



## Ureterocutaneostomy: for whom and when?

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### ABSTRACT

**Objective:** To discuss the indications and the results of the patients treated with ureterocutaneostomy (UCN) for urinary diversion in our center.

**Material and methods:** Between March 2008 and November 2012, 27 patients (19 males and 8 females) were treated with UCN in our clinic. Patients' ages ranged between 56-78 years. Radical cystectomy was performed on 21 of these patients. The patients underwent transureteroureterostomy and UCN or unilateral or bilateral side-by-side UCN on the abdominal wall. Double-J stents were placed inside the ureters and changed every 12 weeks. Comorbidities and American Society of Anesthesiologists (ASA) scores were noted.

**Results:** The patients had invasive bladder cancer (n=24), multiple tumors within and outside of a diverticulum and intractable recurrent bleeding (n=1), recurrent hemorrhage (n=1), and bladder contracture (n=1). As comorbidities, hypertension (n=14), chronic obstructive pulmonary disease (n=11), diabetes mellitus (n=10), coronary artery disease (n=8), chronic renal failure (n=1), and Crohn's disease (n=1) were detected. The ASA score was 3 or greater in 14 patients. During follow-up period, 3 patients experienced pyelonephritis, and one of them had a strictured ureteral orifice.

**Conclusion:** UCN can be used as a method of urinary diversion in selected patients.

**Key words:** Invasive bladder cancer; ureterocutaneostomy; urinary diversion.

### Introduction

Bladder cancer ranks fourth in frequency among all tumors in men, and it is the second most frequently seen genitourinary tumor. In the United States of America in the year 2010, nearly 70.500 newly diagnosed cases of bladder cancer were detected with resultant 14.680 deaths.<sup>[1]</sup> At the time of the diagnosis, in nearly 75-85% of the patients with bladder cancer superficial disease (Ta, T1, CIS) is found.<sup>[2]</sup> Majority of these tumors are not life-threatening, and can be treated with conservative methods. Whereas, 20-25% of the cases are muscle-invasive tumors at the time of the first diagnosis. In 75% of the superficial bladder tumors recurrences develop, while 10-20% of them later on become muscle-invasive. Since at the time of the first diagnosis, 50% of the cases with muscle-invasive bladder cancer (MIBC) have nodal or metastatic disease, optimal treatment should be organized in line with oncological principles. In this group of patients, fundamental goal is, if possible, to achieve a tumor-free state, and maintain quality of life of the patient at a maximal level. Gold standard

in the treatment of MIBC is radical cystectomy (RC), and bilateral pelvic node dissection (PLND).<sup>[3,4]</sup> It has been reported that at the time of diagnosis, 57% of the patients who had undergone RC with the diagnosis of MIBC had muscle-invasive disease, while 43% of them had superficial bladder cancer which differentiated into MIBC during follow-up period.<sup>[5]</sup>

Urinary system diversion was defined by Simon in 1852<sup>[6]</sup>, and became a standard mode of treatment after popularization of the ileal conduit procedure by Bricker in 1950.<sup>[7]</sup> Urinary diversion (UD) is not only used as a post-cystectomy procedure, but it can be also employed for neurogenic bladder abnormalities or its congenital anomalies. Whether it is used with the indication of bladder tumor or for above-mentioned reasons, in every case of UD, cystectomy can not be performed. Three alternative anatomical regions namely abdominal wall, urethra or rectosigmoid colon have been used for UD.<sup>[8]</sup> Type of UD is priorly determined by general health state of the patient, disease-specific health state, and patient's expectations for a better quality of

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life. Although orthotopic ileal neo-bladder seems to be a nearly ideal approach, it has some disadvantages. Presence of locally advanced disease (urethral or bladder neck involvement), long-term complications, expectations for a better quality of life or comorbidities which may complicate the surgical process make ileal conduit or ureterocutaneostomy a rational option. In a study performed in 2008 where complications related to incontinent UDs were evaluated, extra advantages of UCN have been demonstrated over ileal, and colonic conduits during 16 months of follow-up.<sup>[9]</sup> In a more comprehensive study performed in the same year, authors reported lesser long-term complication rates for ileal conduits, when compared with all continent abdominal pouches, and orthotopic neobladder procedures.<sup>[10]</sup>

Herein, our aim is to discuss justifications, and outcomes of UCN chosen as an UD procedure for our patients with various indications.

