Comparison of 90-day morbidity and mortality between ileal conduit and orthotopic neobladder following radical cystectomy in a large, multi-institutional database

The Canadian CBCis experience

Hanaa Fekak[1], Wassim Kassouf[2], Rodney H. Breau[3], Adrian Fairey[4], Agnihotram V. Ramanakumar[5], Camilla Tajzler[5], Eric Hyndman[6], Jasmir G. Nayak[7], Jonathan Izawa[8], Bobby Shayegan[9], Girish S. Kulkarni[10], Afsaneh Eskandari[11], Michele Lodde[12], Ricardo A. Rendon[13], D. Robert Siemens[14], Claudio Jeldres[15], Peter C. Black[16], Jean-Baptiste Lattouf[1]

[1]Division of Urology, Université de Montréal, Montreal, QC Canada; [2]Division of Urology, McGill University Health Center, Montreal, QC, Canada; [3]Ottawa Hospital Research Institute, Division of Urology, University of Ottawa, Ottawa, ON, Canada; [4]Division of Urology, Cross Cancer Centre, Edmonton, AB, Canada; [5]Research Institute, McGill University, Montreal, QC, Canada; [6]Division of Urology, Alberta Health Services, Calgary, AB, Canada; [7]Section of Urology, University of Manitoba, Winnipeg, MB, Canada; [8]Division of Urology, Western University, London, ON, Canada; [9]Division of Urology, McMaster University, Hamilton, ON, Canada; [10]Division of Urology, University of Toronto, Toronto, ON, Canada; [11]Department of Surgical Oncology/Urology, University Health Network, Toronto, ON, Canada; [12]Division of Urology, Université Laval, Quebec City, QC, Canada; [13]Department of Urology, Dalhousie University, Halifax, NS, Canada; [14]Department of Urology, Queen's University, Kingston, ON, Canada; [15]Division of Urology, Université de Sherbrooke, Sherbrooke, QC, Canada; [16]Department of Urologic Sciences, University of British Columbia, Vancouver, BC, Canada

Cite as: Fekak H, Kassouf W, Breau RH, et al. Comparison of 90-day morbidity and mortality between ileal conduit and orthotopic neobladder following radical cystectomy in a large, multi-institutional database: The Canadian CBCis experience. *Can Urol Assoc J* 2026;20(1):E1-7. http://dx.doi.org/10.5489/cuaj.9204

Published online September 23, 2025

Appendix available at *cuaj.ca*

ABSTRACT

INTRODUCTION: In patients undergoing radical cystectomy, ileal conduit (IC) urinary diversions are more frequently carried out than orthotopic neo-bladder reconstructions (ONB). Patients selected for IC likely have more comorbidities, advanced disease, and older age, with many being poor candidates for ONB; ONB often ends up being selected by younger and healthier patients. Differences in complications experienced by IC and ONB patients may be due to differences between patients or urinary diversions. To guide patient counseling and care, we aimed to assess 90-day complications and mortality for patients undergoing either procedure in a large, contemporary, Canadian cohort.

METHODS: Patient information was obtained from the Canadian Bladder Cancer information system (CBCis), encompassing 14 academic Canadian centers. Patients who underwent radical cystectomy between February 2015 and September 2023 were included. Ninety-day complications were analyzed according to the Clavien-Dindo severity scale. Perioperative parameters and 90-day mortality were compared between IC and ONB diversion. We used rank-sum and Chi-squared exact tests as exploratory statistics. Unconditional logistic regression was used to evaluate the association between IC and ONB complications.

RESULTS: Of 2161 patients, 1799 (83%) received an IC and 362 (17%) an ONB. Patients were followed for a median of 235 days (interquartile range [IQR] 486). The median age was 69 years (IQR 14). The age-adjusted Charlson comorbidity index was significantly higher in the IC group (median [IQR] 5 [2] vs. 4 [2], p<0.001). The 90-day complication rate was 46% and the 90-day mortality rate was 4.3% for the entire cohort. On multivariable logistic regression, the risk of overall complications was significantly higher in the ONB than in the IC group (odds ratio 2.2, 95% confidence interval 1.7–2.8, p<0.001). Ninety-day mortality was 4.9% in the IC group and 0.82% in the ONB group.

CONCLUSIONS: In this multi-institutional cohort, patients with ONB had higher odds of perioperative complications; however, there was no difference in higher-severity complications between diversions.

