

## CHANGES OF URODYNAMICS AFTER SUBURETHRAL SLING MIGHT PREDICT LONG-TERM SUCCESS IN WOMEN WITH STRESS URINARY INCONTINENCE

### Hypothesis / aims of study

Although a high success rate has been achieved in the early follow-up after suburethral sling for female stress urinary incontinence (SUI), there are limited data about long-term effects. The objective of this study is to survey the long-term durability of suburethral sling for female SUI and to identify urodynamic changes that are correlated with successful outcomes.

### Study design, materials and methods

Totally 434 women who underwent suburethral slings for SUI between October 1989 and November 2014 were enrolled in this survey. Patients received standardized urodynamic testing preoperatively as the baseline and postoperatively within 6 months. Successful outcome of suburethral slings was defined as negative cough and Valsalva stress test, no self-reported SUI symptoms, and no re-treatment for SUI. Surgical results, demographic characteristics, pre-operative and post-operative urodynamic parameters, and postoperative clinical manifestation were retrospectively analyzed. Changes in urodynamic parameters were correlated to a successful outcome.

### Results

The median follow-up period was 87 months. The overall subjective cure rate was 82.5%. Vaginal delivery and previous SUI surgery had negative influence on cure rate ( $P=0.029$  and  $0.038$ , respectively). Concomitant pelvic organ prolapse (POP) surgery was beneficial for cure rate ( $P=0.03$ ) (Table 1). Patients who met the criteria for surgical success, a significant interaction ( $P<0.001$ ) was detected between the baseline and postoperative urodynamic parameters, including maximum flow rate (Qmax), corrected Qmax, voiding volume (Vol), post-void residual (PVR), voiding efficiency(VE), detrusor pressure at maximum flow rate (Pdet.Qmax) and bladder outlet obstruction index (BOOI). A significant interaction was detected from the baseline to 6 months between successes and failures for Qmax ( $p=0.026$ ) and Vol ( $p=0.001$ ). Multivariable logistic regression analysis revealed that the presence of decreased BOOI (OR: 0.97,  $P=0.006$ ), decreased Pdet.Qmax (OR: 0.97,  $P=0.042$ ), increased VE (OR: 3.9,  $P=0.026$ ), decreased PVR (OR: 0.99,  $p=0.021$ ), increased Qmax (OR: 1.03,  $p=0.039$ ) are independent risk factors for an early treatment failure (Table 2).

### Interpretation of results

In this study, a trend suggests a correlation between greater increases in bladder outlet resistance and long-term successful surgical outcome. These findings suggest that, for sling operations, increased outlet resistance as measured by increased Pdet.Qmax, increased BOOI, decreased Qmax, decreased VE, and increased PVR are associated with better SUI-specific outcomes.

### Concluding message

Suburethral sling has a durable long-term effect in our study. The results indicate that decreased Qmax, decreased corrected Qmax and decreased VE are associated with surgical success, while increased Pdet.Qmax, increased BOOI, and increased PVR are also associated with success. Slight bladder outlet obstruction after sling operation provides long-term efficacy and success. The increased bladder outlet resistance seems essential for achieving dryness.

Table 1. Baseline demography

	Total	Successes	Failures	p-value
No.	434	357	77	
Op age	60±16	60±11	60±11	0.744
Parity	3.5±1.6	3.5±1.6	3.9±1.3	0.053
Vaginal delivery	3.4±1.6	3.4±1.6	3.8±1.3	0.029
Menopause	345 (79.5%)	285 (79.8%)	60 (77.9%)	0.707
Hysterectomy Hx	150 (34.6%)	120 (33.6%)	30 (39.0%)	0.371
POP op Hx	47 (10.8%)	36 (10.1%)	11 (14.3%)	0.282
SUI op Hx	63 (14.5%)	46 (12.9%)	17 (22.1%)	0.038
Concomitant POP surgery	129 (29.7%)	114 (31.9%)	15 (19.5%)	0.030

continuous variable: Student's t test.

categorical variable: Pearson's chi-squared test.

Table 2. Multivariable logistic regression analysis of urodynamic parameters associated with suburethral sling failure

	Crude OR	95%CI	p-value	Adjusted OR*	95%CI	p-value
<b>All Surgery Including Concomitant POP Surgery</b>						
Qmax (mL/s)	1.02	0.99-1.04	0.126	1.03	0.99-1.05	0.064
Corrected Qmax	1.06	0.71-1.59	0.778	1.14	0.75-1.75	0.541
Volume (mL)	1.00	1.001-1.004	0.008	1.00	1.001-1.004	0.007
PVR (mL)	0.99	0.99-1.00	0.167	0.99	0.99-1.00	0.083
Voiding efficiency(%)	1.91	0.73-4.97	0.185	2.30	0.85-6.22	0.099
Ped.Qmax (cmH2O)	0.98	0.95-1.01	0.127	0.97	0.94-0.99	0.042
BOOI	0.98	0.97-0.99	0.037	0.97	0.96-0.99	0.006
<b>Concomitant Anterior Colporrhaphy Excluding</b>						
Qmax (mL/s)	1.03	1.00-1.05	0.049	1.03	1.00-1.06	0.046
Corrected Qmax	1.18	0.74-1.89	0.478	1.20	0.74-1.96	0.453
Volume (mL)	1.00	1.001-1.004	0.004	1.00	1.001-1.004	0.004
PVR (mL)	0.99	0.99-1.00	0.029	0.99	0.99-0.99	0.023
Voiding efficiency(%)	3.56	1.14-11.12	0.029	3.90	1.18-12.92	0.026
Ped.Qmax (cmH2O)	0.98	0.95-1.01	0.296	0.98	0.94-1.01	0.140
BOOI	0.99	0.97-1.00	0.043	0.97	0.95-0.99	0.007
<b>Sling Surgery Only</b>						
Qmax (mL/s)	1.03	1.00-1.06	0.039	1.03	1.00-1.06	0.052
Corrected Qmax	1.24	0.77-1.99	0.369	1.25	0.76-2.04	0.385
Volume (mL)	1.00	1.001-1.004	0.007	1.00	1.001-1.004	0.009
PVR (mL)	0.99	0.99-1.00	0.026	0.99	0.99-0.99	0.021
Voiding efficiency(%)	3.46	1.11-10.79	0.033	3.77	1.13-12.57	0.031
Ped.Qmax (cmH2O)	0.98	0.95-1.01	0.231	0.97	0.94-1.01	0.129
BOOI	0.98	0.96-0.99	0.017	0.97	0.95-0.99	0.006

\* Adjust for the patients' age, parity, vaginal delivery, menopause, hysterectomy Hx, POP op Hx, SUI op Hx and concomitant POP surgery.

Disclosures

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