

## Introduction & Synopsis

**Introduction:** Long-term patient reported outcomes for high-risk prostate cancer patients receiving stereotactic body radiotherapy is limited. Robotic SBRT allows for targeted guidance and high precision of dose delivery, which may result in improved outcomes. This study sought to evaluate in genitourinary and gastrointestinal toxicities as well as report failure characteristics in patients receiving SBRT for prostate cancer.

**Synopsis:** In this single institution cohort, the rates of GI and GU toxicities remain low with favorable biochemical failure rate.

## Methods

- (1) 216 patients with high-risk prostate cancer patients treated with fiducial guided SBRT from December 2008 to July 2023.
- (2) Patients were treated with 35-36.25 Gy to the PTV delivered in five fractions of either 6, 7, 7.25, or 8 Gy using CyberKnife.
- (3) Prostate specific antigen (PSA) levels were obtained and prostate cancer-specific QOL questionnaires were administered before the first SBRT treatment (baseline), 3 months, 6 months, 12, months, 18 months, 24 months, and 36 months after completion of radiation therapy.
- (4) Differences in QOL score were assessed. Recurrence was assessed during follow-up which incorporated clinical symptomatology, digital rectal examination, and rising PSA levels.

	Percent Patient (%) (N = 216)
<b>Race</b>	
White	50
Black	39
Hispanic	2
Other	10
<b>Age</b>	
<60	3
60-69	25
70-79	39
>80	33
<b>Gleason Score</b>	
3 + 3 = 6	9
3 + 4 = 7	12
4 + 3 = 7	11
4 + 4 = 8	47
3 + 5 = 8	4
4 + 5 = 9	17
5 + 5 = 10	1
<b>Initial PSA</b>	
<10	38
10-20	23
>20	39
<b>Hormone</b>	
Yes	75
No	25

Figure 1. Patient Characteristics

## GU & GI Toxicities Remain Low

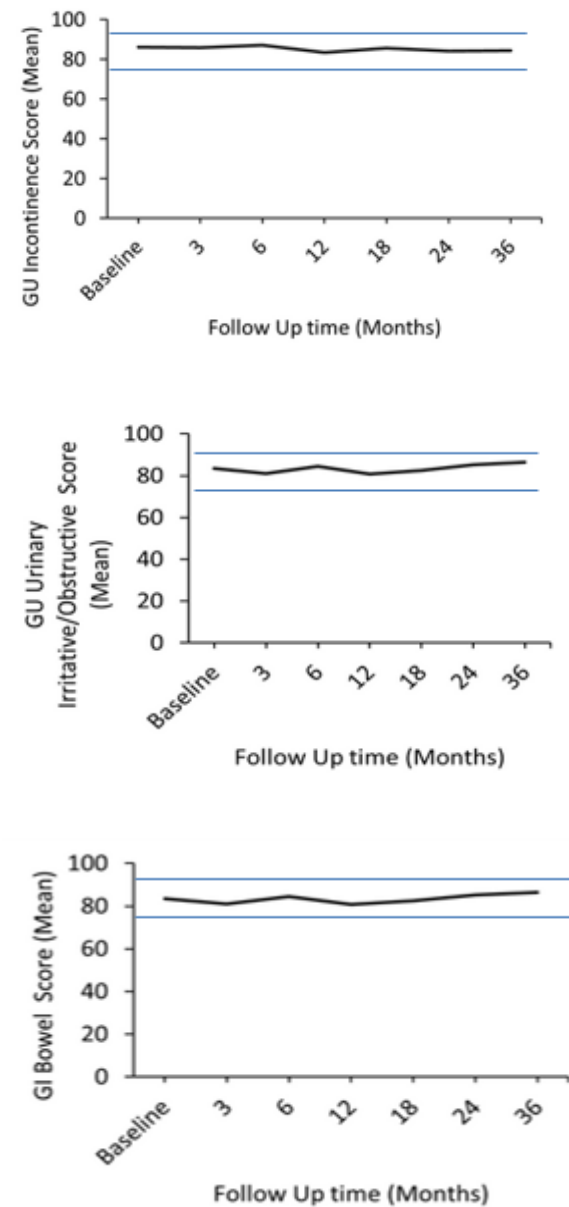


Figure 2. Mean EPIC GI and GU Domain summary scores at baseline and following SBRT for prostate cancer. Clinically significant changes ( $\pm 0.5 \times SD$  from baseline). Scores range from 0 – 100 with higher scores reflecting favorable quality of life

