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A Clinical Audit

QUALITY ASSESSMENT OF TURBT FOR NON-MUSCLE INVASIVE BLADDER CANCER A SINGLE-CENTER

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ABSTRACT

Background: Transurethral resection of bladder tumors (TURBT) is a cornerstone in managing non-muscle-invasive bladder cancer (NMIBC). Accurate documentation and adherence to clinical guidelines are essential to optimize outcomes and reduce recurrence rates. This audit evaluates the quality of TURBT procedures at the Department of Urology, Pakistan Kidney and Liver Institute and Research Center (PKLI & RC), Lahore.

Methods: This retrospective audit included data from 41 NMIBC patients who underwent TURBT between January and September 2024. Data collection focused on patient demographics, imaging findings, procedural and intraoperative details, and pathological reports. Statistical analysis was conducted to describe sample characteristics and evaluate documentation completeness and guideline adherence.

Results: Mitomycin-C was administered within the recommended 24-hour postoperative window in only 29% of patients (n=12). Documentation gaps were noted, with tumor appearance recorded in 58% of cases and mitomycin-C use documented in 63%. Detrusor muscle presence was confirmed in 90% of pathology reports (n=37). However, multidisciplinary team (MDT) discussions were conducted for only 20% of high-risk cases.

Conclusion: This audit highlights critical gaps in TURBT quality, such as suboptimal mitomycin-C administration and limited MDT reviews. Implementing standardized documentation protocols, ensuring timely postoperative care, and regular re-audit cycles are recommended to enhance care quality and outcomes for NMIBC patients. Addressing these gaps would likely significantly reduce recurrence rates and improve long-term prognosis.

Keywords: Transurethral Resection of Bladder Tumor (TURBT); Non-Muscle Invasive Bladder Cancer (NMIBC); Quality Assessment; Bladder Cancer; Audit; Mitomycin-C

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INTRODUCTION

Bladder cancer is the ninth most common cancer worldwide and is more prevalent in men, with high incidence rates reported from Southern and Western Europe, North America, and parts of Northern Africa and Western Asia [1]. In Pakistan, bladder cancer accounts for 5.6% of all cancer cases, with an incidence rate of 8.9 per 100,000 individuals [2]. Transurethral resection of bladder tumor (TURBT) is still the mainstay for diagnosing, staging, and treating visible bladder tumors. The quality of TURBT significantly affects the patient's outcome, such as the ability to make an accurate diagnosis, the precision in staging, and long-term survival. Hence, it is important to assess the quality of TURBT. The basic principles of TURBT include complete removal of visible tumors and procurement of adequate tissue for histological examination. These consist of the tumour grade, stage, depth of invasion and synchronous concomitant carcinoma in situ (CIS); highly dependent on TURBT quality [3]. According to EAU guidelines, quality TURBT includes preoperative cystourethroscopy, complete tumor resection, presence of detrusor muscle (DM) in the specimen, and additional biopsies when necessary. Effective coordination between surgical and histopathological teams, along with proper specimen handling, is critical to ensure accuracy while minimizing complications and costs [4,5]. En-bloc resection is particularly effective for exophytic tumors, ensuring a higher likelihood of DM presence (96-100%) compared to piecemeal resection [6]. The absence of DM in the specimen often leads to a repeat TURBT, which increases the patient's morbidity and increases the healthcare cost due to more recurrent rates and lack of staging [7]. This is a retrospective audit on the quality of TURBT at our institution in NMIBC patients, aiming to review operative documentation, assess compliance with guidelines, and determine areas that require improvement in order to provide better care for these patients.

METHODOLOGY

This retrospective audit was carried out at the Department of Urology, Pakistan Kidney and Liver Institute and Research Center (PKLI & RC), Lahore, over a 9-month period from January to September 2024. The study included data from 41 NMIBC patients who underwent TURBT. Data collection focused on patient demographics, imaging, procedural and intraoperative details, and pathology reports. Statistical analysis was performed to describe sample characteristics and evaluate documentation quality and adherence to guidelines.

RESULTS

Demographics and Preoperative Imaging of 41 patients revealed a mean age of 60.63 years (SD = 11.76) as shown in Figure 1, with 34 patients (82.9%) being male and 7 patients (17.1%) female.

