Urinary Bother as a Predictor of Postsurgical Changes in Urinary Function After Robotic Radical Prostatectomy

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OBJECTIVE To characterize changes in indices of urinary function in prostatectomy patients with presurgical voiding symptoms.

METHODS A retrospective analysis of our prostate cancer database identified robot-assisted radical prostatectomy patients between April 2007 and December 2011 who completed pre- and postsurgical (24 months) Expanded Prostate Cancer Index Composite-26 surveys. Gleason score, margins, D'Amico risk, prostate-specific antigen, radiotherapy, and nerve-sparing status were tabulated. Survey questions addressed urinary irritation/obstruction, incontinence, and overall bother. Responses were averaged to calculate a urinary sum (US) score. Patients were stratified according to the severity of their baseline urinary bother (UB), and changes in urinary indices determined at 24 months.

RESULTS A total of 737 patients were included. Postsurgical improvement in urinary obstruction, bother, and sum score was related to baseline UB ($P < .001$). Men with severe baseline bother had the greatest improvement in US (+9.3), whereas those with asymptomatic baseline UB experienced a decline in US (−2.8). All patients experienced a decline in urinary incontinence of 6.3-8.3 that was independent of baseline bother ($P = .507$). Patients with severe UB experienced positive outcomes, whereas those at asymptomatic baseline experienced negative US outcomes. Negative urinary incontinence outcomes were unrelated to baseline UB. Age, radiotherapy, and nerve-sparing status were not associated with improved UB ($P = .029$). However, baseline UB was significantly associated with improvement in postsurgical UB ($P = .001$).

CONCLUSION Baseline UB is a predictor of postsurgical improvement in urinary function. These data are helpful when counseling a subset of robot-assisted laparoscopic radical prostatectomy patients with severe preoperative urinary symptoms. UROLOGY 86: 817–823, 2015. © 2015 Elsevier Inc.

Although a variety of therapies are available to patients diagnosed with prostate cancer, the range and severity of side effects, particularly in relation to urinary function, can vary markedly between them. Consequently, it is important to have a good understanding of the long-term quality of life (QOL) profiles associated with each treatment to enable informed decision-making.

Radical prostatectomy (RP) is associated with postoperative deficits in urinary function that have a negative impact on QOL.[1-4] Urinary complications after RP are frequently related to incontinence, particularly in the immediate postoperative period, which may only partially resolve over 24 months.[4]

Previous studies have shown that a subset of men with urinary obstruction can expect a postoperative improvement in their symptomatology after RP.[3,5-8] However, these studies utilized the International Prostate Symptom Score or American Urological Association Symptom Score that were validated in patients with symptomatic benign prostatic hyperplasia and were not intended for the evaluation of urinary symptoms after prostatectomy.[9] Furthermore, they do not contain any questions directly related to urinary incontinence (UI), which is a major urologic complaint after prostatectomy. Other studies have used the University of California, Los Angeles (UCLA) prostate cancer index, which emphasizes incontinence but does not directly ask about irritative or obstructive symptoms.[6]

The commonly used index for assessing QOL in prostate cancer patients is the Expanded Prostate Cancer Index Composite (EPIC-26) that evaluates and integrates

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information regarding a patient's voiding and incontinence symptoms.[4,10,11] Questions covering hematuria, dysuria, stream, and frequency are compiled into a single urinary irritation/obstruction (UO) index, whereas questions related to leakage and pad use are used to define an index of UI. A single question, "Overall, how big a problem has your urinary function been for you over the past 4 weeks?" is used to define the urinary bother (UB) index. Responses to all these questions are used to calculate a urinary sum (US) index.[10]

In the present study, we undertook a retrospective analysis of our prostate cancer database over a 4-year contemporary time period to assess the influence of preoperative UB on urinary symptoms after robotic prostatectomy. These data may help in preoperative counseling of RALP patients regarding anticipated postsurgical changes in urinary function and QOL.[12]

METHODS

Patients

We undertook a retrospective review of our institutional review board–approved prostate cancer database to identify patients who completed an EPIC-26 survey immediately prior and 24 months after undergoing robot-assisted laparoscopic RP (RALP) between April 2007 and December 2011. A total of 1544 patients underwent RALP performed by multiple surgeons during this period. Of these, a total of 807 patients were excluded because of the absence of follow-up survey data. The remaining 737 patients completed surveys both preoperatively and at 24 months follow-up and formed the final study cohort.