## Material and methods

Between March 2008 and November 2012, 27 patients (19 males and 8 females; age range, 56-78 years) were treated with UCN in our clinic. Before the operation patients signed a detailed consent form which explicitly informed the patients about phases of the operation, its probable progression, and complications. Radical cystectomy (RC) could be applied in our 21 patients. One patient underwent only UCN because of a contracted bladder. RC was planned in 5 patients because of frozen pelvis, but it couldn't be applied (Table 1).

The patients underwent transureteroureterostomy and UCN or unilateral or bilateral side-by-side UCN on the abdominal wall. Double-J stents were placed inside the ureters and changed every 12 weeks on an ambulatory basis under the local operative room conditions. Comorbidities and American Society of Anesthesiologists (ASA) scores were noted (Tables 1, 2).

## Statistical analysis

For necessary statistical procedures Statistical Package for the Social Sciences (SPSS) v 11.0 (SPSS, Inc., Chicago, III., USA) was used.

## Results

Mean ages of the male, and female patients were  $69.7 \pm 5.2$ , and  $72.1 \pm 4.5$  years for male, and female patients, respectively. The patients had invasive bladder cancer (n=24), multiple tumors within and outside of a diverticulum and intractable recurrent bleeding (n=1), recurrent hemorrhage (n=1), and bladder contracture (n=1). As comorbidities, hypertension (n=14), chronic obstructive pulmonary disease (n=11), diabetes mellitus (n=10), coronary artery disease (n=8), chronic renal failure (n=1), and

Crohn's disease (n=1) were detected. Preoperatively 14 patients had ASA score  $\geq 3$ . The patients died because of progression of the bladder tumor (n=3), and comorbidities (n=4). Adjuvant therapies (RT, and CT) were administered after radical cystectomies because of local residue disease (n=6) or frozen pelvis (n=5). The disease progressed in 11 patients. During the follow-up period episodes of pyelonephritis developed in 3, and ureteral stenosis in one patient.

## Discussion

Standard curative cystectomy in the treatment of muscle-invasive bladder cancer consists of total extirpation of bladder, together with macroscopically visible, and removable all tumor foci of the prostate, distal ureters, and related lymph nodes.<sup>[8]</sup> In the current literature, surgical modifications, and adaptations have been described within the frame of improving patients' quality of life, but refraining from interruption of the tumoral control. Among them, preservation of striated sphincter muscle, anterior, and membranous urethra so as to enable construction of an orthotopic neobladder can be enumerated. Besides, preservation of pelvic autonomic, and sensory nerves, and even partial sparing of prostate, and seminal vesicles have been recommended to maintain fertility, potency, and continence.<sup>[8,11]</sup> In women, standard pelvic exenteration encompasses total extirpation of bladder, urethra, adjacent vaginal wall, uterus, distal ureters, and related lymph nodes.<sup>[8]</sup> Among these adaptations, in women, preservation of urethra, and its autonomic nerves might be considered in order to make future neobladder applications possible.<sup>[11,12]</sup> However in recent studies removal of uterus, and vaginal wall so as to provide support for the future construction of orthotopic neobladder has been debated.<sup>[8]</sup> Even though favourable impact of extended PLND on survival of MIBC patients, actual incidence rates of improvement it provides, and standard boundaries of PLND have not been precisely established.<sup>[8,13,14]</sup>

Type of the urinary diversion is important in that it determines patient's way of life after radical cystectomy. Ideally, maintenance of the integrity of urinary tract by reconstructing a pouch with similar characteristics of the patient's normal bladder localized in its original is desired. For UD various intestinal segments, and techniques have been used (refluxive, non-refluxive, continent or incontinent). Serious, and life-threatening intraoperative problems can be encountered. Therefore improvement in the quality of life of the patient should be weighed against these disadvantages, and ideal method should be determined for each individual patient. In the latest guidelines, studies evaluating norms including quality of life, continence, physical integrity of the patient after UD have been reviewed. In the determination of the quality of life criteria, preoperative stage of the disease, patient's age, and his /her expectations, socioeconomic state, functional capacity of the bladder, experience of the operating team, and

