

## PREDICTORS OF OVERACTIVE BLADDER SYMPTOMS REGARDING THE SHORT-TERM OUTCOME OF TURP IN PATIENTS WITH BENIGN PROSTATIC OBSTRUCTION

### Hypothesis / aims of study

The aim of this study was to investigate whether the urodynamic parameters and the overactive bladder symptom scores (OABSS) preoperatively affected the improvement of overactive bladder (OAB) symptoms following a transurethral resection of the prostate (TURP) in patients with benign prostatic obstruction (BPO).

### Study design, materials and methods

A retrospective study was conducted in 136 patients with BPO who had undergone TURP between November 2009 and November 2011. All patients had completed the preoperative evaluations including the International Prostate Symptom Score (IPSS), quality of life (QOL) index, OABSS and full urodynamics. All cases must have urgency symptoms to meet the OAB symptoms before surgery. Filling cystometry were performed to determine detrusor overactivity (DO), which was comprised phasic detrusor overactivity (PDO) and terminal detrusor overactivity (TDO) before TURP and defined by the new International Continence Society classification (2002). The linear passive urethral resistance relation (LinPURR) was determined by using the Schäfer's diagram, and the degree of obstruction in all patients was LinPURR scores of 2 and above. The subtotal storage symptom scores comprised the summation of nocturia, urgency and an increased frequency scores from IPSS questionnaire. The patients can be divided into mild ( $\leq 5$ ), moderate (6-11) and severe ( $\geq 12$ ) groups according to the preoperative OABSS. The OAB was divided into OAB wet and OAB dry according to whether associated with incontinence. Using the IPSS, QOL index, OABSS, maximum flow rate (Qmax) and post-void residual volume (PVR), the efficacy of TURP was determined after 3 months of surgery. The improvement of OAB symptoms was defined as a reduction of  $\geq 50\%$  in the subtotal storage symptom scores or the OABSS.

### Results

The mean age of the patients entered into the study was 70.5 years (range 50–87 years). On the preoperative urodynamics, 48(35.3%) patients showed DO, which were comprised of PDO 27(19.9%) cases and TDO 21(15.4%) cases. Of the 136 patients, 13(9.6%) had a LinPURR score of 2, 22(16.2%) of 3, 48(35.3%) of 4, 25(18.4%) of 5, and 28(20.6%) of 6. The mean prostate volume estimated by transrectal ultrasonography was  $97.7 \pm 65.8$ g.

There was no significant difference in the preoperative subtotal storage symptom scores and OABSS between the presence and absence of DO. Three months postoperatively, men without preoperative DO had a significantly lower subtotal storage symptom scores and OABSS than those with preoperative DO ( $P < 0.05$ ). Men with preoperative PDO had a significantly lower subtotal storage symptom scores and OABSS compared with men with preoperative TDO before and after the operation ( $P < 0.01$ ). Interestingly, there was no significant difference between the preoperative and postoperative subtotal storage symptom scores and OABSS at the absence DO and presence PDO (Table 1).

90 (66.2%) patients showed OAB wet preoperatively, and 13 (14.4%) patients continued to be showed OAB wet postoperatively. In patients with OAB wet before operation, 8 of 29 (27.6%) of patients with DO and 5 of 61 (8.2%) of patients without DO still showed OAB wet after surgery, the difference had statistical significance ( $P = 0.034$ ). Meanwhile, 7 of 15 (46.7%) of patients with preoperative TDO and 1 of 14 (7.1%) of patients with PDO continued to be showed OAB wet postoperatively ( $P = 0.013$ ).

According to LinPURR scores, the percentage of patients with improvement of the subtotal storage symptom scores were 84.6%, 90.9%, 89.6%, 96.0% and 100.0% at 2, 3, 4, 5, and 6 grade after TURP respectively, and the improvement of OABSS were 69.2%, 95.5%, 81.3%, 92.0% and 85.7% in the above five grades respectively.

Patients were divided into three groups according to the severity of OAB symptoms: 10 cases in the mild group, 94 cases in the moderate group and 32 cases in the severe group. The patients' OAB symptoms of the three groups had significantly improved after operation. Meanwhile, men in the mild group had a better improvement in the OAB symptoms than the other two groups after operation (Table 2).

