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Transurethral Resection of Prostate for BPH > 100 G

KEYWORDS: BPH, TURP, 100 gram Prostate

*** Ajay Anand**

Assistant Professor, Department of Surgery and Urology, Govt. Medical college Hospital, Jammu-180001 * corresponding author

ABSTRACT ***Purpose:*** *To assess safety and effectiveness of TURP for the management of prostate > 100 grams.*

Material and Methods: *Twelve patients with BPH > 100 grams as determined by abdominal ultrasonography were offered TURP between February 2011 and February 2016. International Prostate Symptom Score (IPSS), prostate volume, postvoid residue (PVR), and maximum flow rate (Qmax) formed part of preoperative evaluation. We also assessed intraoperative and postoperative parameters including operative time, irrigant fluid requirement, blood loss, duration of postoperative catheterization, hospital stay and postoperative complications.*

Results: *The mean prostate volume was 109.34 grams (range 101-169 grams). The mean age was 61.70 years (range 53-81 years).9 patients had a catheter preoperatively. Mean IPSS score was 24.67(21-28). Mean Qmax and PVR were 06 ml/sec (4 – 12) and 139 ml (77 – 170) respectively. Mean operative time was 79 minutes (60 – 110) and mean irrigant fluid used was 26.78 litres (19 – 36).Mean resected weight of prostate was 69.4 grams (43 – 74). Average postoperative catheter duration was 2.31 days (2-2.5) with average postoperative hospital stay being 3.70 days (02 – 05). Effectiveness assessed at 6 months was IPSS 5.6, Qmax 20.7 ml/sec, insignificant PVR.*

Conclusions: *TURP is an acceptable treatment modality for prostates > 100 gm. with no side effects in expert hands.*

Introduction: Transurethral resection of the prostate (TURP) is gold standard surgical treatment for symptomatic BPH.[1] Besides providing rapid tissue removal and tissue for pathologic diagnosis, it also defines limits of resection within well defined surgical boundaries.[2] TURP has hitherto been performed in prostates smaller than 65 – 75 grams owing to aspersions that in large volume prostates (> 100 g), TURP is associated with longer operative time, more blood loss and higher requirements of irrigant fluid. Therefore, open surgery remained the traditional surgical recommendation for BPH > 100 gm.[3]

TURP for large volume prostates has been considered to be associated with significant morbidity, which has necessitated attempts at modification of standard equipment and techniques. Transurethral vapor resections of prostate (TUVRP) and Laser prostatectomy are few such modifications and innovations. TUVRP performed with a modified thicker loop leads to simultaneous resection & tissue vaporization and is associated with better hemostasis and shorter operative time.[4] Thicker loops have a greater surface area than standard loops, resulting in a lower current density for a given power output from the generator. This results in a higher dessication effect similar to that of electrovaporization, but a poor cutting effect. These loops are usually used with higher power settings of 200-300 W, which improve cutting effect in addition to coagulation advantages of loop. These devices also reduce bleeding by instant coagulation of vessels, provide good visibility, and reduce operative time and fluid absorption. Postoperative bladder irrigation and duration of catheterization are also reduced.[3-5] Various studies have demonstrated the efficiency of vapor resection of the prostate.[5-9] But these loops are costlier and high power settings used with such loops carry a small but significant incidence of postoperative strictures and rarely postoperative incontinence, owing to use of such high power settings at prostatic apex near the external sphincter. Laser prostatectomy carries a higher cost of equipment and thereby of procedure coupled with higher learning curve for the surgeon.

TURP can be safely used for large volume prostates in experienced hands. It is economically compliant procedure for most patients, with least complications if performed diligently. We assessed the safety and efficacy of transurethral resection of the prostate (TURP) in management of prostate glands with volume > 100 g.

Material and Methods: Twelve patients with diagnosis of BPH and volume > 100 gm on ultrasonogram; and standard indications for surgery were included in the study. This was a prospective study. All surgical procedures were performed by a single surgeon. All these patients had received medical management in past, but had progressive worsening of symptoms. 9 patients with acute urinary retention had failed catheter free trial and were on catheter at time of surgery. Mean obstructive IPSS was 16.39(16-17). All patients who were on catheter preoperatively had prostate weight ranging from 101-169 grams, with prominent intravesical projection - mean median lobe being 21.7 (15-30) grams. Five of these patients had upper tract dilatation on preoperative ultra sonogram. Patients on anticoagulation were excluded from the study.

