International Surgery Journal
Agarwal S et al. Int Surg J. 2018 Sep;5(9):3038-3042
http://www.ijsurgery.com
pISSN 2349-3305 | eISSN 2349-2902

DOI: http://dx.doi.org/10.18203/2349-2902.isj20183719

Original Research Article

Indications and outcome of patients undergoing cutaneous ureterostomy as a mode of urinary diversion after radical cystectomy: an experience from a tertiary care center

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Received: 11 July 2018
Accepted: 06 August 2018

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ABSTRACT

Background: Radical cystectomy is associated with high morbidity, especially in elderly patients. Most of the associated complications are related to the urinary diversion. Cutaneous ureterostomy (CU) is usually an uncommon form of urinary diversion and is avoided because of the frequent complication of stomal stenosis.
Methods: In this study the authors retrospectively analyzed 84 patients who underwent radical cystectomy. 17 Patients who underwent single stoma CU were included in the study who required lifelong monthly stent changes. Varied indication and outcome of these patients were analyzed.
Results: Patients in which CU was used as a mode of urinary diversion had less blood loss, less operative time and discharged without ICU stay.
Conclusions: It seems that single stoma CU is a viable option in elderly, high risk patients and in post radiotherapy patients who require radical cystectomy. Although the patient requires lifelong stent changes, postoperative complications are reduced.

Keywords: Cutaneous ureterostomy, Post-radiotherapy, Radical cystectomy

INTRODUCTION

Bladder cancer is the fourth most common cause of death in people over 80 years old. The bladder cancer is twice more common in patients over 85 years old than in patients between 65 and 69 years old.[1] Although most of the patients have superficial cancer, in 20-40% of patients the disease is diagnosed at an advanced stage with invasive cancer.[2] Radical cystectomy is the standard treatment for locally advanced bladder cancer. Despite continuous advances in surgical techniques, anesthesia and postoperative care, radical cystectomy still shows high rates of morbidity and mortality. Most of morbidity and mortality are related to the method of urinary diversion used.[3] It is desirable to preserve or restitute the normal function, although not always essential after any surgical procedure. Reconstruction of the lower urinary tract is required after radical cystectomy (RC). Since 1960's there is continuous effort to obviate the use of bowel or use of alternative synthetic and biologic materials to reconstruct the bladder. Despite the progress in technology and knowledge, the results are still quite discouraging. Since there is a rise in life expectancy with an increase in both the elderly and bladder cancer population, management of these patients represent an important challenge for present and future urology.

Currently, urinary reconstruction is divided into two general categories: incontinent diversions, such as the ileal conduit, and continent diversions, including both cutaneous reservoirs and orthotopic neobladder connected to the urethra. Ureterosigmoidostomy was

initially widely used surgical technique for urinary diversion, using anal sphincter for continence. However, its usefulness as a urinary diversion became limited due to associated complications like the deterioration of renal function, metabolic complications, and the increased risk for secondary malignancies.[4-7] Subsequent surgical advances with neobladder reconstruction have led to major improvements in both functional outcomes and health-related quality of life (HRQOL).

Cutaneous ureterostomy (CU) is an uncommon form of urinary diversion but it can be the simplest option of urinary diversion in high-risk elderly patients.[8] CU can be performed rapidly with less blood loss, decreased need for intensive care unit stay, decreased hospital stays and reduced early and late postoperative complications. CU can be performed with the single stoma or double stoma. It seems that modified CU with single stoma is a viable option for elderly, high-risk patients who require radical cystectomy. The patient requires either lifelong stent changes or periodic ureteral dilation to prevent ureteral stenosis. In elderly high-risk patients who require cystectomy and in various other clinical conditions, this option can be considered.[9] So this study was performed to assess various indication and complications of cutaneous ureterostomy after radical cystectomy.

METHODS

After taking approval from research and ethical clearance from our institute, the clinical records of patients who underwent radical cystectomy at our center from October 2014 to October 2017, were retrospectively reviewed. Out of the 84 patients who underwent radical cystectomy during this period, 17 underwent cutaneous ureterostomy, for urinary diversion. Cutaneous ureterostomy was performed by the specialized surgeon and the decision to perform method of urinary diversion was taken by the operating surgeon. All the patients who underwent cutaneous ureterostomy as a mode of urinary diversion were included in the study. Preoperative statistics of the patients were recorded including age, sex, BMI, routine blood investigations including hemogram, renal and liver function tests. Pre-anesthetic checkup was done, and ASA score was calculated. Preoperative co-morbidity status was assessed with Carlson's co-morbidity index.