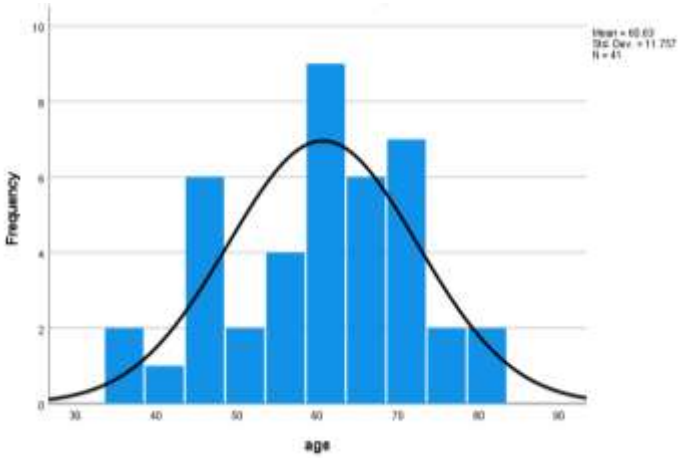

Figure 1: Age Distribution

Preoperative imaging was performed for 30 patients (73.2%), predominantly using CT scans of the chest, abdomen, and pelvis for staging. MRI pelvis was conducted in 23 patients (56.1%) for local staging. Nodal status on imaging showed N0 in 31 patients (75.6%) and N1 to N3 in 10 patients (24.4%) (Figure 2).

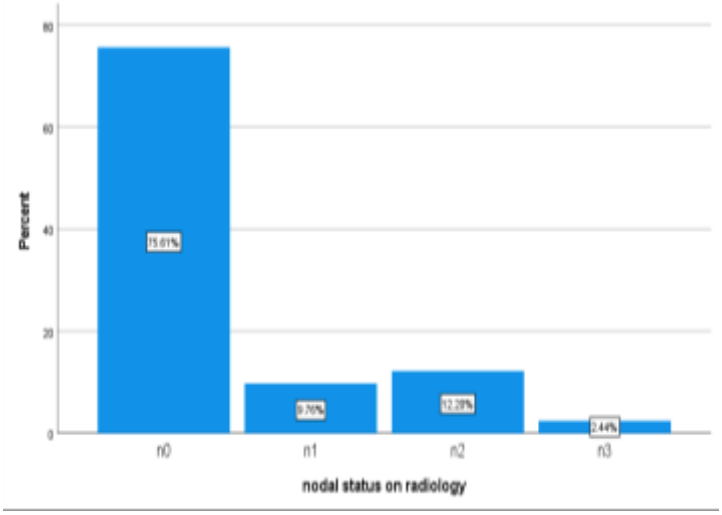

Figure 2: Nodal Status on Radiology

Metastasis status on imaging (Figure 3) indicated M0 (no metastasis) in 32 patients (78%), M1 (metastasis present) in 3 patients (7.3%), and Mx (unknown status) in 6 patients (14.6%).

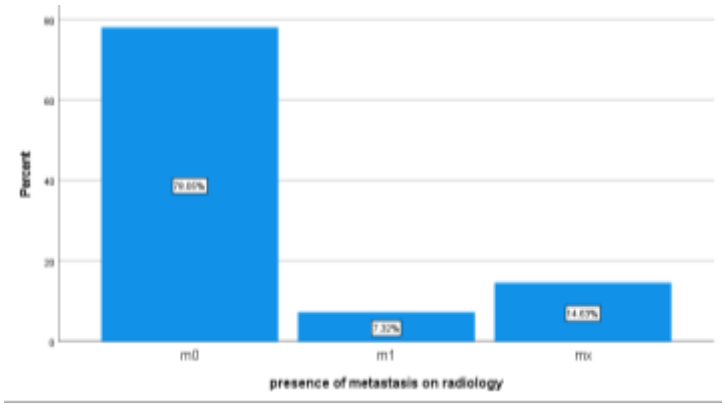

Figure 3: Presence of metastasis on Radiology

Regarding procedural and operative documentation, general anesthesia was administered to 33 patients (80.5%), while spinal anesthesia was used in 8 patients (19.5%). Tumor characteristics revealed 14 patients (34.1%) with solitary lesions and 27 patients (65.9%) with multiple lesions. Tumor location (Figure 4) was predominantly in the trigone (8 patients, 19.5%), with other regions such as the lateral walls also being involved.

