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Original article

There is a place for radical cystectomy and urinary diversion, including orthotopic bladder substitution, in patients aged 75 and older: Results of a retrospective observational analysis from a high-volume center

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Abstract

Introduction: The incidence of cancer increases with age and owing to the changing demographics we are increasingly confronted with treating bladder cancer in old patients. We report our results in patients >75 years of age who underwent open radical cystectomy (RC) and urinary diversion.

Material and methods: From January 2000 to March 2013, a consecutive series of 224 old patients with complete follow-up who underwent RC and urinary diversion (ileal orthotopic bladder substitute [OBS], ileal conduit [IC], and ureterocutaneostomy [UCST]) were included in this retrospective single-center study. End points were the 90-day complication rates (Clavien-Dindo classification), 90-day mortality rates, overall and cancer-specific survival rates, and continence rates (OBS).

Results: Median age was 79.2 years (range: 75.1–91.6); 35 of the 224 patients (17%) received an OBS, 178 of the 224 patients (78%) an IC, and 11 of the 224 patients (5%) an UCST. The 90-day complication rate was 54.3% in the OBS (major: Clavien grade 3–5: 22.9%, minor: Clavien Grade 1–2: 31.4%), 56.7% in the IC (major: 27%, minor: 29.8%), and 63.6% in the UCST group (major: 36.4%, minor: 27.3%); $P = 0.001$. The 90-day mortality was 0% in the OBS group, 13% in the IC group, and 10% in the UCST group ($P = 0.077$). The Glasgow prognostic score was an independent predictor of all survival parameters assessed, including 90-day mortality. Median follow-up was 22 months. Overall and cancer-specific survivals were 90 and 98, 47 and 91, and 11 and 12 months for OBS, IC, and UCST, respectively. In OBS patients, daytime continence was considered as dry in 66% and humid in 20% of patients. Nighttime continence was dry in 46% and humid 26% of patients.

Conclusion: With careful patient selection, oncological and functional outcome after RC can be good in old patients. Old age as the sole criterion should not preclude the indication for RC or the option of OBS. In old patients undergoing OBS, satisfactory continence results can be achieved. © 2016 Elsevier Inc. All rights reserved.

Keywords: Functional outcome; Complications; Cystectomy; Urinary diversion; Elderly

1. Introduction

In industrialized countries the average life expectancy has continuously increased during the last decades and this trend is expected to continue. In Switzerland, a sexagenarian now has a 50% chance, if male, and 70% if female, of reaching the age of 80. By 2050, the population of more than 80 years old people would have multiplied 2.7 times in Switzerland. Age is considered to be the greatest single risk factor for developing cancer. It is widely accepted that by 2030 70% of cancers would occur in more than 65 years old people in the US, most likely due to prolonged exposure to carcinogens (i.e., smoking) and accumulation of cellular and genetic damages [1].

Bladder cancer is no exception and typically affects old patients with a median age at the time of diagnosis of approximately 70 years; 32% of patients diagnosed with bladder cancer in the US are between 75 and 84 years of age [2]. Surgery and the perioperative period can be

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challenging in old patients owing to the presence of comorbidities and age-related physiological changes. In these patients, treatment goals should focus on maintaining a good quality of life for the remaining time span by achieving long-term remission combined with excellent functional results. Radical cystectomy (RC), extended pelvic lymph node dissection (PLND), and urinary diversion (UD) remain the standard of care for patients with muscle-invasive bladder cancer (MIBC) [3]. However, this type of surgery is per se associated with an incidence of postoperative complications of up to 60% and a 90-day mortality of approximately 5% to 15% and physicians tend to shy away from this form of treatment in the patients aged 75 years and older [4,5].

Although there are publications showing that RC with UD is "feasible" in old patients with acceptable morbidity and mortality [6,7], the literature is scarce concerning functional and oncological outcome of orthotopic bladder substitution (OBS) [8]. We report our results in old patients who underwent open RC, PLND, and UD in a high-volume center with a focus on outcome, including functional results in patients receiving an OBS.

2. Material and methods

2.1. Patients

The Institutional Review Board (Registration no. 04-12-13) approved the retrospective review of the medical records of a consecutive series of 244 old patients (age >75 y) who underwent RC and UD (OBS, ileal conduit [IC] and ureterocutaneostomy [UCST]) at our institution between January 2000 and March 2013. All patient data were evaluated retrospectively from a prospectively maintained database. Patients with insufficient follow-up were excluded from analysis, leaving 224 for the study.

