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Original Article

Comparison of two kinds of cutaneous ureterostomy using in radical cystectomy

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Abstract: Objective: To investigate the merits and 10 year follow-up results of two kinds of cutaneous ureterostomy operation in patients with the radical cystectomy. Methods: We retrospective analyzed the information of patients underwent radical cystectomy in the past 10 years, comparing and analyzing the consequence of application value, early and long-term follow-up results using two kinds of cutaneous ureterostomy in patients with radical cystectomy. Results: Unilateral ureteral cutaneous ureterostomy didn't increase patients' early and long-term complications, and improved the patient's life satisfaction. Conclusion: The unilateral cutaneous ureterostomy didn't increase postoperative complications in patients, while improving the patient's life satisfaction. Unilateral ureteral cutaneous ureterostomy is an important complement to urinary diversion after radical cystectomy and the best choice for cutaneous ureterostomy.

Keywords: Cutaneous ureterostomy, radical cystectomy, unilateral, bilateral

Introduction

Bladder cancer is one of the most common malignancies of the urinary system in China. Radical cystectomy is the standard treatment for patients with multiple, recurrent and muscle invasive bladder cancer. There are various methods about postoperative urinary diversion, including controllable and non-controllable ways. Cutaneous ureterostomy is one way of non-controllable urinary diversion, mainly applicable to elderly patients with poor physical condition, underlying diseases, advanced cancer and not be tolerated for a long time surgery. We have been carried out radical cystectomy since 1998, in which we implemented cutaneous ureterostomy including unilateral (**Figure 1**) and bilateral (**Figure 2**) ways for patients with poor health. We reviewed the clinical and follow-up data of patients who underwent two kinds of cutaneous ureterostomy, which are reported as follows.

Materials and methods

Clinical data

Retrospective analysis of clinical data of patients receiving cutaneous ureterostomy over the past 10 years showed that 114 cases got a more complete visit. The number of patients underwent bilateral and unilateral cutaneous ureterostomy was 63 and 51 respectively. Patients with details showed in **Table 1**.

Surgical methods

Bilateral cutaneous ureterostomy: Patients were maintained at supine position after general anesthesia. We sliced through the skin and subcutaneous fat through lower abdominal midline incision to the pubic symphysis. We opened the sheath of rectus, separated the muscle, entered the bladder gap, pushed away the peritoneal reflection, performed exploration and dissection of lymph node. Bilateral ureters were found and cut off. The distal ureter was ligatured, and a single J tube was put into proximal ureter for coming procedure. Radical cystectomy was performed routinely. Two triangular incisions were performed through the full-thickness abdominal wall by McBurney point and anti-McBurney point. Without tension and distorsion, both ureters were pulling out of the abdominal wall for 1 cm respectively. The ureter and sheath of rectus was fixed together through 2 suture needles. A longitudinal incision, about 0.5 cm, was used for the ureter outside the abdominal wall,

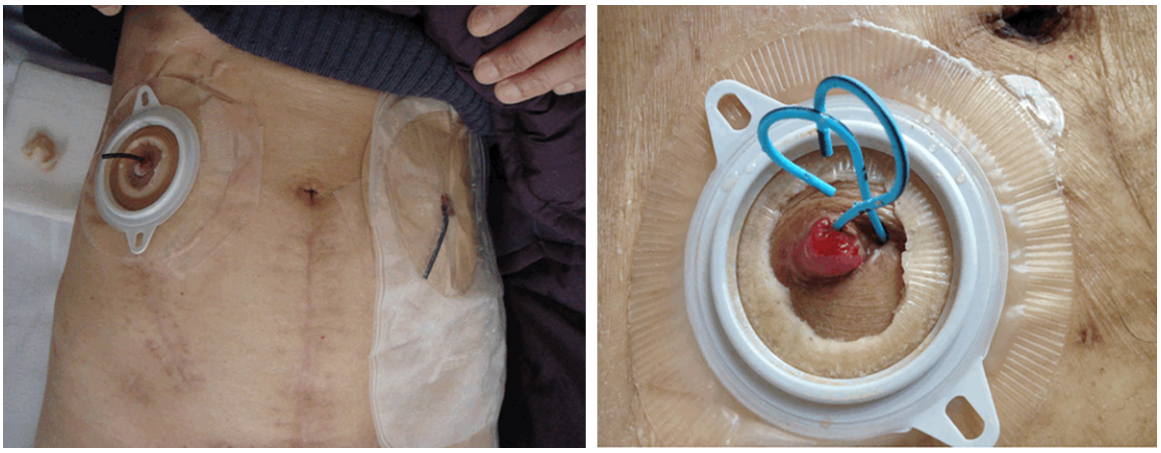

Figure 1. Two kinds of cutaneous ureterostomy (physical map).

