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Quality of Life Analysis in Patients with Simple Cutaneous Ureterostomy versus Ileal Conduit Bricker Following Radical Cystectomy

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Abbreviations:
RC: radical cystectomy;
MIBC: muscle-invasive bladder cancer;
NMIBC: non-muscle-invasive bladder cancer;
SCU: simple cutaneous ureterostomy;
HRQoL: health-related quality of life;
EQ-5D-5L: EuroQol 5-dimension 5-level questionnaire;
EQ-VAS: EuroQol visual analogue scale;
SPSS: Statistical Package for the Social Sciences;
IQR: interquartile range;
SD: standard deviation.

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Rezumat

Analiza calităţii vieţii la pacienţii cu derivaţie urinară de tip ureterostomie cutanată simplă comparativ cu conduct ileal Bricker după cistectomia radicală

Introducere: Cistectomia radicală asociată cu limfadenectomia pelvină rămâne standardul terapeutic în tratamentul cancerului vezical musculo-invaziv (MIBC). Impactul tipului de derivaţie asupra calităţii vieţii post-operatorii (HRQoL) este subiect de dezbatere, în special în contextul practicii clinice est-europene. *Obiectiv:* Studiul de faţă, retrospectiv, observaţional şi multicentric, a urmărit compararea calităţii vieţii la pacienţii supuşi cistectomiei radicale urmate de ureterostomie cutanată simplă (USC) sau conduct ileal non-continent (Bricker), în două centre universitare din România, cu aborduri chirurgicale distincte.
Material şi metodă: Au fost incluşi 46 de pacienţi diagnosticaţi cu TVMI non-metastatice, repartizaţi egal în două grupuri. Calitatea vieţii a fost evaluată la 3 luni postoperator utilizând chestionarul EQ-5D-5L şi scala vizuală analogică EQ-VAS. Scorurile indexate au fost calculate utilizând un set de valori validat la nivel european. S-a aplicat o regresie liniară multiplă pentru identificarea parametrilor independenţi ai scorurilor de calitate a vieţii.
Rezultate: Pacienţii din grupul Bricker au raportat scoruri EQ-VAS uşor mai favorabile. Sprijinul social s-a asociat paradoxal cu scoruri indexate mai reduse ($p<0,001$), sugerând o afectare funcţională mai severă în rândul pacienţilor care necesită asistenţă. Tipul de abord chirurgical nu a influenţat semnificativ calitatea vieţii. Pacienţii de sex masculin au raportat limitări mai accentuate în autoîngrijire şi activităţi cotidiene ($p<0,05$).
Concluzii: Ambele tehnici de derivaţie urinară oferă rezultate comparabile privind calitatea vieţii la 3 luni postoperator. Sprijinul social poate reprezenta un marker indirect al vulnerabilităţii funcţionale, subliniind necesitatea unei abordări individualizate şi multidisciplinare.

Cuvinte cheie: cistectomie radicală, derivarție urinară, ureterostomie cutanată simplă, conduct ileal (tehnica Bricker), calitatea vieții, sprijin social, EQ-5D-5L, EQ-VAS

Abstract

Introduction: Radical cystectomy (RC) with pelvic lymphadenectomy remains the standard therapeutic approach in the treatment of muscle-invasive bladder cancer (MIBC). The impact of urinary diversion type on postoperative health-related quality of life (HRQoL) remains a debated topic, especially in the context of Eastern European clinical practice. *Objective:* This retrospective, observational, multicentric study aimed to compare the quality of life in patients undergoing RC followed by either simple cutaneous ureterostomy (SCU) or non-continent ileal conduit (Bricker), across two academic centers in Romania, utilizing different surgical approaches.
Material and Methods: A total of 46 patients diagnosed with non-metastatic MIBC were included and equally distributed into two groups. Quality of life was assessed at 3 months postoperatively using the EQ-5D-5L questionnaire and the EQ-VAS visual analogue scale. Indexed scores were calculated using a European value set. A multivariate linear regression was applied to identify independent predictors of quality of life scores.
Results: Patients in the Bricker group reported slightly higher EQ-VAS scores. Paradoxically, social support was associated with lower indexed scores ($p<0.001$), suggesting more severe functional impairment among patients requiring assistance. The type of surgical approach did not significantly impact quality of life. Male patients reported greater limitations in self-care and daily activities ($p<0.05$).
Conclusions: Both urinary diversion techniques yield comparable quality of life outcomes at 3 months post-operatively. Social support may serve as an indirect marker of functional vulnerability, emphasizing the need for an individualized and multidisciplinary approach.

Keywords: radical cystectomy, urinary diversion, simple cutaneous ureterostomy, ileal conduit (Bricker technique), quality of life, social support, EQ-5D-5L, EQ-VAS

Introduction

Bladder tumors exhibit a heterogeneous progression, ranging from superficial non-muscle-invasive bladder cancer (NMIBC), characterized by recurrent and progressive potential, to muscle-invasive bladder cancer (MIBC), which requires radical treatments such as radical cystectomy (RC) combined with pelvic lymphadenectomy, systemic chemotherapy, radiotherapy, and, in selected cases, immunotherapy (1-4). Globally, over 550,000 new cases of bladder cancer are diagnosed annually (2). Currently, the standard treatment for non-metastatic MIBC consists of neoadjuvant chemotherapy followed by radical cystectomy with pelvic lymphadenectomy (5-8). Radical cystectomy is also indicated in high-risk NMIBC when conservative treatments fail (6,8-10).

