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IMPROVING THE QUALITY OF TURBT OPERATIVE NOTES USING A STANDARDIZED PROFORMA BASED ON EAU GUIDELINES: A CLOSED-LOOP CLINICAL AUDIT

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Abstract

Background: Transurethral resection of bladder tumor (TURBT) is an important procedure performed for diagnosing and managing bladder cancer. Proper documentation of TURBT operative notes is essential for risk stratification and treatment planning. However, handwritten notes often lack critical details, which may compromise patient care. Aim: To evaluate the quality of handwritten TURBT operative notes against standard EAU guidelines and assess the impact of implementing a structured proforma to improve documentation at Safari Hospital, Bahria Town, Rawalpindi, Pakistan. Materials & Methods: We conducted a closed-loop clinical audit over one year, assessing 108 operative notes. In the initial audit, 45 handwritten TURBT operative notes were evaluated against standardized checklist. A structured proforma was then introduced, designed to improve compliance with EAU guidelines. A re-audit was performed to assess improvements in documentation quality with 63 notes. Data were analyzed using descriptive statistics, and a paired-sample t-test was used to assess statistical significance. Results: Comparison between the first and second audits demonstrated significant improvements in documentation quality. In the initial audit, compliance with essential parameters was suboptimal, with several details missing. Following the introduction of the proforma, documentation rates improved, with multiple parameters reaching 100% compliance. The paired-sample t-test confirmed these improvements were statistically significant ($p = 0.001$). Conclusion: The introduction of standardized proforma significantly improved adherence to guidelines, completeness, and accuracy of TURBT operative notes. Implementing structured proformas across institutions can improve surgical documentation practices and contribute to better patient outcomes.

INTRODUCTION

Operative notes are an important part of surgical practice because they provide a detailed record of procedures performed. They ensure continuity of care, guide postoperative management and serve as essential medico-legal documents. Well-documented operative notes allow surgical teams to make informed decisions regarding patient treatment, including medication, wound care, and the

management of potential complications[1]. The Royal College of Surgeons (RCS) highlights the importance of accurate and comprehensive operative notes in its *Good Surgical Practice* guidelines. These guidelines recommend that notes be structured, preferably typed, and include essential elements such as the procedure performed, intraoperative findings, complications, and postoperative instructions[2].

One surgical procedure where precise documentation is particularly important is the transurethral resection of bladder tumor (TURBT), the gold-standard procedure for both diagnosing and treating bladder cancer[3]. Since 75% of bladder cancer cases are non-muscle invasive (NMIBC), accurate documentation of intraoperative findings, such as tumor size, number, location, and depth of resection is essential for accurate staging and treatment planning[4,5].

The European Association of Urology (EAU) provides specific guidelines for TURBT documentation, ensuring that these details are systematically recorded[6]. These parameters are particularly significant as they form the basis of the EAU NMIBC risk calculator, which stratifies patients based on recurrence and progression risks, guiding decisions on adjuvant therapy and surveillance strategies. Incomplete or inconsistent documentation may result in misclassification of risk, inappropriate treatment decisions, and inadequate follow-up, ultimately compromising patient outcomes[7].

However, despite the well-established EAU and RCS guidelines, compliance with standardized documentation remains inconsistent across surgical specialties. Research indicates that handwritten operative notes are particularly prone to errors, including illegibility, omissions, and inconsistencies[8]. This makes it difficult for doctors to accurately interpret surgical findings and formulate appropriate management plans. Furthermore, surgeons may unknowingly omit necessary details due to time constraints or reliance on memory, leading to incomplete records that can impact clinical decision-making. On the other hand, a structured pro forma can address these challenges and help document all essential information in an organized manner. A clear and structured layout minimizes the risk of omissions, enhances clarity, and improves the consistency of documentation[9].

At Safari Hospital, Bahria Town, Rawalpindi, Pakistan, TURBT operative notes were still recorded by hand, which raises concerns about adherence to best-practice guidelines. This study aims to evaluate the quality of handwritten TURBT operative notes, identify gaps in compliance with EAU standards, and create a structured proforma based on standard guidelines. By conducting a closed-loop audit, we assess whether introducing new proforma improves documentation accuracy, aligns with best practices, and supports continuous quality improvement in surgical record-keeping.

Materials and Methods

This retrospective closed-loop audit was conducted at Safari Hospital, Bahria Town, Rawalpindi, Pakistan to evaluate the quality of TURBT operative note documentation and assess the impact of introducing a standardized structured proforma. The study consisted of one complete audit cycle: an initial assessment of handwritten operative notes followed by a re-audit after implementing the proforma.

A total of 108 operative notes were analyzed in this study. In the first audit, we examined 45 handwritten TURBT operative notes from procedures performed between March 2024 to June 2024. Documentation quality was assessed using a standardized checklist based on the European Association of Urology (EAU) guidelines. The checklist consisted of 17 parameters, including patient demographics, surgical details (operating surgeon, anesthetist, anesthesia technique, and procedure name), tumor characteristics (number, size, location, and appearance), intraoperative findings (bimanual examination, cystoscopy findings, and completion of resection), specimen handling (muscle biopsy sent separately), bladder diagram, postoperative orders, and clerking doctor's name with signature. Each parameter was evaluated using a binary "yes" or "no" response.

