Impact of Minimally Invasive Benign Prostatic Hyperplasia Therapies on 30- and 90-Day Postoperative Office Encounters

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OBJECTIVE To compare the frequency of postoperative encounters in the 30-day and 90-day postoperative periods for various bladder outlet obstruction surgical therapies.

MATERIALS AND METHODS All patients who underwent transurethral resection of the prostate (TURP), GreenLight laser photovaporization of the prostate (GL-PVP) (American Medical Systems Inc.), and holmium laser enucleation of the prostate (HoLEP) from January 1, 2012 to December 31, 2014 were followed for 6 months postoperatively. All postoperative encounters such as patient calls or questions, catheter exchanges or removals, and hospital-based readmissions or emergency department visits were recorded in the electronic medical record.

RESULTS Two hundred and ninety-one consecutive patients underwent outlet procedures during the study period: TURP (N = 199; mean age, 71 years; mean body mass index [BMI], 28.5), HoLEP (N = 60; mean age, 68 years; mean BMI, 28.1), or GL-PVP (N = 32; mean age, 72 years; mean BMI, 29.3). No statistically significant difference was observed for age, BMI, preoperative American Urological Association symptom score, or preoperative maximum flow velocity between the 3 groups. Thirty-day postoperative encounters differed significantly between the 3 surgery types ($P < .001$). Specifically, there were fewer encounters within 30 days of surgery for TURP compared to both HoLEP (≥1 encounter: TURP = 48.7%, HoLEP = 66.7%; $P = .006$) and GL-PVP (≥1 encounter: TURP = 48.7%, GL-PVP = 93.7%; $P < .001$). The number of encounters within 90 days postoperatively was also significantly lower for TURP patients ($P < .001$).

CONCLUSION TURP results in fewer postoperative encounters in both the 30-day and 90-day postoperative periods compared to HoLEP and GL-PVP. Laser prostate therapies may place increased burden on clinic staff during the 30-day and 90-day postoperative periods. UROLOGY 99: 186–191, 2017.

Secondary to significant improvements in International Prostate Symptom Score and urodynamic parameters, including postvoid residual (PVR) and urinary flow rates, transurethral resection of the prostate (TURP) is regarded as the gold-standard surgical therapy for benign prostatic hyperplasia (BPH).[1-3] Despite these benefits, the rate of TURP has been decreasing with a corresponding increase in alternative minimally invasive surgical therapies (MISTs).[4] The etiology of this phenomenon is likely attributable to TURP-related morbidity, including blood loss, transurethral resection syndrome, clot retention, and hospital stay,[3] with an overall morbidity rate of 11.1%.[5]

Given TURP-related morbidity and the rise of MISTs, several systematic reviews and meta-analyses have been performed to compare the safety and efficacy profile of TURP with various MISTs including GreenLight photovaporization of the prostate (GL-PVP) (American Medical Systems Inc.), holmium laser enucleation and ablation of the prostate

Previous Presentation: Southeast Section AUA Podium Presentation, March 18, 2016, Nashville, TN.

Financial Disclosure: *The authors declare that they have no relevant financial interests.*

Funding Support: *Mayo Clinic Institutional Grant.*

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Submitted: August 2, 2016, accepted (with revisions): October 10, 2016

http://dx.doi.org/10.1016/j.urology.2016.10.015
0090-4295

(HoLEP/AP), and bipolar TURP.[6,7] Ahyai et al[6] evaluated 27 separate publications involving 23 different randomized control trials and determined comparable efficacy and overall morbidity for MISTs and TURP. Teng et al[7] examined GL-PVP vs TURP, finding similar efficacy as well.

Unplanned postprocedure care has gained increased scrutiny among healthcare providers in recent years. In fact, under the Affordable Care Act, healthcare policymakers penalize hospitals with poor readmission rates.[8] In the urologic literature, the impact of unplanned postprocedure visits was examined for patients with urolithiasis, citing differences among subsequent rates and costs of various treatment modalities.[9] Although the safety and efficacy profiles of various BPH surgeries are important, to date there has been no publication on the impact of postprocedure encounters on various BPH therapies. Therefore, the primary objective of this study was to compare the frequency of encounters in the 30-day and 90-day postoperative periods for 3 main BPH surgeries. Secondary aims included analyzing the safety and efficacy profiles of these therapies.