**Table 1. ASA score profiles, and comorbidities encountered in patients who had undergone ureterocutaneostomy operations with (+) or without (-) concurrent radical cystectomies**

Treatment modality	Patients (n)	Frozen pelvis	Comorbidities	ASA score ≥3
Radical cystectomy (+)	21	0	COPD (8), DM (6) CAD (6), HT (10) CRF (2)	11
Radical cystectomy (-)	6	5	COPD (3), DM (4) CAD (2), HT (4) Crohn (1)	3

ASA: American Society of Anesthesiologists; COPD: chronic obstructive pulmonary disease; DM: diabetes mellitus; CAD: coronary artery disease; HT: hypertension; CRF: chronic renal failure

**Table 2. Types of ureterocutaneostomy, and patient profiles**

Treatment modality	Patients (n)	Frozen pelvis	Preoperatively functional solitary renal unit	Comorbidities	ASA score ≥3
TUU + UC	8	1	0	COPD (3), DM (2) CAD (2), HT (4)	4
UC	19	4	6	COPD (8), DM (8) CAD (6), HT (10), CRF (2), Crohn (1)	10

TUU: transureteroureterostomy; UC: ureterocutaneostomy; ASA: American Society of Anesthesiologists; COPD: chronic obstructive pulmonary disease; DM: diabetes mellitus; CAD: coronary artery disease; HT: hypertension; CRF: chronic renal failure

potential surgical complications have been reported as important factors.<sup>[8]</sup> In the light of these review articles, each patient was told that any type of UD could not be randomly offered to every patient, and among all UDs, UCN had been asserted to have minimal rates of surgical complications (LE:3). Some contraindications have been determined for the preference of relatively more complicated methods of UD which can be enumerated as extremely severe neurological or psychiatric diseases, shorter life expectancy, impaired hepatic or renal functions, surgically positive margins involving urethra or other regions of the urinary tract (LE:2b).<sup>[8]</sup> Some relative contraindications related to orthotopic reconstruction of neobladder exist which may include delivery of higher doses of preoperative RT; complex urethral stenosis, extremely severe urinary incontinence secondary to urethral sphincter insufficiency (LE:2b).<sup>[15-18]</sup>

In our clinic, the most frequently used types of UD are priority ureterocutaneostomy, followed by predominantly Studer type orthotopic neobladder procedures, and finally UCN. When 27 cases of UCN performed within an indicated period were generally reviewed, it appears that this method had been resorted to, because of locally advanced disease, intestinal, and general health problems which might affect intraoperative survival, and induce risks of serious complications. (Tables 1, 2). In these patients, we didn't take every risk to apply UD method using a bowel segment, as a priority survival of the patient, and nearly ideal quality of life have been pursued.

Points to be considered as for patient's care, and cooperation following ureterocutaneostomy may differ somewhat from other methods of UD. In patients whose intestinal segment can not be excised which discards the possibility of intestinal anastomosis, oral alimentation is initiated more rapidly, and without any problem when compared with other types of UD. Thanks to implantation of a double J-stent with an appropriate caliber into ureter, stricture of ureteral orifice can be prevented. However, cutaneous contracture is one of the important handicaps of UCN. In a series performed in our clinics, in only one patient stricture of the ureteral orifice developed which was opened with local intervention. Although absence of an ileal segment between the skin, and the renal unit facilitates development of pyelonephritis, in our experience, thanks to attentive monitoring, replacement of a double-J catheter at every 2 months, in only 3 patients pyelonephritis developed. Change of a double J stent can be easily realized under local, and sterile conditions by delivering a soft, flexible catheter through the stent.

In conclusion, UCN is the preferable mode of UD in patients which is not amenable to radical cystectomy because of frozen pelvis secondary to MIBC with resultant shorter life expectancy, in cases whose operation should be rapidly terminated due to the deteriorated health state, and those with decreased life expectancy due to associated comorbidities or inability to use intestinal segments owing to related problems.

