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Urologic Oncology: Seminars and Original Investigations 31 (2013) 1155–1160

UROLOGIC ONCOLOGY

Original article

Orthotopic sigmoid vs. ileal neobladders in Japanese patients: A comparative assessment of complications, functional outcomes, and quality of life

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Received 25 September 2011; received in revised form 2 November 2011; accepted 3 November 2011

Abstract

Objectives: To compare the clinical outcomes of sigmoid and ileal neobladders (NBs) created following radical cystectomy.

Materials and methods: This study included 90 and 144 Japanese patients undergoing radical cystectomy and orthotopic NB reconstruction with a sigmoid and ileal segment, respectively. Postoperative clinical outcomes between the sigmoid and ileal NB groups (SNBG and INBG) were compared.

Results: In this series, 110 early and 51 late complications occurred in 71 and 41 patients, respectively; however, there was no significant difference in the incidence of complications between SNBG and INBG. At 1 year postoperatively, there were no significant differences in the proportion of spontaneous voiders and the continence status between these 2 groups; however, despite the lack of significant differences in the maximal flow rate and voided volume, the post-void residual in SNBG was significantly smaller than that in INBG. Voiding functional outcomes at 5 years postoperatively were also obtained from 28 and 49 in SNBG and INBG, respectively. Although there were no significant changes in the functional outcomes in SNBG, the proportion of spontaneous voiders and post-void residual in INBG at 5 years postoperatively were significantly poorer than those at 1 year postoperatively. Furthermore, the postoperative health-related quality of life assessed by a Short-Form 36 survey did not show any significant differences in all 8 scores between these 2 groups.

Conclusions: Both types of NB reconstruction resulted in comparatively satisfactory outcomes; however, the voiding function, particularly that on long-term follow-up, in SNBG appeared to be more favorable than that in INBG.

Keywords: Neobladder; Sigmoid; Ileum; Radical cystectomy; Bladder cancer

1. Introduction

During the past decade, orthotopic neobladder (NB) reconstruction has been regarded as the most preferable form of urinary diversion in appropriately selected patients who have undergone radical cystectomy for invasive bladder cancer [1]. To date, a variety of procedures for creating NBs using a detubularized ileum, right colon, ileocolic, or sigmoid segment have been developed to achieve the ultimate goal of a NB that functions similarly to a normal urinary bladder [2–7]. However, debate currently continues concerning the ideal type of NB characterized by several conditions, such as a sufficient functional reservoir capacity, low intra-reservoir pressure, and preserved tonus of the urethral sphincter [1,8].

It is necessary to simultaneously consider various issues associated with postoperative patient satisfaction, such as complications, voiding function, and quality of life (QOL), in order to properly evaluate clinical outcomes in patients undergoing NB reconstruction. However, there have been few studies analyzing the postoperative features of diverse

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1078-1439/$ – see front matter
http://dx.doi.org/10.1016/j.urolonc.2011.11.015

types of orthotopic NB based on data from a large number of patients [9–12]. At our institutions, NB reconstruction has been performed as a primary procedure of urinary diversion for patients treated with radical cystectomy since 1983, and based on our long-term experience, we have preferred to select either the sigmoid or ileal NB in recent years [13–16]. In this study, therefore, we retrospectively reviewed our experience of orthotopic NB replacement in 234 Japanese patients, consisting of 90 with sigmoid NB and 144 with ileal NB, and compared postoperative clinical outcomes between the sigmoid and ileal NB groups (SNBG and INBG).

