

Research Article

Evaluation of Surgical and Function Outcomes after Bilateral Intravesical Nerve-Sparing Laparoscopic Radical Prostatectomy after TUR-P for Incidental Prostate Cancer

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Objective: To evaluate the impact of nerve-sparing laparoscopic radical prostatectomy (nsLRPT) on surgical and functional outcomes, by using validated questionnaire in patients affected by incidental prostate cancer.

Materials and Methods: Retrospective single surgeon study including 125 consecutive patients who underwent a nsLRP for incidental prostate cancer diagnosed after TUR-P. International Index of Erectile Function (IIEF5) was administered preoperatively, and at 3, 6 and 12 months postoperatively. Potency was defined as a score >17 points. Clinical data were also recorded at each time point.

Results: The mean operative time was 153.1±35.4 min with a mean intraoperative blood loss of 350.3±150.4 ml and a transfusion rate of 1.6%. The mean catheterization time was 8±1 days and the mean length of hospitalization results to be shorter after nsLRPT was 7.2±2.1 days. No major complications occurred in both groups.

Positive margins were detected in only 1 patient (1.8%) with a pT2c tumour. Nevertheless, at a median follow-up of 48 months, all patients were alive with no evidence of tumour recurrence. At the 12th months, a complete continence was reported in 98.4% of patients who underwent surgery. Regarding sexual potency, 52% and 78.4% of all patients reported the ability to engage in sexual intercourse at 6- and 12- months after surgery, respectively.

Conclusion: NsLRP after TUR-P, performed by expert surgeons, results to be a safe procedure with excellent functional outcomes with regard to the urinary continence and sexual potency.

Keywords: Bilateral intrafascial nerve-sparing radical prostatectomy; Incidental prostate cancer; Laparoscopy; Transurethral prostate resection; Sexual function; Outcomes

Introduction

Currently, Radical Prostatectomy (RP) is the only treatment for localised prostate cancer that has shown a cancer-specific survival benefit when compared with conservative management [1].

In the last decade, laparoscopic radical prostatectomy has been increasingly used for the surgical treatment of prostate cancer and it is now considered a well-established alternative to open surgery [2].

Incidental cancer of the prostate is found in 3%-16% of Transurethral Resection of the Prostate (TURP) specimens [3].

It has been reported that nerve-sparing Radical Prostatectomy (nsRP) after previous prostate surgery can be challenging [3-6]. In literature there is only one report regarding the nerve-sparing open Radical Prostatectomy (nsRRPT) in patients previously subjected to prostatic surgery for Benign Prostate Hyperplasia (BPH) [7] but few studies regarding the laparoscopic bilateral nerve-sparing radical

prostatectomy after TUR-P are actually available.

Many studies on Erectile Dysfunction (ED) following nerve-sparing RRP have been published, revealing widely disparate potency rates (30-86%) among various groups in different studies [8]. This variation in potency rates may be due to patient selection, surgeon and hospital volume, and the proportion of nerve-sparing procedures.

The aim of our study was to investigate the effect of nsLRPT on the surgical and functional outcomes in patients previously with incidental prostate cancer.

Materials and Methods

This was a retrospective, single-surgeon study including 125 patients who underwent an extra peritoneal Laparoscopic bilateral nerve-sparing Radical Prostatectomies (nsLRPT) for incidental prostate cancer diagnosed after TUR-P after TUR-P. All patients were informed about the procedures and written consent was obtained.

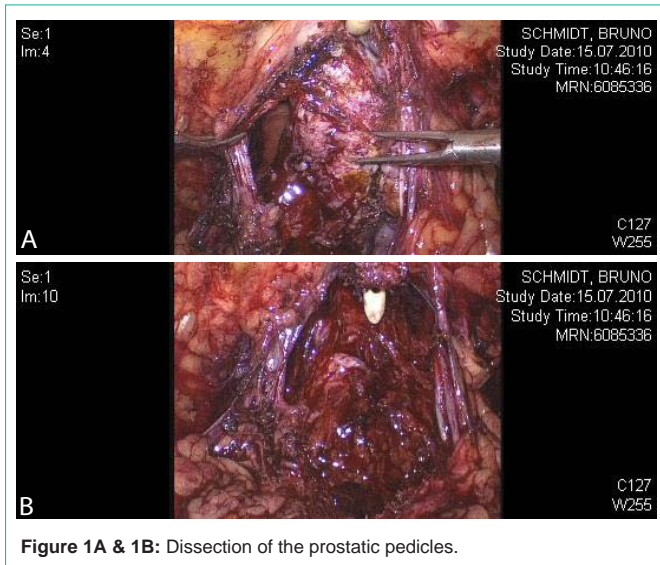


Figure 1A & 1B: Dissection of the prostatic pedicles.

Our surgical technique was previously described [2].

Shortly, after dissection of the bladder neck, the peri-prostatic fascia including the neurovascular bundles is mobilized and dissection is performed posteriorly behind the bladder neck, and the seminal vesicles and the ductus deferens are identified and dissected.

