Original Article

OPEN ACCESS

Assessment of Bladder Cancer Care Delivery Among Patients Undergoing Radical Cystectomy: TURBT Complexity, Treatment Timelines, and Follow-up Compliance

Nadeem Bin Nusrat[1], Sarmad Imtiaz[1], Asadullah Aslam[1], Assad ur Rehman[1], Shujah Muhammad, Nauman Zafar[1], Abdullah Muhammad Ashfaq[1*], Hassan Arshad[1]

[1] *Department of Urology, Pakistan Kidney and Liver Institute and Research Center (PKLI&RC), Lahore- Pakistan*

Article Info

Corresponding Author
Abdullah Muhammad Ashfaq
Department of Urology
Pakistan Kidney and Liver Institute and Research Center (PKLI&RC), Lahore, Pakistan.
Email: abdullah.ashfaq@pkli.org.pk

Date Received:
04th January, 2026
Date Revised:
31st May, 2026
Date Accepted:
04th June, 2026

This article may be cited as:
Nusrat NB, Imtiaz S, Aslam A, Rehman AU, Muhammad S, Zafar N, Ashfaq AM, Arshad H: Assessment of bladder cancer care delivery among patients undergoing radical cystectomy: turbt complexity, treatment timelines, and follow-up compliance. J Postgrad Med Inst. 2026;40(2):67-77. http://doi.org/10.54079/jpmi.40.2.3890

Abstract

Objective: To evaluate complexity & completeness of transurethral resection of bladder tumor (TURBT), treatment timelines, and follow-up compliance among bladder cancer patients undergoing radical cystectomy.

Methodology: A retrospective observational cohort study, seventy patients; histologically proven bladder cancer, underwent primary TURBT & were later referred for radical cystectomy, were selected Pakistan Kidney & Liver Institute & Research Center, during the period of February 2023 to August 2025. The variables assessed included: complexity, completeness, perioperative complications, time to intravesical treatment/surgery, and time to follow-up (cystoscopy, radiological, urine cytology) using descriptive methods. The recurrence of the tumor was confirmed histologically after a tumor-free status.

Results: Male were predominant, 77.1%, mean age 54.1 ± 9.6 years. TURBT was complete in 71.4% of patients, while complex procedures were 18.6%. Intraoperative complications occurred in 26 (37.1%) patients, likely reflecting the high tumor burden and advanced disease stage within this radical cystectomy cohort. Follow-up was initiated in 57.1% of patients; cystoscopy was performed in 11.4%, and imaging in 45.7%. Disease recurrence occurred in 12.9% of patients, at a mean of 15.2 ± 14.1 months. Overall survival was 40.0%

Conclusion: In this cohort of patients with bladder cancer underwent radical cystectomy, there were inconsistencies in the documentation of TURBT procedure, treatment schedules, and follow-up practices. Such observations emphasize possible areas wherein there is need for improvement in the provision of care to patients with bladder cancer.

Keywords: Bladder Neoplasms; Transurethral Resection; Cystectomy, Radical; Treatment Delay; Patient Compliance; Recurrence

Introduction

There have been some emerging trends with regard to the development of bladder cancer, which also poses the same threat and can become a looming public health issue in the coming time in Pakistan.[1-3] According to some global and national studies related to cancer registries, the incidence rate of bladder cancer has also been very high in Pakistan, as Globocan predicted the development of 5,391 new cases of bladder cancer in Pakistan in 2022 (5,391; 2.9% of new cancer incidence), making it among the top ten cancers.[4] In addition, there have also been certain limitations associated with the diagnosis of bladder cancer, including a lack of facilities for early diagnosis and cancer registry, and also a lack of accessibility of uro-oncological facilities in different regions of the country. However, in terms of national registries, data from various regional registries (consolidating cancer incidences in n=269,707 cases between 2015-2019) has been collected; however, some areas of under-representation were still reported.[5]

Transurethral resection of bladder tumour (TURBT) remains the cornerstone for diagnosis, staging and initial management of non-muscle-invasive bladder cancer (NMIBC). The technical quality and perioperative management of TURBT substantially influence accurate staging, the need for re-TURBT, perioperative intravesical instillation, and ultimately recurrence and progression risks. Recent local audits and single-center studies identify important gaps in adherence to guideline-recommended TURBT quality metrics. For example, a retrospective audit at a tertiary centre in Lahore (PKLI & RC) found that immediate postoperative mitomycin-C was administered within 24 hours in only 12 (29%) patients, documentation of key operative details was incomplete in a substantial proportion of cases, and detrusor muscle was present in the specimen in 37 (90%) cases findings that point to both strengths and modifiable weaknesses in current practice.[6]

