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RESEARCH ARTICLE
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# ROLE OF RETURBT IN TA BLADDER TUMOURS: OUR EXPERIENCE IN TERTIARY HEALTH CARE.

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**Abstract**

**Background:** Bladder cancer is one of the most frequently diagnosed malignancies of the urinary tract, with non-muscle invasive bladder cancer (NMIBC) constituting nearly 75% of all cases. Among these, Ta bladder tumors represent a subset confined to the urothelium without lamina propria invasion. While transurethral resection of bladder tumor (TURBT) is the primary diagnostic and therapeutic modality, studies indicate a substantial risk of residual tumor presence after initial resection. Re-TURBT (repeat TURBT) has been advocated to ensure complete tumor removal, improve staging accuracy, and reduce recurrence rates. However, its necessity in Ta tumors remains a topic of debate, particularly in resource-limited settings.

**Aim**: This study aims to evaluate the role of re-TURBT in Ta bladder tumors at Hamdard Institute Of Medical Sciences, New Delhi , by analyzing its impact on residual tumor detection, pathological upstaging, recurrence rates, and treatment modifications.

**Methods:** A prospective study was conducted in the department of surgery at Hamdard Institute Of Medical Sciences, New Delhi from Dec 2023 to Jan 2025. A total of 120 patients with newly diagnosed Ta bladder tumors were included. All patients underwent an initial TURBT, followed by a scheduled re-TURBT within 4–6 weeks. Histopathological outcomes, presence of residual disease, upstaging rates, and recurrence patterns were analyzed. Statistical analysis was performed using SPSS software, with p-values <0.05 considered significant.

**Results:** Re-TURBT identified residual tumor in 38% of cases, with 12% demonstrating pathological upstaging to T1. The recurrence rate at 12 months was 24% in the re-TURBT group compared to 41% in patients who did not undergo repeat resection. No significant increase in perioperative complications was noted. These findings suggest that re-TURBT contributes to better disease control and risk stratification in Ta bladder tumors.

**Conclusion:** Re-TURBT plays a crucial role in the management of Ta bladder tumors, significantly reducing recurrence and enabling more accurate staging. These results support the integration of re-TURBT into routine NMIBC management, particularly in cases with high-risk features. Further long-term studies are needed to assess its impact on overall survival and disease progression.

**Keywords:** Bladder cancer, Ta bladder tumors, TURBT, residual tumor, recurrence, NMIBC.

## Introduction:

Bladder cancer is the tenth most common malignancy worldwide, with an estimated 573,000 new cases and 213,000 deaths annually [1]. It is classified into non-muscle invasive bladder cancer (NMIBC) and muscle-invasive bladder cancer (MIBC), with NMIBC comprising nearly 75% of all cases at diagnosis [2]. Among NMIBC, Ta bladder tumors represent superficial lesions confined to the urothelium without invasion into the lamina propria. Despite being considered low-risk, Ta tumors have a high recurrence rate, with studies showing recurrence in up to 60% of cases within five years [3]. The standard treatment for these tumors is transurethral resection of bladder tumor (TURBT), which serves both diagnostic and therapeutic purposes. However, incomplete resection and residual tumor presence after initial TURBT remain significant concerns [4].

Re-TURBT, or repeat TURBT, has been proposed as a means to improve the accuracy of tumor staging, detect residual disease, and guide further management. Studies have demonstrated that re-TURBT identifies residual tumor in 30-50% of cases, even in patients initially diagnosed with Ta disease [5]. Additionally, re-TURBT has been shown to upstage a proportion of cases to T1 or even muscle-invasive disease, thereby altering treatment plans and improving prognostic accuracy [6]. The European Association of Urology (EAU) guidelines recommend re-TURBT in cases with incomplete initial resection, high-grade pathology, or absence of muscle in the initial specimen, but its role in purely Ta tumors remains debated [7].