2. Patients and methods

This study included a total of 234 consecutive Japanese patients who underwent reconstruction of an orthotopic NB following radical cystectomy for primary bladder cancer between 1997 and 2009, and followed for at least 1 year without any suspicious findings suggesting disease recurrence. All patients included in this series could void spontaneously before surgery. Of these 234 patients, a sigmoid NB and ileal NB were created in 90 (70 male, 20 female; median age, 64.0 years, range, 41–76 years; median observation period, 57.5 months, range, 17–143 months) and 144 (130 male, 14 female; median age, 65.5 years, range, 39–81 years; median observation period, 60.5 months, range, 14–145 months), respectively. At our institutions, the indications for different types of NB reconstruction are basically determined based on each surgeon's preference; therefore, the 2 types of NB reconstruction were evenly performed throughout the interval of this study. Our procedures for reconstruction of the sigmoid NB, which modified several steps of the original method described by Reddy et al. [6], have previously been reported [13], while the ileal NB was created according to the technique described by Perimenis and Studer with a minor modification [3,17].

As a rule, patients were initially followed for 2 months after surgery, then every 2–3 months for 2 years and finally every 6 months until disease progression or death. Routine follow-up examinations included laboratory studies, renal ultrasound, urinary cytology, chest radiography, intravenous pyelogram, and abdominal and/or pelvic computed tomography. In this analysis, all complications that were recorded in medical charts and required more intensive treatment than the standard in routine cases were classified as either early (3 months or less postoperatively) or late (more than 3 months postoperatively) complications.

The voiding pattern and continence status in each patient were evaluated by employing a questionnaire as previously reported [16]. Since there were no patients requiring permanent catheterization, the voiding status was classified into the following 3 categories: voiding without assistance, voiding with clean intermittent catheterization (CIC) assistance, and voiding with CIC alone. At our institutions, CIC is recommended for patients with a post-void residual urine volume greater than 100–150 ml. Patients were regarded as continent when they remained dry without protection, and patients who could remain dry at night if they voided at regular intervals were also considered continent. In addition, free uroflowmetry was performed for patients who could void with no assistance or void with CIC assistance approximately 3 hours after the previous urination. Following this examination, patients were catheterized to empty the NB and determine the post-void residual urine volume. These examinations assessing voiding functional outcomes were performed at 1 year after surgery for all patients included in this study. In addition, the same examinations were conducted in some patients for re-evaluating the voiding function at 5 years postoperatively.

The Medical Outcome Study Short-Form 36-item survey (SF-36), Japanese version 2.0, was used to assess the health-related QOL [18]. This survey consists of 36 self-administered questions for quantification of the health-related QOL using 8 multi-item scales, including physical function (PF), role limitations because of physical health problems (RP), bodily pain (BP), general health perception (GH), vitality (VT), social function (SF), role limitations because of emotional problems (RE), and mental health (MH). The 8 scales were scored separately from 0 to 100 with a higher score indicative of a better outcome.

Differences between SNBG and INBG were compared using the χ^2 test or unpaired t-test. All statistical calculations were performed using Statview 5.0 software (Abacus Concepts, Inc., Berkley, CA), and $P < 0.05$ were considered significant.

3. Results

Early and late complications in the 234 Japanese patients with a NB are summarized in Table 1. In this series, 110 early complications occurred in 71 patients (30.3%) consisting of 30 in SNBG (33.3%) and 41 in INBG (28.5%). The first, second, and third most commonly observed early complications were wound infection, ileus, and pyelonephritis, respectively. Six of the 71 patients with early complications (8.5%) required reoperation due to prolonged ileus in 3, bowel leakage in 2, and deep venous thrombus in 1. Furthermore, 51 late complications occurred in 41 patients (17.5%), including 16 in SNBG (17.8%) and 25 in INBG (17.4%). The first, second, and third most commonly occurring late complications were ureterointestinal stricture, enterourethral stricture, and neobladder stone, respectively. Surgical intervention was necessary for 39 of the 51 late complications (76.5%), including 13 for ureterointestinal stricture, 12 for enterourethral stricture, 10 for NB stone, 3 for incisional hernia, and 1 for adenocarcinoma in the reservoir. There was no significant difference in the frequency of either early or late complications between SNBG and INBG.

Functional outcomes of the 234 Japanese patients with NB examined at 1 year after surgery are presented in Table