Original Article

Short-term and long-term outcomes of intracorporeal "V-O manner" ureter-ileal anastomosis in robotic-assisted laparoscopic radical cystectomy with urinary diversion: a retrospective cohort study

Shuang Huang[#], Hongkai Yu[#], Guangfu Chen, Shengkun Sun

Department of Urology, the Third Medical Center of Chinese PLA General Hospital, Beijing, China

Contributions: (I) Conception and design: G Chen, S Sun; (II) Administrative support: S Sun; (III) Provision of study materials or patients: S Sun; (IV) Collection and assembly of data: S Huang; (V) Data analysis and interpretation: H Yu; (VI) Manuscript writing: All authors; (VII) Final approval of manuscript: All authors.

[#]These authors contributed equally to this article.

Correspondence to: Guangfu Chen, MD, PhD; Shengkun Sun, MD, PhD. Department of Urology, the Third Medical Center of Chinese PLA General Hospital, 69 Yongding Road, Beijing 100039, China. Email: cgf301@foxmail.com; sunshengkun@301hospital.com.cn.

Background: There are several ways to perform ureter-ileal anastomosis (UIA), but there is currently no universally recognized standard approach. Unfortunately, these approaches may increase the risk of urine leakage or stricture. The aim of this study is we to describe an intracorporeal "V-O manner" UIA in robotic-assisted laparoscopic radical cystectomy (RARC) with urinary diversion, and to evaluate the short- and long-term patient outcomes.

Methods: Between May 2012 and September 2018, 28 patients of bladder urothelial carcinomas (clinical stage T2–4aN0M0) who underwent RARC with intracorporeal urinary diversion (IUD) were included. All the patients received regular postoperative follow-up for 6–76 months. During the procedure of intracorporeal diversion, a "V-O manner" of UIA imitating the pyeloplasty in ureteropelvic junction (UPJ) obstruction was used to perform a mucosa-to-mucosa anastomosis. We observed short-term outcomes (operative time, blood loss, transfusion rate, length of hospital stay, 90-day mortality, and surgical complications) as well as long-term outcomes including kidney function and urinary diversion.

Results: Intracorporeal orthotopic ileal neobladder (OIN) was performed in 23 patients whereas intracorporeal ileal conduit (ICD) was performed in 5 patients. The "V-O manner" UIA was applied in all the cases. The average duration of bilateral UIA was about 40 min. The median pelvic lymph node yield was 26 (range, 14–43). All patients ambulated on postoperative 2 to 3 days, and bowel function recovered on postoperative day 3 to 4. The median length of hospital stay was 14 days [interquartile range (IQR), 9–18 days]. A total of 9 patients experienced complications. Postoperative images confirmed satisfying drainage of bilateral ureters without urine leakage or stricture. During the follow up (median 29 months), all participants showed normal renal functions with satisfactory urinary diversion without hydronephrosis.

Conclusions: We describe a feasible intracorporeal "V-O manner" UIA in RARC with urinary diversion, which provides improved outcomes in avoiding urine leakage or stricture and preventing the occurrence of hydronephrosis. Larger randomized controlled trials and longer duration of follow-up needs to be required in the future.

Keywords: Robotic; cystectomy; intracorporeal urinary diversion (IUD); V-O manner; ureter-ileal anastomosis (UIA)

Submitted Feb 17, 2023. Accepted for publication May 11, 2023. Published online May 23, 2023.
doi: 10.21037/tau-23-205
View this article at: https://dx.doi.org/10.21037/tau-23-205

Introduction

Radical cystectomy with pelvic lymph node dissection is the standard surgical procedure for the treatment of muscle invasive or high-risk non-muscle-invasive bladder cancer (Bca) (1,2). With the development of the minimally invasive technique, laparoscopic radical cystectomy with intracorporeal urinary diversion (IUD) has become the most optimized choice (3-5). However, IUD is skill technically demanding and not performed by most surgeons. The main strategies of urinary diversion are ileum conduits diversion, orthotopic ileal neobladder, sigmoid colon or rectal bladder, and others. Until now, urinary diversion has been routinely performed *in vitro* through a small subumbilical incision (6).

