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VOIDING FUNCTIONS IN PATIENTS WITH PELVIC ORGAN PROLAPSE UNDERGOING TVM PROCEDURE

Hypothesis / aims of study
It is well known that there is a relationship between pelvic organ prolapse (POP) and voiding dysfunction. However, few studies have reported the efficacy of reconstructive surgery on voiding function. The tension-free vaginal mesh (TVM) procedure is total reconstructive surgery for POP, and has been reported to show satisfactory results. In this study, we compared pre- and postoperative voiding function in patients with POP and assessed the efficacy of urodynamic studies.

Study design, materials and methods
From November 2005 to February 2010, 134 patients with POP-Q stage of 2 or more underwent the TVM procedure. Soft polypropylene mesh (Gynemesh PS^{TM}) was cut into a similar shape to Prolift^{TM}. Of the 134 patients, 84 underwent preoperative pressure flow study (PFS). Examinations were performed in the untouched condition, *i.e.*, POP was left as is during PFS. Forty-six of 84 patients also underwent PFS one month after the operation.
In the PFS procedure, a 12Fr double-lumen catheter was inserted into the urinary bladder transurethrally, and zeroed to the pressure of the empty urinary bladder. Intra-abdominal pressure (Pabd) was substituted for intra-rectal pressure measured with a transrectally inserted 6Fr balloon catheter. Intra-vesical pressure (Pves) was recorded under conditions of sterile saline injection at 50mL/min.

Results
The mean age of the patients was 67.9 ± 8.7 years (range 47 – 85), and the mean parity was 2 (range 0 – 6). Thirty-four (25 %) patients had a history of hysterectomy for uterine myoma or prolapse. Five (3.7 %) patients had previously undergone reconstructive surgery without grafting.
Examinations were evaluated on Schäfer nomograms. P-Q plots at maximal flow one month after the operation moved to the upper left on Schäfer nomograms compared to preoperative observations. The mean pre- and postoperative detrusor pressure at maximal flow (Pdet at MF) were 35.0 ± 19.3 cmH_2O and 27.7 ± 13.7 cmH_2O, respectively (P<0.01, Wilcoxon's signed-rank test). The mean MFR was also improved significantly after operation, pre and postoperative MFR were 12.1 ± 7.0 mL/s and 18.8 ± 26.0 mL/s, respectively (P<0.01, Wilcoxon's signed-rank test). The mean FDV and MCC also increased significantly after the operation (P<0.01, paired t- test).
Considering N or ST and W or VW as normal and impaired contractility, respectively, the proportion of normal contractility was increased significantly (P<0.05, chi-square test). With regard to obstruction, regarding grade 2 or more as obstructive and grade 0 or 1 as non-obstructive, the proportion of non-obstructive was also significantly increased (P<0.01, chi-square test).
Voiding difficulties defined as more than 100mL post voiding residual (PVR) were seen in nine (6.7 %) patients who required intermittent catheterization. Six of these nine patients were underwent preoperative PFS and five underwent postoperative PFS. Five of the six who underwent preoperative PFS were classified as having impaired detrusor contractility.

Interpretation of results
Although there may be limitations on applying conventional nomograms to women, it has been shown that voiding function improved preoperatively by PFS. The TVM procedure has been reported to show excellent cure rate. We consider that anatomical reconstruction of POP leads to improvement both of detrusor contractility and obstruction.
Nine patients undergoing the TVM procedure required intermittent catheterization because of PVR exceeding 100mL. All except one of these nine were classified as having impaired contractility on preoperative PFS. Voiding difficulties following the TVM procedure may be attributable to baseline impaired detrusor contractility.

Concluding message
To our knowledge, there have been no previous studies of postoperative voiding function in patients with POP by PFS. Both detrusor contractility and bladder outlet obstruction were improved by the TVM procedure.

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Was the Declaration of Helsinki followed?	**Yes**
Was informed consent obtained from the patients?	**Yes**