INTRODUCTION

Radical cystectomy remains a common treatment for patients with muscle-invasive bladder cancer, as well as patients with non-muscle invasive bladder cancer (NMIBC) who have failed bladder preservation approaches.[1-3] Radical cystectomy has a high risk for complications and perioperative death.[4-8] The two most common forms of urinary diversion during cystectomy are an ileal conduit (IC) and an orthotopic urinary neo-bladder (ONB).[9,10] Although preserving body image and being associated with improved quality of life, it is perceived that ONB may come at the expense of a higher complication rate compared to IC.[11,12]

The incidence of invasive bladder cancer peaks after age 70,[13-15] and the usual population suffering from this condition typically harbors multiple comorbidities, including cardiovascular and pulmonary conditions.[16]

KEY MESSAGES

- In a large, pan-Canadian cohort, orthotopic urinary diversion is being offered to/chosen by younger and healthier subjects undergoing radical cystectomy.
- 90-day overall complications are higher in patients receiving orthotopic diversion than those receiving ileal conduit.
- Complication severity was the same with both types of diversions
- The data did not reveal a statistically significant difference in 90-day mortality between ileal conduit and orthotopic neobladder diversion post-radical cystectomy.

Patient selection/choice for the optimal diversion, which balances quality of life with complications and mortality risks, is often based on clinicians' a priori perceptions, which are communicated to the patient, with little supporting or even conflicting data in the literature.[6,7]

To better inform patient decision-making in a Canadian population, we sought to compare the 90-day complication and mortality rates between IC and ONB in a large, prospectively maintained, pan-Canadian cohort of patients who have undergone radical cystectomy.

METHODS

Patients

Patient information was obtained from the Canadian Bladder Cancer information system (CBCis), a prospectively collected and maintained registry that includes data on 7152 patients treated in 14 academic Canadian centers, with each center having institutional review board approval. The collected baseline characteristics include age, age-adjusted Charlson comorbidity index (aCCI), previous abdominal surgery, active smoking, preoperative renal function, body mass index (BMI), use of neoadjuvant chemotherapy, and clinical stage.

Complications are entered into the database using two modalities: first, by inputting a binary entry (yes or no) for 12 predefined items. Alternatively, if the complications do not fit into any categories, they are reported narratively in an empty field under "other complications." Data is collected prospectively in a standardized fashion by trained abstractors at each participating institution.

Outcomes

Co-primary outcomes of our study were 90-day complications, which were analyzed according to the Clavien-Dindo severity scale, and 90-day mortality rates.

Statistical analysis

We summarized continuous variables as means and standard deviations (SD) when normally distributed, and as medians with interquartile ranges (IQR) when non-normally distributed. Categorical variables were presented as counts and percentages. Baseline characteristics between diversion groups were compared using independent t-tests for normally distributed continuous variables, Wilcoxon rank-sum tests for non-normal continuous variables, and either Chi-squared or Fisher's exact tests for categorical variables, as appropriate.

To analyze complications, we performed event-level analyses to accurately account for patients who experienced multiple events. Weighted comparisons were conducted using rank-sum tests for continuous variables and Chi-squared exact tests for categorical variables. To identify complication-associated factors, we used unconditional logistic regression models adjusted for age, sex, CCI, and neoadjuvant chemotherapy.

Mortality outcomes were assessed using multivariable Cox regression, with preoperative radiation therapy excluded due to its low prevalence in the cohort. To control for the risk of type I error arising from multiple comparisons, we applied a false discovery rate (FDR) adjustment. Additionally, we conducted age-stratified subgroup analyses (<70 and ≥70 years) to evaluate risk differences across age groups.

To address potential confounding, we implemented propensity score matching (PSM) using a 1:1 nearest-neighbor approach without replacement. Adequate covariate balance between matched groups was confirmed by achieving a standardized mean difference (SMD) of less than 0.15. Further, we validated this analysis by logistic regression.

All statistical analyses were performed using STATA 17 (StataCorp LLC, College Station, TX, U.S.), with careful attention to degrees of freedom to ensure the robustness and validity of our findings.

RESULTS

A total of 2256 patients who underwent radical cystectomy between February 2015 and September 2023

were available for analysis. We excluded 95 patients with missing data (Supplementary Figure 1; available at *cuaj.ca*). Baseline patient characteristics are presented in Table 1. The median age at surgery was 69 years (IQR 14). Of 2161 patients analyzed, 1670 (77%) were male. The median aCCI was 5, and more patients with IC had a score of >5 compared to ONB (33% vs. 12%, p<0.001). Prior radiation therapy was more prevalent in the IC group (9% vs. 0.6%, p<0,001), whereas neoadjuvant chemotherapy was significantly higher in patients who received ONB (50% vs. 31%, p<0.001). The clinical stage was similar between the IC and ONB patients.

