

Urodynamic profile in patients with Bladder outflow obstruction: Predicting outcomes

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ABSTRACT

Purpose: To assess bladder functions or exact degree of outflow obstruction in patients undergoing TURP. **Material and Methods:** PF studies performed in 100 patients undergoing TURP between Aug 2012 to Aug 2014 before and 3 months after TURP. **Results:** The mean age of the patients was 70.29 (45-84) years. All patients enrolled in the study were having Serum PSA below 4 ng/ml with average being 1.3 ng/ml. Out of 100 patients, 42 presented with refractory retention and 58 with high AUA score. All patients with refractory retention had stable filling phase; Pdet@Qmax > 79 cm/H₂O, with average Qmax -8ml/sec and AG No. >40. 35 patients were happy with outcomes of surgery. Out of 58 patients with high AUA Score, 29 patients were having predominant voiding symptoms, 17 patients were having predominant storage symptoms and 12 patients were having both storage and voiding symptoms. Patients with predominant voiding symptoms and both storage and voiding symptoms had urodynamically stable filling phase with high detrusor pressure and reduced flow rate. All of these had good surgical outcome. 13 patients with predominant storage symptoms had detrusor over activity of which 3 were happy with outcomes of surgery; 7 patients had persistent LUTS, 3 lost to follow up. **Conclusions:** Patients having high AUA symptom score with predominant storage symptoms had detrusor instability (85%) and 45% were unhappy and hence in these patients PF studies could help us to counsel about the results of TURP.

Keywords: prostate, PF study, TURP

Introduction

Understanding of BPH pathophysiology requires detailed insight into obstruction-induced bladder dysfunction. Prostatic hyperplasia increases urethral resistance, resulting in compensatory changes in bladder function [1]. The elevated detrusor pressure required to maintain urinary flow in the presence of increased outflow resistance changes viscoelastic function of the bladder. Urodynamics with pressure flow studies remain the gold standard for diagnosing BOO and other voiding and storage abnormalities responsible for LUTS and voiding dysfunction. Urodynamic studies are most useful when their results will affect treatment and therefore should be used judiciously [2]. There is a strong argument in favor of using PF studies to assess patients who may need

surgery. On the other hand, some argue that obstructive symptoms may be easily diagnosed based on clinical history and free flow rate, making an invasive and expensive examination unnecessary. Furthermore, they claim that clinical results cannot be predicted by urodynamics and that the findings do not modify the therapeutic approach [3]. We attempt to establish prospective value of urodynamic evaluation for clinical prognosis of patients treated with TURP.

Purpose- To assess bladder functions or exact degree of outflow obstruction in patients undergoing TURP. To correlate outcomes of TURP with Urodynamic outcomes.

Materials and methods

This open, prospective study was conducted at urology department, Seth G.S. Medical College and K.E.M. Hospital, Mumbai. Duration of study was from August 2012 to August 2014. All BPH patients with age > 40 years were included in the study. Patients with known

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neurological disorders like CVA, Parkinson's disease, Spinal disorders or known case of neurogenic bladder, those with Ca prostate and stricture urethra were excluded. There were total 100 patients. Ethical committee approval was taken. Patients were seen on Outpatient Department basis for evaluation of his LUTS. Complete medical history, physical examination including digital rectal examination (DRE), serum PSA and USG KUB with prostate size and PVR was done in all patients. After admission, under antibiotic coverage and informed consent patients underwent PF study prior to surgery. PF studies were performed with patient sitting and through urethra with bladder pressure zero at pubic symphysis, the cystometric phase was performed at 20ml/min filling rate through 8 Fr feeding tube placed per urethrally. Residual volume was calculated by subtracting the voided volume from infused volume. Urodynamic obstruction was determined by plotting detrusor pressure at maximum flow rate and maximum flow rate was calculated according to AG Nomogram. Patients were followed up after 3 months of surgery. All patients underwent PF studies after 3 months postoperatively.

Results

The mean age of the patients was 70.29 (45-84) years. All patients enrolled in the study were having Serum PSA below 4 ng/ml with average being 1.3 ng/ml. Out of 100 patients, 42 presented with refractory retention and 58 with high AUA score. All patients with refractory retention had stable filling phase; $P_{det}@Q_{max} > 79 \text{ cm/H}_2\text{O}$ with average Q_{max} -8 and AG No. > 40 . 35 patients were happy with outcomes of surgery; 4 patients presented with poor flow postoperatively on subsequent evaluation diagnosed to have bulbar urethral stricture. Later on they required VIU. Three out of 42 patients have persistent voiding difficulty with normal postop cystoscopy. PF study in these patients showed slight improvement of $P_{det}@Q_{max}$, and average Q_{max} . These patients were catheter free. Out of 58 patients with high AUA Score, 29 patients were having predominant voiding symptoms, 17 patients were having predominant storage symptoms and 12 patients were having both storage and voiding symptoms. Patients with predominant voiding symptoms and both storage and voiding symptoms had urodynamically stable filling phase with high detrusor pressure ($P_{det}@Q_{max} > 60 \text{ cm/H}_2\text{O}$) and reduced flow rate ($Q_{max} < 8 \text{ ml/sec}$) with prolonged voiding time. All of these had good surgical outcome with postop improvement in flow rate ($Q_{max} > 12 \text{ ml/sec}$) and voiding time. Out of 17 patients

