

DE-NOVO DETRUSOR UNDERACTIVITY FOLLOWING LAPAROSCOPIC RADICAL PROSTATECTOMY

Hypothesis / aims of study

Strain voiding has been reported to be a frequent symptom following radical prostatectomy. However, pathophysiology of vesicourethral function underlying voiding difficulty has not been well studied. In the present study, we focused on bladder function as an etiology of voiding difficulty and investigated de-novo detrusor underactivity following radical prostatectomy.

Study design, materials and methods

The records on urodynamic study (pressure-flow study, urethral pressure profile and measurement of post-void residual volume) were retrospectively investigated in 95 patients who underwent laparoscopic radical prostatectomy for prostate cancer through a retroperitoneal approach and all urodynamic studies pre- and post-operatively between January 2003 and January 2006. We extracted the cases with detrusor underactivity according to the criteria of overt strain voiding pattern on post-operative pressure flow study; detrusor pressure at the maximum flow rate (Pdet Qmax) was less than 10 cmH₂O in conjunction with an increase of abdominal pressure. Additionally, we performed follow-up urodynamic study on the patients with detrusor underactivity following radical prostatectomy, and evaluated the changes of postoperative detrusor functions in the long-term.

Results

Of the 95 patients (mean age: 66.0 years old), 9 (mean age: 67.0 years old) (9.5%) were found to have detrusor underactivity on the urodynamic study which was performed at 3 months after the operation. In all patients, good detrusor contraction was confirmed on the pre-operative urodynamic study. On the voiding phase of pressure-flow study in these patients, mean Pdet Qmax showed a significant decrease postoperatively from 59.2 cmH₂O to 3.1 cmH₂O (p=0.002), although mean abdominal pressure at Qmax significantly increased from 24.5 cmH₂O to 102.8 cmH₂O (p=0.02). Mean Qmax showed a significant increase from 12.2 ml/sec to 24.3 ml/sec (p=0.02). No patient had significant post-void residual urine. On the storage phase of the study, however, maximum cystometric capacity (mean 225.3 ml vs 245.8 ml), maximum urethral closing pressure (mean 54.2 cmH₂O vs 48.9 cmH₂O) showed no significant change between pre- and post-operative studies. Seven patients acquired continence and 2 had mild urinary incontinence using one pad a day. All patients proved to have pathologically localized cancer within the prostate. No patient had overt neurologic disease which might be a cause of detrusor underactivity.

We performed a follow-up urodynamic study on 5 of these patients. Mean period from the operation was 36 months (15-49 months). Mean Pdet Qmax was 7.5 cmH₂O, mean abdominal pressure was 72.5 cmH₂O, mean Qmax showed 21.0 ml/sec, mean maximum cystometric capacity was 216.3 ml, and mean maximum urethral closing pressure was 47.0 cmH₂O. There was no significant change on each urodynamic parameter between the short-term and long-term post-operative studies; detrusor underactivity following radical prostatectomy persisted even in the long-term after surgery and no improvement of bladder function was found.

Interpretation of results

It was confirmed that the operative procedure of radical prostatectomy could cause impaired detrusor contractility persisting in the long-term, since all patients with post-operative detrusor underactivity had good detrusor contractility on the pre-operative urodynamic study without overt neurological abnormality. However, we could not exactly identify what procedure might cause the impairment in the present study. It was reported that urodynamically-proven post-operative detrusor underactivity was recognized in 29.5% of the patients undergoing open retropubic radical prostatectomy (1). Since the incidence of post-operative detrusor underactivity in our study was 9.5%, laparoscopic radical prostatectomy might be less invasive in terms of impairment on detrusor function as compared with open surgery.

Concluding message

The present study showed that detrusor contractility could be impaired during radical prostatectomy. Although denervation of trigone after radical prostatectomy has been described in the literature as an etiologic factor, no apparent operative procedure related to detrusor dysfunction could not be identified in the present patients. Despite the detrusor underactivity, all patients could excrete urine effectively without residue by means of abdominal straining. It should be noted that the post-operative detrusor underactivity following radical prostatectomy was irreversible phenomenon persisting in the long-term.

References

(1) Gomha MA, et al.: Voiding patterns in patients with post-prostatectomy incontinence: urodynamic and demographic analysis. J Urol, 169:1766-1769, 2003

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HUMAN SUBJECTS: This study was approved by the Nagoya University Ethics Committee and followed the Declaration of Helsinki Informed consent was obtained from the patients.