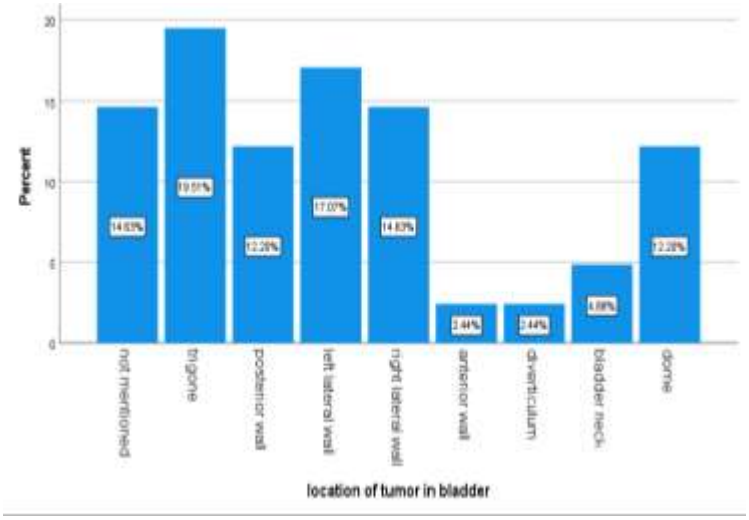

Figure 4: Location of tumor in bladder

Tumor size was documented in 30 cases (73.2%), tumor count in 28 cases (68.3%), and tumor appearance in only 19 cases (46.3%), indicating a need for improved documentation. Tumor site was recorded in 38 cases (92.7%), showing relatively high compliance.

Postoperative care and histopathology findings highlighted a significant gap in adherence to guidelines, as only 3 patients (7.3%) received mitomycin-C within 24 hours postoperatively. Detrusor muscle presence was observed in 32 cases (78.0%), which is critical for accurate staging. Detrusor muscle involvement was found in 14 cases (34.1%), with transitional cell carcinoma (TCC) being the most common histological type in 36 cases (87.8%) in Figure 5.

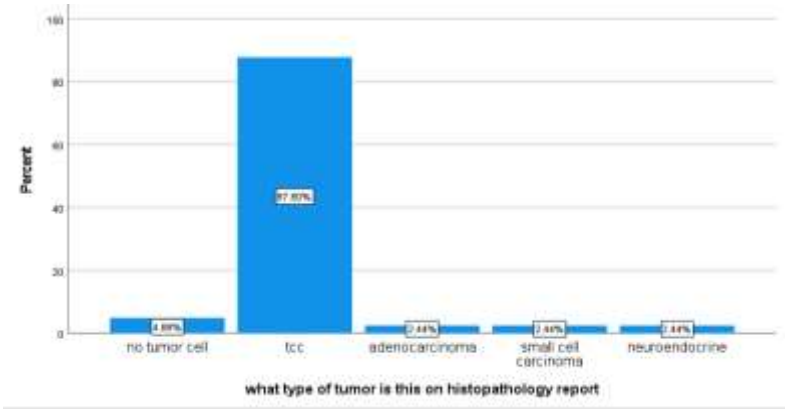

Figure 5: Histopathological Tumor Type

High-grade tumors accounted for 35 cases (85.4%), and T-stage distribution showed T1 in 27 cases (65.9%) and T2 in 12 cases (29.3%). According to the EAU risk classification, 17 patients (41.5%) were categorized as high-risk (Figure 6).

