

Supplementary Information

Title Page:

Title: Prostate cancer lesions in transition zone exhibit a higher propensity for pathological upgrading in radical prostatectomy

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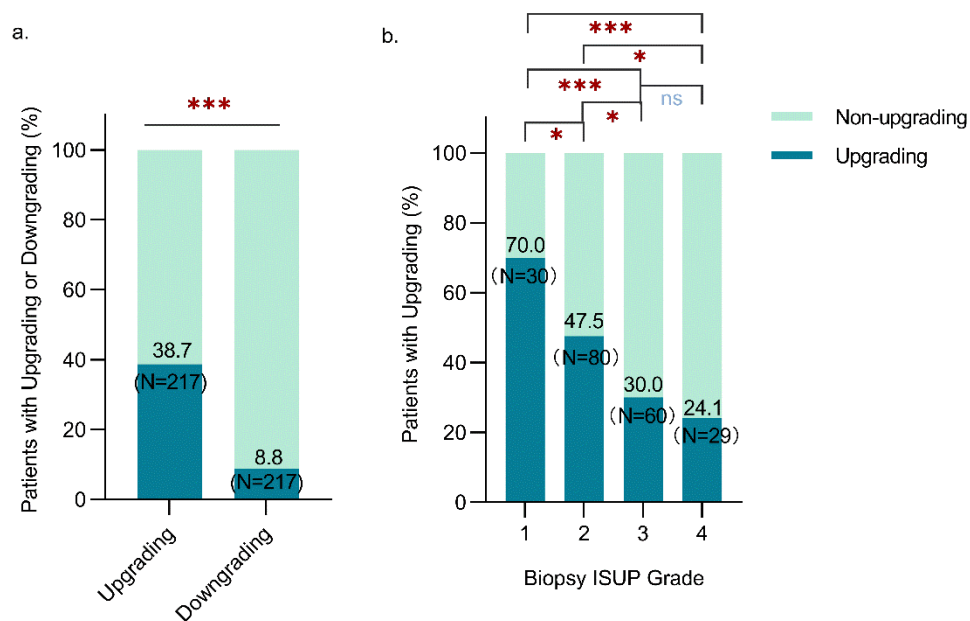
These authors are co-authors of communication.

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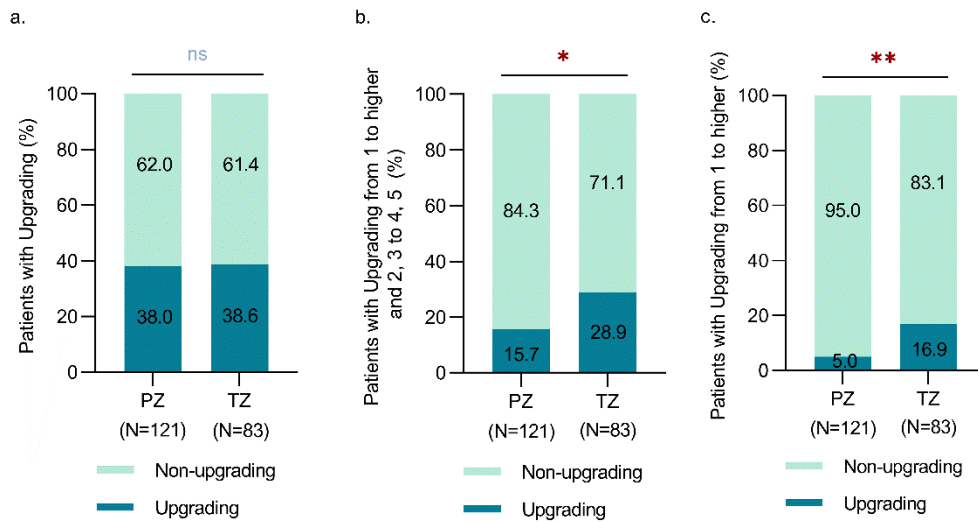
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Online Resource 1. The ISUP grade upgradation of enrolled cases. (a) The rate of upgradation was significantly higher than that of downgrading (38.7% vs. 8.8%, $p < 0.001$). (b) Patients with ISUP grades 1 experienced a higher rate of upgradation compared to those with grades 2, 3 and 4 (70.0% vs. 47.5% vs. 30.0% vs. 24.1%, respectively, $p < 0.05$). ISUP grade 2 patients showed a higher upgradation rate than those with grades 3 and 4 (47.5% vs. 30.0% vs. 24.1%, respectively, $p < 0.05$). (ISUP, International Society of Urological Pathology; *: $p < 0.05$, ***: $p < 0.001$).



