No Difference In Late Toxicity With Postoperative Radiation Therapy Following Open Or Robotic Prostatectomy

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INTRODUCTION

Robotic assisted laparoscopic prostatectomy (RALP) has become a standard surgical approach at many centers. This transperitoneal approach could be speculated to result in higher rates of gastrointestinal (GI) morbidity compared to open, retropubic radical prostatectomy (RRP). We sought to examine the effect of surgical approach on late GI or genitourinary (GU) toxicity, as well as QOL, in the setting of postoperative radiotherapy (RT).

MATERIALS AND METHODS

84 men were identified with sufficient records for analysis., including 38 men (45%) who underwent RRP and 46 men (55%) who underwent RALP. Median age was 60. All men were treated with Intensity-Modulated RT with a median dose of 66 Gy to the prostate bed. 36% received concurrent androgen deprivation therapy (ADT, median 4 months). 33% were treated to an initial pelvic field. Late toxicity was prospectively defined at each follow-up visit. The Kaplan-Meier method was used to estimate freedom from grade ≥ 2 (FFG2) GI or GU toxicity (CTCAE v3.0) for the following factors: age, diabetes, tobacco history, anticoagulant use, bladder volume and rectal volume, whole pelvic radiotherapy (WPRT), ADT, and history of previous abdominal surgery. The type of surgery was analyzed for associations with QOL in the 54 men with at least one completed EPIC-26 questionnaire. Domains analyzed included global incontinence, irritability/obstructive symptoms, bowel symptoms, and sexual scores at times 6, 12, and 24 months post-radiation using ANOVA.

RESULTS

Median follow-up was 38 months and did not differ significantly between RRP and RALP (49 vs. 34 months, p=0.10). In general, groups were balanced in terms of RT dose and normal tissue metrics. However, patients undergoing RALP were more frequently treated with WPRT (44% vs. 21%, p=0.03) and ADT (46% vs. 24%, p=0.04).

Similar FFG2 GI toxicity (97% vs. 92%, p=0.20) and GU toxicity (92% vs. 91%, p=0.17) were observed for RALP and RRP (Figure 1). On univariate analysis, no factors tested were found to be associated with a FFG2 GI or GU toxicity (Table 2). However, WPRT was associated with a trend towards increased FFG2 GU toxicity (3-yr FFG2 toxicity: 87% vs. 94%, p=0.07, Figure 2). On multivariable analysis, neither type of surgery (p=0.28) or WPRT (p=0.14) demonstrated an association with FFG2 GU toxicity.

Type of prostatectomy did not significantly impact patient QOL with regard to urinary, bowel and sexual function at all time points examined (all p>0.05).

CONCLUSIONS

RT following prostatectomy results in similarly low rates of late GU and GI toxicity, regardless of whether the surgery was performed via an open or robotic approach.

Table 1. Patient and treatment characteristics (n=84)

	Number (%)
Age (years)	Median 60
T stage	
pT2	26 (31%)
pT3a	45 (54%)
pT3b	13 (15%)
N stage	
pN0	72 (86%)
pN1	5 (6%)
pNx	7 (8%)
Pathologic Gleason score	
2-6	16 (19%)
7	50 (60%)
8-10	18 (21%)
Pre-RT PSA (ng/mL)	Median 6
	IQR 5-10
Radiation dose (Gy)	Median 66
	IQR 66-68
Whole pelvic RT	28 (33%)
Concurrent ADT	30 (36%)
Duration (mo)	Median 4
Follow-up Time (mo)	Median 38
	IQR 26-57

IQR = Interquartile range; ADT = androgen deprivation therapy

Table 2. 3-year freedom from grade ≥2 gastrointestinal and genitourinary toxicity

	3- yearr freedom from grade ≥2 toxicity	
	Gastrointestinal	Genitourinary
RALP vs. RRP	97 v 92, p=ns	92 v 91, p=ns
Tobacco		
History vs. Never	92 v 97%, p=ns	91 v 93%, p=ns
Current vs. Not	89 v 96%, p=ns	82 v 93%, p=ns
Diabetes (Yes vs No)	100 v 94%, p=ns	92 v 92%, p=ns
Anticoagulant Use (Yes vs No)	96 v 94%, p=ns	90 v 93%, p=ns
Age > Median (Yes vs No) [median = 60 years]	92 v 98%, p=ns	94 v 89%, p=ns
Rectal Volume > Median (Yes vs No) [median = 90.4cc]	95 v 95%, p=ns	89 v 93%, p=ns
WPRT v Prostate bed	100 v 93%,p=ns	87 v 94%, p=0.07
ADT Use (Yes vs No)	96 v 94%, p=ns	85 v 96%, p=ns

