

Original Article

Orthotopic Ileal Neobladder *versus* Sigmoidal Neobladder: A “Quality of life” (QOL) Survey

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To compare the quality of life (QOL) in patients with ileal neobladder and sigmoidal neobladder, a retrospective survey was conducted using a formulated questionnaire. Between January and March 1999, a QOL survey was conducted using self-administered questionnaires (EORTC QLQ-C30, IPSS, supplemented with detailed questionnaires about continence, sexual function, and patient's satisfaction with the selected urinary diversion method) for 78 patients with orthotopic urinary reservoir (OUR) who were followed-up for more than 3 months after cystectomy. Among 78 patients, 63 had OUR using an ileal segment (male/female = 59/4, median age: 70.8 years old, median follow-up: 1.7 years). Fifteen patients had OUR using a sigmoidal segment (male/female = 13/2, median age: 71.9, median follow-up: 3.9). The QLQ-C30 functional evaluation and the items in relation to sexual function showed no differences between the 2 groups. Concerning the voiding condition, bladder emptying, frequency, and urgency, scores in the sigmoidal OUR group were significantly higher. The QOL score concerning voiding conditions, daytime, and nighttime continence and quantity of pad showed a better score in the ileal OUR group. Concerning the satisfaction with methods of urinary diversion, patients in the sigmoidal OUR group expressed less satisfaction than their preoperative expectations. Considering several postoperative voiding conditions, ileal OUR seems superior to sigmoidal OUR.

Key words: urinary diversion, orthotopic urinary reservoirs, bladder cancer, quality of life

Radical cystectomy with urinary tract reconstruction currently remains the standard treatment for invasive bladder cancer. During the last decade orthotopic urinary reservoirs (OUR) have become a gold standard for urinary tract reconstruction after radical cystectomy for invasive bladder cancer to improve patient quality of life (QOL) [1-16], even for elderly patients [17]. Generally, an

OUR is a constructed spherical pouch using a detubularized bowel segment, to which the ureteral implantation and the urethro-neobladder anastomosis is performed. Various bowel segments are used for OUR with the ileum and sigmoid colon being used most frequently [1, 2, 18-20]. With experience, complication rates and operative times have been reduced, and studies have shown that the type of OUR performed has no impact on cancer control in carefully selected patients. Therefore, other factors should be considered when deciding which kind of OUR is suitable for each patient. Apart from functionality and long-term

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complications, QOL is important when deciding which diversion is appropriate. However, differences in QOL which depend on the type of OUR have rarely been reported [21].

Materials and Methods

Between January and March 1999, a QOL survey was conducted using self-administered questionnaires for 78 patients with OUR who were followed-up for more than 3 months after radical cystectomy at the Okayama University Hospital and its affiliated hospitals (the Okayama Urological Research Group (OURG)). The surgical procedures were based on the original Hautmann method, the Studer method, or the Reddy method [1]. Patients were considered disease-free when their last follow-up visit, including a physical examination, chest X-ray, and CT of the abdomen and pelvis, showed no evidence of local or distant recurrence.

A health-related QOL (HRQOL) assessment was performed using the European Organization for the Research and Treatment of Cancer Quality of Life Core Questionnaire (EORTC-QLQ-C30) [22] developed to measure basic components of HRQOL that are similar for most malignancies. This comprises 5 functional scales covering physical, role, emotional, cognitive and social aspects, one scale of overall health status, and overall HRQOL. There are also 3 symptom scales of fatigue, nausea/vomiting, and pain, and 6 single items that deal with dyspnea, insomnia, appetite loss, constipation, diarrhea, and financial difficulties caused by the disease or its treatment. Questions on the physical scale were answered using a dichotomous response scale (yes/no), while overall HRQOL was scored from 1 to 7 (very poor to excellent). The other items were answered through a Likert scale, and responses were graded from 1 to 4 (1 = not at all, 4 = very much). All scores were linearly transformed to a 0–100 scale. For functional and overall scales, higher scores represent a better outcome on HRQOL, whereas for symptom and single-item scales, higher scores correspond to more problems and a reduced HRQOL.

In addition to the above questionnaire, the International Prostate Symptom Score (IPSS) supplemented with detailed questionnaires about continence, sexual function, and patient's satisfaction with

the selected urinary diversion method designed by the Department of Urology in collaboration with the Department of Psychiatry, were used to evaluate these patients.