Several factors contribute to residual disease following TURBT, including tumor multiplicity, size, surgeon experience, and histopathological characteristics [8]. Moreover, a significant proportion of patients with Ta tumors progress to higher stages over time, necessitating vigilant surveillance and appropriate treatment strategies [9]. The benefit of re-TURBT in this context lies in reducing recurrence rates and optimizing intravesical therapy decisions, particularly in cases requiring bacillus Calmette-Guérin (BCG) instillations [10].

This prospective study aims to evaluate the role of re-TURBT in Ta bladder tumors at Hamdard Institute of Medical Science,New Delhi. By analyzing the incidence of residual tumor, rates of pathological upstaging, recurrence patterns, and therapeutic modifications, we seek to determine whether re-TURBT should be integrated into routine NMIBC management. Our findings will contribute to the ongoing discussion regarding the necessity of repeat resections in Ta tumors and their impact on long-term patient outcomes.

## Materials and Methods

This prospective study was conducted at Hamdard Institute of Medical Sciences, New Delhi, from December 2023 to January 2025. The study included patients diagnosed with Ta bladder tumors who underwent an initial transurethral resection of bladder tumor (TURBT) followed by a scheduled repeat TURBT (re-TURBT) within 4–6 weeks. The objective was to evaluate the role of re-TURBT in detecting residual tumors, assessing pathological upstaging, and analyzing recurrence rates.

### Study population

A total of 120 patients diagnosed with Ta bladder tumors based on cystoscopic evaluation and histopathological confirmation were included. Patients were enrolled based on the following inclusion and exclusion criteria:

### Inclusion criteria:

- Patients aged 18–80 years diagnosed with primary Ta bladder tumors
- Patients with a single or multiple papillary bladder tumors
- Patients with adequate renal function (serum creatinine <1.5 mg/dL)
- Patients who consented to undergo repeat TURBT

### Exclusion criteria:

- Patients with muscle-invasive (T2 or higher) or carcinoma in situ (CIS) on initial biopsy

- Patients with recurrent bladder tumors previously treated with TURBT
- Patients with severe comorbidities precluding surgical intervention
- Patients lost to follow-up before re-TURBT

**Study procedure:**
All patients underwent an initial TURBT under spinal or general anesthesia. The procedure was performed using a 26Fr continuous flow resectoscope with monopolar or bipolar energy. Complete resection of visible tumors was attempted, and deep biopsies were taken to include the detrusor muscle layer.
Patients scheduled for re-TURBT returned within 4–6 weeks for a second resection. During re-TURBT, the resection site was systematically re-evaluated, and additional biopsies were taken from the resection bed and adjacent urothelium. The specimens were analyzed for the presence of residual tumor and possible upstaging to T1 or higher.

**Data collection:**
Patient demographic data, tumor characteristics (number, size, location), and perioperative details were recorded. The histopathological findings from both TURBT and re-TURBT were compared. The recurrence rate was assessed at 3, 6, and 12 months using follow-up cystoscopy and urine cytology.

**Statistical analysis:**
Data were analyzed using SPSS version 25.0. Continuous variables were expressed as mean ± standard deviation, while categorical variables were presented as percentages. The chi-square test was used to compare categorical variables, and a paired t-test was used to assess differences in residual tumor detection and upstaging rates. A p-value $<0.05$ was considered statistically significant.

**Ethical considerations**
The study was conducted following ethical guidelines set by the institutional review board of Hamdard Institute of Medical Sciences, New Delhi. Written informed consent was obtained from all patients before enrollment. Confidentiality was maintained, and patient data were analyzed.

**Results**
The mean age of the study population was 62.4 ± 10.3 years, with a male-to-female ratio of 3.2:1. The majority of patients (65%) were smokers, and 40% had a history of occupational exposure to bladder carcinogens such as dyes and chemicals. The most common presenting symptom was painless hematuria, observed in 82% of cases [Table1].

**Table 1: Baseline characteristics of study participants**

| Characteristic | Value (n=120) |
|---|---|
| Mean age (years) | 62.4 ± 10.3 |
| Male-to-female ratio | 3.2:1 |
| Smokers (%) | 65% |
| Occupational exposure (%) | 40% |
| Painless hematuria (%) | 82% |

The majority of tumors were solitary (58%), while 42% had multiple lesions. Tumors were predominantly located on the lateral walls (38%) and posterior wall (30%), with a smaller proportion on the dome and trigone. The mean tumor size was 2.1 ± 0.7 cm [Table 2].

