

Purpose: The effect of beam energy IMRT plans for prostate cancer was studied for competing IMRT plans optimized for delivery with either 6 or 15 MV beams.

Methods: This retrospective planning study included 10 patients treated for localized prostate cancer. A dose of 66 Gy was prescribed in 33 daily fractions of 2 Gy. For inverse IMRT treatment planning, we used a 7-coplanar non-opposed beam arrangement at 0, 50, 100, 150, 210, 260 and 310 degree angles. To ensure that differences among plans are due only to energy selection, the beam arrangement, number of beam, and dose constraints were kept constant for all plans. The DVHs for the 6 and 15 MV plans were compared for PTV and for OARs such as the rectum, bladder and both femoral heads. Doses received by the 95% and 5% volume of PTV were less than or equal to 1% for 6 MV compared to 15 MV plan for 10 patients.

Results: Percentage of doses received by the 10, 30 and 50% volume of bladder were less than or equal to 1%. Percentage of doses received by the 10, 30, and 50% volume of rectum were 1~2% higher for 6 MV photons. Also, percentage of doses received by the 10% and 50% volume of femur head were 4~5% higher for 6 MV.

Conclusions: There is no greater advantage from 15 MV as compared with 6 MV in 95% volume of PTV coverage. Also, percentage dose received by 5% volume of PTV was no remarkable difference in 6 and 15 MV plan. However, percentage doses received by OARs volume were higher 6 MV. Therefore, we recommend the use of 15 MV for IMRT of prostate cancer to achieve better in target coverage and integral dose which can be reduce by using IMRT of 15 MV.