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Perioperative Complications and Omission of Ureteral Stents During Robot-Assisted Radical Cystectomy With Intracorporeal Ileal Conduit

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Study Need and Importance: Ureteral stents are often placed during radical cystectomy with urinary diversion, although data supporting their efficacy at reducing complications are limited. Recent data suggest that stent use may be associated with increased risk of postoperative infectious complications. This study aims to assess the role of ureteral stents in postoperative complications after robot-assisted radical cystectomy with intracorporeal ileal conduit (RARC-IC).

What We Found: Ureteral stent use during RARC-IC was associated with a significantly higher rate of UTIs within 30 days of surgery (19% difference, 95% CI, 9.0%-29%, $P = .007$; Figure). Composite ureteroenteric anastomosis-related complications were higher in the stented group (20% vs 9.5%, 10% difference, 95% CI, −3.4% to 24%, $P = .2$), though not statistically significant. Use of stents was associated with significantly longer operative time (median, 435 minutes vs 381 minutes; $P = .024$) and greater estimated blood loss (median, 250 mL vs 175 mL; $P = .009$). There were no significant differences in urine leak or ureteral stricture, although event rates were low.

Limitations: Our study was retrospective and underpowered to detect significant differences in some outcomes, such as ureteral stricture rates. While we accounted for various confounders, the observational design limits the ability to establish causality between stent use and complications. Patients were from a single, high-volume center, which may limit generalizability to other institutions.

Interpretation for Patient Care: Our findings suggest that omitting ureteral stents during RARC-IC could reduce the risk of postoperative infections, particularly UTIs, without increasing other major complications. These data can inform surgical practice, demonstrating the safety and feasibility of performing radical cystectomy without use of ureteral stents. The findings of this study have motivated a randomized trial at our institution to determine the effect of stent use on postoperative complications after radical cystectomy.

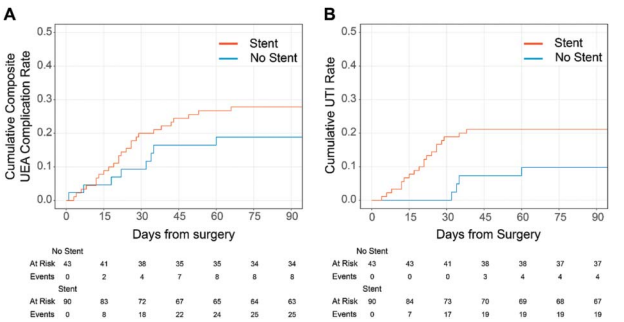

Figure. A, Cumulative incidence of composite ureteroenteric anastomosis (UEA) complications, including urine leak, UTI, abdominal or pelvic abscess, or sepsis. B, Cumulative UTI rate. Red line: stented group. Blue line: unstented group.

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Perioperative Complications and Omission of Ureteral Stents During Robot-Assisted Radical Cystectomy With Intracorporeal Ileal Conduit

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Purpose: Ureteral stents are commonly placed intraoperatively during radical cystectomy, although their efficacy in reducing complications is unproven. We compared clinical outcomes among patients undergoing robot-assisted radical cystectomy with intracorporeal ileal conduit (RARC-IC) with or without ureteral stents to determine if omission of ureteral stents affects postoperative complications.

Materials and Methods: All RARC-IC surgeries performed at our institution between November 2017 and June 2023 were reviewed. Beginning August 2021, ureteral stents were routinely omitted. Primary outcome was ureteroenteric anastomosis complications (urine leak, UTI, abscess, and/or sepsis) within 30 and 90 days of RARC-IC. Secondary outcomes included rates of wound infections, urgent care center visits, inpatient readmissions, and ureteral stricture.

Results: Among 133 patients included, 90 patients (68%) received a ureteral stent and 43 (32%) did not. Composite ureteroenteric anastomosis complications were higher in the stented group (20% vs 9.5%, 10% difference, 95% CI, −3.4% to 24%, $P = .2$), though not statistically significant. The stented group had a significantly higher 30-day UTI rate (19% difference, 95% CI, 9.0%-29%, $P = .007$). The 30-day readmission rates were higher in the stented group, although differences did not meet statistical significance (19% vs 9.8%, 9.1% difference, 95% CI, −4.8% to 23%, $P = .3$). Limitations include lack of randomization and inability to evaluate some outcomes, including ureteral obstruction or strictures.