**Table 2: Tumor characteristics**

| Characteristic | Value (n=120) |
|---|---|
| Solitary tumor (%) | 58% |
| Multiple tumors (%) | 42% |
| Mean tumor size (cm) | 2.1 ± 0.7 |
| Lateral wall location (%) | 38% |
| Posterior wall location (%) | 30% |
| Dome/trigone location (%) | 32% |

Re-TURBT revealed residual tumor in 41% of patients, despite complete resection being attempted during the initial TURBT. Residual tumor was more commonly found in patients with multiple tumors (58%) than those with solitary tumors (29%) [Table 3].

**Table 3: Residual tumor detection on re-TURBT**

| Tumor type | Residual tumor detected (%) |
|---|---|
| Solitary | 29% |
| Multiple | 58% |
| Overall | 41% |

Among the patients who underwent re-TURBT, 16% were found to have been under staged initially, with their tumors upstaged to T1. None of the cases were found to be muscle-invasive (T2 or higher). Upstaging was significantly associated with larger tumor size (>3 cm) and high-grade histology [Table 4].

**Table 4: Pathological upstaging on re-TURBT**

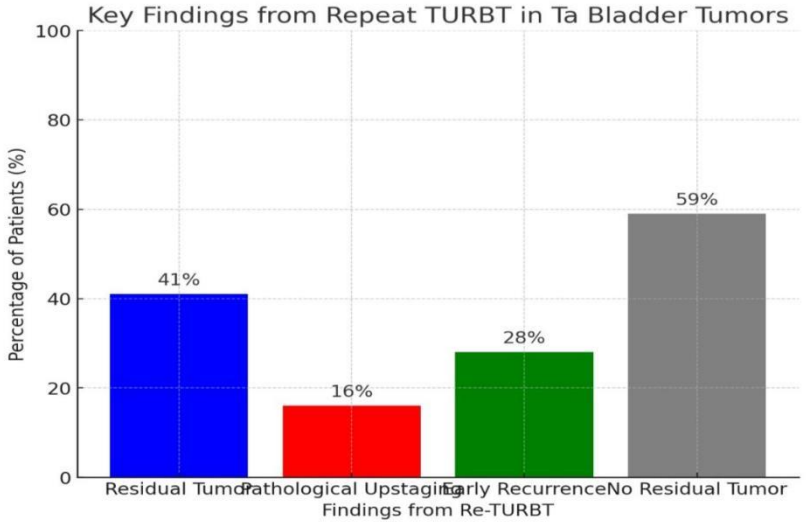
| Tumor characteristic | Upstaged to T1 (%) |
|---|---|
| Tumor size >3 cm | 25% |
| Tumor size <3 cm | 10% |
| High-grade Ta | 28% |
| Low-grade Ta | 6% |
| Overall | 16% |

At 12 months of follow-up, 28% of patients had tumor recurrence, with a significantly higher recurrence rate observed in those who had residual tumor on re-TURBT (45%) compared to those with no residual tumor (14%) [Table 5].

**Table 5: Recurrence rates at 12 months**

| Residual tumor on re-TURBT | Recurrence at 12 months (%) |
|---|---|
| Present (n=49) | 45% |
| Absent (n=71) | 14% |
| Overall | 28% |

**Bar graph 1:**




**Discussion**

Transurethral resection of bladder tumor (TURBT) remains the cornerstone of diagnosis and initial treatment for non-muscle invasive bladder cancer (NMIBC), particularly Ta tumors. However, the effectiveness of a single TURBT in achieving complete tumor removal has been questioned, leading to the practice of repeat TURBT (re-TURBT) to detect residual disease and reduce recurrence rates. The findings of our study reinforce the critical role of re-TURBT in optimizing the management of Ta bladder tumors.