Online Resource 2. Upgrading rates in patients with TZ vs. PZ lesions. (a) No difference in upgrading rates between TZ and PZ lesions (62.0% vs. 61.4%, $p=0.983$). (b) Patients with TZ lesions experienced a higher rate of upgrading from 1 to higher and 2, 3 to 4, 5 compared to PZ lesions (28.9% vs. 15.7%, $P=0.021$). (c) Patients with TZ lesions experienced a higher rate of upgrading from 1 to higher compared to PZ lesions (16.9% vs. 5.0%, $P=0.005$). (TZ, Transitional Zone; PZ, Peripheral Zone; *: $p<0.05$, **: $p<0.01$)

Online Resource 3. Univariate and multivariate logistic regression analysis of factors associated with upgrading from 1 to higher and 2, 3 to 4, 5 in enrolled patients

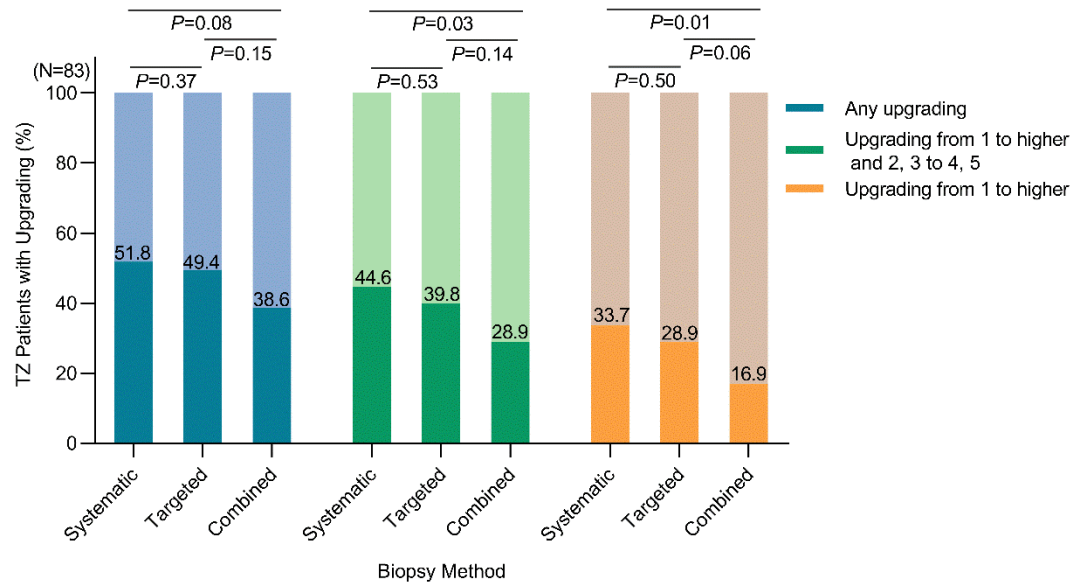
factor	Single factor logistic regression analysis				Multivariate logistic regression analysis					
	OR	2.5% OR	97.5% OR	P	OR	2.5% OR	97.5% OR	P		
Age	0.970	0.923	1.019	0.227	0.960	0.906	1.016	0.165		
tPSA	1.001	0.976	1.024	0.916	1.048	0.965	1.143	0.276		
f/tPSA	17.194	0.273	953.751	0.162	8.869	0.050	934.875	0.374		
largest dimension of lesion	1.009	0.958	1.060	0.738	1.004	0.910	1.108	0.933		
lesion volume	1.034	0.899	1.169	0.612	0.764	0.433	1.274	0.320		
Prostate volume	1.011	0.996	1.027	0.144	1.008	0.922	1.099	0.857		
TZ volume	1.013	0.992	1.034	0.199	0.985	0.870	1.112	0.810		
lesion volume ratio	1.004	0.952	1.051	0.870	1.108	0.912	1.341	0.286		
TZ volume ratio	1.011	0.987	1.035	0.375	1.011	0.958	1.070	0.680		
PSA density	0.690	0.289	1.425	0.360	0.224	0.012	2.792	0.276		
Number of positive cores	0.910	0.796	1.033	0.155	0.964	0.823	1.122	0.645		
lesion in TZ	2.698	1.394	5.315	0.004	**	2.406	1.182	4.980	0.016	*

OR, Odds Ratio; CI, Confidence Interval; tPSA, total Prostate-Specific Antigen; f/tPSA, free PSA /total PSA; TZ, Transitional Zone; PZ, Peripheral Zone; *: p<0.05, **: p<0.01.

