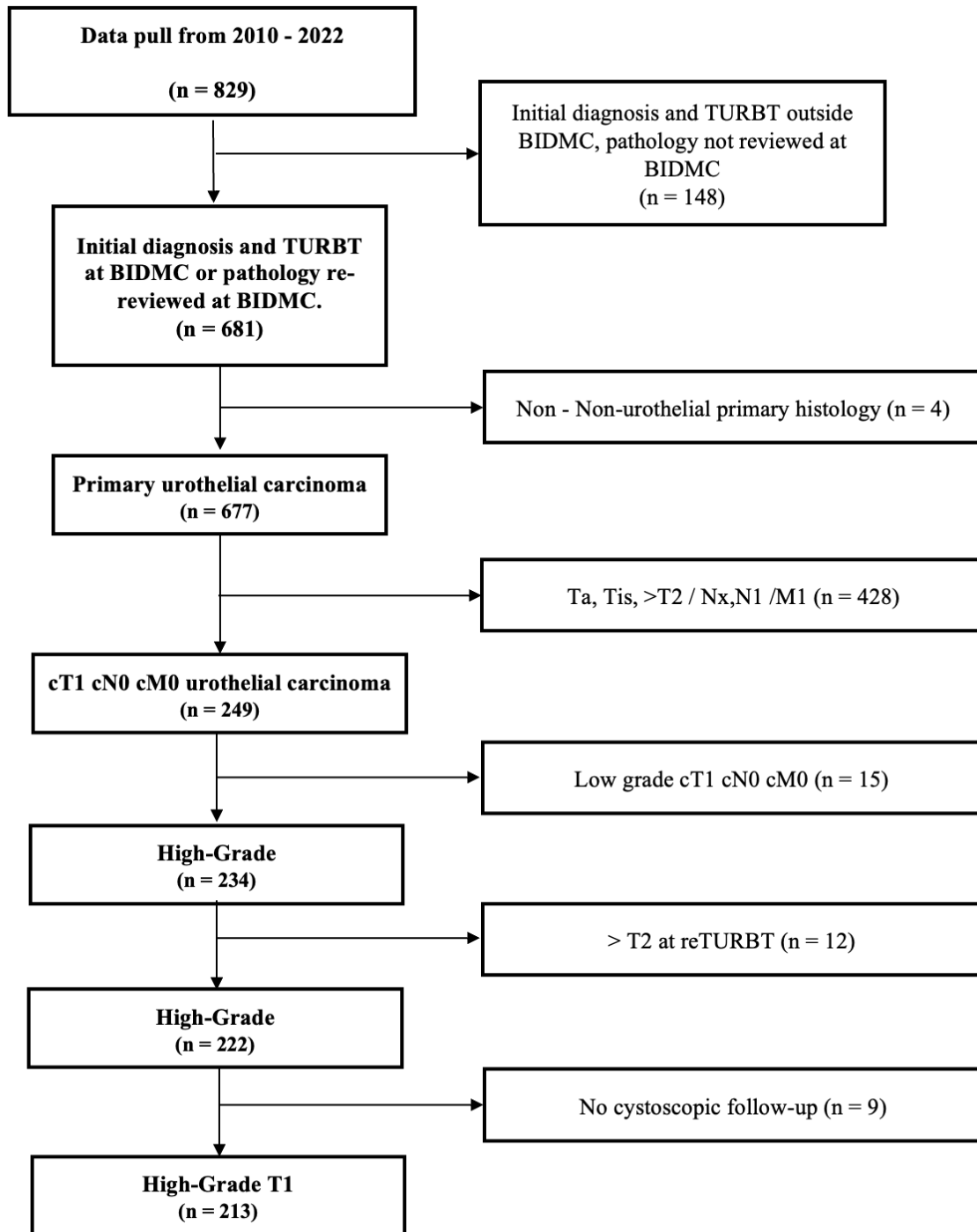


APPENDIX

Supplementary Figure 1. CONSORT flow diagram for the study cohort.



Supplementary Table 1. Survival estimates for RFS	
Time (months)	Survival estimate
12	0.65 (0.59, 0.73)
24	0.55 (0.47, 0.63)
36	0.51 (0.44, 0.60)
48	0.50 (0.43, 0.59)
60	0.48 (0.40, 0.57)
72	0.44 (0.36, 0.54)
84	0.41 (0.32, 0.51)

RFS: recurrence-free survival.