The incidence of postoperative complications following RC is high, with reported rates reaching up to 80% at 30 and 90 days postoperatively. Moreover, procedure-related mortality is estimated at 2.1% at 30 days and 4.7% at 90 days (11,12).

The literature includes numerous studies evaluating the impact of bladder cancer on quality of life (13-16). According to recent data, the preoperative period is considered an optimal time for implementing general health optimization strategies such as physical activity, nutritional support, psychological counseling, and smoking cessation, all aimed at improving surgical tolerance, reducing the frequency and severity of complications, and enhancing postoperative recovery and HRQoL (17).

Studies evaluating the effects of RC in MIBC have highlighted its negative impact on urinary, gastrointestinal, and sexual functions, often contributing to symptoms of anxiety and depression (18-21). Patients requiring urinary diversion through techniques such as SCU or the non-continent ileal conduit (Bricker) must undergo major lifestyle adjustments and face challenges associated with the presence of a urinary stoma. Postoperative recovery involves not only direct medical care but also the integration of family members in the daily stoma management, requiring adaptation of routines to provide effective patient support (22).

Over the past decades, approximately 100

studies have validated the psychometric properties of the EQ-5D-5L questionnaire, most conducted in Western European countries, within the Organisation for Economic Co-operation and Development, and to a lesser extent, in East Asia (23). The EQ-5D-5L questionnaire facilitates a detailed evaluation of functional and psychosocial health parameters, including mobility, autonomy in self-care, ability to carry out daily activities, perception of pain and discomfort, and emotional status, focusing on anxiety and depression (18,24). The last component of the instrument uses a visual analogue scale (EQ-VAS) ranging from 0 to 100 to quantify the patient's perception of their health status at the time of the survey (18,23).

The primary rationale of this study stems from the need to clarify an ongoing clinical debate regarding the optimal type of urinary diversion following radical cystectomy. While international literature provides various perspectives on post-operative functional outcomes and quality of life, there is a notable lack of data that are directly applicable to the Eastern European context. In Romania, the choice of urinary diversion method is often influenced not only by patient-specific clinical factors, but also by the availability of surgical infrastructure (laparoscopic versus open approach) and the operative experience of each institution - elements that differ significantly between medical centers. Therefore, a comparative evaluation of these two diversion techniques in institutions with distinct but regionally relevant practices emerges as a necessary endeavor to inform a personalized therapeutic approach, tailored to local resources and the real-world needs of patients.

The aim of this study is to evaluate the quality of life in patients who underwent RC with urinary diversion via SCU or non-continent ileal conduit (Bricker). The assessment was conducted using the EQ-5D-5L questionnaire in two academic centers in Romania - one utilizing an open surgical approach and the other a laparoscopic approach - in order to identify differences in functional outcomes and postoperative quality of life.

Materials and Methods

The present study was designed as a retrospective, observational, comparative analysis conducted in two academic medical institutions in Romania with advanced expertise in oncologic urological surgery. The study was carried out between January 2022 and January 2025 at the Cluj-Napoca Municipal Clinical Hospital and the Prof. Dr. Th. Burghele Clinical Hospital in Bucharest. The selection of these two centers was based on the complementary nature of their surgical approaches: the center in Cluj-Napoca has a strong clinical background in laparoscopic urological surgery, whereas the Bucharest unit has long-standing and recognized experience in conventional open procedures.

To minimize the risk of selection bias, all patients consecutively diagnosed with non-metastatic muscle-invasive bladder cancer (MIBC) who underwent radical cystectomy followed by urinary diversion through Bricker or SCU between January 2022 and January 2025 in the two participating centers were included. Thus, the sample reflects current clinical practice without influencing patient selection. Each patient underwent a urinary diversion procedure, with the technique selected individually based on clinical, anatomical, and functional characteristics, as well as preoperative preferences expressed following multidisciplinary counseling.

The patient cohort was divided into two equal groups based on the type of urinary diversion performed. Group I included 23 patients who underwent simple cutaneous ureterostomy. Group II also included 23 patients who received urinary diversion via non-continent ileal conduit according to Bricker principles. Included patients ranged in age from 46 to 85 years, with male sex predominating in both groups. Inclusion criteria required a confirmed diagnosis of MIBC, completion of a complex surgical intervention such as radical cystectomy, and urinary diversion exclusively by one of the two analyzed techniques. Only patients who attended the 3-month postoperative follow-up visit and were capable of validly completing the EQ-5D-5L questionnaire were included. Exclusion criteria comprised the presence of severe neuropsychiatric disorders that could impair self-assessment capacity, lack of compliance with follow-up, loss to follow-up, and early oncological progression manifested as local recurrence or systemic metastases within the first 3 months after surgery. In total, 8 patients were excluded: 3 due to cognitive impairment, 2 lost to follow-up, and 3 due to early oncologic progression. The final study sample included 46 patients.

To assess quality of life, the EQ-5D-5L questionnaire was used - an internationally recognized tool with validated psychometric properties in oncological contexts. It explores five essential dimensions of the patient's functional and psychological status: mobility, self-care (including personal

hygiene and dressing), usual activities (such as shopping or home management), perception of pain and physical discomfort, and emotional status, with a focus on anxiety and depression, along with a global indexed score. Each dimension is rated on a scale from 1 to 5, where score 1 indicates no problems and score 5 indicates severe limitations or complete inability. The EQ-5D-5L index score was calculated for each patient based on responses to the five dimensions: mobility, self-care, usual activities, pain/discomfort, and anxiety/depression. Each dimension was assigned a severity level from 1 (no problems) to 5 (extreme problems). The resulting combinations were transformed into index scores using a European EQ-5D-5L value set, validated for use in the absence of a national Romanian set. The index score ranges from 0.281 (health state perceived as worse than death) to 1 (perfect health state), reflecting the perceived utility value of health status in internationally comparable terms.