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Conflict of Interest Disclosures: The Authors have no conflicts of interest to disclose.

Ethics Statement: This study received Institutional Review Board approval (MSK IRB No. 16-364).

Author Contributions:

Conception and design: Goh, Bochner, Tallman, Donat, Alam, Donahue.

Data analysis and interpretation: Goh, Vickers, Vertosick, Cha, Pietzak, Tallman, Donat, Alam.

Data acquisition: Goh, Cha, Baky, Tallman, Donat, Alam.

Drafting the manuscript: Goh, Vertosick, Tallman, Alam.

Critical revision of the manuscript for scientific and factual content: Goh, Vickers, Bochner, Vertosick, Cha, Pietzak, Baky, Tallman, Donat, Alam, Donahue.

Statistical analysis: Goh, Vickers, Vertosick, Tallman, Alam, Donahue.

Supervision: Goh, Bochner, Cha, Pietzak, Baky, Tallman, Donat.

Administrative, technical, or material support: Goh.

Data Availability: The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

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Conclusions: Omission of ureteral stent placement at RARC-IC is safe and feasible. Randomized trials are warranted to determine the effects of stents on risk of postoperative complications after RARC-IC.

Key Words: bladder cancer, postoperative complications, radical cystectomy, robot-assisted surgery, urinary diversion

DESPITE recent advances in surgical technique and perioperative care, complications after radical cystectomy remain high.[1] Ureteral stents are commonly placed intraoperatively across the urinary diversion ureteroenteric anastomosis (UEA) during cystectomy to reduce UEA-related complications, including urine leak and associated intra-abdominal infections, wound infections, and ileus, along with UEA stenosis. While the introduction of robot-assisted radical cystectomy with intracorporeal ileal conduit (RARC-IC) has changed many aspects of cystectomy technique, most surgeons continue to place ureteral stents.[2]

Despite decades of routine use, there is limited and conflicting data regarding the relationship between stent use and UEA-related complications. Some early studies reported improved outcomes with stent use.[3,4] Conversely, recent data suggest that stents may lead to worse outcomes among patients undergoing radical cystectomy.[5,6] Ureteral stents are colonized rapidly with pathogenic bacteria after insertion,[7] such that their use may cause increased infectious complications, particularly at the time of stent removal.[8] Most studies have focused on open urinary diversion, and to our knowledge, there has been no evaluation of intraoperative stent use among patients undergoing RARC-IC for bladder cancer.

Based on our institutional data showing reduced perioperative complications with the omission of stents during open radical cystectomy,[5] surgeons at our center began omitting routine placement of ureteral stents during RARC-IC in August 2021. We sought to determine the effect of ureteral stents on postoperative complications for patients undergoing RARC-IC for bladder cancer.

MATERIALS AND METHODS

Cohort Description

After study approval by the Memorial Sloan Kettering Cancer Center (MSK) Institutional Review Board, we performed a retrospective review of all patients with bladder cancer who underwent robot-assisted radical cystectomy (RARC) at our institution between November 2017, when RARC-IC was first used, and June 2023. Prior to August 2021, surgeons at MSK performing RARC-IC routinely used ureteral stents for all cases; however, beginning August 2021, our surgeons began routinely omitting ureteral stents for RARC-IC based on previously published data from our institution suggesting use of ureteral stents may be associated with increased risk of postoperative complications.[5] All patients' charts were reviewed to confirm stent status and other data analyzed. Exclusion criteria included nonileal conduit urinary diversion, extracorporeal urinary diversion, congenital abnormalities of the urinary tract or other aberrant urinary tract anatomy, and end-stage renal disease or anephric patients. Only ileal conduit urinary diversions were included for consistency of stent omission and to reduce potential confounding by diversion type. All cases were performed by 1 of 2 surgeons at our institution with extensive robotic surgical experience before the initiation of the study period.

