Transurethral Bipolar Enucleation of the Prostate Is an Effective Treatment Option for Men With Urinary Retention

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OBJECTIVE To evaluate outcomes of transurethral bipolar enucleation (TuBE) of the prostate in patients with refractory lower urinary tract symptoms.

MATERIALS AND METHODS A retrospective analysis was performed on patients who underwent TuBE from July 2014 to March 2015. Perioperative factors evaluated included International Prostate Symptom Score, Sexual Health Inventory for Men score, prostate-specific antigen, postvoid residual volume, transrectal ultrasound volume measurement, estimated blood loss, operative time, pathologic weight, and complications. Postoperative evaluation was performed at 6 weeks and 3 months.

RESULTS Forty-nine patients were identified. Mean age was 67 years and mean follow-up was 4.4 months. Twenty-eight patients (57%) were in retention. Preoperative, 6-week, and 3-month mean postvoid residual volumes were 278 mL, 66 mL, and 87 mL ($P < .01$); mean International Prostate Symptom Scores were 22, 9, and 8 ($P < .01$); mean quality of life scores were 5.0, 1.9, and 1.9; and Sexual Health Inventory for Men scores were 7.1, 8.4, and 7.0 ($P = .35$), respectively. Twenty-eight patients (57%) were able to have erections preoperatively and were still able to postoperatively. All (100%) of the patients in retention were able to void postoperatively. Mean operative time was 93 minutes, estimated blood loss was 49 mL, and pathologic weight was 18 g. Urinary tract infection occurred in 3 patients (6%), urethral stricture in 1 (2%), and bladder neck contracture in 2 (4%). Mean prostate-specific antigen decreased from 3.2 ng/dL to 0.9 ng/dL at 3 months ($P < .01$).

CONCLUSION TuBE is an effective operation for refractory urinary tract symptoms including those who are in urinary retention. UROLOGY 87: 166–171, 2016. © 2015 Elsevier Inc.

Transurethral resection of the prostate (TURP) and open simple prostatectomy (OSP) have historically been the gold standards for surgical treatment of benign prostatic hyperplasia (BPH) for small and large glands, respectively. They continue to be mainstays in treatment as evidenced by both the American Urological Association's and the European Urology's most recent BPH guidelines.[1,2] However, holmium laser enucleation of the prostate (HoLEP) is gaining acceptance as the new gold standard operation for BPH and lower urinary tract symptoms.[3,4] HoLEP has been shown to be superior perioperatively to OSP in regard to transfusion rates, hospitalization time, and catheterization time.[5] It also produces equal to improved functional outcomes with longer durability than TURP, transurethral vaporization of the prostate (TUVP), and photovaporization of the prostate.[5-11] HoLEP offers the advantage of a single operation for large prostates.[12] Despite the clear benefits of HoLEP, it has not gained widespread utilization likely secondary to a steep learning curve, inability to convert easily to a conventional resection, and the added expense of the morcellation device and high-energy holmium laser.[1,4,10]

Thus, the international urologic community has sought various approaches and equipment that can be used to enucleate the prostate with the hope of producing similar efficacy to enucleating with the holmium laser. Continuous fire thulium lasers have been developed to allow better vaporization of tissue while laser enucleation is performed.[13,14] They appear promising but may not produce a cost reduction, given the need to purchase a thulium laser, which has limited utility outside of the prostate. Transurethral bipolar enucleation techniques were first

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reported in 2006.[15] There have been two separate techniques described that are common in that the energy source utilized is bipolar electrocautery and the majority of the enucleation is performed bluntly using the tip of the resectoscope. Plasmakinetic enucleation of the prostate (PkEP) utilizes bipolar electrocautery with a loop instrument, whereas bipolar plasma enucleation of the prostate (BPEP) uses a button electrode for enucleation.[15-19] Thus, regardless of electrode being used, a transurethral bipolar enucleation (TuBE) of the prostate is being performed.

Techniques for addressing enucleated prostate tissue vary. Two groups describe leaving the prostate attached at the bladder neck as a loop electrode is used to resect the enucleated tissue relatively bloodlessly.[17,20] Other groups report use of traditional morcellation devices after the adenoma has been released off of the prostatic bed.

This study reports a single surgeon's early experience with TuBE with loop resection. Particular attention will be paid to those patients in retention. We hypothesize that the outcomes of TuBE will be comparable with those reported with other enucleation procedures.

