

Post-prostatectomy bladder dysfunction

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Introduction

Post-prostatectomy urinary incontinence (PPI) can occur following radical prostatectomy despite advances in surgical techniques such as nerve-sparing procedures and robotic-assistance. PPI is a debilitating complication of prostatectomy surgery which significantly impacts the patient's quality of life. The incidence of post-prostatectomy incontinence (PPI) following robotic assisted procedures is estimated at 5-20% at 12 months (1).

PPI can result from intrinsic sphincter deficiency (ISD) and/or bladder dysfunction. PPI is commonly attributed to ISD based on patient's symptoms correlating with stress urinary incontinence (SUI). Bladder dysfunction resulting from reduced compliance and/or detrusor overactivity (DO) can impact the success of stress incontinence surgery. Furthermore, artificial urinary sphincter (AUS) or sling procedures increase outlet resistance and therefore increase leak point pressures. If reduced compliance and/or DO is present, higher amplitude and more sustained detrusor pressures can occur as a result, increasing the risk of renal dysfunction. Despite the ability of urodynamics to fully characterise bladder function, there is not a consensus whether urodynamic should be performed before treating the stress component of PPI nor is it explicitly recommended in any of the major guidelines.

The aim of our retrospective study was to identify the prevalence of bladder dysfunction in post-prostatectomy patients who underwent urodynamic studies.

Patients	Presenting Symptoms					
	SUI	MUI	UUI	NE	Urgency	Poor flow
Post prostatectomy (n = 84)	38	31	11	1	2	1
No-EBRT (n=66)	27	27	9	0	2	1
EBRT (n=18)	11	4	2	1	0	0

Table 1: Summarising presenting symptoms of patients undergoing urodynamics post-prostatectomy, split into groups depending on whether they have had previous pelvic external beam radiotherapy (EBRT). Stress urinary incontinence (SUI), mixed urinary incontinence (MUI), urge urinary incontinence (UUI).

Methods

- Retrospectively reviewed urodynamic studies of 84 patients reporting lower urinary tract symptoms (LUTS)
- Inclusion criteria:
 - Prostatectomy.
- Exclusion criteria:
 - Known neuropathy.
 - Previous anti-incontinence surgery
- Urodynamic studies were conducted in accordance with the ICS good Urodynamics Practice document.
- Unpaired t-tests and Mann Whitney tests were used to compare parametric and non-parametric variables between external beam radiotherapy (EBRT) and non-EBRT groups respectively.
- If persistent urinary leakage occurred in the absence of sensation and raised detrusor pressure, the urethra was occluded using a penile cuff, allowing the faithful assessment of bladder filling parameters. Urethral occlusion was removed when the patient experienced a strong desire to void.

Results

- The age range was aged between 48-84 years (median 67). The primary presenting symptom for each patient is displayed on Table 1.
- Table 2 details the UDS parameters, comparing patients with and without EBRT. 58 (69%) of patients had SUI reproduced during UDS.
- 52 (62%) of patients demonstrated DO during UDS, 25 (30%) of patients had high pressure DO (>40cmH₂O).
- 18 (21%) patients having a compliance value <40ml/cmH₂O.
- 19/84 patients had previous pelvic EBRT. No statistical difference between the prevalence of DO in non-EBRT and EBRT groups.
- No statistical difference in DO PP with non-EBRT and EBRT.
- 44% of EBRT group had compliance reduced compliance (<40ml/cmH₂O), compared to the 15% of non-EBRT group's (p = 0.06).
- No statistical difference in voided volume, Q_{max} or PVR
- EBRT group did have statistically higher maximum detrusor pressures during voiding with a mean of 40 (±24) cmH₂O compared to the non-EBRT group of 28 (±17) cmH₂O (p = 0.02).

Patients	MCC (ml)	C (ml / cm. H ₂ O)	C < 40 ml / cm. H ₂ O (n)	DO (n)	DO PP (cm. H ₂ O)	DO PP > 40 cm. H ₂ O (n)	DO associated with UI (n)	SUI (n)	VV (ml)	max. P _{det} (cm. H ₂ O)	P _{det} · Q _{max} (cm. H ₂ O)	Q _{max} (ml/s)	PVR (ml)	Radiographic BOO (n)
Post prostatectomy (n = 84)	362±177	99±101	18 (21%)	52 (62%)	27±30	25 (30%)	35 (42%)	58 (69%)	347±167	31±19	26±15	18±10	8±20	6 (7%)
No-EBRT (n=66)	370±185	107±106	10 (15%)	41 (62%)	28±32	21 (32%)	27 (41%)	45 (68%)	354±167	28±16	25±15	18±10	8±20	2 (2%)
EBRT (n=18)	333±149	68±70	8 (44%)	11 (61%)	23±22	4 (22%)	8 (44%)	13 (72%)	320±171	40±24	29±17	16±9	7±18	4 (22%)
p value	0.44	0.14	0.06	0.95	0.57	0.54	0.83	0.79	0.46	0.02*	0.29	0.43	0.90	0.21

Table 2: Urodynamic parameters of post-prostatectomy patients. Parametric parameters include mean (± standard deviation), non-parametric parameters have incidence (% of cohort). Parameters include maximum cystometric capacity (MCC), bladder compliance (C), detrusor overactivity (DO), stress urinary incontinence (SUI), voided volume (VV), post void residual (PVR) and whether bladder outlet obstruction (BOO) was observed with fluoroscopic imaging simultaneously with sustained detrusor pressure and poor flow.

Concluding message

Almost 2/3 and 1/5 of patients with PPI demonstrated DO and reduced compliance respectively. The two factors are likely to mean treating the outlet dysfunction alone is unlikely to cure the incontinence but more likely worsen the filling phase LUTS.

Therefore, UDS, with urethral occlusion where necessary should be performed before treating the ISD to fully characterise the bladder dysfunction and the prognostic information used to fully inform the patient before treating the stress component of PPI.

References

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