Lessons Learned From 1,000 Neobladders: The 90-Day Complication Rate

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Abbreviations and Acronyms

ASA = American Society of Anesthesiologists

BMI = body mass index

RC = radical cystectomy

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Nothing to disclose.

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Editor's Note: This article is the fourth of 5 published in this issue for which category 1 CME credits can be earned. Instructions for obtaining credits are given with the questions on pages 1234 and 1235.

Purpose: We report the 90-day morbidity of the ileal neobladder in a large, contemporary, homogenous series of patients who underwent radical cystectomy at a tertiary academic referral center using a standard approach.

Materials and Methods: Between January 1986 and September 2008 we performed 1,540 radical cystectomies. A total of 281 patients had an absolute contraindication for orthotopic reconstruction. The remaining 1,259 patients were candidates for a neobladder. Of these patients 1,013 (66%) finally received a neobladder and form the basis of this report. All patients had a thorough followup until December 2008 or until death. All complications within 90 days of surgery were defined, categorized and classified by an established 5 grade and 11 domain modification of the original Clavien system.

Results: Of 1,013 patients 587 (58%) experienced at least 1 complication within 90 days of surgery. Infectious complications were most common (24%) followed by genitourinary (17%), gastrointestinal (15%) and wound related complications (9%). The 90-day mortality rate was 2.3%. Of the patients 36% had minor (grade 1 to 2) and 22% had major (grade 3 to 5) complications. On univariate analysis the incidence and severity of the 90-day complications rate correlate highly significantly with age, tumor stage, American Society of Anesthesiologists score and preoperative comorbidity.

Conclusions: Radical cystectomy and ileal neobladder formation represent a major surgery with potential relevant early complications even in the most experienced hands. The rate of severe and lethal complications is acceptably low.

Key Words: cystectomy, urinary bladder neoplasms, urinary diversion, postoperative complications

URINARY diversion has reached a new level, with the ultimate goal of urinary reconstruction not only the creation of a means to divert urine and protect the upper urinary tract, but also the creation of a continent means to store urine and allow for volitional voiding through the native urethra. These advances in urinary diversion have been made to give patients a normal lifestyle with a positive self-image after removal of the bladder. We and others are dedicated to the continued improvement of lower urinary tract reconstruction, and believe that the neobladder represents the most ideal form of urinary diversion.

Radical cystectomy and urinary diversion have been assessed the highest relative value in terms of difficulty of surgery of any procedure in urology. They are also the most difficult laparoscopic or robotic procedures, and more so if the diversion is performed totally intracorporeally. The risk of cystectomy is based not only on

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the technical challenges of the procedure but also on the nature of the patient needing a cystectomy. Recently Donat emphasized the need for standardized reporting of complications, especially in urological oncology, because of the mostly elderly population and the associated comorbidities.[1] RC and urinary diversion are 2 steps of 1 operation. However, the literature uniformly reports the complications of RC while ignoring that the majority of complications are diversion related, and while this may seem semantic it is not.

We present the true ileal neobladder related 90-day complication rate at 1 high volume center where all patients were treated by high volume surgeons under standardized conditions in terms of indications for surgery, operative characteristics including 1 type of diversion, postoperative care, analysis of complications and comorbidity.

PATIENTS AND METHODS

Study Population

We established a computerized database containing comprehensive clinical and pathological information on all 1,540 patients who underwent RC between January 1986 and September 2008 at our institution. In 281 patients there was an absolute contraindication for orthotopic reconstruction (table 1).

The remaining 1,259 patients were considered candidates for a neobladder and of these 1,013 received an ileal neobladder. The characteristics of these 1,013 and the 527 patients who did not receive a neobladder are presented in table 2. Preoperative evaluation routinely included chest x-ray, abdominal ultrasound, excretory urography, routine blood chemistry studies, computerized tomography of the abdomen and pelvis, and a bone scan in selected patients. According to a prospective protocol all patients were seen after 3 months postoperatively to assess all early complications within the first 90 days. The clinical and pathological characteristics collected included age, gender, pathological stage, prior cancer treatments, ASA score, Charlson-Romano comorbidity score, BMI, renal function, serum creatinine levels and creatinine clearance.

Table 1. *Absolute contraindications for orthotopic bladder replacement*

	%
Refusal	2.1
Tumor infiltration of bladder neck (females)/prostatic apex (males)/urethra	6.6
Impaired renal function (serum creatinine greater than 200 μmol/l)	2.4
Severe radiation damage	1.9
Inflammatory diseases of intestine	0.9
Neurogenic diseases of pelvic floor	1.5
Severe stress urinary incontinence	0.8
Female pts before 1993*	2.5
Total	18.3

* Orthotopic bladder replacement only offered to female patients since 1993.

Table 2. *Patient characteristics*

	Neobladder	No Neobladder	p Value (chi-square test)
No. gender:			0.00001
M	867	318	
F	146	209	
% Pt age:			0.000002
Younger than 40	2.4	2.8	
40–49	8.3	5.7	
50–59	25.0	14.2	
60–69	42.1	26.4	
70–79	21.0	41.5	
80 or Older	1.2	9.3	
% Underlying disease:			0.0004
Benign	2.4	3.3	
Transitional cell Ca	90.6	80.1	
Nontransitional cell Ca of bladder	6.3	8.9	
Other malignancy	0.7	7.7	
Mean comorbidity:			
ASA score	2.2	2.6	
Charlson index	3.0	4.2	

Specific Patient Preparation

Patients were on a liquid diet and had 2 bowel enemas the day before surgery. Because ileum is used no specific preoperative preparation was necessary. All patients received prophylactic low molecular weight heparin subcutaneously, initiated on the day of surgery and maintained until discharge from hospital. Compression leg stockings were routinely used. All patients received an intravenous antibiotic with a third generation cephalosporin for 5 days. A nasogastric tube was placed intraoperatively and removed within the first 24 hours after surgery. Whenever feasible patients received epidural application of local anesthetics and opioids intraoperatively to reduce the need for general anesthesia as well as postoperatively for pain management.

Operative Technique

Our cystectomy and neobladder technique has been described in detail.[2] In 1997 we gave up the Le Duc ileoureterostomy and replaced it with a freely refluxing technique with bilateral afferent limbs and ipsilateral Wallace anastomoses of the spatulated ureters.

Postoperative Care

All patients were monitored during postoperative days 3 to 7. In the first postoperative days the neobladder was irrigated and actively aspirated using 50 cc saline 3 times daily to remove any mucus. The bowel was stimulated by parasympathomimetics. Any bacteriuria was treated until the urine was sterile. All ureterointestinal anastomoses were stented intraoperatively for at least 14 days until a contrast cystogram revealed no more leakage. Urethral catheters were removed the following day. Patients were encouraged to drink 2 to 3 l fluid daily. Blood gases were controlled regularly. In cases with negative base excess less than −2 mmol/l an oral intake of sodium bicarbonate was started.

Complications

All complications within 90 days of surgery were recorded, defined and graded according to an established 5 grade and 11 domain modification of the original Clavien sys-