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Robotic assisted laparoscopic radical prostatectomy following transurethral resection of the prostate: perioperative, oncologic and functional outcomes

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Purpose: The aim of this study was to assess surgical, oncologic and functional results after robotic-assisted laparoscopic radical prostatectomy (RALP) with and without previous transurethral resection of the prostate (TURP).

Methods: Between December 2005 and January 2010, 200 patients underwent RALP, of whom 16 (8%) had received previous TURP and 184 (92%) had not. Perioperative and postoperative data were compared between those with previous TURP (group 1) and those without previous TURP (group 2). All patients included in the study had at least 1-year follow-up.

Results: Preoperative clinical parameters were comparable between both groups. Group 1 patients were found to have significantly more need for bladder neck reconstruction (93.75 % vs. 15.21%, $P<0.001$), more rectal injury (18.75% vs. 0%, $P<0.001$), higher incidence of major complications (18.8% vs. 1.1%, $P<0.001$), and smaller specimen volume (31.63 mL vs. 45.49 mL, $P<0.001$) than group 2. The 12-month continence rate was 93.8 % in group 1 and 97.8% in group 2 ($P=0.344$). A nerve-sparing technique was significantly less successfully performed in group 1 patients than in group 2 (33.3% vs. 92.0 %, $P=0.001$).

Conclusions: Performing RALP for prostate cancer in patients who have had previous TURP is a technically demanding procedure and may be potentially associated with a higher perioperative major complication rate in short-term follow-up. Neurovascular bundle preservation is technically more challenging.

Keywords: Prostatic neoplasm, Prostatectomy, Robotics, Transurethral resection of prostate

INTRODUCTION

Incidental cancer of the prostate is found in 3%–16% of specimens from transurethral resection of the prostate (TURP) [1,2]. The results of open radical retropubic prostatectomy (RRP) or laparoscopic radical prostatectomy (LRP) for prostate cancer after previous TURP have been evaluated [3-11]. The reports are conflicting as to whether or not previous TURP worsens the prognosis after radical prostate surgery as a result of fibrous scarring and altering of tissue layers associated with difficult surgical procedures.

Since 2000, use of the da Vinci robotic system (Intuitive Surgical, Sunnyvale, CA, USA) has allowed the worldwide spread of RALP. The advantages of surgical robotics include three-dimensional visualization, seven degrees of freedom with instrument movement and absence of the fulcrum effect of conventional laparoscopy. However, limited data are available regarding robotic-assisted laparoscopic radical prostatectomy (RALP) after previous TURP [12-14]. In our previous study [15], we found that learning curve to decrease

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major complications of RALP is significantly decreased after 150 cases. Nevertheless, RALP in patients with previous TURP tended to be more technically difficult and potentially associated with more perioperative complications. Hence, the aim of the present study was to examine whether previous TURP affects the oncologic safety, functional efficacy and complication rates of RALP.

MATERIALS AND METHODS

1. Patients and procedure

From December 2005 to January 2010, 200 consecutive patients with prostate cancer underwent RALP by a single surgeon (Y.C.O.) at our institution. RALP was performed after a minimum of 6 weeks after biopsy and 12 weeks after TURP. Among 200 RALPs performed, 16 patients (8%) had received previous TURP (group 1) and 184 patients (92%) had not. Recorded preoperative clinical characteristics included age, body mass index (BMI), American Society of Anesthesiologists anesthetic/surgical risks class (ASA), prostate-specific antigen (PSA) levels, PSA density, biopsy percentage, biopsy Gleason score and clinical stage (using the 2002 American Joint Committee on Cancer stage).

Transperitoneal RALP was performed as previously described [15-17]. Dissection of the bilateral pelvic lymph nodes (BPLND) was usually performed and only excluded in low-risk patients with a low likelihood (<3%) of lymph node positivity. Neurovascular bundle (NVB) sparing procedures using the Vattikuti Institute Prostatectomy technique [18] were performed depending on preoperative tumour status and each patient's choice. For low risk patients, bilateral NVB preservation was tried. For intermediate risk patients, unilateral NVB preservation was tried. And no NVB preservation will be attempted for high risk patients. Urethrovesical anastomosis was made utilizing two 18-cm 3–0 Monocryl continuous stitches. An 18-French silicon Foley catheter with a 10-mL balloon was placed. The urinary bladder was then filled with 200 mL normal saline to check for watertight anastomosis.

Intraoperative and perioperative parameters were recorded for each surgery including performance of BPLND, type of NVB preservation (i.e., none, unilateral, bilateral), vesicourethral anastomosis time, surgeon's console time, estimated blood loss, transfusion rate and complications up to 180 days postoperatively. Console time was defined as the time interval while the surgeon was sitting at the surgical console using the daVinci system during the entire operation. Specimens were fixed, Indian ink-coated and serially perpendicular sectioned at 4-mm intervals. Oncologic results were recorded, including specimen volume, tumour volume, tumour percentage, Gleason score, positive surgical margin (PSM) rate, and nodal status. Perioperative complications over the 180-day postoperative period were evaluated and graded from grade 0 to grade V according to the Clavien-Dindo classification system [19]. Grade I to grade II were considered as minor complications, while grade III to grade V were classified as major complications.

Continence was defined as having no pad use. Potency was defined as achieving sufficient erection to intercourse with or without phosphodiesterase 5 inhibitor. Postoperative potency and continence data for up to 12 months were assessed and recorded. PSA or biochemical failure was regarded as two serial serum PSA results >0.2 ng/mL [20].

The preoperative, intraoperative, and postoperative data were collected, and the results were retrospectively compared between the patients with a history of resection (group 1) and those without previous TURP (group 2).

2. Statistical analysis

A retrospective cross-sectional evaluation of surgical, oncologic and functional results was made to compare groups 1 and 2. The SPSS ver. 12.0 (SPSS Inc., Chicago, IL, USA) was used for the statistical analyses. Statistical analysis was carried out using the independent sample *t*-test & chi-square test. In all tests, $P<0.05$ was considered to indicate statistical significance.

RESULTS

As shown in Table 1, a total of 200 patient charts were reviewed, identifying 16 patients with previous TURP (group 1) and 184 without previous TURP (group 2). In group 1, there were three patients with benign pathology in the previous TURP specimens but prostate cancer was discovered during subsequent follow-up. The other 13 patients had prostate cancer incidentally identified in TURP chips. No significant differences were found between the two groups in age, BMI, ASA risk class, clinical stage, mean preoperative PSA level, free PSA, PSA density or Gleason grade from the biopsies. However, the biopsy percentage was higher in group 1 than in group 2 (33.4% vs. 21.6%, $P=0.003$).

Table 2 reveals the intraoperative data and complications. The need for bladder neck reconstruction was significantly greater in group 1 than in group 2 (93.75% vs. 15.21%, $P<0.001$). Rectal injury was higher in group 1 compared to group 2 (18.75% vs. 0%, $P<0.001$). More major complications occurred in group 1 than in group 2 (18.8% vs. 1.1%,