Surgical Technique and Postoperative Care

All patients underwent RARC-IC as previously described.[9,10] The UEAs were completed using a Bricker technique with running 4-0 Vicryl suture in both groups: stent use vs no stent use.[11] Indocyanine green intraoperative fluorescence imaging was routinely used for all cases to evaluate perfusion of the distal end of each ureter before performing the UEA. For cases in which a ureteral stent was used, a 7.5 French single-J stent was placed over a sensor wire at the time of the UEA. Stent removal was usually performed before discharge or within 7 to 10 days postoperatively; antibiotic prophylaxis, typically either weight-based dosing of intravenous gentamicin if inpatient or oral amoxicillin-clavulanate if outpatient, was given at the time of stent removal. In some instances, antibiotic choice was adjusted based on prior positive urine culture data or clinical factors such as penicillin allergies or diminished renal function. A closed suction drain was placed during surgery in all patients. Drain creatinine was routinely measured in all patients during the inpatient stay before surgical drain removal and compared with the serum creatinine to determine the presence of urine leak. All patients followed the same postoperative clinical pathway and had similar outpatient follow-up, regardless of whether they received ureteral stents.

Statistical Analyses

Evidence show that several patient characteristics increase the risk of postoperative complications from RARC-IC[12] and may also influence a surgeon's decision regarding stent use, thus acting as confounders. These include age, sex, BMI, smoking history, comorbidity, prior pelvic surgery, and prior abdominopelvic radiotherapy. Demographic and clinical characteristics were compared between patients with and without stents to identify the possibility of selection bias. Intraoperative variables including estimated blood loss and surgery duration were recorded in the anesthesia record and automatically abstracted.

The primary outcome of interest was any UEA-related complication, including urine leak, UTI, abdominal or pelvic abscess, and/or sepsis. We assessed this at both 30 and 90 days of RARC-IC. Secondary outcomes included

the following: (1) rates of wound infections; (2) urgent care center visits within 30 and 90 days; (3) inpatient readmission within 30 and 90 days; and (4) ureteral stricture. For these outcomes, we calculated the rate in the 2 groups (stented and unstented) along with the difference in rates and 95% CI thereof and a P value calculated by χ^2. As a sensitivity analysis, we investigated whether differences in comorbidities, operative time, and estimated blood loss between groups influenced our results. Owing to the small number of events, we used a 2-stage modeling approach. We first created a logistic regression model with stent use as the outcome and number of comorbidities, operative time, and estimated blood loss as covariates. The predicted probability from the first-stage model was then included as a covariate along with stent use in logistic regression models for our primary outcome of any UEA-related complication at 30 and 90 days. We also repeated our sensitivity analysis to incorporate year of surgery into the first stage of our 2-stage analysis.

We report the number of strictures in each group among patients with at least 6 months follow-up because population-based studies have shown most of the ureteral strictures after radical cystectomy will occur within 6 months.[13] UTI was defined as the presence of both (1) positive urine culture with more than 100,000 colony-forming units of a pathogenic organism and (2) signs and/or symptoms of a UTI (eg, fever, flank pain, or gross hematuria). Patients were evaluated for ureteral strictures in the course of routine clinical care and follow-up with cross-sectional imaging performed every 3 months for the first year, every 4 months for the second year, every 6 months for the third year, and annually thereafter according to risk profile and AUA guidelines, or for cause (eg, progressively worsening renal function, pyelonephritis, or new-onset flank pain).

All analyses were conducted using R version 4.3.0 (R Foundation for Statistical Computing, Vienna, Austria) with the gtsummary (v1.7.2) and tidyverse (v2.0.0) packages.[14,15]

RESULTS

In total, 143 patients with bladder cancer who underwent RARC-IC at MSK between November 2017 and June 2023 were identified. Ten patients were excluded because of concurrent nephrectomy leading to being anephric at the conclusion of RARC-IC (n = 3), aberrant upper tract anatomy (n = 5), presence of nephrostomy tubes at the conclusion of surgery (n = 1), and intraoperative death (n = 1), leaving 133 patients in total for analysis. Patient characteristics were typical of cystectomy patients older, male, and having a relatively high burden of comorbidities. Median follow-up for the cohort was 12 months (IQR, 6-25 months). While there were no statistically significant differences in preoperative clinical or demographic characteristics between the stented and unstented groups (Table 1), each evaluated comorbidity was more common among stented patients. Of all patients, 5 (3.8%) had a solitary kidney, of which 3 were due to prior nephrectomy and 2 were due to concurrent nephroureterectomy at the time of RARC-IC. There were no cases in our cohort in which a stent was placed due to an intraoperative concern, either before or after the practice change to perform the procedure without stents.

