SEXUAL MEDICINE REVIEWS

Post-Prostatectomy Incontinence: How Common and Bothersome Is It *Really*?

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ABSTRACT

Introduction: The implications of post-prostatectomy urinary incontinence (PPI) on quality of life pose a matter of great concern for urologists and patients alike. Efforts to mitigate this devastating complication have met with varying degrees of success and the literature has shown a discrepancy between patient- and surgeon-reported outcomes.

Aim: To describe the multifactorial physiology of PPI, its evaluation, and its effect on health-related quality of life and sexual function and to review preoperative predictive factors for PPI and explore the disparity between patient- and surgeon-reported outcomes.

Methods: We selected a representative sample of principal studies addressing these topics pertaining to PPI. The search was executed by a relevant term search on PubMed from 1994 to the present.

Main Outcome Measures: The main topics of consideration in this review are pathophysiology, predictors and prevalence, and methods of evaluating PPI. We also report on findings on the role of PPI in sexual activity, surgical methods to prevent PPI, and variability in methods of outcome reporting.

Results: The application of various measures to prevent PPI has had variable success and efforts to further refine and widely implement improvements have been complicated by the heterogeneity in measurements used to report and compare outcomes.

Conclusion: Patient age, incontinence definitions, and preoperative baseline incontinence make collecting and interpreting urinary function data after radical prostatectomy challenging. Confusion in the literature is compounded by the discrepancy between patient- and surgeon-reported outcomes. On a patient-physician level, there is the issue of potentially under-counseling patients during preoperative discussions on the profound impact of PPI on quality of life in general and on sexual function and satisfaction in particular. **Trofimenko V, Myers JB, Brant WO. Post-Prostatectomy Incontinence: How Common and Bothersome Is It *Really*? Sex Med Rev 2017;X:XXX–XXX.**

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INTRODUCTION

Post-prostatectomy incontinence (PPI) has a major impact on patient satisfaction after radical prostatectomy (RP).[1] Urinary function is the single strongest predictor of patient health-related quality of life (HRQoL) after RP, ranking above treatment modality and sexual function.[2] Although most patients (68%) become completely continent within 2 months,[3] persistent urinary incontinence after RP is common and affects 8% to 25% of patients.[4–6] For those in whom incontinence does not resolve, PPI poses a potentially devastating long-term problem for QoL. In view of the long disease-specific survival after treatment of early prostate cancer, men with any permanent postoperative complications will likely suffer with them for many years.[7]

Assessing the prevalence and nature of PPI and the efficacy of methods used to address it is inherently complex because of heterogeneity in the literature of patient ages, incontinence definitions, and preoperative baseline continence, which make interpreting urinary function data after RP challenging. Methods to attempt to mitigate complications of RP and improve continence, ranging from preoperative pelvic floor physical therapy to

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surgical techniques of nerve sparing or bladder neck preservation, are gaining attention. Thus far, these efforts have been met with variable degrees of success.

The aims of the present review are to describe the multifactorial physiology of PPI and methods used in its evaluation and the effect of PPI on HRQoL and sexual function. We also review preoperative predictive factors for PPI and a selection of surgical techniques used to mitigate PPI. We also explore the disparity between patient- and surgeon-reported outcomes as they pertain to reporting PPI and discuss their implications on preoperative patient counseling and patient satisfaction.