To assess the role of social support in postoperative recovery, patients were asked an additional binary question regarding its presence ("present"/ "absent"). This variable enabled the identification of differences between patients actively supported by family or caregivers and those managing the postoperative process independently.

In addition to these dimensions, the EQ-VAS visual analogue scale was used, allowing the subjective global assessment of health status on a scale from 0 to 100. A score of 0 represents the worst imaginable health state, while a score of 100 reflects the best possible health state perceived by the patient at the time of completing the questionnaire.

To identify independent predictors of the EQ-5D-5L index score, a multivariate linear regression model was applied, including the following variables: sex, age, presence of social support, type of surgical approach (open vs. laparoscopic), and type of urinary diversion (SCU vs. Bricker), as well as interactions between sex and support, and between age and surgical approach.

In addition to subjective questionnaire data, relevant clinical and demographic information was collected, such as the patient's age at the time of surgery and the type of surgical approach used (laparoscopic for most patients operated in Cluj-Napoca and open for those treated in Bucharest). These data were used to correlate possible influences on the perception of postoperative quality of life.

Statistical analysis was conducted using IBM SPSS Statistics software, version 25, as well as Microsoft Office (Excel and Word), 2024 edition. The distribution of quantitative variables was tested using the Shapiro-Wilk test. Variables were expressed as means with standard deviations (for normal distributions) or medians with interquartile ranges (for non-parametric distributions). Comparisons of independent quantitative variables were performed accordingly: for normally distributed data, the independent samples t-test (Student's t-test) was used, with prior testing for homogeneity of variances via Levene's test; for non-parametric data, the Mann-Whitney U test was applied. Categorical variables were expressed as absolute values and percentages, and comparisons between groups were performed using Fisher's exact test. The threshold for statistical significance was set at the conventional $\alpha = 0.05$, with differences considered significant when p-values were below this threshold.

This study is distinguished by its comparative approach applied within an Eastern European context, using an internationally validated instrument for evaluating the quality of life among oncology patients undergoing major surgical procedures. Unlike other studies conducted in Western medical centers, this research analyzes the functional and psychosocial impact of the two techniques under real-world Romanian clinical conditions, offering a relevant comparative framework for assessing postoperative outcomes.

All procedures were conducted in accordance with the Declaration of Helsinki, and the study protocol was approved by the ethics committees of both participating institutions. All patients provided informed consent for the scientific use of their medical data, and all information was collected, analyzed, and reported in compliance with confidentiality and personal data protection regulations, in line with applicable national and European legislation.

Results

Descriptive analysis of the cohort revealed a balanced distribution of patients based on the type of surgical technique used. The characteristics of the study cohort are presented in *Table 1* and *Fig. 1.* Of the 46 patients included in the study, 23 (50%) underwent urinary diversion via the Bricker technique, and the remaining 23 (50%) received simple cutaneous ureterostomy (SCU). Similarly, distribution by academic center was balanced: half

Table 1. Patient characteristics according to the type of urinary diversion

Parameter	Total	SCU	Bricker	p
N (%)	100	50	50	-
Center (%)				
Cluj-Napoca	50	21.7	78.3	<0.001*
Bucharest	50	78.3	21.7	
Sex (%)				
Male	71.7	73.9	69.6	1.000*
Female	28.3	26.1	30.4	
Age (Mean ± SD) (years)	68.2 ± 7.06	69.9 ± 5.25	66.5 ± 8.28	0.104**
Residence (%)				
Rural	45.7	52.2	39.1	0.554*
Urban	54.3	47.8	60.9	
Surgical Approach (%)				
Open	60.9	100	21.7	<0.001*
Laparoscopic	39.1	0	78.3	
EuroQoL-5D Parameters – Median (IQR)				
Mobility	1 (1-3.25)	1 (1-4)	1 (1-2)	0.103***
Self-Care	1 (1-3.25)	1 (1-4)	1 (1-2)	0.469***
Usual activities	3 (1-4)	3 (1-4)	3 (1-5)	0.496***
Pain/Discomfort	2 (1-4)	2 (1-4)	2 (1-4)	0.964***
Anxiety/Depression	2 (1-3.25)	2 (1-4)	2 (1-3)	0.354***
VAS Score – Perceived Health Status	80 (57.5-90)	75 (50-85)	80 (60-90)	0.549***
Social Support (%)				
Absent	73.9	65.2	82.6	0.314*
Present	26.1	34.8	17.4	

*Fisher's Exact Test, **Student T-Test, ***Mann-Whitney U Test

of the patients were treated at the Prof. Dr. Th. Burghele Clinical Hospital in Bucharest, and the other half at the Cluj-Napoca Municipal Clinical Hospital.

However, when considering the type of diversion used, the distribution differed significantly between the two institutions. In Bucharest, the majority of patients underwent SCU (78.3%), while in Cluj-Napoca the Bricker technique was predominantly used (also 78.3%), with this difference being statistically significant ($p < 0.001$). This variation most likely reflects the specific characteristics of each center regarding infrastructure, surgical expertise, and the therapeutic protocols implemented locally.