Table 1. *Patient and Disease Characteristics*

Characteristic	Stented (n = 90)		Unstented (n = 43)		P value
Age, median (IQR), y	73	(68-78)	75	(67-78)	.6
BMI, median (IQR), kg/m^2	28	(24-32)[a]	29	(26-33)[b]	.4
Smoking history, No. (%)					> .9
Never	29	(33)	13	(33)	
Former	49	(55)	22	(56)	
Current	11	(12)[c]	4	(10)[d]	
Solitary kidney, No. (%)	4	(4.4)	1	(2.3)	> .9
Comorbidities, No. (%)					
Chronic kidney disease	16	(18)	5	(12)	.4
Diabetes	28	(31)	10	(23)	.3
Hypertension	64	(71)	24	(56)	.08
Prior pelvic surgery	18	(20)	7	(16)	.6
Prior abdominopelvic radiation	3	(3.3)	1	(2.3)	.2
At least 1 comorbidity	76	(84)	31	(72)	.09
Neoadjuvant chemotherapy, No. (%)	37	(41)	21	(49)	.4
Pathologic T stage, No. (%)					.8
≤pT1	52	(58)	26	(60)	
pT2	10	(11)	5	(12)	
≥pT3	28	(31)	12	(28)	
Median duration of surgery (IQR), min	435	(361-552)	381	(339-451)	.024
Median estimated blood loss (IQR), mL	250	(150-350)	175	(100-250)	.009
Median hospital length of stay (IQR), d	5	(4-6)[e]	5	(4-7)[e]	.3

[a] Data missing for 12 patients.
[b] Data missing for 16 patients.
[c] Data missing for 1 patient.
[d] Data missing for 4 patients.
[e] Data missing for 5 patients.

Intraoperatively, patients with stents vs those without stents were found to have significantly longer operative time (435 minutes vs 381 minutes, respectively; P = .024) and greater estimated blood loss (250 mL vs 175 mL, respectively; P = .009). Hospital length of stay was similar between both groups (median, 5 days for both groups; P = .3). Median stent duration was 9 days (IQR, 5-11).

UEA-related complications within 30 and 90 days of RARC-IC were observed in 22 (17%) and 33 (25%) patients, respectively. The 30-day UEA-related complication rate was higher in the stented group (20% vs unstented group: 9.5%; Figure, A) and remained higher at 90 days (28% vs unstented group: 19%). Although clinically relevant, these differences were not statistically significant (30-day: 10% difference, 95% CI, −3.4% to 24%, P = .2; 90-day: 9.4% difference, 95% CI, −7.6% to 26%, P = .4; Table 2 and Supplementary Table 1, https://www.jurology.com).

Table 2 shows results for all primary and secondary outcomes within 30 days of surgery. There were 2 patients in the unstented group who did not have full 30-day follow-up for all complication outcomes, and 5 patients in the stented group and 3 in the unstented