Variables examined in this retrospective single-center study were age, sex, American Society of Anesthesiologists (ASA) physical status classification system, P-POSSUM score, Charlson comorbidity index age-adjusted (CCIaa) score, Glasgow prognostic score (GPS), preoperative anemia, preoperative renal insufficiency, coronary disease, diabetes mellitus, neoadjuvant radiotherapy/chemotherapy, postoperative tumor, and lymph node stage (pT and pN).

2.2. Preoperative management, surgical technique, and postoperative management

Patients received no oral bowel preparation, but 2 high enema the evening before surgery. Perioperative antibiotic therapy consisted of obramycin and metronidazole for 2 days and amoxicillin/clavulanic acid until removal of all stents and catheters. Low-molecular-weight heparin was started on the evening before surgery and maintained throughout hospitalization. PLND, open RC, and UD were performed according to institutional standards. Postoperatively, patients were transferred to the intermediate care unit for 3 to 5 days according to our institutional protocol [9].

2.3. Patients follow-up

Follow-up data were prospectively entered into the departmental database. Follow-up was scheduled at 3 months, then at 6 monthly intervals for the first 5 years and thereafter yearly [10]. Basic follow-up visits consisted of a physical examination, blood tests, urine culture, residual urine measurement, and renal ultrasonography. In patients with a $\geq$pT3 tumor stage, abdominal/pelvic computer tomography and bone scintigraphy were performed after 6, 12, and 18 months. A standardized questionnaire concerning voiding, daytime and nighttime continence, and pad use was completed in patients with an OBS [11,12]. Continence was defined as complete dryness or the loss of no more than a few drops of urine once or twice a month with some patients wearing a pad as a safety measure [12].

2.4. Outcome measurements

Clinical outcomes evaluated were the 90-day postoperative complication rate, the 90-day mortality, and the overall survival (OS) and cancer-specific survival (CSS). All complications were recorded, defined, and graded according to the 5-grade modification of the original Clavien system and to the Memorial Sloan-Kettering Cancer Center complication grading system [4,13]. Major complications were defined as grade 3 to 5 and minor as grade 1 and 2.

CSS was calculated as time from RC to date of death from progressive bladder cancer; OS was calculated as time from RC to date of death from any cause. Patients alive without recurrence were censored at the date of last follow-up; patients dying without recurrence were censored at the time of death.

Functional end points were daytime and nighttime continence 12 months postoperatively in patients receiving an OBS.

2.5. Statistics

This was an exploratory study and therefore no power analysis was performed to determine sample size. Data were analyzed using nonparametric statistical models. Categorical data were compared with results from the Fisher exact test or chi square test. Continuous data were compared using the Kruskal-Wallis test. Multiple logistic regression analyses using a forward selection procedure were applied to identify independent risk factors for postoperative complication and day-/nighttime continence rates and reported as adjusted odds ratios (ORs) with 95% CIs. Potential confounders included were sex, body mass index (20–25 vs. <20 or >25), ASA scores, CCIaa, GPS, P-POSSUM score (continuous), preoperative anemia, and

preoperative renal insufficiency. Factors were included if $P < 0.10$. No interaction terms were included owing to the sample size. The fit and predictive capability of the model was assessed using the Hosmer-Lemeshow goodness-of-fit test.

Survival probabilities were estimated using Kaplan-Meier plots with log-rank tests to assess significance. Through backward stepwise elimination within Cox proportional hazard models, independent predictive factors were evaluated in the multivariable setting. A $P < 0.05$ was considered statistically significant and all P values reported are 2-sided. Data were analyzed using SPSS software version 21 (SPSS Inc, Chicago IL).

3. Results

3.1. Baseline characteristics and oncological data

A cohort of 224 consecutive patients who underwent RC and UD were included. Median age was 79.2 years (range: 75.1–91.6) (Table 1).

MIBC occurred in 213 of the 224 patients (95%), 6 of the 224 (2.7%) had squamous cell cancer, 2 of the 224 (0.9%) had prostate cancer, and 3 of the 224 (1.3%) other malignancies (1 cervical cancer, 1 ovarian cancer, and 1 rectal cancer). All of the patients with nonbladder cancer received an IC. Patients with MIBC receiving an OBS had significantly lower pT stages compared with those receiving an IC or UCST. Less lymph nodes in the IC and UCST groups were removed compared with the OBS group (Table 2).