RALP=robotic-assisted laparoscopic prostatectomy; RRP=radical retropublc prostatectomy; WPRT = whole pelvic RT; ns=not significant (p>0.10)

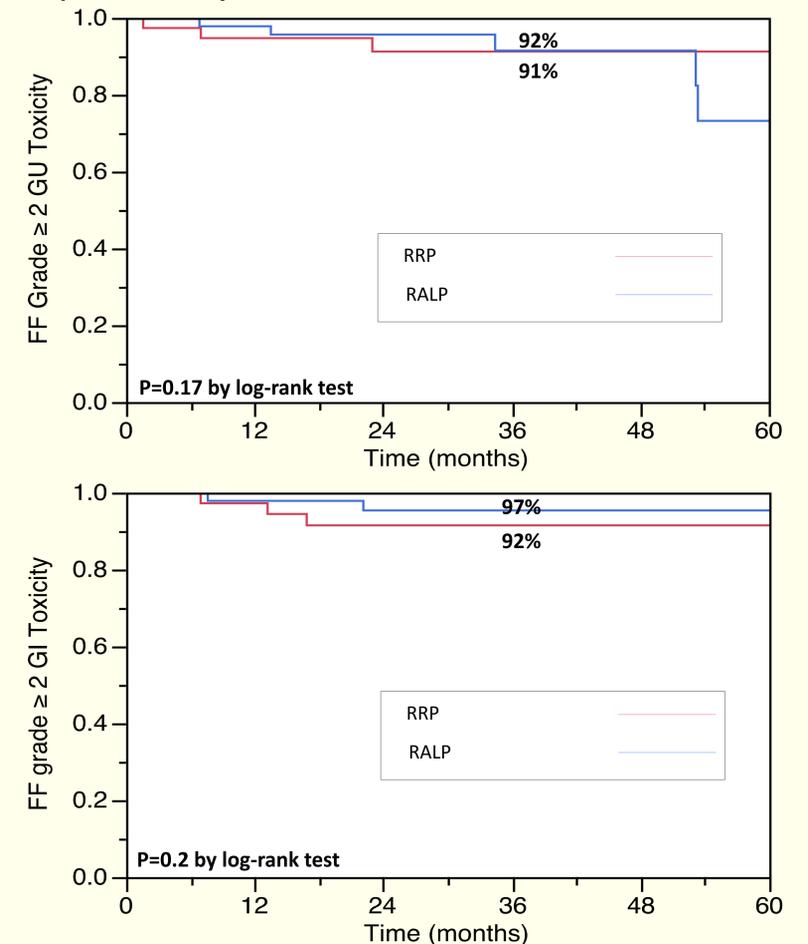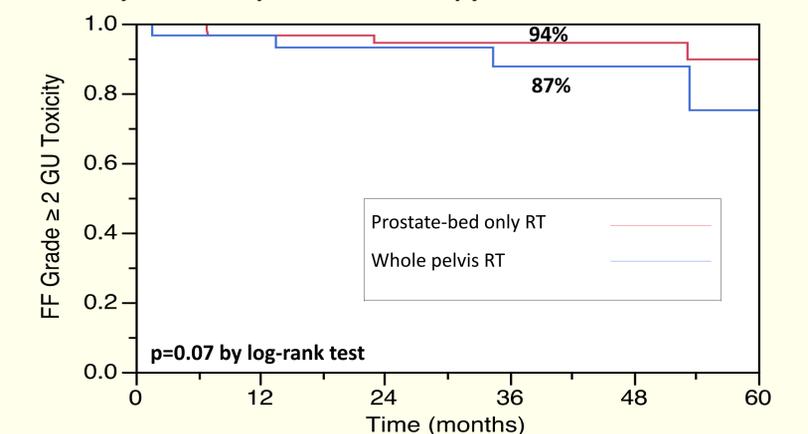**Figure 1. Freedom from grade ≥2 GU and GI toxicity according to type of prostatectomy**

Figure 2. Freedom from Grade ≥ 2 GU Toxicity according to prostate-bed only vs. whole pelvis radiotherapy