



PROSTATIC DISORDERS  
REVIEW

# Holmium laser enucleation versus simple prostatectomy for treating large prostates: Results of a systematic review and meta-analysis



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## KEYWORDS

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Holmium;  
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## ABBREVIATIONS

OP, open prostatectomy;  
HoLEP, holmium enucleation of the prostate;

**Abstract Objective:** To compare and evaluate the safety and efficacy of holmium laser enucleation of the prostate (HoLEP) and simple prostatectomy for large prostate burdens, as discussion and debate continue about the optimal surgical intervention for this common pathology.

**Materials and methods:** A systematic search was conducted for studies comparing HoLEP with simple prostatectomy [open (OP), robot-assisted, laparoscopic] using a sensitive strategy and in accordance with Cochrane collaboration guidelines. Primary parameters of interest were objective measurements including maximum urinary flow rate ( $Q_{max}$ ) and post-void residual urine volume (PVR), and subjective outcomes including International Prostate Symptom Score (IPSS) and quality of life (QoL). Secondary outcomes of interest included volume of tissue retrieved, catheterisation time, hospital stay, blood loss and serum sodium decrease. Data on baseline characteristics and complications were also collected. Where possible, comparable data were combined and meta-analysis was conducted.

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LASP, laparoscopic simple prostatectomy; MeSH, Medical Subject heading;  $Q_{\max}$ , maximum urinary flow rate; PVR, post-void residual urine volume; QoL, quality of life; RASP, robot-assisted simple prostatectomy; RCT, randomised controlled trial; WMD, weighted mean difference

**Results:** In all, 310 articles were identified and after screening abstracts (114) and full manuscripts (14), three randomised studies (263 patients) were included, which met our pre-defined inclusion criteria. All these compared HoLEP with OP. The mean transrectal ultrasonography (TRUS) volume was 113.9 mL in the HoLEP group and 119.4 mL in the OP group. There was no statistically significant difference in  $Q_{\max}$ , PVR, IPSS and QoL at 12 and 24 months between the two interventions. OP was associated with a significantly shorter operative time ( $P = 0.01$ ) and greater tissue retrieved ( $P < 0.001$ ). However, with HoLEP there was significantly less blood loss ( $P < 0.001$ ), patients had a shorter hospital stay ( $P = 0.03$ ), and were catheterised for significantly fewer hours ( $P = 0.01$ ). There were no significant differences in the total number of complications recorded amongst HoLEP and OP ( $P = 0.80$ ).

**Conclusion:** The results of the meta-analysis have shown that HoLEP and OP possess similar overall efficacy profiles for both objective and subjective disease status outcome measures. This review shows these improvements persist to at least the 24 month follow-up point. Further randomised studies are warranted to fully determine the optimal surgical intervention for large prostate burdens.

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## Introduction

BPH is a condition, which affects  $\approx 28\%$  of men aged  $> 70$  years [1]. The progressive nature of this disease has been confirmed by landmark studies, such as the Olmstedt County Study [2] and Baltimore Longitudinal Study of Aging [3]. The search for the optimal surgical treatment for large prostate burdens ( $> 80$  mL) is unremitting and remains the subject of continued conjecture and debate [4]. Before the advent of endoscopic approaches, simple open prostatectomy (OP) surgery was the prerogative and still is the only option in certain developing countries [5]. Despite a decline in the number of open procedures carried out each year in western countries, it remains a core component of the urologist's therapeutic arsenal [6].

Holmium laser enucleation of the prostate (HoLEP) is an efficient, laser-based, transurethral alternative, which is both minimally invasive and has been cited as 'size independent' [7]. Its application has achieved diffusion across centres worldwide with 10-year outcome data now available. While there has been increased attention towards the efficacy of HoLEP vs its endourological alternatives such as TURP and photo-selective vapourisation of the prostate, formal evaluation of HoLEP compared with simple prostatectomy [OP, laparoscopic simple prostatectomy (LASP), and robot-assisted simple prostatectomy (RASP)] remains under reported.

The objective of the present study was to systematically review the evidence and compare the efficacy and safety between HoLEP and simple prostatectomy.

## Materials and methods

A systematic search was conducted according to Cochrane Collaboration guidelines and the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) checklist [8]. The search strategy was devised to retrieve studies from electronic databases including Medline, Web of Science, Embase, and the Cochrane Central Register of Registered Trials (CENTRAL), and Scopus. The search was performed on 24 May 2015.

Specific search terms included, but were not limited to: 'holmium', 'enucleation', 'laser surgery', 'open prostatectomy', 'laparoscopy', 'minimally invasive', 'robotic', 'benign prostate hyperplasia', and 'lower urinary tract symptoms'. Medical Subject heading (MeSH) phrases included: 'prostatectomy' [MeSH], 'laser therapy' [MeSH], 'laparoscopy' [MeSH], 'robotic surgical procedures' [MeSH], 'prostatic hyperplasia' [MeSH]. Phrases were combined using Boolean operators ('AND', 'OR') to augment the search. References from suitable studies were also hand searched.

### Data extraction and analysis

The pre-defined inclusion criteria were for randomised controlled trials (RCTs) comparing HoLEP with any form of simple prostatectomy. The list of potentially relevant studies generated by the search was reviewed by two of the authors independently (P.J. and O.A.). The extraction of data from selected studies was performed in the same manner.

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