IC was the most commonly performed UD in 178 of the 224 patients (79%) followed by the OBS in 35 of the 224 (16%) and 11 of the 224 (5%) with UCST. Patients receiving an OBS had significantly less comorbidities with lower ASA, CCIaa, and P-POSSUM scores and were slightly younger than patients receiving an IC or a UCST (Table 1).

Palliative cystectomy without PLND was performed in 17 patients (13/178 [7%] IC and 4/11 [36%] UCST). These patients and patients with nonbladder cancer were excluded from the survival analyses.

3.2. Postoperative complications

The 90-day complication rate was 54.3% (19/35 patients) in the OBS group (major 22.9% [8/35] and minor 31.4% [11/35]), 56.7% (101/178 patients) in the IC group (major 27.0% (48/178) and minor 29.8% (53/178)), and 63.6% (7/11 patients) in the UCST group (major 36.4% [4/11] and minor 27.3% [3/11]); $P = 0.001$. Most complications occurred within the first 30 postoperative days and the number of major complications was significantly lower in OBS group (Table 3). Between postoperative days 31 and 90, no difference in the incidence of complications could be detected between the types of UD (Table 3). Postoperative complications were recorded and grouped into 11 categories with no statistical difference between the different types of UD (Table 4). Most common complications were related to

Table 1
Baseline characteristics

	Overall (n = 224)	IC (n = 178)	OBS (n = 35)	UCST (n = 11)	P value
Age, y	79.2 [75.1–91.6]	79.8 [75.1–91.6]	76.3 [75.1–80.9]	83.8 [75.3–89.1]	<0.0001
Sex (male/female)	153/71 (68%/32%)	118/60 (66%/34%)	29/6 (83%/17%)	6/5 (55%/45%)	0.092
ASA					<0.0001
2	68 (33.3%)	48 (27%)	19 (54.3%)	1 (9.1%)	
3	151 (67.4%)	128 (71.9%)	16 (45.7%)	7 (63.6%)	
4	5 (2.3%)	2 (1.1)	0 (0%)	3 (27.3%)	
P-POSSUM	47 [32–70]	48 [32–70]	42 [34–60]	48 [33–67]	<0.0001
CCIaa	5 [3–14]	6 [3–14]	4 [3–10]	6 [5–8]	<0.0001
BMI, kg/m^2	25.1 [13.8–41.0]	25.3 [13.8–41.0]	24.0 [19.4–31.6]	25.5 [17.0–36.2]	0.472
Previous radiotherapy (no/yes)	211/13 (94%/6%)	166/12 (93%/7%)	34/1 (97%/3%)	11/0 (100%/0%)	0.333
Coronary disease (no/yes)	171/53 (76%/24%)	130/48 (73%/27%)	32/3 (91%/9%)	9/2 (82%/18%)	0.059
Diabetes mellitus (no/yes)	192/32 (86%/14%)	150/28 (84%/16%)	32/3 (91%/9%)	10/1 (91%/9%)	0.530
Preop anemia (no/yes)	98/126 (44%/56%)	73/105 (41%/59%)	21/14 (60%/40%)	4/7 (36%/64%)	0.097
Glasgow prognostic score					0.108
0	100 (44.8%)	77 (43%)	20 (57%)	3 (30%)	
1	84 (37.7%)	66 (37%)	14 (40%)	4 (40%)	
2	39 (17.5%)	35 (20%)	1 (3%)	3 (30%)	
Neoadjuvant. chemotherapy (no/yes)	209/15 (93%/7%)	163/15 (92%/8%)	34/1 (97%/3%)	11/0 (100%/0%)	0.323
Preop renal insufficiency (no/yes)	188/36 (84%/16%)	149/29 (84%/16%)	34/1 (97%/3%)	5/6 (56%/54%)	0.001
Preop creatinin value, µmol/l	95 [41–851]	98 [41–443]	79 [43–130]	140 [77–851]	<0.0001

ASA = American Society of Anesthesiologists physical status classification system; BMI = body mass index; P-POSSUM = median portsmouth physiological and operative severity score for the enumeration of mortality and morbidity.
Definitions: preoperative renal insufficiency = estimated glomerular filtration rate (eGFR) <60 ml/min; preoperative anemia = according to the WHO definitions hemoglobin <130 g/l for men and <120 g/l for women.

