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Melioidosis Impact of Different Urinary Diversions on Quality of Life After Radical Cystectomy in the Elderly

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Abstract

Introduction: Radical cystectomy with urinary diversion is the standard treatment for invasive or high-risk non-invasive bladder cancer. The choice of diversion depends on clinical, surgical, and functional factors and directly influences quality of life (QoL). In the elderly population, few studies have compared the different techniques.

Materials and Methods: We conducted a prospective study between 2021 and 2024 in the urology department of the University Hospital of Casablanca. A total of 99 patients underwent radical cystectomy, of whom 83 completed the SF-36 and Barthel index questionnaires. Two groups were compared: ileal conduit (IC, n=32) and ureterocutaneostomy (UC, n=51). Clinical, operative, and postoperative data were analyzed.

Results: The mean follow-up was longer for patients with ileal conduit than for those with ureterocutaneostomy. UC was associated with shorter operative time and hospital stay, as well as earlier drain removal. Regarding QoL, the ileal conduit was associated with better emotional function, while UC was correlated with more marked fatigue. No significant difference was observed for the other dimensions of QoL between the two groups.

Discussion: These results confirm that the choice of diversion must be individualized. The ileal conduit appears to be a more suitable option for younger patients in good general condition who are concerned about their body image and psychological well-being. Ureterocutaneostomy remains a safer alternative in elderly and frail patients due to its reduced operative risk.

Conclusion: Although no overall difference in QoL was observed, the ileal conduit seems preferable for young and fit patients, while UC should be favored in high-risk elderly patients. The use of QoL questionnaires and informed counseling remain essential to guide therapeutic decision-making.

Keywords: Radical cystectomy; Urinary diversion; Quality of life; SF-36; Barthel index

Introduction

Radical cystectomy with urinary diversion remains the standard of care for muscle-invasive bladder cancer and for high-risk non-muscle-invasive tumors refractory to conservative treatments [1]. Despite significant advances in surgical techniques and perioperative management, this procedure continues to be associated with substantial morbidity and has a profound impact on patients' quality of life [2]. The selection of the optimal urinary diversion type following radical cystectomy is a critical decision that requires careful individualization. This choice depends on a range of factors, including patient age, comorbidities, functional status, renal function, life expectancy, personal preferences, and surgical expertise [3]. The primary options: ileal conduit, and cutaneous ureterostomy—each present a distinct profile in terms of technical complexity, perioperative morbidity, functional outcomes, and psychosocial adaptation. Beyond achieving oncological control, the evaluation of patient-reported outcomes and health-related quality of life (HRQoL) has become central to the therapeutic decision-making process [4]. Particularly in

elderly or frail populations, maintaining functional autonomy and a satisfactory quality of life are essential treatment objectives [5]. However, the available comparative data regarding the impact of different urinary diversion techniques on quality of life remain heterogeneous and sometimes conflicting [6]. Consequently, a more precise characterization of postoperative functional outcomes and patient autonomy is necessary to optimize patient selection and enhance the personalization of care. In this context, the present study aims to compare the perioperative outcomes and quality-of-life impact of different urinary diversion techniques using validated functional and quality-of-life assessment tools. The goal is to provide objective evidence to inform and refine the clinical decision-making process. Here is a high-level, optimized English translation of the "Materials and Methods" section, suitable for submission to an international scientific journal.

Materials and Methods

Study Design and Patient Selection

A single-center cross-sectional study was conducted in the Urology Department of the University Hospital of Casablanca. Informed consent was obtained from all participants. Data were retrospectively collected from the medical records of patients who underwent radical cystectomy (RC) with urinary diversion between 2021 and 2025. Quality of life questionnaires were administered during follow-up consultations or via standardized telephone interviews. The analyzed variables included: age, sex, body mass index (BMI), operative time, length of hospital stay, time to drain removal, variations in hemoglobin and creatinine levels, postoperative complications, and follow-up duration. Patients were stratified into three groups according to the type of urinary diversion: orthotopic neobladder, ileal conduit (IC), and cutaneous ureterostomy (CU). The SF-36 and Barthel Index questionnaires were administered to all surviving patients with ongoing follow-up. Exclusion criteria were: death from non-oncological causes within the first three postoperative months, absence of follow-up data, local recurrence or metastatic disease, and presence of a concomitant cancer. Cutaneous ureterostomy was preferentially indicated in patients presenting with positive lymph nodes, positive urethral margins, limited life expectancy, severe neurological or psychiatric comorbidities, significant hepatic or renal impairment, history of high-dose pelvic radiotherapy, complex urethral stricture, severe incontinence, inflammatory bowel disease, or in cases of salvage cystectomy.