QOL questionnaires and a cover letter explaining the nature of the survey were mailed to all participants in the study. If there was no reply, a reminder letter was sent, followed by a telephone call, if necessary.

The results of the questionnaires were converted into scores and statistically analyzed using the Mann-Whitney U-test.

Results

Among 78 patients, 63 had OUR using an ileal segment. Their median age was 70.8 years (range 32.0 to 90.4); median follow-up was 1.7 years (range 0.2 to 8.1); there were 59 males and 4 females. Fifteen patients had OUR using a sigmoidal segment. Their median age was 71.9 years (range 54.4 to 80.4); median follow-up was 3.9 years (range 1.9 to 6.0); there were 13 male and 2 female patients (Table 1).

The EORTC QLQ-C30 functional evaluation showed no statistically significant differences on any item between the two groups (Fig. 1).

Regarding the EORTC QLQ-C30 symptom scales, diarrhea was recognized as being worse in the ileal OUR group, and the difference was statistically significant ($p = 0.0319$). No significant difference between the 2 groups was recognized in other symptoms (Fig. 2).

In relation to sexual function, no difference between the 2 groups was recognized on any item in our questionnaires (Fig. 3).

Table 1 Patients' characteristics

Urinary diversion	Ileal neobladder	Sigmoidal neobladder
No. of cases n = 78	63	15
Sex (M/F)	59:4	13:2
Median age (range)	70.8 (32.0–90.4)	71.9 (54.4–80.4)
Median follow-up (range)	1.7 years (0.2–8.1 years)	3.9 years (1.9–6.0 years)

Concerning voiding condition by the IPSS, bladder emptying, frequency, and urgency scores in the sigmoidal OUR group were significantly higher than those in the ileal OUR group ($p = 0.0277$, 0.0045 and 0.0470 , respectively), while no differences between the 2 groups were recognized in scores reflecting intermittency, weak stream, straining, and nocturia.

The QOL score concerning voiding conditions in the sigmoidal OUR group was also lower ($p = 0.0189$) (Fig. 4).

Daytime and nighttime continence and quantity of pad showed a statistically significant better score in the ileal OUR group ($p = 0.0075$, < 0.0001 and 0.0006 , respectively) (Fig. 5).

Regarding satisfaction with urinary diversion, more patients in the sigmoidal OUR group felt disap-

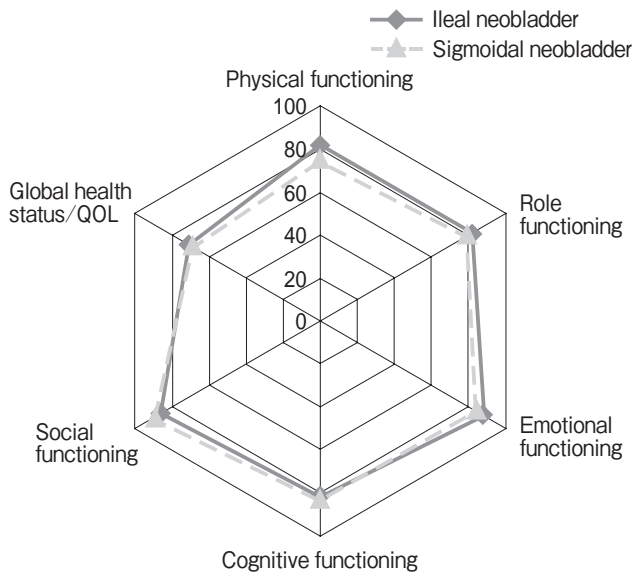


Fig. 1 EORTC QLQ-C30 Functional scales: A high scale score represents a high/healthy level of functioning (0-100). No statistically significant differences on any items.