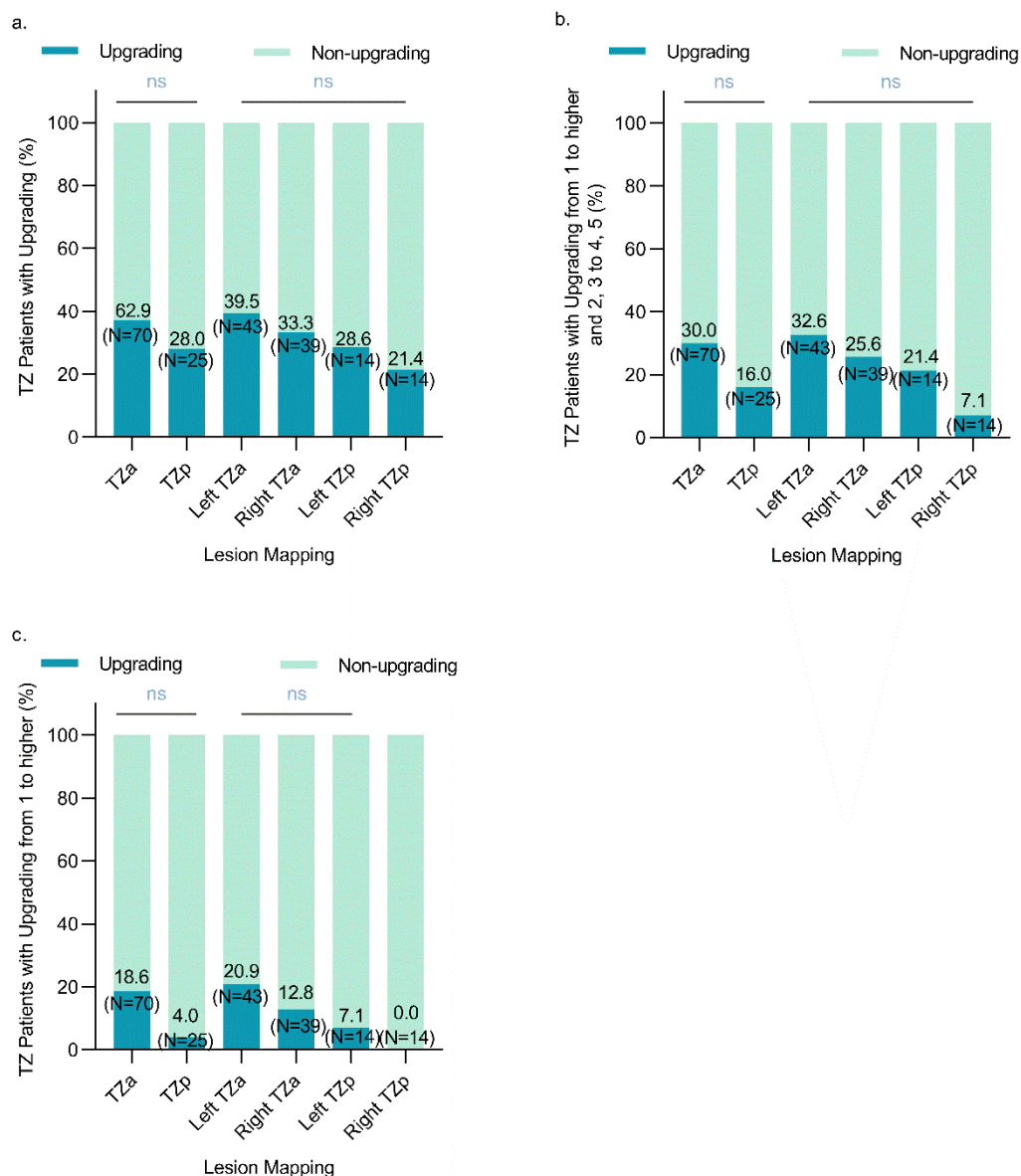
Online Resource 4. Univariate and multivariate logistic regression analysis of factors associated with upgrading from 1 to higher in enrolled patients