After introduction and popularization of the Da Vinci system, the clinical feasibility of robotic-assisted laparoscopic radical cystectomy (RARC) and IUD became more widely recognized (7,8). As compared to open and laparoscopic cystectomy with urinary diversion, RARC and urinary diversion offers the advantages of less operative trauma, clear surgical field exposure, less intraoperative bleeding, faster postoperative recovery, and better ergonomics (6).

Ureter-ileal anastomosis (UIA) remains one of the most difficult components of IUD. Suboptimal anastomosis may lead to urine leakage or stricture. There are several approaches for UIA, but currently there is no standard approach. However, the risk of urine leakage or stricture for these approaches is above 10% (9,10). Moreover, the incidence of hydronephrosis varies and can cause kidney damage, affecting patients' quality of life. The V-O anastomosis technique is now being adopted by robotic cystectomists. In this study, we aimed to describe an intracorporeal "V-O manner" UIA in RARC with urinary diversion and to evaluate the short- and long-term patient outcomes. We described a "V-O manner" UIA imitating pyeloplasty in ureteropelvic junction (UPJ) obstruction to overcome the challenges both in RARC with intracorporeal ileum conduits diversion (ICD) and orthotopic ileal neobladder (OIN). The highlights of our study are as follows: (I) it was previously used in open surgery, but we apply it entirely under laparoscopy; (II) we treat each V-O anastomosis as a UPJO procedure, with interrupted suturing for the anterior wall and continuous or interrupted suturing for the posterior wall, preventing complications from anastomotic stricture; (III) this anastomosis method is based on the Bricker method and seems superior to the Wallace method. If a ureteral stump develops a tumor again, it can be easily removed and treated separately. We present this article in accordance with the STROBE reporting checklist (available at https://tau.amegroups.com/article/view/10.21037/tau-23-205/rc).

Highlight box

Key findings

- Intracorporeal "V-O manner" ureter-ileal anastomosis (UIA) in robotic-assisted laparoscopic radical cystectomy with urinary diversion is effective and efficient.

What is known and what is new?

- UIA was traditionally performed with ureteral split-nipple technique or tunneled anastomosis.
- "V-O manner" anastomosis is more time-efficient and effective compared to the conventional method.

What is the implication, and what should change now?

- "V-O manner" UIA overcomes the challenges of intracorporeal ureteroileal anastomoses with safe outcomes. This technique should be widely applied in clinical practice.

Methods

Patients

The present study is a retrospective cohort study. We retrospectively analyzed 28 patients who underwent RARC with IUD for bladder cancer in the Third Medical Center of Chinese PLA General Hospital from May 2012 to September 2018. The inclusion criteria were as follows: (I) muscle-invasive BCa T2–4a, N0–Nx, M0; (II) high-risk non-muscle-invasive BCa (T1G3); (III) frequently recurrent non-muscle-invasive BCa; (IV) Bacillus Calmette-Guérin (BCG)-resistant BCa. The exclusion criteria included previous pelvic radiation, clinical stage >T4a, distant metastasis, or medically unfit patients. Clinical stage was analyzed according to the international tumor-node-metastasis (TNM) classification [2017].

Perioperative data including median operative time, estimated blood loss, blood transfusion, number of lymph nodes removed, conversion to open surgery, and perioperative complications were assessed. Preoperative intravenous pyelogram (IVP) or computed tomography urography (CTU) examination was performed to assess the upper urinary tract tumor. All patients underwent preoperative computed tomography (CT) or magnetic resonance imaging (MRI) to assess tumor, lymph node status, and distant metastasis. The study was conducted in

accordance with the Declaration of Helsinki (as revised in 2013). This study was approved by the Ethics Committee of the Third Medical Center of Chinese PLA General Hospital, Beijing, China (No. C2017-037-01). All patients signed written consent for permission to access their data for this study. All procedures were performed by surgeons with advanced robotic-assisted laparoscopic skills.