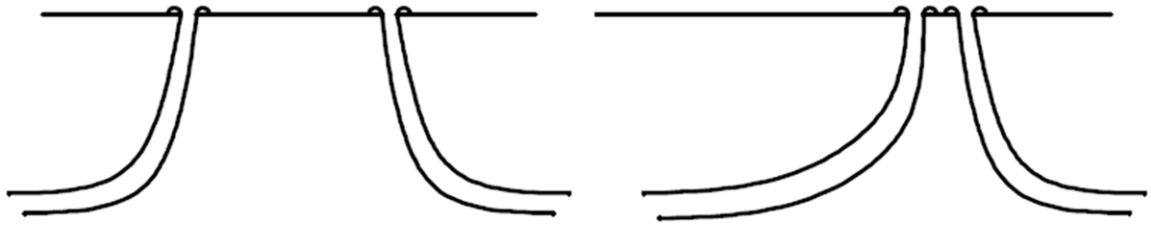

Figure 2. Two kinds of cutaneous ureterostomy (sketch map).

Table 1. Clinical data of patients' underment cutaneous ureterostomy

Manner	Number	Gender		Age	Grade			Stage			
		Man	Woman		G1	G2	G3	T1	T2	T3	T4
Unilateral	51	37	14	70±17.32	3	20	28	1	19	22	9
Bilateral	63	48	15	69±21.46	5	27	31	2	25	23	13

which was sutured with the skin interruptedly and forms a semi papillary structure.

Uniateral cutaneous ureterostomy: The operation process is similar to bilateral cutaneous ureterostomy except a difference. Both Ureteral stomas are located on the right side and the left Ureteral stoma is below the right stoma, a distance of about 1 cm, and the left ureter was led to right side through the sigmoid colon retroperitoneal gap.

Statistical analysis

Computerized statistical analyses were performed using the SPSS version 17.0. The t-test was used to analyze the data of surgery situation and EORTC QLQ-C30 scores in two groups. Differences were considered significant if the *P*-value from a two-tailed test was <0.05.

Results

General situation comparison

Two groups were compared with age (70±17.32 vs. 69±21.46), histological grade and clinical stage, finding no significant difference (P>0.05). The number of patients in men was more than women (**Table 1**).

Surgery situation comparison

Surgery in both two groups went smoothly, unilateral cutaneous ureterostomy was a little longer than bilateral cutaneous ureterostomy (P<0.05). No significant difference was found in intraoperative blood loss, postoperative hospital stay and hospital costs between two groups (P>0.05) (**Table 2**).

Early postoperative complications

The number of early postoperative complications happening in patients with unilateral cutaneous ureterostomy was 10 (19.61%), including wound infection (5 cases), urinary tract infection (1 case), postoperative urine leakage (1

Table 2. Comparison of surgery situation in two groups

Groups	Number	Surgery time (min)	Blood loss (ml)	Postoperative hospital stay (d)	Hospitalization expense ($)
Unilateral	51	183.34±31.64	326.72±52.16	13.36±3.41	6244.35±762.24
Bilateral	63	172.21±37.31	331.82±49.38	14.51±4.22	6431.72±698.35
P value		<0.05	>0.05	>0.05	>0.05

Table 3. Comparison of EORTC QLQ-C30 scores for each dimension in patients with unilateral and bilateral cutaneous ureterostomy (x ± s)

Group	Number	PF	RF	CF	EF	SF
Unilateral	51	55.34±14.67	51.23±13.86	62.44±16.51	65.38±11.47	51.22±17.34
Bilateral	63	49.21±15.51	53.17±12.90	65.55±15.77	60.56±12.69	53.73±19.26
P Value		<0.05	>0.05	>0.05	<0.05	>0.05

Note: PF-physical function, RF-role function, CF-cognitive function, EF-emotional functioning, SF-social function.

case), ureteral colostomy poor healing of the skin (1 case), papillary necrosis (1 case) which underwent bilateral renal fistula, postoperative electrolyte imbalance (1 case). No obstruction, stoma hernia and perioperative deaths occurred. Patients underwent bilateral cutaneous ureterostomy found 13 (20.63%) cases with early postoperative complications, including wound infection (5 cases), urinary tract infections (2 cases), ureteral colostomy poor healing of the skin (2 cases) (both one side of poor healing), postoperative single urine leakage side (1 case), and postoperative incomplete intestinal obstruction (1 case). No stoma hernia, electrolyte imbalance and perioperative deaths occurred. The incidence of early complications in the two groups was not significantly different (P>0.05).

Quality of life evaluation

We adopted the European Organization for Research and Treatment (EORTC QLQ-C30) [1] to evaluate all patients' situations. The physical function and emotional function scores in patients with unilateral cutaneous ureterostomy were higher than patients in bilateral groups (P<0.05). While the scores in the role function, cognitive function and social function in the two groups were not significantly different (P>0.05) (**Table 3**).