Equally concerning are high early recurrence rates after TURBT reported from Pakistan. A cohort study assessing first check cystoscopy (3 months after TURBT) reported tumour recurrence in 28 of 41 patients (28; 68%), illustrating that early recurrence remains a major clinical problem and an important marker of potential shortcomings in initial resection, perioperative care, or surveillance.[7] These local recurrence data echo international evidence that incomplete resection, absence of the detrusor muscle, late adjuvant intravesical therapy, and non-adherence with follow-up visits all independently predict worse outcomes.

The large burden of bladder cancer and existing gaps in the quality-of-care delivery highlight the importance of evaluating institutional management practices. In resource-constrained settings such as Pakistan, limitations in standardized documentation, variations in treatment pathways, and inconsistent follow-up practices may influence continuity of care and patient outcomes. Few institutional studies from Pakistan have comprehensively evaluated bladder cancer care pathways, particularly with simultaneous assessment of TURBT complexity, treatment timelines, and follow-up compliance among patients progressing to radical cystectomy. Therefore, this study was designed to descriptively evaluate TURBT complexity, completeness of resection, treatment timelines, and follow-up compliance among bladder cancer patients undergoing radical cystectomy at a tertiary care center.

Methodology

The current study was a Retrospective Observational Cohort Study, done in the Dept. Of Urology, Pakistan Kidney & Liver Institute & Research Center. This institute is a tertiary-level hospital having the best Robotic Surgical Systems as well as Open Surgical Units. The study started only after approval from the Institutional Review Board (IRB) of PKLI & RC (Approval Number: PKLI-IRB/AP/0068/2025; on July 29, 2025). The study did not require written consent because the study was a Retrospective Study using anonymized existing data.

The patients diagnosed with bladder cancer from 1 February 2023 to 28 August 2025 and underwent initial transurethral resection of bladder tumor (TURBT) at PKLI & RC were selected for assessment for inclusion into this study. The aim of this study is to assess care delivery processes at initial treatment for patients with advanced or high-risk bladder cancer who proceeded with radical cystectomy for better evaluation of initial treatment processes. Individuals who only received treatment using bladder conservation techniques were excluded from the study, thereby narrowing its scope but helping in studying specific treatment methods that lead to definitive surgery. Accordingly, recurrence patterns and follow-up findings should be interpreted specifically within the context of patients progressing to definitive surgical management rather than the broader bladder cancer population.

Inclusion Criteria

- Histologically confirmed bladder cancer
- Underwent initial TURBT at PKLI & RC
- Age ≥18 years

Exclusion Criteria

- Presence of metastatic disease at initial presentation
- Patients managed or primarily treated outside PKLI & RC

A non-probability purposive sampling technique was used to include all eligible bladder cancer patients treated during the study period. As this was a retrospective descriptive cohort study, a formal sample size

J Postgrad Med Inst 2026;40(2):67-77.
http://doi.org/10.54079/jpmi.40.2.3890

calculation was not performed, and all available eligible cases were included.

Data were retrospectively collected from institutional electronic medical records, operative reports, histopathology reports, radiology records, oncology treatment logs, and follow-up documentation.

Follow-up compliance was defined according to international surveillance protocols for non-muscle-invasive bladder cancer, recommending regular cystoscopy with or without urine cytology and upper tract imaging to detect recurrence after TURBT. The first surveillance cystoscopy is generally performed at 3 months post-TURBT, with subsequent follow-up scheduled according to individual risk stratification [EAU Guidelines, 2025].[8]

Recurrence was defined as a histologically confirmed bladder tumor detected after a documented tumor-free status or progression to a more advanced stage upon follow-up [Hof et al., 2026].[9] Follow-up compliance was defined as documentation of at least one surveillance visit (cystoscopy and/or imaging) within 6 months following TURBT or radical cystectomy, in line with EAU guideline-recommended surveillance intervals.[10]

Variables were categorized into four major domains. Patient-related factors included age, sex, and Eastern Cooperative Oncology Group (ECOG) performance status. ECOG performance status was extracted from preoperative anesthesia and oncology assessment records documented closest to the time of radical cystectomy. Variables regarding TURBT included the level of complexity of the procedure (routine/complex), resection being complete or incomplete, reason(s) for incomplete TURBT, and occurrence of intra-operative and immediate post-operative complications. Care delivery timelines encompassed duration of symptoms prior to diagnosis, time from diagnosis to initial TURBT, time from TURBT to initiation of intravesical therapy (BCG or intravesical chemotherapy), where applicable, and time from TURBT to definitive surgery (radical cystectomy), where applicable. Compliance with follow-up and practices involved post-TURBT follow-up initiation, modality of follow-up (cystoscopy, imaging, and urine cytology), following of the appropriate schedules for follow-up, and follow-up findings.