MATERIALS AND METHODS

Demographic Information

This study was approved by the Mayo Clinic Institutional Review Board. At our institution, 3 main surgical options (>30 cases/year) exist for BPH refractory to medical therapy: monopolar TURP, GL-PVP, and HoLEP. A total of 291 consecutive patients who underwent monopolar TURP (N = 199), HoLEP (N = 60), or GL-PVP (N = 32) for BPH at our institution between January 1, 2012 and December 31, 2014, were included in this retrospective study. All 6 surgeons performed TURP; however, a single surgeon performed GL-PVP and another performed HoLEP (HoLEP surgeon introduced this therapy to our practice with no prior experience, whereas the GL-PVP surgeon had significant experience at the onset of the study). Consistent with practice norms, significantly elevated prostate volumes (glands >80-100 cc) were triaged to HoLEP. However, shared decision-making with patient and physician ultimately decided the BPH surgical therapy. Preoperative surgical instructions were similar as all patients, regardless of surgical therapy enlisted, were seen by physician assistants familiar with postoperative care, after surgeon consultation. All patients underwent PVR testing at the time of Foley catheter discontinuation. Moreover, patients received postoperative narcotic medication for 3-5 days unless allergic, in which case acetaminophen was used. Baseline demographic characteristics and disease information (age, state of residency, pathology, body mass index [BMI], preoperative prostate-specific antigen [PSA], preoperative American Urological Association [AUA] score, preoperative maximum urine velocity [Q_{max}], preoperative average urine velocity [Q_{avg}], preoperative PVR, preoperative hemoglobin, and Anesthesia Severity Assessment status), operative characteristics (grams resected, Joules, estimated blood loss, operative time, amount of and irrigation fluid used), postoperative outcomes (PSA, AUA score, Q_{max}, Q_{avg}, PVR, hemoglobin, length of hospital stay, duration of catheterization, number of encounters within 30 days and 90 days of discharge, and number of encounters within 6 months of discharge), and intraoperative or postoperative complications (transfusion rates, urinary retention, clot retention, and readmission) were recorded.

Primary Objective

The primary outcome measure was the number of encounters within 30 days of discharge. Postoperative encounters were defined as any interaction with urology service, including any nursing or physician phone calls, catheter exchanges or removal visits, readmissions, or emergency department visits. It is our institution's policy to log any patient interaction in the electronic medical record. At our institution, clinic nurses triage all patient phone calls. Excluded from this analysis were encounters related to discussion of pathology (TURP or HoLEP).

Secondary Objectives

All patients were scheduled for a return visit and uroflow test 3 months postoperatively. Secondary objectives involved safety and efficacy profiles for each of the surgeries. Safety parameters recorded included blood loss, length of hospital stay, duration of catheterization, transfusion rate, urinary retention, clot retention, and readmission. Efficacy parameters included postsurgical differences in AUA symptom score, Q_{max}, Q_{avg}, and PVR.

Statistical Analysis

Continuous variables were summarized with the sample median and range. Categorical variables were summarized with number and percentage of patients. Patient demographic, disease, and operative characteristics were compared between the 3 surgery types (TURP, HoLEP, and GL-PVP) using a Kruskal-Wallis rank-sum test or Fisher's exact test. Postoperative outcomes were also compared between the 3 surgery types using a Kruskal-Wallis rank-sum test or Fisher's exact test, and pairwise comparisons in outcomes between these 3 surgery types were made using a Wilcoxon rank-sum test or Fisher's exact test. P values ≤.05 were considered statistically significant, with the exception of the P values resulting from pairwise comparisons of outcomes between the 3 surgery types, where P values ≤.0167 were considered statistically significant after applying a Bonferroni correction for multiple comparisons. All statistical analysis was performed using SAS (version 9.2; SAS Institute, Inc., Cary, NC).

RESULTS

Demographic Information

A comparison of demographic, disease, and operative information between TURP patients, HoLEP/AP patients, and GL-PVP patients is shown in Table 1. Regarding demographic and disease information, characteristics were similar between the 3 surgery groups with the exception of preoperative PSA (P = .001), preoperative Q_{avg} (P = .041), and preoperative PVR (P = .004). The differences in preoperative PSA between the 3 surgery groups are expected due to the nature of the surgeries, as larger glands (80-100) were triaged to HoLEP; however, the differences in preoperative Q_{avg} and preoperative PVR may have some confounding potential when comparing outcomes according to type of surgery. To investigate this further, we evaluated the association between each of these 2 variables and the primary outcome of number of encounters within 30 days of discharge and observed no notable associations (P = .83 and P = .89, respectively, from the Spearman test of correlation). Therefore, these 2 variables are unlikely to have any confounding potential, and we did