

Experience With More Than 1,000 Holmium Laser Prostate Enucleations for Benign Prostatic Hyperplasia

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Purpose: Holmium laser prostate enucleation is a contemporary treatment for benign prostatic hyperplasia. We report our experience with more than 1,000 procedures.

Materials and Methods: From June 1998 to March 2009 we performed 1,065 holmium laser prostate enucleations. After receiving institutional review board approval we retrospectively reviewed the database. Reported short-term, intermediate term and long-term results are 0 to 6, 6 to 12 and greater than 12 months, respectively.

Results: Bladder stones were present in 50 patients (4.7%) and 87 of the 717 (12.1%) with laboratory studies available had renal insufficiency. Preoperative urinary retention was present in 411 cases (38.7%). Significant preoperative stress and urge incontinence was noted in 8 and 16 patients, respectively. Mean transrectal ultrasound prostate volume was 99.3 gm (range 9 to 391). Mean preoperative American Urological Association symptom score was 20.3 (range 1 to 35) and maximum urinary flow was 8.4 cc per second (range 1.1 to 39.3). Intraoperative or postoperative complications occurred in 24 cases (2.3%). Mean followup was 287 days (range 6 to 3,571). At short-term, intermediate term and long-term followup the mean symptom score was 8.7, 5.9 and 5.3, and maximum urinary flow was 17.9, 19.5 and 22.7 cc per second, respectively. At the most recent followup 3 patients (0.3%) were in urinary retention. One patient with maximum urinary flow 20 cc per second required a second procedure for bleeding prostatic regrowth. Urethral stricture was noted in 9 (0.9%), 11 (1.3%), 4 (1.3%) and 0 patients, and bladder neck contracture was found in 0, 7 (0.8%), 4 (1.3%) and 5 (6.0%) at short-term, intermediate term, long-term and greater than 5-year followup, respectively. At the most recent followup significant stress and urge incontinence was noted in 9 and 6 patients, respectively.

Conclusions: Holmium laser prostate enucleation is safe and effective for benign prostatic hyperplasia. The complication rate is low, and incontinence and the need for ancillary procedures are rare for holmium laser prostate enucleation with durable long-term results.

Key Words: prostate, laser therapy, prostatic hyperplasia, prostatectomy, transurethral resection of prostate

HOLMIUM laser enucleation of the prostate has emerged as an effective transurethral treatment option in patients with symptomatic BPH of any size.¹ Several single center and multi-center series have documented HoLEP

efficacy and safety.¹⁻¹⁶ In the last 10 years this minimally invasive surgical technique has been the most rigorously studied of any BPH therapy with multiple randomized clinical trials comparing efficacy to

Abbreviations and Acronyms

AUA = American Urological Association
BPH = benign prostatic hyperplasia
HoLEP = holmium laser enucleation of the prostate
PSA = prostate specific antigen
Qmax = maximum urinary flow
TURP = transurethral prostate resection

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that of classic TURP^{4–8,16} and open simple prostatectomy.^{2,4,13} To date HoLEP is the only endourological procedure to provide superior relief of bladder outlet obstruction compared to TURP on urodynamic measures.⁷

There is evidence that of all the new technologies proposed for BPH HoLEP may be the most cost-effective. The multifunctional nature of the holmium laser, reusable fibers, low complication rate and short hospital stay make it a cost-effective treatment option. Only HoLEP has the potential to save more costs in the long term compared to TURP and the benefit is greatest if only 1 HoLEP procedure is necessary in a lifetime.¹⁷

Recent evidence suggests that 1 HoLEP procedure can produce long-term control of BPH symptoms. Elzayat and Elhilali reported their 4-year experience with HoLEP with a 4.2% re-treatment rate, and an association between re-treatment and the HoLEP learning curve.¹⁵ Gilling et al reported on 38 patients with 6-year followup studied urodynamically before and after HoLEP, noting durable long-term HoLEP results with less than a 2% re-treatment rate.⁹ We evaluated all patients treated with HoLEP at our institution, where the procedure has been done more than 10 years, to assess short-term and long-term benefits of the procedure.