Extraction of information from the medical records was conducted by two postgraduate trainees under the guidance of the primary investigator, with the use of a standard information abstraction sheet. The process followed consensus approach in the case of discrepancies. Data collected was stored in SPSS worksheets (IBM SPSS Statistics, version 27). All patient-identifiable information was anonymized. The data was evaluated for any incompleteness, internal consistency, and logical errors before analysis.

The main outcomes of interest were descriptive indicators related to bladder cancer care delivery, namely: Proportion of complex and routine TURBT cases; Incomplete rate of TURBT; Timelines within various stages of care delivery; Compliance with recommendations for follow-up. No causal associations or predictors were specified.

For the purpose of this study, TURBT was categorized as "complex" when operative records documented one or more of the following features: tumor size >3 cm, multifocal tumors, difficult or adherent tumor resection, tumors located near the ureteric orifices or lateral wall with risk of obturator reflex, significant intraoperative bleeding, or requirement for staged/incomplete resection. Complexity status was retrospectively abstracted from operative notes and surgical documentation available in the electronic medical record.

The statistical analysis was conducted using IBM SPSS Statistics version 27. The type of statistical analysis employed was strictly descriptive statistics as mandated by the research objective. Frequency tables were employed to describe categorical variables. Descriptive statistics were employed to analyze the variables to determine if they can be represented using mean ± SD or median and IQR, especially in the case of variables related to time intervals. Missing values were specifically noted for every variable considered. No imputation was employed. No comparative or inferential statistical analysis was undertaken to analyze the variables considering the main objective of the current research.

Results

Seventy patients with bladder cancer were analyzed. The average age of the population was 54.12 ± 9.58 years with a mean BMI of 26.62 ± 4.4 kg/m^2. The gender and ethnic distribution of the study population is as follows: male = 54 (77.1%), female = 16 (22.9%). Most of the population belong to the ethnic group of Punjab, consisting of 68 (97.1%), while the remaining 2 (2.9%) were Sindhis. The characteristics and TURBT findings are provided below in Table 1.

Preoperative imaging primarily included CT scans in 46 patients [65.7%] and MRI in 16 patients [22.9%]. Imaging data were unavailable in 8 patients [11.4%]. Imaging Characteristics, Treatment Modalities and Outcomes described in table 2.

Follow-up was initiated in 40 patients [57.1%], while follow-up status was unavailable for 30 patients [42.9%]. During follow-up, cystoscopic surveillance was performed in 8 patients [11.4%], not performed in 33 patients [47.1%], and data were unavailable for 29 patients [41.4%]. Follow-up imaging was obtained in 32 patients [45.7%], whereas 8 patients [11.4%] did not undergo imaging, and data were unavailable for 30 patients [42.9%]. Among those who underwent imaging, CT scan was the most used modality (35 patients [50.0%]), followed by MRI in 2 patients [2.9%]. Urinary cytology during follow-up was performed in 1 patient

[1.4%], not performed in 37 patients [52.9%], and data was unavailable for 32 patients [45.7%]. During follow-up, disease recurrence was documented in 9 patients (12.9%), while 31 patients (44.3%) remained recurrence-free; recurrence status was unavailable in 30 patients (42.9%). from institutional records due to incomplete documentation or loss to follow-up, which is a common limitation in retrospective studies. (Table 3).

Among patients with recurrence, pelvic lymph nodes (2 [2.9%]) and other sites (4 [5.7%]) were the most frequently involved locations. Metastatic disease was identified in 4 patients (5.7%), with the liver, lymph nodes, and colon each involved in 1 patient (1.4%). Management of recurrent disease included radiotherapy in 2 patients (2.9%) and nephroureterectomy in 1 patient (1.4%), with a complete response observed in 1 patient (1.4%).

At the time of analysis, 28 patients (40.0%) were alive, whereas 42 patients (60.0%) had died. The mean time to recurrence was 15.20 ± 14.10 months (Range: 2–60), and the mean overall survival was 18.04 ± 14.36 months (Range:2–60).

