

# Learning curves and perioperative outcomes after endoscopic enucleation of the prostate: a comparison between GreenLight 532-nm and holmium lasers

Peyronnet B, et al. World J Urol. 2017 Jun;35(6):973-983.

## Background

Transurethral resection of the prostate (TURP) or open prostatectomy (OP) are standard surgical options for the management of lower urinary tract symptoms (LUTS) resulting from benign prostatic obstruction (BPO).

Photovaporisation of the prostate (PVP) is another surgical alternative that has shown comparable short-term functional outcomes to TURP, but reports suggest that outcomes are not as favourable for patients with larger prostates, plus limited tissue is available for pathological analyses post-procedure.

There is now increasing interest in the technique of enucleation of the prostate using a holmium laser (HoLEP), which has been shown in clinical studies to be associated with similar long-term outcomes and reoperation rates but lower rates of morbidity than TURP or OP. The technique of enucleation may also overcome some of the limitations of PVP.

The efficacy and safety of HoLEP have been confirmed in randomised, clinical trials but the technique is complex and associated with a steep learning curve. An alternative technique, green laser enucleation of the prostate (GreenLEP), using the GreenLight™ laser system normally used for PVP, has shown favourable outcomes and may offer another surgical alternative.

**This study compared the learning curves and perioperative and early functional outcomes of GreenLEP (using the GreenLight XPS laser system) and HoLEP for enucleation of the prostate.**

## Patients and study methods

- A retrospective analysis of prospectively collected data from 100 consecutive patients at each of two centres who underwent either GreenLEP or HoLEP surgery for BPO between June 2012 and November 2014

## Surgical procedures

### A single surgeon at one centre undertook the HoLEP procedures:

- Lumenis 100-W laser generator with a 550-µ reusable laser fibre used for all procedures
- Two-lobe enucleation

### A second single surgeon at another centre undertook the GreenLEP procedures:

- A GreenLight XPS 532-nm laser generator with HPS 120-W laser fibres. used for all procedures
- 'En bloc' enucleation

## Assessments

### Preoperative assessments:

- American Society of Anesthesiology (ASA) score
- Serum prostate-specific antigen (PSA)
- Prostate volume
- International Prostate Symptom Score (IPSS)
- IPSS quality of life (QoL) score
- Maximum flow rate (Qmax)
- Post-void residual (PVR) volume
- International Index of Erectile Function (IIEF-5)

### Perioperative parameters:

- Operative time, operative speed, total energy delivered, energy/mL prostate
- Complications within 1.5 months, assessed using the Clavien–Dindo classification

### Postoperative functional outcomes:

- Assessed at 1.5, 3 and 6 months



**Both GreenLEP and HoLEP procedures provided similar short-term functional outcomes but the findings suggested a tendency towards a shorter learning curve for GreenLEP.**

## Results

### PERIOPERATIVE PARAMETERS

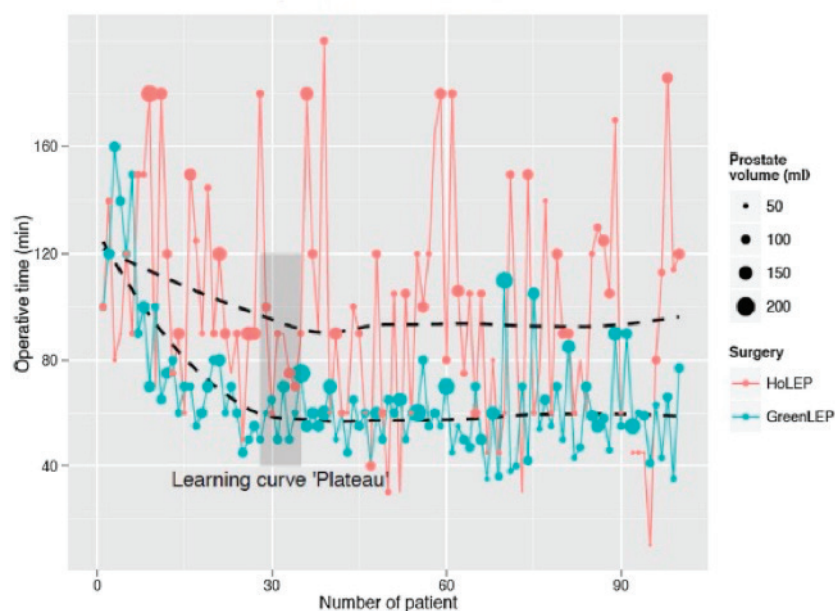
Parameter	HoLEP (n=100)	GreenLEP (n=60)	p-value
Total energy (KJ)	110 (75; 180)	58 (45; 85)	<0.0001
Intraoperative time (min)	90 (60; 120)	60 (55; 70)	<0.0001
Early post-op complications	25%	19%	0.13

Values are n (%) or median and [1st; 3rd quartile range]

### FUNCTIONAL OUTCOMES

- Broadly similar between groups
- Greater increase of Qmax at 3 months and a greater IPSS decrease at 1 month for GreenLEP
- Greater decreases in IPSS and QoL scores at 6 months for HoLEP
- Transient stress urinary incontinence comparable between groups

### Learning curves: comparison of operative times for GreenLEP and HoLEP



#### Operative time

- Reached a plateau after 30 procedures for each technique

#### Learning curves

- 14–30 cases for GreenLEP
- 22–40 cases for HoLEP

## Conclusions

- This study is the first to compare GreenLEP and HoLEP enucleation techniques for the treatment of patients with BPO.
- The two techniques were found to result in comparable perioperative and short-term functional outcomes.
- However, some differences were noted between the two techniques, including the finding that GreenLEP was associated with a tendency towards a shorter learning curve compared with HoLEP.

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