

## URODYNAMIC AND CLINICAL PARAMETERS IN FUNCTIONAL AND ANATOMIC FEMALE BLADDER OUTLET OBSTRUCTION.

### Hypothesis / aims of study

Bladder outlet obstruction in women can be caused by a variety of conditions. Classically it is thought of in anatomical terms, but many functional conditions can also result in bladder outlet obstruction in women. Some studies have excluded functional causes in their analysis of female bladder outlet obstruction when trying to standardize urodynamic diagnostic criteria.<sup>1-2</sup> We sought to compare the clinical presentation and urodynamic characteristics of functional and anatomic obstruction in women to determine if there is a difference between the two. We also wanted to determine if there was any difference between the different causes within these broader categories of obstruction

### Study design, materials and methods

After obtaining Institutional Review Board approval, we performed a retrospective review of all videourodynamic studies performed from 03/2003 to 08/2009 at a single institution. The diagnosis of bladder outlet obstruction was made utilizing videourodynamic criteria of a sustained detrusor contraction of any magnitude with radiographic evidence of obstruction.<sup>3</sup> Only those studies with a final diagnosis of bladder outlet obstruction were included for analysis. Demographic data, symptomatology at presentation, and urodynamic parameters were collected. Patients were categorized as anatomically obstructed if obstruction was due to: prolapse, urethral sling, stricture, or extrinsic obstruction from other causes. Patients were categorized as functional obstruction if obstruction was due to: dysfunctional voiding (DV), detrusor external sphincter dyssynergia (DESD), or primary bladder neck obstruction (PBNO). Categorical variables were compared using chi-squared test. Continuous variables were compared using t-tests and analysis of variance. Cases were excluded in analysis if urodynamic, clinical, or demographic data was missing.

### Results

A total of 157 patients were identified and analyzed after exclusion. Of those patients, 86(54.8%) had anatomic obstruction and 71(45.2%) had functional obstruction. The distribution by specific causes of obstruction includes: 18(11.5%) DESD, 38(24.2%) DV, 22(14%) prolapse, 31(19.7%) obstructing urethral sling, 26(16.6%) stricture, 16 (10.2%) PBNO, and 6(3.8%) other.

	Functional	Anatomic	p-value
Median age in yrs	46 (28-85)	62.5 (27-90)	<0.001
# with Preop Storage Sxs	38 (53.5%)	50 (58.8%)	0.5060
# with Preop Voiding Sxs	37(52.1%)	57 (66.3%)	0.0715
Median First Desire (cc)	139 (26-830)	145 (3-731)	0.162
Median Normal Desire (cc)	211(51-1401)	200 (76-731 )	0.040
Median Maximum Capacity (cc)	358 (147-1500)	350 (142-849)	0.144
Median Qmax (ml/s)	10.0 (0-35.7)	6.0 (0-41.7)	0.005
Median Pdet Qmax (cm H20)	36.5 (11-95)	33.5 (3-154)	0.564
Median Pdetmax (cm H20)	43 (5-154)	39.5 (15-156)	0.833
Median % PVR	38.4% (0-100)	43.8% (0-100)	0.34
Median Compliance (cc/cmH20)	78.6 (10.35-470.5)	94.63 (23.1-570)	0.248
Median End Filling Pressure (cmH20)	5 (0-20)	4 (0-18)	0.061
Detrusor Overactivity (%)	27(38%)	27(31.4%)	0.383
Obstruction Diagnosed by Fluoroscopy Only (%)	6 (8.45%)	16(18.6%)	0.0681

When stratified by specific cause of obstruction, there were statistically significant differences in preoperative voiding symptoms ( $p=0.003$ ), age ( $p<0.001$ ), end filling pressure ( $p=0.017$ ), Qmax ( $p=0.012$ ), Pdet Qmax( $p=0.006$ ), Pdetmax ( $p=0.011$ ), and %PVR ( $p=0.001$ ) between the various causes. When specifically comparing non-neuropathic DV to neuropathic DESD there was no difference in prevalence of preoperative voiding ( $p=0.176$ , 52.6% vs 33.3%) or storage symptoms ( $p=0.457$ , 60.5% vs 50%), but there was a higher prevalence of detrusor overactivity in those with DESD (66.7%) compared to those with dysfunctional voiding (26.3%)( $p=0.004$ ). There was also a difference in age at presentation ( $p=0.003$ ), end filling pressure ( $p=0.019$ ), and %residual ( $p=0.018$ ) between those with DESD compared to DV.

### Interpretation of results

Despite presenting at a significantly younger age patients with functional obstruction compared to anatomic obstruction present with similar symptomatology. Even though there is a significant difference in maximum flow rate, the detrusor pressure at maximum flow rate was no different between female patients with anatomic bladder outlet obstruction compared to functional obstruction. This difference may reflect the fixed vs dynamic nature of obstruction between these groups. When assessing neuropathic vs. non-neuropathic functional sphincteric dysfunction, the incidence of detrusor overactivity and % post void

residual were significantly higher in the DESD group compared to DV and may reflect a higher level of bladder dysfunction due to underlying neurologic disorder in these patients compared to those with DV.

#### Concluding message

Female patients with anatomic and functional bladder outlet obstruction present with similar symptomatology and minimal differences in urodynamic parameters. As such they should not be treated as different entities and patients with both types should be included in future studies trying to further characterize bladder outlet obstruction in women.

#### References

1. Lemack and Zimmern: J Urol 2000; 163:1823-28
2. Chassagne, et al: Urology 1998; 51:408-11
3. Nitti, et al: J Urology 1999; 161:1535-1540

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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>Yes</b>
<b><i>Specify Name of Ethics Committee</i></b>	<b>New York University Institutional Review Board</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>