Table 2
Surgical and oncological data for urothel carcinoma ($n = 213$)

	Overall	IC ($n = 167$)	OBS ($n = 35$)	UCST ($n = 11$)	P value
pT stage					0.011
y0–2b	96 (44%)	68 (39%)	24 (69%)	4 (36%)	
≥3	117 (56%)	99 (61%)	11 (31%)	7 (64%)	
Tumor grade					0.795
0	6 (3%)	4 (3%)	2 (6%)	0 (0%)	
1–2	18 (9%)	16 (10%)	2 (6%)	0 (0%)	
3	180 (88%)	140 (87%)	29 (88%)	10 (100%)	
pN					0.021
0	147 (73%)	108 (69%)	32 (91%)	7 (70%)	
1	21 (10%)	19 (12%)	1 (3%)	1 (10%)	
2–3	34 (17%)	30 (19%)	2 (6%)	2 (20%)	
Lymph node (n)	24 [0–88]	24 [0–88]	29 [15–73]	15 [0–30]	<0.0001
Tumor progress (no/yes)	147/67 (69%/31%)	116/52 (69%/31%)	27/8 (77%/23%)	4/7 (36%/64%)	0.031

the gastrointestinal (GI) tract (15%), infection (15%), and heart (13%). Independent predictors for 90-day postoperative severe complications were preoperative renal insufficiency (OR = 4.326 [95% CI: 1.889–9.907]; $P = 0.001$), body mass index (OR = 0.461 [95% CI: 0.224–0.950]; $P = 0.028$), and P-POSSUM score (OR = 0.222 [0.132–0.372]; $P < 0.0001$).

Table 3
Postoperative complication rate according to the Clavien-Dindo classification

Complication	IC ($n = 178$)	OBS ($n = 35$)	UCST ($n = 11$)	P value
From postoperative day 0–30				
0	91 (51%)	19 (54%)	5 (45%)	0.002
1	12 (7%)	0 (0%)	0 (0%)	
2	38 (21%)	11 (31%)	1 (9%)	
3a	14 (8%)	4 (11%)	2 (18%)	
3b	9 (5%)	1 (3%)	0 (0%)	
4	2 (1%)	0 (0%)	0 (0%)	
4d	6 (3%)	0 (0%)	3 (27%)	
5	6 (3%)	0 (0%)	0 (0%)	
From postoperative day 31–90				
0	139 (78%)	28 (80%)	10 (91%)	0.239
1	5 (3%)	2 (6%)	0 (0%)	
2	9 (5%)	1 (3%)	0 (0%)	
3a	3 (2%)	3 (9%)	0 (0%)	
3b	3 (2%)	0 (0%)	0 (0%)	
4	0 (0%)	1 (3%)	0 (0%)	
4d	2 (1%)	0 (0%)	0 (0%)	
5	17 (10%)	0 (0%)	1 (9%)	
Overall postoperative complications postoperative day 0–90				
0	77 (43%)	16 (46%)	4 (36%)	0.001
1	11 (6%)	2 (6%)	0 (0%)	
2	42 (24%)	9 (26%)	1 (9%)	
3a	11 (6%)	6 (17%)	2 (18%)	
3b	10 (6%)	1 (3%)	0 (0%)	
4	1 (0.6%)	1 (3%)	0 (0%)	
4d	5 (3%)	0 (0%)	3 (27%)	
5	21 (12%)	0 (0%)	1 (9%)	

If patients had more than 1 complication in the same category, only 1 complication was counted (the most relevant).

The 90-day mortality was 0% (0/35 patients) in the OBS, 13% (23/178) in the IC, and 10% (1/11) in the UCST group ($P = 0.077$). If patients with UCST were excluded, 90-day mortality reached significance in the IC and OBS groups ($P = 0.017$, relative risk = 0.816, 95% CI: 0.765–0.873). Independent predictors for 90-day mortality were preoperative anemia (OR = 3.040 [1.061–8.712]; $P = 0.038$) and GPS (GPS 2 vs. 0 (OR = 3.789 [95% CI: 1.288–11.145]; $P = 0.016$); $P = 0.015$.

