Evaluating Urinary Continence and Preoperative Predictors of Urinary Continence After Robot Assisted Laparoscopic Radical Prostatectomy

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Abbreviations and Acronyms

BMI = body mass index

ICIQ-UI SF = International Consultation on Incontinence Questionnaire-Urinary Incontinence Short Form

IIEF = International Index of Erectile Function

PCa = prostate cancer

PSA = prostate specific antigen

RALP = robot assisted laparoscopic radical prostatectomy

RRP = radical retropubic prostatectomy

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See Editorial on page 829.

Purpose: We evaluated urinary continence using a validated questionnaire in a series of consecutive patients who underwent robot assisted laparoscopic radical prostatectomy, and identified the preoperative predictors of the return to urinary continence.

Materials and Methods: The clinical records of 308 consecutive patients who underwent robot assisted laparoscopic radical prostatectomy for clinically localized prostate cancer at a tertiary academic center were prospectively collected. All patients were continent before surgery. Urinary continence was evaluated using the International Consultation on Incontinence Questionnaire-Urinary Incontinence Short Form instrument. All of the patients reporting no leak in response to the question, "How often do you leak urine?" were defined as continent.

Results: A total of 273 patients (90%) were continent 12 months after robot assisted laparoscopic radical prostatectomy. Continent patients were significantly younger (61.4 ± 6.4 vs 64.1 ± 6.1 years, p = 0.02) than those who were incontinent. On univariable regression analysis patient age at surgery (OR 1.075, p = 0.024) and Charlson comorbidity index (OR 1.671, p = 0.007) were significantly associated with 12-month continence status. On multivariable analysis age (OR 1.076, p = 0.027) and Charlson comorbidity index (OR 1.635, p = 0.009) were independent predictors of continence rates.

Conclusions: Using the International Consultation on Incontinence Questionnaire-Urinary Incontinence Short Form 90% of patients undergoing robot assisted laparoscopic radical prostatectomy reported no urine leak 12 months after surgery. Patient age at surgery and Charlson comorbidity index were independent predictors of the return to urinary continence, whereas notably no variable related to prostate cancer was significantly correlated with urinary continence.

Key Words: prostatectomy, laparoscopy, robotics, prostatic neoplasms, urinary incontinence

URINARY incontinence is one of the most relevant functional complications following radical prostatectomy. In recent years RALP using the da Vinci® Surgical System has gained widespread use. Nonetheless a recent systematic review of the comparative studies evaluating robot assisted, retropubic and laparoscopic radical prostatectomy revealed that few publications used appropriate methodology to report the functional outcomes of these surgeries, with the use of validated questionnaires being uncommon.[1] More data on the return to continence following RALP are available

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from surgical series. Reported continence rates ranged from 30% to 89% at 3 months,[2–5] from 50% to 95% at 6 months[2,4–7] and from 62% to 97% at 12 months.[3–5,8,9] Such significant variability may be attributed to the adoption of different definitions and tools to evaluate urinary continence as well as to physician proficiency in performing the procedure. To our knowledge no study to date has analyzed the predictors of return to urinary continence in a RALP series. We evaluated urinary continence in a series of consecutive patients who underwent RALP using a validated questionnaire and identified the preoperative predictors of return to urinary continence.

MATERIALS AND METHODS

The clinical records of all 415 patients who underwent RALP for clinically localized PCa at our institution between April 2005 and April 2009 were prospectively collected in the Prostate Cancer Padua Database. For the present study we excluded 107 patients with followup shorter than 12 months. In addition, 4 patients who did not fill in the questionnaires were excluded from the study, leaving 304.

All patients underwent RALP as previously reported.[10,11] The bladder neck and the pubourethral component of the puboprostatic ligaments were preserved. No attempt was made to reconstruct Denonvilliers musculofascial plate. Preservation of the neurovascular bundles was indicated in those patients with cT1–cT2a PCa, biopsy Gleason score 7 or less, preoperative IIEF greater than 26 and without significant comorbidity. An intrafascial technique was used in most patients.[12] Lymphadenectomy was usually performed in patients with intermediate or high risk disease according to the D'Amico risk group.[13] The prostatectomy specimen was processed as previously described.[11,14]

Urinary continence was evaluated using the ICIQ-UI SF instrument.[15] The questionnaire was completed by the patients before surgery and at 12-month followup. All of the patients reporting no leak in response to the question, "How often do you leak urine?" were defined as continent. In addition, erectile function was evaluated preoperatively and at 12 months after surgery using the IIEF-6 questionnaire. During followup patients were invited to complete the questionnaire and return it by mail. A third person who was blinded to the preoperative characteristics of the patients inserted the score in the database. In this study we defined potent patients as those with an IIEF-6 score of 18 or greater regardless of the use of phosphodiesterase type 5 inhibitors.

Patient comorbidity was evaluated using the Charlson comorbidity index score.[16] Clinical and pathological stages were reported according to the 2002 TNM system.[17] Institutional review board approval is not needed in Italy for nonexperimental studies such as this one.

In terms of statistical analysis continuous normally distributed variables were reported as mean ± SD. Continuous nonnormally distributed variables were presented as median (IQR). The t test, Mann-Whitney U test and Pearson's chi-square test were used to compare continuous and categorical variables as appropriate. Logistic regression analyses were used for univariable and multivariable analyses. Total PSA, clinical T stage and Gleason score were excluded from the multivariable regression model due to collinearity with the D'Amico risk group. All reported p values were 2-sided and statistical significance was set at $p < 0.05$. All statistical tests were performed using SPSS® v. 16.0.

RESULTS

Table 1 shows the clinical and pathological characteristics of the 304 evaluated patients. Mean patient age was 61.6 ± 6.4 years. Median serum PSA at diagnosis was 6.3 ng/ml (IQR 4.6 to 8.4). According to the D'Amico classification 206 patients (68%) had low risk cancers, 77 (25%) intermediate risk and 21 (7%) high risk. All patients were continent before surgery. A bilateral, intrafascial nerve sparing technique was performed in 201 cases (66%), a unilateral nerve sparing technique was performed in 22 (7%) while a nonnerve sparing RALP was performed in 81 (27%). Median catheterization time was 5 days (IQR 4 to 7) and median in-hospital stay was 6 days (IQR 5 to 7).

Followup data showed that 12 months after RALP 148 patients (49%) were potent and 273 (90%) were continent. Of the patients 281 (93%) reported not using any pad or protection system during the day. Those patients using pads reported using a median of 1 pad (IQR 1 to 2) daily.

Continent patients were significantly younger (61.4 ± 6.4 vs 64.1 ± 6.1, $p = 0.02$) than those who were incontinent. All the other clinical and pathological characteristics were similar between the groups. Surprisingly the adopted nerve sparing technique did not affect 12-month continence rates ($p = 0.629$) (table 1).

On univariable regression analysis patient age at surgery (OR 1.075, $p = 0.024$) and Charlson comorbidity index (OR 1.671, $p = 0.007$) were significantly associated with 12-month continence status, whereas BMI, preoperative erectile function, PSA, clinical T stage, biopsy Gleason score and D'Amico risk group were not (table 2). On multivariable analysis age (OR 1.076, $p = 0.027$) and Charlson comorbidity index (OR 1.635, $p = 0.009$) were independent predictors of 12-month continence rates.

DISCUSSION

Based on the ICIQ-UI 90% of our patients undergoing RALP reported no urine leak 12 months after surgery. Patient age at surgery and Charlson comorbidity index were independent predictors of the return to urinary continence. In contrast, notably no variable related to PCa (PSA, clinical stage, Gleason