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**Background:** To analyze late toxicity and quality of life (QOL) for patients receiving definitive IMRT and propose a set of “ideal” and often achievable DVH parameters when treating the prostate with modern planning techniques.

**Methods:** 372 men were treated with primary IMRT for adenocarcinoma of the prostate. Toxicity and QOL (EPIC-26) were assessed prospectively at baseline, 2, 6, 12, 18, and 24 mo. Dosimetric data for bladder and rectum were compiled and compared to CTC 3.0 GU and GI late toxicity starting 3 months following treatment. Estimates of the freedom from grade 2+ (FFG2) GI and GU toxicity were calculated by the Kaplan-Meier method and associations were tested using the log-rank test. QOL questions were grouped into global domain scores (0-100, with 100 full health) and assessed using a GEE univariate model. “Ideal” sets of rectal and bladder DVH parameters were tested which consisted of V70<10%, V65<20%, and V40<40% for both the rectum and the bladder.

**Results:** The median age was 69 years; RT dose was 76 Gy; concurrent androgen deprivation (ADT) was given to 147 men (47%) for a median of 4 mo. 71 patients received an initial pelvic field (WPRT) and 301 received a PO field. By NCCN risk group, there were 89 low, 175 intermediate, and 108 high-risk patients. Median follow up was 47 mo.

At 4 years, FFG2 GI toxicity was 92% and FFG2 GU toxicity was 76%. WPRT and ADT were not associated with GU or GI toxicity. Use of anticoagulation (p=.05) and increasing age (p=.06) were associated with GI toxicity, while increased bladder volume (p=.01), concurrent smoking (p=.01) and RT dose (p=.01) were associated with GU toxicity.

Urinary irritation or obstruction scores and urinary continence scores remained similar or were improved over the 24 month follow up period. Bowel related QOL declined 2 months post treatment, but this improved by 6 months and was similar to baseline at 24 months (Figure 1a-c).

58 patients met the “ideal” rectum planning criteria. For this group, FFG2 GI toxicity was 100% at 4 years compared to 92% otherwise (p=.029, Figure 2). Men meeting these criteria had less Gr 2+ proctitis and GI hemorrhage (p=.05 and p=.04 respectively). Overall bowel QOL scores were also higher for this group of patients (p=.005).

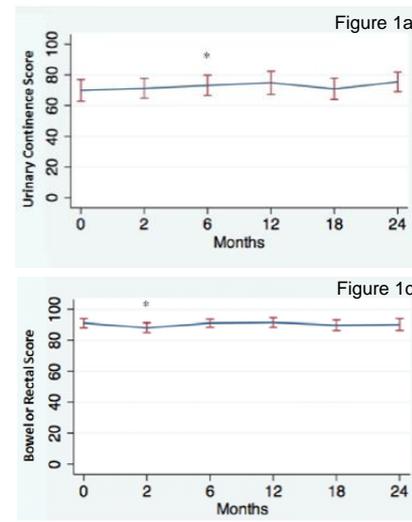


Figure 1: Global domain scores following radiation therapy. The asterisk represents scores that were statistically different (P<.05, t test) to the baseline value (designated at 0 months). Standard error is shown by the vertical red lines (N=162).

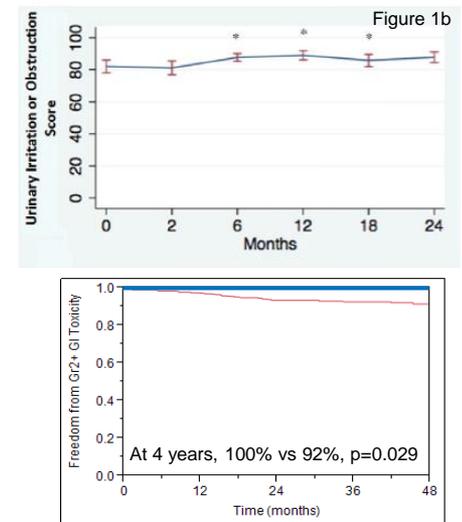


Figure 2: Freedom from Gr2+ GI toxicity for patients meeting our “ideal” rectum planning criteria (blue line) vs those patients that did not (red line)

76 patients met the “ideal” bladder planning criteria. For this group, FF CTC Gr 2+ GU toxicity was 76% at 4 yrs compared to 76% otherwise (p=.94). Urinary irritation and continence QOL scores were not improved for these patients (p>0.1 for both).

**Conclusions:** Compared to guidelines proposed by the RTOG (e.g. V70 Gy rectum <15-25%), more stringent planning goals can be achieved with IMRT. We report no late Gr 2+ rectal toxicity at 4 years, and improved bowel QOL for men achieving a more strict rectal tissue sparing goal.