### Interpretation of results

Not only subjective symptoms such as the IPSS (the subtotal storage and obstructive symptom scores), OABSS and QOL index but also objective parameters such as Qmax and PVR were significantly improved after 3 months of TURP. Compared with the patients with PDO or without DO, the patients with TDO will be poor in the improvement of OAB symptoms, and the patients' OAB symptoms of the PDO, TDO and non-DO groups had significantly improved after operation. In patients with OAB wet preoperatively, DO patients were apt to improve disappointingly in the OAB wet symptoms than patients without DO, and patients of TDO played a significant role. The patients with more serious degree of BOO trended to better in the improvement of OAB symptoms after operation, but the difference had no statistical significance. Patients with mild OAB symptoms preoperatively had a better improvement in the OAB symptoms than the serious ones, but they all obviously improved compared with preoperation. It's emphasized that there was no difference in age among the groups above.

### Concluding message

The preoperative TDO and the level of OABSS can predict the improvement of OAB symptoms following a TURP in patients with BPO.

Table 1 Changes in OAB symptoms according to the detrusor overactivity

| Parameter           | non- DO    | DO         | PDO        | non-TDO    | TDO           |
|---------------------|------------|------------|------------|------------|---------------|
| n                   | 88         | 48         | 27         | 115        | 21            |
| Age                 | 70.07±7.06 | 71.17±7.45 | 70.11±8.26 | 70.08±7.32 | 72.52±6.19    |
| IPSS (storage)      |            |            |            |            |               |
| At baseline         | 11.28±2.40 | 11.46±2.66 | 10.33±2.51 | 11.06±2.45 | 12.90±2.12&&£ |
| 3 months after TURP | 2.55±1.76  | 3.71±2.97# | 2.67±2.70  | 2.57±2.00  | 5.05±2.80&&£  |
| D-value             | 8.74±2.60  | 7.75±3.19  | 7.67±2.91  | 8.49±2.70  | 7.86±3.60     |
| P <sup>+</sup>      | 0.000      | 0.000      | 0.000      | 0.000      | 0.000         |
| OABSS               |            |            |            |            |               |
| At baseline         | 9.39±2.67  | 9.40±2.75  | 8.37±2.62  | 9.15±2.68  | 10.71±2.37&&£ |
| 3 months after TURP | 2.50±1.77  | 3.23±2.21# | 2.33±1.75  | 2.46±1.76  | 4.38±2.25&&£  |
| D-value             | 6.89±2.78  | 6.17±2.99  | 6.04±2.85  | 6.69±2.81  | 6.33±3.23     |
| P <sup>+</sup>      | 0.000      | 0.000      | 0.000      | 0.000      | 0.000         |

Values shown as mean ± SD. If the difference between groups is statistically significant (P < 0.05), special symbols represent it. #: non-DO and DO groups, &: PDO and TDO, £: non-TDO and TDO. P<sup>+</sup> : statistical comparison between preoperation and postoperation.

Table 2 Changes in OAB symptoms according to the OABSS

| Parameter           | mild       | moderate   | severe     | P     |
|---------------------|------------|------------|------------|-------|
| n                   | 10         | 94         | 32         |       |
| Age                 | 69.90±9.00 | 70.47±6.67 | 70.59±8.26 | >0.05 |
| IPSS (storage)      |            |            |            |       |
| At baseline         | 8.10±2.60  | 11.20±2.36 | 12.78±1.62 | 0.000 |
| 3 months after TURP | 1.50±0.71  | 2.97±2.43  | 3.38±2.14  | 0.022 |
| D-value             | 6.60±2.22  | 8.23±2.94  | 9.41±2.43  | 0.013 |
| P <sup>+</sup>      | 0.000      | 0.000      | 0.000      | 0.000 |
| OABSS               |            |            |            |       |
| At baseline         | 4.50±0.53  | 8.69±1.65  | 12.97±0.90 | 0.000 |
| 3 months after TURP | 1.40±0.52  | 2.70±1.88  | 3.34±2.27  | 0.008 |
| D-value             | 3.10±0.57  | 5.99±2.20  | 9.63±2.58  | 0.000 |
| P <sup>+</sup>      | 0.000      | 0.000      | 0.000      | 0.000 |

Values shown as mean ± SD. P : statistical comparison among the three groups. P<sup>+</sup> : statistical comparison between preoperation and postoperation.

#### Disclosures

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