Surgical Technique

All cystectomies were performed using an open approach according to standard techniques. For ileal conduit, a 15 cm ileal segment was isolated approximately 20 cm proximal to the ileocecal valve. The ureters were spatulated and anastomosed using either the Wallace or Bricker technique. For cutaneous ureterostomy, a V-shaped or U-shaped skin flap was fashioned, the ureter was extraperitoneal zed, and a double-J stent was placed prior to skin closure with 4-0 polyglactin sutures.

Follow-up Data Collection and Functional Assessment

Among the operated patients (40 IC, 59 CU), complete quality of life data was obtained for 32 IC patients and 51 CU patients. Health-related quality of life was assessed using the validated SF-36 questionnaire, which evaluates eight dimensions: physical functioning, role limitations due to physical health, role limitations due to emotional problems, vitality, mental health, social functioning, bodily pain, and general health perception. Each domain is scored from 0 (maximal impairment) to 100 (optimal status). Functional autonomy was evaluated using the Barthel Index (BI), which measures independence in activities of daily living (feeding, grooming, dressing, mobility, transfers, stair climbing). The total score ranges from 0 (complete dependence) to 100 (complete independence). Here is the optimized English translation of the "Results" section, with the corrected specific postoperative events as requested.

Results

Demographic and Perioperative Data

Demographic and perioperative characteristics were compared across the three urinary diversion groups in 99 patients. No significant differences were observed regarding mean age, sex distribution, body mass index (BMI), or perioperative hemoglobin variations. Operative time differed significantly between groups ($p < 0.001$), being shortest in the cutaneous ureterostomy (CU) group and longest in the ileal conduit (IC) group. Length of hospital stay was significantly shorter in the CU group compared to the IC group ($p = 0.002$). Similarly, time to drain removal and follow-up duration were significantly shorter in the CU group than in the IC group ($p = 0.002$ and $p < 0.001$, respectively). Pre- and postoperative creatinine level variations are presented in (Table 1).

Quality of Life and Functional Autonomy

Among the 83 patients who completed the quality-of-life questionnaires, only the "emotional function" and "fatigue" dimensions of the SF-36 differed significantly between groups ($p = 0.016$ and $p = 0.001$, respectively). The IC group exhibited significantly higher emotional function scores, while the CU group reported higher fatigue scores. No significant association was observed between the occurrence of complications and quality of life or autonomy scale scores.

Complications and Associated Factors

A significant association was found between the occurrence of complications and both length of hospital stays and ASA score. The presence of complications was correlated with a significant prolongation of hospitalization, while an ASA score of 4 increased the risk of complications. A significant relationship was also observed between complication occurrence and follow-up duration: patients who experienced complications had a shorter follow-up period. Multivariate analysis identified age and ASA score as independent factors associated with complications. A one-year decrease in age was associated with an increased risk of complications (OR = 1.11; 95% CI: 1.02–1.21). An ASA score of 4 was associated with a major increase in complication risk compared to scores 2–3 (OR = 31.98; 95% CI: 3.97–257.64) (Table 2).

Table 1: *Preoperative and postoperative blood creatinine levels of the patient groups.*

Creatinine	Preop	Postop	Postop 1st month	Postop 3rd month
Ureterocutaneostomy	1,28±0,93 1,09 (0,9–1,31)	1,30±0,80 1,17 (0,95–1,4)	1,34±0,90 1,11 (0,89–1,41)	1,38±1,24 1,13 (0,92–1,53)
Orthotopic Neobladder	1,06±0,37 0,91 (0,79–1,38)	1,23±0,55 1,12 (0,95–1,39)	1,2±0,37 1,26 (0,9–1,5)	1,23±0,48 1,19 (0,84–1,54)

Table 2*: Comparison of the characteristics and perioperative outcomes of patient groups.*

Groups	Ureterocutaneostomy	Ileal Conduit
Age, Mean±SD	68,0±9,5	68,4±8,7
Gender,n,(%)		
Male	46 (%90)	32 (%100)
Female	5 (%10)	0 (%0)
BMI, Mean±SD	25±2,8	25,1±3,5
Operation Time (minute)Mean ± SD	262,7±77,9	316,5±72,4
Hospital stay (day)		
Mean±SD	11,3±9,4	13,6±11,8
median (IQR	8 (6–16)	10 (8–15)
Hgb change, mean±SD	3,1±1,3	3,3±1,3
Drain withdrawal time (day),		
Mean±SD	5,7±2,3	7±2,8
Median (IQR)	5 (4–7)	7 (5–8)
Follow-up time,		
mean±SD	11,7±13,5	24,2±20,8
median (IQR)	6 (1–56)	19 (0–72)
Creatinine preop,		
mean±SD	1,28±0,93	1,05±0,35
median (IQR)	1,09 (0,9–1,31)	0,96 (0,82–1,21)
Creatinine postop,		
mean±SD	1,30±0,80	1,14±0,35
Median (IQR)	1,17 (0,95–1,4)	1,09 (0,9–1,33)
Creatinine postop1 st month,		
Mean±SD	1,34±0,90	1,30±0,72
median (IQR)	1,11 (0,89–1,41)	1,09 (0,85–1,58)
Creatinine postop 3rd month,		
Mean±SD	1,38±1,24	1,41±0,72
Median (IQR)	1,13 (0,92–1,53)	1,3 (1–1,49)

