

INFLUENCE OF NERVE-SPARING PROCEDURE ON LOWER URINARY TRACT SYMPTOMS AFTER ROBOT-ASSISTED RADICAL PROSTATECTOMY

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Introduction and objective

- Radical prostatectomy is a commonly used treatment option for patients with clinically localized prostate cancer and a life expectancy of at least 10 years.
- Several groups have reported that the nerve-sparing (NS) radical prostatectomy contributes not only to the recovery of erectile function, but also to the improvement of urinary incontinence [1].
- However, there is a relative paucity of data on the impact of the NS procedure on lower urinary tract symptoms (LUTS) with the exception of urinary incontinence, especially in the context of robot-assisted radical prostatectomy (RARP).
- The purpose of this study was to investigate the impact of the NS procedure on LUTS, including urinary incontinence, after RARP.

Study design, materials and methods

- The study protocol was approved by the institutional ethics committee for clinical trials.
- The participants in this prospective, clinical cohort, observational study were 283 consecutive patients who underwent RARP at our institution between October 2010 and January 2016.
- All patients were urinary continent before surgery.
- All patients signed an institutional ethical committee-approved informed consent form, and all patients were informed that data would be used anonymously for the purpose of clinical research. On acceptance, preoperative data were prospectively collected for each participant. Data analyses for the purpose of the present study were performed retrospectively.
- All prostatectomies were performed via the 6 port transperitoneal approach. Surgical procedures were performed by three different surgeons.
- NS techniques were performed using a similar method according to the four grades of posterolateral resection of the prostate: grade 1, intrafascial dissection; grade 2, interfascial dissection; grade 3, extrafascial dissection; grade 4, wide dissection. In this study, NS was defined as NS grade 1 or 2 and non-NS was defined as NS grade 3 or 4.
- The International Prostate Symptom Score (IPSS), IPSS subscore including voiding and storage, The Overactive Bladder Symptom Score (OABSS), and urinary incontinence were assessed preoperatively (2 days before RARP) and at 1, 3, 6, 9, and 12 months after RARP.
- Postoperative urinary incontinence was assessed at scheduled visits 1, 3, 6, 9, and 12 months after RARP. Patients who used no pads were considered to be urinary continent and those who used one or more security liner pads per day were considered to be urinary incontinent.

Results

- Patient characteristics are summarized in Table 1.
- A strong association was found between the degree of the neurovascular plate preservation and urinary continence (Figure 1).
- All patients showed increases in the IPSS total score at 1 month but then improved back to baseline level at 3 months. At 6, 9, and 12 months, the IPSS total scores were significantly lower than those at baseline. At 3 months, the IPSS voiding subscore improved by approximately 30% compared to baseline and remained stable over the long term. All patients experienced an 84% increase at 1 month in the IPSS storage subscore, but then improved back to baseline level at 6 months and remained stable over time.
- The NS procedure did not affect improvement of the IPSS total score, the IPSS voiding subscore, the IPSS storage subscore, and OABSS total score (Figure 2).

Table 1. Patient characteristics.

	n=283
Age, yr, median (range)	66.0 (48-76)
PSA, ng/ml, median (range)	8.25 (1.2-50.5)
Putative prostate volume, ml, median (range)	28.8 (9.8-130.9)
Biopsy Gleason score, n (%)	
6	55 (19.4)
7	120 (42.4)
8	74 (26.1)
≥9	34 (12.0)
Clinical stage, n (%)	
T1c	61 (21.6)
T2a	126 (44.5)
T2b	11 (3.9)
T2c	54 (19.1)
T3a	29 (10.2)
T3b	2 (0.7)
NCCN risk classification, n (%)	
Low	34 (12.0)
Intermediate	125 (44.2)
High	124 (43.8)

Figure 1. Effects of nerve-sparing procedure on urinary continence rate after RARP.

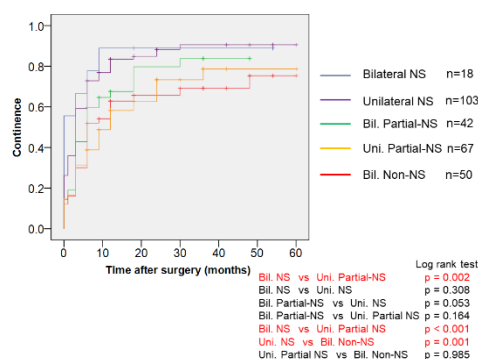
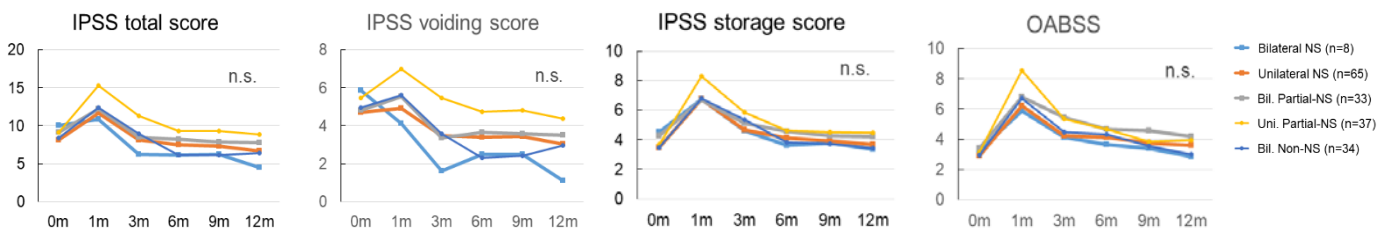


Figure 2. Effects of nerve-sparing procedure on the IPSS total score, the IPSS voiding score, the IPSS storage score, and OABSS after RARP.



Interpretation of results

- The results of this study indicated that the NS procedure could achieve early improvement of urinary incontinence, although the NS procedure did not affect improvement of LUTS, with the exception of urinary incontinence, after RARP.
- A recent review showed that when performing non-NS surgeries, both somatic and autonomic nerves are at risk of damage, due to either wide excision at the level of the seminal vesicles or the peri-prostatic dissection, or at the level of the apex where convergence occurs and the nerves are within a few millimeters of the dissection plane and suture bites [2].
- The somatic and autonomic nerves travel within the layers of the fascia of the levator ani and could sustain injury if the resection plane is sufficiently wide.
- Therefore, the NS procedure may lead to early improvement of urinary incontinence after RARP.

Concluding message

- The NS procedure in RARP has the possibility to improve urinary incontinence after surgery, although the NS procedure in RARP did not ameliorate LUTS, with the exception of urinary incontinence. Therefore, if possible, the NS procedure is recommended from the viewpoint of early improvement of urinary incontinence after RARP.

References

1. Steineck G, Bjartell A, Hugosson J et al. Degree of preservation of the neurovascular bundles during radical prostatectomy and urinary continence 1 year after surgery. *Eur Urol* 2015; 67:559-568.
2. Bessede T, Sooriakumaran P, Takenaka A et al. Neural supply of the male urethral sphincter: comprehensive anatomical review and implications for continence recovery after radical prostatectomy. *World J Urol* 2017; 35:549-565.