MATERIALS AND METHODS

After receiving institutional review board approval we retrospectively reviewed our prospectively collected HoLEP database. The database, initiated with the first HoLEP performed at our institution in 1998, contains all patients who consented to the use of their medical records for research purposes. We identified 1,065 consecutive patients who underwent HoLEP between June 1998 and March 2009 at our hospital.

The AUA symptom index, BPH index score and urine flow rate were not documented before surgery in patients in urinary retention, defined as an indwelling urinary catheter or intermittent catheterization for bladder drainage. Although HoLEP can be done successfully in anticoagulated cases,¹⁴ it is our practice to discontinue all anticoagulants other than low dose aspirin. Of all HoLEP procedures 850 (80%) were done by 1 surgeon (JEL), as previously described.¹⁸ The remainder were done by a total of 7 surgeons. Equipment used for enucleation included a 100 W holmium:YAG laser with a 550 μ end fire laser fiber, a 28Fr continuous flow resectoscope with a laser bridge housing a 7Fr stabilizing catheter and normal saline irrigant. The enucleated adenoma was removed from the bladder using a rigid offset 27Fr nephroscope with a 5 mm working channel placed through the laser resectoscope sheath and a tissue morcellator. Enucleated prostate tissue weight was provided by the pathologist and recorded in gm.

Typically the urethral catheter was removed early on postoperative day 1 and the patient was discharged home

within 24 hours of the procedure. In certain patients the procedure was done on an outpatient basis and they were discharged home the same day. Pain medication was not administered unless a concurrent procedure was done.

Postoperative results are reported as short-term (0 to 6 months after the surgery date), intermediate term (6 to 12 months), long-term (greater than 12 months to 5 years) and greater than 5-year results. Renal insufficiency was defined as serum creatinine 1.6 mg/dl or greater. Significant urinary incontinence was considered a patient self-report of stress or urge incontinence all or most of the time.

RESULTS

Table 1 lists patient information. Mean age at HoLEP was 75 years (range 40 to 95). Prior BPH procedures were done in 97 patients (9.1%), of whom 11 underwent 2 prior surgeries each (total 108). Significant incontinence was noted preoperatively in 24 patients (2.3%), including 8 (0.8%) with stress and 16 (1.5%) with urge incontinence. Preoperatively urinary retention was present in 411 cases (38.7%). Mean preoperative AUA symptom score was 20.3 (range 1 to 35), mean BPH Index score was 7.2 (range 0 to 30) and mean Qmax was 8.4 cc per second (range 1.1 to 39). Known preoperative prostate cancer was present in 36 patients (3.4%). Mean American Society of Anesthesiologists score in the entire cohort was 2.5 (range 1 to 4).

Intraoperatively perineal urethrostomy was required in 4 patients (0.4%) in whom the resectoscope was not long enough to reach the bladder and it was

Table 1. Preoperative, intraoperative and postoperative demographics in 1,065 patients who underwent HoLEP for BPH

Mean mg/dl preop PSA (range)	7.2 (0.47–26.8)
No. prior prostate procedure (%):	108
TURP	39 (36.1)
Transurethral microwave therapy	39 (36.1)
KTP or holmium ablation	21 (19.4)
Transurethral needle ablation	7 (6.5)
Indigo laser ablation	2 (1.9)
No. bladder calculus (%)	50 (4.7)
No. renal insufficiency (%)	87 (12.1)
No. concurrent procedure (%):	31 (2.9)
Transurethral resection/bladder tumor fulguration	10 (32)
Ureteroscopy	6 (19)
Scrotal procedure	4 (13)
Circumcision	2 (6)
Percutaneous nephrolithotomy	2 (6)
da Vinci® bladder diverticulectomy	1 (3)
Urethral stricture dilation	1 (3)
Leg hematoma evacuation	1 (3)
Shock wave lithotripsy	1 (3)
Mean gm specimen wt (range)	76 (0.4–532.2)
Mean hrs catheterization (range)	19.1 (1–310)
Mean hrs hospitalization (range)	32 (2–600)

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