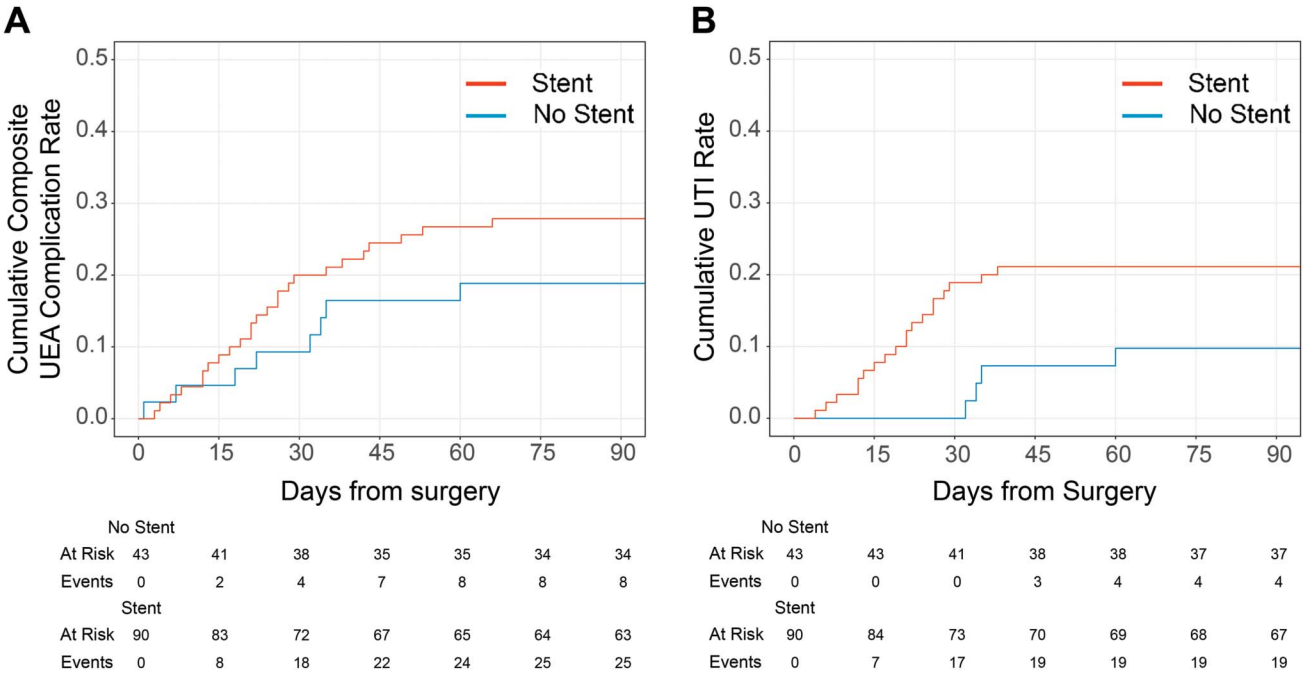

Figure. A, Cumulative incidence of composite ureteroenteric anastomosis (UEA) complications, including urine leak, UTI, abdominal or pelvic abscess, or sepsis. B, Cumulative UTI rate. Red line: stented group. Blue line: unstented group.

group did not have 90-day follow-up for all outcomes. Most end points favored the unstented group, but the only significant difference was higher probability of a UTI within 30 days of RARC-IC in the stented group (19% vs 0%, 19% difference, 95% CI, 9.0%-29%, $P = .007$; Figure, B). Notably, the 30-day inpatient readmission rate was also higher in the stented group (19% vs unstented group: 9.8%), though not statistically significant (9.1% difference, 95% CI, −4.8% to 23%, $P = .3$; Table 2), with the difference between the 2 groups decreasing at 90 days postoperatively (stented group: 31% vs unstented group: 27%; 3.9% difference, 95% CI, −15% to 22%, $P = .8$; Supplementary Table 2, https://www.jurology.com). In the primary analysis, the odds ratio (OR) was 2.37 (95% CI, 0.82-8.66) for stent use vs no stent use for 30-day ureteroenteric outcomes and 1.69 (95% CI, 0.71-4.36) for 90-day outcomes. The 2-stage modeling sensitivity analyses for ureteroenteric complications at 30 and 90 days which adjusted for number of comorbidities, operative time, and estimated blood loss showed similar results, with an OR of 2.81 (95% CI, 0.83-13.1) and 1.82 (95% CI, 0.67-5.50) for 30 and 90 days, respectively. This is not unexpected because the low number of events makes it challenging to properly account for confounding factors.

We also repeated our sensitivity analysis incorporating year of surgery into the first stage of our 2-stage analysis and found that estimates were consistent when accounting for surgery year. When incorporating surgery year, the OR for ureteroenteric complications was 2.62 (95% CI, 0.78-12.0, $P = .2$) for 30 days and 1.81 (95% CI, 0.68-5.41, $P = .3$) for 90 days.

Of the 38 patients readmitted within 90 days, 18 (47%) were due to an infection (UTI, sepsis, pelvic abscess; Supplementary Tables 2 and 3, https://www.jurology.com). Moreover, among the 23 patients who experienced a UTI, 20 (87%) were readmitted within 90 days for an infection-related diagnosis (Supplementary Table 4, https://www.jurology.com).

Table 2. *Complications Within 30 Days of Radical Cystectomy*

Outcome	Stented (n = 90)	Unstented (n = 43)	Difference (%)	95% CI	*P* value
Ureteroenteric anastomosis complication	18/90 (20%)	4/42 (9.5%)	10	−3.4% to 24%	.2
Urine leak	0/90 (0%)	2/41 (4.9%)	−4.9	−13% to 3.5%	.2
UTI	17/90 (19%)	0/41 (0%)	19	9.0%-29%	.007
Abscess	2/90 (2.2%)	2/42 (4.8%)	−2.5	−11% to 6.3%	.8
Sepsis	6/90 (6.7%)	2/41 (4.9%)	1.8	−8.4% to 12%	> .9
Wound infections	3/90 (3.3%)	0/41 (0%)	3.3	−2.2% to 8.8%	.6
Urgent care center visits	15/90 (17%)	6/42 (14%)	2.4	−12% to 17%	> .9
Inpatient readmissions	17/90 (19%)	4/41 (9.8%)	9.1	−4.8% to 23%	.3

Denominator varies because of patient lost to follow-up or death.