The Denonvilliers’ fascia was stripped from the prostatic capsule, and the prostatic pedicles were clipped and dissected (Figure 1A & 1B). No coagulation or ultrasound dissector was used during this step. Inclusion criteria were as follows: PSA < 10, Gleason ≤ 7 and only two positive of at least 12 biopsy cores.

Surgical and functional outcomes were compared. Postoperatively, all patients were treated with Tadalafil 20 mg (on demand).

No single patient underwent nerve-sparing LRP within the first 4 months after TUR-P, in order to diminish the periprostatic inflammation due to the first intervention.

All surgical procedures were performed by one surgeon (F.G.) who had completed at least 70 nsLRPTs and at least 200 laparoscopic radical prostatectomies before the beginning of the study, thus reducing the learning-curve effect.

Data were expressed as mean ± Standard Deviation (SD) and statistical significance was accepted at $p < 0.05$. Statistical analysis was performed using Sigmaplot® software version 13.0 (SPSS Inc., Chicago, IL, USA) and Graphpad Prism 5 (Graphpad Software, CA, USA).

Fisher’s exact test was applied to evaluate statistical between-group differences in pathological stages. Changes over time in measure of sexual function scores were analyzed by the repeated measures two-way analysis of variance.

Main Outcome Measures

The primary outcome parameters were defined as any changes in sexual function, as measured by IIEF-5 at 12 months postoperatively compared to the baseline as well as changes in IIEF-5 domains and total score over time. Preoperatively and at each follow-up visit (3

Table 1: Preoperative data.

Mean age (years)	56.8±6.7
Body mass Index kg/m ²	27.7±3.8
PSA level (ng/ml before TUR-P)	3.2±1.4
Clinical stage:	
T1a	51 (40.8%)
T1b	74 (59.2%)
Preoperative Gleason score: Patients (%)	
5-6	92 (73.6%)
7	33 (26.4%)
8-10	0
mean IIEF-5 I	22.5±2.3
mean IPSS mean ICIQ-SF	10.6±4.2 0.2±0.4

months, 6 months, 1 year), the IIEF-5 questionnaire has been given to the patients.

All questionnaires were completed independently. The secondary outcome measure of the study was to evaluate the efficacy and clinical performance of nsRP after TUR-P in patients affected by incidental prostate cancer.

Preoperatively, all patients were evaluated with a general medical history, sexual history, physical examination, 24 hours pad count (number of sanitary pads used in 24 hours), video urodynamics, and cystoscopy.

Urinary continence and erectile function at the follow-up were evaluated using the International Prostate Symptom Score (IPSS), the International Consultation of Incontinence Questionnaire – Urinary Incontinence (ICIQ-UI) short-form instrument. All the patients reporting the need of no pad were defined as continent. All the patients with an IIEF-5 of > 17 were defined as potent.

Results

Preoperative demographic data are reported in the (Table 1). The patients were generally young (56.8±6.7 years) with a mean preoperative prostate specific antigen of 3.2±1.4 ng/ml. preoperatively, the mean IIEF-5 was 22.5±2.3 and the mean preoperative IPSS was 10.6±4.2.

Table 2: Intra- and postoperative data.

Mean operation time (min)	153.1±35.4
Mean estimated blood loss (ml)	350.3±150.4
Blood transfusion (%)	1.6
Mean catheterization time (days)	8±1
Mean hospital stay (days)	7.2±2.1
Mean prostate weight (g)	21.1±4.3
Mean Gleason score	6.35± 0.63
Tumor stage (patients):	
T0	0
T2a	43
T2b	28
T2c	54
T3a/b	0
Positive surgical margins (pT2c, %)	1.8
Tumor recurrence at 4 year (patients)	0

Perioperative data are summarized in (Table 2). The mean operative time was 153.1 ± 35.4 min with a mean intraoperative blood loss of 350.3 ± 150.4 ml and a transfusion rate of 1.6%. The mean catheterization time was 8 ± 1 days and the mean length of hospitalization results to be shorter after nsLRPT was 7.2 ± 2.1 days.

Each patient underwent a cystography on the 7th postoperative day to evaluate the urethral anastomosis for leakage.

No major complications occurred in both groups. Only in one patient who previously underwent an extraperitoneal laparoscopic hernia repair with mesh placement, a lesion of the bladder occurred during developing the preperitoneal space by the balloon dilatation. Nevertheless the bladder was laparoscopically repaired with a two-layer suture line.

The mean Gleason score resulted 6.35 ± 0.63 and no patient showed absence of prostate cancer at definitive pathologic examination (pT0).

Positive margins were detected in only 1 patient (1.8%) with a pT2c tumour. Nevertheless, at a median follow-up of 48 months, all patients were alive with no evidence of tumour recurrence functional outcomes (Table 3).

The early return to continence at 4 weeks after the operation was achieved by only 54 (43.2%) patients in the nsLRPT. Six months postoperatively, 110 patients (88%) were continent, 13(10.4%) experienced a minimal stress incontinence (1-2 pads per day) and 2 (1.6%) experienced a moderate stress incontinence (2-4 pads per day).