Surgical technique

The operation was performed under general anesthesia with patient in a supine, steep Trendelenburg position. A total of 5 trocars were inserted. A 12 mm camera trocar was inserted 2 fingers breadth above the umbilicus. Trocars for the first and second arm were inserted 8 cm bilateral to the umbilicus. The trocar for third arm was inserted 8 cm lateral to the port for the first arm. A 12 mm assistant trocar was inserted along the left anterior axillary line at the level of umbilicus. In some cases, an additional 12 mm port was inserted at the anti-Maxwell point.

RARC was performed, followed by either intracorporeal OIN or intracorporeal ileal conduit. UIA was performed in the "V-O manner" imitating our experience of pyeloplasty in UPJ obstruction (11,12). The ureter was spatulated into a V-shape appearance. Then, an O-shaped small incision was made near the end of the ileal afferent limb. The apex of the spatulated ureter was sutured to the ileal incision using a 4-0 Vicryl suture, the posterior UIA was completed in a continuous manner; the suture was locked in every 2 stitches. Anterior anastomosis was completed in an interrupted manner. Mucosa-to-mucosa anastomosis was performed; single-J stents were inserted (*Figure 1*).

Follow-up

Patients was followed up every 3 months during the first year, every 6 months during the second year, and annually thereafter postoperatively. Physical examination, blood investigations including full blood count, and renal profile were performed during follow up. Chest X-ray, abdominal ultrasonography, and a CT or MRI scan were performed at postoperative 3 months, 6 months, and annually. Intravenous urography or renal ultrasonography was performed at 1, 3, and 6 months postoperatively to ensure patency of the anastomosis, and to rule out stricture or leakage. Additional imaging was performed as clinically indicated. Perioperative and postoperative outcomes were reported.

Statistical analysis

The analysis included descriptive statistics such as mean, median, range and percentage. Continuous variables with normal distribution were presented as mean with standard deviation (SD). Continuous variables with non-normal distribution were presented as median with interquartile range (IQR). Categorical variables were expressed as percentages. All statistical analyses were performed using SPSS statistical software package (version 25.0; IBM Corp., Armonk, NY, USA).

Results

Patient characteristics are listed in *Table 1*. There were 23 males and 5 females with a mean age of 56.32 years and a mean body mass index (BMI) of 25.08 kg/m^2. There was no conversion to open surgery and no perioperative mortalities. Totals of 22 males and 1 female were performed with intracorporeal orthotopic ileal neobladder; 1 male and 4 females were performed with intracorporeal ileal conduit. The mean operating time was 546 min (OIN) and 313 min (ICD). The median blood loss was 300 mL (IQR, 200–400 mL), with a transfusion rate of 17.86% (5 of 28). The median pelvic lymph node yield was 26 (range, 14–43). The average duration of bilateral UIA was about 40 min. All patients ambulated on postoperative 2 to 3 days, and bowel function recovered on either postoperative day 3 or 4. The median length of hospital stay was 14 days (IQR, 9–18 days). One month after operation, intravenous urography and renal ultrasonography were arranged to confirm patency of the ureteral ileal anastomosis. During the follow up of 6–76 months (median 29 months), all of the patients maintained normal renal functions and satisfactory urinary diversion without severe hydronephrosis (*Table 2*).

The complication rate in this cohort was 32.14% according to Clavien–Dindo classification (13). The details of complications in our robotic series are listed in *Tables 2,3*: 9 patients (32.14%) developed complications within 90 days after surgery; 2 patients presented fever about 1 month after operation and 2 patients developed febrile urinary tract infections; they were treated with parenteral antibiotics; 1 patient presented with lymphorrhagia requiring prolonged drainage; 2 patients presented with prolonged ileus requiring total parenteral nutrition. Mild hydronephrosis was found in 2 patients (1 on the left side and 1 on the right side), further assessment showed no progression of the hydronephrosis; single-J stent dislodgment occurred in 1