3.3. OS and CSS

Median follow-up was 22 months (range: 0.04–147). Mean estimated OS was 90 months (95% CI: 75–106) in the OBS, 47 months (95% CI: 38–56) in the IC, and 11 months (95% CI: 8–15) in the UCST group ($P < 0.0001$) in patients with MIBC and PLND (Fig. 1). Negative predictors were pN+ (hazard ratio [HR] = 1.826 [95% CI: 1.189–2.803]; $P = 0.006$), pT stage ≥3 (HR = 1.578 [95% CI: 1.001–2.487]; $P = 0.049$), GPS of 2 (HR = 1.987 [95% CI: 1.181–3.343]; $P = 0.010$), and UCST vs. IC (HR = 2.696 [95% CI: 1.306–5.569]; $P = 0.007$) in the Cox model for OS. A positive predictor was an OBS compared to an IC (HR = 0.269, [95% CI: 0.120–0.606]; $P = 0.002$).

Mean estimated CSS was 98 months (95% CI: 83–112) in the OBS, 91 months (95% CI: 76–106) in the IC, and 12 months (95% CI: 9–16) in the UCST group ($P = 0.002$) (Fig. 2). Negative predictors were pN+ (HR = 3.416 [95% CI: 1.838–5.911]; $P < 0.0001$), GPS of 2 HR = 2.938 [95% CI: 1.332–6.481]; $P = 0.008$), and UCST vs. IC (HR = 3.416 [95% CI: 1.169–9.978]; $P = 0.025$) in the Cox model for CSS.

3.4. Functional results in patients undergoing OBS

Excellent daytime continence at 1 year was achieved in 23 of the 35 (66%) patients (dry), satisfactory (≤1 pad/day) in 7 of the 35 patients (20%), and unsatisfactory (>1 pad/day) in 5

Table 4
Summary of postoperative complication types and categories

Category (% of total)	Complications (Total = 165)	0–30 postoperative day			31–90 postoperative day		
		IC	OBS	UCST	IC	OBS	UCST
Gastrointestinal tract (15%; $n = 25$)		17	2	1	4	1	0
	Ileus	8	1		2	1	
	Small bowel obstruction	2	1				
	Constipation	2					
	Clostridium difficile colitis	1			1		
	Gastrointestinal bleeding	1		1			
	Diarrhea	3			1		
Infection (15%; $n = 24$)		14	2	0	8	0	0
	Pyelonephritis	9			1		
	Urinary tract infection	4	1		5		
	Sepsis		1		1		
	Urosepsis	1			1		
Wound (11%; $n = 18$)		11	2	1	3	0	1
	Wound seroma	2	1				
	Wound infection	3	1		1		
	Wound dehiscence	4		1	1		
	Facial dehiscence/evisceration	2			1		1
Genitourinary tract (10%; $n = 17$)		9	3	0	5	0	0
	Renal failure	2	1		2		
	Ureteral obstruction/RUT	4			2		
	Urinary leak	3	1		1		
	Urinary retention		1				
Heart (13%; $n = 21$)		15	1	1	4	0	0
	Arrhythmia	8	1	1	3		
	Myocardial infarction	1					
	Congestive heart failure	6			1		
Lungs (8%; $n = 13$)		8	1	1	3	0	0
	Pneumonia	7		1	3		
	Respiratory distress	1	1				
Bleeding (6%; $n = 10$)		6	0	1	1	0	2
	Anemia requiring transfusion	3		1			1
	Postoperative bleed other than GI	3			1		1
Thromboembolic (6%; $n = 9$)		5	2	0	1	1	0
	Deep venous thrombosis	2	1		1	1	
	Pulmonary embolism	3	1				
Neurological (2%; $n = 4$)		3	0	0	1	0	0
	Peripheral neuropathy	2					
	CVA/TIA	1					
	Delirium/agitation				1		
Miscellaneous (13%; $n = 21$)		12	4	0	3	2	0
	Psychological illness		1				
	Acidosis	2	1				
	Decubitus ulcer	1			1		
	Lymphocele	6	2			2	
	Dehydration	1			1		
	Other rare complications	2			1		
Surgical (2%; $n = 3$)		3	0	0	0	0	0
	Vascular injury	1					
	Neurological	2					

CVA/TIA = cerebrovascular accident/transient ischemic attack.

of the 35 patients (14%). Nighttime continence was achieved in 16 of the 35 patients (46%), satisfactory in 9 of the 35 patients (26%), and unsatisfactory in 10 of the 35 patients (29%). During the follow-up period, 1 female patient (2.8%) needed intermittent self-catheterization and 2 male patients (5.6%) a condom urinal catheter because of declining mobility.