At the 12th months, a complete continence was reported in 98.4% of patients who underwent surgery.

Regarding sexual potency, 52% and 78.4% of all patients reported the ability to engage in sexual intercourse at 6- and 12- months after surgery, respectively. The use of Phosphodiesterase type 5 (PED5) inhibitors must be considered when interpreting the potency results (on demand Tadalafil 20 mg).

Discussion

In recent years, LRP has been established as a safe and effective treatment for prostate cancer in specialized centres [8-15].

Performed by any of the surgical approaches, previous TURP may impose difficulties for the surgical team during radical prostatectomy. Infections of the prostate and seminal vesicles and perforation of the prostate's capsule during TURP with extravasation of irrigation fluid, might result in peri-prostatic fibrosis and distortion of the surgical plains, making the dissection difficult.

With better visualization of the anatomy and a relatively bloodless field, LRPT has the potential to provide good functional outcomes with equal oncologic effectiveness [16].

Although Jaffe et al., [17] reported that patients with a history of transurethral prostate resection, who undergo laparoscopic radical prostatectomy, have worse outcomes with respect to operative time, length of stay, positive margin rate and overall complication rate, other reports indicated that radical prostatectomy may be performed safely with an acceptable morbidity rate following TURP, although postoperative urinary incontinence and erectile dysfunction are more

Table 3: Postoperative functional outcomes.

Complete urinary continence % (patients):	
4 weeks after surgery	43.2 (54)
6 months after surgery	88 (110)
12 months after surgery	98.4 (123)
Potency at 6 months after surgery % (patients)	52 (65)
Potency at 12 months after surgery % (patients)	78.4 (98)

frequent as compared to primary cases [6-8,18-21].

Colombo et al., [7] reported on 109 patients who had RRP for prostate cancer, after surgical intervention for BPH. In 88 of these 109 patients the previous intervention was TURP. Patients were matched in pairs according to their PSA level, age and clinical stage. The peri- and postoperative morbidity increased moderately in comparing with naïve patients, but functional results were assessed in only 48.8% of the patients. In that study complete urinary control was achieved in 86%, and adequate erectile function in 12% at a follow-up of 1 year after RRP.

Performing nerve-sparing radical prostatectomy in patients who previously had surgery for urinary obstruction can present some unexpected difficulties, requiring better surgical skills [6,8].

In 2008 Suardi et al., [8] reported their experienced with 15 consecutive patients who underwent nsRRPT after holmium laser enucleation of the prostate (HoLEP) and after

TUR-P, with encouraging results. All operations were successfully performed without major complications.

It has been postulated that nsLRPT resulted in a higher rate of positive margins. For an objective evaluation of the positive margin rate, three aspects have to be considered. The first is the technique of histopathology examination, because pathologic evaluation of the prostate can influence the detection of positive margins. The second aspect is the stratification of positive margin rates according to pathologic stage. The third aspect is the case selection (with or without adjuvant therapy) [14]. In many reports in the literature [7,8,18-21], there was no significant difference in the rate of positive margins associated with open or laparoscopic RP after TUR-P, as resulted also in our study (2.7% and 5.2% in the laparoscopic and open groups, respectively).

The quality of life is strongly affected by urinary incontinence. It had been shown that incidence of postoperative incontinence depends on the urologist's experience, patient's age (increased frequency after 70 years), operative technique (i.e. nerve-sparing or not) [22,23]. Laparoscopic surgery may offer an improved identification of anatomic landmarks such as striated muscles and neurovascular bundles, resulting in less damage to the striated sphincter. Moreover Stolzenburg et al., [13] proved better results on early continence by preserving the puboprostatic ligament during nsLRP. The main question associated with a RP after TUR-P is represented by its safety concerning the postoperative continence and potency rate. Again the study group of the University Vita-Salute San Raffaele, Milan [8] reported interesting continence rate in all patients who underwent nsRRPT after HoLEP and TUR-P. At 6 months after the procedure,

93.3% of all patients were continent and 53.3% of the patients after HoLEP and 40% of the patients after TUR-P reported satisfactory sexual intercourse, with use of PED5 inhibitors.

In our study all procedures were performed without major complications. An earlier return to continence was observed in 43.8% of the patients. Nevertheless, at the 12th month, a complete continence was reported in 98.4% of patients who underwent surgery. Regarding sexual potency, the outcomes resulted to be promising, with 52% and 78.4% of all patients reporting the ability to engage in sexual intercourse at 6- and 12- months after surgery, respectively.

Conclusion

nsLRPT is a feasible procedure in patients diagnosed with prostate cancer who previously underwent TUR-P for BPH, although it may require higher surgical skills in comparing with patients who never underwent a prostate surgery. It provides satisfactory oncologic results, presenting excellent functional outcomes with regard to urinary continence and sexual potency at 1 year follow-up.

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