Perioperative parameters and pathologic outcomes are shown in Table 2. Estimated blood loss was higher in patients who received ONB (837 vs. 661 mL, p<0.001). Likewise, unplanned readmission was also higher in this group (48% vs. 34%, p<0.001). Pathologic T stage was higher in patients who received IC (pT3/pT4 29%/14% in IC vs. 2.3%/0.9% in ONB), as well as lymph node status, albeit to a lesser extent (Table 3). Positive surgical margins were more frequent in the IC group, specifically at the urethral margin (18% in IC vs. 5.8% in ONB, p<0.001).

Table 3 presents postoperative complication rates according to diversion type. It shows that overall complications, wound infections, urine/bowel leaks, and lymphoceles were significantly higher in patients who received ONB (44% vs. 57% p<0.001; 13% vs. 22% p<0.001; 4.0% vs. 17%, p<0.001; and 2% vs. 5.5%, p<0.001, respectively). Only hemorrhage, pneumonia, and delirium occurred more frequently in IC, without this reaching statistical significance. Other unclassified complications amounted to 107 (14%) of total complications and did not reveal differences with respect to diversion type.

Multivariable analysis for various complications is shown in Table 4. The association of any complication with ONB is still noted (odds ratio [OR] 2.0, 95% confidence interval [CI] 1.53–2.63, p<0.001), as well as the higher rates of wound infection, urine/bowel leaks, and lymphoceles in patients who received ONB (OR 1.96, 95% CI 1.41–2.72, p<0.001; OR 4.84, 95% CI 3.37–6.96, p<0.001; and OR 2.91, 95% CI 1.53–5.54, p=0.001, respectively).

The severity of complications with respect to diversion is presented in Supplementary Table 1 (available at *cuaj.ca*) There were 99 (14.5%) complications with unknown Clavien-Dindo scores. Of the remaining 586 complications analyzed, we could not show an association between the type of diversion and overall complication severity; however, complication severity was particularly higher in IC for hemorrhage (0.6% vs. 0%, p=0.07), whereas it was higher in ONB for fistulas/

Table 1. Baseline characteristics

	IC (n=1799)	ONB (n=362)	p
Male gender	1362 (76)	308 (86)	**<0.001**
Age at surgery (yrs),			
Mean (SD)	66.4 (16)	58.6 (16)	**<0.001**
Median (25th–75th)	62 (55–63)	61 (55–68)	
≤70, n (%)	889 (50)	308 (86)	**<0.001**
>70, n (%)	893 (50)	52 (14)	
aCCI			
Mean (SD)	3.9 (1.6)	4.9 (2.0)	**<0.001**
Median (25th–75th)	5 (4–6)	4 (3–5)	
0 [≤2], n (%)	155 (9.3)	59 (19)	
1 [3–5], n (%)	962 (57)	223 (70)	
2 [>5], n (%)	559 (33)	37 (12)	
Previous abdominal/pelvic surgery, n (%)	103 (5.8)	12 (3.3)	0.16
Previous abdominal/pelvic RT, n (%)	160 (9.0)	2 (0.6)	**<0.001**
Active smoking (current smoker), n (%)	436 (24)	98 (27)	**0.047**
Pre-op serum creatinine			
Mean (SD)	103.3 (42)	93.4 (24)	**0.0052**
Median (25th–75th)	94 (77–119)	88 (76–107)	
NAC, n (%)	561 (31)	180 (50)	**<0.001**
BMI, n (%)			
Normal	712 (40)	142 (39)	0.2
Overweight	534 (30)	123 (34)	
Obese	312 (18)	61 (17)	
Clinical T stage, n (%)			
cT0	2 (0.12)	0 (0.0)	
cTa	118 (7.2)	30 (8.8)	
CIS	97 (5.9)	14 (4.1)	
cT1	332 (20)	76 (22)	
cT2	907 (57)	185 (55)	
cT3	86 (5.4)	22 (6.6)	
cT4	45 (2.8)	7 (2,1)	0.6
Clinical node-positive disease, n (%)	90 (8.4)	16 (7.4)	0.6

Clinical stage is the worst diagnosis before the cystectomy. Due to missing information on specific variables, the total numbers may not sum accurately. Bolded values indicate statistical significance. aCCI: age-adjusted Charlson comorbidity index; BMI: body mass index; IC: ileal conduit; NAC: neoadjuvant chemotherapy; ONB: orthotopic neobladder; RT: radiation therapy; SD: standard deviation.