Mortality and Prognostic Factors

Mortality was significantly associated with operative time, preoperative hemoglobin level, and Charlson Comorbidity Index (CCI). Deceased patients had shorter operative times, lower preoperative hemoglobin, and higher CCI scores. A significant association was also observed between mortality and follow-up duration, as well as pre- and postoperative creatinine levels. Deceased patients had shorter follow-up durations and consistently higher creatinine values. On multivariate analysis,

CCI score and preoperative hemoglobin emerged as independent factors for mortality. A one-point increase in CCI was associated with an increased risk of mortality (OR = 1.84; 95% CI: 1.31–2.58). A one-unit decrease in preoperative hemoglobin increased the risk of mortality (OR = 1.32; 95% CI: 1.04–1.67). Although statistically significant differences in preoperative albumin levels were observed between the CU and IC groups, these remained within normal limits and were not considered clinically relevant.

Specific Postoperative Events

Two patients required ileal resection, and two required colostomies, with subsequent survival (Table 3).

***Table 3**: Comparison of perioperative outcomes based on complications and mortality.*

	Complication		Mortality	
	No	Yes	Alive	Ex
Group, n (%)*				
Ureterocutaneostomy	46 (%90)	5 (%10)	47 (%92)	4 (%8)
Ileal conduit	31 (%98)	1 (%2)	30 (%94)	2 (%6)
Age Mean±SD	68,1±9,0	62,4±7,7	67,2±8,6	68,9±9,9
Gender,n,(%)*				
Male	71 (%85)	5 (%6)	70 (%84)	6 (%7)
Female	6 (%7)	1 (%1)	7(%8)	0(%0)
BMI, Mean±SD	25,2±3,1	25,1±4,4	25,3±3,1	24,9±3,2
Operation Time (minute)Mean ± SD	307,8±94,1	283,1±78,3	318,1±91,3	283,4±93,7
Hospital stay (day), Mean±SD median (IQR	12,5±10,5 9 (7–14)	23,9±18,1 16,5 (11,5–37)	12,9±11,4 10 (7–14,5)	13,5±11,1 10 (7–16)
Preoperative Hgb, Mean±SD	12,2±1,8	11,3±1,6	12,5±1,8	11,5±1,6
Preoperative Albumin, Mean±SD	35,6±5,7	34,9±6,0	36,1±5,1	34,7±6,7
ASA score, n (%) *				
2	47 (%98)	1 (%2)	32 (%67)	16 (%33)
3	79 (%95)	4 (%5)	55 (%66)	28 (%34)
4	4 (%57)	3 (%43)	5 (%71)	2 (%29)
CCI, Mean±SD	4,98±1,37	5,75±1,39	4,66±1,32	5,72±1,23
Median (IQR)	5 (4–8)	6 (4,5–6,5)	4 (4–6)	6 (5–6)
Hgb change, Mean±SD	3,28±1,29	3,49±1,11	3,3±1,29	3,27±1,26
Drain withdrawal time (day), Mean±SD	6,75±4,1	8,88±3,87	7,1±4,6	6,4±2,8
Median (IQR	6 (2–38)	7 (5–15)	7 (5–8)	5 (4–8)
Follow-up time, mean±SD	20,8±20,3	6,4±6,1	22,6±21,1	14,9±16,8
median (IQR)	13 (4–31)	4,5 (2–9)	16 (6–35)	11 (2–18)
Creatinine preop, mean±SD	1,15±0,68	1,15±0,32	1,07±0,41	1,31±0,99
median (IQR)	1,01 (0,86–1,28)	1,17 (0,94–1,4)	0,98 (0,81–1,21)	1,09 (0,91–1,44)
Creatinine postop, mean±SD	1,21±0,61	1,28±0,44	1,14±0,42	1,38±0,84
Median (IQR)	1,12 (0,92–1,37)	1,25 (1,11–1,31)	1,09 (0,84–1,38)	1,2 (1,05–1,34)
Creatinine postop1 st month,				
Mean±SD	1,31±0,78	1,20±0,51	1,24±0,79	1,45±0,72
median (IQR)	1,1 (0,88–1,52)	1,1 (0,8–1,37)	1,05 (0,78–1,49)	1,25 (1,01–1,59)
Creatinine				
postop 3rd month, Mean±SD	1,39±0,95	1,16±0,56	1,28±0,95	1,59±0,86
Median (IQR)	1,21 (0,95–1,53)	1 (0,85–1,15)	1,15 (0,9–1,4)	1,35 (1,07–1,7)