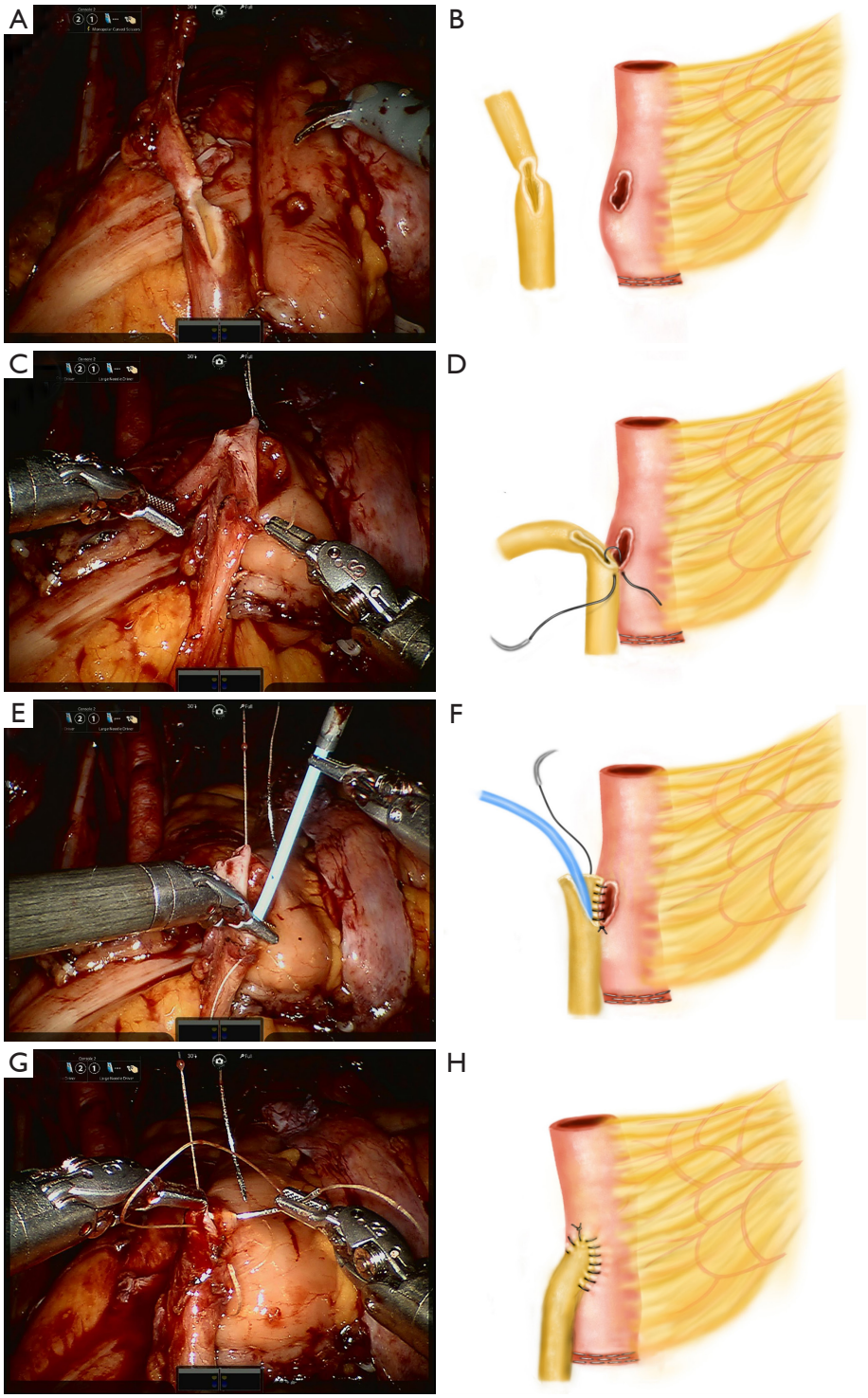

Figure 1 Mucosa-to-mucosa anastomosis and single-J stents insertion. (A,B) The extreme of the ureter was split longitudinally into a V-shape. An O-shaped small incision was made near to the end of afferent limb; (C,D) the lower apex of the O-shape incision was sutured to the apex of the spatulated ureter using 4-0 Vicryl suture, the posterior UIA was completed with a running suture, of which every two sutures were coupled with a lock-stitch suture; (E,F) a single-J stents were inserted; (G,H) the remaining anterior anastomosis was closed with an interrupted suture or running suture to complete a mucosa-to-mucosa anastomosis. UIA, ureter-ileal anastomosis.