Table 2. Pathologic and perioperative outcomes

	IC (n=1799)	ONB (n=362)	p
Perioperative outcomes			
EBL (ml)			
Mean (SD)	661 (552)	837 (614)	**<0.001**
Median (25th–75th)	600 (400–1000)	750 (500–1100)	
Length of hospital stay (d)			
Mean (SD)	12.8 (6)	17.6 (7)	**0.014**
Median (25th–75th)	8 (7–13)	9 (7–13)	
Unplanned readmission (90 d), n (%)	264 (34)	99 (48)	**<0.001**
Adjuvant chemotherapy, n (%)	115 (6.4)	26 (7.2)	0.6
Mortality (90 d), n (%)	89 (4.9)	3 (0.82)	**<0.001**
Pathologic outcomes, n (%)			
Histology			
Urothelial	1014 (66)	213 (77)	
Non-urothelial	101 (6.6)	14 (5.0)	
Mixed	426 (28)	51 (18)	**0.002**
Pathologic T stage, n (%)			
pT0	167 (9.6)	64 (18)	
pTa	53 (3.1)	14 (4.0)	
pTis	167 (9.6)	64 (18)	
pT1	179 (10)	48 (14)	
pT2	350 (20)	48 (14)	
pT3	505 (29)	86 (23)	
pT4	239 (14)	8 (0.9)	**<0.001**
Pathologic N stage, n (%)			
pN0	1147 (66)	265 (76)	
pN1	206 (12)	34 (9.8)	
pN2	225 (13)	30 (8.6)	
pN3	58 (3.4)	5 (1.4)	
pNx	80 (4.6)	14 (4.0)	**0.005**
Positive surgical margin, n (%)			
Any site	270 (18)	16 (5.8)	**<0.001**
Bladder	81 (4.5)	7 (1.9)	0.024
Ureter	49 (2.8)	4 (1.1)	0.068
Urethra	143 (8.0)	6 (1.7)	**<0.001**
Lymph nodes removed, mean (SD)	19.0 (11)	22.1 (11)	**<0.001**

Bolded values indicate statistical significance. EBL: estimated blood loss; IC: ileal conduit; IQR: interquartile range, ONB: orthotopic neobladder; SD: standard deviation.

leaks (1.5% vs. 4.1%, p=0.004). When including missing data for each of these two complications, the difference between IC and ONB was still present for fistulas/leaks but was absent for hemorrhage. Otherwise, the analysis with or without missing data did not yield any differences for the other listed complications.

Analyzing data with respect to age (<70 years, n=1197; >70 years, n=945), ONB and smoking were significantly associated with increased odds of complication rates in the older than 70 years group, while these associations were weaker in the younger group (Supplementary Table 2; available at *cuaj.ca*).

Ninety-day mortality could not be meaningfully compared in a multivariable analysis between IC and ONB, given the low rate of events in patients who received ONB (n=3). Absolute 90-day mortality numbers and rates are presented in Table 3. Mortality was 4.9% in patients who received IC and 0.82 % in those who received ONB.

DISCUSSION

Comparing diversions in patients undergoing radical cystectomy is fraught with selection bias due to patient preference when choosing a procedure and the way surgeons present the patient with options with respect to their overall condition, age, and disease stage. In this study, we sought to contribute to the body of literature by assessing a large, multicentric, Canadian database with respect to 90-day complications and mortality. We further sought to find preoperative determinants of worse outcomes for each IC and ONB to facilitate clinical decision-making.

Our results show that patients receiving ONB were significantly younger (86% of ONB patients were under 70 years) and had fewer comorbidities (CCI >5 in 33% in IC vs. 12% in ONB, p<0.0001). Analysis by age group showed that ONB portends high complications in the older patient (older than 70 years) with a smoking history. This suggests that ONB should be offered only after careful consideration of the overall clinical picture in this type of patient (Appendix; available *at cuaj.*ca).

