MMJ

Malta Medical Journal, 2024; 36(3)
http://mmsjournals.org/index.php/mmj/41

ORIGINAL ARTICLE

Preoperative Factors affecting TURP Postoperative Outcomes

Bernard Schembri, Rachelle Attard, Maria Micallef, Noella Mifsud, Gerald Busuttil

Objectives

To determine whether preoperative patient specific characteristics, presenting symptoms, renal status, medical treatment and patient comorbidities have an effect on TURP outcome by looking at postoperative variables such as trial without catheter (TWOC) success, long term catheter dependence, complication rate and follow-up duration.

Methods

Data was collected retrospectively from patients >40 years who underwent TURP and were followed up postoperatively between January 2014 and March 2015 in Malta's state hospital. Preoperative and postoperative variables were collected and compared using Fisher's exact test, independent sample t-test and one-way ANOVA.

Results

A total of 141 males were included, with 85 patients (60.3%) being catheter free with no or mild lower urinary tract symptoms reported in their last follow-up visit. Statistical significance was noted between indication of surgery and catheter dependence postop (LUTS vs AUR p=0.029; LUTS vs CUR p=0.003; LUTS vs any retention p=0.003). Poor preoperative renal status prior to surgery also increased the risk of remaining catheter dependent (p=0.008) and of having failed postoperative trial without catheter (p=0.004).

Conclusion

Patients undergoing a TURP locally had an overall successful outcome. Late presentation for TURP and a diminished renal function are associated with a poor postoperative outcome.

Dr Bernard Schembri BSc, MD, MSc, MRCS
Department of Surgery, Mater Dei Hospital, Msida, Malta

Dr Rachelle Attard, MD, MRCEM (UK)
Department of Emergency Medicine, Mater Dei Hospital, Msida, Malta

Dr Maria Micallef, MD
Primary Health Care Department, Ministry for Health, Malta

Dr Noella Mifsud, MD
Department of Anaesthesia, Intensive Care and Pain Medicine, Mater Dei Hospital, Msida, Malta

Mr Gerald Busuttil, MRCSEd, FEBU, FRCS (Uro)
Department of Surgery, Mater Dei Hospital, Msida, Malta

Transurethral resection of the prostate (TURP) is a common endourological procedure for the treatment of obstructive urinary symptoms secondary to benign prostatic hypertrophy (BPH).

Literature shows that obstructive urinary symptoms are attributed to BPH, and are linked to aging with a resulting poor quality of life [1] Malta has an ageing population and the number of TURPs performed annually is expected to rise. Catheter failure rates and urinary incontinence following TURP have been associated with increasing age.[2,3]

Indications for having a TURP mainly include LUTS (lower urinary tract symptoms), acute urinary retention (AUR), chronic urinary retention (CUR). Studies show that patients presenting with urinary retention have a poor outcome.[4,5] Painless retention further increases the risk of having a failed trial without catheter (TWOC) success postoperatively.[6] Predictors of TWOC success will help prioritise patients for surgery.[7,8]

High bladder volumes increase the risk of bladder hypotonia, renal insufficiency and subsequent poor outcome. Overuse of medical treatment and delaying surgery has increased the prevalence of such presentations.[9,10] Medications such as alpha-antagonists, 5-alpha reductase inhibitors and a combination of the latter improve symptoms in a safe cost-effective manner.[10-12] Furthermore studies showed that BPH progresses faster in patients suffering from diabetes.[13,14]

The purpose of this study is to evaluate whether preoperative patient specific characteristics, presenting symptoms, renal status, medical treatment and comorbidities have an effect on TURP outcome during their postoperative follow-up by looking at TWOC success, long term catheter dependence, complication rate and follow-up duration. This will help with better resource allocation and patient prioritisation to improve outcomes of surgery.

METHODS

A retrospective review was conducted for men >40 years of age undergoing a TURP from January 1st 2014 to March 31st 2015 (16 months) for whom at least one postoperative recording was available. These dates were selected to have at maximum 5-year follow-up period from the date of surgery to the date of data collection. Data collection for each patient stopped at the time of their last follow-up. Patients who passed away by the time of data collection were excluded from the study since their records could not be accessed. All TURPs were performed under the supervision of five full time consultant urologists, who provide urological care in the Maltese islands. Data was collected from a database stored in the department of urology at Mater dei hospital (MDH) which listed all patients who underwent a TURP between January 2012 and December 2019.

