

Publication Summary



The Efficacy and Safety of Laser and Electrosurgical Transurethral Procedures for the Treatment of BPO in High-Risk patients: A Systematic Review

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Disclosures

Glyn Burt, Emily Woodward and Paul Zantek are employed by Boston Scientific. Cassandra Springate and Alison Martin are employed by Crystallise Ltd, who received funding from Boston Scientific to conduct the research. Feras Al Jaafari has worked as a consultant for Boston Scientific. Gordon Muir has worked as a consultant for Boston Scientific, PROCEPT and Olympus GMBH. Vincent Misrai has worked as a consultant for Boston Scientific. The authors report no other conflicts of interest in this work.

BACKGROUND



- Laser energy has potential haemostatic advantages over electrosurgical resection and may help prevent bleeding-related adverse events¹
- There is a lack of Level 1 evidence for the safety of laser technologies for benign prostatic obstruction (BPO) treatment in high-risk populations, however high-risk patients have been studied in numerous cohort studies

This systematic literature review aimed to identify observational and comparative studies of Greenlight (120 W and 180 W), Holmium and Thulium laser therapies, and other enucleation and vaporisation therapies *versus* standard electrosurgical transurethral resection of the prostate (TURP) in high-risk patients with BPO and determine any safety or efficacy differences.

METHODS

This review included studies in patients who underwent BPO surgery and were considered high-risk for standard TURP, with high-risk defined as (each criterium is and/or):



Aged >80 years



Large prostate (≥80 mL)



Increased bleeding risk



History of urinary retention or current in-dwelling catheter



Significant comorbidity

Technologies

- GreenLight (120 W and 180 W), Holmium and Thulium laser therapy, and other enucleation and vaporisation therapies versus standard electrosurgical TURP

Key outcomes assessed



Efficacy: International Prostate Symptom Score (IPSS), maximum urine flow rate (Q_{max}), post-void residual volume of urine (PVR)



Safety: Blood transfusion, clot retention, bleeding

RESULTS



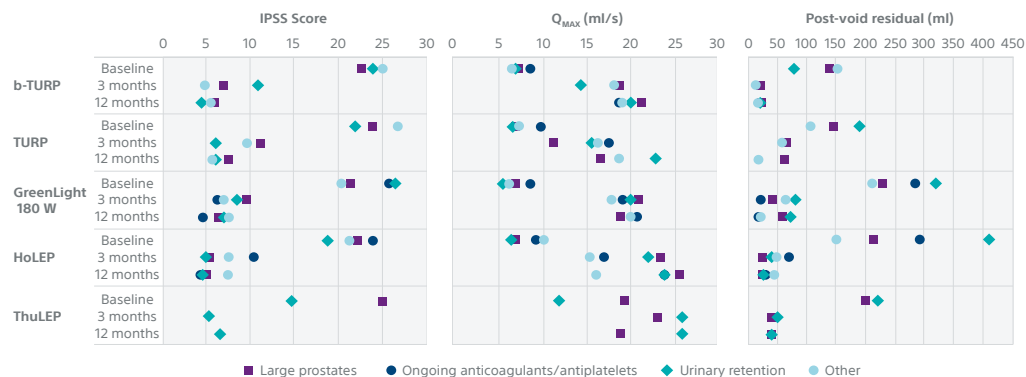
268 studies*



31,862 patients

Efficacy as measured by Q_{MAX} improvement and IPSS and PVR reduction was similar across all interventions

Figure 1: Efficacy outcomes at baseline, 3 months and 12 months follow-up (weighted average values per high-risk groups)

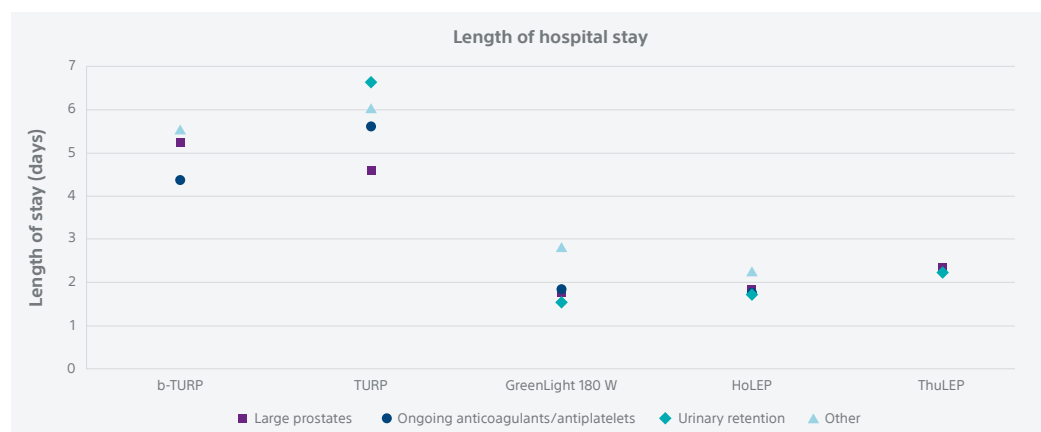


bTURP, bipolar transurethral resection of the prostate; HoLEP; Holmium laser enucleation of the prostate; IPSS; International prostate symptom score; Q_{max} ; maximum flow rate; ThuLEP, Thulium laser enucleation of the prostate; TURP; transurethral resection of the prostate

