It Is Safe to Teach Residents Laser Prostate Surgery in the Private Practice Setting

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OBJECTIVE To examine the effect of resident involvement on laser prostate surgery outcomes within a urology group in a private practice setting.

MATERIALS AND METHODS Patients with ≥6 months of follow-up data who had undergone holmium laser ablation of the prostate by a single surgeon (R.L.Y.) within a private urology group were included in the present study. The patients were divided into 2 groups, with resident involvement in 1 group and no resident involvement in 1 group. The preoperative, intraoperative, and postoperative parameters were reviewed. The outcomes variables included changes in the International Prostate Symptom Score, quality of life scores, postvoid residual urine volumes, and reoperation rates. Statistical analysis used a 2-tailed Student *t* test with a significance level of .05.

RESULTS Of 153 holmium laser ablations of the prostate, 79 (52%) met the inclusion criteria. Of the 79 cases, 42 (53%) involved a resident. No statistically significant differences were found among the 2 groups in preoperative patient characteristics, including age, Society of Anesthesiologists score, prostate-specific antigen level, postvoid residual urine volume, International Prostate Symptom Score, or quality of life. The operative times were significantly longer in the resident group (57 vs 46 minutes, $P = .05$). Postoperatively, no differences in the mean values were found in postvoid residual urine volume (56 vs 64 mL, $P = .73$), change in International Prostate Symptom Score (11.5 vs 9.7, $P = .44$), change in quality of life score (−2.1 vs −1.3, $P = .13$), or reoperation rate (5% vs 11%, $P = .19$).

CONCLUSION The operative times were longer in the resident group, reflecting the inherent time taken to teach the residents the procedure. The results from the present study suggest that it is feasible to safely teach residents new surgical technology such as holmium laser ablation of the prostate in a nonacademic private practice setting without adversely affecting surgical performance or outcomes. UROLOGY 81: 629–633, 2013. © 2013 Elsevier Inc.

Benign prostatic hyperplasia (BPH) represents a heavy burden for aging men. For example, by the seventh decade of life, BPH affects 3 of every 4 men in the form of bothersome lower urinary tract symptoms.[1] BPH is the most common urologic diagnosis for office visits among men aged 40-70 years, with an annual cost of $3.9 billion in the United States.[1,2] Furthermore, the morbidity associated with bladder outlet obstruction secondary to BPH can lead to other sequelae, such as urinary tract infection, acute urinary retention, hematuria, and kidney injury.

Despite the success of medical management for BPH, surgical approaches continue to be used extensively in its treatment. One study, citing Medicare data, showed that BPH procedures increased 44%, from 88,868 in 1999 to 127,786 in 2005.[3] Transurethral resection of the prostate (TURP) has been recognized as the reference standard of surgical treatment of BPH for decades; however, TURP has inherent problems. Patients who undergo TURP are generally hospitalized, at least overnight, and common complications include bleeding, which often requires prolonged continuous bladder irrigation. Furthermore, transurethral resection (TUR) syndrome due to the use of glycine during the procedure is a rare, but often serious, complication. The incidence of mild to moderate TUR syndrome has been estimated at 0.5%-8%, with a mortality rate of 0.2%-0.8%. However, the mortality rate of patients with severe TUR syndrome can be as great as 25%.[4]

In recent years, laser prostatectomy procedures have been increasingly used as minimally invasive alternatives to traditional TURP. For example, in 2005, TURP represented only 39% of all BPH procedures as the newer

Financial Disclosure: *Ronald L. Yap is a Consultant for Boston Scientific. The other author declares that he has no relevant financial interests.*

Funding Support: *This work was sponsored by the LeBaron Foundation and the Concord Hospital Trust.*

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Submitted: June 27, 2012, accepted (with revisions): September 28, 2012

0090-4295/12/$36.00

http://dx.doi.org/10.1016/j.urology.2012.09.059

less-invasive procedures became more mainstream.[3] The current data have shown that holmium laser ablation of the prostate (HoLAP) has outcomes similar to those after TURP and other ablative procedures, such as photoselective vaporization of the prostate, with long-term follow-up data showing durable results.[5-8] The procedure has a decreased risk of bleeding owing to the sealing action of the laser and the risk of TUR syndrome is negligible because HoLAP is performed using isotonic saline. Another notable advantage of HoLAP procedures is that they can be performed on an outpatient basis. Furthermore, holmium laser technology is widely available to most urologists, because it is commonly used in the treatment of urolithiasis.

As surgical technology has evolved, so too has the need to safely instruct residents in these cutting edge techniques. The surgical outcomes in teaching hospitals with residents have been well documented, showing longer operative times and a slight increase in morbidity but a decrease in mortality.[9,10] However, the effect of residents on the surgical outcomes in a private hospital has been poorly studied. We studied the effect of resident involvement on laser ablative prostatectomy in a private practice, ambulatory setting.