Data was collected over a period of 8 months which started on the 5th March 2020 and ended on the 27th November 2020. Using the local health care software system (iSOFT and patient dashboard), discharge summaries and inpatient/outpatient records in MDH and Gozo General Hospital. Patients who underwent TURP for BPH only were included in this study.

Preoperative variables for patients who underwent TURP included patient demographics, indication for surgery, bladder residual volume at presentation, uroflowmetry, urinary tract ultrasound imaging, renal profile, catheter status at time of operation, medical treatment together with its prescribed duration, and patient comorbidities. The postoperative course was evaluated in terms of length of stay, uroflowmetry, TWOC failure, catheter status on discharge and at last follow-up, final operation outcome, medical treatment needed after surgery and follow-up duration.

Statistical analysis was performed using Fisher's exact test for categorical variables. Independent sample t-test and one-way ANOVA analysis was used for continuous variables. Results were considered significant if $p < 0.05$. IBM SPSS Statistics (Version 26) was used for data analysis. Approval for this study was obtained from the University of Malta Research Ethics Committee FREC number- UREC-DP2112004MED.

RESULTS

A total of 141 patients were included in this retrospective analysis. Mean age was 69.5 years (SD 7.6 years) with the most common age group being between 60-69 years. Mean LOS was 3 days (SD 1.3) and mean follow-up post-TURP was 1149 days (SD 851 days). Common indications for surgery include LUTS (n=61 (43.3%)) and retention i.e. AUR and CUR (n=75 (53.2%). Out of 141 patients, 85 patients (60.3%) were catheter free with no or mild LUTS reported in their last follow-up visit. The commonest early complication was bleeding requiring readmission (5 (3.6%)). Preoperative and postoperative variables are listed in **Table 1** and **Table 2** respectively.

Table 1 *Variables of measured TURP preoperative and postoperative variables*

Retention status	Residual urine >500ml n= 118	53 (37.6%)
	Painful urine retention n= 141	30 (21.3 %)
	Mean residual urine volume at presentation (ml) n= 120	635.39 (694.51)
Renal status	Hydronephrosis at presentation n= 96	25 (17.7%)
	Atrophy at presentation n= 96	4 (2.8%)
	AKI[1] at presentation n= 140	37 (26.2%)
	Mean eGFR at presentation (SD) n= 140	75.36 (26.18)
Catheter status	Failed preoperative TWOC[2] n= 141	38 (27.0%)
	Catheter in situ at TURP[3] n= 141	63 (44.7%)
Comorbidities (n= 141)	Diabetes n= 141	38 (27.0%)
	CVA n= 141	4 (2.8%)
	Parkinsons n= 141	2 (1.4%)
	Neurological condition n= 141	5 (3.6%)
Medication (n= 141)	Preop medical treatment for BOO[4] n= 141	95 (67.4%)
	Mean duration of treatment preop in months (SD) n= 85	16.39 (24.03)
Indication (n= 141)	LUTS[5]	61 (43.4%)
	Refractory urinary retention	22 (15.6%)
	Chronic retention without catheter	14 (9.9%)
	Chronic retention with catheter	39 (27.7%)
	Intractable prostatic bleeding	4 (2.8%)
	Bladder stones	1 (0.7%)

[1]Acute kidney injury, [2]Trial without catheter, [3]Transurethral resection of the prostate, [4]Bladder outlet obstruction, [5]Lower urinary tract symptoms