With proper consent and preoperative preparation, patients underwent standard radical cystectomy and pelvic lymph node dissection using extraperitoneal approach. Both lower ureters were divided close to urinary bladder and ligated (for passive dilatation). After complete closure of peritoneum, both the ureters were mobilized up to the crossing of iliac vessels preserving the blood supply and peri-ureteral fat. The left ureter is mobilized to the right behind the sigmoid meso-colon and anastomosed to right ureter in end to side fashion (without tension) over 5/26 DJ stent. A V-shaped skin hiatus was made in the right lower quadrant and the abdominal wall musculature was pierced bluntly using artery forceps. The right ureter is brought out through the skin hiatus, where tip of V of abdominal skin is anastomosed to spatulated right ureter in "inverted" fashion over another DJ stent (Figure 1).

Figure 1: Image of cutaneous ureterostomy.

Rotation/kinking of ureter was avoided by passing 6 FR infant feeding tube into the ureter during the entire procedure. Cutaneous ureterostomy was fashioned using monocryl 4-0 absorbable suture, with meticulous attention during anastomosis of ureter to skin margin. The right ureter is fixed to posterior peritoneum using absorbable sutures. Timing of surgery and intra-operative blood loss was noted. Post operatively, both DJ stent were changed every month (position shown in x-ray in Figure 2).

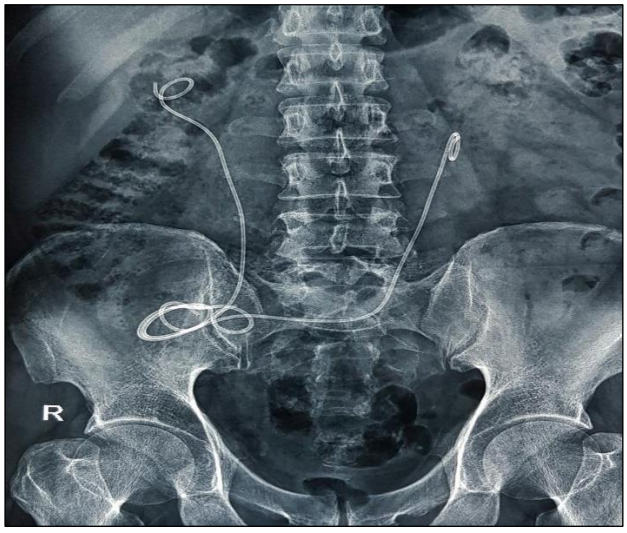

Figure 2: X-ray of operated patient.

Statistical analysis

The data was collected and entered into Microsoft excel 2010. Statistical analysis was done using SPSS software version 22. Descriptive statistics was calculated for variables. Mean±SD for continuous variable and frequency (%) for quantitative variables was calculated.

RESULTS

Overall 17 patients underwent cutaneous ureterostomy for urinary diversion, after radical cystectomy. Most of these patients were elderly male with multiple co-morbidities and high anesthesia risk (ASA score of 2 in 7 and 3 in 10 patients). Mean charlson comorbidity index was 5.94 (Table 1).

Table 1: Demographic and clinical characteristic of study population.

Demographic/clinical variable	n (%)
Age (Mean±SD) (years)	59.76±11.10
Gender n (%)	
Male	16 (94.11%)
Female	1 (5.88%)
Hemoglobin (Mean±SD)(g/dl)	10.89±1.87
T. proteins (Mean±SD) (mg/dl)	5.14±0.81
S. creatinine (Mean±SD)(mg/dl)	1.69±1.38
ASA score n (%)	
2	7 (41.17%)
3	10 (58.82%)
Charlson co-morbid index (Mean±SD)	5.94±1.34
Indications (%)	
Post radiotherapy	12 (70.58%)
Morbid	4 (23.52%)
De-vascularized loop	1 (5.88%)

The most common indication to perform cutaneous ureterostomy were patients who failed definitive radiation therapy for known T2 or higher stage TCC urinary bladder (12 out of 17). After cystectomy, these patients were electively chosen for cutaneous ureterostomy, to prevent the complications of leak at bowel and urinary anastomosis, which are frequently reported in patients who received pelvic radiotherapy.

The second group were elderly morbid patients (4 out of 17) who were high anesthesia risk (ASA 3) with poor pulmonary functions. They also underwent planned procedure to decrease operative time and morbidity.

Table 2: Intra operative and post-operative data of study population.

Parameters	Value
Operating time (Mean±SD) hours	3.12±0.45
Blood loss (mean) ml	247.64
Need for ICU monitoring, n (%)	0 (0%)
Hospital stay (Mean±SD) days	7.52±4.7

One of the patients had de-vascularization of harvested ileal bowel loop, for which no cause was certain. On table decision was taken to perform cutaneous ureterostomy, for urinary diversion and the de-vascularized segment was sacrificed. Overall, patients in which CU was used had less blood loss (mean - 247 ml) and shorter operative time (mean- 3.12 hours), thereby minimizing peri-operative surgical and anesthesia related complications (Table 2). None of the patients required postoperative ICU care and were discharged with mean hospital stay was 7.52 days (postoperative).

