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The introduction of a surgical checklist for the transurethral resection of the bladder improves recurrence-free survival in non-muscle invasive bladder cancer patients

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Introduction and Objective

More than half of patients with non-muscle invasive bladder cancer (NMIBC) will experience an intravesical recurrence, requiring additional treatment and its resulting morbidity, decreasing quality of life and increasing healthcare costs. The quality of surgical resection is essential in the management of bladder cancer (BC) patients and may have a significant impact on the risk of intravesical recurrence. To standardize the procedure and to improve surgical outcomes, the introduction of a surgical checklist (SC) has been proposed. Moreover, the SC improves operative reporting, which can be considered a proxy of surgical quality. However, studies reporting the impact of a SC on oncological outcomes are lacking.

The aim of our study was to evaluate the impact of the introduction of a SC on recurrence-free survival (RFS) of NMIBC patients undergoing TURBT.

Patients and Methods

An eight-item SC was progressively implemented into clinical practice at two tertiary referral centers. We reviewed the reports of TURBTs performed before and after the SC's implementation. Patients undergoing TURBTs between January 2012 and January 2017 were enrolled in this retrospective study. A multivariable logistic regression was performed to assess the impact of SC on the presence of detrusor muscle in pathologic specimen. Kaplan-Meyer curve was built to assess the impact of SC on RFS. A multivariable Cox regression model was built to assess the impact of SC on RFS rate.

Surgical Checklist

Tumor status	Primary vs recurrent
Pre-TUR bimanual palpation	Positive vs negative
Macroscopic appearance	Papillary vs solid
Tumor size	≤1 cm vs 1-3 cm vs >3 cm
Number of tumors	1 vs 2-7 vs ≥8
Location	Trigone vs bladder neck vs others
TUR macroscopically complete	Yes vs no
Post-TUR bimanual palpation	Positive vs negative

Baseline patients' characteristics

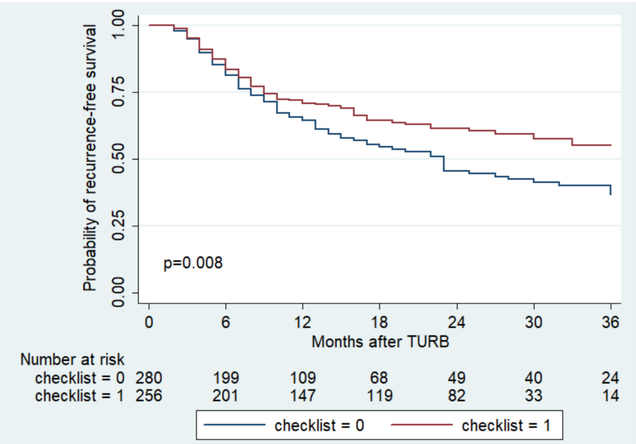
		Surgical checklist		
Variables	Total	No	Yes	p value
Number of patients	547	281 (51)	266 (49)	
Median age (IQR), years	72 (63-78)	71 (62-77)	72 (64-78)	0.08
Gender, n (%)				
Female	88 (16)	50 (18)	38 (14)	
Male	459 (84)	231 (82)	228 (86)	0.3
ASA score, n (%)				
1	22 (7)	20 (11)	2 (1)	
2	199 (60)	82 (43)	117 (84)	<0.001
3	105 (32)	86 (45)	19 (14)	
4	4 (1)	2 (1)	2 (1)	
Smoking habit, n (%)				
Never smoker	97 (23)	43 (23)	54 (23)	0.2
Former smoker	187 (44)	74 (40)	113 (48)	
Current smoker	139 (33)	69 (37)	70 (29)	
Exposure to chemical compounds, n (%)	52 (9)	17 (6)	35 (13)	0.7
Recurrent tumor, n (%)	140 (26)	47 (17)	93 (35)	<0.001
Pathological tumor stage, n (%)				
pTa	291 (53)	151 (54)	140 (53)	
pTis	3 (1)	1 (1)	2 (1)	0.9
pT1	202 (37)	102 (36)	100 (37)	
pT2	51 (9)	27 (9)	24 (9)	
Pathological tumor grade 2004, n (%)				
Low grade	223 (42)	126 (46)	97 (38)	0.09
High grade	306 (58)	150 (54)	156 (62)	
Concomitant CIS, n (%)	54 (10)	36 (13)	18 (7)	0.02
Detrusor muscle in TUR specimen, n (%)	330 (60)	173 (62)	157 (59)	0.15
Adjuvant intravesical therapy, n (%)	251 (46)	112 (40)	139 (52)	0.003
Type of intravesical therapy, n (%)				
Adjuvant chemotherapy	90 (26)	27 (24)	63 (46)	<0.001
Adjuvant BCG	160 (46)	85 (76)	75 (54)	
Restaging TUR, n (%)	160 (29)	79 (28)	81 (30)	0.6

Conclusions

TURBT is essential in the management of BC patients. We demonstrated that the implementation of a SC into clinical practice increases the quality of operative report thereby potentially improving individualized risk-stratification and care resulting in lower disease recurrence-rate. Therefore, the introduction of a SC should be recommended in order to enhance oncological outcomes by improving surgical standardization and operative reporting.

Results

Overall, 547 patients were included in the study and 266 of them (49%) underwent TURBT after the SCs' implementation. Median follow-up for patients alive at last follow-up was 20 months (IQR 10-31). Median age at TURBT was 72 years (IQR 63-78) and 459 (84%) patients were male. Most of the patients had NMIBC (91%) and high-grade disease (58%). Detrusor muscle in TURBT specimen was detected in 60% of the cases. On logistic multivariable regression analysis, the introduction of the SC was not significantly associated with the presence of detrusor muscle in the surgical specimen (OR 0.81, 95% CI 0.49-1.34, p=0.4). On univariable and multivariable Cox regression analysis, that adjusted for the effects of standard prognosticators, SC's implementation was independently associated with a significative improvement of RFS (OR 0.57, 95% CI 0.35-0.92, p=0.02).



Kaplan-Meier estimates for recurrence-free survival according to checklist status in 496 patients with non-muscle invasive bladder cancer treated with transurethral resection of the bladder.

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