factor	Single factor logistic regression analysis				Multivariate logistic regression analysis			
	OR	2.5% OR	97.5% OR	P	OR	2.5% OR	97.5% OR	P
Age	0.957	0.895	1.024	0.200	0.968	0.893	1.050	0.433
tPSA	0.952	0.893	0.998	0.084	0.995	0.848	1.162	0.955
f/tPSA	251.380	2.045	28014.300	0.019	* 83.534	0.076	36048.169	0.170
Largest dimension of lesion	0.919	0.837	0.996	0.054	0.933	0.786	1.103	0.416
lesion volume	0.799	0.517	1.042	0.198	0.669	0.195	1.674	0.452
Prostate volume	1.020	1.001	1.039	0.028	* 1.058	0.934	1.197	0.371
TZ volume	1.025	1.000	1.049	0.037	* 0.945	0.804	1.110	0.489
lesion volume ratio	0.898	0.762	1.000	0.118	1.176	0.800	1.684	0.376
TZ volume ratio	1.022	0.989	1.055	0.194	1.019	0.944	1.102	0.631
PSA density	0.097	0.010	0.523	0.019	* 0.378	0.002	34.586	0.703
Number of positive cores	0.773	0.616	0.942	0.016	* 0.985	0.761	1.249	0.904
lesion in TZ	4.601	1.783	13.398	0.003	** 4.594	1.569	15.238	0.008 **

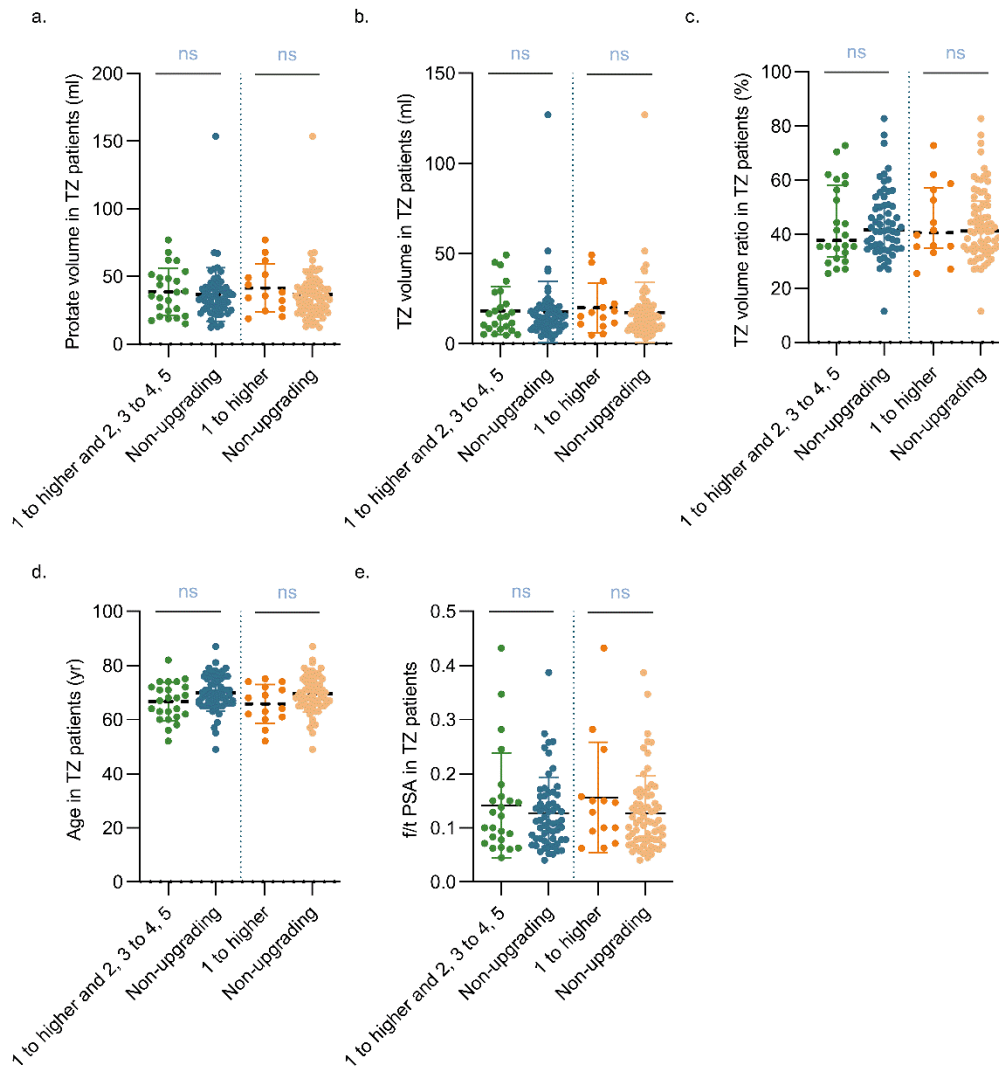
OR, Odds Ratio; CI, Confidence Interval; tPSA, total Prostate-Specific Antigen; f/tPSA, free PSA /total PSA; TZ, Transitional Zone; PZ, Peripheral Zone; *: p<0.05, **: p<0.01.



