

EFFICACY OF HOLMIUM LASER ENUCLEATION OF PROSTATE ACCORDING TO PREOPERATIVE PATIENTS' CHARACTERISTICS: PROSTATE SIZE, BLADDER OUTLET OBSTRUCTION, DETRUSOR OVERACTIVITY AND DETRUSOR CONTRACTILITY

Hypothesis / aims of study

Holmium Laser Enucleation of the Prostate (HoLEP) has been one of the standard therapy for surgical relief of benign prostatic obstruction (BPO). But, there have been few reports investigating predictors for success of HoLEP. Therefore, we evaluate the efficacy of HoLEP according to prostate size, bladder outlet obstruction (BOO), detrusor overactivity (DO), detrusor contractility and evaluate the factors influencing to success of HoLEP.

Study design, materials and methods

Patients that underwent HoLEP from 2009 to 2013 and completed a postoperative follow up at least 6 months were included. Of these, patients with underlying neurologic disorders, other urologic disease such as urinary calculi, urethral stricture, and prostate cancer were excluded. Finally, medical records of 174 patients were reviewed. Preoperative evaluation included PSA, prostatic size by transrectal ultrasonography, urodynamic study, and International Prostate Symptom Score (IPSS)/QoL. At postoperative 6 months, surgical outcome was evaluated with

IPSS/QoL, maximum flow rate (Qmax) and post void residual urine (PVR).

Based from estimation criteria suggested by Homma (table 1), treatment was considered successful if median value of efficacy score demonstrates more than 2. Patients were analyzed by prostate size (< 40ml, 40-80 ml, ≥ 80ml), BOOI (< 40, ≥ 40) DO (present or not), and BCI (< 100, ≥ 100). And then multiple logistic regression analysis was used to find the predictors of success of HoLEP. Age, PSA, IPSS, QoL, Qmax, PVR, prostate size, BOOI, BCI, PdetQmax and DO were included as predictors of success.

Results

The patients' mean age was 69.3 years. The mean IPSS/QoL, Qmax and PVR were 21.7/4.3, 8.7ml/sec, and 107.7 cc, respectively. Preoperative baseline PSA was significantly high in the groups of BOOI ≥ 40, BCI ≥ 100 and prostate size ≥ 80ml ($p < 0.05$). Preoperative Qmax was significantly low and PVR was high in the groups of BOOI ≥ 40. All parameters showed significant improvement at postoperative 6 months (IPSS; 21.7±6.6 to 6.8±5.2, QoL; 4.5±2.4 to 1.7±1.3, Qmax; 8.7±3.8 to 24.1±35.1, PVR; 107.7±111.0 to 25.6±24.3). Improvement of IPSS and PVR was more significant in a group of BOOI ≥ 40 compared to group of BOOI < 40. There was no significant difference in all parameters about postoperative changes between groups according to prostate size, DO and BCI. The overall success rate and reduction rate of PSA level were 93.7% and 82.8%, respectively. The degree of BOO and PdetQmax were significant factors to predict success of HoLEP in univariate analysis. The degree of BOO was the only significant factors to predict success of HoLEP in multivariate analysis (HR 10.8(2.25-51.76), $p=0.003$).

Interpretation of results

In the overall patients, all parameters showed significantly improvement after HoLEP. The overall success rate of HoLEP was 93.7%. In the patients with higher BOOI, improvement of the IPSS and PVR were significantly higher than those with lower BOOI after HoLEP. Factors to predict success of HoLEP were degree of BOO and PdetQmax in univariate analysis and degree of BOO in multivariate analysis.

Concluding message

HoLEP improved LUTS and urine flow in most of the patients with BPO, irrespective of the pre-operative urodynamic and prostate size parameters. But, surgical outcome was more significant in patients with higher degree of BOO. These results will be useful to predict the effectiveness of HoLEP.

Table 1. Estimation criteria for each outcome variable in BPH treatment.

Efficacy (score)	IPSS (After/Before)	QoL (Before/After)	Qmax (After/Before)
Excellent (4)	≤ 0.25	≥ 4	≥ 10
Good (3)	≤ 0.50	3	≥ 5
Fair (2)	≤ 0.75	2, 1	≥ 2.5
Poor/worse (1)	> 0.75	≤ 0	< 2.5

Treatment success was defined as median value of efficacy score demonstrates more than 2.