Of all patients, 2 were identified with urine leaks, both in the unstented group. One patient experienced a urine leak which was asymptomatic and identified on routine drain creatinine measurement before drain removal; this was managed conservatively and spontaneously resolved. The second patient was noted to have a urine leak from the posterior aspect of the ileal conduit, away from the UEAs, on contrasted CT imaging and was managed with percutaneous nephrostomy urinary diversion and abdominal drain placement, which resulted in resolution of the leak.

There were 102 patients who had at least 6 months of follow-up for evaluation of ureteral stricture development. Median follow-up in the stented and unstented groups was 20 months (IQR, 10-32) and 6 months (IQR, 4-9), respectively. There were 5 patients who developed a ureteral stricture, including 4 in the stented group (at 2, 2, 4, and 13 months) and 1 in the unstented group (at 2 months).

DISCUSSION

While our primary outcome, composite UEA-related complications, was not significantly different between patients who did or did not receive stents during RARC-IC, we identified a significantly decreased probability of early UTIs among patients without stents. Patients without stents had lower probability of urgent care center visits and inpatient readmissions compared with patients with stents, also predominantly because of a decreased rate of UTI-related complications, although these differences were not statistically significant.

UTIs are one of the most common complications after cystectomy, leading to increased inpatient readmission rates, intensity of postoperative care, and costs.[12,16] Previous studies have suggested an association between ureteral stents and increased risk of UTIs.[5,17] While placement of ureteral stents for radical cystectomy is common, evidence supporting their efficacy in reducing complications is limited. While some early pioneers of radical cystectomy and urinary diversion did not routinely use stents,[17,18] a 1981 survey of AUA members found significant variation in the rate of stent use, duration of stenting, and perceived complications because of stents.[19] Some early studies found a decreased rate of urine leaks when using ureteral stents,[20] while others found no significant difference in complications.[21] The applicability of these decades-old data to modern practice is questionable.

Contemporary data evaluating stent use at radical cystectomy and postoperative complications are limited. Multiple studies have identified no difference in complications such as urine leak and UEA stricture by stent use,[22,23] although these studies are limited by small sample sizes and outdated techniques. In a more recent study by Donat et al,[5] multivariable logistic regression showed significantly increased odds of composite urinary complications with intraoperative stent use (OR, 3.55, 95% CI, 2.93-4.31, $P < .0001$) during open radical cystectomy. In this study, we similarly identified increased UTIs among stented patients who underwent RARC-IC. Omission of ureteral stents led to a 50% and 30% reduction in composite UEA-related complications postoperatively at 30 and 90 days, respectively. Moreover, these complications were a common reason for readmission, with a nearly 50% reduction in hospital readmissions among patients without stents.

Currently, there are 2 published randomized trials of ureteral stent use for urinary diversion after cystectomy, but both had significant limitations.[4,24] In the study by Mattei et al,[4] 54 patients were randomized to undergo radical cystectomy with or without ureteral stents. The stented group demonstrated decreased pelvicalyceal dilation, decreased nausea and vomiting, and more rapid compensation of metabolic acidosis, but no differences in serum creatinine or length of hospital stay were observed. Furthermore, only 3 pyelonephritis events (stented group: 2 vs unstented group: 1) and 3 ureteral strictures (all in the stented group) were observed. The study was underpowered to perform a statistical comparison for these relevant outcomes, was performed before the introduction of the robot-assisted approach and enhanced recovery after surgery pathways, and does not report other relevant outcomes such as readmission and urine leak rates.[4] In the study by Lambertini et al,[24] 63 patients were randomized to undergo robot-assisted cystectomy with intracorporeal neobladder with or without ureteral stents. Patients without stents had shorter operative time, less blood loss, and shorter time to discharge, but no significant differences were reported in postoperative complications. This study was similarly underpowered and did not evaluate stent use among patients receiving ileal conduits, the most common urinary diversion choice in the United States.[25]

Complications after radical cystectomy are not easily predictable, and while our study demonstrated an association between stents and postoperative UTIs, the evidence is insufficient to determine causality. Bacterial colonization of both the urinary tract and ureteral stent itself occurs rapidly after insertion, providing a plausible biological mechanism[26] for increased risk of UTIs. However, other possible explanations, such as the higher rates of comorbidity among patients with stents in our cohort, are possible. Thus, we deem the evidence sufficiently strong to warrant a

randomized trial to more definitively evaluate whether stent use increases the risk for postoperative complications after radical cystectomy, particularly in the setting of limited high-quality evidence evaluating ureteral stent use.

