

Outcome of bipolar transurethral resection in benign enlargement of prostate

Samir Shrestha¹, Pukar Maskey², Jay N Shah²

¹Assoc. Prof., ²Prof., Dept. of Surgery, Patan Hospital, Patan Academy of Health Sciences, Lalitpur, Nepal

ABSTRACT

Introduction: Lower urinary tract symptoms (LUTS) secondary to benign enlargement of prostate (BEP) is one of the common urological problem in men. Bipolar transurethral resection of prostate (B-TURP) is a standard surgical intervention for BEP. In this study we aim to analyze the perioperative outcome and complications of B-TURP for BEP.

Method: This retrospective study analyzed the perioperative outcome & complications of B-TURP in patients with BEP from August 2017 to July 2020 at Patan Hospital, Patan Academy of Health Sciences, Lalitpur, Nepal. Data was collected from the operating room register and from inpatients files from the record section. SPSS version 16 was used to analyze the data. Study variables included age, ASA grade with known concomitant comorbidities, prostate volume, total prostate specific antigen (TPSA), operative time, decreased hemoglobin level, postoperative bladder irrigation duration, hospital stay, transurethral resection syndrome (TURS), hyponatremia, blood transfusion, postoperative hematuria requiring intervention, postoperative acute urinary retention, urinary tract infection (UTI) and urine incontinence.

Result: A total of 72 patients underwent B-TURP. Data was analyzed on 46 patients. Those with incomplete data and those files which were unable to retrieve were not analyzed. Perioperative outcomes were: median operative time was 81.73 minutes, median hospital stay was 3.4 days, median decreased hemoglobin was 3.0 g/dl and median postoperative bladder irrigation duration was 22.50 hours. Perioperative complications were: hyponatremia in 1 (2.1%), postoperative urinary retention in 2 (4.3%), blood transfusion in 4 (8.6%), postoperative hematuria requiring intervention in 3 (6.5%), urinary incontinence in 8 (17.3%) & urethral stricture in 6 (13.0%). There were no TURS & mortalities.

Conclusion: Our study shows B-TURP is safe procedure with minimal morbidity for the treatment of benign enlargement of prostate.

Keywords: Benign enlargement of prostate (BEP), bipolar transurethral resection of prostate (B-TURP), lower urinary tract symptoms (LUTS)

CORRESPONDENCE

Dr. Samir Shrestha

Dept. of Surgery, Patan Hospital, Patan Academy of Health Sciences, Lalitpur, Nepal

Email: samir_shrestha99@yahoo.com

INTRODUCTION

Benign enlargement of prostate (BEP) associated with lower urinary tract symptoms (LUTS) is a common problem in older men.¹ The prevalence of LUTS related to BEP increases with age, approaching 50% by age 60 years and 90% by age 85 years.² However some men with BEP will eventually progress to bothersome LUTS & urinary retention with time and age, when surgical intervention becomes inevitable. Studies evaluating surgical therapy for BEP have reported rates of postoperative morbidity greater than 10%.³

Transurethral resection of the prostate (TURP) has been considered as a gold standard treatment for symptomatic BPH. However, some studies have raised concerns about the safety and effectiveness of TURP.⁴ B-TURP is associated with significantly less fluid absorption⁵ and has less perioperative complications resulting in a greater safety.⁶ It uses normal saline as irrigation fluid which significantly eliminates the risk of transurethral resection syndrome (TURS)⁷.

In this study we aim to analyze the perioperative outcome and complications of B-TURP for BEP.

METHOD

This retrospective study includes patients who had undergone B-TURP for BEP from Aug 2017 to July 2020 at Patan Hospital, Patan Academy of Health Sciences (PAHS), Nepal. For data analysis in-patient identification numbers & patients files were retrieved from operation room register and record section respectively. All patient who underwent B-TURP at the study period were included. Those files with incomplete data and or files unable to retrieve from record section were excluded. Serum PSA, creatinine and electrolytes, serology, urine culture and Echocardiogram were checked as per hospital protocol. All patients received intravenous amikacin as prophylactic antibiotic. TURP was performed under spinal anesthesia. All the procedure begins with routine check cystoscopy and urethral calibration with male sound. Bipolar TURP was performed using a 26F resectoscope and a electrosurgical generator, with normal saline as irrigation fluid. Diathermy settings were 90 and 70 for cutting and coagulation, respectively. Ellik's evacuation of resected adenoma chips was done and specimen weight measured and sent for histopathological examination (HPE). At the end of the procedure, 18 or 20 Fr 3-way Foley catheter was inserted to provide continuous irrigation with normal saline postoperatively. Gentle traction of Foley catheter