Discussion

The present study, a retrospectively designed cohort study, offers a very comprehensive and practical overview on bladder cancer management at a specialized healthcare unit in Pakistan, particularly with regards to TURBT complexity and adequacy, treatment interval times, and follow-up rates in those undergoing RC. To our knowledge, it is among the very first kind of institution-wide study from Pakistan on how the entire process quality with regards to surgeries and follow-up can be mapped instead of just cancer-specific outcome.

More than half of the cohort had unavailable or incomplete TURBT adequacy documentation, suggesting important deficiencies in operative reporting practices within retrospective institutional records These may have direct implications for diagnosis accuracy, planning, and management decisions. The importance of accurate documentation of the TURBT process cannot be overstressed through the current literature. Botros et al. highlighted the significant impact that well-designed templates for TURBT documentation had on the documentation process and the surgery itself, possibly with implications for cancerous cases.11 In our study, TURBT documentation quality is often missing or inadequate (36 [51.4%]), thus underlining insufficient documentation as a prominent deficit area for care delivery with sufficient support for adequate operative documentation practices in developing realms.[11]

The younger age of onset seen in this series, compared to Western series, could be due to various demographic and exposure patterns found in developing and developing regions. Hematuria was a presenting symptom in close to all subjects 68 (97.1%), as it is known to be the predominant symptom in bladder cancers.[12] The demographic characteristics of our series, with a median age of 54.1 ± 9.6 years and a predominantly male population (54 (77.1%)), are similar to those found in other regions and international series, where it is well established that bladder cancer predominates in the middle to older aged group and is largely a dis-

Table 1. Baseline Characteristics, Clinical Presentation, TURBT Details, and Pathological Findings (N = 70)

Variable	Category	n (%) / Mean ± SD
Lifestyle Factors	Smoking – Yes	37 (52.9)
	Alcohol use – Yes	0 (0.0)
Comorbidities*	Hypertension	12 (17.1)
	Diabetes mellitus	7 (10.0)
	Ischemic heart disease	5 (7.1)
	Chronic kidney disease	3 (4.3)
	Hepatitis C	1 (1.4)
Past Medical History	Family history of cancer – Yes	0 (0.0)
	Previous cancer diagnosis/treatment – Yes	8 (11.4)
Performance Status	ECOG 0	57 (81.4)
	ECOG 1	10 (14.3)
	ECOG 2	3 (4.3)
Urological History	Previous bladder infection – Yes	6 (8.6)
	Previous bladder instrumentation/TURBT history– Yes	60 (85.7)

J Postgrad Med Inst 2026;40(2):67-77.
http://doi.org/10.54079/jpmi.40.2.3890

Clinical Presentation	Hematuria – Yes	68 (97.1)
	Dysuria – Yes	36 (51.4)
	Urinary frequency – Yes	18 (25.7)
	Urinary urgency – Yes	13 (18.6)
	Pain – Yes	8 (11.4)
	Lower abdominal mass – Yes	8 (11.4)
Symptom Duration	Duration before diagnosis (months)	7.60 ± 8.53
TURBT Performed	Yes	62 (88.6)
	No	8 (11.4)
Exposure History	Occupational chemical exposure	0 (0.0)
	Chronic Foley catheterization	0 (0.0)
	Prior pelvic radiation	0 (0.0)
	Chronic NSAID use	0 (0.0)
TURBT Complexity	Routine	31 (44.3)
	Complex	13 (18.6)
	Data not available	26 (37.1)
Reason for TURBT Complexity†	Large tumor (>3 cm)	5 (7.1)
	Multifocal tumors	6 (8.6)
	Adherent/difficult resection	1 (1.4)
Completeness of TURBT	Complete resection	50 (71.4)
	Incomplete resection	20 (28.6)
Reason for Incomplete TURBT†	Large/bulky tumor	9 (12.9)
	Multiple tumors	5 (7.1)
	No muscle in specimen	2 (2.9)
	Advanced disease	1 (1.4)
	Residual tumor	2 (2.9)
Intraoperative Complications†	Yes-Bleeding (Hemorrhage)	7 (10.0)
Post-TURBT Complications	Yes	0 (0.0)
Tumor Location (TURBT)	Lateral wall	10 (14.3)
	Anterior wall	1 (1.4)
	Multiple locations	23 (32.9)
	No residual visible tumor documented at repeat assessment	36 (51.4)
Tumor Multiplicity	Single	3 (4.3)
	Multiple	26 (37.1)
	None detected	41 (58.6)