Table 2 *Variables of measured TURP preoperative and postoperative variables*

Retention status	Mean residual urine after successful TWOC[1] (ml) n=141	69.59 (111.64)
	Mean residual urine volume at follow-up (ml) n=102	47.14 (109.50)
Catheter status n= 137	Failed inpatient TWOC	18 (12.8%)
	Catheter free at last follow-up	124 (87.2%)
	Catheter dependent at last follow-up	13
	Mean days postoperatively with catheter	5.10 (8.03)
Postoperative complications n= 141	Bleeding requiring re-admission	5 (3.6%)
	Bleeding requiring re-operation	1 (0.7%)
	Sepsis	4 (2.9%)
	Readmission with retention	2 (1.4%)
	Stress urinary incontinence	1 (0.7%)
	Urethral stricture	4 (2.9%)
	Prostate regrowth- LUTS[2]	2 (1.4%)
	Prostate regrowth- re-TURP[3]	3 (2.1%)
	None	118 (84.0%)
Outcome n= 141	Catheter free- no or mild LUTS	85 (60.3%)
	Catheter free- LUTS (conservative treatment)	3 (2.1%)
	Catheter free- LUTS (medical treatment)	30 (21.3%)
	Catheter free- LUTS (re-TURP)	6 (4.3%)
	Long term catheter	3 (2.1%)
	Intermittent self catheterisation	10 (7.1%)
	Did not turn up for follow-up	4 (2.8%)

[1]Trial without catheter, [2]Lower urinary tract symptoms, [3]Transurethral resection of the prostate

Table 3 *Catheter dependence at last follow-up is related to mode of presentation*

Outcome Indication	Catheter free at last follow-up	Catheter dependent at last follow-up	*p*-value
LUTS[1] vs AUR[2] n= 80	57	1	*0.029*
	19	3	
LUTS vs CUR[3] n= 110	57	1	*0.003*
	42	10	
AUR vs CUR n= 74	19	3	0.743
	42	10	
LUTS vs Any retention n= 132	57	1	*0.003*

[1]Lower urinary tract symptoms, [2]Acute urinary retention, [3]Chronic urinary retention

The mean age of men who were catheter free at last follow-up was 69.2 years compared with the 71.9 years for men who were not catheter free ($p = 0.159$). Only 5 patients were never catheter free post-TURP (mean age of 75.1 years). No statistical difference was noted when comparing catheter free rates with age groups ($p = 0.543$).

Table 3 shows that when compared to patients with LUTS, patients with AUR and CUR prior to surgery have a higher risk of remaining catheter dependent (LUTS vs AUR $p = 0.029$; LUTS vs CUR $p = 0.003$). Patients with any type of retention are also more likely to remain catheter dependent postoperatively when compared to LUTS ($p = 0.003$). There was no statistical significance in patients presenting with painful retention and outcome of surgery ($p = 0.364$). Furthermore there was no relationship between preoperative post-void residual (PVR) urine volumes and postoperative outcomes ($p = 0.3$).

Patients presenting with hydronephrosis were associated with a higher rate of failed TWOC (($p = 0.004$) and catheter dependence ($p = 0.008$) postoperatively. A failed postoperative TWOC (P 0.012) and poor outcome (P 0.003) were linked to a lower mean eGFR levels as seen in Table 4.

Table 4 *Effects of hydronephrosis and renal status on postoperative outcome*

Variable	Hydronephrosis n= 96		*p*-value	eGFR n=136	*p*-value
	Yes	No			
Failed postoperative inpatient TWOC[1]	8	5	*0.004*	60	*0.012*
Successful TWOC	17	66		77	
Catheter free at last follow-up	18	66	*0.008*	77	*0.003*
Catheter dependent at last follow-up	7	3		54	

[1]Trial without catheter

The majority of patients (95 (67.4%)) were on medical treatment prior to surgery. Mean age of patients on medication and those not on medication was 69.8 and 69.9 respectively (p = 0.48). Mean duration of medication was 16.4 months. Patient follow-up (p = 0.207) and outcome (p = 0.835) were not affected by preoperative medication.

Diabetic patients did not have an increase in the rate of postoperative complications (p = 0.980), poor outcome (p = 0.940), re-TURP (p = 0.741) or length of follow-up (p = 0.584).

Preoperative Qmax was calculated in 13 patients (9.2%) while postop Qmax was calculated in 18 patients (12.8%).[1] One patient received a transfusion during the perioperative period.