Table 1 Baseline patient characteristics (n=28)

Characteristic	Result
Age at surgery, years, mean ± SD	56.32±10.19
Sex (male/female)	23/5
BMI, kg/m^2, mean ± SD	25.08±3.03
Baseline serum creatinine, mg/dL, mean ± SD	77.31±12.76
Baseline estimated GFR, mL/min, mean ± SD	109.52±24.05
ASA, mean ± SD	I–II

SD, standard deviation; BMI, body mass index; GFR, glomerular filtration rate; ASA, American Society of Anesthesiologist.

Table 2 Perioperative outcomes (n=28)

Outcome	Result
Operative time, min, mean ± SD	
OIN	546±177.99
ICD	313±38.99
Estimated blood loss, mL, median [IQR]	300 [200–400]
Transfusion rate, n (%)	5 (17.86)
No. of lymph nodes removed, median [range]	26 [14–43]
Conversion to open surgery, n	0
Length of hospital stay, d, median [IQR]	14 [9–18]
Complication, n (%)	9 (32.14)
Minor complication	7
Major complication	2
90-day readmission rate, n (%)	5 (17.86)
90-day mortality, n (%)	0
Median follow-up periods, months [range]	29 [6–76]

OIN, orthotopic ileal neobladder; ICD, ileum conduits diversion; IQR, interquartile range; SD, standard deviation.

patient on postoperative day 1, but he was not complicated with urine leakage or stricture; 5 patients were readmitted within 90 days after operation due to fever, urinary tract infections, or ileus.

No urine leakage or stricture were observed for patients who underwent "V-O manner" UIA in postoperative imaging. No patient was complicated with stoma hernia. Creatinine level for all participants remained stable during the follow up period for at least 6 months (*Figure 2*).

Discussion

Globally, nearly 43 million people are diagnosed with bladder cancer every year, contributing to >165,000 cancer-related deaths (14). Among bladder malignancies, about 90% of cases are diagnosed as bladder urothelial carcinoma. Among all urinary tumors, bladder urothelial carcinoma has the second highest morbidity and mortality, due to the high recurrence and metastasis rates, with a 5-year survival rate of 75% (15). At present, open radical cystectomy (ORC) is still the standard surgical treatment for muscle-invasive bladder cancer. With the wide application of the Da Vinci surgical operating system, RARC has gradually become one of the alternative options to radical cystectomy. Series of emerging data have supported the oncologic safety of RARC as compared to ORC (16). RARC will probably be widely performed worldwide in the near future. The Da Vinci surgical operating system increases the feasibility and reproducibility of IUD with similar perioperative outcomes as extracorporeal urinary diversion (EUD); meanwhile, it provides additional, benefits of minimal invasive surgery (6). It has not been widely adopted and its performance has been limited to high volume centers due to its technical challenges in intracorporeal ureteroenteric anastomosis and neobladder formation (17,18).

Table 3 Complications categories

Grade	Complication	OIN (n=23)	ICD (n=5)	Management
I	Fever	2	0	Antibiotics
II	Urinary tract infection	2	0	Antibiotics
II	Lymphorrhagia	1	0	Drainage
II	Prolonged ileus	2	0	Conservative
IIIa	Mild hydronephrosis	2	0	Conservative

OIN, orthotopic ileal neobladder; ICD, ileum conduits diversion.

