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## Surgery in Motion

# Holmium Laser Enucleation of the Prostate: Results at 6 Years

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## Abstract

**Objectives:** The issue of durability is an important concern when evaluating new surgical modalities. To date, only 24-mo data have been published on holmium enucleation of the prostate (HoLEP) despite its widespread use worldwide although 4-yr data exist for the earlier technique of holmium resection. This study addresses the issue of durability of HoLEP.

**Methods:** All patients who had undergone HoLEP and been evaluated in three prospective trials conducted at this institution between 1997 and 2002 were evaluated. Patients available at follow-up had data assessed on the International Prostate Symptom Score (IPSS), maximal flow rate ( $Q_{\max}$ ), quality of life (QOL), International Continence Society Male Short Form (ICS-SF), International Index of Erectile Function (IIEF), Benign Prostatic Hyperplasia Impact Index (BPHII), and continence questionnaire.

**Results:** The mean follow-up was 6.1 yr (range: 4.1–8.1 yr). The mean age of the patients at follow-up was 75.7 yr (range: 58–88 yr). Of 71 HoLEP patients originally studied on the protocol, 38 (54%) were available for analysis, 14 were deceased, and 19 were lost to follow-up. The mean IPSS for this group was 8.5 (range: 0–24) and  $Q_{\max}$  19 ml/s (range: 6–28 ml/s). The QOL score was 1.8 (range: 0–5) and the BPHII 2.0 (range: 0–11). One patient (1.4%) had undergone reoperation, an additional HoLEP. Overall, 92% were either satisfied or extremely satisfied with their outcome.

**Conclusions:** HoLEP is durable and most patients remain satisfied or extremely satisfied with the long-term outcome.

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## 1. Introduction

Many minimally invasive procedures, including laser techniques, for the treatment of bladder outflow obstruction due to benign prostatic hyperplasia (BPH) have come and gone over the last 15 yr [1–4]. One of the main issues exposed with years of use of some of these techniques is the failure of the treatment over time and the need for retreatment. Other issues leading to the demise of these procedures include significant patient dissatisfaction with the early results (eg, irritative symptoms or prolonged catheterization), inefficiency of the primary treatment, reimbursement issues, and lack of ongoing support and marketing from the device manufacturer. Commercial issues notwithstanding, durability concerns often become the most important determinant of the ultimate survival of a given technique for the practising urologist.

Holmium laser prostatectomy has been around in various forms since 1994 [5]. In the quest for increasing efficiency and in the pursuit of improved outcomes, the procedure has evolved from a combination procedure (with neodymium:yttrium-aluminum-garnet [Nd:YAG]), to an ablative procedure [6], to excisional techniques involving resection of small fragments [7], and most recently, anatomic enucleation of whole lobes [8]. Holmium laser enucleation of the prostate (HoLEP) has been performed since 1996 [9] and has been adopted in many centers throughout the world [10–13]. Despite numerous single and multicenter studies documenting its efficacy and safety, the durability of HoLEP has not been properly studied.

This analysis of a cohort of closely scrutinized patients from a combination of three prospective studies serves to document the medium- to long-term outcome of this procedure.

## 2. Methods

The patients and data out to 12 mo from the HoLEP arms from three published randomized trials [14–16] were pooled to form the study population. The inclusion and exclusion criteria were similar for all patients apart from variable prostatic volume depending on the study: peak urinary flow rate measurement ( $Q_{\max}$ ) <15 ml/s, International Prostate Symptom Score (IPSS) of  $\geq 8$ , postvoid residual (PVR) <400 ml, and Schaffer grade of  $\geq 2$  on video urodynamics. Catheterized patients and those with previous prostatic or urethral surgery were excluded. All patients had an IPSS, single-question quality-of-life (QOL) score and  $Q_{\max}$  measurement at all time points. Pressure–flow studies, residual volume estimates, and transrectal ultrasound (TRUS) measurements were performed at baseline and at 6 mo.

Attempts were then made to contact all these patients initially from the study database information, the national



**Fig. 1 – A modified inner sheath (Storz) is used, which contains a metal insert to stabilize the laser fiber.**

hospital database, or telephone book as a last resort. The case notes of patients who were deceased or were not contactable were screened to determine if any further urologic procedures had been performed.

All available patients at follow-up were interviewed and had an IPSS and QOL score,  $Q_{\max}$ , BPHII, continence assessment (including an International Continence Society Male Short Form [ICS-SF] questionnaire), International Index of Erectile Function (IIEF), and a general assessment including overall satisfaction.

### 2.1. Procedure

A dedicated inner sheath incorporating a laser guide is used (Fig. 1) in the majority of cases (Storz 27040 XAL) in conjunction with a standard telescope bridge, 30° telescope, and 26F continuous flow resectoscope sheath. Alternatively, a dedicated combined bridge and inner sheath may be used (Olympus A21500A). A 550- $\mu$ m laser fiber is passed through a 6F ureteric catheter for further stability and secured by a Luer lock device. This is connected to a 100-W holmium



**Fig. 2 – The mechanical morcellator uses reciprocating blades, an ergonomic hand piece, and a two-stage foot pedal attached to a controller box that contains a high-powered suction pump.**

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