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Original article

Laser enucleation of the prostate: Overview of our results after the first 18 months of acquisition

Y. Kharbach [a,b,*], S. Tenkorang [b], T. Gateau [a], M.H. Farih [b], F. Junès [a]

[a] *Urology Department, Robert Boulin Hospital, Libourne 33500, France*
[b] *Urology Department, Hassan II Teaching Hospital, Fez 30000, Morocco*

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Abstract
Introduction: New techniques using laser are now available as an alternative to conventional techniques in the treatment of benign prostatic hyperplasia (BPH). Holmium laser enucleation of the prostate (HoLEP) reproduces via endoscopy have shown results similar to that of open prostatectomy.
Objective: To give an overview of the use of HoLEP in Robert Boulin hospital (Libourne, FRANCE) and to study its feasibility even in a center that has no prior experience in this technique.
Patients and methods: This is a retrospective descriptive study from November 2013 to April 2015 of all patients who underwent HoLEP by two urologists with no prior experience of this technique.
Results: In total, 138 patients underwent HoLEP with mean age of 74.59 ± 9.96 (56–90) years and a median of 75 years. The mean preoperative prostate volume was 59.61 ± 18.86 (30–180) ml. The average operative time was 103.03 ± 31.07 (50–150) min. The resected weight was 55.75 ± 19.04 g with a delivered energy of 186.3 ± 52.4 kJ. The duration for keeping urethral catheters and hospitalization were 1.1 (1–2) and 1.4 (1–4) days. Eighteen patients experienced at least one perioperative complication of which four were converted to TURP and two required bladder clot evacuation.
Twenty patients had postoperative complications including of which eleven required urethral catheter reinsertion. There was a significant improvement in IPSS and Q_{max} at the 3rd month postoperative review.
Conclusion: HoLEP is a promising technique that has proven to be safe and reproducible. Through the analysis of our results we have shown the presence of a learning curve and predictive values of some clinical features to optimize patients care.

* Corresponding author at: Urology Department, Hassan II Teaching Hospital, Route Sidi Harazem, 30000 Fez, Morocco.
E-mail addresses: youssef.kharbach@outlook.com (Y. Kharbach), snrsomuahtenkorang@gmail.com (S. Tenkorang), tristan.gateau@ch-libourne.fr (T. Gateau), mhfarih@hotmail.fr (M.H. Farih), francois.junes@ch-libourne.fr (F. Junès).
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Introduction

Benign prostatic hyperplasia (BPH) is a real health problem for men as they gradually advance in age [1]. At age 80, approximately 50% of men have low urinary tract disorders that alter their quality of life [2].

Today new techniques using laser such as (HoLEP) are available as an alternative to conventional methods of treatment of BPH and can reproduce results via endoscopie identical to open prostatectomy. This new technique is the most studied of all the therapeutic options for BPH [3].

Objective

To give an overview of the use of HoLep in Robert Boulin hospital (Libourne) and to study its feasibility in a center that has no prior experience in this technique.

Patients and methods

This is a descriptive and analytical retrospective study of all patients who underwent holmium laser enucleation of the prostate (HoLEP) by two urologists with no previous experience in this technique from November 2013 to April 2015.

All patients underwent a careful history, a complete physical examination including DRE with an assessment of symptoms using the IPSS score, a urine flow test and an assessment of post void residual urine.

We used a holmium: YAG laser with 100 W 550 µ fiber in a 28ch resectoscope. The enucleated adenoma was removed from the bladder through a rigid nephroscope allowing morcellation.

Clavien-Dindo classification was used to determine complications.

Results

Demographic and preoperative data

In total, 138 patients underwent HoLEP with mean age of 74.59 ± 9.96 (56–90) years and a median of 75 years. Diabetes and heart disease were the most frequent comorbidities. The mean preoperative prostate volume was 59.61 ± 18.86 (30–180) ml. The maximum flow rate (Q_{max}) was 9.50 ml/s. The most common indication for surgery was medical treatment failure (Table 1).

Intraoperative data

The average operative time was 103.03 ± 31.07 (50–150) min. The resected weight was 55.75 ± 19.04 g with a delivered energy of 186.3 ± 52.4 kJ. The duration for urethral catheterization and hospitalization were 1.1 (1–2) and 1.4 (1–4) days. Eighteen patients experienced at least one perioperative complication if which four were converted to TURP (Table 2).

Postoperative data

Twenty patients had postoperative complications including eleven requiring urethral catheter reinsertion (Table 3).

Table 1 Demographics and preoperative.