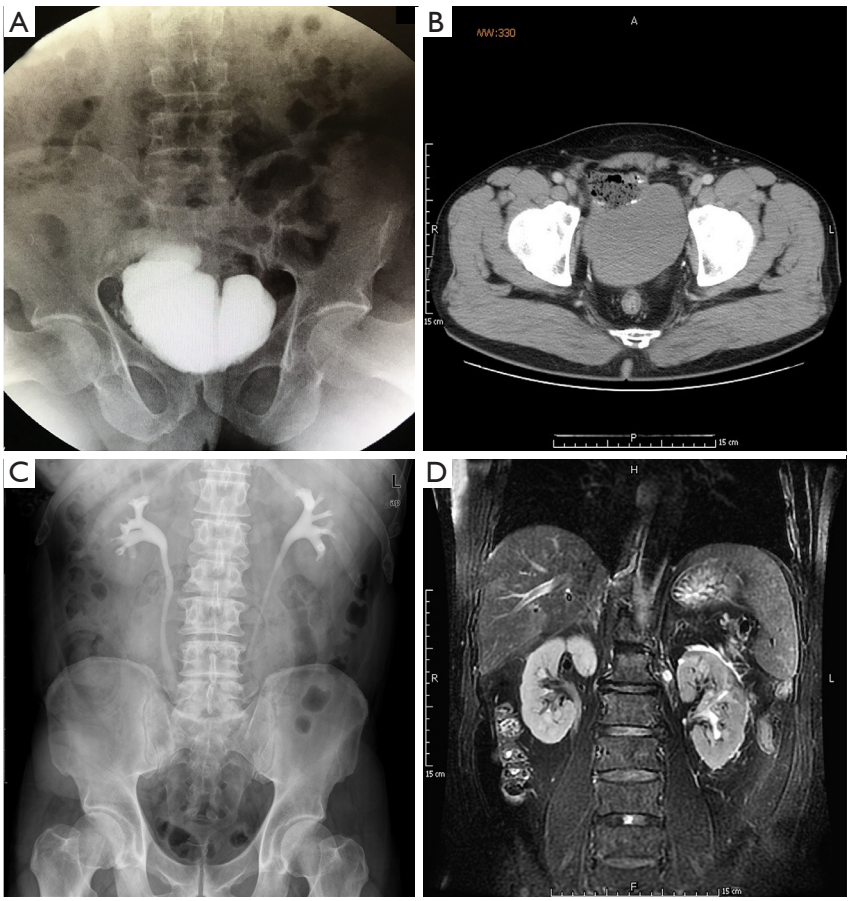

Figure 2 No patient was complicated with stoma hernia. (A) Cystography detected no obvious reflux; (B) a good shape neobladder was confirmed by CT scan; (C) intravenous urography of a patient with ileal conduit diversion; (D) MRI of a patient with orthotopic ileal neobladder. CT, computed tomography; MRI, magnetic resonance imaging.

For both EUD and IUD, the existing strategy is direct UIA with anti-reflux technique. Anti-reflux techniques include serous-lined extramural tunnel (SLET), LeDuc, Goodwin, Leadbetter, and Padua, among others (9,19). The issues of direct versus anti-reflux techniques in UIA have been debated for a long time. The contradiction between stricture prevention and anti-reflux is always the issue (20). In our opinion, an anti-reflux technique is not necessary in reconstruction of de-tubular low-pressure urinary diversion. Renal impairment after urinary diversion is influenced by many factors. The main concerns of anti-reflux surgery are incremental in complexity of the operation and risk of UIA stricture. The incidence of severe upper urinary tract dilatation due to ureteral anastomotic stenosis in patients who receive papillary valves anti-reflux treatment is relatively high. In a prospective randomized controlled study with 70 cases of ileal neobladder diversion, Studer *et al.* reported that the incidence of severe upper urinary tract dilatation due to ureteral anastomotic stenosis was 13.5% in the patients with nipple regurgitation, and 3% in the end-to-side anastomosis group (21). In fact, reflux is extremely weak under normal voiding conditions, as long as the neobladder is not overly filled due to the kinetic anti-reflux system of the peristaltic output segment. Elevation of abdominal pressure that is required to induce urination in neobladder will be distributed to the upper tract as well, thus there is no pressure difference between the neobladder and upper tract to cause reflux. Mild urinary reflux would not lead to obvious hydronephrosis. Thus, in most cases, hydronephrosis after urinary tract diversion is caused by anastomotic stenosis rather than reflux.