In this study, the 90-day complication rate (44% in IC and 57% in ONB) is similar to what has been previously reported in the literature. In a systematic review and meta-analysis of 32 publications (16 prospective and 16 retrospective case-control/cohort studies) grouping 46 787 patients and assessing cohorts from globally widespread countries (including the U.S., Japan, Chili, Germany, Poland, Italy, Korea, Sweden, and India, among others), Brown et al compared IC to ONB with respect to five outcomes: quality of life,

long-term durability, complication rate, mortality, and length of stay between the two groups.[17] Complication rates were reported to be 61.9% in IC vs. 60.1% in ONB, with an OR of 1.16 (p<0.01). This stands in contrast to our results; however, although statistically significant, a 1.8% difference may not substantially influence clinical decision-making, especially in light of the heterogeneity of studies that were used to generate the data. Furthermore, this meta-analysis included patients who underwent cystectomy for reasons other than bladder cancer. Our results arguably evaluate a more homogenous set of patients being treated according to national guidelines and may more appropriately apply to a Canadian context.

Although large North American and European cohort studies report similar results to the present study, with ONB presenting a higher complication rate,[18,19] other studies assessing patients in similar environments and geographic regions suggest an equivalence between IC and ONB in terms of complication rate, if not a slight superiority of ONB.[8,20-23]

Unplanned readmission was higher in the ONB group (48% vs. 34%, p<0.0001), implying a higher complication rate for patients receiving ONB. On the other hand, the severity of complications, according to the Clavien-Dindo scale, did not show a statistically significant difference between the two groups overall, except for fistulas/leaks.

In this study, 90-day mortality was 4.9% in patients who received an IC and 0.82% in patients who received an ONB (p<0.0001). Browne et al's meta-analysis favored ONB (9.6% vs. 1.6%, OR 6.29, p<0.01), with the authors noting that the risk of death is possibly related to older age and higher-grade tumors in the IC group, which tend to bias results.[17] Although the disease stage was similar between groups in our study, older age in the IC group may explain the observed trend. More recent data suggest equivalence in mortality rates between the two approaches.[18]

Overall, disparity in published results may suggest that geographical regions and studied populations should influence the information patients are given when being counseled on a tailor-made approach. In that sense, using our data from a Canadian population, IC seems to portend fewer complications than ONB, albeit possibly with a price in terms of altered lifestyle. Future endeavors should assess further use of biomarkers combined with artificial intelligence tools for more informative and discriminating prediction of outcomes.

Table 3. Frequency of cystectomy-related complications among the cohort

Complications		IC (n=1799)	%	ONB (n=362)	%	p
Any complications		783	44	208	57	**<0.001**
MI/DVT/PE/CVA		137	7.6	33	9.1	0.3
Wound infections		241	13	81	22	**<0.001**
Fascial dehiscence		62	3.5	16	4.4	0.3
Hemorrhage		31	1.7	3	0.83	0.2
Pneumonia		45	2.5	7	1.9	0.5
Delirium		62	3.5	9	2.5	0.3
Ileus		298	17	62	17	0.8
Bowel/urine leak		72	4.0	61	17	**<0.001**
Lymphocele		35	2.0	20	5.5	**<0.001**
Failure to thrive/weakness/malnutrition		10	0.56	3	0.83	0.5
Electrolyte-acid imbalance		18	1.0	4	1.1	0.9
Renal failure		35	2.0	8	2.2	0.8
Pain control issues		9	0.50	4	1.1	0.2
Other complications		107	6.0	30	8.3	0.8
EBL (ml)	Mean [SD]	661 (552)		837 (614)		**<0.001**
	Median [25th–75th]	600 (400–1000)		750 (500–1100)		
Length of hospital stay (d)	Mean [SD]	12.8 (6)		17.6 (7)		**0.014**
	Median [25%–75%]	8 (7–13)		9 (7–13)		
Unplanned readmission (90 d)	n (%)	264 (34)		99 (48)		**<0.001**
Mortality (90 d)	n (%)	89 (4.9)		3 (0.82)		**<0.001**

Bolded values indicate statistical significance. CVA: cerebrovascular accident; DVT: deep venous thrombosis; EBL: estimated blood loss; IC: ileal conduit; MI: myocardial infarction; ONB: orthotopic neobladder; PE: pulmonary embolism; SD: standard deviation.

Limitations

Limitations of this study include selection bias. Although the data collection is prospective and multicentric, controlling for confounding factors was carried out using multivariable analysis, which does not guarantee the elimination of bias. We carried out alternative statistical analyses using inverse probability of treatment weighting, which did not yield different outcomes, suggesting a reliable and reproducible result. Also, the database did not account for the enhanced recovery after surgery protocol application, which could influence 90-day complication rates.

