

## CAN THE COMBINATION OF TWO NON-INVASIVE EVALUATIONS OF BLADDER OUTLET OBSTRUCTION (BOO) RUB OUT SOURCES OF VARIABILITY USING PENILE CUFF TEST (PCT)?

### Hypothesis / aims of study

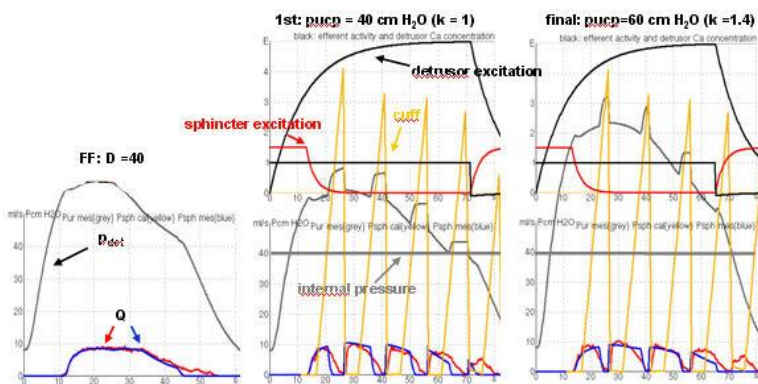
In men suspected of benign prostatic enlargement (BPE), the main problem is to evaluate BOO. ICS nomogram and the Abrams-Griffiths number (**AG**) allow the analysis of invasive pressure-flow studies (PFs). The **PCT** [1] and its nomogram use non-invasive recordings of the flow vs. the penile cuff pressure ( $p_{\text{cuff}}$ ) and analyze a critical point the coordinates of which are maximum flow rate ( $Q_{\text{max}}$ ) and cuff pressure at flow interruption ( $p_{\text{cuff.int}}$ ). That analysis suffers from the difficulty to accurately locate the coordinates, mainly  $p_{\text{cuff.int}}$ . Our objective was to try to rub out that deficiency using the **D index** [2] derived from the VBN method which gives from a free flow (FF) a relationship between the **VBN** parameters: urethral compression (**pucp**) and detrusor contractility (**k**). **AG** is strongly correlated with **pucp** [3].

### Study design, materials and methods

Retrospectively, 44 sessions (1 FF and 1 **PCT** the same day) of BPE patients were analyzed (16 patients 1 session, 14 patients 2 sessions at 1 month interval). The **PCT** obeys the general law of flow in an elastic pipe: the flow is governed by the prostatic compression at low  $p_{\text{cuff}}$  (equivalent to a FF) and by the cuff at high  $p_{\text{cuff}}$ .

The **D index** was evaluated from the FF and the first part of the flow during the first cuff inflation leading to the relationship between the **VBN** parameters; the real values of **k** and **pucp** were obtained from the analysis of the 2 first cuff inflations.

Then, **AG** was obtained from a theoretical voiding (initial volume = 300 mL, catheter 6F, above values of **k** and **pucp**).



### Results

1- **D index** values were not significantly different between FF and **PCT** (1 session) or between 2 sessions ( $\Delta D = 0.24 \pm 1.67$ ).  
 2- Evaluation of obstruction using the 3 methods was reached from 38 sessions; same evaluation only in 16 sessions (42.1%), under evaluation of obstruction by **PCT** in 22 other (57.9%).

For patients with 2 sessions, **PCT** evaluation of obstruction was the same in 17/19 (89.4%) cases.

3- High discrepancies between **PCT** evaluation of obstruction and **AG** were observed when **AG**  $\geq 70$ .

### Interpretation of results

There are several, well known, sources of variability, contributing to the differences between invasive and non-invasive classifications. Often, combination with peak flow rate is proposed to obtain a high agreement.

Analysis using the **VBN** model verifies that there is a brisk transition between flow governed by prostatic obstruction and flow governed by cuff compression.

Evaluation of BOO using the Newcastle nomogram remains adequate for low or mild obstruction but is not accurate for high obstruction.

So, Combination of **VBN** analysis (which takes into account possible abnormalities of the nervous control) and **PCT** allows obtaining **AG** free of all the possible effects due to the examination.

### Concluding message

Indeed a complicated method, combination of the two non-invasive methods **VBN** and **PCT** allows an accurate evaluation of BOO in men suspected of BPE according with ICS criterion which avoids all causes of variability.

### References

1. J Urol 2005; 174: 1323.
2. BJU 2008; 101: 995-999.
3. Ann Réadap Méd Phys 2005; 48: 11-19.

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