The technique of ureteropelvic anastomosis in retroperitoneal laparoscopic dismembered pyeloplasty has been reported and shown to be safe and effective by our

group (11,12). In this series of patients, we introduced "V-O manner" UIA that imitated the pyeloplasty in UPJ obstruction to form a mucosa-to-mucosa anastomosis. The posterior anastomosis was performed in a continuous manner with suture locking every 2 stitches. Apart from saving operating time, this suturing technique can prevent anastomotic stenosis due to excessive suture tension and anastomotic leakage due to loosening of sutures. The anterior ureteropelvic anastomosis was closed via interrupted suture or in a continuous manner.

In this study, the average duration of bilateral UIA was 40 min, supporting the efficiency of intracorporeal UIA. The "V-O manner" anastomosis that was sutured continuously was time-saving and efficient as compared to the traditional method.

No urine leakage, stricture, or reflux were observed in UIA with "V-O manner". The creatinine level for all participants remained stable for at least 6 months during the follow up period. These results showed that the "V-O manner" UIA was effective with good outcomes.

New understandings of urinary reflux in urinary diversion, especially in OIN and its effect on kidney function have been gleaned from clinical studies. Many complications of urinary diversion are able to be managed effectively (22,23). In the past decade, RARC and an appropriate form of urinary diversion had become the preferred treatment of muscle invasive and high-risk non-muscle-invasive BCa. In some major medical centers, OIN had become the preferred method of urinary diversion and has gradually become the standard treatment. With accumulation of experience, many centers have ventured into intracorporeal reconstruction after RARC. Along the way, multiple efforts have been made to solve the technical problems of intracorporeal reconstruction.

There were several limitations in this study. First, this paper only reported our initial research experience of intracorporeal "V-O Manner" UIA in RARC with urinary diversion, and some surgical details need to be further optimized. Second, this was a single center study with small sample size; therefore, further larger, multicenter studies with longer periods of follow up are required to validate our results.

Conclusions

"V-O manner" UIA is effective and efficient to overcome the challenges of intracorporeal ureteroileal anastomoses with safe outcomes. Pertinent use of this technique may play an important role to increase the popularity of RARC with IUD. High quality research with a sufficient period of follow up is required to validate the long-term outcomes of this technique.

Acknowledgments

Funding: None.

Footnote

Reporting Checklist: The authors have completed the STROBE reporting checklist. Available at https://tau.amegroups.com/article/view/10.21037/tau-23-205/rc

Data Sharing Statement: Available at https://tau.amegroups.com/article/view/10.21037/tau-23-205/dss

Peer Review File: Available at https://tau.amegroups.com/article/view/10.21037/tau-23-205/prf

Conflicts of Interest: All authors have completed the ICMJE uniform disclosure form (available at https://tau.amegroups.com/article/view/10.21037/tau-23-205/coif). The authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. This study was conducted in accordance with the Declaration of Helsinki (as revised in 2013). The protocol for this study was approved by the Ethics Committee of the Third Medical Center of Chinese PLA General Hospital, Beijing, China (No. C2017-037-01). All patients signed written consent for permission to access their data for this study.

