

CAN POST-VOID RESIDUAL URINE STAND ALONE IN THE ASSESSMENT OF VOIDING DYSFUNCTION IN WOMEN?

Hypothesis / aims of study

The use of invasive urodynamics before treatment of uncomplicated, predominant stress urinary incontinence (SUI) has been debated after three recent randomized controlled trials (RCT). In order to exclude patients with severely impaired bladder emptying, all patients with post-void residual urine (PVR) of 150 ml or more were excluded from all three studies. The use of a cut-off of 150 ml for the PVR seems to be arbitrary and not evidence based.

The International Urogynecological Association and the International Continence Society define voiding dysfunction (VD) as an abnormally slow and/or incomplete micturition, diagnosed by symptoms and urodynamic investigations.

To the best of our knowledge, there are no studies on the sensitivity of PVR as a screening test for VD. The aim of the present study was to investigate the sensitivity of PVR < 150 ml to exclude urodynamic VD, and to categorize the type of VD in patients with PVR < 150 ml.

Study design, materials and methods

We retrospectively reviewed the medical records of all patients who underwent invasive urodynamics from January 1st 2013 to December 31st 2013. Examinations with abnormality in the pressure-flow part of the examination were investigated further. We retrieved information regarding the patients' spontaneous uroflowmetries, either by directly viewing the uroflowmetry results or by reading the charts. A normal uroflowmetry consists of a smooth, arc-shaped flow rate curve; with a maximum flow rate of minimum 15 ml/s. Abnormal uroflowmetries with voided volumes under 150 ml were considered inconclusive. PVR was registered in all patients with abnormal uroflowmetries. Patients were divided into a group with PVR < 150 ml and a group with PVR > 150 ml. All patients with abnormal uroflowmetries were analyzed for bladder outlet obstruction (BOO), using a BOO nomogram for women (1).

Results

During 2013, we conducted 205 invasive urodynamics, 43 pressure-flow studies were not available for analyzes, and 106 had normal pressure-flows.

56 had abnormal pressure-flows. 28 of these presented normal uroflowmetries, five had no uroflowmetries available for analyses, and three uroflowmetries were inconclusive due to low voided volumes.

The remaining 20 had abnormal uroflowmetries, two of them with PVR > 150 ml (520 ml and 178 ml, respectively). Finally, 18 patients with PVR ≤ 150 ml (range 0-50 ml) had abnormal uroflowmetries. Their maximum flow rates spanned from 2.1 ml/s to 23.4 ml/s, and all uroflowmetries with maximum flow rates ≥ 15 ml/s displayed abnormally shaped curves.

Based on a BOO nomogram, seven of the patients had mild BOO (fig. 1) and two had moderate BOO. One patient had severe BOO, her pressure-flow revealed a maximum detrusor pressure of 135 cmH₂O, maximum flow rate was 5.3 ml/s and PVR was zero. Eight patients did not have BOO; six of these had no detrusor pressure on the pressure-flows. The remaining two had uneven and discontinuous flow curves, despite detrusor pressure.

The two patients with PVR ≥ 150 ml had pressure-flows demonstrating mild obstruction and no detrusor pressure, respectively.

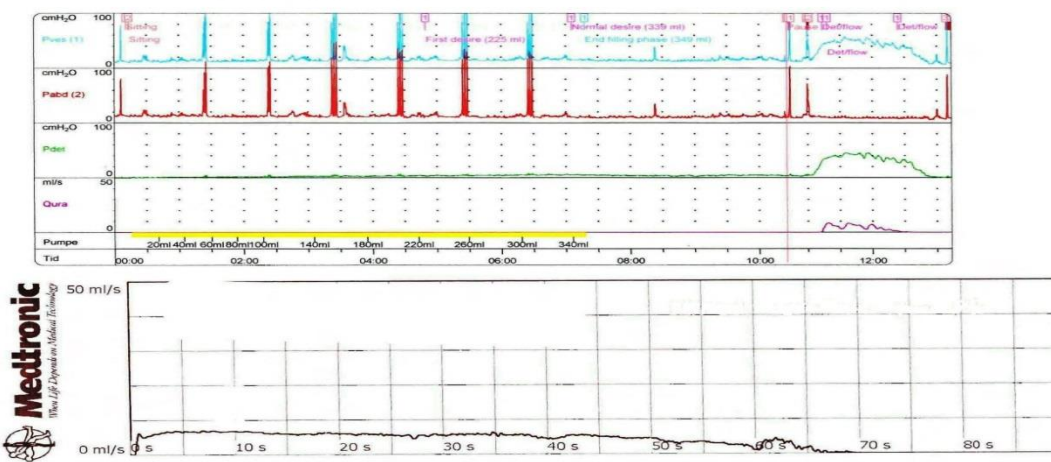


Figure 1. Patient with mild BOO. The maximum detrusor pressure was 47 cmH₂O and there was no abdominal straining. The flow was abnormally low (maximum flow rate 8 ml/s) which was in consistency with the result of the uroflowmetry (maximum flow rate 7 ml/s, voided volume 333 ml). PVR < 50 ml.

Interpretation of results

Our results show that only 10 % of the patients with urodynamic VD have PVR > 150 ml (2/20), indicating that PVR has a very low sensitivity for identifying VD. We have shown that PVR can be normal (0 ml) in patients without detrusor function, and in patients with obstruction. Since a midurethral sling is an obstructive procedure (2), one should exert caution when considering anti-incontinence surgery in this patient category. A subgroup analysis from the largest of the RCT's showed that patients with SUI and concurrent VD have a tendency toward poorer treatment outcome compared to patients without VD (successful outcome 62.1 % vs. 78.3% in patients with and without preexisting VD respectively, p=0.064). The study was not even powered for the comparison. (3) However, treatment outcome in patients with SUI and concurrent VD may vary depending on the type of VD. This matter requires further research.

We found a high percentage of urodynamic VD in this study, which may be explained by the fact that the population is selected. We perform invasive urodynamics only when there, after non-invasive urodynamics, remains a urodynamic question with a therapeutic consequence.

Pressure-flows were inconclusive in 43 of the invasive urodynamics. This is explained by the mere fact that, at our department, pressure-flow is not repeated if the urodynamic question regards the cystometric part of the study. However, the majority of these examinations showed detrusor overactivity resulting in voiding, before the pressure-flow could be initiated.

When performing uroflowmetry, we routinely ask our patients to void when they feel a normal desire to void. Afterwards we ask our patients if their voiding was similar to their usual voiding and if not we repeat the examination at another appointment. 28 patients with abnormal pressure-flows had normal uroflowmetries, emphasizing the importance of consistency. A patient's symptoms and history should correlate to the results of both the non-invasive and invasive urodynamics, before physicians act upon them.

Uroflowmetry is a non-invasive, inexpensive and simple investigation. There is no risk of urinary tract infection and it subjects the patient to minimal embarrassment and inconvenience. Together with PVR, it provides us with essential and basic information regarding a patient's voiding pattern.

Concluding message

Post-void residual urine cannot stand alone as a screening test to exclude voiding dysfunction. Uroflowmetry is necessary for the assessment of voiding dysfunction, even in patients with normal post-void residual urine.

References

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3. Sirls LT, Richter HE, Litman HJ, Kenton K, Lemack GE, Lukacz ES, et al. The effect of urodynamic testing on clinical diagnosis, treatment plan and outcomes in women undergoing stress urinary incontinence surgery. *J Urol.* 2013 Jan;189(1):204–9.

Disclosures

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