Demographically, the majority of patients were male (71.7%), with a mean age of 68.2 years (± 7.06), a median age of 69 years, and an interquartile range (IQR) between 65 and 73 years. Nearly half of the patients (45.7%) were over the age of 70, and most (54.3%) originated from urban areas. Regarding the surgical approach, 60.9% of

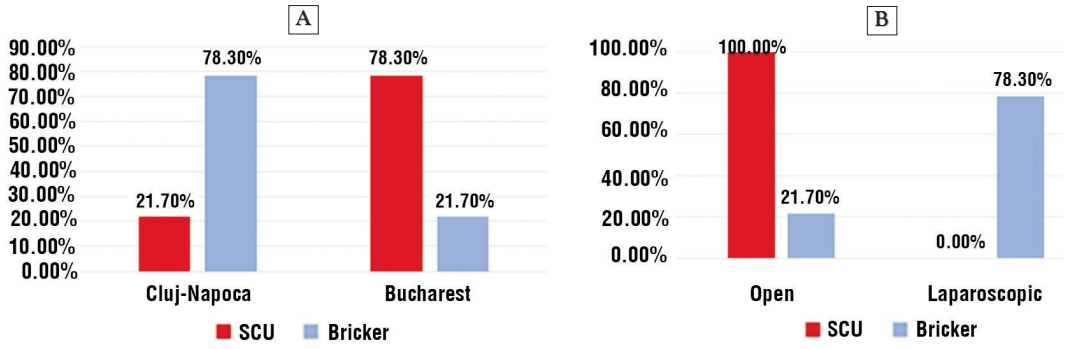

Figure 1. Distribution of patients according to the surgical technique and university center **(A)** or surgical approach **(B)**

patients underwent open surgery, which was significantly more common in the SCU group, where it was applied exclusively (100% vs. 21.7% in the Bricker group, $p < 0.001$). It is also noteworthy that SCU was more frequently performed in older patients, likely due to the shorter duration and technically simpler nature of the procedure compared to Bricker, making it more suitable for individuals with reduced functional reserve.

Analysis of the EQ-5D-5L questionnaires revealed no statistically significant differences between the two types of urinary diversion for any of the functional or emotional dimensions assessed ($p > 0.05$). Overall, the scores reflected a relatively mild impact on quality of life at 3 months postoperatively. For mobility and self-care, the median score was 1 (IQR = 1-3.25), suggesting preserved autonomy in most patients. Usual activities were slightly more affected (median = 3, IQR = 1-4), which is expected following a major surgical intervention and the need to adapt to a new postoperative status. Pain perception had a median score of 2 (IQR = 1-4), indicating a low level of discomfort, while depressive symptoms were moderate (median = 2, IQR = 1-3.25). The EQ-VAS score for perceived overall health was 80 (IQR = 57.5-90), suggesting that despite the magnitude of the intervention, patients generally perceived their health status as good.

The multiple regression model explained approximately 52.8% of the variance in indexed scores ($R^2 = 0.528$). Among all variables investigated, only social support had a statistically significant influence on the index score ($p < 0.001$), being negatively associated with perceived quality of life. None of the other variables - sex ($p = 0.24$), age ($p = 0.13$), surgical approach ($p = 0.89$), type of urinary diversion ($p = 0.35$), or interaction terms - had a significant impact on the index score. Although not statistically significant, the slightly higher scores in the Bricker group may indicate a favorable trend, possibly associated with the minimally invasive approach (*Table 2* and *Fig. 2*).

Table 2. Multiple linear regression analysis of factors associated with EQ-5D Index Score at 3 months post-cystectomy

Variable	Regression Coefficient (B)	Standard Error	p-value
Social support (present vs. absent)	-0.594	0.141	< 0.001
Sex (male vs. female)	-0.082	0.068	0.240
Age (continuous)	-0.014	0.009	0.130
Surgical approach (laparoscopic vs. open)	0.005	0.055	0.890
Urinary diversion (Bricker vs. SCU)	0.037	0.039	0.350
Sex X Support interaction	-0.021	0.017	0.270
Age X Approach interaction	0.008	0.012	0.430

*The model applied was a multiple linear regression with the EQ-5D-5L index score as the dependent variable. Statistical significance was defined as $p < 0.05$. Coefficients represent the direction and strength of association between each predictor and the quality of life score.

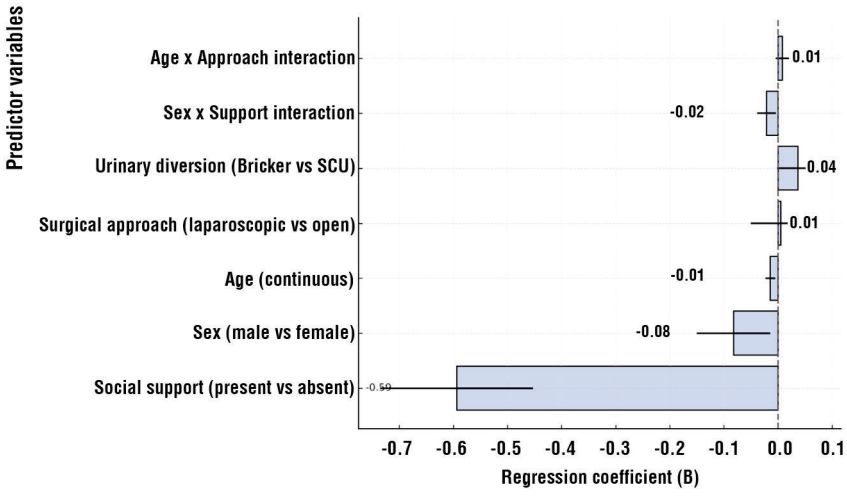

Figure 2. Strength and direction of association between clinical and psychosocial predictors and EQ-5D-5L Index Score at 3 months post-cystectomy

* Horizontal bars represent regression coefficients (B) with standard error. Negative values indicate association with lower quality of life scores.