Histological Type	Urothelial carcinoma	57 (81.4)
	Squamous cell carcinoma	4 (5.7)
	Other histological variants / unavailable documentation	9 (12.9)
Tumor Grade	High grade	56 (80.0)
	Low grade	7 (10.0)
	Data not available	7 (10.0)
Pathological Stage	T1	21 (30.0)
	T2	35 (50.0)
	T3	4 (5.7)
	T4	3 (4.3)
	Data not available	7 (10.0)
Adequacy of TURBT	Adequate	31 (44.3)
	Inadequate	3 (4.3)
	Data not available	36 (51.4)

*Footnotes: Data are presented as n (%) unless otherwise specified.; *Patients may have had more than one comorbid condition.; †Percentages calculated using the total study population (N = 70); categories are not mutually exclusive.; Missing or unavailable data are explicitly reported and were excluded from denominator calculations where applicable.; ECOG, Eastern Cooperative Oncology Group; TURBT, Transurethral Resection of Bladder Tumor; NSAIDs, Non-steroidal Anti-inflammatory Drugs; SD, Standard Deviation.; A substantial proportion of adequacy-related variables were unavailable because several procedures had been performed prior to implementation of standardized operative documentation templates. Percentages for subgroup analyses were calculated using available data for each variable; therefore, denominators may vary because of missing documentation.*

Table 2. Imaging Characteristics, Treatment Modalities, and Treatment Outcomes (N = 70)

Variable	Category	n (%) / Mean ± SD
Tumor Location on Imaging	Multiple locations	42 (60.0)
	Lateral wall	13 (18.6)
	Posterior wall	4 (5.7)
	Anterior wall	4 (5.7)
	Dome	2 (2.9)
	Data not available	5 (7.1)
Tumor Burden on Imaging	Localized / single measurable tumor	49 (70.0)
	Extensive disease*	15 (21.4)
	Data not available	6 (8.6)
Tumor Size Category	Measurable tumor	49 (70.0)
	Large tumor	3 (4.3)
	Multiple tumors	6 (8.6)
	Wall thickening	5 (7.1)
	Whole bladder involvement	1 (1.4)
	Data not available	6 (8.6)
Tumor Size (cm)	Mean ± SD (range)	5.39 ± 2.45 (1.0–10.0)

J Postgrad Med Inst 2026;40(2):67-77.
http://doi.org/10.54079/jpmi.40.2.3890

Lymph Node Involvement	Regional lymphadenopathy	32 (45.7)
	No lymphadenopathy	29 (41.4)
	Distant lymphadenopathy	1 (1.4)
	Data not available	8 (11.4)
Tumor Invasion on Imaging†	Muscle invasion	20 (28.6)
	Perivesical invasion	16 (22.9)
	Adjacent organ invasion	18 (25.7)
	No invasion	8 (11.4)
	Data not available	8 (11.4)
Ureteral Invasion	Yes	34 (48.6)
	No	29 (41.4)
	Data not available	7 (10.0)
Imaging–Pathology Concordance	Concordant	56 (80.0)
	Discordant	12 (17.1)
	Data not available	2 (2.9)
Interval Change on Imaging	Yes	10 (14.3)
	No	60 (85.7)
BCG Therapy	Received BCG	5 (7.1)
	Not received	65 (92.9)
Indication for BCG	High-grade T1 disease	5 (7.1)
	Not applicable	65 (92.9)
BCG Adverse Effects	None	4 (5.7)
	Local cystitis	1 (1.4)
	Not applicable	65 (92.9)
Response to BCG	Partial response	3 (4.3)
	Not applicable	67 (95.7)
BCG Discontinuation	Yes	2 (2.9)
	Due to adverse effects	1 (1.4)
	Due to progression	1 (1.4)
	Data not available	1 (1.4)
Intravesical Chemotherapy	Yes	1 (1.4)
	No	66 (94.3)
	Data not available	3 (4.3)
Invasive Treatment	Yes	62 (88.6)
	Data not available	8 (11.4)
Neoadjuvant Chemotherapy	Yes	26 (37.1)
	No	43 (61.4)
	Data not available	1 (1.4)