at bladder neck was applied in all the patients till postoperative day 1. All cases were subjected with continuous bladder irrigation till next morning. Stoppage of bladder irrigation was decided by the urologist during morning round. Variables analysed were patient's age, ASA grade with known concomitant co-morbidities (hypertension, diabetes, COPD, heart disease), prostate volume, total prostate specific antigen, operative time, decreased hemoglobin level, bladder irrigation duration, hospital stay, transurethral resection syndrome (TURS), hyponatremia (at the end of operation, defined as serum sodium less than 135mmol/L), blood transfusion, postoperative hematuria requiring intervention (cystoscopy & bladder wash, electrocauterization), postoperative acute urinary retention, urinary tract infection (UTI), urine incontinence & retrograde ejaculation.

RESULT

Out of total of 72 B-TURP performed during the three year's study period, data on 46 patients were analyzed after excluding others with incomplete data or whose files were not found. We had 32 (69.4%) patients in ASA grade 2. Twenty-three (50%) of the patients had concomitant medical illnesses as shown in table 1.

Most common indication for surgery was acute urinary retention with failed trial without catheter (TWOC) in 24 patients (52.1%) followed by failed medical treatment in 10 (21.7%), recurrent UTI in 8(17.3%) & recurrent hematuria in 4 (8.6%). The median age was 58.4 years with median prostate volume 64.0 grams. The preoperative variables are depicted in table 2.

The median operating time was 81.73 min. Median postoperative bladder irrigation duration was 22.50 hours. None of the patients developed the TUR syndrome and no mortality was seen. The median duration of hospital stay was 3.4 days. The perioperative variables are depicted in table. 3.

We had 1(2.1%) case of hyponatremia with serum sodium concentration of 130 meq/l (at 2 hours of operation) without any adverse events. However, the cause of hyponatremia was not found & repeat analysis revealed normal finding. There were 2 (4.3%) cases of postoperative urinary retention following catheter removal at day three. Clean intermittent catheterization was taught and discharged. Both did well at follow up. The perioperative complications are depicted in table 4.

Blood transfusion was required in 4 (8.6%) patients. Out of them, 3 had prolonged operative time with intraoperative hemorrhage, while one of the patients had relatively low preoperative hemoglobin (9.0 g/dl). It is our routine practice to obtain negative urine culture prior all urological intervention, so was in this study. However, one of (2.1%) the patients developed UTI postoperatively.

He was managed with injection Piperacillin + Tazobactam 4.5 grams intravenously.

Three of our patient required intervention for postoperative hematuria.

Six (13%) patients developed urethral stricture and 8 (17.3%) experienced urinary incontinence.

Table 1. Prevalence of concomitant co-morbidities in benign enlargement of prostate (BEP) patients who had undergone bipolar TURP (N=23)

Comorbidities	Number (N)	%
Hypertension	12	26.0
Diabetes	7	15.2
COPD	6	13.0
Cardiac arrhythmia	4	8.6

*total % adds up more than 50, because of more than one co-morbidities in one patient

Table 2. Preoperative measurements

Variables	Median	Range
Age (in years)	58.4	50-82
Hemoglobin (g/dl)	12.6	9-15.2
Creatinine (mg%)	1.1	0.6-1.5
Total prostate specific antigen, TPSA (in ng/ml)	1.8	1.0-3.4
Prostate volume (in grams)	64.0	50-105
Post void residual urine, PVRU (in ml)	115	55-210
Intravesical prostatic protrusion, IVPP (in mm)	10	6-18

Table 3. Perioperative outcomes

Variables	Median	Range
Operative time (minutes)	81.73	65-128
Hospital stay (days)	3.4	2.0-7.0
Decreased hemoglobin (g/dl)	3.0	1.4-3.4
Postoperative bladder irrigation duration (hours)	22.50	18-44

Table 4. Perioperative complications after bipolar TURP (N=46) for BEP

Complications	N	%
Hyponatremia	1	2.1
Postoperative urinary retention	2	4.3
Blood transfusion	4	8.6
Urinary tract infection(UTI)	1	2.1
Post-operative hematuria requiring intervention <ul style="list-style-type: none"> • Electrocauterization of bleeders in 1 • Cystoscopy bladder wash in 2 	3	6.5
Urinary incontinence (at 4 weeks)	8	17.3
Urethral stricture (at 3 months)	6	13.0
Retrograde ejaculation	32	69.5

DISCUSSION

Currently there are standardized way to define perioperative complications. Patients with lower urinary tract symptoms secondary to benign enlargement of prostate are usually elderly and associated with other morbidities as well. However it is considered safe because it excludes the patient from the electrical circuit and uses a normal saline as an irrigant which is more physiological solution.