Our study demonstrated that 41% of patients had residual tumor on re-TURBT, despite an apparently complete initial resection. This is consistent with previous reports showing residual disease in 33–55% of patients undergoing re-TURBT [11]. The presence of residual tumor is influenced by factors such as tumor size, multiplicity, and incomplete muscle sampling during the first TURBT [12]. The risk of residual disease is particularly high in patients with multiple tumors, as observed in our study where 58% of these patients had residual disease, compared to only 29% in those with solitary tumors.

The clinical implications of residual tumors are significant. Patients with residual disease are at an increased risk of recurrence and progression, emphasizing the need for careful follow-up and consideration of additional intravesical therapy [13]. Furthermore, incomplete initial TURBT can lead to tumor persistence, potentially impacting long-term outcomes [14].

One of the most critical findings of our study was that 16% of patients were upstaged from Ta to T1 following re-TURBT. This rate is comparable to previous studies reporting upstaging in 10–25% of cases [15]. The likelihood of upstaging was significantly associated with tumor size (>3 cm) and high-grade histology, consistent with prior literature [16].

The phenomenon of pathological upstaging suggests that an initial TURBT alone may not always provide an accurate assessment of tumor depth. The absence of detrusor muscle in the initial resection specimen is a well-known predictor of understaging, leading to inadequate risk stratification and potentially suboptimal treatment decisions [17]. Re-TURBT serves as an essential tool to correct this misclassification and guide appropriate treatment strategies, including early consideration of intravesical therapy or more aggressive management in upstaged cases [18].

Our study found that 28% of patients experienced recurrence within 12 months, with a significantly higher recurrence rate (45%) among those with residual tumor on re-TURBT. These findings align with studies indicating that residual disease is a strong predictor of early recurrence and tumor progression [19]. The recurrence rate in our study is within the reported range of 25–50% for Ta tumors, further highlighting the unpredictable nature of NMIBC and the necessity of vigilant surveillance [20].

Intravesical therapies such as Bacillus Calmette-Guérin (BCG) and mitomycin C have been shown to reduce recurrence rates in NMIBC [21]. However, their efficacy depends on the completeness of

the initial TURBT. Re-TURBT ensures that the bladder is truly tumor-free before initiating intravesical therapy, thereby enhancing its effectiveness and minimizing the risk of disease progression [22].
Based on our findings, routine re-TURBT should be strongly considered for all patients with Ta bladder tumors, particularly those with high-risk features such as multiple tumors, larger tumor size, and high-grade histology. The benefits of re-TURBT in detecting residual disease, reducing recurrence, and preventing understaging outweigh the additional procedural risks and costs associated with repeat resection [23].

Future research should focus on identifying biomarkers that can predict residual tumor presence and recurrence risk more accurately, potentially reducing the need for re-TURBT in selected patients. Additionally, advancements in imaging techniques such as narrow-band imaging (NBI) and photodynamic diagnosis (PDD) may enhance the detection of residual tumors, providing a less invasive alternative to repeat resection [24].

**Conclusion**
Our study reinforces the critical role of repeat transurethral resection of bladder tumor (re-TURBT) in the management of Ta bladder tumors. Despite an apparently complete initial TURBT, residual tumor was detected in a significant proportion of patients, emphasizing the limitations of a single resection in achieving complete tumor clearance. Moreover, pathological upstaging to T1 disease was observed in 16% of cases, underlining the risk of initial understaging and the importance of re-TURBT in accurate tumor classification.
The impact of re-TURBT on recurrence rates was evident, with patients having residual disease showing significantly higher early recurrence. These findings support the routine use of re-TURBT, particularly in patients with large, multiple, or high-grade tumors, to optimize disease control and improve long-term outcomes. The procedure enhances the effectiveness of subsequent intravesical therapy by ensuring a tumor-free bladder at the time of treatment initiation.
Future research should focus on refining patient selection criteria for re-TURBT using molecular markers and advanced imaging techniques. Further prospective trials are needed to establish standardized protocols that balance the benefits of repeat resection against procedural risks and healthcare costs. Until then, re-TURBT should remain an essential component of the management strategy for Ta bladder tumors, ensuring optimal diagnosis, staging, and treatment planning.

**Conflict of interest:** None

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