Data Collection

Since April 2007, we have routinely used the EPIC-26 to track the urologic outcome of prostate cancer patients at our clinical center. Patients completed surveys both preoperatively and at 24 months follow-up. All surveys were self-administered by patients. Baseline surveys were completed during a preoperative visit to the clinic. Follow-up surveys were either mailed and completed by patients at home or completed during a scheduled follow-up visit.

Survey Questions

Responses to each survey question related to UO, UI, and UB were scored on a 4- or 5-point Likert scale (varied by questions) and transformed to a scale of 0-100 (100 equivalent to asymptomatic). UO scores reflected voiding and storage symptoms and were determined using specific questions related to pain/dysuria, hematuria, weak stream/incomplete emptying, and frequency. UI questions were related to urine leakage, urinary control, and the use of pads or adult diapers. Responses to a single UB question were used to assess how big a problem overall urinary function was for each patient. Baseline UB was categorized as severe (UB = 0-50), moderate (UB = 75), or asymptomatic (UB = 100) and was subsequently used to stratify patients according their baseline UB for further analyses. UO, UI, and UB scores were calculated as previously described[12-14] and were subsequently averaged to calculate an overall US score.

A copy of the EPIC-26 survey used in this study can be accessed at http://www.med.umich.edu/urology/research/EPIC/EPIC-Urinary-2.2002.pdf. Additional supporting information regarding the EPIC survey can also be accessed at (http://www.med.umich.edu/urology/research/EPIC.html).

Statistical Analyses

Analyses were performed based on the dependent variable (ie, 1-way analysis of variance for age, Kruskal-Wallis for prostate-specific antigen (PSA), clinical and pathology volume scores, and chi-square test of proportions for surgical margins, nerve-sparing method, and use of adjuvant or salvage radiotherapy or neoadjuvant or salvage hormonal ablation).

Distributions of each of the scale scores were examined to determine the appropriate statistical approach. Neither the raw nor transformation data (logarithmic or square root) met assumptions for normality. As such, nonparametric analyses were performed.

Changes in each of the urinary scales (obstructive/irritative, continence, bother and overall US) from baseline to 24 months were first assessed using Wilcoxon signed rank test.

The primary analyses assessed the relationship between baseline bother score and change in UO, UI, UB, and US scores at 24 months compared with baseline. To facilitate these nonparametric analyses, a single measure of change for each scale was created. Patients were defined as having either a positive or negative change at 24 months after surgery. An improvement (higher scores) or worsening of symptoms (lower scores) was defined as positive or negative change. Patients without change were characterized based on their baseline score. Patients who were asymptomatic at baseline and did not experience a change in a score were considered as having a positive outcome. In contrast, patients with identical symptomatic scores at baseline and at 24 months were included in the negative outcome group. Chi-square tests of proportion were used to compare the proportions of positive and negative change on each of the scales based on the baseline bother group.

As several of the demographic and baselines clinical indices differed for the baseline bother groups, a multivariate approach was used. Subsequently, logistic regressions predicting a positive or negative outcome on each of the scales were conducted to determine if baseline bother was a predictor of these outcomes independent of any factors found to statistically associated ($P \leq .05$) with baseline scores in univariate analyses.

RESULTS

Demographics and Clinical Indices of All Patients

A total of 737 patients were included in the study cohort. At the time of surgery, this patient cohort had a median age of 61.0 years (interquartile range [IQR]: 55.9-65.7 years) and a median PSA of 5 ng/mL (IQR: 4-6.8 ng/mL). When stratified according to D'Amico risk, 318 (43.1%), 334 (45.3%), and 85 (11.5%) were determined to be at low, intermediate, and high risk of recurrence, respectively. At diagnosis, biopsies were predominantly graded at Gleason 6 (345 patients; 46.8%) or Gleason 7 (322 patients; 43.8%). The remaining 69 patients (9.4%) had biopsies that were scored Gleason 8-10 (Table 1). At final pathology, 188 (25.5%), 493 (66.9%), and 53 (7.2%) of patients had Gleason 6, 7, and 8-10 disease, respectively (Table 1). At final pathology, tumors were predominantly staged at pT2c (474; 64.2% of patients) and pT3a (150; 20.3% of patients).