The median age of patients in our study was 58.4 years & 69.4% (n=32) patients were in ASA grade-2 with 50% (n=23) being associated with other morbidities viz; hypertension, diabetes, COPD & cardiac arrhythmias. However B-TURP was successfully done despite their respective age and comorbidities. Krogh, et al. in their study did not find age as a factor in determining the outcome of TURP. Their analysis did not reveal a clinically

significant increase in morbidity among elderly groups of patients.⁸

The median operative time in our study was 81.73 minutes. Our operative time was relatively longer compared to previous studies done by Ho, et al.⁹ and Paola, et al. which may be due to the time consumption during urethral caliberation with male metal sound prior to resection.

B-TURP is also associated with blood loss during intervention. We had median hemoglobin decrement of 3 gm/dl comparable to study by Yong Wei¹¹ where they had 2.35+/- 0.63 gm/dl decline in hemoglobin post procedure. Blood transfusion needed in 4(8.6%) of our patients comparable to the large series where the blood transfusion rate ranged between 2.5-8.6%.^{12,13} We encountered hyponatremia and postoperative urinary retention in 1(2.1%) and 2(4.3%) of our cases respectively, comparable to a study done by Yong Wei, et al.¹¹ where they had 2.9% of hyponatremia, however they noted only 1% of the cases of postoperative urinary retention. Hyponatremia is less common with B-TURP as it uses normal saline as the irrigant. We had relatively more cases of postoperative urinary retention, which may be associated with neurogenic condition like hypertension and diabetes in our subgroup of patient. Moreover uroflowmetry and urodynamic study is not carried out routinely in preoperative period as most of our patients are unaffordable and do not wish to go for these investigations.

We also had 3 (6.5%) cases that required intervention for postoperative hematuria in the form of electrocauterization of the bleeders in one and cystoscopy bladder wash in other two patients. This was comparable to the study done by Uddin MM, et al.¹⁴ where they encountered postoperative hematuria in 4.4% of their cases. These complications are commonly encountered in patients with larger prostate with maximum resection of adenomas during surgery. Also, patients with antiplatelets or anticoagulants therapy are more vulnerable for post-operative hematuria and intervention.

Urinary incontinence (at 4 weeks) in our study was 8(17.3%), all were were taught Kegel's exercise and anticholinergic drug (tab oxybutynin 5 mg) was prescribed. Seven of them were dry during regular follow up. Yong Wei, et al.¹¹ had 10.3% of incontinence in their study. Higher incidence of urinary incontinence in our study may be due to excessive resection of prostate adenoma around

apex in vicinity to external sphincter. Nonetheless, neurogenic/neuropathic condition like diabetes and hypertension in our patients could be the other reason. Urethral stricture in our study was 6(13%). Five had bulbar stricture [underwent direct vision optical urethrotomy (DVIU)] & one had penile stricture [underwent buccal mucosal graft urethroplasty]. All of them are under regular follow up. Kazumasa Komura, et al.¹⁵ in their study found the stricture rate of 19%. The increased electrical density on the outer sheath of the resectoscope and any small damage on the surface of the outer sheath can cause dispersions of flow on the urethral mucosa, as outer sheath of the resectoscope acts as return electrode, and thus theoretically this could lead to an increased risk of urethral lesion.¹⁶

Limitations of this study include limitations inherent to retrospective analysis, small sample size and relatively shorter follow up. Beside these, there were inadequate preoperative data pertaining to International Prostate Symptoms Score and some investigations like uroflowmetry and urodynamic study.

CONCLUSION

With a continuously improving armamentarium and technique in endourology, we can conclude B-TURP is safe procedure for benign enlargement of prostate or lower urinary tract symptoms with minimal and acceptable morbidities.

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