Table 1: Patient demographics

Total number of patients	12
Age (years)	61.70 (53-81)
IPSS	24.67 (21-28)
Obstructive IPSS	16.39(16-17)
Irritative IPSS	8.28(5-11)
On Catheter	09
Prostate size (mean)	109.34 (101-169)
Q max (ml/sec)	06 (4 – 12)
PVR (ml)	139 (77 – 170)

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All patients underwent TURP with regional anaesthesia, during period February 2011 to February 2016. Preoperative assessment included detailed medical history with International Prostate Symptom Score (IPSS), digital rectal examination, urinanalysis, urine culture, complete blood cell counts, renal function tests, serum electrolyte levels and serum prostate-specific antigen. Blood cell counts and serum electrolytes were repeated in evening of zero postoperative days, to assess for any changes. Preoperative IPSS evaluation of patients with preoperative catheter was made on basis of their symptoms prior to catheterization. Urodynamic study was not performed in any of the patients preoperatively.

Prostate size was assessed by transabdominal ultrasonography. Uroflowmetry was performed in all patients except those on catheter.

Informed consent was taken preoperatively from all patients cystoscopy and urethral dilatation to 28 Fr was performed. Continuous flow resectoscope no. 27 Fr was used alongwith wolf wing cutting electrode.[10,11,12]

We used Verilab electrocautery with settings of 120 W for cutting and 80 W for coagulation. We used modified Nesbit's technique for resection, using a thin loop. Resection was initially started at 5 and 7 O'clock positions, followed by resection from 12 to 5 O'clock and then from 12 to 7 O'clock positions. Finally resection was completed at 6 O'clock position. We aimed at achieving complete resection till prostatic capsule was reached.

All procedures were performed using monopolar cautery and glycine as irrigant fluid. Intraoperative blood loss was estimated using Freedman and associated indicator dilution principal.[13] We also estimated amount of blood loss by subtracting effluent fluid from amount of irrigant fluid used intraoperatively, in addition to estimating hemoglobin of effluent fluid. Finally every patient had postoperative hemoglobin and hematocrit done on evening of surgery**.** Operative time included time between introduction of resectoscope to placement of catheter. Irrigation was stopped on 1st postoperative day morning, and catheter was removed as soon as irrigation was clear and patient was ambulatory.

We recorded resected weight of prostate. Record was made of any intraoperative and postoperative complications. Patients were reviewed 3 monthly for 1 year for parameters of IPSS, Qmax and postvoid residual urine.

Results: The patient characteristics and intraoperative parameters are shown in Tables 1 and 2. The mean prostate volume was 109.34 grams (range 101-232 grams). The mean age was 61.70 years (range 53-81 years). 9 patients used a catheter preoperatively. Mean IPSS score was 24.67(21-28), obstructive IPSS was 16.39 (16-17) and irritative IPSS was 8.28 (5-11). 09 patients in our study had preoperative urgency. Mean Qmax and PVR were 06ml/sec (4 – 12) and 139 ml (77 – 170) respectively. Mean operative time was 79 minutes and mean irrigant used was 26.78 litres (19-36). Mean resected weight of prostate was 69.4 grams (43 – 74). Average intraoperative blood loss was 110 ml (80 – 150). Mean preoperative hemoglobin (Hb) and Packed Cell Volume (PCV) were 12.5(11-13.5) gm/dl and 38(33.1-41.5) respectively.

Table 2: Intraoperative parameters

Parameter	
Operative time (min)	79 (60 – 110)
Intra-oerative irrigant (lit.)	26.78 (19 – 36)
Resected weight (gms)	69.4 (43 – 74)
Intraoperative blood loss (ml)	110 (80 – 150)

Postoperative parameters of patients are shown in Table 3. Average postoperative catheter duration was 2.31 days (02 – 2.5) with average postoperative hospital stay being 3.70 days (02 – 05)**.** Mean postoperative hemoglobin (Hb) and Packed Cell Volume (PCV) were 12.1(10.7-12.8) gm/dl and 36.3(32.5-40.7) respectively.