Laser treatments were associated with shorter hospital stays than TURP

➤ GreenLight, HoLEP and Thulium Laser treatments are associated with shorter hospital stays than mTURP and bTURP in high-risk groups, including patients with large glands and patients taking anticoagulants and antiplatelet drugs.

Figure 2. Weighted average length of hospital stay after BPO surgery by risk group



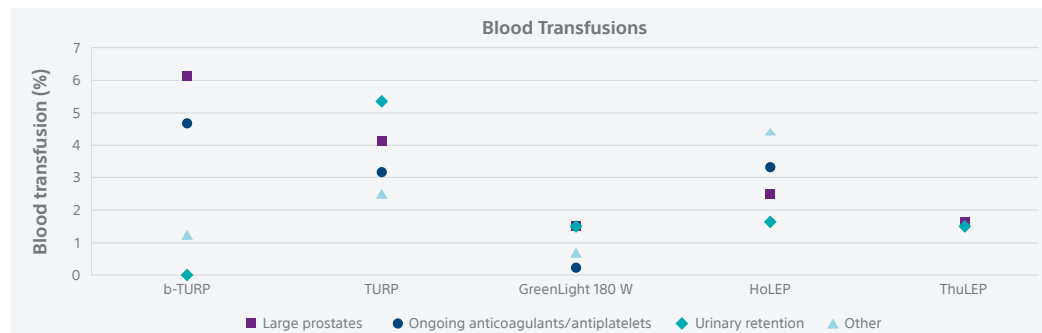
bTURP, bipolar transurethral resection of the prostate; HoLEP; Holmium laser enucleation of the prostate; ThuLEP, Thulium laser enucleation of the prostate; TURP; transurethral resection of the prostate

*After deduplication, the searches identified 5,980 records, of which 268 studies had relevant data for the selected interventions and outcomes for this publication, from a total of 31,862 patients.

Bleeding complications overall were less common with laser techniques than with TURP

- Weighted mean clot retention rates were lowest with GreenLight lasers (vs. other interventions): <2% with GreenLight 120 W, <3% with GreenLight 180 W, >3% with HoLEP and Thulium lasers, and >6% with bTURP or mTURP.

Figure 3: Post-surgical need for blood transfusion in certain high-risk groups



bTURP, bipolar transurethral resection of the prostate; GL; GreenLight; HoLEP; Holmium laser enucleation of the prostate; mTURP, monopolar transurethral resection of the prostate; ThuLEP, Thulium laser enucleation of the prostate; TURP; transurethral resection of the prostate

- Reintervention rates for clot retention and haematuria were not well reported across studies. Haematuria, clot retention and reinterventions for bleeding were most common after mTURP.

LIMITATIONS

This systematic review has a number of limitations including:

- No universally agreed definition of 'high-risk', with different cut-off values for high-risk criteria
- Measures of complications, in particular bleeding events, are varied and poorly defined
- Incomplete and inconsistent reporting of peri- and postoperative outcomes

CONCLUSION

- Laser therapies are effective, well-tolerated treatment options for high-risk patients with BPO compared with monopolar or bipolar TURP.
- Given the advantageous safety profile of laser treatments, patients with an elevated risk of bleeding should be offered laser surgery preferentially to mono- or bipolar TURP.

REFERENCE

1. Hoffman RM, MacDonal R, Wilt T. Laser prostatectomy for benign prostatic obstruction. *Cochrane Database Syst Rev*. 2004; **2000**:CD001987.

Author Contributions

Glyn Burtt and Emily Woodward were responsible for the conception of the literature review. Alison Martin and Cassandra Springate contributed to the study design, execution, data acquisition and synthesis, and drafting of the manuscript. Paul Zantek contributed to the interpretation of the data. Feras Al Jaafari, Gordon Muir, and Vincent Misrai contributed to the interpretation of the data and the writing of the manuscript. All authors made substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data; took part in drafting the article or revising it critically for important intellectual content; agreed to submit to the current journal; gave final approval for the version to be published; and agreed to be accountable for all aspects of the work.

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