer.

Conflict of Interest: Research sponsored by Prowess Inc.