Follow-up results

The fallow-up time in unilateral cutaneous ureterostomy was 4-118 months, an average of 60 months. During the follow-up, regular replacement of double J tube was implemented. Among the 51 cases, 18 patients died. One patient died of liver cancer, 1 patient died of myocardial infarction, 1 patient died of severe pneumonia and 12 died of bladder cancer systemic metastases, 2 patients died of renal failure, 1 case of death after trauma infection. In 7 cases of pelvic lymph node metastases patients, 2 patients died, 5 cases currently received radiotherapy and chemotherapy; 2 cases of ureteral stoma retraction, 1 case of stoma stenosis, 1 case of necrosis after the end of the ureter, one case of double J tube fracture cannot be removed, the residual stayed in vivo, two cases occurred peristomal ulcer, 6 cases of unilateral hydronephrosis with normal serum creatinine and blood urea nitrogen, 1 patient already died who had bilateral hydronephrosis. 31 cases were satisfied overall (60.78%).

Bilateral cutaneous ureterostomy group followed up 6-120 months, mean 66 months. Among of the 63 patients, 23 died and one patient died of pulmonary embolism, 2 died of cerebral infarction, 1 died of poisoning, 15 died systemic and local metastasis, 1 died of renal failure, 1 died of urinary tract infections, 1 died of lung infection, 1 died of sudden death with unknown causes. In the nine cases of pelvic lymph node metastasis, 2 patients died, seven cases currently receiving radiotherapy, chemotherapy and traditional Chinese medicine; 3 patients ureter retraction, are overweight patients, 2 patients had a single ureteral stoma stenosis, six cases of unilateral hydronephrosis. 33 cases were satisfied overall (52.38%).

The incidence of postoperative complications was no significant difference in two groups. In the terms of overall survival satisfactory, the unilateral cutaneous ureterostomy was better than bilateral cutaneous ureterostomy.

Discussion

In the early 19th century, Hages first applied the cutaneous ureterostomy as a urinary diversion method [2]. In the early stage, cutaneous ureterostomy is mainly used for children with congenital urinary tract obstruction, first reported by Johnston in 1963 [3]. Then it gradually developed into one of the important methods of urinary diversion for adult with pelvic malignancies. Relative to Bricker and Kock surgery [4], cutaneous ureterostomy is mainly applicable to the patients who are with general poor conditions, older age, short life expectancy, or associated with intestinal disease [5].

Compared with other urinary diversion procedure, cutaneous ureterostomy has the following advantages: ① Surgical procedure is relatively simple, time is short and quick recovery. ② Surgical procedures occur in the extraperitoneal, which reduces the incidence of complications. ③ There is no electrolyte and acid-base imbalance associated with intestinal absorption of urine. ④ The stoma was smaller than colostomy, which is more convenient for patient' self-care [6]. But as for cutaneous ureterostomy, there are also some complications, mainly are nerve atrophy, collapse, end necrosis, fistula, narrow mouth, urinary infection, poor drainage and retrograde flushing caused by expansion of water, leading to renal pelvis ureter expansion water, infection and uremia [7]. Considering the above advantages and disadvantages, cutaneous ureterostomy is a more appropriate clinical urinary diversion for the patients with poor conditions, short life expectancy, or combining with intestinal disease. Through retrospective the past 10 years data, we found that patients with cutaneous ureterostomy had shorter survival compared with patients underwent classic urinary diversion, which may be associated with surgery screening conditions. Cutaneous ureterostomy was generally applied to elderly patients with poor health and not tolerate surgical bowel diversion. During follow-up, we found that many patients died of systemic disease rather than cancer-related diseases. Therefore, considering the scope, the advantages and disadvantages of cutaneous ureterostomy, we believed that cutaneous ureterostomy was a better alternative and complementary type of urinary diversion for patients we mentioned above.

Clinically, the most common cutaneous ureterostomy is generally bilateral ureteral stoma, which is characterized by simple operation, easy to grasp, and shorter free length of ureteral in surgery, reducing the incidence of ureteral necrosis, retraction and narrow chances. While bilateral ureteral stoma makes patients great inconvenient in personal care, increase occurrence of adverse events, and thus indirectly affect the patient's physical activity and mental activity [8]. Therefore, we carried out a modified surgical approach that is the implementation of ureters with unilateral cutaneous ureterostomy. We followed up for a period of 10 years, finding that unilateral cutaneous ureterostomy did not increase the incidence of postoperative complications, while improved postoperative life satisfaction.