DISCUSSION

Our study did not show a relationship between age and catheter free rates. In a prospective study, Losco et al[2] determined that age does influence the risk of postoperative catheter dependence. The latter also recommended that TURPs should be recommended in context of anaesthetic risk and long-term disability of these patients. Other minimally invasive surgeries such as GreenLight laser vaporization, Holmium laser enucleation and transurethral needle ablation of the prostate were recommended in elderly individuals however all of the latter are not commonly performed locally.[2]

Our results revealed that 53 patients (37.6%) present late in states of retention. Khan et alconcluded that mode of presentation heavily determines the postoperative outcome.[4] Painful or painless retention should be specified during preoperative assessment. This retrospective analysis failed to show a link between painless retention and a failure to TWOC postoperatively. Literature shows that painless retention is highly indicative of bladder dysfunction and is less likely to improve with a TURP[15] Other factors which influence the risk of a failed TWOC and poor surgical outcome include prostate mass (>50g), severe LUTS according to International Prostate Symptom Score (IPSS) and high preoperative PVRs (>1000ml).[7]

Hydronephrosis was a common feature in patients presenting for a TURP in our cohort. This may be related to a delay in surgery due to a heavy reliance on pharmacological treatment for BOO with many patients presenting in states of retention and hydronephrosis resulting renal insufficiency.[10-11] Studies recommend starting patients presenting with AUR on an alpha blocker with an eventual plan for TWOC and TURP since it increases the chance of having a successful outcome postoperatively.[16]

Contrary to the above results, literature shows that patients with diabetes are susceptible to more postoperative complications and have a higher risk of re-TURP.[13]

The European Association of Urology recommends that uroflowmetry be performed prior to undertaking medical or surgical treatment. This will help monitor postoperative treatment outcomes.[1] Our study showed that preoperative Qmax was only documented in 13 patients preoperatively.

Smith et al[17] does not recommend routine crossmatch since it is classified as a low-risk procedure. Patients should be candidates for cross match taking in the presence of a coagulopathy and if Hb is <10g/dl.[17] This idea is reinforced above since only one patient required perioperative

SUMMARY BOX

What is already known:

- Catheter failure rates and urinary incontinence following TURP have been associated with increasing age
- Studies show that patients presenting with urinary retention have a poor outcome
- High bladder volumes increase the risk of bladder hypotonia, renal insufficiency and subsequent poor outcome.
- BPH progresses faster in patients suffering from diabetes

What this study adds:

- Age has no affect on postoperative catheter status
- Patients with any type of retention are more likely to remain catheter dependent postoperatively when compared to LUTS
- Patients presenting with hydronephrosis were associated with a higher rate of failed TWOC and catheter dependence postoperatively
- Diabetic patients did not have an increase in the rate of postoperative complications (p = 0.980), poor outcome (p = 0.940), re-TURP (p = 0.741) or length of follow-up (p = 0.584).

administration of blood products. Avoiding routine cross match taking will improve cost cutting significantly.

Being a retrospective study, data collection was only limited to data which could be gathered from patients' medical notes. Our population number was limited to patients who were alive at the time of data collection since patients who passed away could not have their records accessed. Last day of follow-up was considered as their last visit to a urology clinic irrespective to whether this visit was related to their TURP follow-up. This led to some patients having longer follow-ups which do not reflect their true postoperative follow-up. Human error during data collection was limited as much as possible by creating standardised data collection models.

CONCLUSION

In conclusion, this study showed that TURP remains a successful procedure for all age groups and it is still the gold standard surgical treatment for LUTS/BPH Our findings support the hypothesis that patients presenting with retention and hydronephrosis have a less favourable result after postoperative TWOC and should be prioritised to prevent progression of disease. Such patients should be informed preoperatively that their chances of failure to void after TURP is greater.

ACKNOWLEDGEMENTS

Special thanks to statistician and lecturer at the University of Malta Prof Liberato Camilleri for his assistance and guidance in data analysis and interpretation. Our thanks also goes to all urology consultants working at Mater Dei Hospital who granted approval for this study.

