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IS ABDOMINAL STRAINING SEEN ON URODYNAMICS A NORMAL VARIANT OF FEMALE VOIDING OR AN ARTIFACT?

Hypothesis / aims of study
Pressure flow studies (PFS) are currently our best method for evaluating the micturition cycle. Straining during the voiding phase has been commonly seen among women. It has been debated if this is an artifact of urodynamic (UDS) testing or a normal variant in female voiding. Using a prospective design, we evaluated whether the 7-french urethral UDS catheter is the cause of previously noted abdominal straining patterns on UDS.

Study design, materials and methods
Women with various etiologies of voiding dysfunction were prospectively included for evaluation. Patients with a neurogenic etiology or pelvic organ prolapse were excluded. All women underwent free flow uroflowmetry (FFS) with a 9 Fr. rectal manometer balloon in place to evaluate abdominal straining and then had multichannel video urodynamics performed. Cystometrography was performed using a 7 Fr. double lumen urethral catheter, rectal balloon manometer and perineal patch electrodes. Statistical analysis using a paired T-test or Chi-square test were used to evaluate differences amongst free flow and UDS parameters between the FFS and PFS testing groups.

Results
Twenty women with a mean age of 51.8 years (range 29-68) underwent a free flow study (FFS) in the seated position. Abdominal pressure tracings were recorded throughout the free flow. Subsequently, a UDS evaluation including a PFS was performed. No difference was observed for maximum flow (Qmax; 18.2 ml/s and 18.5 ml/s for FFS and PFS respectively) or average flow (Qavg; 8.7 ml/s and 8 ml/s for FFS and PFS). Time to Qmax and flow time was significantly longer during the PFS compared to the FFS (19.8 s vs. 8.3 s, p = 0.0036) and (46.9 s vs. 26.4 s, p = 0.035). Maximum abdominal pressure (Pabd) and Pabd at Qmax were significantly elevated during the PFS compared to the FFS (32.7 cmH20 and 11.7 cmH20, p = 0.0012) and (11.8 cmH20 and 4.4 cmH20, p = 0.0036). Abdominal straining was seen more frequently during PFS compared to FFS (61% vs. 36%, p = 0.02). All patients with abdominal straining on FFS were noted to have abdominal straining on PFS.

Key: Flow max-Qmax, Average Flow-Qavg

Interpretation of results
For the first time, objective UDS data demonstrates an increase in the amplitude and frequency of abdominal straining during PFS with a urethral catheter in place compared to a FFS. The fact that this straining pattern is significantly different between the FFS and PFS implicates the urethral catheter as the causative factor. Similarity in flow rates between the 2 groups is likely due to compensation by increased abdominal straining during the PFS to reach Qmax. This is further supported by the observation of an elevated time to Qmax in this group.

Concluding message
Given the findings of this study, the presence of abdominal straining during a PFS should not be considered as a normal variant of female micturition but is likely secondary to the urethral catheter. Uroflowmetry with rectal manometry preceding the PFS can further elucidate abdominal straining present on a PFS.

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Is this a clinical trial?	**Yes**
Is this study registered in a public clinical trials registry?	**No**
What were the subjects in the study?	**HUMAN**
Was this study approved by an ethics committee?	**Yes**
Specify Name of Ethics Committee	**Institutional Review Board**
Was the Declaration of Helsinki followed?	**Yes**
Was informed consent obtained from the patients?	**Yes**