Our study has some important limitations. We were unable to report rates of ureteral obstruction because of limitations of our retrospective data collection, although this is a relevant clinical outcome and the risk of which may also be increased by stent use. The study was underpowered to report significant differences in ureteral stricture rates, although the stricture rate overall was low in both groups. While median follow-up was shorter in the unstented group, which may decrease the number of identified strictures, most strictures occurred within 6 months of surgery.[13] It is plausible that improvements in clinical outcomes were due to general improvements over time in surgical technique and postoperative care, although multiple surgeons experienced in RARC were included and our center has a high cystectomy volume, making it less likely to have seen a large improvement in postoperative complications during the relatively short study period. This is a single-institution study from a high-volume cancer center; thus, the patient population may have greater comorbidity and frailty than other settings, increasing the risk for postoperative complications and limiting the generalizability of our findings to lower volume settings. Strengths of our study include consistency of surgical technique across the cohort and inclusion of patients undergoing RARC, for whom an evaluation of stent use during intracorporeal urinary diversion has not been reported. This balance between strengths and weaknesses in this observational study is why we recommend further evaluation in a randomized trial.

CONCLUSIONS

Omission of ureteral stent placement at RARC-IC is safe and feasible. In our study, we observed a significantly lower rate of UTIs at 30 days among patients who did not receive ureteral stents compared with those receiving stents at the time of RARC-IC. These data have motivated a randomized trial at our institution to determine the effects of stent use on the risk of postoperative complications after radical cystectomy.

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EDITORIAL COMMENTS

The paper authored by Tallman et al[1] commendably brings attention to the well-established practice of ureteral stent placement through the ureteroenteric anastomoses (UEAs) during robot-assisted radical cystectomy with intracorporeal ileal conduit (RARC-IC) formation while questioning the potential of higher complications from this practice pattern. The increasing adoption of RARC-IC highlights significant advances in minimally invasive surgical techniques; however, complications and readmissions remain common for this high-risk surgical population despite ongoing advances in minimally invasive surgical techniques.[2] The authors used prior data from their high-volume center to transition toward a stent-free approach and now present a retrospective comparison of these 2 practice patterns.[3]

While statistical significance is not reached in their primary end point of evaluating complications between the 2 cohorts, there seems to be a demonstrable benefit in decreasing complications in the stent-free cohort. The stent-free cohort experienced reduced incidence of UTIs and hospital readmissions compared with the stented cohort. Furthermore, the subgroup analysis of patients who experienced a UTI had an 87% readmission rate within 90 days. Although often overlooked as a potentially less serious complication, postoperative UTIs in this highly comorbid, high-risk patient population represented a significant driver of readmissions.[1]

UEA strictures can be a severe complication after radical cystectomy, and many patients become stent or nephrostomy tube dependent. Canonically, ureteral stents are placed across the anastomosis to prevent strictures during the healing phase; however, a 2024 retrospective review notes a significant association between stent placement and development of strictures at the UEA during RARC-IC.[4] Tallman et al[1] reported more stented patients developed UEA strictures than those who were left unstented, but this may be confounded by a longer median follow-up for the stented vs unstented patient cohort. The authors provide a robust argument for initiating a randomized trial to further investigate these outcomes and other potential complications after RARC-IC.