MATERIALS AND METHODS

A retrospective review of an Institutional Review Board-approved database was performed on 49 consecutive patients who had undergone a TuBE. Indications included medical refractory lower urinary tract symptoms, contraindications to oral therapy, or complications of an enlarged prostate including retention, bladder stones, recurrent hematuria, and recurrent urinary tract infections.

Preoperative parameters evaluated include age, prostate-specific antigen (PSA), International Prostate Symptom Score (IPSS), IPSS quality of life (QOL) score, Sexual Health Inventory for Men (SHIM) score, transrectal ultrasound volume study of the prostate, history of prostate biopsy or prior prostate surgery, and postvoid residual volume (PVR). These parameters were reassessed at 6 weeks and 3 months. Urodynamic testing was sometimes performed in younger patients, those with small prostates, those in urinary retention, or those with diabetes or neurologic conditions. However, urodynamics was not often included preoperatively, and is thought to be largely unnecessary by the authors. Urine culture was tested preoperatively. If urine culture was positive, infection was treated and urine was retested prior to surgery.

Surgical Approach

After informed consent was obtained, all patients received preoperative antibiotics and underwent general anesthesia. The surgical procedure has been previously described[20] using a 27 French OES Pro Resectoscope (Olympus America Incorporated). The Plasmabutton (Olympus America Incorporated) was used to enucleate the prostate. During enucleation, a bridge of mucosa was left attached at the bladder neck and apex to stabilize the prostate during resection, which was completed with a fine loop electrode.

Postoperative Management

The patients received a 22 French two-way catheter and were admitted for observation overnight. The catheter was placed on light traction for 4 hours postoperatively and then removed on postoperative day 1. The patients were instructed to void twice prior to discharge to ensure low PVRs. If there were intraoperative concerns for prostate capsule perforation or undermining of the bladder neck, the patient would be discharged with a catheter in place and would be instructed to return for follow up in 2-5 days, depending on clinic schedule, for catheter removal. If a patient was unable to void after catheter removal, then a 16 French catheter was replaced and the patient was discharged with instruction to return for follow up in 2-5 days for catheter removal.

The patients were followed at 6-week and 3-month intervals. At each visit, PVR, flow rate, IPSS, and SHIM scores were assessed. At 3 -month visits, PSA was also assessed. If PSA was appropriate and symptoms were resolved, then the patients were discharged from the clinic. Persistent irritative symptoms such as urgency and frequency were treated first with a course of anticholinergics. If the symptoms remained severe and bothersome, then onabotulinum toxin was offered. If PVR was elevated, or increasing from 6 weeks to 3 months, a cystoscopy was performed to rule out a bladder neck contracture or urethral stricture.

Statistical Analysis

Continuous variables were evaluated with the Student *t* test. One-way analysis of variance was utilized to test the difference between preoperative continuous variables and the 6-week and 3-month variables. A two-tailed *P* value less than .05 was considered significant. Statistical analysis was performed using SPSS version 21 (IBM, Armonk, NY).

RESULTS

Preoperative

Forty-nine consecutive patients underwent TuBE from July 2014 to March 2015. Mean follow-up was 4.4 months (range 1.2 to 10.7). All 49 patients (100%) had a minimum of 6 weeks follow-up. Thirty-two patients (65%) completed the 3-month follow-up. Preoperative factors can be seen in Table 1. Nine patients had preoperative urodynamics performed. Seven patients had bladder outlet obstruction, whereas 2 patients had acontractile bladder. Forty patients had prostates less than 80 g, and 9 patients had prostates greater than 80 g.

Table 1. Preoperative factors

Patient number	49
Mean age (years)	67 (54-88)
Mean follow up (months)	4.4 (1.2-10.7)
Patients in retention	28 (57%)
Prostate specific antigen (44 patients)	3.2 (0.1-15.8)
Prior surgical resection	9 patients (18%)
Prior prostate biopsy	10 patients (20%)
Mean PVR (mL)	278 (0-900)
Mean transrectal ultrasound volume (g)	50 (11-168)
Mean IPSS	22 (4-35)
Mean QOL score	5 (2-6)
Able to achieve erection	28 patients (57%)
Mean SHIM score	7.4 (1-25)

IPSS, International Prostate Symptom Score; PVR, postvoid residual volume; QOL, quality of life; SHIM, Sexual Health Inventory for Men.