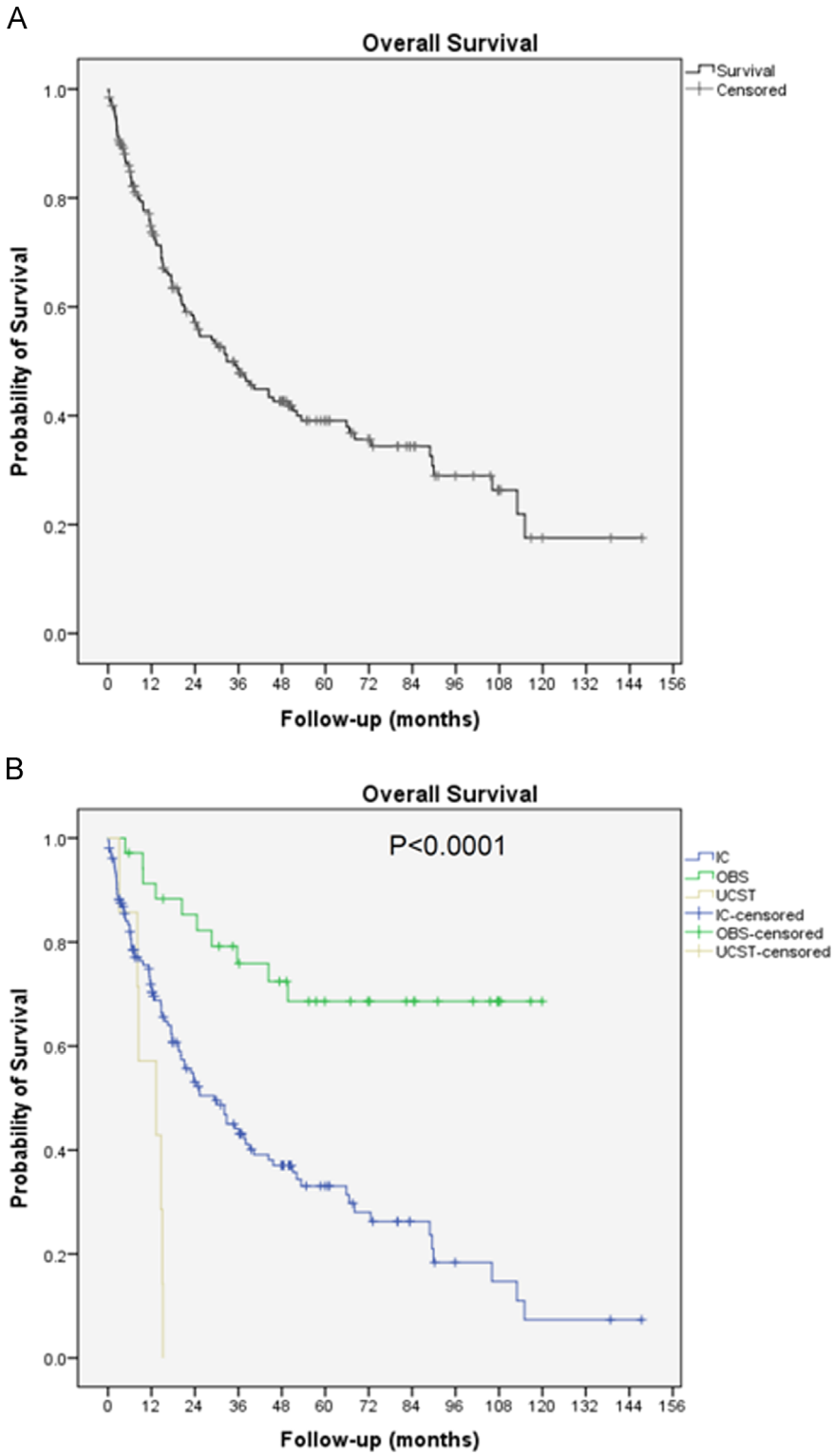

Fig. 1. Overall survival for the complete series of 213 patients with MIBC (A) and according to the derivation (B).

