

BLADDER AND URETHRAL SPHINCTER FUNCTION AFTER RADICAL RETROPUBIC PROSTECTOMY: 3 YEARS FOLLOW UP

Hypothesis / aims of study

Recent studies report that following Radical Retropubic Prostatectomy (RRP) several patients may be affected by urodynamic dysfunction, such as impaired detrusor contractility, bladder overactivity and/or decreased bladder compliance. No consistent data are available on lower urinary tract function before and after the operation during a long term follow up. In this prospective study we analyzed the effects of RRP on detrusor and sphincter function by comparing clinical and urodynamic status preoperatively and during longitudinal follow up.

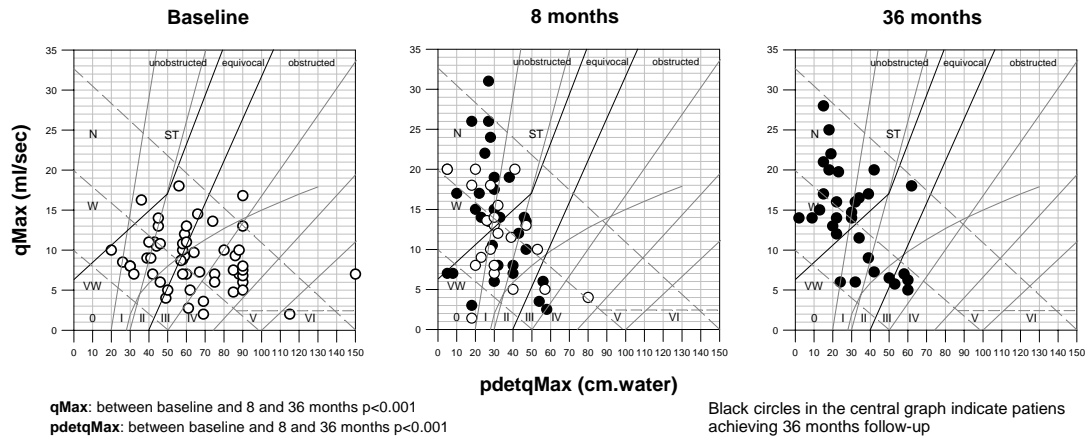
Study design, materials and methods

54 patients undergoing RRP for localized prostatic cancer were included. All patients underwent urodynamics 1-3 days before surgery (baseline) and after 8 months follow up; 32 patients were studied again 3 years afterwards. Detrusor Overactivity (DO), Bladder compliance, Bladder Outlet Obstruction (BOO) and detrusor contractility status were assessed by urodynamics with pressure-flow studies. Linear passive urethral resistance relation curves quantified obstruction and detrusor contractility. Urethral pressure profile and Valsalva Leak Point Pressure evaluated urethral sphincter function.

Data analysis: Statistical analysis was performed using Tests for repeated non parametric data (Friedman and Cochran Q tests). Wilcoxon and McNemar tests were used for post hoc multiple comparisons.

Results

At baseline, BOO was present in 32 (59.2%) patients and DO in 33 (61.1%). Reduced bladder compliance was detected in 20 (37%) patients and impaired detrusor contractility in 20 (37%) cases, associated with DO in 9. The association between DO and impaired detrusor contractility was observed in 9 cases. No patient showed urethral sphincter weakness. Compared to baseline: at 8 months follow up, BOO disappeared in 25 patients. DO was detected in 38 (70.3 %) and 18 (56.2%) patients at 8 months and 3 years follow up respectively. De novo detrusor overactivity was observed in 8 (14.8%) and 4 (12.5%) patients at 8 months and 3 years follow up respectively. At 8 months the number of patients with reduced bladder compliance was significantly increased (29 versus 20, $p < 0.05$); at 3 years the dysfunction persisted in 14 (43.7%) patients. Urethral sphincter weakness with stress urinary incontinence was observed in 40 (74%) patients at 8 months with 19 (59.3 %) showing a low degree of stress incontinence (few drops/day, no pads) at 3 years follow up. Impaired detrusor contractility in 31 (57.4%) cases at 8 months was significantly worse than at baseline ($p < 0.01$), and returned to pre-surgery condition at 3 years in 17 of the evaluated patients. DO associated with impaired detrusor contractility was found in 20 patients (37%, $p < 0.05$) and in 7 patients at 8 months and 3 years follow up respectively. The figure below shows the classification of BOO and contractility status of patients according to the Schäfer nomogram at baseline and during followup.



Interpretation of results

Anatomical dissection around the prostate during RRP may disrupt afferent and efferent innervation of the trigone, neobladder neck and posterior urethra, causing outlet incompetence and partial detrusor muscle denervation. Thus, in addition to any preoperative pathological conditions, many patients are subject to various postoperative dysfunction. The present study shows that detrusor hypocontractility and decreased bladder compliance are de novo bladder dysfunction in about 20% and 17% of cases respectively, which are probably due to bladder denervation. They persist in about 50% of patients at 3 years after surgery. Furthermore, pre-existent impaired detrusor contractility and reduced bladder compliance are not influenced by RRP in a large percentage of cases. Also the association between DO and impaired detrusor contractility is related to bladder denervation and it appears to resolve during time. The lack of significant differences in the number of patients with DO between baseline and follow up indicates detrusor overactivity is not influenced by RRP but it is probably related to neural plasticity induced by BOO.

Concluding message

After RRP reduced bladder compliance, detrusor overactivity, and impaired detrusor contractility, include both de novo bladder dysfunction and pre-existing conditions that are not influenced by the operation. When induced by RRP, they appear as established dysfunction within about 12 months of surgery. No significant changes are observed 3 years later. At the same time point a low grade of urethral sphincter weakness persists in about 60% of patients.