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Radical cystectomy remains a highly morbid procedure. Even with the use of the robotic platform, no significant decline in complications has been noted over time in the largest of the series.[1] To explore this further, Tallman et al[2] analyzed if intraoperative use of stents in robotic cystectomy and intracorporeal ileal conduit affects the infective complications, which is the most common postoperative complication. The study reported, on a small number of patients, that postoperative infective complications are reduced with an unstented anastomosis; however, the same group experienced an approximately 5% leak rate compared with zero in the stented group. Urine leaks (big or small) remain a nightmare for the surgeon, not only from a management perspective but also from its long-term consequences, for example, strictures. Omission of stents defies the very basic principle of anastomosis; however, scientific evidence can challenge such and change the practices. Mahmood et al[3] found no differences in infective complications in a much larger cohort of similar patients, from a single-institution single-surgeon series. Interestingly, they noted a decline in anastomotic stricture rates over time in unstented patients, with change of practice. Limited washout of the conduit during intracorporeal diversion may contribute to upper tract seeding with bacteria, in stented patients. Newer methods are needed to ensure adequate cleaning of the conduit and prevent seeding during intracorporeal urinary diversions. The authors report that a randomized controlled trial is already underway and will have a more stringent protocol to eliminate some bias, which may be masking the reported outcomes. Until then, stenting or no stenting is purely the surgeon's choice, because "damned if you do and damned if you don't."

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This study evaluates whether ureteral stent omission in patients undergoing robotic radical cystectomy and intracorporal ileal conduit urinary diversion reduces postoperative complications.[1] Using a clinically relevant composite of outcomes (urinary leak, UTI, abscess formation, and/or sepsis), the authors found that omission of ureteral stents was not associated with increased ureteroenteric anastomosis complications and, in fact, was associated with lower rates of UTIs. Therefore, they suggest that omitting ureteral stents could improve outcomes—a finding that challenges conventional practice.

One important consideration is the duration of stent placement in this study, which was 9 days (IQR, 5-11). There are some data to suggest that early vs late stent removal plays a role in reduction of complications, such as UTI.[2] It is unknown from the current study whether simply a shorter stent duration, say routine removal on postoperative day 3 or before discharge, would result in a similar decrease in UTI as omission of ureteral stenting altogether. Another consideration is the duration of follow-up to evaluate for ureteroenteric anastomosis strictures. While the median time to stricture is 6 months in a large robotic cystectomy cohort with median follow-up of 4 years, almost a third still present beyond 1 year.[3] Therefore, with a median follow-up of 1 year in the current study, longer follow-up is needed to more fully evaluate the association between ureteral stenting and stricture formation.

Nevertheless, the findings from this study suggest that omission of stents during robotic-assisted radical cystectomy may reduce UTI rates without compromising safety. We commend the authors for this work and would support a clinical trial to further evaluate this concept.

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REPLY BY AUTHORS

We appreciate the editorial commentaries[1-3] to our study and would like to address several salient points. We agree with Moon et al[1] that UTI, and resultant hospital readmission, is frustratingly common and a significant source of morbidity after radical cystectomy. Our data[4] add to the growing body of literature supporting omission of ureteral stents to reduce postoperative complications.

Drs Pingle and Lenis[3] posit that the risk of UTI associated with ureteral stents may be related to duration in place and whether UTIs could be significantly reduced by removing stents 3 days after surgery rather than omitting altogether. First, one must pose the question what is the presumed benefit of stenting: Is it to reduce the risk of urine leak or ureteral stricture? Our study and others have indicated no clear difference in these outcomes with routine omission of ureteral stents.[5] If the suggestion is that shorter stent duration is favored, then it follows that avoiding placement completely could be advantageous as we have shown here. A concern was also raised that follow-up may be too short to discern a difference in ureteral stricture rates between stented and unstented patients. While ureteroenteric anastomotic stricture was not a primary end point, it is acknowledged that this is a time-dependent phenomenon with delayed strictures possibly identified with longer follow-up. We have previously shown at a population level and in our own data that nearly all strictures after radical cystectomy are detected within the first 9 months.[6,7] With a median follow-up of 12 months in the current cohort, we do not anticipate that further follow-up would substantially change our findings.

There were 2 patients in the unstented group vs 0 in the stented group with a detected urine leak. This difference was not statistically significant and previously published data have shown no difference in rate of urine leaks between stented and unstented patients,[8] commensurate with our findings. Of the 2 leaks which were identified in our study, 1 leak was incidentally discovered on drain creatinine testing requiring no intervention. The second was from the end of the ileal conduit rather than the ureteroenteric anastomosis, a complication which would not have been prevented by stent use.

We acknowledge the potential for selection bias and limits of generalizability in this retrospective study and are actively accruing to our randomized clinical trial of modifications to radical cystectomy (NCT06703476), which will provide much needed prospective data to better define the benefits and risks of ureteral stent use for patients undergoing radical cystectomy. Until then, we hope that this study encourages readers to carefully consider surgical dogma in their practice that might warrant closer, evidence-based inspection.

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