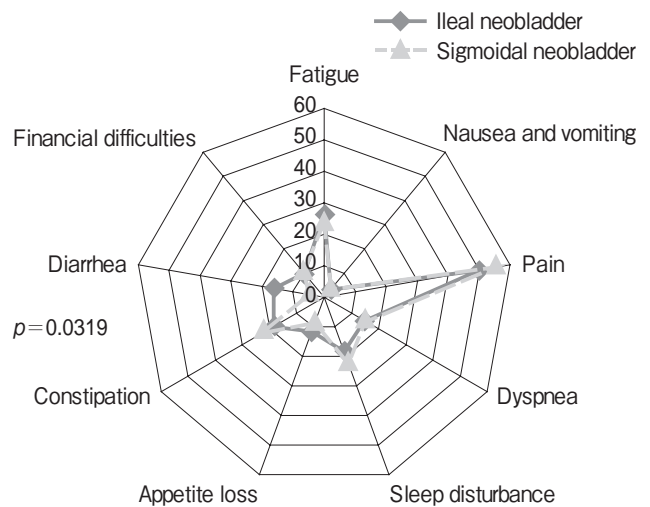


Fig. 2 EORTC QLQ-C30 Symptom scales: A high scale score represents a high level of symptomatic problems (0-100). Diarrhea was worse in the ileal OUR group ($p = 0.0319$).

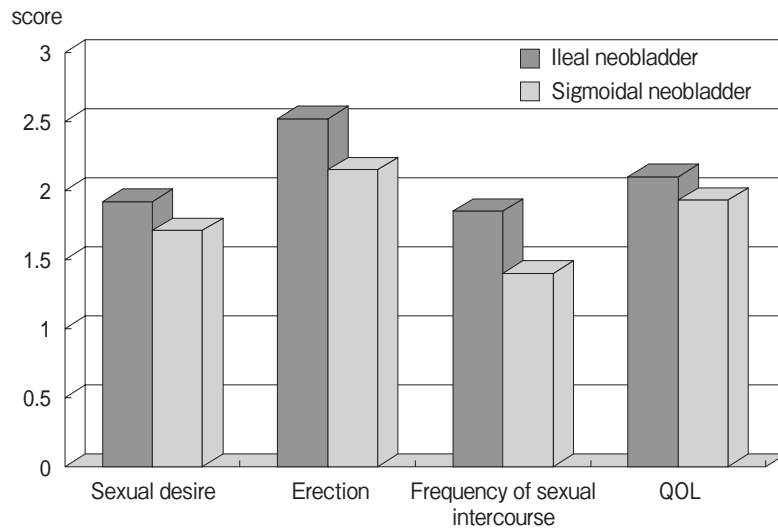


Fig. 3 Sexual Function: A high score represents a high level of problems (0-3). No statistically significant differences on any items.

pointment than those in the ileal OUR groups (Fig. 6).

Discussion

While there are some differences in post surgical course between the ileal OUR and sigmoidal OUR, the current published literature does not conclusively

document that one type of OUR is superior to another in terms of HRQOL. The assessment of HRQOL outcome is an important part of determining the overall effectiveness and benefit of a particular therapy. HRQOL is most important in disease processes where the treatments yield similar cancer-specific and survival results. To make an informed decision, patients need to know the after-surgery QOL that each tech-