## Frequency was most common GU & GI Toxicity

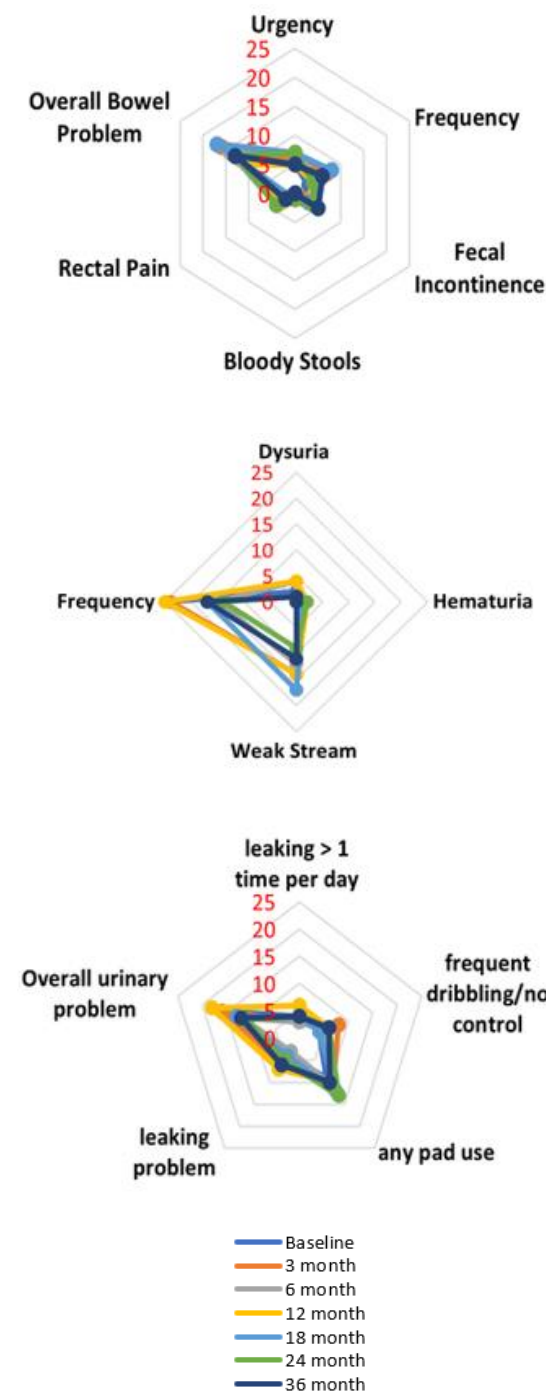


Figure 3. Radar Plots for percentage of patients experiencing specific GU & GI symptoms at follow up.

## Favorable Biochemical Control Rate

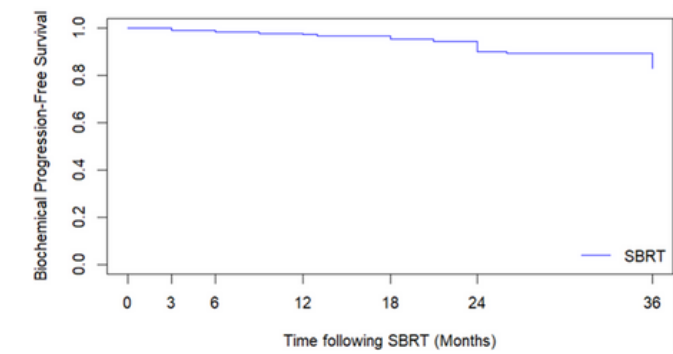


Figure 4. Kaplan-Meier Curve for Biochemical Control Rate. Recurrence was determined by clinical symptomatology, and digital rectal examination, and encompassing rising PSA levels.

## Failure Characteristics

	Average (Range)
<b>PSA ng/ml</b>	
Initial	22.9 (1.3 – 6)
Nadir	1.82 (0.1 – 34)
Recurrence	22.03 (0.39 - 429.8)
<b>Time To Failure (Months)</b>	40 (3 – 131)
<b>Percent Patients (%) (N=33)</b>	
<b>Gleason Score</b>	
G6	3%
G7	24%
G8	36%
G9	36%
<b>Dose (Gy)</b>	
35	18%
36.25	82%
<b>DRE</b>	
Abnormal	55%
Normal	45%
<b>Patter of failure</b>	
Bone	42%
Local	21%
PSA Only	30%
Abdomen	15%
Pelvis	15%

Figure 5. Clinical characteristics of recurrences

## Results/Discussion

**EPIC Domain Scores:** GU Incontinence scores decreased from an initial baseline value of 86.04 to 84.4 at the 36-month follow up. GU irritative/obstructive score increased from baseline of 83.4 to 87.4 at 36 months. Bowel Score slightly decreased from 92.7 to 90.6. None of the reductions were statistically significant.

**Specific Domain:** Urinary frequency and pad usage was the most common urinary symptom seen at baseline as well as 36 months. Urinary frequency decreased from 24% of patients to 17% while pad usage slightly increased from 9% to 10%. The most frequent bowel problem at baseline was urgency at 5% and frequency at 6%. Urgency remained constant 5% at 36 month follow up and frequency increased from 3% to 6% at 36 months.

**Recurrence:** Total of 33 recurrences were observed. 23 occurred within 36 months indicating a biochemical disease-free survival of 89% in 3 years. 4 occurred within 12 months. Average time to failure was 40 months and median time to failure was 36 months. Average initial PSA was 22.9 ng/ml, average PSA Nadir value was 1.82 ng/ml post-treatment, and average PSA recurrence value was 22.03 ng/ml. 70% of recurrences received ADT. Recurrences in bone were the most common.

**Discussion:** SBRT for high-risk prostate cancer has excellent GU and GI toxicity alongside promising 3-year biochemical recurrence-free survival rates. 70% of the recurrences occurred within the first 36 indicating the importance of active surveillance within the first 3 years post-radiotherapy. While nodal failures were rare among our subjects, the absence of prophylactic pelvic nodal radiation prompts consideration for optimized treatment strategies in managing high-risk prostate cancer. Further, we hypothesize many of recurrences may have been present pre-radiotherapy and usage of PSMA in workup may result in better detection.

## References

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4. Brand, D. H. et al. Intensity-modulated radiotherapy versus stereotactic body radiotherapy for prostate cancer (PACE-B): 2-year toxicity results from an open-label, randomised, phase 3, noninferiority trial. Articles Lancet Oncol 23, 1308–1328 (2022).