

AbstractID: 5448 Title: Absolute Rectal Volumetric Dose as a Meaningful Predictor to Its Late Side Effect in Prostate IMRT

**Purpose:** To investigate a meaningful correlation between rectal volumetric doses and the rectal late side effect in prostate IMRT.

**Method and Materials:** Six cases with complaints of prolonged rectal bleeding after one year of prostate IMRT course were analyzed. The DVH's were compared with the control group comprised of 14 similar IMRT cases without late rectal side effects. The follow-up time was 24-45 months. In each case, a total of 75.6 Gy radiation dose was delivered in 32 fractions using 7-field 18 MV photon beams. All CTV's were delineated on fused MR/CT images. The posterior margins of PTV's were 7 mm for initial 45 Gy and 4 mm for the 30.6 Gy reduction dose. Nonexclusively, PTV protruded into the anterior portion of rectal wall. During patient daily setup, an ultrasound targeting system was employed to ensure the accuracy.

**Results:** There were no significant deviations seen in relative volumetric DVH's between the two groups for rectal D<sub>5</sub> through D<sub>50</sub> ( $p > 0.05$ ). However, DVH's for absolute rectal volume indicated significant higher values ( $p < 0.01$ ) in the group with late rectal side effect, as seen in table 1.

Table 1. Rectal Mean Dose (cGy) in Prostate IMRT

Rectal Volume cm <sup>3</sup>	Test Group (No=6)		Control Group (No=14)		t-test p (2 tails)
	Mean	SD	Mean	SD	
<b>0</b>	9083	80	8473	265	0.000
<b>5</b>	7489	350	6959	524	0.019
<b>10</b>	6890	357	5987	692	0.001
<b>15</b>	6313	442	5351	667	0.002
<b>20</b>	5878	346	4754	706	0.000
<b>25</b>	5349	222	4201	674	0.000
<b>35</b>	4403	441	3220	832	0.001
<b>45</b>	3205	665	1927	1228	0.008

**Conclusions:** No statistical meaningful correlation was found in our data between relative volumetric DVH and the occurrence of late rectal side effect. Rectal DVH using absolute volume is suggested by this study to be a more sensitive indicator to predict late rectal side effect in prostate IMRT. This study is valuable for future follow-ups and investigations.



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