Table 3. Characteristics of patients who underwent SCU technique, according to the university center

Parameter	Cluj-Napoca	Bucharest	p
Sex (%)			
Male	60	77.8	0.576*
Female	40	22.2	
Age (Mean ± SD)(years)	71.6 ± 3.21	69.44 ± 5.68	0.430**
Residence (%)			
Rural	60	50	1.000*
Urban	40	50	
Surgical Approach (%)			
Open	100	100	-
Laparoscopic	0	0	
EuroQoL-5D Parameters – Median (IQR)			
Mobility	1 (1-2)	2 (1-4)	0.325***
Self-care	1 (1-4)	1.5 (1-4.25)	0.801***
Usual activities	3 (1.5-3)	3 (1-4.25)	0.638***
Pain/Discomfort	2 (1.5-2.5)	2.5 (1-4)	0.538***
Anxiety/Depression	2 (1-2.5)	2.5 (1-4.25)	0.325***
VAS Score – Perceived Health Status	80 (77.5-80)	72.5 (50-90)	0.446***
Social Support (%)			
Absent	60	66.7	1.000*
Present	40	33.3	

*Fisher's Exact Test, **Student T-Test, ***Mann-Whitney U Test

Comparative analyses between centers, according to the diversion technique used, provided additional insights. The characteristics of patients who underwent SCU procedures, stratified by academic center, are presented in *Table 3*. In the SCU group, most patients were treated in Bucharest (78.3%), predominantly male (73.9%), with a mean age of 69.91 years and an even distribution between rural (52.2%) and urban areas. No significant differences were recorded between centers in terms of sex, age, or place of residence. EQ-5D index scores were similar across both centers. Despite comparable EQ-5D scores, the VAS score indicated a slightly more favorable global health perception in the Bricker group.

The characteristics of patients who underwent surgery using the Bricker technique, as related to the academic center, are presented in *Table 4*. In the Bricker group, most patients were treated in Cluj-Napoca (78.3%), and 69.6% were male, with a

Table 4. Characteristics of patients who underwent Bricker technique, according to the university center

Parameter	Cluj-Napoca	Bucharest	p
N (%)	78.3	21.7	-
Sex (%)			
Male	66.7	80	1.000*
Female	33.3	20	
Age (Mean ± SD) (years)	66 ± 7.59	68.4 ± 11.23	0.578**
Residence (%)			
Rural	44.4	20	0.611*
Urban	55.6	80	
Surgical Approach (%)			
Open	0	100	<0.001*
Laparoscopic	100	0	
EuroQoL-5D Parameters – Median (IQR)			
Mobility	1 (1-1.25)	1 (1-4)	0.491***
Self-care	1 (1-2)	2 (1.5-4.5)	0.111***
Usual activities	3 (1-4.25)	4 (3-5)	0.130***
Pain/Discomfort	2 (1-3)	4 (2.5-4.5)	0.046***
Anxiety/Depression	2 (1-3.25)	2 (1-2.5)	0.691***
Scor total	8.5 (6.75-13.75)	14 (10.5-18.5)	0.111***
VAS Score – Perceived Health Status	80 (67.5-91.25)	70 (40-87.5)	0.403***
Social Support (N, %)			
Absent	88.9	60	0.194*
Present	11.1	40	

*Fisher's Exact Test, **Student T-Test, ***Mann-Whitney U Test

Table 5. Comparative analysis of health-related quality of life (HRQoL) scores using EQ-5D-5L at 3 months post-cystectomy, according to type of urinary diversion

Group	Number of patients	Mean EQ-5D Index Score	Standard Deviation	EQ-VAS Median (IQR)	Mobility (Median, IQR)	Self-care (Median, IQR)	Usual Activities (Median, IQR)	Pain/ Discomfort (Median, IQR)	Anxiety/ Depression (Median, IQR)
Bricker (Cluj-Napoca)	23	0.63	0.33	85 (70–95)	2 (1–3)	2 (1–3)	3 (2–4)	2 (1–3)	2 (1–2.5)
SCU (Bucharest)	23	0.34	0.33	70 (35–80)	3 (2–5)	4 (3–5)	5 (3–5)	3 (2–4)	3.5 (2.2–4.7)
Total	46	0.485		80 (57.5–90)	2 (1–3.25)	1 (1–3.25)	3 (1–4)	2 (1–4)	2 (1–3.25)

*Comparisons were made using the Mann-Whitney U test for continuous variables and Fisher's exact test for categorical data.
A p-value < 0.05 was considered statistically significant.

mean age of 66.52 years, and 60.9% originated from urban areas. Most patients in Cluj-Napoca underwent laparoscopic surgery, unlike those in Bucharest, where open surgery was predominantly used. This difference in approach was statistically significant ($p < 0.001$). Regarding EQ-5D-5L index scores (*Table 5*), patients operated in Cluj-Napoca had a mean score of 0.63 (SD = 0.33), compared to a significantly lower mean of 0.34 (SD = 0.33) in Bucharest, $p = 0.093$. Although the difference did not reach statistical significance ($p < 0.05$), the trend suggests less functional impairment in patients who underwent laparoscopic surgery, possibly due to the reduced invasiveness and faster postoperative recovery.