PATHOPHYSIOLOGY

The etiology of PPI after RP is multifactorial and dependent on preoperative detrusor function, operative technique, and altered anatomy. Continence is generally facilitated by the combination of the action of the detrusor muscle, the proximal intrinsic sphincter, the rhabdosphincter,[8] and the urethral suspensory mechanism composed of pubourethral ligaments.[9] RP removes a component of the proximal intrinsic sphincter, the proximal urethral sphincter, and suspensory ligaments, resulting in postoperative continence that is largely dependent on the rhabdosphincter. Damage of the pudendal nerve fibers to the rhabdosphincter carries functional implications that can be visualized by transurethral ultrasound, which depicts thinning or atrophy and impaired contractility of the rhabdosphincter, in addition to decreased urethral closure pressures.[10] Detrusor and trigonal denervation also contribute to PPI, resulting in impaired detrusor contractility and poor bladder compliance.[11,12] As such, although sphincteric incontinence is the predominant urodynamic finding, intrinsic bladder dysfunction, including involuntary detrusor contractions, impaired or absent detrusor contractility, and low bladder compliance, pre-existing or de novo, play a role in PPI. Preoperative urodynamic abnormalities have been observed to be present in 41% of patients, with half having detrusor overactivity.[3] Although it is not surprising that overactivity persists postoperatively in most of these patients, the observation of detrusor overactivity as a de novo dysfunction in approximately 20% of patients is important.[13] Similarly, although impaired bladder compliance and impaired detrusor contractility are highly prevalent preoperatively, these, too, can be a de novo postoperative finding in 50% and 47% of patients, respectively.[14]

The relative contributions of each mechanism to PPI have been attempted to be correlated with objective measurements. On urodynamic studies conducted at least 1 year after a RP, sphincteric incontinence was the most common finding, affecting 88% to 100% of patients with PPI.[11,15,16] Notably, intrinsic sphincter deficiency was the isolated cause of incontinence in only a third of all patients. Detrusor instability and impaired detrusor contractility each affected up to a third of patients but were the only urodynamic finding in fewer than 9% of patients.[11,16] Bladder outlet obstruction was present in 20% of patients, but the sole urodynamic finding occurred in only 1%.[15] Other urodynamic findings included delayed first sensation (42%), mixed urgency-urge incontinence (48%), and decreased capacity to less than 300 mL (41%).[11]

Bladder neck contracture (BNC; also known as anastomotic stricture) is an independent risk factor for PPI.[17,18] Definitions of BNC are multiple and include the inability to pass a 14-Fr cystoscope[11,19] and a bladder neck caliber small than 16 Fr.[20,21] It should be noted that the incidence of BNC has substantially decreased with the introduction of robot-assisted laparoscopic prostatectomy (RALP), from 10% to 20% in the era of radical retropubic prostatectomy (RRP),[22] to 1% to 2% in RALP-only series.[21,23,24]

Although the question of whether adjuvant external beam radiation treatment increases rates of PPI has been debated,[25,26] the notion of an increased rate of long-term overactive bladder symptoms after adjuvant radiation is commonly accepted.[27] The mechanisms for the development of bladder overactivity after radiation are postulated to be related to multiple factors, including radiation-induced fibrosis of the bladder musculature, vascular damage leading to ischemia of the bladder wall, and alterations in innervation of the trigone because of nerve damage.[28]

PREDICTORS OF PPI

Among the relevant preoperative predictors of PPI are age at least 65 years, high body mass index, and comorbidities. In addition, lower urinary tract symptoms, sexual dysfunction, and preoperative incontinence are correlated with a significant risk of PPI.[4,29] Wille et al[30] specifically noted an association between erectile dysfunction as a predictor for PPI and did not find PPI to be related to age. The ability to attain continence immediately after catheter removal has been associated with the absence of lower urinary tract symptoms and higher preoperative and postoperative maximum urethral closure pressure at rest and during voluntary sphincter contraction.[3] With increasing rates of preoperative imaging, anatomic characteristics have been attracting increasing attention as factors that might be mitigated with customized surgical techniques. These anatomic factors include thickness of the pelvic diaphragm at sagittal imaging, the ratio of the levator ani on the axial image to prostate volume, and functional urethral and sphincter length.[31,32]

METHODS OF EVALUATING CONTINENCE

The evaluation of patients with PPI should begin with a comprehensive history, including onset, duration, description of the type and severity of incontinence, and precipitating events. A voiding diary can be helpful to quantify fluid intake and functional bladder capacity. One approach to quantifying the severity of leakage is based on the number of pads used or pad weight. The 1- and 24-hour pad tests have been used in PPI clinical practice and research,[23,33] with patient perception closely