ORIGINAL RESEARCH—ONCOLOGY

Recovery of Erectile Function after Nerve-Sparing Laparoscopic Radical Prostatectomy in Japanese Patients Undergoing Both Subjective and Objective Assessments

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ABSTRACT

Introduction. The sexual potency rate following a radical prostatectomy can vary. In Japanese patients, sexual activity after nerve-sparing prostatectomy seems especially unfavorable. Most studies have assessed potency status subjectively using questionnaires.

Aims. The aim of this study is to evaluate the recovery of potency in Japanese patients after nerve-sparing laparoscopic prostatectomy (nsLRP) both subjectively and objectively.

Methods. Twenty-seven patients operated on with nsLRP (bilateral sparing in four patients, unilateral in 23 patients) were enrolled. The mean age of the patients was 60.1 years. Seventeen of 27 patients used type 5 phosphodiesterase inhibitors on demand at least 3 months after surgery.

Main Outcome Measures. Subjective erectile function was examined by the International Index of Erectile Function (IIEF)-15 and by the Erection Hardness Score (EHS) questionnaires before and at 3, 6, and 12 months after surgery. Objective erectile function, with measurement of rigidity and tumescence of the penis, was evaluated by RigiScan-Plus as the erectile response to audio-visual stimulation.

Results. IIEF erectile function domain, IIEF-total, and EHS scores decreased significantly after surgery; they were almost half of pretreatment levels at 12 months after surgery. On the other hand, penile rigidity and tumescence measured by RigiScan also decreased significantly 3 months after surgery. However, these values gradually improved, and head nearly recovered at 12 months after surgery. At 12 months after surgery, recovery rates of penile rigidity and tumescence from baseline were rigidity 92.6% at tip and 96.3% at base, with tumescence of 87% at tip and 76% at base.

Conclusions. Discrepancies were found between results of subjective and objective assessments of erectile function. From an objective viewpoint, the recovery of erectile function in Japanese patients after nsLRP was not bad.

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Key Words. Laparoscopic Prostatectomy; Prostate Cancer; Nerve Sparing; Erectile Function; RigiScan

Introduction

Prostate cancer has become one of the most frequent malignant tumors in men. For patients after prostatectomy, erectile function (EF) and urinary incontinence are severe postoperative hazards to quality of life [1]. Therefore, in choice of treatment for localized prostate cancer, sexual function has sometimes been a critical factor. Cavernous nerve preservation and EF recovery after radical prostatectomy (RP) are the most topical issues.

In the era of widely performed nerve-sparing prostatectomy, the sexual potency rate following RP is not certain, because it is associated with various factors including the method of reporting of EF [2–4]. Based on the AUA Prostate Cancer Guidelines Panel database exemplifying the

reporting of EF outcomes after treatments for localized prostate cancer, accurate understanding of these results is currently limited because the descriptions of erectile dysfunction and EF end points are not standardized [5].

In Japan, although the introduction of robotic RP has only recently occurred, nerve-sparing laparoscopic radical prostatectomy (nsLRP) has gradually come to be performed. However, from previous subjective studies, sexual activity in Japanese patients after RP seems especially unfavorable [6].

In this study, to evaluate the longitudinal recovery of potency in Japanese patients with nsLRP, we performed not only subjective questionnaires but also objective audio-visual stimulation tests using RigiScan (Timm Medical Technologies, Eden Prairie, MN, USA) before and after treatment and conducted a comparative study on subjective vs. objective assessments of EF.

Methods

From July 2008 to December 2009, 27 Japanese patients with nsLRP treated at Kansai Medical University Hirakata Hospital were enrolled in this study. The patients included in this study were younger than 70 years. All had good preoperative sexual function and no significant risk factor for EF. None of the patients received hormone therapy or radiotherapy treatment before or after nsLRP. Preoperative staging showed locally confined prostate cancer in all patients. Two surgeons who regularly performed laparoscopic RP and indicated that they were experienced in nsLRP participated in this study. All laparoscopic RPs were done with extraperitoneal approaches. Bilateral nerve sparing was attempted in four patients and unilateral nerve sparing in the other 23 patients. Twenty patients underwent intrafascial nerve-sparing technique, and seven patients underwent interfascial technique [7,8]. The distribution of the final tumor stage after complete histopathological processing was 11 with stage pT2a, one pT2b, 14 pT2c, and one pT3b.

For subjective longitudinal evaluation of EF after nsLRP, the International Index of Erectile Function (IIEF)-15 questionnaires with Erection Hardness Score (EHS) were completed before and at 3, 6, and 12 months after nsLRP. In addition, to evaluate objective potency, the audio-visual stimulation (AVSS) test with RigiScan-Plus (Timm Medical Technologies) was performed in all patients. RigiScan has been the most widely utilized device for measuring EFs in evaluation of penile tumescence and rigidity [9]. The penis of the patient was connected to the RigiScan with two soft loops around the tip and base of the penis. The loops in soft contact applied pressure to the penile shaft at intervals of 15 seconds. Penile tumescence is measured every 15 seconds, and rigidity is measured during alternate constriction every 30 seconds. Tumescence is expressed in centimeters and rigidity in percent relative to a standard hard-rubber cylinder (range 0–100%). Each patent watched a digital video consisting of various types of sexual stimuli from commercially available films individually for 30 minutes in a darkened and silent room. Written informed consent was obtained from all patients, and this study was approved by the hospital ethics committee.

Data are presented as mean ± standard error, and differences in values were determined by the paired Wilcoxon's *t*-test or Kruskal–Wallis test. A *P* value of less than 0.05 was considered statistically significant.

Results

The mean age of the patients was 60.1 ± 1.3 years (range 41–70). The mean preoperative serum prostate-specific antigen value and total testosterone level measured by radioimmunoassay were 7.7 ± 1.0 ng/mL and 4.3 ± 0.3 ng/mL, respectively. Seventeen of 27 patients used type 5 phosphodiesterase inhibitors (PDE5i) (tadalafil 20 mg) on demand at least 3 months after surgery. These 17 patients were instructed that taking tadalafil should be avoided from at least 3 days before the AVSS assessment. None of the patients received prostaglandin E1 treatment after nsLRP. Baseline EF domain of IIEF (IIEF-EF), total score of IIEF (IIEF-total), and EHS were 14.7 ± 1.9, 35.4 ± 3.8, and 3.2 ± 0.2, respectively. They decreased significantly after surgery and were far apart from baseline for 12 months. At 12 months after surgery, subjective EFs were almost half of pretreatment levels (IIEF-EF, IIEF-total, and EHS were 5.2 ± 1.1, 17.6 ± 2.3, and 1.6 ± 0.2, respectively) (Figures 1 and 2).

Changes in penile rigidity and tumescence compared with pretreatment measured by RigiScan are shown in Figures 3 and 4. Rigidity measures of 0% were excluded from analysis. The numbers of patients we evaluated for penile rigidity before and at 3, 6, and 12 months after nsLRP were 21, 12, 15, and 18, respectively. Baseline maximum rigidity was 39.0% at tip of the penis