Supplementary Table 2. Survival estimates for PFS	
Time (months)	Survival estimate
12	0.85 (0.80, 0.91)
24	0.80 (0.74, 0.87)
36	0.78 (0.72, 0.85)
48	0.77 (0.70, 0.84)
60	0.72 (0.65, 0.81)
72	0.69 (0.60, 0.79)
84	0.65 (0.55, 0.76)

PFS: progression-free survival.

Supplementary Table 3. Survival estimates for CSS	
Time (months)	Survival estimate
12	0.99 (0.97, 1.00)
24	0.97 (0.94, 1.00)
36	0.95 (0.92, 0.99)
48	0.95 (0.92, 0.99)
60	0.95 (0.92, 0.99)
72	0.94 (0.90, 0.98)
84	0.92 (0.86, 0.98)

CSS: cancer-specific survival.

Supplementary Table 4. Univariable associations of baseline characteristics with recurrence, progression, and cancer-specific mortality			
	RFS	PFS	CSS
Characteristic	Unadjusted HR (95% CI)	Unadjusted HR (95% CI)	Unadjusted HR (95% CI)
Age, years	1.00 (0.98, 1.02)	1.02 (0.99, 1.05)	1.01 (0.94, 1.08)
Gender			
Male	–	–	–
Female	0.72 (0.40, 1.30)	1.18 (0.56, 2.47)	1.24 (0.26, 5.97)
Charlson index			
0	–	–	–
1	1.13 (0.64, 1.99)	1.08 (0.48, 2.43)	2.23 (0.50, 10.0)
2	0.77 (0.40, 1.49)	0.41 (0.12, 1.37)	–
3+	1.08 (0.61, 1.93)	0.88 (0.38, 2.06)	1.34 (0.24, 7.34)
Smoking status			
Never	–	–	–
Former	1.52 (0.97, 2.40)	0.93 (0.47, 1.83)	0.68 (0.15, 3.04)
Current	1.25 (0.61, 2.54)	1.72 (0.72, 4.14)	1.85 (0.34, 10.1)
Race			
White	–	–	–
Black	1.98 (0.86, 4.60)	2.54 (0.90, 7.21)	5.88 (1.21, 28.5)*
Others	0.99 (0.48, 2.06)	0.47 (0.11, 1.95)	–
Hispanic			
No/Unknown	–	–	–
Family history of bladder cancer			
No	–	–	–
Yes	1.08 (0.39, 2.94)	1.78 (0.55, 5.76)	–
Year of diagnosis			
2010–2012	–	–	–
2013–2015	0.75 (0.41, 1.37)	0.51 (0.22, 1.18)	0.73 (0.10, 5.16)
2016–2018	0.80 (0.42, 1.50)	0.60 (0.25, 1.45)	1.55 (0.25, 9.61)
2019–2021	1.09 (0.57, 2.07)	1.08 (0.45, 2.59)	1.64 (0.21, 12.8)
Number of tumors (continuous)	1.16 (0.89, 1.51)	1.58 (1.15, 2.17)*	1.60 (0.84, 3.05)
Number of tumors (categorical)			
1	–	–	–
2	0.80 (0.34, 1.85)	0.76 (0.18, 3.24)	5.74 (0.96, 34.4)
≥3	1.33 (0.66, 2.69)	2.76 (1.17, 6.52)*	2.52 (0.26, 24.3)
Maximum tumor size (in cm) (continuous)	1.12 (0.98, 1.28)	1.06 (0.85, 1.32)	0.67 (0.35, 1.28)
Maximum tumor size (in cm)			
<3	–	–	–
≥3	1.34 (0.79, 2.27)	1.50 (0.63, 3.60)	0.19 (0.02, 1.67)
Hydronephrosis			