Online Resource 5. Upgrading rates in TZ patients with combined systematic and targeted biopsies vs. systematic and targeted biopsies alone. Combined biopsies tend to have lower rates of: Upgrading (38.6% vs. 51.8% and 49.4%, $p=0.08$, $p=0.15$); Upgrading from 1 to higher and 2, 3 to 4, 5 (28.9% vs. 44.6% and 39.8%, $p=0.03$, $p=0.14$); Upgrading from 1 to higher (16.9% vs. 33.7% and 28.9%, $p=0.01$, $p=0.06$). (TZ, Transitional Zone; *: $p<0.05$, **: $p<0.01$)



Online Resource 6. Upgrading rates in different zones of the TZ. (a) No significant difference in upgrading rates between the TZ anterior (TZa) and TZ posterior (TZp) (31.7% vs. 28.0%, $p=0.410$). (b) Trend towards higher rate of upgrading from 1 to higher and 2, 3 to 4, 5 in the TZa compared to the TZp (30.0% vs. 12.5%, $p=0.109$). (c) Trend towards higher rate of upgrading from 1 to higher in the TZa compared to the TZp (18.6% vs. 4.0%, $p=0.104$). (TZ, Transitional Zone; TZa, TZ Anterior; TZp, TZ Posterior)



Online Resource 7. Factors associated with upgrading in TZ tumors. There were no statistically significant differences in terms of prostate volume (37 vs. 34 ml, $P=0.544$), TZ volume (14.83 vs. 14.48 ml, $P=0.856$), TZ volume ratio (37.69 vs. 41.67, $P=0.540$), age (67 vs. 70 years, $P=0.056$), and the free-to-total PSA ratio (f/t PSA) (0.11 vs. 0.11, $P=0.934$) between patients with and without upgrading from 1 to higher and 2, 3 to 4, 5. No statistically significant differences were found in prostate volume (37 vs. 34 ml, $P=0.300$), TZ volume (16.28 vs. 14.41 ml, $P=0.364$), TZ volume ratio (40.54 vs. 41.14, $P=0.930$), age (66 vs. 70 years, $P=0.060$), and f/t PSA (0.14 vs. 0.11, $P=0.342$) between patients with and without upgrading from 1 to higher.

Online Resource 8. Univariate and multivariate logistic regression analysis of factors associated with upgrading from 1 to higher in TZ patients

factor	Single factor logistic regression analysis				Multivariate logistic regression analysis			
	OR	2.5% OR	97.5% OR	P	OR	2.5% OR	97.5% OR	P
Age	0.922	0.842	1.004	0.066	0.927	0.823	1.039	0.192
tPSA	0.948	0.876	1.005	0.126	1.013	0.765	1.344	0.927
f/tPSA	84.544	0.071	7.350E+04	0.195	241.959	0.004	2.650E+07	0.330
largest dimension of lesion	0.910	0.814	1.000	0.069	0.886	0.686	1.123	0.318
lesion volume	0.802	0.499	1.062	0.232	1.108	0.217	3.869	0.878
Prostate volume	1.012	0.983	1.041	0.373	1.107	0.909	1.391	0.326
TZ volume	1.008	0.970	1.040	0.593	0.858	0.587	1.112	0.285
lesion volume ratio	0.901	0.751	1.015	0.161	0.996	0.543	1.862	0.866
TZ volume ratio	1.002	0.958	1.045	0.924	1.050	0.929	1.240	0.988
PSA density	0.164	0.013	1.024	0.097	2.103	2.397E-04	1.467E+04	0.460
Number of positive cores	0.529	0.321	0.774	0.004 **	0.586	0.336	0.891	0.029 *
lesion in TZa	6.933	1.262	129.720	0.070	10.797	1.503	248.727	0.048 *

OR, Odds Ratio; CI, Confidence Interval; tPSA, total Prostate-Specific Antigen; f/tPSA, free PSA /total PSA; TZ, Transitional Zone; PZ, Peripheral Zone; TZa, TZ anterior; *: p<0.05, **: p<0.01.