References

1. Babjuk M, Böhle A, Burger M, et al. EAU Guidelines

on Non-Muscle-invasive Urothelial Carcinoma of the Bladder: Update 2016. Eur Urol 2017;71:447-61.
2. Alfred Witjes J, Lebret T, Compérat EM, et al. Updated 2016 EAU Guidelines on Muscle-invasive and Metastatic Bladder Cancer. Eur Urol 2017;71:462-75.
3. Shao P, Li P, Ju X, et al. Laparoscopic radical cystectomy with intracorporeal orthotopic ileal neobladder: technique and clinical outcomes. Urology 2015;85:368-73.
4. Gupta NP, Gill IS, Fergany A, et al. Laparoscopic radical cystectomy with intracorporeal ileal conduit diversion: five cases with a 2-year follow-up. BJU Int 2002;90:391-6.
5. Smith JA Jr. Laparoscopic radical cystectomy with urinary diversion: completely intracorporeal technique. J Urol 2003;169:1607-8.
6. Ahmed K, Khan SA, Hayn MH, et al. Analysis of intracorporeal compared with extracorporeal urinary diversion after robot-assisted radical cystectomy: results from the International Robotic Cystectomy Consortium. Eur Urol 2014;65:340-7.
7. Aron M, Gill IS. Robotic radical cystectomy: so far, so good--what next? Eur Urol 2015;67:361-2.
8. Desai MM, Gill IS, de Castro Abreu AL, et al. Robotic intracorporeal orthotopic neobladder during radical cystectomy in 132 patients. J Urol 2014;192:1734-40.
9. Pantuck AJ, Han KR, Perrotti M, et al. Ureteroenteric anastomosis in continent urinary diversion: long-term results and complications of direct versus nonrefluxing techniques. J Urol 2000;163:450-5.
10. Olson L, Satherley H, Cleaveland P, et al. Retrograde Endourological Management of Upper Urinary Tract Abnormalities in Patients with Ileal Conduit Urinary Diversion: A Dual-Center Experience. J Endourol 2017;31:841-6.
11. Zhang X, Li HZ, Ma X, et al. Retrospective comparison of retroperitoneal laparoscopic versus open dismembered pyeloplasty for ureteropelvic junction obstruction. J Urol 2006;176:1077-80.
12. Zhang X, Li HZ, Wang SG, et al. Retroperitoneal laparoscopic dismembered pyeloplasty: experience with 50 cases. Urology 2005;66:514-7.
13. Dindo D, Demartines N, Clavien PA. Classification of surgical complications: a new proposal with evaluation in a cohort of 6336 patients and results of a survey. Ann Surg 2004;240:205-13.
14. Xu N, Qu GY, Wu YP, et al. Upregulation of Arp2 expression is associated with the prognosis and prediction of lymph node metastasis in bladder urothelial carcinoma. Cancer Manag Res 2018;10:503-11.
15. Dong F, Shen Y, Gao F, et al. Prognostic value of site-specific metastases and therapeutic roles of surgery for patients with metastatic bladder cancer: a population-based study. Cancer Manag Res 2017;9:611-26.
16. Bochner BH, Dalbagni G, Sjoberg DD, et al. Comparing Open Radical Cystectomy and Robot-assisted Laparoscopic Radical Cystectomy: A Randomized Clinical Trial. Eur Urol 2015;67:1042-50.
17. Smith AB, Raynor M, Amling CL, et al. Multi-institutional analysis of robotic radical cystectomy for bladder cancer: perioperative outcomes and complications in 227 patients. J Laparoendosc Adv Surg Tech A 2012;22:17-21.
18. Almassi N, Zargar H, Ganesan V, et al. Management of Challenging Urethro-ileal Anastomosis During Robotic Assisted Radical Cystectomy with Intracorporeal Neobladder Formation. Eur Urol 2016;69:704-9.
19. Song C, Kang T, Hong JH, et al. Changes in the upper urinary tract after radical cystectomy and urinary diversion: a comparison of antirefluxing and refluxing orthotopic bladder substitutes and the ileal conduit. J Urol 2006;175:185-9; discussion 189.
20. Shaaban AA, Abdel-Latif M, Mosbah A, et al. A randomized study comparing an antireflux system with a direct ureteric anastomosis in patients with orthotopic ileal neobladders. BJU Int 2006;97:1057-62.
21. Studer UE, Danuser H, Thalmann GN, et al. Antireflux nipples or afferent tubular segments in 70 patients with ileal low pressure bladder substitutes: long-term results of a prospective randomized trial. J Urol 1996;156:1913-7.
22. Tal R, Sivan B, Kedar D, et al. Management of benign ureteral strictures following radical cystectomy and urinary diversion for bladder cancer. J Urol 2007;178:538-42.
23. Dangle PP, Abaza R. Robot-assisted repair of ureteroileal anastomosis strictures: initial cases and literature review. J Endourol 2012;26:372-6.

(English Language Editor: J. Jones)

Cite this article as: Huang S, Yu H, Chen G, Sun S. Short-term and long-term outcomes of intracorporeal "V-O manner" ureter-ileal anastomosis in robotic-assisted laparoscopic radical cystectomy with urinary diversion: a retrospective cohort study. Transl Androl Urol 2023;12(5):736-743. doi: 10.21037/tau-23-205

