

## NORMAL DISTRIBUTION OF URETHRAL RESISTANCE AND DETRUSOR CONTRACTILITY IN WOMEN WITH URINARY INCONTINENCE AND ANTERIOR COMPARTMENT PELVIC ORGAN PROLAPSE

### Hypothesis / aims of study

Defining the outflow tract function has considerable implications in the treatment of female lower urinary tract symptoms and pressure-flow studies (PFS) are an essential instrument in its evaluation. The presence of anterior pelvic organ prolapse may interfere with urodynamic parameters in incontinent women. Nomograms have been constructed to differentiate obstructed from non obstructed voiding and poor detrusor contractility from normal detrusor contractility. Schäfer nomogram combines maximal flow rate (Qmax) and detrusor pressure at maximal flow rate (PdetQmax) to determine bladder outlet obstruction (1). It has a good correlation with clinical obstruction but it was designed using urodynamic parameters of a male population. However, it is probably applicable to women. The aims of this study were to: 1) define the distribution pattern of urethral resistance and detrusor contractility using a detrusor-flow plot, in a population of incontinent women, with anterior compartment pelvic organ prolapse (POP) and 2) compare it with the distribution in women without POP.

### Study design, materials and methods

We performed a retrospective observational study of women submitted to a sling procedure (transobturator vaginal tape, tension-free vaginal tape - TVT or TVT-Secur) for urinary incontinence between January of 2004 and November of 2008. All had preoperative evaluation with urodynamic studies. Exclusion criteria were: women who voided with abdominal straining greater than 10 cm H<sub>2</sub>O, who were unable to void for the PFS or had catheter loss during the exam. Patients were divided into two clinical groups. Group A included women without anterior compartment POP and group B women with anterior compartment POP (at least stage 3 according to POPQ classification). We analysed urethral resistance and detrusor contractility using a detrusor-flow plot according to Schäfer, and graded urethral resistance as 0 when no obstruction was present, as 1-2 with mild obstruction, as 3-4 with moderate obstruction and as 5-6 with severe obstruction. Detrusor contractility was divided into 6 grades: VW (very weak), W- (weak minus), W+ (weak plus), N- (normal minus), N+ (normal plus) and ST (strong). Student's *t*-test and Wilcoxon test 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 296 patients submitted to sling procedures, 61 were excluded (53 because of abdominal straining greater than 10 cm H<sub>2</sub>O, 4 who were unable to void for the PFS and 4 because of catheter loss during the exam). A total of 249 women were analysed – group A (n=174), group B (n=75). The two groups were homogeneous concerning the distribution of race and past vaginal delivery but heterogeneous concerning age, body mass index (BMI), and postmenopausal status.

Table 1 – Demographic characteristics

	Group A (n=174)	Group B (n=75)	<i>P</i> value
Caucasian n (%)	171 (98.2)	75 (100.0)	NS
BMI (kg/m <sup>2</sup> ) median [min-max]	30 [21.5-40.7]	27 [23.1-36.9]	<i>P</i> < 0,05
Age (years) median [min- max]	56.0 [33-78]	65.5 [45-80]	<i>P</i> < 0,05
Patients with vaginal births n (%)	167 (95.9)	72 (96.0)	NS
Postmenopausal n (%)	96 (55.2)	65 (86.7)	<i>P</i> < 0,05

Table 2 – Detrusor contractility in women without and with anterior POP

	Group A	Group B
Detrusor contractility	N (%)	N (%)
V W	5 (2.9)	3 (4.0)
W -	23 (13.2)	12 (16.0)
W +	31 (17.8)	19 (25.3)
N -	46 (26.4)	25 (33.3)
N +	45 (25.9)	14 (18.7)
ST	24 (13.8)	2 (2.7)
Total	174 (100)	75 (100)

Figure 1 - Detrusor contractility distribution in women without anterior POP

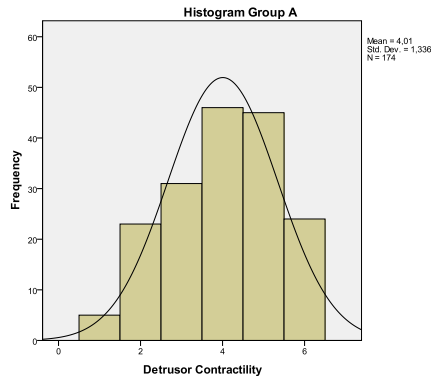


Figure 2 - Detrusor contractility distribution in women with anterior POP

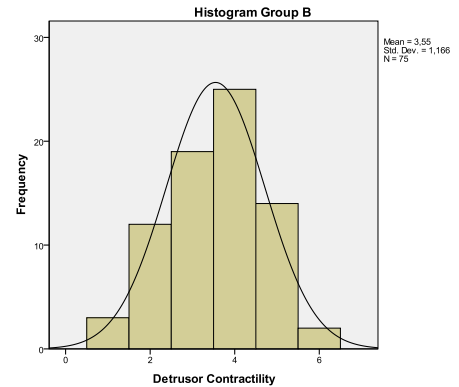


Table 3 – Urethral resistance in women without and with anterior POP

	Group A	Group B
Urethral resistance	N (%)	N (%)
0	144 (82.8)	51 (68.0)
1	22 (12.6)	21 (28.0)
2	4 (2.3)	2 (2.7)
3	3 (1.7)	1 (1.3)
4	1 (0.6)	0
5	0	0
6	0	0
Total	174 (100)	75 (100)

Figure 3 - Urethral resistance distribution in women without anterior POP

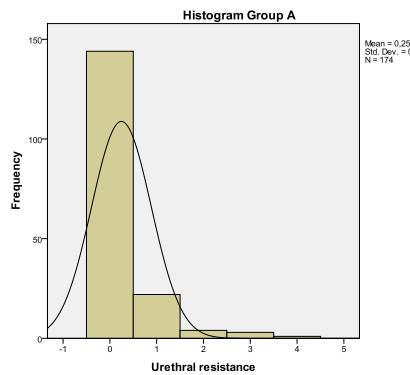
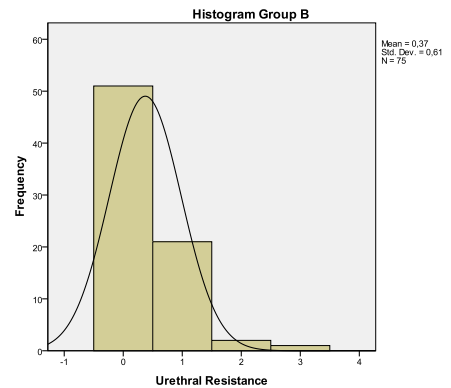


Figure 4 - Urethral resistance distribution in women with anterior POP



**Interpretation of results**

Most women with anterior compartment POP had an urethral resistance grade 0 and W+/N- detrusor contractility. As expected, detrusor contractility was significantly lower and urethral resistance significantly higher in group B than in group A. The main shortcoming of this study is the exclusion of women who could not urinate or exhibited valsalva voiding, which may be indicative of bladder outlet obstruction (BOO).

**Concluding message**

Using Schäfer’s nomogram in this population, incontinent women with anterior compartment POP revealed a significant lower contractility and a higher resistance than women without POP. This may mean that the presence of an anterior POP not only contributes to BOO but also affects detrusor contractility.

**References**

1. (1) Rosario D J, Woo H, Chapple C. Definition of Normality of Pressure-Flow Parameters Based on Observations in Asymptomatic Men. *Neurourol Urodyn* 2008;27:388-394.

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<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>It is 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>