ABBREVIATIONS

TURP	Transurethral resection of the prostate
BPH	Benign prostatic hypertrophy
LUTS	Lower urinary tract symptoms
AUR	Acute urinary retention
CUR	Chronic urinary retention
TWOC	Trial without catheter
MDH	Mater dei hospital
PVR	Post void residual
AKI	Acute kidney injury
BOO	Bladder outlet obstruction

REFERENCES

1. EAU-Guidelines-on-Non-Neurogenic-Male-LUTS-incl.-BPO-2020.pdf. Accessed: Mar. 12, 2021. [Online]. Available: https://uroweb.org/wp-content/uploads/EAU-Guidelines-on-Non-Neurogenic-Male-LUTS-incl.-BPO-2020.pdf
2. Losco G, Mark S, Jowitt S. Transurethral prostate resection for urinary retention: does age affect outcome?:Outcome of TURP for retention. ANZ J Surg. 2013;83(4):243–245.
3. Green W, Campain N, Peracha A, Ratan H, T Walton, Parkinson R. Very high residual volumes should not prevent transurethral resection of the prostate being offered to men presenting with urinary retention. Scand J Urol. 2014;48(6):549–53.
4. Khan M, Khan AL, Khan S, and Nawaz H. Benign prostatic hyperplasia:mode of presentation and postoperative outcome. JPMA J Pak. Med. Assoc. 2005; 55(1):20–23.
5. Marszalek M, Ponholzer A, Pusman M, Berger I, and Madersbacher S. Transurethral Resection of the Prostate. Eur. Urol. Suppl. 2009;8(6):504–12.
6. Mebust WK, Holtgrewe HL, Cockett AT, and Peters PC. Transurethral prostatectomy: immediate and postoperative complications. A cooperative study of 13 participating institutions evaluating 3,885 patients. J Urol. 1989;141(2):243–47.
7. Fitzpatrick JM, et al. Management of acute urinary retention:a worldwide survey of 6074 men with benign prostatic hyperplasia. Bju Int. 2012;109(1):88–95.
8. Djavan B, Kazzazi A, and Lepor H. BPH: predicting TWOC failure in acute urinary retention. Nat Rev Urol. 2012;9(4):181–82.
9. Lu CH, et al. Is intravesical prostatic protrusion a risk factor for hydronephrosis and renal insufficiency in benign prostate hyperplasia patients?. J Chin. Med. Assoc. 2019;82(5):381–84.
10. Izard J, and Nickel JC. Impact of medical therapy on transurethral resection of the prostate: two decades of change: IMPACT OF MEDICAL THERAPY ON TURP. BJU Int. 2011;108(1):89–93.
11. Marberger M. The MTOPS Study:New Findings New Insights and Clinical Implications for the Management of BPH. Eur. Urol. Suppl. 2006;5(9):628–33.
12. JD McConnell et al. The long-term effect of doxazosin, finasteride, and combination therapy on the clinical progression of benign prostatic hyperplasia. N Engl. J Med. 2003;349(25):2387–98.
13. Soleimani M, Hoseini SY, Aliasgari M, Dadkhah F, Lashay A, Amini E. Long-term outcome of Trans Urethral Prostatectomy in benign prostatic hyperplasia patients with and without diabetes mellitus. Pak J, Med Assoc 2010;60(2):4.
14. Burke JP, Jacobson DJ, Roberts RO, Girman CJ, Lieber MM, and Jacobsen SJ. Diabetes and benign prostate hyperplasia in Olmsted County Minnesota. Ann. Epidemiol. 2004;14(8):604.
15. Reynard JM, and Shearer RJ. Failure to void after transurethral resection of the prostate and mode of presentation. p. 4, 1999.
16. Desgrandchamps F, De La Taille A, Doublet JD, RetenFrance Study Group. The management of acute urinary retention in France:a cross-sectional survey in 2618 men with benign prostatic hyperplasia. BJU Int. 2006vol. 97(4):727–33.
17. Smith H, Falconer R, Szczachor J, and Ahmad S. Routine preoperative group and save for TURP and TURBT – need and cost effectiveness. J Clin. Urol. 2018;11(1):33–7.