The characteristics of patients who underwent surgery using the SCU technique, reported by academic center, are presented in *Table 6*. Sex-

Table 6. Comparison of EuroQoL-5D questionnaire scores according to demographic variables and type of surgical approach

Parameter (Median (IQR)) / Age	< 70 years	≥ 70 years	p
Mobility	1 (1-3.5)	1 (1-3.5)	0.848*
Self-care	1 (1-2)	2 (1-4)	0.187*
Usual activities	3 (1-4)	3 (2-4.5)	0.311*
Pain/Discomfort	2 (1-3.5)	2 (2-4)	0.335*
Anxiety/Depression	2 (1-3.5)	2 (1-3.5)	0.449*
Total score	9 (6.5-15)	12 (8-18.5)	0.223*
ScVAS Score – Perceived Health	80 (55-90)	75 (55-80)	0.233*
Social support present (N, %)	5 (20%)	7 (33.3%)	0.335**
Parameter (Median (IQR)) / Sex	**Male**	**Female**	**p**
Mobility	1 (1-4)	1 (1-1.5)	0.146*
Self-care	2 (1-4.5)	1 (1-1.5)	0.028*
Usual activities	3 (1.5-5)	2 (1-3)	0.020*
Pain/Discomfort	2 (1-3.5)	2 (1.5-4)	0.598*
Anxiety/Depression	2 (1-4)	2 (1-3)	0.559*
Total score	12 (7-19.5)	8 (7.5-11.5)	0.221*
ScVAS Score – Perceived Health	80 (50-90)	80 (65-80)	0.693*
Social support present (N, %)	11 (33.3%)	1 (7.7%)	0.135**
Parameter (Median (IQR)) / Place of Residence	**Rural**	**Urban**	**p**
Mobility	1 (1-3)	1 (1-4)	0.919*
Self-care	1 (1-3)	1 (1-4)	0.809*
Usual activities	3 (1.5-4)	3 (1-5)	0.600*
Pain/Discomfort	2 (1.5-3.5)	2 (1-4)	0.786*
Anxiety/Depression	3 (1.5-3.5)	1 (1-3.5)	0.158*
Total score	9 (7-17)	10 (7.5-16.5)	0.974*
ScVAS Score – Perceived Health	75 (50-82.5)	80 (65-90)	0.196*
Social support present (N, %)	6 (28.6%)	6 (24%)	0.749**
Parameter (Median (IQR)) / Surgical Approach	**Open**	**Laparoscopic**	**p**
Mobility	1 (1-4)	1 (1-1.25)	0.068*
Self-care	2 (1-4)	1 (1-2)	0.114*
Usual activities	3 (1.25-4)	3 (1-4.25)	0.667*
Pain/Discomfort	2.5 (1.25-4)	2 (1-3)	0.243*
Anxiety/Depression	2 (1-3.75)	2 (1-3.25)	0.623*
Total score	11.5 (8-19.5)	8.5 (6.75-13.75)	0.151*
ScVAS Score – Perceived Health	75 (50-83.75)	80 (67.5-91.25)	0.301*
Social support present (N, %)	10 (35.7%)	2 (11.1%)	0.090**

* Mann-Whitney U Test, **Fisher's Exact Test

based analysis revealed that male patients experienced significantly greater impairments in self-care ($p = 0.028$) and performance of usual activities ($p = 0.020$) compared to female patients. These differences may be explained by the potential difficulty men face in adapting to postoperative changes involving body image and daily routines, as well as by a possibly lower level of preoperative involvement in household and self-care activities.

A particularly important and clinically relevant aspect was the analysis of social support's impact on postoperative quality of life (*Table 7*). Only 26.1% of patients reported having active social support. Comparative analysis between patients who had support and those without a support network revealed significant differences across almost all EQ-5D dimensions. Paradoxically, patients who benefited from social support recorded higher scores (i.e., greater impairment): mobility (median = 4, IQR = 2.25–5, $p < 0.001$), self-care (median = 5, IQR = 4–5, $p < 0.001$), usual activities (median = 5, IQR = 3.25–5, $p < 0.001$), depression (median = 3.5, IQR = 2.2–4.7, $p = 0.002$), a significantly lower index score (mean = 0.088 vs. 0.682; $p < 0.001$), and a lower VAS score (median = 70, IQR = 35–80, $p = 0.017$).

This apparently paradoxical association suggests that patients receiving active social support are, in fact, those with more severe functional impairment, requiring constant assistance with daily activities. Thus, social support may indirectly reflect the severity of the clinical condition.

Discussion

This study aimed to comparatively evaluate the quality of life among patients who underwent radical cystectomy followed by urinary diversion via either a non-continent ileal conduit (Bricker) or simple cutaneous ureterostomy (SCU), performed in two distinct academic centers in Romania. The study stands out due to its multidimensional approach, which considered not only the surgical technique and type of diversion, but also psychosocial factors such as social support and their influence on recovery and health perception at three months postoperatively.

An important finding of this study is the significant influence of the academic center on the selection of surgical technique. Although the overall distribution of patients was balanced between the two diversion types, a detailed analysis revealed a statistically significant difference in the choice of surgical method between the two hospitals ($p < 0.001$). This finding points not only to variability in clinical practice, but also to potential differences in therapeutic protocols, surgical expertise, and access to technology. Thus, the choice of technique was not exclusively determined by patient-related characteristics but also by institutional factors such as surgical experience, infrastructure, and local protocols.

Comparison between the two urinary diversion techniques revealed higher mean EQ-VAS scores in the Bricker group, suggesting a better perception of general health status. Observed differences in the self-care and usual activities dimensions appear to be influenced by initial patient selection, with SCU being more frequently applied in immunocompromised patients. These findings are partially consistent with those reported by Wang et al. and Arman et al., who noted good postoperative adaptation with both techniques, though with a favorable trend for Bricker diversion in terms of overall quality of life scores when applied in patients with optimal preoperative status (24,25).