**Informed Consent:** Written informed consent was obtained from patients who participated in this study.

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## References

1. Siegel R, Naishadham D, Jemal A. Cancer statistics, 2013. *CA Cancer J Clin* 2013;63:11-30.
2. Babjuk M, Oosterlick W, Sylvester R, Kaasinen E, Böhle A, Palla-Redorta J, et al. EAU Guidelines on Non-Muscle Invasive Urothelial Carcinoma of the Bladder, the 2011 Update. *Eur Urol* 2011;59:997-1008.
3. Khosravi-Shahi P, Cabezon-Gutierrez L. Selective organ preservation in muscle-invasive bladder cancer: Review of the literature. *Surg Oncol* 2012;21:17-22.
4. Hautmann RE, Abol-Enien H, Hafez K, Haro I, Mansson W, Mills RD, et al. Urinary Diversion, WHO Consensus Conference on Bladder Cancer. *Urology* 2007;69:17-49.
5. Vladya A, Soloway MS, Hawke C, Tiguert R, Civantos F. De novo muscle invasive bladder cancer: Is there a change in trend? *J Urol* 2001;165:47-50.
6. Simon J. Ectopia vesicae (absence of the anterior walls of the bladder and pubis abdominal parietis); operation for directing the orifices of the ureters into the rectum; temporary success; subsequent death; autopsy. *Lancet* 1852;ii:568.
7. Bricker EM. Bladder substitution after pelvic evisceration. *Surg Clin North Am* 1950;30:1511-3.
8. Stenzl A, Cowan CN, de Santis M, Kuczyk MA, Merseburger AS, Ribal MJ, et al. Treatment of muscle invasive bladder cancer: Update of the EAU Guidelines. *Eur Urol* 2011;59:1009-18.
9. Pycha A, Comploj E, Martini T, Trenti E, Mian C, Lusuardi L, et al. Comparison of complications in three incontinent urinary diversions. *Eur Urol* 2008;54:825-32.
10. Nieuwenhuijzen JA, de Vries RR, Bex A, van der Poel HG, Meinhart W, Antonini N, et al. Urinary diversions after cystectomy: the association of clinical factors, complications and functional results of four different diversions. *Eur Urol* 2008;53:834-44.
11. Stenzl A, Nagele U, Kuczyk M, Sievert KD, Anastasiadis A, Seibold J, et al. Cystectomy- technical considerations in male and female patients. *EAU Update Series* 2005;3:138-46.
12. Stenzl A, Colleselli K, Poisel S, Feichtinger H, Pontasch H, Bartsch G. Rationale and technique of nerve sparing radical cystectomy before an orthotopic neobladder procedure in women. *J Urol* 1995;154:2044-9.
13. Advanced Bladder Cancer (ABC) Meta-analysis Collaboration. Adjuvant chemotherapy in invasive bladder cancer: a systematic review and meta-analysis of individual patient data Advanced Bladder Cancer (ABC) Meta-analysis Collaboration. *Eur Urol* 2005;48:189-201.
14. Herr HW, Bochner BH, Dalbagni G, Donat SM, Reuter VE, Bajorin DR. Impact of the number of lymph nodes retrieved on outcome in patients with muscle invasive bladder cancer. *J Urol* 2002;167:1295-8.
15. Farnham SB, Cookson MS. Surgical complications of urinary diversion. *World J Urol* 2004;22:157-67.
16. Stenzl A, Sherif H, Kuczyk M. Radical cystectomy with orthotopic neobladder for invasive bladder cancer: a critical analysis of long term oncological, functional and quality of life results. *Int Braz J Urol* 2010;36:537-47.
17. Stein JP, Clark P, Miranda G, Cai J, Groshen S, Skinner DG. Urethral tumor recurrence following cystectomy and urinary diversion: clinical and pathological characteristics in 768 male patients. *J Urol* 2005;173:1163-8.
18. Hautmann RE, Volkmer BG, Schumacher MC, Gschwend JE, Studer UE. Long-term results of standard procedures in urology: the ileal neobladder. *World J Urol* 2006;24:305-14.