



Research Article

ROLE OF TURP IN UNDERACTIVE DETRUSOR FOLLOWING LONG STANDING BOO DUE TO BPH- PROSPECTIVE, DESCRIPTIVE AND ANALYTICAL STUDY

Govindarajan Ramanujam., Periasamy Ponnusamy and Palani Narayanan

Department of Urology, Kilpauk Medical College Hospital, Chennai

ARTICLE INFO

Article History:

Received 20th January, 2018

Received in revised form 13th

February, 2018 Accepted 15th March, 2018

Published online 28th April, 2018

Key words:

UDS – urodynamic study, IPSS – International prostate symptom score, detrusor underactivity, PVR-post void residual urine, CIC- clean intermittent catheterisation

ABSTRACT

Aims and Objectives: The purpose of this study is to prospectively evaluate efficacy and safety of TURP in underactive bladder following longstanding bladder outlet obstruction due to BPH. The goal of this study is to evaluate the post-TURP satisfaction in patients with lower urinary tract syndrome with detrusor hypocontractility.

Study Centre: Department of Urology, Kilpauk Medical College Hospital and Government Royapettah hospital, Kilpauk, Chennai.

Methodology: This is a prospective study of underactive detrusor following long standing BOO due to BPH. The patients characteristics are to be studied with respect to IPS score, PVR, need of catheterisation in preop and post op period. UDS is to be done in preop period using parameters like maximum voiding detrusor pressure.

Post intervention – parameters like IPSS improvement, PVR and need of catheterisation or CIC in post op period are to be analysed.

Conclusion: TURP should be considered a viable treatment option in men with enlarged prostate with underactive detrusor who had poor response to medical treatment. Preoperative counseling and postoperative follow-up are crucial in the management of such patients.

Copyright©2018 Govindarajan Ramanujam et al. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

INTRODUCTION

The goal of prostate surgery for bladder outlet obstruction (BOO) is to improve lower urinary tract symptoms (LUTS) in men by relieving benign prostatic obstruction. Its efficacy in men with proven BOO has been well documented. Impaired detrusor contractility in the form of detrusor underactivity can contribute to LUTS and confound the diagnosis of BPH.

The diagnosis of Detrusor Underactivity can only be made by detrusor pressure-uroflow urodynamic studies. Detrusor underactivity is defined by the International Continence Society (ICS) as, “a contraction of reduced strength and/or duration, resulting in prolonged bladder emptying, and/or failure to achieve complete bladder emptying within a normal time span”. This definition, though, is devoid of metrics; and does not specifically define “reduced strength,” detrusor contraction “duration”, and “a normal time span”.

It has been reported that as many as 48% of men being assessed for LUTS display evidence of Detrusor underactivity. There is much lacking in our understanding of the underlying physiologic mechanisms of Detrusor underactivity, which is likely to be multi-factorial in nature, with both myogenic and neurogenic etiologies.

It is also generally recognized that detrusor contractility diminishes with aging, but in some cases Detrusor underactivity co-exists with BPH and can be a result of long standing untreated obstruction. Long standing obstruction can lead to the development of smooth muscle hypertrophy, which is associated with significant intracellular and extracellular abnormalities in the smooth muscle cell. Specifically, changes in contractile protein expression, abnormalities of calcium signaling, impaired cell communication and mitochondrial dysfunction. These findings were responsible for impaired detrusor contractility.

At present, there are no clear methods of diagnosing BPH in men with Detrusor underactivity unless detrusor pressure at maximum uroflow (pdetQmax) is > 40 cm H20. In addition, there is much controversy in the surgical management of these cases as many urologists hesitate to consider prostate surgery in men with Detrusor underactivity for fear that the results are suboptimal, unnecessarily subjecting them to the risk of the surgical procedure .

In this prospective, descriptive and analytical study, we investigate this problem by comparing the outcomes of bipolar saline TURP in men with urodynamic evidence of BPH with either Detrusor underactivity.

***Corresponding author: Govindarajan Ramanujam**

Department of Urology, Kilpauk Medical College Hospital, Chennai

Materials and Study Design

Inclusion Criteria

Among patients with lower urinary tract symptoms with features of BPH, those patients

1. Who presented with acute retention of urine with high urine volume drained (more than 1 litre of urine) on catheterisation
2. Who showed detrusor hypocontractility at urodynamic study.