Chemotherapy Regimen	Gemcitabine + carboplatin	9 (12.9)
	Data not available	61 (87.1)
Response to Chemotherapy	Complete response	2 (2.9)
	Partial response	11 (15.7)
	No response	4 (5.7)
	Data not available	53 (75.7)
Surgical Treatment	Radical cystectomy	70 (100.0)
Urinary Diversion	Ileal conduit	70 (100.0)
Radiotherapy	Yes	12 (17.1)
	No	58 (82.9)
Radiotherapy Indication	Pre-operative	10 (14.3)
	Post-operative	1 (1.4)
	Data not available	1 (1.4)
Radiotherapy Regimen	External beam radiotherapy	1 (1.4)
	Data not available	11 (15.7)
	Not applicable	58 (82.9)
Response to Radiotherapy	Complete response	1 (1.4)
	Partial response	1 (1.4)
	No response	1 (1.4)
	Not applicable	58 (82.9)
	Data not available	9 (12.9)
Surgery/Treatment-Related Complications†	Any complication	26 (37.1)
Complication type	Infection	15 (21.4)
	Bleeding	1 (1.4)
	Stomal complications	6 (8.6)
Other complications‡		4 (5.7)

Footnotes
Data are presented as n (%) unless otherwise specified.
**Extensive disease includes large, multifocal tumors, bladder wall thickening, or whole bladder involvement.*
†Categories are not mutually exclusive; patients may have more than one finding or complication.
‡Other complications include anastomotic leak/gut perforation, burst abdomen, urine leak, and rectocutaneous fistula (each n = 1).
Missing or unavailable data are explicitly reported and excluded from denominator calculations where applicable.
BCG, Bacillus Calmette–Guérin; SD, Standard Deviation
Percentages for subgroup analyses were calculated using available data for each variable; therefore, denominators may vary because of missing documentation.

ease of males.[13]

A large proportion of patients presented with adverse disease characteristics, such as high-grade tumors (56 [80.0%]) and muscle-invasive disease ≥T2 (42 [60.0%]), which is most likely due to all patients having undergone radical cystectomy. These observations are consistent with what has been observed among South Asians because of delayed presentation and a lack of availability of early diagnostic workups for bladder cancer.[13]

In our study, TURBT was finished in 50 patients (71.4%), and in 20 patients (28.6%), it was found to be incomplete. This is consistent with other institutions where the rate of incomplete TURBT has been found to range from 20% to 40% in high-grade, high-stage lesions such as those invading the bladder wall in bladder cancer, as in other series.

Rate of intraoperative complications that was seen in our study population was 37.1% with the breakdown as fifteen infections, one bleeding, six stomal complica-

Table 3. Disease Recurrence, Metastasis, Management, Survival, and Mortality Outcomes (N = 70)

Variable	Category	n (%) / Mean ± SD
Disease Recurrence	Yes	9 (12.9)
	No	31 (44.3)
	Data not available	30 (42.9)
Recurrence Detected on Follow-up	Yes	9 (12.9)
	No	31 (44.3)
	Data not available	30 (42.9)
Location of Recurrence	Ureter	1 (1.4)
	Pelvic lymph nodes	2 (2.9)
	Distant metastasis	1 (1.4)
	Other sites	4 (5.7)
	Data not available	25 (35.7)
	Not applicable	37 (52.9)
Metastatic Disease	Yes	4 (5.7)
	No	31 (44.3)
	Data not available	33 (47.1)
	Not applicable	2 (2.9)
Site of Metastasis	Liver	1 (1.4)
	Lymph nodes	1 (1.4)
	Colon	1 (1.4)
	Data not available	35 (50.0)
	Not applicable	32 (45.7)
Treatment for Recurrent Disease	Radiotherapy	2 (2.9)
	Nephroureterectomy	1 (1.4)
	Data not available	36 (51.4)
	Not applicable	31 (44.3)
Response to Recurrence Treatment	Complete response	1 (1.4)
	No response	2 (2.9)
	Data not available	36 (51.4)
	Not applicable	31 (44.3)
Overall Survival Status	Alive	28 (40.0)
	Deceased	42 (60.0)

tions and one each anastomotic leak/gut perforation, burst abdomen, urine leak, and recto cutaneous fistula .Although the rates in our study seem to be somewhat higher than in Western literature, it must be kept in mind that the tumor burden, complexity, and the advances in the stages of the disease were comparable in our study. The complexity of resection, large tumor size, as well as complicated resections were previously associated with higher complication rates in earlier studies, thus the importance of expert personnel as well as standardized resections in TURBT was reinforced.[12]