The data were analyzed using IBM SPSS 16.0, with percentages and frequencies calculated to identify deficiencies in documentation. The findings were then presented to the surgical team, highlighting gaps in adherence to best practices.

To address these gaps, a structured and standardized operative note pro forma was developed (Appendix). This new pro forma included all the necessary details according to standard TURBT documentation guidelines. The proforma combined tick-box options for necessary details like tumor number, site, and resection completeness, which could minimize the risk of missing information. Free-text fields were included for specific details such as tumor size, antibiotic use, and postoperative instructions. This structured approach aimed to make documentation more efficient, reduce variability, and ensure all essential details were noted.

A re-audit was conducted between July 2024 and December 2024 after implementing the standardized documentation, evaluating 63 operative notes using the same checklist. Compliance rates were reassessed using SPSS to evaluate whether documentation quality improved following the intervention. A paired sample t-test was also performed to find the significance of the improvement.

Results

The first audit analyzed 45 handwritten TURBT operative notes to assess adherence to documentation standards. Among the cases reviewed, 35 patients (78%) were male and 10 (22%) were female, with a mean age of 52.3 years. Several important parameters were consistently documented, with 100% compliance for the operating surgeon's name, surgical procedure, and post-operative orders. The name of the anesthetist was recorded in 41 cases (91.1%), and the anesthesia technique was noted in 40 cases (88.9%). The tumor site was specified in 41 cases (91.1%), and the clerking doctor's name and signature were mentioned in 40 cases (88.9%).

However, compliance with other essential parameters was inconsistent. The number of tumors was recorded in 23 cases (51.1%), while tumor size was documented in 28 cases (62.2%). Completion of tumor resection was mentioned in 32 cases (71.1%). A bladder diagram was drawn in 31 notes (68.9%), whereas tumor appearance was specified in only 19 cases (42.2%). Several important parameters were frequently omitted, including muscle biopsy requests, which were documented in only 9 cases (20%), leaving 80% of cases without this information. Bimanual palpation findings were included in just 5 notes (11.1%), and cystoscopy findings, tumor clinical stage, and prior treatment history were completely absent from all operative notes.

Following the implementation of a standardized proforma, a re-audit was conducted, evaluating 63 TURBT operative notes. Among these cases, 38 patients (60.3%) were male, and 25 (39.7%) were female, with a mean age of 61.6 years. The structured format led to significant improvements in documentation quality. Several parameters were consistently documented in 100% of cases, including the operating surgeon's name, anesthetist's name, surgical procedure, clerking doctor's name with signature, post-operative orders, tumor number, tumor site, tumor size, completion of tumor resection, and cystoscopy findings.

Other parameters also showed notable improvement. The anesthesia technique was recorded in 58 cases (92.1%), while bimanual palpation findings were noted in 59 cases (93.7%). The tumor clinical stage and tumor appearance were documented in 53 cases (84.1%). Muscle biopsy requests, which were previously recorded in only 20% of cases, were now documented in 30 operative notes (47.6%). Additionally, prior treatment history, which was absent in the initial audit, was written in 50 notes (79.4%).

The improvements are summarized in the following table:

Standard no.	Parameter	Initial Audit (n=45)	Re-Audit (n=63)	Improvement
1	Operating surgeon's name	100% (45)	100% (63)	No change
2	Anesthetist's name	91.1% (41)	100% (63)	↑ 8.9%

3	Anesthesia technique	88.9% (40)	92.1% (58)	↑ 3.2%
4	Surgical procedure	100% (45)	100% (63)	No change
5	Tumor clinical stage	0% (0)	84.1% (53)	↑ 84.1%
6	Bimanual palpation findings	11.1% (5)	93.7% (59)	↑ 82.6%
7	Cystoscopy findings	0% (0)	100% (63)	↑ 100%
8	Tumor number	51.1% (23)	100% (63)	↑ 48.9%
9	Tumor appearance	42.2% (19)	84.1% (53)	↑ 41.9%
10	Tumor site	91.1% (41)	100% (63)	↑ 8.9%
11	Tumor size	62.2% (28)	100% (63)	↑ 37.8%
12	Completion of tumor resection	71.1% (32)	100% (63)	↑ 28.9%
13	Muscle biopsy request	20% (9)	47.6% (30)	↑ 27.6%
14	Bladder diagram	68.9% (31)	100% (63)	↑ 31.1%
15	Prior treatment history	0% (0)	79.4% (50)	↑ 79.4%
16	Post-operative orders	100% (45)	100% (63)	No change
17	Clerking doctor's name & signature	88.9% (40)	100% (63)	↑ 11.1%

The results of paired sample analysis showed that the mean score increased from 58.04 (SD = 38.51) in the initial audit to 93.00 (SD = 13.57) in the re-audit. A significant positive correlation was found between the two audits (r = 0.528, p = 0.029), indicating a moderate relationship.