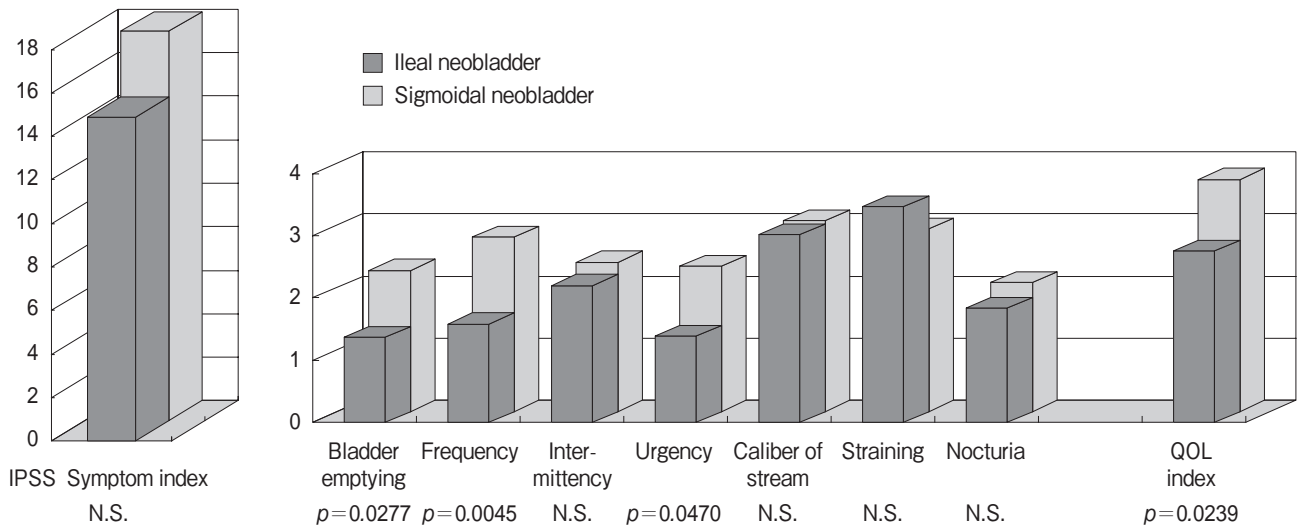


Fig. 4 Voiding condition (IPSS): A high score represents a high level of problems. Regarding bladder emptying, frequency and urgency in the sigmoidal OUR group were inferior to those in the ileal OUR group. The QOL index in the sigmoidal OUR group was also lower.

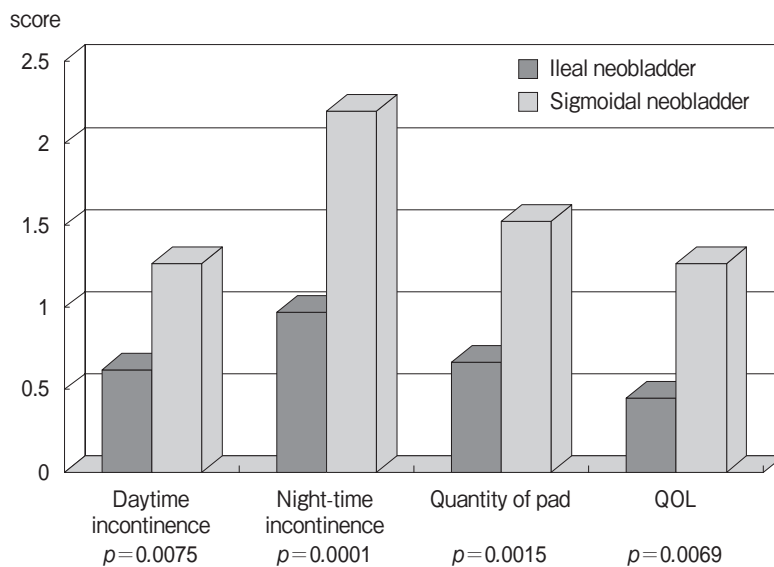


Fig. 5 Urinary incontinence: A high score represents a high level of problems. Daytime and night time continence and quantity of pad were better in the ileal OUR group.

nique offers. However, the assessment of HRQOL outcome in bladder cancer and type of urinary diversion is in its preliminary stages. To our knowledge, only one study has compared QOL between ileal OUR and Sigmoidal OUR [21].

We used EORTC-QLQ-C30 as a previously validated instrument for measuring the general aspects of HRQOL that are specific to cancer. However, this did not address the domains of specific relevance to patients with bladder cancer. While the functional evaluations showed no differences between the 2 groups, as for the symptom scales, diarrhea was recognized as being worse in the ileal than the sigmoidal OUR group. This result may indicate the possibility of indigestion at the ileal region and patients who are candidates for ileal OUR should be informed that they may need to take anti-dyspeptic diarrhea medicine.

Unfortunately, general instruments may not be very responsive to changes specific to bladder cancer and urinary diversion. EORTC-QLQ-C30 does not specifically address issues such as erectile dysfunction or urinary incontinence. Some preliminary work has been performed to develop and validate bladder cancer/urinary diversion-specific instruments [23], but as of now no well-studied instrument for measuring HRQOL in the setting of bladder cancer and urinary diversion is available. The FACT-BI has undergone some validation, but even this instrument has not been well-researched and may not be very responsive [14]. Therefore, we used our original questionnaires and the IPSS for evaluating subjective/objective condi-

tions of urination and sexual function. While no difference was recognized in sexual function between the 2 groups, bladder emptying, frequency, and urgency scores of IPSS in the sigmoidal OUR group were significantly higher than those in the ileal OUR group. Furthermore, daytime and nighttime continence and quantity of pad showed obviously better scores in the ileal OUR group. Results show that the QOL scores of IPSS in the sigmoidal OUR group were inferior, and patients in the group felt less satisfaction than their preoperative expectations. The possible reason for the difference are, as Koraitim *et al.* [24] have shown, that the ileal OUR can provide a greater-capacity, lower-pressure reservoir with greater compliance and less-frequent involuntary contractions than the sigmoidal OUR.