Regarding data completeness, only 1.5% of the information was missing; this is considered relatively minor and should not influence the conclusions. Additionally, Clavien-Dindo scores were missing for about 14.5% of cases, but

Table 4. Multivariable logistic regression analysis with adjusted odds ratio for various complications according to diversion type

Complications	Multivariable		
	OR	95% CI	p
Any complications			
IC	1.00		
ONB	**2.00**	**1.53–2.63**	**<0.001**
MI/DVT/PE/CVA			
IC	1.00		
ONB	1.41	0.88–2.22	0.14
Wound infection			
IC	1.00		
ONB	1.96	1.41–2.72	**<0.001**
Fascial dehiscence			
IC	1.00		
ONB	1.71	0.90–3.22	0.10
Hemorrage/bleeding			
IC	1.00		
ONB	0.58	0.17–2.02	0.4
Pneumonia/pulmonary			
IC	1.00		
ONB	0.92	0.37–2.30	0.9
Delirium/neurologic			
IC	1.00		
ONB	0.94	0.43–2.01	0.9
Ileus-related			
IC	1.00		
ONB	1.07	0.75–1.51	0.7
Bowel/urine leaks/fistula			
IC	1.00		
ONB	4.84	3.37–6.96	**<0.001**

Multivariable analysis was adjusted for age, adjusted Charlson comorbidity index, sex, smoking, hospital stay, and neoadjuvant chemotherapy. Bolded values indicate statistical significance. CI: confidence interval; CVA: cerebrovascular accident; DVT: deep venous thrombosis; IC: ileal conduit; MI: myocardial infarction; ONB: orthotopic neobladder; OR: odds ratio; PE: pulmonary embolism; SD: standard deviation.

Table 4 (cont'd). Multivariable logistic regression analysis with adjusted odds ratio for various complications according to diversion type

Complications	Multivariable		
	OR	95% CI	p
Lymphocele			
IC	1.00		
ONB	**2.91**	**1.53–5.54**	**0.001**
Renal failure			
IC	1.00		
ONB	1.30	0.56–3.04	0.5
Electrolytes-acid imbalances			
IC	1.00		
ONB	1.47	0.30–7.10	0.6
Failure to thrive/ weakness/malnutrition			
IC	1.00		
ONB	2.24	0.39–9.07	0.4
Pain control issues			
IC	1.00		
ONB	3.16	0.74–14.1	0.12
Other complications			
IC	1.00		
ONB	1.11	0.68–1.83	0.7

Multivariable analysis was adjusted for age, adjusted Charlson comorbidity index, sex, smoking, hospital stay, and neoadjuvant chemotherapy. Bolded values indicate statistical significance. CI: confidence interval; CVA: cerebrovascular accident; DVT: deep venous thrombosis; IC: ileal conduit; MI: myocardial infarction; ONB: orthotopic neobladder; OR: odds ratio; PE: pulmonary embolism; SD: standard deviation.

no considerable difference in the final results was elicited when the analysis was carried out with the missing data.

It would probably have also been significant to report long-term data, such as overall survival and quality of life data. Our overall survival seemed to favor ONB, but given the lack of long-term followup for all patients, we were not able to draw any meaningful and reliable conclusions from the data.

More granular analysis taking into account male to female comparisons, as well as robotic vs. open approaches, could not be carried out due to the small numbers of female patients receiving ONB and the very small number of robotic surgeries.

Finally, quality-of-life data are lacking from our dataset and would have been of significant value for patient counseling.

CONCLUSIONS

Perioperative complications following radical cystectomy remain significant. The 90-day complication rate is higher in patients receiving ONB in our multicentric patient cohort. On the other hand, no overall difference could be demonstrated in the severity of these complications in patients who received ONB vs. those who received IC, except for fistulas and leaks. The long-term benefits of orthotopic diversion should still be considered when selecting a urinary diversion.