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Initial_audit	58.035	17	38.5144	9.3411
	Re_audit	93.000	17	13.5666	3.2904

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Initial_audit & Re_audit	17	.528	.029

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Initial_audit - Re_audit	-34.9647	33.3997	8.1006	-52.1372	-17.7922	-4.316	16	.001

The paired sample t-test showed a statistically significant improvement (p = 0.001), with a mean difference of -34.96 (95% CI: -52.14 to -17.79). These results confirm a significant improvement in documentation following the intervention.

Discussion

Accurate and comprehensive operative documentation is essential in surgical practice, particularly in procedures like transurethral resection of bladder tumors (TURBT). However, handwritten operative notes fail to meet documentation standards despite their continued use in various surgical practices. They are often incomplete, illegible, and inconsistent, leading to communication barriers among healthcare providers and potential compromises in patient care[10]. Studies have highlighted that handwritten documentation frequently omits essential details such as tumor size, detrusor muscle presence, and administration of chemotherapy, all of which are crucial for accurate staging and treatment planning[11,12].

The Royal College of Surgeons (RCS) and the European Association of Urology (EAU) emphasize the importance of clear, structured, and detailed operative notes. Our study aimed to address these challenges by introducing a standardized pro forma aligned with EAU guidelines to improve compliance and documentation quality. We assessed the compliance of handwritten TURBT operative notes at Safari Hospital, Bahria Town, Rawalpindi, Pakistan with established documentation standards. Then, we created a structured pro forma based on standard EAU guidelines and evaluated the quality of notes.

The introduction of a standardized pro forma has been associated with multiple benefits, including improved documentation accuracy, enhanced compliance with guidelines, and better clinical decision-making. Studies have shown that implementing checklists and templates leads to better documentation of important details such as tumor size, depth of resection, and postoperative treatments[13,14]. Additionally, standardized documentation facilitates clearer communication among multidisciplinary teams, reduces variability in documentation, and improves adherence to clinical protocols.

The results of our study showed a significant improvement in documentation quality after introducing the standardized proforma. Key details that were often missing in handwritten notes, such as tumor characteristics and detrusor muscle presence, were recorded more consistently. This aligns with findings from previous studies that have implemented structured templates and checklists for operative documentation. For instance, a study by Guerrero et al. (2022) showed that introducing a TURBT checklist improved the documentation of tumor size, depth of resection, and chemotherapy administration[15]. Similarly, Dave et al. (2023)

reported that a checklist incorporating important TURBT elements increased operative note accuracy and surgeon prediction of tumor characteristics[14].

Electronic documentation systems have also been explored as a solution to the limitations of handwritten notes. A study by Ekowo et al. (2022) found that electronic notes outperformed handwritten notes in 17 out of 18 criteria for good surgical practice as outlined by RCS[16]. Additionally, Eminaga et al. (2024) demonstrated that schematic electronic documentation improved bladder lesion characterization during TURBT, further supporting the transition toward structured digital records[17].

Another approach to improving documentation quality involves education and training. Haddad et al. (2017) showed that a formal training session on TURBT dictations, combined with a checklist, significantly improved resident documentation[18]. Abdelbagi et al. (2024) further emphasized the role of targeted staff training in enhancing compliance with RCS guidelines[19].

Regular audits and feedback mechanisms are also essential in sustaining improvements in documentation practices. Oladeji et al. (2022) found that ongoing audits and feedback increased compliance with RCS guidelines while reducing the use of non-standard abbreviations in operative notes[20]. Finally, a multidisciplinary approach involving various healthcare professionals has been shown to optimize documentation practices. Vaidya & Bourdoumis (2023) highlighted that the introduction of electronic templates and standardized consent forms improved compliance with RCS guidelines and minimized variability in documentation[21].

Despite the improvements observed in this study, there are several limitations to consider. One major limitation is the small sample size, which may limit the ability to apply these findings to a larger population. A study involving multiple institutions with more cases would provide stronger conclusions. Additionally, since this was a single-center study, the results may not be relevant to hospitals with different documentation practices. Furthermore, the absence of electronic integration remains a drawback, as paper-based records, even when structured, can still be misplaced or difficult to read. Implementing an electronic system could improve accuracy, accessibility, and compliance with guidelines. Overall, our audit highlights the benefits of structured documentation and emphasizes the need for ongoing improvements in surgical record-keeping.

Conclusion

This audit showed that implementing a standardized proforma significantly improved the accuracy and completeness of TURBT operative documentation. Important parameters that were previously missing or inconsistently recorded, such as cystoscopy findings, tumor clinical stage, and prior treatment history, were consistently documented after the intervention. The structured format streamlined the documentation process, reduced omissions, and increased adherence to clinical guidelines.

To improve the quality of surgical records, hospitals should adopt structured proformas as a standard practice. Future efforts should focus on integrating electronic systems, conducting multi-center studies, and promoting staff training to further improve compliance and maintain high-quality surgical records.

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