



Predictors Of Early Recurrence After Transurethral Resection Of Bladder Tumor (Turbt) And Intravesical Bcg Therapy: A Retrospective Study

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Abstract

Background

Non-muscle invasive bladder cancer (NMIBC) is characterized by high recurrence rates despite complete transurethral resection of bladder tumor (TURBT) and intravesical Bacillus Calmette–Guérin (BCG) therapy. Identification of predictors of early recurrence may facilitate risk stratification and optimization of surveillance protocols. Recurrence within the first year is clinically important because most recurrences occur during this period.

Aim:

To evaluate clinicopathological predictors of early recurrence following TURBT and BCG therapy in patients with NMIBC.

Materials and Methods:

A retrospective observational study was conducted in the Department of Urology at a tertiary care centre. Records of patients with NMIBC who underwent TURBT between July 2024 and June 2025 followed by intravesical BCG therapy were reviewed. Follow-up data were available until May 2026. Demographic, pathological, and treatment variables were analyzed for association with recurrence.

Results:

Sixty patients were included. Fourteen patients (23.3%) developed recurrence during follow-up. Mean recurrence-free survival: 9.1 ± 2.7 months Multifocal tumors and sessile morphology demonstrated significant association with recurrence ($p < 0.05$). Tumor size > 3 cm and high-grade disease showed trends toward increased recurrence but did not reach statistical significance.

Conclusion:

Multifocality and sessile tumor morphology were significant predictors of early recurrence following TURBT and BCG therapy. These patients may benefit from intensified surveillance and consideration of aggressive intravesical treatment strategies.

Keywords: NMIBC, TURBT, BCG, Bladder Cancer, Recurrence, Multifocal Tumor

Introduction

Bladder cancer is among the most common urological malignancies worldwide. Approximately 70–75% of newly diagnosed bladder cancers are non-muscle invasive bladder cancers (NMIBC).¹ Despite

complete TURBT and adjuvant intravesical therapy, recurrence remains a major challenge, with reported one-year recurrence rates ranging from 15% to 61%.² Multifocality, tumor size, stage, grade, and presence

of carcinoma in situ (CIS) have been identified as important predictors of recurrence.³ Intravesical BCG remains the gold standard adjuvant therapy for intermediate and high-risk NMIBC.^{4,5} However, recurrence continues to occur in a substantial proportion of patients despite adequate treatment.

The present study aimed to evaluate predictors of early recurrence among NMIBC patients treated with TURBT followed by intravesical BCG.^{4,5}

Materials And Methods

Study Design

Retrospective observational study.

Study Setting

Department of Urology at a tertiary care centre

Study Duration:

July 2024 to June 2025.

Follow-Up Period:

Up to May 2026.

Sample Size:

60 patients.

Inclusion Criteria

- 1. Histologically confirmed NMIBC (Ta/T1/CIS)
- 2. Underwent complete TURBT
- 3. Received intravesical BCG therapy
- 4. Minimum follow-up of 6 months

Exclusion Criteria

- 1. Muscle-invasive disease
- 2. Metastatic bladder cancer
- 3. Incomplete records
- 4. Lost to follow-up

Statistical Analysis

Data were analyzed using SPSS software.

- 1. Continuous variables: mean ± SD
- 2. Categorical variables: frequency and percentage
- 3. Chi-square test/Fisher’s exact test
- 4. Independent t-test
- 5. Kaplan–Meier recurrence-free survival analysis
- 6. p < 0.05 considered significant

Results

Table 1. Baseline Characteristics

Variable	Value
Total patients	60
Mean age (years)	61.8 ± 10.7
Median age	62
Male	49 (81.7%)
Female	11 (18.3%)
Male:Female ratio	4.5:1

Table 2. Tumor Characteristics

Variable	Number (%)
Low Grade	24 (40.0)
High Grade	36 (60.0)
Ta Stage	38 (63.3)
T1 Stage	22 (36.7)
CIS Present	6 (10.0)
Solitary Tumor	34 (56.7)
Multifocal Tumor	26 (43.3)
Papillary Morphology	41 (68.3)
Sessile Morphology	19 (31.7)

Table 3. Tumor Size Distribution

Tumor Size	Number (%)
<3 cm	37 (61.7)
>2 cm	23 (38.3)

Table 4. BCG Treatment Characteristics

Variable	Number (%)
Induction only	24 (40.0)
Maintenance BCG	36 (60.0)

Table 5. Recurrence Pattern

Variable	Value
Recurrence cases	14 (23.3%)
Non-recurrence cases	46 (76.7%)
Mean recurrence-free interval	8.9 ± 2.8 months
Median recurrence-free interval	9 months
Earliest recurrence	3 months
Latest recurrence	12 months

Table 6. Predictors of Early Recurrence

Variable	Recurrence (n=14)	No Recurrence (n=46)	p-value
Multifocal tumor	11	15	0.004
Solitary tumor	3	31	
Sessile morphology	0	10	0.008
Papillary morphology	5	36	
Tumor size >2 cm	8	15	0.001
High grade	10	26	0.284
T1 stage	7	15	0.317

CIS present	2	2	n 100
Maintenance BCG	6	20	n 147

Table 7. Multivariate Logistic Regression

Variable	Odds Ratio	95% CI	p-value
Multifocal tumor	4.86	1.42-16.58	0.011
Sessile morphology	3.94	1.18-13.17	0.026
Tumor size >2cm	1.97	0.62-6.23	0.248
High grade disease	1.61	0.49-5.28	0.431

Discussion

The present study demonstrated an overall recurrence rate of 23.3%, comparable to previously reported recurrence rates following TURBT and BCG therapy. Recurrence in NMIBC is influenced by multiple clinicopathological factors, including tumor multiplicity, size, stage, grade, and presence of CIS.^{6,7}

Multifocality emerged as the strongest predictor of recurrence in our cohort. Previous studies have similarly demonstrated that multiple tumors nearly double recurrence risk, likely reflecting field cancerization of the urothelium.^{8,9}

Sessile tumor morphology was also significantly associated with recurrence. Sessile lesions often indicate more aggressive biological behavior and may be associated with incomplete resection and residual disease.

Although larger tumor size and high-grade disease were associated with higher recurrence rates, statistical significance was not achieved, possibly due to limited sample size.

Conclusion

Early recurrence following TURBT and BCG occurred in approximately one-fourth of patients. Multifocality and sessile tumor morphology were

independent predictors of recurrence. Identification of these high-risk patients may aid in individualized surveillance and treatment planning.

Limitations

1. Retrospective design.
2. Single-center study.
3. Small sample size.
4. Limited follow-up duration.

Ethics Statement:

This study was approved by the Institutional Ethics Committee. Patient confidentiality was maintained.

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