Table 3: Postoperative parameters

Parameter	
Irrigant (litres)	26.78 (19 – 36)
Hb change (mean, gm/dl)	-0.43 (- 0.28 to – 0.60)
Catheter removal (Mean, days)	2.31 (02 – 2.5)
Recatheterised	01
Postoperative hospital stay (days)	3.70 (02 – 05)

All patients with preoperative urgency had resolution of their symptoms and none of the patients developed de novo postoperative urgency. Complications included transient dysuria in 2 patients. None of the patients had urethral stricture or hyponatremia. No patient required blood transfusion postoperatively, and none of the patients had postoperative incontinence. Effectiveness assessed at 6 months was IPSS 5.6, Qmax 20.7 ml/sec, and insignificant PVR.

Discussion: TURP has become the gold standard for treatment of BPH. Many centres have gradually started using alternative techniques for BPH like TUVRP, Laser Prostatectomy. These procedures may not be affordable by majority of population. Since TURP is used by most of centre worldwide, we attempted using it for large volume prostates with three basic tenets of surgery in mind – speed, accuracy and good postoperative outcome. We tried to achieve complete resection of prostatic tissue, till we reached prostatic capsule, starting from bladder neck to verumontanum. Whatever was left behind after our complete vaporresection was peripheral zone of prostate.

Previously, we published a study that compared standard TURP with TUVRP in prostates > 40 g and another study using TUVRP for BPH > 100 g. The study revealed that TUVRP is associated with less blood loss, less irrigant requirement, good intraoperative visibility, and was safe in patients with comorbid conditions. TUVRP required less time for surgery than standard TURP.[11,12] Subsequently, we compared standard TURP, TUVRP and holmium laser resection/enucleation of the prostate. This study replicated the results of the previous study and revealed the excellent hemostatic property of the holmium laser with less perioperative morbidity. However, the laser surgery requires special equipment and is associated with a learning curve.[13]

We included patients with prostate volume > 100 g in our present study to assess safety and efficacy of TURP using thin loop. Max prostate volume managed with TURP in our study was 169 gm. All procedures were performed using thin loop, monopolar cautery with a cutting current of 120 W. TURP was found to be safe and effective in prostates more than 100 grams with less bleeding and excellent intraoperative vision.

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Post-operative bladder irrigation was stopped on morning of 1st postoperative day and catheter removed on 2nd postoperative day in majority of patients. Catheter was removed as soon as irrigation was clear and patient was ambulatory. Blood transfusion was not required in any of the patients. Very few patients had transient dysuria, which resolved spontaneously. Patients were mostly discharged on 3rd postoperative day. TURP was found to be an excellent procedure for prostate volume > 100 gm in expert hands with good postoperative outcome. Unlike open prostatectomy, TURP has advantages of decreased blood loss, excellent intraoperative vision, less operative time and shorter hospital stay.

Various groups have reported other alternatives for surgical management of large volume prostate – like HOLEP (Holmium Laser Enucleation of the Prostate).[14-18] HOLEP requires surgical expertise and special equipment, which is available in few centers worldwide. HOLEP no doubt has less bleeding but TUVRP has been found to have an edge over HOLEP in prostates > 100 gm. Ivano Vavassori et al reported mean Hb drop of 1.2 g/dl, whereas in our study of TURP, mean Hb drop was 0.43 g/dl.[19] In addition to being economically feasible, in experienced hands, TURP has been found to have less intraoperative resection time and better intraoperative manipulation of instruments in prostates > 100 gm; than that with HOLEP. Laser fibre in HOLEP needs to be adjusted again and again, unless it is fixed in access catheter by using injection port. However electrode used in TUVRP, once fixed, does not usually need to be readjusted, thereby leading to smooth vapor-resection of prostate in minimal time.

Conclusion: TURP is an acceptable treatment modality in present times, for prostates > 100 gm. Excellent intraoperative vision, minimal intraoperative and postoperative morbidity, reduced hospital stay should make TURP 'the gold standard' treatment even for > 100 gm prostates.

Abbreviations:-

TURP – Transurethral Resection of Prostate

BPH - Benign Prostatic Hyperplasia

IPSS – International Prostate Symptom Score

PVR – Post void residue

Qmax – Maximum Flow rate

TUVRP – Transurethral Vapor Resection of Prostate

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