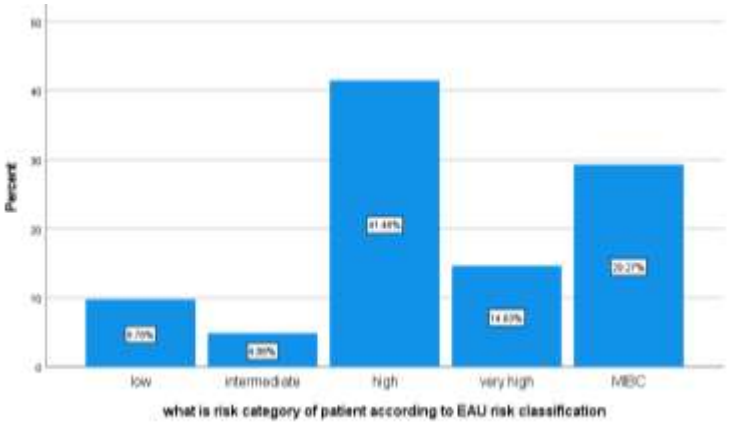

Figure 6: EAU risk classification

The mean postoperative hospital stay was 1.15 days (SD = 0.36 days), indicating minimal variability. Multidisciplinary team (MDT) discussions occurred in only 23 cases (56.1%), offering room for improvement in team-based decision-making. Re-TURBT was performed in 15 patients (36.6%), with a mean time from the first TURBT to Re-TURBT of 19.15 days (SD = 27.22 days), showing considerable variability.

DISCUSSION

This audit highlights key areas for improving the quality of TURBT at PKLI & RC, Lahore. The administration of mitomycin-C within the recommended 24-hour window was notably low, and the inconsistent documentation of tumor appearance and mitomycin-C usage underscores the need for enhanced record-keeping. Achieving 100% documentation of detrusor muscle (DM) presence is critical for accurate staging, and increasing MDT discussions could enhance care planning for high-risk cases.Accurate operative notes are vital in urology, especially in cancer cases where precise documentation guides postoperative care and coordination with

multidisciplinary teams. The Royal College of Surgeons (RCS) and European Association of Urology (EAU) emphasize comprehensive documentation, including tumor details such as size, type, location, and number. These records not only support repeat procedures but also carry prognostic implications. However, in this study, documentation of tumor size (73.2%) and tumor count (68.3%) was suboptimal, highlighting the need for better adherence to these guidelines. Tumor site documentation (92.7%) demonstrated good protocol compliance but left room for overall improvement in note quality.The presence of DM in histopathological specimens—a crucial quality indicator for TURBT—was observed in 78% of cases in our study. While comparable to global benchmarks, this figure falls short of the ideal target of 90-100%. Literature supports the significance of DM presence; for instance, Mariappan et al. reported recurrence rates of 23.1% in cases with DM inclusion versus 85.7% without [14]. These findings underscore the importance of complete resection for accurate staging and recurrence prevention. Mitomycin-C was administered to only 7.3% of patients within 24 hours postoperatively, a stark contrast to the Scottish multicenter program's 71% compliance [17]. Immediate intravesical instillation is known to reduce recurrence rates, indicating a critical need for improved guideline adherence in our practice.Re-TURBT was performed in 36.6% of cases, consistent with recommendations for high-risk non-muscle-invasive bladder cancer (HR-NMIBC). However, the meantime to re-TURBT (19.15 days) showed significant variability, suggesting the need for standardized follow-up protocols. Additionally, MDT discussions occurred in only 56.1% of cases, reflecting insufficient multidisciplinary engagement, which is essential for optimal patient outcomes.Bladder cancer remains challenging, with modest survival improvements over the past three decades. Factors such as incomplete surgeries, inconsistent guideline adherence, and variability in treatment strategies contribute to these outcomes. In this study, high-grade tumors were observed in 85.4% of cases, and detrusor muscle involvement in 34.1%, reflecting the aggressive nature of the disease in our population.Despite limitations of a single-center retrospective design and a smaller sample size, our findings emphasize the need for quality improvement initiatives. Standardized pathways aligned with EAU guidelines could enhance care, reduce recurrence rates, and improve survival outcomes for NMIBC patients. Future prospective studies are essential to evaluate these measures' long-term impact. Recommendations include using a checklist for consistent tumor documentation, ensuring mitomycin-C administration within 24 hours post-TURBT, promoting routine MDT discussions for NMIBC cases, and conducting regular audits to monitor and improve TURBT quality.

CONCLUSION

This audit highlights areas for quality improvement in TURBT procedures for NMIBC, emphasizing documentation completeness, guideline compliance, and multidisciplinary collaboration. By addressing these gaps, our center can optimize patient outcomes and enhance the overall quality of care provided to NMIBC patients.

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AUTHORS' CONTRIBUTIONS:

Study concept and design- Nadeem Bin Nusrat, Assad ur Rehman, Shujah Muhammad, Nauman Zafar, Asadullah Aslam, Sarmad Imtiaz

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Data analysis- Saira Imtiaz

Manuscript writing/editing- Atif Hussain, Ammar Asghar, Sharafat Ali

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