Table 2. The change of parameters between preop- and postop 6months analyzed by prostate size, BOOI, DO and BCI. (mean $\pm$ SD)

		IPSS		QoL		Qmax		PVR	
		Pre-op	Post-op	Pre-op	Post-op	Pre-op	Post-op	Pre-op	Post-op
Prostate size	< 40 (n=27)	23.0 $\pm$ 7.7	8.3 $\pm$ 5.2	4.5 $\pm$ 0.9	2.0 $\pm$ 1.4	9.2 $\pm$ 4.0	18.2 $\pm$ 8.1	113.1 $\pm$ 120.6	27.1 $\pm$ 40.9
	40~80 (n=107)	21.1 $\pm$ 6.4	6.3 $\pm$ 4.9	4.3 $\pm$ 1.0	1.7 $\pm$ 1.3	8.7 $\pm$ 3.7	26.1 $\pm$ 44.2	107.4 $\pm$ 117.7	25.3 $\pm$ 20.6
	$\geq$ 80 (n=40)	22.4 $\pm$ 6.6	6.9 $\pm$ 5.8	5.1 $\pm$ 4.8	1.7 $\pm$ 1.4	8.3 $\pm$ 3.8	22.9 $\pm$ 8.6	105.0 $\pm$ 85.7	25.5 $\pm$ 18.6
BOOI	< 40 (n=57)	21.2 $\pm$ 7.6	8.4 $\pm$ 6.0*	4.4 $\pm$ 0.9	2.1 $\pm$ 1.3	9.6 $\pm$ 3.7	20.1 $\pm$ 9.0	77.2 $\pm$ 62.4	19.6 $\pm$ 17.3*
	$\geq$ 40 (n=117)	21.9 $\pm$ 6.2	6.0 $\pm$ 4.5*	4.6 $\pm$ 2.9	1.6 $\pm$ 1.3	8.3 $\pm$ 3.7	26.1 $\pm$ 42.3	122.6 $\pm$ 125.8	28.5 $\pm$ 26.6*
DO	Yes (n=92)	22.2 $\pm$ 6.9	6.5 $\pm$ 5.3	4.8 $\pm$ 3.3	1.6 $\pm$ 1.5	8.4 $\pm$ 3.8	21.0 $\pm$ 8.4	100.7 $\pm$ 83.6	25.0 $\pm$ 19.3
	No (n=82)	21.1 $\pm$ 6.4	7.1 $\pm$ 5.0	4.3 $\pm$ 1.0	1.9 $\pm$ 1.2	9.0 $\pm$ 3.7	21.0 $\pm$ 10.0	115.7 $\pm$ 135.5	26.2 $\pm$ 29.0
BCI	< 100 (n=71)	21.9 $\pm$ 6.7	7.7 $\pm$ 5.5	4.3 $\pm$ 0.9	2.0 $\pm$ 1.3	8.0 $\pm$ 3.3	19.5 $\pm$ 8.4	116.9 $\pm$ 121.3	24.5 $\pm$ 26.8
	$\geq$ 100 (n=103)	21.6 $\pm$ 6.6	6.1 $\pm$ 4.8	4.7 $\pm$ 3.1	1.6 $\pm$ 1.3	9.2 $\pm$ 4.0	27.3 $\pm$ 45.0	101.4 $\pm$ 103.5	26.3 $\pm$ 22.5

* p<0.05; compare improvements between groups according to prostate size, BOOI, DO, BCI.

Table 3. Success rates analyzed by prostate size, BOOI, DO and BCI.

	Prostate size (ml)			BOOI		BCI		DO	
	< 40	40~80	≥ 80	< 40	≥ 40	< 100	≥ 100	Yes	No
Success (%)	96.3%	93.5%	92.5%	84.2%	98.3%	91.5%	95.1%	93.5%	93.9%
p-value	0.813			< 0.001		0.359		0.909	

References

1. Int J Urol. 1996 Jul;3(4):267-73.

Disclosures

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