MATERIAL AND METHODS

The human investigation committee at Concord Hospital provided institutional review board approval for the present retrospective study. From January 2007 to December 2010, 153 consecutive patients underwent HoLAP by a single surgeon (R.L.Y.). Charts were reviewed for preoperative patient characteristics, intraoperative parameters, including resident participation data, and postoperative outcomes. Patients with prostate nodules or an elevated prostate-specific antigen level had negative prostate biopsy findings before HoLAP. Patients with < 6 months (< 180 days) of follow-up data or incomplete records or who had undergone any simultaneous procedures with HoLAP were excluded from the present study.

The preoperative evaluation included a complete medical history and physical examination, including digital rectal examination, urinalysis, ultrasound-determined postvoid residual urine (PVR) volume, cystoscopy, prostate-specific antigen level, International Prostate Symptom Score (IPSS), and quality of life (QOL) score. Patients were apprised of their medical and surgical options, including TURP. The decision to proceed with HoLAP was made with appropriate patient-informed consent. Adjunctive tests such as uroflow and transrectal ultrasonography were performed on a case by case basis and, as such, were not included in the present study. The American Society of Anesthesiologists score was assigned preoperatively by the anesthesiologist and recorded for each patient. A 100-W Lumenis holmium laser was used with a 550-μm side-firing laser fiber during the HoLAP procedure. The laser setting was 2.0 J, with a rate of 40-50 Hz. on completion of the procedure, a urethral catheter was placed and the bladder manually irrigated. After the surgeon deemed the color of the catheter drainage to be acceptable, the case was terminated and the catheter left in place for gravity drainage.

The residents who participated in the procedure were a part of the Dartmouth Hitchcock Medical Center Urology Residency Program. Each resident does a 3-month rotation at Concord Hospital to gain experience in a private practice setting. The residents were either in their first or third year of urology training. Resident participation was determined by their availability and not the difficulty of the case or their level of training. No resident who participated in these procedures had ever performed a HoLAP procedure before the start of their rotation at Concord Hospital. The degree of participation for each resident varied on a case by case basis and was determined by the discretion of the same attending surgeon (R.L.Y.) in all cases.

Patients were placed on an ambulatory discharge pathway with an indwelling urethral catheter in place once they had met all the discharge criteria. A voiding trial was performed on postoperative day 3, as previously reported by Jumper et al,[11] and any deviation from this pathway was documented between the 2 groups, including failed voiding trials and hospital admissions. The 6-month and annual follow-up data were reviewed, including PVR volumes and changes in the IPSS and QOL score. Statistical analysis was performed with Microsoft Excel (Microsoft, Redmond, WA) using a 2-tailed Student *t* test, with a significance level of .05.

Table 1. Average baseline patient characteristics

	Resident Group (n = 42)	No-resident Group (n = 37)	*P* Value
Age (y)	64.6 ± 9.3	65.1 ± 12.5	.14
PSA (ng/mL)	2.8 ± 2.9	2.6 ± 2.3	.27
Prostate volume (cm^3)	36.2 ± 17.6	34.1 ± 14.9	.59
Preoperative PVR (mL)	156.2 ± 274.1	169.3 ± 208	.95
Preoperative IPSS	20.7 ± 8.5	21.2 ± 8.1	.69
Preoperative QOL score	3.9 ± 1.6	4.1 ± 4.0	.52
ASA	2.3 ± 0.5	2.4 ± 0.5	.47
Average follow-up (d)	520.6 ± 285	574.3 ± 279.1	.4

ASA, American Society of Anesthesiologists; IPPS, International Prostate Symptom Score; PSA, prostate-specific antigen; PVR, postvoid residual (urine volume); QOL, quality of life.
Data presented as mean ± standard deviation.

RESULTS

Of the 153 total patients who underwent HoLAP, 79 (52%) met the inclusion criteria. Resident involvement occurred in 42 of the 79 cases (53%). A resident was not involved in 37 cases (47%). No statistically significant differences were found in the baseline characteristics between the 2 groups, including age, prostate-specific antigen level, PVR urine volume, preoperative IPSS and QOL score, prostate volume, and American Society of Anesthesiologists classification. The prostate volumes were estimated by the same surgeon in all cases from the digital rectal examination findings. The average follow-up period for the resident group and no-resident group was 520.6 and 574.3 days, respectively ($P = .40$; Table 1).

The intraoperative and postoperative data are presented in Table 2. The operative time between the 2 groups was significantly different, with the resident group having longer operative times than the no-resident group (57 vs 46 minutes, $P = .05$). No difference was