DISCUSSION

Carcinoma urinary bladder is quite common in elderly age group especially more than 80 yrs.[10] With the increase in life expectancy and increase in elderly population, incidence of bladder cancer is also increasing. These patients usually have associated co-morbidities like DM, HTN, CHF, CAD or COPD. Invasive bladder cancer is very aggressive tumor with significant morbidity and mortality.[11,12] If the elderly patient with carcinoma bladder is left untreated, they die of disease and not from age-related illness.[13] Radical cystectomy with pelvic lymph node dissection is the treatment of choice for muscle-invasive bladder cancer. This surgical technique has considerable peri-operative morbidity and mortality in an elderly population with co-morbidities. The most dangerous of these complications are due to the type of diversion technique used.[14] Cystectomy with urinary diversion is possible in elderly patients with favorable ASA (American society of anesthesiologist) physical status classification due to advances in medical and surgical technique.

Cutaneous ureterostomy (CU) as a mode of urinary diversion is a quick procedure. There is lack of a bowel anastomosis, and peritoneal lesions can be minimized or omitted, thus reducing the risk of postoperative ileus.[15] It reduces operative time and is less invasive and simple procedure. This technique of urinary diversion is of advantage for elderly patients with advanced disease and limited life expectancy.[16] CU can be performed with a bilateral stoma or single stoma. In our study, single stoma with inverted skin flap is used to create a spatulated widened anastomosis. This technique provides the advantage of less dissection and mobilization, reduced operative time and fewer chances of ureteric stenosis as compared to classical CU. The modified ureterostomy with the use of an inverted skin flap prevents the formation of strictures involving the terminal ureter and the stoma, which are frequent with simple or tubeless ureterostomies.[15] This technique brings great convenience to the patients and their families and facilitates home care after surgery.[17]

To date, CU was usually performed on frail patients. But there are other indications in which it can be performed. Most common indication in our study was patients who failed definitive radiotherapy for known T2 or higher stage TCC bladder. Radiotherapy causes tissue ischemia which can lead to more vulnerable intestinal tissue, with a higher risk of an anastomotic leak, prolonged ileus, diarrhea, delayed wound healing, and increased infection rates.[18] So modified CU still have a definitive role in post radiotherapy patients as a quick and reliable form of

urinary diversion. In elderly patients with co-morbid illness, CU represents a simplified alternative for urinary diversion, which was the second most common indication in our study.[16,19]

The most common complication of CU is stomal stenosis, especially on the left side.[15] In the present study, 2 (11.7%) patients developed stomal stenosis, one in post radiotherapy group and other who developed de-vascularization of harvested bowel loop. However, none developed anastomotic stricture at trans uretero-ureterostomy site. Patient with stomal stenosis in post radiotherapy group underwent stoma revision through circum-stomal incision and bringing healthier ureter to the skin surface and reconstruction of anastomosis of skin to healthy ureter. The other patient was managed with laparotomy and harvesting another ileal loop with precautions to its precarious blood supply and anastomosing healthy segment of right ureter to proximal segment of ileum using Bricker's technique and bringing distal end of ileum as stoma on skin surface.

Ureteral stenosis is due to more extensive mobilization of left ureter to transfer to the right side, which can result in ischemic lesions of the distal ureter and also while passing through the abdominal wall. In our technique, minimizing mobilization of left ureter and anastomosis of left ureter to right side resulted in minimal tension on the left, thereby avoiding stricture formation.

Furthermore, all patients were kept on DJ stents on both sides with monthly stent change. The mortality rate of urinary diversion by an ileal conduit or neobladder reconstruction was 0-4.5% in varied studies which is similar to the present study using CU of urinary diversion with no mortality.[20-27]

It is an observational, retrospective study and the sample size is small.

CONCLUSION

CU with single stoma represents a valid alternative in varied indications, especially in post radiotherapy patients. It can be performed faster with few complications. Complications following CU can be reduced with the meticulous care of cutaneous ureterostomy with prophylaxis antibiotics and frequent change of stents. Unilateral ureterostomy is more comfortable to the patients.

ACKNOWLEDGEMENTS

Authors would like to acknowledge Dr. Sonika Agarwal.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Agarwal S, Sarpal R, Dang S, Kalra Y, Biswas M. Indications and outcome of patients undergoing cutaneous ureterostomy as a mode of urinary diversion after radical cystectomy: an experience from a tertiary care center. Int Surg J 2018;5:3038-42.