In the 10 years of follow-up, we found that unilateral ureteral stoma increased patients' convenience in personal care, but also increased the difficulty in the operation and the potential possibility of operative complications. Time required in unilateral ureteral stoma was longer than bilateral ureteral stoma, mainly because it needed to fully dissociate the left ureter and arrived at the right side of the stoma with no tension. When dissociated the left ureter, we needed to try to keep blood vessels to nourish ureter and reduce postoperative ureteral ischemia and necrosis. Left ureter necrosis occurred in one patient who underwent unilateral cutaneous ureterostomy in early stage. Therefore, we propose that in the separation of the left ureter, there is no need to get bone mineralization free, with appropriate adipose comprehensive nutrient vessels. Based on the lessons learned in the past, no ureteral necrosis cases occurred, as for the patient with ureteral necrosis received left nephrostomy permanently. In addition, there were no significant differences between the two procedures in aspects of intraoperative blood loss, postoperative hospital stay and hospital charges.

The life satisfaction in patients with unilateral cutaneous was higher than that in patients with bilateral cutaneous ureterostomy, mainly due to the reduction in the intensity of nursing work and patient life concerns. Through quantifying the patients with EORTC QLQ-C30, we found that physical function and emotional functional performance in patients with unilateral cutaneous ureterostomy were significantly better than those in patients with bilateral cutaneous ureterostomy, mainly due to its' convenience and reduction of patients' physical and psychological burden.

During the long-term follow-up, we found that patients' survival and quality of life in ureteral stoma skin decreased when compared with classic urinary diversion style, which is related to the original cases screened. The patients who are generally poor or inappropriate line of intestinal urinary diversion patients are selected cases. With a long-term follow-up, we found patients had no significant difference in short and long term complications between two groups. Unilateral cutaneous ureterostomy didn't increase the incidence of complications while increased patients' convenience.

In summary, unilateral cutaneous ureterostomy is a more appropriate choice for the patients who are elderly, generally poor or merge with intestinal disease. The traditional bilateral ureteral stoma surgery is convenient to operate, but it will enhance the difficulty in patients' care and psychological pressure. It is worth widely recommended unilateral cutaneous ureterostomy because that it brings a great convenience to patients and their families, facilitate home care after surgery and without increasing complications and changing the surgery situation.

Disclosure of conflict of interest

None.

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References

[1] Maffezzini M, Campodonico F, Canepa G, Manuputty EE, Tamagno S, Puntoni M. Intravesical mitomycin C combined with local microwave hyperthermia in non-muscle-invasive bladder cancer with increased European Organization for Research and Treatment of Cancer (EORTC) score risk of recurrence and progression. Cancer Chemother Pharmacol 2014; 73: 925-930.

[2] Lee RK, Abol-Enein H, Artibani W, Bochner B, Dalbagni G, Daneshmand S, Fradet Y, Hautmann RE, Lee CT, Lerner SP, Pycha A, Sievert KD, Stenzl A, Thalmann G, Shariat SF. Urinary diversion after radical cystectomy for bladder cancer: options, patient selection, and outcomes. BJU Int 2014; 113: 11-23.

[3] Johnston JH. Temporary cutaneous ureterostomy in the management of advanced; congenital urinary obstruction. Arch Dis Child 1963; 38: 161-166.

[4] Kock NG, Nilson AE, Nilsson LO, Norlén LJ, Philipson BM. Urinary diversion via a continent ileal reservoir: clinical results in 12 patients. 1982. J Urol 2002; 167: 1153-1159; discussion 1159-1160.

[5] De Nunzio C, Cindolo L, Leonardo C, Antonelli A, Ceruti C, Franco G, Falsaperla M, Gallucci M, Alvarez-Maestro M, Minervini A, Pagliarulo V, Parma P, Perdonà S, Porreca A, Rocco B, Schips L, Serni S, Serrago M, Simeone C, Simone G, Spadavecchia R, Celia A, Bove P, Zaramella S, Crivellaro S, Nucciotti R, Salvaggio A, Frea B, Pizzuti V, Salsano L, Tubaro A. Analysis of radical cystectomy and urinary diversion complications with the Clavien classification system in an Italian real life cohort. Eur J Surg Oncol 2013; 39: 792-798.

[6] Tsurusaki T, Takehara K. [Extraperitoneal bilateral tubeless cutaneous ureterostomy with umbilical stoma]. Hinyokika Kiyo 2007; 53: 789-793.

[7] Rodriguez AR, Lockhart A, King J, Wiegand L, Carrion R, Ordorica R, Lockhart J. Cutaneous ureterostomy technique for adults and effects of ureteral stenting: an alternative to the ileal conduit. J Urol 2011; 186: 1939-1943.

[8] Deliveliotis C, Papatsoris A, Chrisofos M. Urinary diversion in high-risk elderly patients: modified cutaneous ureterostomy or ileal conduit? Urology 2005; 66: 299-304.