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Thulium fiber laser enucleation of the prostate – A single-arm prospective cohort study

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Objective

To investigate the intra and early postoperative outcomes of Thulium Fiber Laser Enucleation of the Prostate (ThuFLEP) for management of benign prostatic hyperplasia (BPH) with known complications.

Methods

30 male patients with known BPH complications underwent ThuFLEP. Preoperative prostate volume, adenoma volume, prostate-specific antigen (PSA), and hemoglobin values were recorded. International Prostate Symptom Score (IPSS), uroflowmetry parameters including maximal flow rate (Qmax) and residual volume post voiding (PVRU), and International Index of Erectile Function-5 score (IIEF-5) were assessed. Operative time, enucleation time, morcellation time, catheterization time, hospital stay, change in hemoglobin levels, and postoperative complications were recorded. Patients' continence, erectile functions and voiding outcomes were evaluated 3 months after surgery.

Results

For perioperative outcomes, ThuFLEP showed adenoma volume (median 31g), enucleation time (median 30 min), morcellation time (median 30 min), enucleation efficiency (median 0.8 g/min), catheterization time (median 1 day), hospital stay median 1 day) and hemoglobin change (median 1.2 g/dL). All patients successfully weaned off urinary catheters. The 30-day complication rate was 3.3%.

At 3-month follow-up, the median IPSS was 5 out of 30, median QOL score was 2 out of 6, median Qmax was 20.3mL/sec, median PVRU was 50mL, and median PSA was 1.2. There was no urinary incontinence. Among the 13.3% (N=4) who reported erectile dysfunction, the median IIEF-5 score was 15, and all of them reported no sexual life before the operation.

Conclusion

Even in a complicated subgroup of BPH patients, ThuFLEP managed to improve voiding, with high efficacy and safety. In addition to its relatively high enucleation efficiency, the complication profile is favourable, in terms of perioperative blood loss, incontinence and sexual dysfunction.

Table 1 Patient characteristics & Perioperative outcomes

Patient characteristics	n = 30
Median age at operation (year)	70.5 (67-75)
Median preoperative prostate size (ml)	60 (49.8-71.5)
Preoperative PSA (ng/ml)	5.8 (3.7-8)
ASA grading	2 (2-2)
Indication	
Acute urinary retention	66.7%
BPH-related bladder stones	16.7%
BPH-related hematuria	10%
Bothersome LUTS	6.7%
Preoperative catheter dependence	50%
Preoperative urinary incontinence	0%
Perioperative outcome	
Median operative time (mins)	85 (73-99.5)
Median enucleation time (mins)	30 (20-30)
Median morcellation time (mins)	30 (17.5-30)
Median enucleation efficiency (g/min)	0.97 (0.64-1.02)
Median morcellation efficiency (g/min)	0.82 (0.71-1.2)
Median weight of prostate chips resected (g)	31 (20-39.3)
Median resection ratio	56.9% (38.4-70.4%)
Median duration of bladder irrigation (hours)	6 (6-6)
Median length of stay (hours)	28 (26-30)
Catheter free rate by postoperative day 1	86.7%
Catheter free rate by postoperative day 7	96.7%
Catheter free rate by postoperative day 14	100%
Median postoperative haemoglobin drop (g/dL)	1.2 (0.5-1.8)
Transfusion requirement	3.3%
30-day complications	Total = 4 (13.3%)
Clavien Dindo Grade 1-2	4
Acute urinary retention	2
Epididymo-orchitis	1
Hematuria	1
Clavien Dindo Grade 3 or above	0
Condition at 6 weeks	
Median IPSS	6 (3-10)
Median IPSS-QoL	3 (2-3)
Median OABSS	3 (2-6)
Condition at 3 months	
Mean change of PSA (ng/ml)	5.62 (p <0.001)
Mean percentage change of PSA	75.8%
Median voided volume (ml)	154 (131-216)
Median Qmax* (ml/s)	21 (13.1-26.2)
Median RU* (ml)	50 (26-67)
Median IPSS	4 (1-7)
Median IPSS-QoL	2 (2-3)
Median OABSS	3 (1-5)
Urinary incontinence	3.3%
Condition at 1 year	
Median voided volume (ml)	226 (96.2-293)
Median Qmax* (ml/s)	22.8 (21.6-27.7)
Median RU* (ml)	40 (30-54)
Median IPSS	5 (1.5-9.5)
Median IPSS-QoL	1 (1-3)
Median OABSS	1 (1-1)
Urinary incontinence	0%

PSA, prostate specific antigen; ASA, American Society of Anesthesiologists; LUTS, lower urinary tract symptoms; TWOC, trial without catheter; Qmax, maximum flow rate; RU, residual urine; IPSS, international prostate symptom score; QoL, quality of life; OABSS, overactive bladder symptom score

The results were expressed in mean +/- standard deviation, median (interquartile range), or count (percentage) as appropriate.

*Those with voided volume <125ml were excluded from Qmax and RU analysis.

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