Only few patients received the infield treatment BCG, in 5 of whom (7.1%), this was done because they all were diagnosed with high-grade T1 disease. The limited use

Cause of Death	MODS	14 (20.0)
	Sepsis	7 (10.0)
	Cardiac arrest	7 (10.0)
	Acute kidney injury	3 (4.3)
	Wound infection/sepsis	3 (4.3)
	Septic shock	1 (1.4)
	Cardiogenic shock	1 (1.4)
	Pelvic exenteration–related wound infection/ sepsis	1 (1.4)
	Fever/sepsis	1 (1.4)
	Unknown	4 (5.7)

Footnotes: Percentages are calculated using the total cohort (N = 70); missing and not applicable data are explicitly reported; Percentages for subgroup analyses were calculated using available data for each variable; therefore, denominators may vary because of missing documentation.

here is due to the advanced stage in most victims in the study. The international guidelines make a paramount mention regarding the necessity to quickly perform the infield therapy in the appropriate TURBT in the NMIBC. Failure to comply has been linked to poor oncological success.[10]

Ongoing compliance was identified as another concern. While follow-up was started in 40 patients (57.1%), cystoscopic follow-up was done in 8 patients (11.4%), and urinary cytology follow-up was noted in 1 patient (1.4%) only. This is in great contrast to the EAU guidelines, which recommend structured follow-up by cystoscopy after TURBT and risk-adapted follow-up regimens.[10]

The importance of structured follow-up after radical cystectomy has been highlighted by authors such as Soukup et al. and Jensen et al. for detection of recurrence and diversion complications and functional recovery and survivor outcomes following radical cystectomy.[14,15] The poor adherence to follow-up care observed in our series can be attributed to a lack of well-structured documentation and isolation and poor survivor care system infra-structure faced in resource-challenged healthcare settings.[14,15]

The rate of recurrence was recorded in 9 cases (12.9%), with the average recurrence-free survival of 15.2 ± 14.1 months. Although the recurrence rate in the present study was relatively low in contrast to NMIBC recurrence rate observations in the previous studies, the data must be regarded with caution owing to the large proportion of lost data for follow-up observations, 30 subjects (42.9%). The survival rate at the end of the observation was 40.0% owing to the severity of the disease, the large rate of morbidity during the surgical intervention, as well as systemic constraints in the subsequent postoperative care.

First and foremost, the strength of the study is clearly the multifaceted evaluation of the care processes instead of the common-oncological outcome measures. This study has several limitations. The retrospective single-center design limits external generalizability and introduces the possibility of selection and information bias. A substantial proportion of variables contained missing or incomplete documentation, particularly regarding operative details and follow-up surveillance. Since this study focused on patients who received radical cystectomy, it does not necessarily reflect the entire population of bladder cancer patients, especially those treated using bladder preservation approaches. Moreover, due to lack of standard follow-up, inferential statistics could not be conducted. Moreover, the potential for information bias could be noted due to the fact that some of the variables had to be retrospectively analyzed from incomplete electronic records.

With regard to the practical significance of this study, it must be recognized that the study correctly highlights the necessity to perform TURBT with structured checklists, record the status of the resection and the detrusor muscle, and follow particular surveillance measures in the hospital. Such steps can prove highly cost-effective for developing hospitals.

Conclusion

While a radical cystectomy has been done in this group, there are still some gaps in terms of the management of the TURBT and adherence to follow-up among patients with advanced bladder cancer. These deficits must be remedied if improvements in outcomes of bladder cancer are to be made within resource-limited settings.

References

1. Waqar U, Jaffar R, Rafique T, Madad S, Khan S, Ahmed L. Bladder cancer in Pakistan: challenges in early diag-

nosis and multidisciplinary management. J Popul Ther Clin Pharmacol 2024;31(7):1020-7. DOI: 10.53555/jptcp.v31i7.7186.