4. Discussion

Our data support that cystectomy is a realistic option in old and oldest patients with a median age of 79 concerning both perioperative morbidity and mortality as well as OS and CSS and that old patients are as eligible for curative RC with UD as younger patients.

The relevance of these findings is notable as only a quarter of patients >75 years old with MIBC underwent RC in a population-based study by Prout et al. [14]

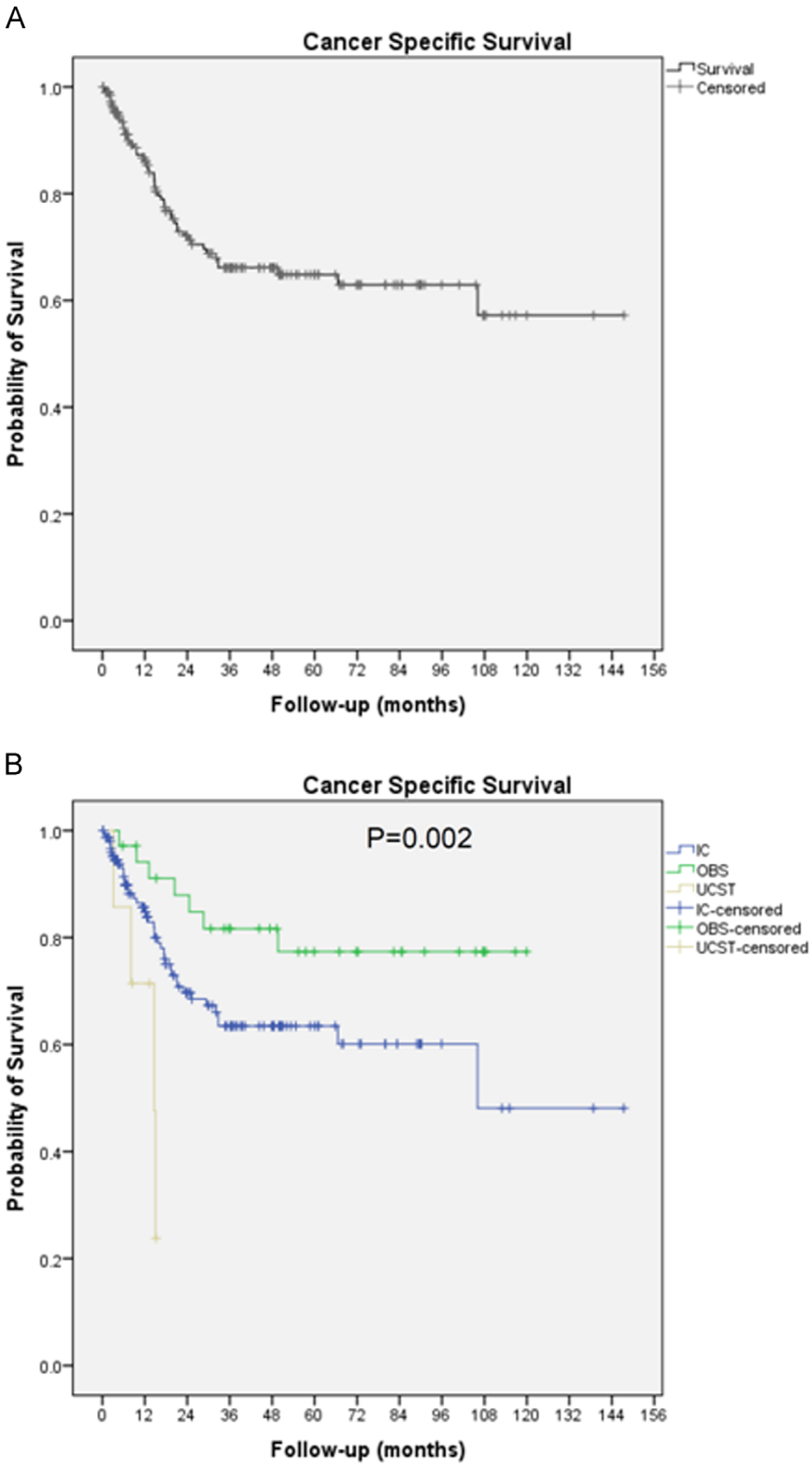

Fig. 2. Cancer-specific survival for the complete series of 213 patients with MIBC (A) and according to the derivation (B).