Exclusion Criteria

Patients having a history of neurologic conditions, spinal trauma or surgery, pelvic trauma or surgery, diabetes mellitus with end organ damage, urethral pathology or surgery and prostate cancer were excluded from the study.

Sample size : 15
Duration of study: 1 year

Among patients with lower urinary tract syndrome with BPH, 15 patients who showed detrusor hypocontractility at urodynamic study were analyzed.

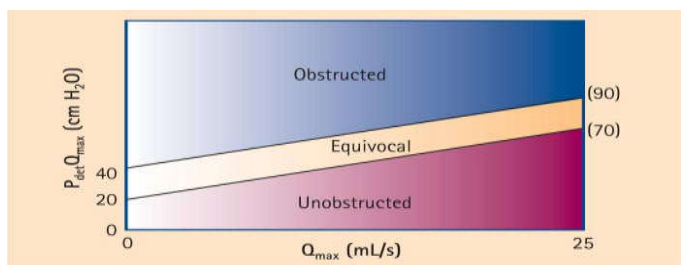
The mean age was 69 years old (58 - 88 years old). Clinical history, physical examination, renal function test, urinalysis, cystourethroscopy, transabdominal or transrectal ultrasonography, Uroflowmetry and urodynamic study were recorded. Preoperative and postoperative International Prostate Symptom Score (IPSS), need for catheterisation in preop or postop, and uroflow Qmax were researched and compared.

Based on urodynamic findings, men with BOO (defined by a Bladder Outlet Obstruction index (BOOI) > 40) and along with Detrusor underactivity are identified. Detrusor underactivity was defined by a Bladder Contractility Index (BCI) < 100.

$$BOOI = P_{det} @ Q_{max} - 2 Q_{max}$$

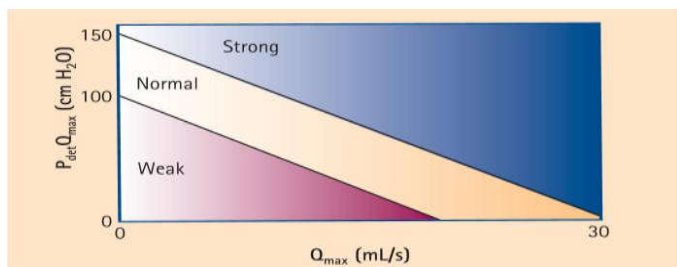
Based on these findings, using ICS nomogram, men can be divided into obstructed, equivocal, and unobstructed according to their BOOI: BOOI > 40 = obstructed; BOOI 20-40 = equivocal; and BOOI < 20 = unobstructed.

ICS Nomogram



The bladder contractility index (BCI) is represented by the following formula: $BCI = P_{det} Q_{max} + 5 Q_{max}$. Using this formula, contractility can be divided into strong > 150, normal 100-150, and weak < 100.²⁶ This is represented by the bladder contractility nomogram.

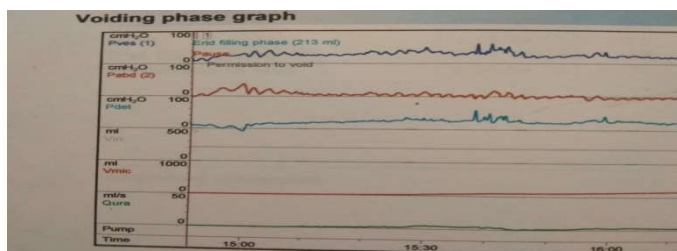
Bladder Contractility Nomogram



Bladder contractility nomogram. Patients are divided into 3 classes: strong, normal, and weak contractility according to the Bladder Contractility Index (BCI). P_{det}, detrusor pressure; Q_{max}, maximum flow rate.