The questionnaires were completed by patients during the 3-month follow-up visit, with the support of medical staff to ensure proper comprehension. The 3-month postoperative time point was chosen as it is considered relevant for the stabilization of functional and emotional status after surgery, according to data from the literature. This timing facilitates comparability with other studies and allows for an objective assessment of the impact of urinary diversion on quality of life,

Table 7. Comparison of EuroQoL-5D questionnaire scores based on the presence of social support

Parameter (Median (IQR)) / Social Support	Absent	Present	p*
Mobility	1 (1-1)	4 (2.25-5)	<0.001
Self-care	1 (1-2)	5 (4-5)	<0.001
Usual activities	2.5 (1-3)	5 (3.25-5)	<0.001
Pain/Discomfort	2 (1-3.25)	3 (1.25-4.75)	0.194
Anxiety/Depression	1.5 (1-3)	3.5 (2.2-4.7)	0.002
VAS Score – Perceived Health Status	80 (67.5-90)	70 (35-80)	0.017

* Mann-Whitney U Test

avoiding distortions related to immediate postoperative recovery. For example, a study published in European Urology evaluated the quality of life of patients at 3 and 6 months after radical cystectomy using the Short Form-8 and FACT-VCI questionnaires. The authors observed a significant improvement in emotional well-being at 3 months postoperatively compared to preoperative values (26).

Our results differ from those of other studies, such as that by Longo et al., which did not identify significant differences between the two urinary diversion types (27). This discrepancy may be explained by differential patient selection: in our center, SCU was preferentially used in elderly patients or those with multiple comorbidities, which can affect functional recovery and quality of life perception. Literature suggests that the presence of two stomas or ureteral strictures can reduce the theoretical benefits of SCU on quality of life. For example, stoma complications (stenosis, reflux, infections) are associated with significant physical limitations and psychological distress (27,29,30).

The surgical approach was another aspect evaluated, comparing the Bucharest center, where open surgery was predominantly used, with the Cluj-Napoca center, where most procedures were performed laparoscopically. The absence of significant differences in quality of life scores at three months suggests that the benefits of laparoscopy tend to diminish during the intermediate postoperative period, although early recovery advantages are well documented. This result is supported by international studies indicating that the benefits of laparoscopy are primarily evident in the immediate postoperative phase, with limited impact on medium-term quality of life (31,32). Our findings reinforce the idea that the advantages of minimally invasive surgery are most notable immediately after surgery - through reduced pain, earlier return of bowel function, and quicker mobilization - but that after approximately 3-6 months, patient-reported quality of life levels out, being predominantly dictated by the presence of a stoma and individual adaptation (33).

Once the convalescent period is over, quality of life becomes less dependent on the type of incision and more influenced by the long-term consequences of cystectomy (e.g., functional changes due to the stoma, oncologic status, comorbidities). Our observation that surgical approach (laparoscopic vs. open) was not an independent predictor of QoL at follow-up aligns with the conclusions of Catto et al., who reported that, at a population level, age- and sex-adjusted generic quality of life is similar regardless of the treatment approach for muscle-invasive bladder cancer (5).

Sex-based analysis revealed significantly greater functional impairment among male patients, particularly in self-care and performance of daily activities ($p = 0.028$ and $p = 0.020$, respectively). This finding may reflect adaptation difficulties to the new postoperative status, as well as cultural or behavioral differences regarding preoperative involvement in self-care activities. Clinicians should be aware of these particularities and personalize postoperative educational and psychosocial interventions accordingly.

A novel aspect of our study was the evaluation of social support as an independent factor. Contrary to expectations, patients who reported receiving social support had, on average, lower quality of life scores. This paradoxical association may be interpreted as indicating that those who require constant support are functionally or emotionally more impaired, and in this context, social support reflects more a marker of disease severity than a protective factor. A psychological mechanism may also be considered: loss of functional independence, fear of becoming a burden to loved ones, and depressive symptoms may contribute to a negative perception of quality of life despite the presence of active support (34).

Our study draws attention to these subtle aspects and supports the integration of psychosocial approaches into the care of post-cystectomy patients. This finding, supported by statistically significant differences in most dimensions ($p < 0.001$), suggests that social support does not always act as a protective factor but may be an indirect indicator of poor functional status. Severely affected patients are more likely to require assistance, and the perception of dependence may amplify feelings of vulnerability or uselessness, thereby lowering subjective health scores (35).

Finally, the advanced age, reduced functional reserve and cognitive status of patients selected for SCU may represent a potential source of bias that must be considered (36,37). Although no statistically significant differences in age were found between groups, the preferential selection of elderly patients for this technique may negatively influence functional scores, without directly reflecting the inferiority of the surgical method.

Interestingly, male patients demonstrated greater functional impairment, particularly in self-care and daily activities ($p = 0.028$ and $p = 0.020$).

This may reflect challenges in adapting to the postoperative status and a lower degree of prior involvement in domestic and self-care tasks. Nonetheless, the literature indicates increased emotional vulnerability among female patients, which may negatively affect general health perception through changes in body image, sexuality, and increased risk of depression. Studies by McNichol and Mason emphasize the importance of postoperative education programs for urostomy patients, showing that structured social support, both educational and emotional, can have a significant positive impact on reintegration and well-being perception (18,22).

