

## EVALUATION OF BLADDER OUTLET OBSTRUCTION AFTER A PUBOVAGINAL SLING PROCEDURE

### Hypothesis / aims of study

Occurrence of long-term bladder outlet obstruction (BOO) after urinary incontinence surgery is a concern among clinicians. However, it may not be associated with voiding symptoms. Nomograms have been constructed to assess the occurrence of bladder outlet obstruction. The aim of this study was to evaluate the long-term effect of pubovaginal sling procedures on urethral resistance (UR), as a parameter of BOO.

### Study design, materials and methods

We performed a retrospective observational study of women submitted to a pubovaginal sling procedure for urinary incontinence, between January of 2004 and November of 2008, who had both a preoperative and postoperative urodynamic study (UDS). We excluded women who had anterior compartment pelvic organ prolapse, who voided with abdominal straining greater than 10 cm H<sub>2</sub>O, who were unable to void for the pressure-flow study (PFS) or had catheter loss during the exam. We compared UR and detrusor contractility (DC), using detrusor-flow plot according to Schäfer, in two distinct moments: before and 1 year after surgery. We graded UR as 0 when there was no obstruction, as 1-2 with mild obstruction, as 3-4 with moderate obstruction and 5-6 with severe obstruction. DC was divided into 6 grades: VW (very weak), W- (weak minus), W+ (weak plus), N- (normal minus), N+ (normal plus) and ST (strong). T-Student and Wilcoxon were used according to the variable type. *P* values <0.05 were considered statistically significant. Statistical analysis was performed with PASW Statistics 18.

### Results

Of the 411 patients submitted to a sling procedure we excluded 114 patients who didn't have both preoperative and postoperative UDS available, 101 who had anterior compartment pelvic organ prolapse (at least stage 3 according to POPQ classification), 36 because of abdominal straining greater than 10 cm H<sub>2</sub>O, 7 who were unable to void for the PFS and 5 because of catheter loss during the exam. A total of 117 women were analysed. The postoperative UDS was done at a mean time of 13 months (Std deviation 5,2) after surgery. Seventy-five women were submitted to a transobturator vaginal tape (TVT-O), 27 to a tension-free vaginal tape (TVT), 12 to a TVT-Secur (TVT-S), 2 to a Pelvace TO and 1 to a Pelvace.

Table 1 – Demographic characteristics

Caucasian	n (%)	116 (99.1)
BMI (kg/m <sup>2</sup> )	median [min-max]	30 [22-41]
Age (years)	median [min- max]	57.5 [33-78]
Patients with vaginal births	n (%)	109 (93.2)
Postmenopausal	n (%)	72 (65.5)

Table 2 and 3 – Urethral resistance before and after surgery (n=117)

		Urethral Resistance after surgery					Total
		0	1	2	3		
Urethral Resistance before surgery	0	75	20	3	0	98	
	1	6	6	1	1	14	
	2	2	0	1	0	3	
	3	1	0	0	0	1	
	4	0	0	0	1	1	
	Total	84	26	5	2	117	

UR	Before surgery	After surgery
	N (%)	N (%)
0	98 (83.8)	84 (71.8)
1	14 (12.0)	26 (22.2)
2	3 (2.6)	5 (4.3)
3	1 (0.9)	2 (1.7)
4	1 (0.9)	0

Table 4 and 5 – Detrusor contractility before and after surgery (n=117)

		Detrusor contractility after surgery						Total
		V W	W -	W +	N -	N +	ST	
Detrusor contractility before	V W	1	1	0	0	1	0	3
	W -	2	3	7	1	1	0	14
	W +	3	1	7	5	4	0	20
	N -	2	6	6	14	5	0	33

V W	3 (2.6)	8 (6.8)
W -	14 (12.0)	17 (14.5)
W +	20 (17.1)	30 (25.6)
N -	33 (28.2)	33 (28.2)
N +	30 (25.6)	23 (19.7)

surgery	N +	0	4	8	8	6	4	30
	ST	0	2	2	5	6	2	17
	Total	8	17	30	33	23	6	117

Table 6 – Urethral resistance before and after surgery according to the type of surgery

	TVT-O		TVT		TVT-S	
	Before surgery	After surgery	Before surgery	After surgery	Before surgery	After surgery
Urethral resistance	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
0	60 (80)	54 (72)	26 (96.3)	18 (66.7)	9 (75)	10 (83.3)
1	11 (14.7)	15 (20)	1 (3.7)	8 (29.7)	3 (25)	2 (16.7)
2	2 (2.7)	4 (5.3)	0	1 (3.7)	0	0
3	1 (1.3)	2 (2.7)	0	0	0	0
4	1 (1.3)	0	0	0	0	0
Total	75 (100)	75 (100)	27 (100)	27 (100)	12 (100)	12 (100)
	NS		p < 0,05		NS	

#### **Interpretation of results:**

UR was significantly higher after surgery when analysing UR in two classes – non-obstructed (UR=0) and obstructed (UR=1 – 4). A subgroup analysis, according to the type of surgery, revealed that only with retropubic TVT was UR significantly increased. Our study also showed a significant decrease of DC after all types of pubovaginal slings. The main shortcoming of this study was the exclusion of women who could not urinate or exhibited valsalva voiding, which may be indicative of bladder outlet obstruction (BOO).

#### **Concluding message:**

Schäfer nomogram applied in this population of incontinent women without anterior compartment pelvic organ prolapse, showed TVT to be the only pubovaginal sling with an obstructive long-term effect in the female outflow tract. This may eventually be associated with a difference in urethral angulation between the various surgical procedures. All types of sling procedures had a negative effect on detrusor contractility. The reason for this is not clear and more studies are needed to see if this is going to be a long term effect.

<b><i>Specify source of funding or grant</i></b>	<b>None</b>
<b><i>Is this a clinical trial?</i></b>	<b>No</b>
<b><i>What were the subjects in the study?</i></b>	<b>HUMAN</b>
<b><i>Was this study approved by an ethics committee?</i></b>	<b>No</b>
<b><i>This study did not require ethics committee approval because</i></b>	<b>Its a retrospective study</b>
<b><i>Was the Declaration of Helsinki followed?</i></b>	<b>Yes</b>
<b><i>Was informed consent obtained from the patients?</i></b>	<b>No</b>