

DVH COMPARISON FOR INTENSITY MODULATED RADIATION THERAPY(IMRT) AND 3D CONFORMAL THERAPY FOR PROSTATE CARCINOMA

In order to increase delivered dose to the prostate gland while decreasing toxicity, we have used IMRT in combination with interstitial brachytherapy. We compare dose distributions and dose volume histograms (DVH) of IMRT versus 3-D conformal treatments (3D-CRT).

IMRT treatments were planned and delivered using the Corvus treatment planning system and a MIMic multileaf intensity modulating collimator (NOMOS). Planning target volumes were created with anterior-posterior margin = 11.2 mm, right-left = 5mm, and superior-inferior = 10.2 mm. A 3-Dimensional treatment plans were created for the same patients using conformal 4-field technique (Pinnacle3, ADAC). In order to compare plans generated by these two treatment planning systems, the ADAC plans were generated using the minimum GTV dose obtained from the IMRT plan.

Fifty patients were treated with IMRT and DVH's were generated for prostate, bladder and rectum using both planning systems. Under the condition of equal minimum prostate dose, minimum rectum and bladder doses were significantly lower (60-80%) with IMRT planning, while the maximum prostate, rectum and bladder doses were slightly higher (6-8%). The mean prostate dose was 8% higher, and rectum and bladder mean doses were 9-12% lower in case of IMRT treatment. This behavior of DVH's suggest, that IMRT treatment resulted in less homogeneous dose distribution within the GTV, and reduced dose to the surrounding critical organs, which on the other hand let us expect reduced gastrointestinal toxicity.