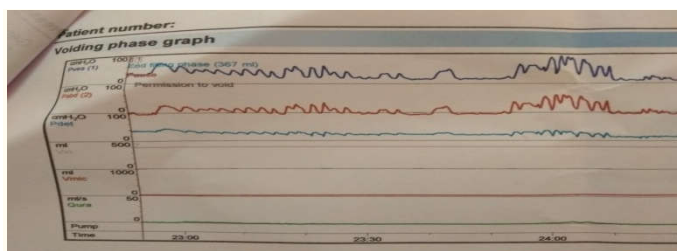
Sample Urodynamic Study

Patient – X



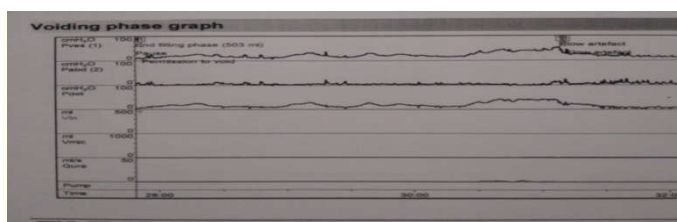
Voiding phase results	
VOID	5 / 190 / 0
Total bladder capacity	213 ml
Qmax	5.3 ml/s
Time to Qmax	28 s
Pdet Qmax	28 cmH ₂ O
Voided volume	187 ml
Flow time	85 s
Voiding time	97 s
Hesitancy	17 s
Average flow rate	2.2 ml/s
Computed residual urine	26 ml
Residual urine	0 ml

Patient – Y



Voiding phase results	
VOID	3 / 80 / -
Total bladder capacity	367 ml
Qmax	2.9 ml/s
Time to Qmax	70 s
Pdet Qmax	18 cmH ₂ O
Voided volume	81 ml
Flow time	74 s
Voiding time	143 s
Hesitancy	6 s
Average flow rate	1.1 ml/s
Computed residual urine	286 ml

Patient – Z



Patient number: OP-2110/17	
Voiding phase results	
VOID	5 / 100 / -
Extra infused volume	1 ml
Total bladder capacity	504 ml
Qmax	5.2 ml/s
Time to Qmax	236 s
Pdet.Qmax	41 cmH ₂ O
Voided volume	103 ml
Flow time	72 s
Voiding time	396 s
Hesitancy	160 s
Average flow rate	1.4 ml/s
Computed residual urine	401 ml

All subjects had pre-operative uroflow (Qmax), post-void residual volume (PVR) measurements, IPS scoring, UDS and cystoscopy. Post-operative Qmax, PVR, need for clean intermittent catheterization (CIC), and IPS score were obtained at 2 months after TURP surgery. All available data parameters were compared using *paired T test*.

RESULTS

	Preoperative	POST OPERATIVE at 2 months	P value
IPSS	24 ± 4	10 ± 5	<0.0001
PVR (ml)	160 ± 40	50 ± 10	<0.0001
Qmax(ml/sec)	7 ± 2	16 ± 2	<0.0001
Need for catheterisation	5/15	2/15	<0.0001

The mean follow-up period was 1 year. Mean prostate volume was 55 ± 5 ml. Five patients had a history of preoperative catheterization with mean duration of preoperative catheterization 20 ± 5 days, and PVRU volume was 160 ± 40 ml.

The International Prostate Symptom Score changed from 24 ± 4 preoperatively to 10 ± 5 postoperatively which was found statistically significant. Two patients out of 15 remained on a per-urethral catheter or clean intermittent catheterization due to voiding failure after TURP beyond 2 months TURP should be considered a viable treatment option in men with enlarged prostate with underactive detrusor who had poor response to medical treatment. Preoperative counseling and postoperative follow-up are crucial in the management of such patients.

DISCUSSION

The surgical outcome of TURP in patients of BPH with detrusor underactivity remains debatable. Geriatric patients are difficult to treat population having multiple comorbidities, long-lasting high postvoid residual (PVR), decompensated detrusor, and multiple drug intake having an impact on the urinary system. Clinical and urodynamic parameters remain in the armamentarium for predicting surgical outcome in patients with detrusor underactivity and prostatic enlargement.

At our center, among the patients who underwent TURP, 15% of patients demonstrated underlying detrusor underactivity on the preoperative urodynamic study.

In our study, at 2 months follow-up, a significant improvement in the IPSS, QOL, and PVRU was recorded in patients with detrusor underactivity. The International Prostate Symptom Score changed from 24 ± 4 preoperatively to 10 ± 5 postoperatively which was found statistically significant. Both storage and voiding symptoms improved after TURP although voiding symptoms were relieved more than storage symptoms. In literature, advanced age, preoperative detrusor underactivity, and high PVR are described as risk factors and predictors of poor surgical outcome while no association of symptom score and prostate size is established. Two patients

of 15 were unable to void or having high PVRU leading to renal function damage, such patients were kept on permanent per-urethral catheter or CIC postoperatively.