Age	74.59 ± 9.96
Comorbidities	
HBP	30
Ischemic or valvular heart disease	28
Diabetes	36
Chronic renal failure	8
Bronchopulmonary pathology	12
Rheumatic disease	16
Prostate volume (ml)	59.61 ± 18.86
Q_{max}	9.50 ± 5.88
IPSS	22.64 ± 6.42
Surgical indication	
Recurrent acute urinary retention	40 (28.9%)
Medical treatment failure	56 (40.5%)
Bladder calculi	15 (10.8%)
Recurrent urinary tract infections	10 (7.2%)
Renal failure	5 (3.6%)
Patient request	12 (8.7%)

Table 2 Perioperative data.

Operating time (minutes)	103.03 ± 31.07
Energy used (kJ)	186.3 ± 52.4
Resected prostate volume (g)	55.75 ± 19.04
Perioperative Complications	
Perforation of the capsule	12
Conversion to RTUP	4
Bladder mucosa injury	6
Transfusion	2

Table 3 Post operative data.

Duration of post operative urethral catheter (days)	1.1
Duration of hospitalization (days)	1.4
Immediate post operative complications (<30 days)	
Prolonged hematuria	6
Urinary retention	10
Urinary infection	2
Intravesical hematoma	5

Table 4 Evolution of IPSS and Q_{max}.

Parameter	Preoperative	3rd month post operative	*P*
IPSS	22.64	4.65	0.01
Q_{max}	9.5	24.78	0.005

Only 3 patients kept an indwelling catheter for 48 additional hours after surgery. Clinical review at the 3rd month showed significant improvement in IPSS and Q_{max} (Table 4).

Discussion

Trans urethral resection of the prostate and open prostatectomy have been considered the treatment of choice for symptomatic benign prostate hyperplasia for many decades [4]. Despite the good treatment results, there is a significant risk of complications for both techniques, thus explaining the unceasing efforts in researching alternative therapeutic options such as laser therapy methods [5].

It is clear that Holmium laser treatments can be considered very expensive but this is counterbalanced by its multifunctional nature

(it can be used for the treatment of stones, for example), its reusable fiber, its low rate of complications and the short length of hospitalization [3].

HoLEP has been a subject of several comparative studies after its first description by Gilling et al. [6] these studies have shown satisfactory results which is significantly better than other techniques with less morbidity in certain cases [7]. Though studies on open prostatectomy have shown better operating time and prostate volume removed, HoLEP causes lesser time for post operative urethral catheterization, short period of hospitalization and lesser bleeding complications [8].

We report our experience with this technique in our department as the acquisition of this equipment required a significant investment.

HoLEP is the only endoscopic technique till date, which has demonstrated its superiority over trans urethral prostatic resection [9]. However, it requires longer learning curve; an average of 15 interventions would be required for the acquisition of confidence by the surgeon [5,10] who can produce similar results as compared to experts in this technique after 50 interventions [5,11,12].

The operating time is significantly longer as compared to TURP, it is mainly influenced and directly related to the size of the prostate [13]. Several studies have suggested better efficiency of HoLEP with larger prostates [13–15], but by comparing the rate of tissue retrieval rates (grams per minute) we noticed that there was no significant difference 0.52 g/min vs. 0.57 g/min) [9].

The mean duration for postoperative hospitalization and urethral catheterization are respectively 1.1 and 1.4d. We find the same periods in international publications [3,12]. This demonstrates the superiority of the HoLEP over open surgery in postoperative morbidity [16].

Potential intraoperative complications are capsular perforation and lesions of the bladder mucosa [9,17]. Studies have shown that HoLEP has a lesser rate of post operative complications to that of TURP [7], no TURP syndrome has been described even with greater prostatic volumes [7,9].

In our study, systematic follow up conducted at 3 months after surgery showed a significant improvement in IPSS and Q_{max}. A meta analysis that compared the functional outcomes of minimally invasive TURP techniques showed that HoLEP was the only technique that has proven superior in improving IPSS [9].

Elzayat et al. [18] investigated the usefulness of this technique in patients on anticoagulants. This study found HoLEP to be a safe alternative as the laser coagulates and enucleates at the same time.

Currently there is no limitation on prostate volume in using HoLEP; it can be used on any prostate gland size [9,19,20], and therefore this procedure may possibly replace open prostatectomy. Published cases of operated patients with 800 g of adenomas could confirm this hypothesis [7,21].

Conclusion

HoLEP is a promising technique that has proven to be safe and reproducible. We have demonstrated through the analysis of our results its feasibility even in a center that has no prior experience in this technique as these results are significantly acceptable. It is a technique that is rapidly gaining ground and which is becoming the gold standard for the treatment of benign prostatic hyperplasia.

Conflict of interests

The authors declare that they have no competing interests.

Authors' contributions

YK was the principal author and major contributor in writing the manuscript. ST and TG analyzed and interpreted the patient data and reviewed the literature. FJ and MHF read and corrected the manuscript. All authors read and approved the final manuscript.

Ethical Committee Approval

The Ethics Committee of the Robert Boulin Hospital approved the completion of our study.

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Consent

All patients gave written consent to work after detailed explanation of the study.

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