Discussion

The choice of urinary diversion type after radical cystectomy is based on an individualized assessment integrating patient preferences, functional status, life expectancy, and oncologic control. In clinical practice, ileal conduit (IC) represents the most frequently used option [7]. Ileal conduit is generally associated with better body image perception and improved social interactions, but it remains technically more demanding and may be associated with a higher reoperation rate [8]. Cutaneous ureterostomy (CU), the simplest technique, constitutes a relevant alternative in frail patients (ASA score ≥ 3), as it avoids the use of

an intestinal segment, thereby reducing metabolic and surgical complications. It is particularly indicated in patients requiring anticoagulation, presenting with inflammatory bowel disease, or with a history of multiple abdominal surgeries [1,9]. Regarding morbidity, Kilciler et al. reported no increased risk of complications or reoperation with CU compared to IC, suggesting that CU constitutes a safe alternative [13]. However, other studies have reported divergent results [14,15], highlighting the heterogeneity of study populations and selection criteria. Concerning blood loss, our results show comparable hemoglobin variations between groups ($p = 0.128$), in agreement with the work of Kilciler and Sainin [1,13], as well as with Moeen et al., who found no significant difference in transfusion requirements between continent and incontinent diversions [2]. Experience in a high-volume center may contribute to reduced transfusion requirements. Preservation of renal function is a major concern. Some studies suggest an increased risk of renal impairment after CU due to recurrent pyelonephritis episodes or hydronephrosis secondary to stomal stenosis [1,9]. However, a comparative study including four types of diversion showed no significant difference in terms of renal function, although recurrent pyelonephritis and chemotherapy may play a deleterious role [16]. In our cohort, the increase in creatinine was significant in the IC group ($p = 0.004$), while the variations observed in the CU groups were more moderate. These results could be explained by direct and continuous urinary drainage in CU, whereas the ileal conduit may be exposed to reflux phenomena, anastomotic stenosis, or reservoir dysfunction. Quality of life after urinary diversion depends on multiple factors, including age, comorbidities, type of diversion, occurrence of complications, patient expectations, and surgical expertise. It is recommended that these procedures be performed in high-volume centers [2].

Few studies have simultaneously compared both modalities (CU, IC) [2,17,18]. In our study, assessment was based on the SF-36 [3] and Barthel index [4] questionnaires, which constitutes an original approach in this population. Literature data are contrasting. Erber et al., using the EORTC QLQ-C30 and BLM30 questionnaires, reported an advantage of IC in terms of physical function and global health status [19-20]. Other work suggests that IC might offer benefits in elderly patients on certain functional parameters, provided there are no long-term complications [21]. Conversely, Elbadry et al., using the FACT-BL questionnaire, observed higher overall scores in IC patients associated with better body image and better urinary control [22]. A meta-analysis of 21 studies including 2,285 patients showed globally comparable results, with a slight advantage for IC in young patients in good general condition [23]. In our study, only the "emotional function" and "fatigue" dimensions differed significantly. IC patients presented better emotional scores, probably related to more favorable body perception. In contrast, CU patients reported more fatigue, possibly related to initial frailty, comorbidities, and constraints associated with stoma equipment, particularly at night. These findings are consistent with the observations of Thulin et al., who reported impaired sleep and quality of life in some IC patients due to incontinence [24], highlighting the multifactorial complexity of these assessments. Some studies suggest that neither age, nor postoperative complications, nor BMI significantly influence long-term quality of life [25]. Our results confirm that, despite some specific differences, overall quality of life scores remain comparable between modalities. However, our study has several limitations: relatively short follow-up duration, single-center design, limited sample size in the IC group, and incomplete questionnaire response rate. Furthermore, assessments were performed at different postoperative time points, which may introduce variability. In conclusion, although many quality-of-life dimensions are similar between the two techniques, ileal conduit appears associated with better emotional function, while cutaneous ureterostomy is associated with more pronounced fatigue. IC seems more suitable for young patients in good general condition, whereas CU constitutes a relevant option for elderly high-risk patients. The decision must remain individualized, integrating comorbidities, surgeon experience, and detailed patient information, with quality-of-life questionnaires serving as an essential decision-making aid tool.

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