COMPETING INTERESTS: Dr. Kassouf has received advisory board honoraria from Astellas, AstraZeneca, Bayer, BMS, CG Oncology, EMD Serono, enGene, Ferring, Janssen, Merck, Pfizer, and Photocure. Dr. Breau has been on advisory boards for Abbvie, Astellas, CG Oncology, EMD Serono, Knight, Merck, and Tolmar. Dr. Shayegan has been an advisory board member for Abbvie, Astellas, Bayer, Ferring, Janssen, Knight, Merck, Pfizer, and TerSera; and has participated in clinical trials supported by Ipsen, Janssen, Merck, Myovant, and Pfizer. Dr. Kulkarni has been on advisory boards for AAA/Novartis, Abbvie, Astellas, AstraZeneca, BMS, EMD Serono, enGene, Ferring, J&J, Knight Therapeutics, Merck, Pfizer, Photocure, Theralase, and Verity; has received payment and/or honoraria from AAA/Novartis, Astellas, BMS, Ferring, J&J, Photocure, Protara PPharmaceuticals, Theralase, TerSera, and Verity; has participated in clinical trials supported by BMS, CG Oncology, Ferring, J&J, Merck, Pfizer, Protara Therapeutics, Seagen, Theralase, and Verity; and sits on the board of Bladder Cancer Canada. Dr. Rendon has been an advisory board and speakers' bureau member for and has received honoraria from Abbvie, Amgen, Astellas, Astra Zeneca, Bayer, Ferring, Jansen, Pfizer, Roche, Sanofi, and Tolmar; has received honoraria/grants from Abbvie, Astellas, Bayer, Ferring, Janssen, Sanofi, TerSera, and Tolmar; holds investments in Myovant; and has participated in clinical trials supported by Abbvie, Astellas, Bavarian Nordic, Bayer, Ferring, Janssen, Myovant, and Sanofi. Dr. Black has been on advisory boards for Abbvie, Astellas, AstraZeneca, Aura, Bayer, BMS, CG Oncology, Combat, EMD-Serono, EnGene, Ferring, Johnson & Johnson, Merck, Nonagen, NanOlogy, Nanobot, Pfizer, Photocure, Prokarium, Sumitomo, TerSera, Tolmar, and Verity; has been a speaker for Bayer, J&J, Pfizer, and TerSera; has received research grants from CIHR, CRS, TFRI, CUASF, BCC, Hecht Foundation, and the Michael Smith Foundation; has participated in clinical trials supported by CG Oncology, enGene, J&J, Therelase, and Verity; and serves as IBCN President and NCI GUSC Bladder Cancer Task Force Co-Chair. Dr. Lattouf has been on advisory boards for Astellas, Ipsen, Janssen, Novartis, Pfizer, and TerSera; and has participated in clinical trials supported by BMS and Sustained Therapeutics. The remaining authors do not report any competing personal or financial interests related to this work.

FUNDING: This project was supported by the Canadian Bladder Cancer information system Collaborative (CBCis) and Bladder Cancer Canada. CBCis has received unrestricted grants or in-kind support from AstraZeneca, Bladder Cancer Canada, BMS, Ferring, Janssen, Merck, Pfizer/EMD Serono, Roche, and Seagen.

