

## ULTRASOUND EVALUATION OF THE PELVIC FLOOR IN PATIENTS WITH URINARY INCONTINENCE

### Hypothesis / aims of study

Perineal ultrasound allows a real time and dynamic assessment of the pelvic floor in women with urinary incontinence. The meaning of an open bladder neck is still controversial, although it is frequently associated with urinary stress incontinence.

The aim of this study was to analyse and compare ultrasound parameters concerning the anatomy and mobility of the bladder neck and urethra between two groups of women: with pure stress urinary incontinence (SUI) or mixed urinary incontinence (MUI).

### Study design, materials and methods

We reviewed perineal ultrasounds performed in our institution, between 2012 and 2016, in patients with clinical diagnosis of SUI or MUI. Patients with previous anti-incontinence surgery or with concomitant pelvic floor prolapse  $\geq$  grade 2 (POP-Q quantification system) were excluded.

We used a 2-5MHz microconvex probe (*GE Ultrasound Voluson 730*) placed in the interlabial region of the vulva in a sagittal orientation, with the patient in lithotomy position. The parameters evaluated, at rest and Valsalva, were the bladder neck status (open or closed), the distance from bladder neck to the most inferior point of the symphysis pubis (BN-SP), the  $\alpha$  angle (between BN-SP line and the central axis of the SP), and the posterior urethrovesical  $\beta$  angle (between the urethral axis and the bladder base). We then calculated the variation of these parameters during Valsalva comparing to rest (V-R).

### Results

Eighty patients (n = 80) were included: 33 with SUI (mean age = 55,2  $\pm$  12,4 years old, median parity = 2) and 47 with MUI (mean age = 61,5  $\pm$  12,4 years, median parity = 2).

The group with MUI had a higher prevalence of open bladder neck comparing to SUI patients, both at rest (57.5% vs. 39.4% respectively, with  $p = 0.08$ ) and during Valsalva (74.5% vs. 51.5% respectively, with  $p = 0.03$ ). There were no statistically significant differences between the two groups in the variation V-R of the  $\alpha$  and  $\beta$  angles nor the BN-SP distance (detailed results in table 1).

### Interpretation of results

In our sample the bladder neck opening was more common in patients with MUI, at rest and during Valsalva, which can support a possible relation between the entry of urine in the proximal urethra and urinary urgency or detrusor overactivity. However, the also high prevalence of this finding in SUI patients shows that its significance remains doubtful. It would be interesting to evaluate incontinent patients by perineal ultrasound and urodynamics simultaneously, and also to study an eventual relation between the continence status after midurethral slings and the bladder neck status.

### Concluding message

Perineal ultrasound allows a dynamic and holistic evaluation of the pelvic floor in patients with urinary incontinence, with many advantages such as its easy availability, low cost, simple technique and noninvasive nature. More studies are needed to determine the significance of an open bladder neck.

	Total of patients (n = 80)	SUI (n = 33)	MUI (n = 47)	p
<b><math>\alpha</math> angle (<math>^{\circ}</math>)*</b>				
Rest (R)	97,2 $\pm$ 25,3	94,5 $\pm$ 23,8	99 $\pm$ 26,6	
Valsalva (V)	122,8 $\pm$ 28,6	122,2 $\pm$ 27,3	123,2 $\pm$ 30	
Variation (V-R)	28,4 $\pm$ 15	28,1 $\pm$ 10,8	28,2 $\pm$ 17,9	0.972
<b><math>\beta</math> angle (<math>^{\circ}</math>)*</b>				
Rest (R)	132,1 $\pm$ 17,7	134,9 $\pm$ 15,7	130,3 $\pm$ 18,9	
Valsalva (V)	148,1 $\pm$ 21,1	148,6 $\pm$ 17,1	147,8 $\pm$ 23,8	0.197
Variation (V-R)	20,4 $\pm$ 14	15,7 $\pm$ 8,6	27,3 $\pm$ 15,5	
<b>BN-SP distance (mm)*</b>				
Rest (R)	22,6 $\pm$ 6,0	22,9 $\pm$ 4,5	22,6 $\pm$ 6,1	
Valsalva (V)	20,4 $\pm$ 5,5	20,4 $\pm$ 4,2	19,6 $\pm$ 5,1	
Variation (V-R)	- 3,8 $\pm$ 5,5	- 2,3 $\pm$ 4,5	- 3,7 $\pm$ 5,6	0.165
<b>Bladder neck opening**</b>				
Rest	40 (50%)	13 (39,4%)	27 (57,5%)	<b>0.08</b>
Valsalva	52 (65%)	17 (51,5%)	35 (74,5%)	<b>0.03</b>

**Table 1** – Measured parameters in the two groups of patients. Results expressed in the form of mean  $\pm$  standard deviation\* or number of patients (percentage)\*\*

References

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Disclosures

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