

Improved Beam Selections in Prostate IMRT

Since we commenced IMRT at our center in May 2001, there have been more than 350 patients with prostate cancer treated with IMRT. A routine IMRT plan consists of 5 evenly separated 18 MV photon beams. Use of 18 MV photons was based on conventional clinical experiences. With the improvement of RTPS and the desire to achieve a more homogenous dose in PTV and less rectum dose, we recently investigated a 7-beam 6 MV configuration for prostate IMRT and compared the relevant dose volume parameters to that obtained with the 5-beam 18 MV configuration. Based on our results with 5 prostate IMRT cases, we observed that the 7-beam configuration is able to achieve 1) significantly decreased maximum global dose, 2) improved dose homogeneity within the PTV, 3) reduced rectum dose by 15% or better for the same PTV coverage with a steeper dose gradient at the prostate-rectum interface. Furthermore, we investigated the dosimetric benefits of mixing beam energies. The results indicated that with a 4 posterior beams at 18 MV energy, dose to rectum can be further reduced. These dosimetric findings may potentially have clinical implications for reduced urinary complication and rectum toxicity, while maintaining a better tumor control due to escalated dose.