Our results are different from those of Miyake *et al.* [21], especially concerning urinary symptoms and patient's satisfaction. There are several possible reasons: first, the age distribution in the current study was older than that in the prior report (median 70.8 in ileal OUR and 71.9 sigmoidal versus mean 62.3 and 55.8 years old) although no influence of age distribution in our series could be found; second, the duration of follow-up in the current study was different from that reported previously (median 20.4 in ileal OUR and 46.8 sigmoidal versus mean 40.2 and 43.1 months), and third, the current study consisted of 72 males and 6 females. The greatest limitation of both studies was the lack of baseline and longitudinal assessment of HRQOL. Prospective studies with lon-

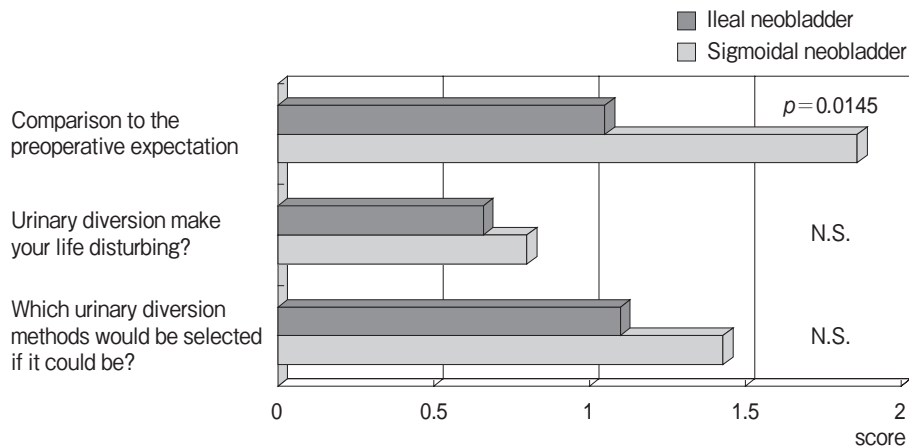


Fig. 6 Satisfaction with methods of urinary diversion: A high score represents a high level of problems. Patients in the sigmoidal OUR group expressed less satisfaction than their preoperative expectations.

gitudinal data collection to measure HRQOL could answer many of the important questions regarding HRQOL and the type of OUR.

Since the current study was a retrospective analysis involving a relatively small number of patients, the results are not sufficiently conclusive regarding the superiority of HRQOL in the ileal OUR for bladder cancer. However, some potentially useful information may be gained reflecting preoperative informed consent, as well as the selection of the type of urinary diversion and postoperative care.