2. Saeed S, Khan D, Faisal S, Rauf F, Ali MO, Rehman A. A histopathological and epidemiological study of urothelial carcinoma at a tertiary care centre in Peshawar, Pakistan. J Pak Med Assoc 2024;74(6):1160-2. DOI: 10.47391/JPMA.9546.
3. Nusrat NB, Rehman AU, Zafar N, Muhammad S, Bajwa SI, Imtiaz S. Challenges and technical aspects in the management of muscle invasive bladder cancer as retrograde radical cystectomy with ileal conduit. J Pak Med Assoc 2024;74(3):513-8. DOI: 10.47391/JPMA.9567.
4. Ferlay J, Ervik M, Lam F, Laversanne M, Colombet M, Mery L, et al. Global Cancer Observatory: Cancer Today. In: Global Cancer Observatory [Internet]. Lyon (France): International Agency for Research on Cancer; 2024 [cited 2026 May 31]. Available from: https://gco.iarc.who.int/today
5. Ikram A, Pervez S, Khadim MT, Sohaib M, Uddin H, Badar F, et al. National Cancer Registry of Pakistan: first comprehensive report of cancer statistics 2015-2019. J Coll Physicians Surg Pak 2023;33(6):625-32. DOI: 10.29271/jcpsp.2023.06.625.
6. Nusrat NB, Muhammad S, Rehman AU, Zafar N, Aslam A, Imtiaz S, et al. Quality assessment of TURBT for non-muscle invasive bladder cancer: a single-center clinical audit. Pak J Urol 2024;2(2):142-8. DOI: 10.69885/pju.v2i02.81.
7. Malik IH, Bangash WG, Qazi SM. Superficial bladder cancer recurrence on first check cystoscopy after transurethral resection of bladder tumour (TURBT). J Rawalpindi Med Coll 2016;20(2).
8. European Association of Urology. EAU guidelines on non-muscle-invasive bladder cancer. Presented at the EAU Annual Congress Madrid 2025. Arnhem, The Netherlands: EAU Guidelines Office; 2025.
9. Hof JP, Kiemeney LALM, Aben KKH, van der Heijden AG, Vrieling A, Vermeulen SH. Recurrence patterns in a large contemporary cohort of patients with non-muscle invasive bladder cancer. Clin Genitourin Cancer 2026;24(1):102464. DOI: 10.1016/j.clgc.2025.102464.
10. Gontero P, Birtle A, Capoun O, Compérat E, Dominguez-Escrig JL, Liedberg F, et al. European Association of Urology guidelines on non-muscle-invasive bladder cancer (TaT1 and carcinoma in situ): summary of the 2024 guidelines update. Eur Urol 2024;86(6):531-49. DOI: 10.1016/j.eururo.2024.07.027.
11. Botros A, Rival PM, Davis ID, Sengupta S. A systematic review of the use of surgical checklists in transurethral resection of bladder tumour. Cancers (Basel) 2024;16(21):3626. DOI: 10.3390/cancers16213626.
12. Gorrepati R, Pal BC, Panda A. Transurethral resection of bladder tumor: elements of the surgical technique. UroCancer Clin India 2024;2(2):74-8. DOI: 10.4103/UCCI.UCCI_17_24.
13. Kumar M, Yadav A, Kumar K, Dhayal IR. Assessment of outcome and feasibility of bladder preservation therapy in muscle invasive bladder carcinoma: a prospective observational study with meta-analysis. Int J Med Res Health Sci 2022;11(6):30-52.
14. Jensen BT, Lauridsen SV, Jensen JB. Optimal delivery of follow-up care after radical cystectomy for bladder cancer. Res Rep Urol 2020;12:471-86. DOI: 10.2147/RRU.S270240.
15. Soukup V, Babjuk M, Bellmunt J, Dalbagni G, Giannarini G, Hakenberg OW, et al. Follow-up after surgical treatment of bladder cancer: a critical analysis of the literature. Eur Urol 2012;62(2):290-302. DOI: 10.1016/j.eururo.2012.05.008.

Authors' Contribution Statement

NBN contributed to the conception, design, acquisition, analysis, interpretation of data, drafting of the manuscript, critical review of the manuscript, and final approval of the version to be published. SI contributed to the design, acquisition, analysis, interpretation of data, drafting of the manuscript, and critical review of the manuscript. AA contributed to the analysis, interpretation of data, drafting of the manuscript, and critical review of the manuscript. AR contributed to the acquisition, analysis, interpretation of data, and drafting of the manuscript. SM contributed to the acquisition, analysis, interpretation of data, and drafting of the manuscript. NZ contributed to the acquisition, analysis, interpretation of data, and drafting of the manuscript. AMA contributed to the design, interpretation of data, drafting of the manuscript, and critical review of the manuscript. HA contributed to the acquisition, analysis, interpretation of data, critical review of the manuscript, and final approval of the version to be published. All authors are accountable for their work and ensure the accuracy and integrity of the study.

Conflict of Interest

Authors declared no conflict of interest

Grant Support and Financial Disclosure

None

Data Sharing Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.