REFERENCES

1. Chang SS, Chou R, Boorjian SA, et al. Diagnosis and treatment of non-muscle-invasive bladder cancer: AUA/SUO guideline. *J Urol* 2016;196. https://doi.org/10.1016/j.juro.2016.06.049
2. Flaig TW, Agarwal N, Spiess PE, et al. Bladder cancer, version 3.2020, NCCN clinical practice guidelines in oncology. *J Natl Compr Cancer Netw* 2020;18:329-54.
3. Witjes JA, Bruins HM, Carrión A, et al. European association of urology guidelines on muscle-invasive and metastatic bladder cancer: Summary of the 2023 guidelines. *Eur Urol* 2024;85:17-31. https://doi.org/10.1016/j.eururo.2024.03.002
4. Novotny V, Koch R, Zastrow S, et al. Radical cystectomy in patients over 70 years of age: Impact of comorbidity on perioperative morbidity and mortality. *World J Urol* 2011;30:769-76. https://doi.org/10.1007/s00345-011-0782-0
5. Berneking AD, Askeland EJ, Rosebear HM, et al. Morbidity and mortality of octogenarians following open radical cystectomy using a standardized reporting system. *Can J Urol* 2013;20:6826-31.
6. Hautmann RE, Davidsson T, Abol-Enein H, et al. ICUD-EAU international consultation on bladder cancer 2012: Urinary diversion. *Eur Urol* 2013;63:67-80. https://doi.org/10.1016/j.eururo.2012.08.050
7. Faba OR, Artibani W, Tyson MD, et al. Update of the ICUD-SIU international consultation on bladder cancer 2018: Urinary diversion. *World J Urol* 2019;37:85-93. https://doi.org/10.1007/s00345-018-2601-3
8. Lavallée LT, Witiuk K, Schramm D, et al. Peri-operative morbidity associated with radical cystectomy in a multicenter database of community and academic hospitals. *PLoS One* 2014;31:e111281. https://doi.org/10.1371/journal.pone.0111281
9. Colombo R, Naspro R. Ileal conduit as the standard for urinary diversion after radical cystectomy for bladder cancer. *Eur Urol Suppl* 2010;9:736-44. https://doi.org/10.1016/j.eursup.2010.09.001
10. Lee RK, Artibani W, Abol-Enein H, et al. Urinary diversion after radical cystectomy for bladder cancer: Options, patient selection, and outcomes. *BJU Int* 2014;113:11-23. https://doi.org/10.1111/bju.12627
11. Siracusano S, Bassi P, Zaka A, et al. Quality-of-life outcomes in female patients with ileal conduit or orthotopic neobladder urinary diversion: 6-month results of a multicenter prospective study. *Front Oncol* 2022;12:855546. https://doi.org/10.3389/fonc.2022.855546
12. Bahlburg H, Reike M, Reichers A, et al. A prospective evaluation of quality of life, psychosocial distress, and functional outcomes two years after radical cystectomy and urinary diversion in 842 German bladder cancer patients. *J Cancer Surviv* 2024;19:1102-10. https://doi.org/10.1007/s11764-024-01535-0
13. Cancer Research UK. Bladder cancer incidence statistics. *Cancer Res UK* 2024. Available from: Https://www.cancerresearchuk.org/health-professional/cancer-statistics/statistics-by-cancer-type/bladder-cancer/incidence
14. American Cancer Society. Key statistics for bladder cancer. *Am Cancer Soc* 2025. Available from: Https://www.cancer.org/cancer/types/bladder-cancer/about/key-statistics.html
15. SEER (USA). Bladder cancer fact sheets & statistics. *SEER Stat Fact Sheets* 2023. Available from: Https://seer.cancer.gov/statfacts/html/urinb.html
16. Williams SB, Chamie K, Kamat AM, et al. Systematic review of comorbidity and competing-risks assessments for bladder cancer patients. *Eur Urol Oncol* 2018;1 :91-100. https://doi.org/10.1016/j.euo.2018.03.005
17. Browne E, Jack GS, Lawrentschuk N, et al. A systematic review and meta-analysis of the long-term outcomes of ileal conduit and orthotopic neobladder urinary diversion. *Can Urol Assoc J* 2021;15:E28-57. https://doi.org/10.5489/cuaj.6466
18. Rezaee MA, Bihrle W, Atwater BL, et al. Ileal conduit versus continent urinary diversion in radical cystectomy: A retrospective cohort study of 30-day complications, readmission, and mortality. *Urology* 2022;170:139-45. https://doi.org/10.1016/j.urology.2022.08.020
19. Tappero SD, Cerruto MA, Dell'Oglio P, et al. Ileal conduit versus orthotopic neobladder urinary diversion in robot-assisted radical cystectomy: Results from a multi-institutional series. *Eur Urol* 2023;50:47-56. https://doi.org/10.1016/j.euros.2023.01.009
20. Nahar B, Prakash NS, Koru-Sengal T, et al. Comparison of readmission and short-term mortality between different types of urinary diversion in patients undergoing radical cystectomy. *J Urol* 2017;197:393-9. https://doi.org/10.1016/j.juro.2017.02.1683
21. Roghmann F, Trinh QD, Becker A, et al. Updated assessment of neobladder utilization and morbidity according to urinary diversion after radical cystectomy: A contemporary US-population based cohort. *Can Urol Assoc J* 2013;7:E552-60. https://doi.org/10.5489/cuaj.221
22. Demaegd L, Muilwijk T, Albersen M, et al. Comparison of postoperative complications of ileal conduits versus orthotopic neobladders. *Transl Androl Urol* 2020;9:2541-54. https://doi.org/10.21037/tau-20-713
23. Peñaranda NR, Marmiroli A, Di Bello F, et al. Urinary diversion versus adverse in-hospital outcomes after radical cystectomy. *Ann Surg Oncol* 2025:2243-4.

CORRESPONDENCE: Dr. Jean-Baptiste Lattouf, Division of Urology, Department of Surgery, Université de Montréal, Montreal, QC, Canada; jean-baptiste.lattouf@umontreal.ca