SBRT. The median PFS after SBRT was 5.3 m (range: 1.8-8.7) with a 2-yr PFS of 29.3%. Patient-level PFS was improved with LT (6.7 vs 1.4 m; p = 0.001) and DM (NR vs 2.9 m; p = 0.015), whereas improved OS was related with LT (18.9 vs 6.6 m; p = 0.03), DM (p = 0.04), ECOG (p = 0.004), and no relapse after SBRT (NR vs 9.8 m; p <0.001). Exposure to < 3 systemic agents prior to SBRT portended better PFS (6.7 vs 2.6 m; p = 0.04) without any impact by IO. At site level, 20.4% of sites had local relapse with 4 being the first event. Site was related with PFS (p = 0.009) with order of increased relapse risk being liver > bone > soft tissue > node > lung. No dosimetric feature was related with recurrence risk. On MVA, both DM (p = 0.02) and LT (p = 0.002) were predictive for PFS. Only recurrence after SBRT predicted for OS on MVA (HR: 6.7, 95% CI: 1.4-31; p = 0.014). In the IO subset, median PFS was 5.3 m and OS was 9.4 m, with no difference seen with IO-SBRT sequence or PDL1 status.

Conclusion: Optimized selection criteria for metastasis-directed therapy in patients with UT tumors is unclear, notably with IO. Future studies may benefit by assessing circulating tumor markers prior to SBRT.

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Treatment Outcomes of Simultaneous Integrated Boost to Intraprostatic Lesions with External Beam Radiotherapy in Localized Prostate Cancer Patients

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Purpose/Objective(s): To evaluate the treatment outcomes and toxicity of definitive radiotherapy (RT) for prostate cancer (PC) patients using the simultaneous integrated boost (SIB) technique to intraprostatic lesion (IPL).

Materials/Methods: All the patients received 78 Gy for their prostate ± seminal vesicles and 86 Gy for the IPL using the SIB technique. High-risk patients received pelvic nodal irradiation. The pelvic lymphatic field received 46−54 Gy of radiation. Univariable and multivariable analyses were conducted of the prognostic factors for freedom from biochemical failure (FFBF), progression-free survival (PFS), and PC-specific survival (PCSS) of 619 PC patients who received definitive RT between September 2012 and August 2021. Predictors of late Grade ≥ 2 genitourinary (GU) and gastrointestinal (GI) toxicities were also identified using logistic regression.

Results: The median age of the entire cohort was 69 years (range, 47−89 years). Most of the patients (82.7%) had tumors with a GS of 6 or 7, 134 (21.6%) had PC with a GS of 3 + 4, 126 (20.4%) had PC with a GS of 4 + 3, and only 9% had clinical nodal metastasis. The median follow-up time for the entire cohort was 68.5 months (95% CI, 64.4−72.6 months). The 5-year FFBF, PFS, and PCSS rates were 93.2%, 83.2%, and 98.6%, respectively. They were predicted by the serum prostate specific antigen (PSA), Gleason score (GS), clinical nodal stage, and D'Amico risk group. Only 45 patients (7.3%) developed disease recurrence 41.9 months after RT. Of these patients, 12 (1.9% of the total) had BF only, 31 (5.3%) had both BF and distant metastasis, and 2 (0.3%) had distant metastasis only. The 5-year FFBF rates for low-, intermediate-, and high-risk disease were 98.0%, 93.1%, and 88.5%, respectively (p < 0.001). The 5-year PFS and PCSS rates according to risk groups were 91.0%, 82.1%, and 77.4% ($p < 0.001$), and 99.2%, 96.4%, and 95.9% (p = 0.03), and respectively. GS > 7 and lymph node metastasis negatively predicted FFBF and PCSS in multivariable analysis. Lymph node metastasis was associated with poor PFS, but only marginally ($p = 0.06$). Ninety (14.6%) and 44 (7.1%) patients had acute Grade ≥ 2 GU and GI toxicities, respectively, and 42 (6.8%) and 27 (4.4%) patients had late Grade ≥ 2 GU and GI toxicities, respectively. Diabetes (OR = 2.61; 95% CI = 1.29−5.26; $p = 0.007$) and transurethral resection of prostate (OR = 6.75; 95% CI = 3.37−13.54; $p = 0.001$) independently predicted late Grade ≥ 2 GU toxicity, but no significant predictor of late Grade ≥ 2 GI toxicity was found.

Conclusion: Localized PC was effectively and safely treated with definitive RT using the SIB technique to deliver 86 Gy to the IPL in 39 fractions without severe late toxicity. This finding must be validated with long-term results.

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Dosimetric Predictors of Toxicities and Quality of Life Following Two-Fraction Stereotactic Body Radiotherapy for Prostate Cancer

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Purpose/Objective(s): There is emerging interest in two-fraction stereotactic body radiotherapy (2#SBRT) for localized prostate cancer. However, there is limited data to guide organs at risk (OAR) dose constraints in 2#SBRT. We aim to identify dosimetric predictors of toxicities and quality of life (QoL) using real life patient data from two prospective 2#SBRT trials.

Materials/Methods: We included 60 patients who had 2#SBRT in the 2STAR (NCT02031328) and 2SMART (NCT03588819) phase 2 trials. The prescribed dose was 26Gy to the prostate +/- focal boost of 32Gy to the dominant intraprostatic lesions. Toxicities and QoL data were prospectively collected using CTCAEv4 and EPIC26 questionnaires. For QoL, we reported the minimal clinical important changes (MCIC), defined as changes in QoL score of >0.5 standard deviation from baseline QoL score. We evaluated the bladder, urethra, rectum, and penile bulb dosimetry (urethra dosimetry only available in 30 patients in 2SMART trial). Some of the dosimetric parameters were log-transformed to normalize the distribution. Cox regression was used to identify dosimetric predictors for acute and late grade ≥2 GU toxicities. Logistic regression was used to identify dosimetric predictors for late MCIC in urinary, bowel and sexual QoL domains. Backward stepwise selection was used to identify significant dosimetric parameters. For GU toxicities and urinary QoL, three additional clinical factors (age, prostate volume and IPSS) were included in the final model as