Hollenbeck et al., using the Surveillance Epidemiology and End Results database, identified 13,796 patients with bladder cancer, 24% of whom were >80 years old. Elderly patients were less likely to be treated with extirpative surgery than their younger counterparts. Nevertheless, after controlling for disease grade and stage, cystectomy (radical or partial) was associated with the greatest risk reduction of death from bladder cancer [15].

The 90-day complication rate was between 54% (OBS) and 64% (UCST) with most of the complications occurring during the first 30 days after surgery. A range and distribution of complications similar to those in other series including younger patients was observed [4]. Most frequent complications in this cohort of old patients were related to the GI tract (delayed return of bowel function) and infection. Even in patients receiving UCST without bowel resection and anastomosis and with an extraperitoneal approach, the incidence of GI tract complications was approximately 10%, suggesting that age itself may affect bowel function after abdominal surgery. This is in line with recent publications where increasing age (>60 y) is considered a risk for postoperative ileus because of the reduced overall capacity of the body to recover from the surgical trauma [16]. In addition, older patients are prone to have lower serum albumin concentration, illustrated in this series by the approximately 60% of the patients with a GPS > 1, which is an additional risk factor for delayed return of the bowel function and was an independent predictor of complications [17].

The overall 90-day mortality was 11%, which is higher than that reported in other series including younger and fitter patients [4] and 5 times the rate recently published from our institution [18]. It is also somewhat higher than the 3% to 7.5% reported morbidity in similar age groups from other institutions; however, our patients had more serious comorbidities [19,20]. Comorbidities were assessed by CCIaa, GPS, and P-POSSUM scores and not just the more commonly used ASA classification. GPS, a simple and accurate score to assess the preoperative inflammatory and nutritional status, strongly correlated with morbidity and mortality [18,21]. Preoperative anemia, an important outcome marker in old patients and again a marker of nutritional status, also correlated with increased morbidity [18,22]. This illustrates the importance of preoperative assessment of nutritional status and its optimization before surgery, especially in old patients. Indeed, trimodal prehabilitation has been proposed to accelerate postoperative recovery and to decrease postoperative morbidity in frail patients [23,24].

OS was the best in the OBS group followed by the IC and then the UCST groups, most likely reflecting careful patient selection. Only the fittest were selected for an OBS and this is reflected by the increasing P-POSSUM and CCIaa scores, indicating a more severe comorbidity. This is in line with the observations of Weizer et al. [25], where impaired functional status assessed by a geriatric test (Karnofsky performance status) was a negative predictor for OS. CSS was only slightly lower than in other series including younger patients, suggesting that even in old patients curative surgical treatment can be achieved [26]. There is some controversy regarding the benefit of RC in old patients as precedent studies found that they were more likely to have cancer recurrence and die of cancer [27,28], whereas others could not detect any difference in cancer-related outcome and survival [29]. Here again increasing comorbidities may have played a role, as well as the fact that owing to these comorbidities 36% of patients in the UCST group did not receive a standard PLND, whereas more lymph nodes were removed in the OBS group. An additional factor is the lower disease severity in the ONB group.

We found that satisfactory continence results can be achieved in old patients undergoing RC and OBS, albeit inferior to those with younger patients [11]. Reports on functional results after OBS in older patients are scarce [8]. Saika et al. could show a 50% daytime continence in patients more than 75 years of age. Sogni et al. found daytime and nighttime complete continence rates of 56% and 25%, respectively. Interestingly 70% performed clean intermittent self-catheterization that can pose a problem in this age group [30]. Again careful patient selection in the elderly is mandatory for good functional results as mirrored in our series. This is reflected by the 90-day mortality of 0% in patients with OBS, whereas more polymorbid patients receiving an UCST or IC had a mortality of 10% to 13%.

5. Conclusion

With careful patient selection, oncological and functional outcomes after RC can be good in old patients. Old age as the sole criterion should not preclude the indication for RC or the option of OBS. GPS (mortality), P-POSSUM (morbidity), and CClaa (survival) may prove to be helpful markers to optimize patient management in this setting.

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