

PYURIA AND POST-OPERATION URINARY TRACT INFECTION FOLLOWING DIODE LASER (980 NM) ENUCLEATION OF THE PROSTATE FOR BENIGN PROSTATE OBSTRUCTION

Hypothesis / aims of study

Transurethral resection of prostate (TURP) remains the golden standard for benign prostate obstruction (BPO). Recently evolved laser surgical technique provides less perioperative complications with equivalent outcomes. (1) New developed laser enucleation offers better hemostasis and shortens catheterization duration and hospital stay. However, postoperative urinary tract infection sequelae (POUTIs) seem to be increased in patients with diode laser enucleation (DiLEP). We conduct a retrospective study to compare the POUTIs between DiLEP and TURP.

Study design, materials and methods

From July 2011 to September 2014, we retrieved records on patients with lower urinary tract symptoms due to BPO underwent monopolar TURP and DiLEP. Demographic characteristics were recorded from a single center computerized database, including history of the underlying disease, use of anticoagulant or antibiotic before operation, the duration of indwelling catheter, PSA level, history of transrectal ultrasound (TRUS) biopsy, perioperative and postoperative details, hospitalization period. The parameters of uroflowmetry, International Prostate Symptom Score (IPSS) were assessed at baseline and after the surgery during follow-up period to predict the functional improvement of each group. POUTIs were compared between TURP and DiLEP. Kaplan-Meier curve was used to determine the time of persistence of pyuria after operation. We also performed multivariate analysis to evaluate the risk factor of prolong pyuria.

Results

One hundred and twelve patients underwent DiLEP and 81 received monopolar TURP with the same surgeon at the same period. There was more anticoagulant used in DiLEP group than in TURP group (17.9% vs 7.4 %, $p=0.038$). Operation time was longer and post-operation normal saline irrigation interval was shorter in DiLEP in comparison with TURP respectively (61.8 ± 20.7 vs 47.4 ± 22.1 mins, $p<0.001$; 2.1 ± 0.3 vs 2.5 ± 0.9 days, $p<0.001$). The detail of POUTIs between TURP and DiLEP are illustrated in Table 1. Figure 1 revealed the time to normalization of pyuria after operation between two groups.

Interpretation of results

The difference of post operation infection between groups is statistically significant in epididymitis and POUTIs related hospitalization. (Table 1) The subjective and objective improvements were comparable between the DiLEP and TURP groups, and were sustained during a follow-up of up to 1 year, except that DiLEP resulted in more dysuria (27.6%vs 11.2%, $p<0.001$) and presented with longer pyuria period (17 vs 12 weeks, $p=0.0014$). (Figure 1) DiLEP, old age, and use of anticoagulant before operation seems to carry risk of prolong pyuria after operation. (Table 2) Previous study (2) revealed that diode laser possess deep optical penetration that caused coagulation necrosis and higher risk of bladder neck contracture. The sloughed necrotic tissue and prolong wound healing time could be a predisposing factor for inflammation and tamponade, subsequent urinary tract infection.

Concluding message

According to our study, DiLEP offers a safe and feasible procedure in the management of patients with symptomatic BPO, even in patient with anticoagulant. However, aged patients with advanced co-morbidities may suffer from more POUTIs possibly caused by longer pyuria period. Further larger prospective study is necessary for the evaluation the association between post-operative pyuria and POUTIs.

Table 1. Infection associated complication according to surgical type.

Characteristics	TURP	LASER	P value*
Urinary tract infection	4 (4.9%)	12 (10.7%)	0.151
Epididymitis	1 (1.2%)	11 (9.8%)	0.015
Hospitalization	1 (1.2%)	9 (8%)	0.037
Preoperative pyuria patients No.	5	16	0.074
Epididymitis	0	4	0.544

*Student t test

Figure 1. Kaplan-Meier estimates for the time to normalization of urinalysis according to surgical type.

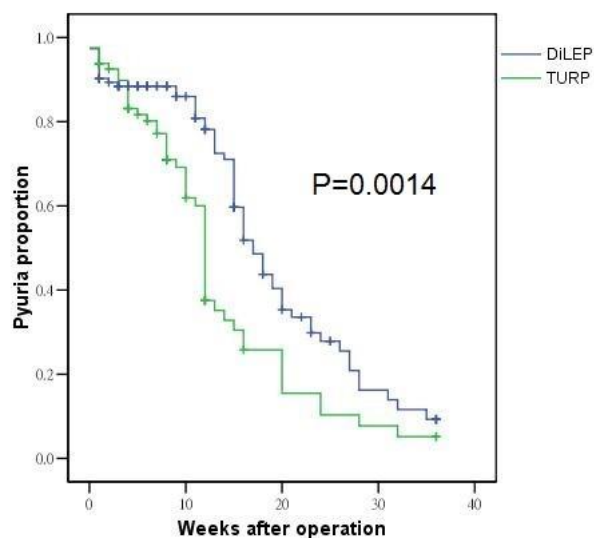


Table 2. Multivariate analysis the risk factors of prolong pyuria

	Univariate analyses*		Multivariate analyses**	
	Pearson	P	HR (CI 95%)	P
Age	0.293	0.000	0.974(0.949~0.999)	0.042
OP method	0.269	0.001	0.549(0.366~0.823)	0.004
Pre-anticoagulant	0.245	0.003	0.622(0.319~1.201)	0.156
Post-Qmax	-0.176	0.024	1.033(0.999~1.069)	0.056

*linear regression analysis, **COX regression analysis; OP method: TURP vs LASER, Pre-anticoagulant: use of anticoagulant before operation, Post-Qmax: Qmax after operation.

References

1. Diode laser (980 nm) vaporization in comparison with transurethral resection of the prostate for benign prostatic hyperplasia: randomized clinical trial with 2-year follow-up; Urology. 2014 Sep;84(3):526-32. doi: 10.1016/j.urology.2014.05.027.
2. Laser treatment of benign prostate enlargement--which laser for which prostate?; Nat Rev Urol. 2014 Mar;11(3):142-52. doi: 10.1038/nrurol.2014.23. Epub 2014 Mar 4.

Disclosures

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