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No hydronephrosis	—	—	—
Left/right/bilateral	1.79 (0.89, 3.60)	2.34 (0.90, 6.07)	1.51 (0.19, 12.1)
ASA			
I/II	—	—	—
III/IV/V	1.38 (0.88, 2.17)	1.46 (0.73, 2.90)	0.81 (0.20, 3.25)
Intraoperative blue light cystoscopy			
No	—	—	—
Yes	0.85 (0.27, 2.70)	—	—
Postoperative complications			
No	—	—	—
Yes	1.11 (0.55, 2.21)	1.53 (0.64, 3.63)	2.85 (0.59, 13.7)
Lamina propria invasion			
Non-focal T1/unknown	—	—	—
Focal T1	0.85 (0.55, 1.32)	0.95 (0.50, 1.79)	1.15 (0.31, 4.30)
High-grade proportion			
All high-grade	—	—	—
Low-grade with focal high-grade/mix of low-grade and high-grade	0.41 (0.15, 1.12)	—	—
Lymphovascular invasion			
No	—	—	—
Yes	0.84 (0.27, 2.67)	1.47 (0.35, 6.12)	4.05 (0.48, 34.0)
Variant histology present			
No	—	—	—
Yes	1.30 (0.76, 2.21)	1.97 (0.99, 3.94)	0.60 (0.08, 4.82)
Concomitant CIS			
No	—	—	—
Yes	0.97 (0.60, 1.57)	0.80 (0.38, 1.68)	1.52 (0.38, 6.10)
Multifocal disease			
No	—	—	—
Yes	1.32 (0.74, 2.35)	1.43 (0.63, 3.25)	2.10 (0.42, 10.4)
Muscularis propia in specimen			
No	—	—	—
Yes	0.98 (0.62, 1.55)	0.95 (0.49, 1.84)	0.53 (0.14, 1.97)
Re-TURBT performed			
No	—	—	—
Yes	0.84 (0.55, 1.29)	0.73 (0.39, 1.38)	0.69 (0.17, 2.75)
Immediate postoperative chemotherapy			
No	—	—	—
Yes	1.07 (0.59, 1.93)	0.33 (0.08, 1.37)	—
Type of adjuvant intravesical therapy			
None	—	—	—
BCG	0.36 (0.21, 0.61)*	0.20 (0.10, 0.42)*	0.37 (0.08, 1.65)
Other	0.35 (0.18, 0.68)*	0.32 (0.14, 0.73)*	0.51 (0.08, 3.09)
Complete response to intravesical therapy			

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No	–	–	–
Yes	0.05 (0.03, 0.09)*	0.15 (0.07, 0.32)*	0.62 (0.11, 3.41)
Not assessed	–	–	–

*p<0.05. ASA: American Society of Anesthesiologists; BCG: bacillus Calmette-Guérin; CI: confidence interval; CIS: carcinoma in situ; HR: hazard ratio; TURBT: transurethral resection of bladder tumor.

Supplementary Table 5. Multivariable associations of baseline characteristics with recurrence, progression, and cancer-specific mortality^a

	RFS	PFS
Characteristic	Adjusted HR (95% CI)	Adjusted HR (95% CI)
Type of adjuvant intravesical therapy		
None	–	–
BCG	0.24 (0.11, 0.51)*	0.19 (0.06, 0.63)*
Other	0.15 (0.05, 0.43)*	0.19 (0.04, 0.85)*
Number of tumors (continuous)	1.18 (0.81, 1.72)	1.69 (0.99, 2.88)
Maximum tumor size (continuous)	1.16 (1.01, 1.33)*	1.18 (0.93, 1.50)
Concomitant CIS		
No	–	–
Yes	1.61 (0.88, 2.97)	1.35 (0.49, 3.75)
Lymphovascular invasion		
No	–	–
Yes	0.39 (0.05, 2.89)	–
Lamina propria invasion		
Non-focal T1/unknown	–	–
Focal T1	1.27 (0.71, 2.26)	1.48 (0.58, 3.78)
High-grade proportion		
All high-grade	–	–
Low-grade with focal high-grade/mix of low-grade and high-grade	0.33 (0.08, 1.44)	–

^aComplete response to intravesical therapy was not included in the multivariable model as it is a “post-treatment” feature (i.e., not known or planned at the time of diagnosis). *p<0.05
BCG: bacillus Calmette-Guérin; CI: confidence interval; CIS: carcinoma-in-situ; HR: hazard ratio; TURBT: transurethral resection of bladder tumor.