Intra- and post-operative complications of TURP were similar among these patients when compared with normal detrusor patients as described in the literature. Overall, based on our study results, we advocate TURP in patients of detrusor underactivity with BPH with LUTS. The majority of patients were benefited and very few remained as such as they were preoperatively.

CONCLUSION

TURP should be considered a viable treatment option in men with enlarged prostate with underactive detrusor who had poor response to medical treatment. Preoperative counseling and postoperative follow-up are crucial in the management of such patients.

References

1. Kanik EA, Erdem E, Abidinoglu D, Acar D, Akbay E, Ulusoy E. Can the outcome of transurethral resection of the prostate be predicted preoperatively? *Urology*.
2. Schafer W. The value of free flow rate and pressure/flow-studies in the routine investigation of BPH patients. *Neurourol Urodyn*. 1988; 7:219-21.
3. Rollema HJ, Van Mastrigt R. Improved indication and followup in transurethral resection of the prostate using the computer program CLIM: A prospective study. *J Urol*. 1992;148:111
4. Abrams P, Cardozo L, Fall M, Griffiths D, Rosier P, Ulmsten U, et al. The standardisation of terminology of lower urinary tract function: Report from the standardisation sub-committee of the international continence society. *Neurourol Urodyn*. 2002; 21:167-78.
5. Schäfer W. Analysis of bladder-outlet function with the linearized passive urethral resistance relation, linPURR, and a disease-specific approach for grading obstruction: From complex to simple. *World J Urol*. 1995; 13:47-58.
6. Han DH, Jeong YS, Choo MS, Lee KS. The efficacy of transurethral resection of the prostate in the patients with weak bladder contractility index. *Urology*. 2008;71:657-61
7. Javle P, Jenkins SA, Machin DG, Parsons KF. Grading of benign prostatic obstruction can predict the outcome of transurethral prostatectomy. *J Urol*. 1998; 160:1713-7.
8. Ou R, Pan C, Chen H, Wu S, Wei X, Deng X, et al. Urodynamically diagnosed detrusor hypocontractility: Should transurethral resection of the prostate be contraindicated? *Int Urol Nephrol*. 2012; 44:35-9.
9. Masumori N, Furuya R, Tanaka Y, Furuya S, Ogura H, Tsukamoto T. The 12-year symptomatic outcome of transurethral resection of the prostate for patients with lower urinary tract symptoms suggestive of benign prostatic obstruction compared to the urodynamic findings before surgery. *BJU Int*. 2010; 105:1429-33.
10. Tanaka Y, Masumori N, Itoh N, Furuya S, Ogura H, Tsukamoto T. Is the short-term outcome of transurethral resection of the prostate affected by preoperative degree of bladder outlet obstruction, status of detrusor

- contractility or detrusor overactivity? *Int J Urol.* 2006;13:1398-404
11. Neal DE, Styles RA, Powell PH, Ramsden PD. Relationship between detrusor function and residual urine in men undergoing prostatectomy. *Br J Urol.* 1987; 60:560-6.
 12. Abrams P. Bladder outlet obstruction index, bladder contractility index and bladder voiding efficiency: Three simple indices to define bladder voiding function. *BJU Int.* 1999; 84:14-5.
 13. Griffith D, van Mastrigt R, Bosch R. Quantification of urethral resistance and bladder function during voiding, with special reference to the effects of prostate size reduction on urethral obstruction due to benign prostatic hyperplasia. *Neurourol Urodyn.* 1989; 8:17-27.
 14. Te AE, Kaplan SA. Urodynamics and benign prostatic hyperplasia. *Textbook of Benign Prostatic Hyperplasia.* 1996; 1:187-98.
 15. Ameda K, Sullivan MP, Bae RJ, Yalla SV. Urodynamic characterization of nonobstructive voiding dysfunction in symptomatic elderly men. *J Urol.* 1999; 162:142-6.

How to cite this article:

Govindarajan Ramanujam *et al* (2018) 'Role of Turp in Underactive Detrusor Following Long Standing Boo Due to Bph- Prospective, Descriptive and Analytical Study', *International Journal of Current Advanced Research*, 07(4), pp. 11677-11680. DOI: <http://dx.doi.org/10.24327/ijcar.2018.11680.2028>