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References

- Madersbacher S and Studer UE: Contemporary cystectomy and urinary diversion. *World J Urol* (2002) 20: 151–157.
- Hautmann RE: Which patients with transitional cell carcinoma of the bladder or prostatic urethra are candidates for an orthotopic neobladder? *Curr Urol Rep* (2000) 1: 173–179.
- Bjerre BD, Johansen C and Steven K: Health-related quality of life after cystectomy: bladder substitution compared with ileal conduit diversion. A questionnaire survey. *Br J Urol* (1995) 75: 200–205.
- Boyd SD, Feinberg SM, Skinner DG, Lieskovsky G, Baron D and Richardson J: Quality of life survey of urinary diversion patients: comparison of ileal conduits versus continent Kock ileal reservoirs. *J Urol* (1987) 138: 1386–1389.
- Gerharz EW, Weingartner K, Dopatka T, Kohl UN, Basler HD and Riedmiller HN: Quality of life after cystectomy and urinary diversion: results of a retrospective interdisciplinary study. *J Urol* (1997) 158: 778–785.
- Mansson A, Johnson G and Mansson W: Quality of life after cystectomy. Comparison between patients with conduit and those with continent caecal reservoir urinary diversion. *Br J Urol* (1988) 62: 240–245.
- Hart S, Skinner EC, Meyerowitz BE, Boyd S, Lieskovsky G and Skinner DG: Quality of life after radical cystectomy for bladder cancer in patients with an ileal conduit, cutaneous or urethral Kock pouch. *J Urol* (1999) 162: 77–81.
- Fujisawa M, Isotani S, Gotoh A, Okada H, Arakawa S and Kamidono S: Health-related quality of life with orthotopic neobladder versus ileal conduit according to the SF-36 survey. *Urology* (2000) 55: 862–865.
- McGuire MS, Grimaldi G, Grotas J and Russo P: The type of urinary diversion after radical cystectomy significantly impacts on the patient's quality of life. *Ann Surg Oncol* (2000) 7: 4–8.
- Hardt J, Filipas D, Hohenfellner R and Egle UT: Quality of life in patients with bladder carcinoma after cystectomy: first results of a prospective study. *Qual Life Res* (2000) 9: 1–12.
- Conde Redondo C, Estebanez Zarranz J, Rodriguez Tovez A, Amon Sesmero J, Alonso Fernandez D and Martinez Sagarra JM: Quality of life in patients treated with orthotopic bladder substitution versus cutaneous ileostomy. *Actas Urol Esp* (2001) 25: 435–444.
- Hobisch A, Tosun K, Kinzl J, Kemmler G, Bartsch G, Holtl L and Stenzl A: Life after cystectomy and orthotopic neobladder versus ileal conduit urinary diversion. *Semin Urol Oncol* (2001) 19: 18–23.
- Dutta SC, Chang SC, Coffey CS, Smith JA Jr, Jack G and Cookson MS: Health related quality of life assessment after radical cystectomy: comparison of ileal conduit with continent orthotopic neobladder. *J Urol* (2002) 168: 164–167.
- Mansson A, Davidsson T, Hunt S and Mansson W: The quality of life in men after radical cystectomy with a continent cutaneous diversion or orthotopic bladder substitution: is there a difference? *BJU Int* (2002) 90: 386–390.
- Joniau S, Benijts J, Van Kampen M, De Waele M, Ooms J, Van Cleynenbreugel B and Van Poppel H: Clinical experience with the N-shaped ileal neobladder: assessment of complications, voiding patterns, and quality of life in our series of 58 patients. *Eur Urol* (2005) 47: 666–673.
- Porter MP and Penson DF: Health related quality of life after radical cystectomy and urinary diversion for bladder cancer: a systematic review and critical analysis of the literature. *J Urol* (2005) 173: 1318–1322.
- Saika T, Arata R, Tsushima T, Nasu Y, Suyama B, Takeda K, Ebara S, Manabe D, Kobayashi T, Tanimoto R and Kumon H: Health-related Quality of Life after Radical Cystectomy for Bladder Cancer in Elderly Patients with an Ileal Conduit, Ureterocutaneostomy, or Orthotopic Urinary Reservoir: A Comparative Questionnaire Survey. *Acta Med Okayama* (2007) (In press).
- Hautmann RE: Urinary diversion: ileal conduit to neobladder. *J Urol* (2003) 169: 834–842.
- Perimenis P and Studer UE: Orthotopic continent urinary diversion an ileal low pressure neobladder with an afferent tubular segment: how I do it. *Eur J Surg Oncol* (2004) 30: 454–459.
- Reddy PK, Lange PH and Fraley EE: Total bladder replacement using detubularized sigmoid colon: technique and results. *J Urol* (1991) 145: 51–55.
- Miyake H, Nakamura I, Eto H, Gotho A, Fujisawa M, Okada H, Arakawa S, Kamidono S and Hara I: An evaluation of quality of life in patients who underwent orthotopic bladder replacement after cystectomy: comparison of ileal neobladder versus colon neobladder. *Urol Int* (2002) 69: 195–199.
- Aaronson NK, Ahmedzai S, Bergman B, Bullinger M, Cull A, Duez NJ, Filiberti A, Flechtner H, Fleishman SB, de Haes JCJM, Kaasa S, Klee M, Osoba D, Razavi D, Rofe PB, Schraub S, Sneeuw K, Sullivan M, Takeda F for the European Organization for Research and Treatment of Cancer Study Group on Quality of Life: The European Organization for Research and Treatment of Cancer QLQ-C30: a quality-of-life instrument for use in international clinical trials in oncology. *J Natl Cancer Inst* (1993) 85: 365–376.
- Cookson MS, Dutta SC, Chang SS, Clark T, Smith JA Jr and Wells N: Health related quality of life in patients treated with radical cystectomy and urinary diversion for urothelial carcinoma of the bladder: development and validation of a new disease specific questionnaire. *J Urol* (2003) 170: 1926–1930.
- Koraitim M, Atta MA and Foda MK: Early and rate cystometry of detubularized and nondetubularized intestinal neobladders: new observations and physiological correlates. *J Urol* (1995) 154: 1700–1703.