Recent studies highlight that gender-specific internalized socio-behavioral norms significantly influence postoperative adaptation. Male patients, often less involved prior to surgery in routine tasks related to personal care or domestic management, may exhibit a diminished capacity to adjust to the functional demands imposed by the presence of a urinary stoma. In contrast, female patients - by virtue of their consistent engagement in daily caregiving roles - tend to develop a higher degree of practical competence in managing the new medical condition (39). Furthermore, psychological stress management strategies differ by sex: men are more likely to employ passive or avoidant coping styles, such as symptom minimization or distraction, which may delay access to appropriate support and exacerbate the perception of functional limitations (40). Conversely, women more frequently mobilize relational resources and express emotional distress openly, which may facilitate a more effective psychological adjustment. A recent study has shown that social integration and the ability to reintegrate into everyday life are more profoundly impaired in men, whereas female patients did not demonstrate similar disparities (41).

Clinically, our results indirectly suggest that Bricker diversion may be recommended for patients with good functional reserve, whereas SCU remains a feasible solution for patients with higher operative risk. This hypothesis is based primarily on the clinical profile of patients selected for each surgical technique rather than on a direct comparison of the efficacy of the two methods. Simple cutaneous ureterostomy (SCU) was predominantly performed in elderly patients or those with multiple comorbidities, which may account for the lower functional scores observed in this group.The choice of diversion method should be personalized, taking into account not only surgical aspects but also the patient's psychosocial profile and available resources for postoperative support. Additionally, promoting minimally invasive surgery in centers with the necessary infrastructure may help reduce early complications and enhance recovery.

Integrating social support assessment into clinical practice may allow identification of vulnerable patients and the referral of such individuals to counseling services, support groups, or specific rehabilitation programs (demonstrated by Rutten et al. to improve preoperative QoL) (9, 41). Ultimately, the therapeutic objective should not be limited to oncologic cure but should also include maintaining a quality of life as close to normal as possible through a multidisciplinary, patient-centered approach.

The present study has inherent limitations due to its retrospective, observational, and comparative design. Patient allocation according to urinary diversion type was not randomized but rather reflected the standard clinical practice of the two participating centers, which may introduce a potential selection bias. However, the consecutive inclusion of all eligible cases and the comparative analysis of baseline characteristics between groups help reduce this risk and enhance the study's external validity, providing an accurate depiction of clinical reality. The timing of quality of life assessment at 3 months postoperatively may be considered relatively early to reflect long-term outcomes. Nevertheless, the literature supports this interval as relevant for functional and emotional stabilization, and its use enables comparability with other research and early identification of patients at risk for unfavorable evolution. The small sample size may limit statistical power in detecting subtle differences between groups. However, patient homogeneity and the use of appropriate statistical methods - including adjusted regression models—contribute to the robustness of the analysis. Regarding social support, this was evaluated through a binary question ("present"/ "absent"), a simplified method that nevertheless allowed integration of a relevant psychosocial component into a realistic clinical framework. The introduction of this variable into an observational study adds an innovative dimension and suggests valuable directions for future research using more complex psychosocial instruments.

Conclusions

This retrospective, multicentric study conducted in two Romanian academic centers with distinct

surgical approaches demonstrated that both Bricker urinary diversion and simple cutaneous ureterostomy (SCU) can offer comparable quality of life outcomes at three months following radical cystectomy for muscle-invasive bladder cancer. Although no significant differences were identified between the two diversion types in most functional and emotional dimensions assessed by the EQ-5D-5L questionnaire, the Bricker technique was associated with a slightly more favorable overall health perception (EQ-VAS), particularly in patients treated laparoscopically.

Social support was more frequently observed among patients with severe functional impairment, suggesting it is more likely a marker of clinical severity rather than a protective factor per se. Thus, the presence of family support should be interpreted within the clinical complexity of each case. This finding may inform future interventions, aimed not only at providing support but also at early identification of patients at risk for significant functional decline. Furthermore, the analysis revealed significantly greater functional impairment among male patients, particularly regarding self-care and daily activities. These findings may reflect adaptation difficulties among men to the new postoperative status. The literature also points to heightened emotional vulnerability among female patients, associated with factors such as altered body image or social stigma, highlighting the need for personalized, gender-sensitive interventions - both physical and psychological.

Our results support the notion of an individualized therapeutic approach, wherein the selection of urinary diversion technique should consider not only surgical criteria, but also the patient's general condition, available postoperative resources, and psychosocial factors. The Bricker technique is suitable for patients with good functional status, while SCU is a viable alternative in high-risk surgical candidates but requires close monitoring. Future prospective studies are needed to assess the impact of psychosocial rehabilitation and long-term support on quality of life in order to better guide therapeutic decisions and personalize care.

In conclusion, optimizing postoperative outcomes following radical cystectomy requires the integration of a multidisciplinary vision that includes not only oncologic control but also interventions aimed at preserving autonomy, psychological well-being, and reintegration into social and family life.

Author's Contributions

All authors made significant contributions to the conception, drafting, and critical revision of the manuscript. Each author reviewed and approved the final version of the article and assumes responsibility for the accuracy and integrity of the scientific content. C.-G.R. had full access to the dataset and is responsible for the validity and accuracy of the statistical analysis. All authors confirm compliance with scientific authorship criteria and consent to the publication of this work.

Conflict of Interest Statement

The authors declare no conflicts of interest related to this work.

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Ethics Approval

The study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki. The research protocol was approved by the ethics committees of the participating medical institutions.

Informed Consent

All patients included in the study provided informed consent for participation and for the processing of their medical data for scientific purposes.

Data Availability

The data supporting the findings of this study are available from the corresponding author upon reasonable request, in compliance with confidentiality and personal data protection regulations.

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