with predominant storage symptoms, 4 patients were having urodynamically stable filling phase with prolonged voiding time and reduced flow rate ($Q_{max} < 8 \text{ ml/sec}$). These patients showed slight improvement postoperatively with increased flow rate ($Q_{max} > 12 \text{ ml/sec}$) and reduced voiding time. 13 patients with predominant storage symptoms had detrusor over activity. 3 were happy with outcomes of surgery; 7 patients had persistent LUTS, 3 lost to follow up. PF studies at 3 months revealed persistence of instability with improvement in voiding time and increased flow rate ($Q_{max} \sim 12 \text{ ml/sec}$).

Discussion

PF studies were performed in 100 patients undergoing TURP, out of which 42 patients presented with refractory retention. These patients had urodynamically proved outlet obstruction. Another 58 patients presenting with high AUA symptom score, patients with predominant voiding symptoms (29/58) and patients with both storage and voiding symptoms (12/58) were having urodynamically proved outlet obstruction. In patients with predominant storage symptoms (17/58) only 4 patients had outlet obstruction proved on PF study, remaining 13 patients had detrusor instability. Thus total 87% of patients had urodynamically proved outlet obstruction and 13% of patients had detrusor instability. Fusco *et al* [4] reviewed a multicenter urodynamic database of 963 consecutive men referred for the evaluation of persistent lower urinary tract symptoms at 2 community based and 1 urological referral center. Bladder outlet obstruction was diagnosed in 69% of patients. Concomitant detrusor over activity was observed in 47% of obstructed cases. In Patients with refractory retention (42/100), 39 (93%) patients were happy with outcomes of surgery in which 4 patients required VIU postoperatively. Remaining 3(7%) had persistent symptoms with normal cystoscopy and PF study postop and patients were catheter free. Khan *et al* [5] performed TURP in 345 BPH patients of these 270 patients presented with urinary retention and 75 with LUTS. All patients presented with LUTS voided successfully following TURP. Seven (5.4%) out of 129 patients with acute retention, 11(13.6%) of 81 patients with chronic retention and 9(15%) of 60 patients with acute on chronic retention failed to void on catheter removal. Pickard *et al* [6] reported failure to void in 9.2% of patients with acute retention compared with only 2.3% of those undergoing TURP for LUTS. Various studies suggest that some recovery of detrusor function does occur with time after relieving obstruction in those initially unsuccessful voiders. In

patients having high AUA Symptom score with predominant storage symptoms (17/58), 13 of these had Type3 and Type4 instability. 3(25%) patients out of these 13 had favorable results in spite of type 3 and 4 instability. Remaining 7 were not happy and 3 lost to follow up. Zhao *et al* [7] carried out retrospective study in 128 patients; all were having preoperative urgency symptoms with detrusor instability. They have shown statistically significant improvement in mean overactive bladder symptom score from 9.6 to 2.7. They concluded that preoperative severity of overactive bladder symptoms; detrusor contractility and degree of BOO do not have effect on postoperative improvement. Mombelli *et al* [8] also observed improvement in Qmax after TURP while persistence of bladder contractility after surgery. But the study performed with limited patients. Patients having high AUA Symptom score with both storage and voiding symptoms all have shown good surgical outcome. Postop Pressure-flow study in these patients was suggestive of increased flow rate and reduced AG Number with average decrease of 9. This is in contrast to study performed by Hackenberg *et al*[9] who observed 15% of patients with obstructive symptoms experiencing considerable discomfort for prolonged periods (6 to 15 months) following uncomplicated TURP.

Conclusions

Clinical decision-making remains a valid instrument for selecting patients for TURP. Patients with refractory retention and high AUA symptom score with predominant voiding symptoms-94 % of patients showed BOO and hence UDS is not necessary. Patients having high AUA symptom score with predominant storage symptoms had instability (85%) and totally 7/13 patients showed improvement post-surgery. 45% were unhappy and hence in these patients PF studies could help us to counsel about the results of TURP or should have been managed differently.

Abbreviations: TURP- Trans Urethral Resection of Prostate, PF-Pressure-flow, PSA- Prostate Specific Antigen, AUA-American Urological Association, Pdet@Qmax- detrusor pressure at maximum flow rate, Qmax- Maximum flow rate, AG No.- Abrams-Griffiths Number, LUTS-Lower Urinary Tract Symptoms, BPH-Benign Prostatic Hyperplasia, BOO-Bladder Outlet Obstruction, CVA-Cerebrovascular Accident, VIU- Visual Internal Urethrotomy.

Conflict of Interest: None

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