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**Title:** DETECTION OF VALSALVA LEAK POINT PRESSURE WITH COLOUR DOPPLER – NEW METHOD FOR ROUTINE USE

### Aims of the study:

The measurement of Leak Point Pressure (LPP) has become an important method of assessing urethral function in patients with stress urinary incontinence. Different measurement techniques for detection LPP were described. To provoke leakage the Valsalva manoeuvre as well as cough can be used.

Ultrasound is one of the methods used in monitoring of the lower urinary tract, and is an integral part of urogynecological examination. In previous studies colour Doppler imaging was able to demonstrate urine leakage through the urethra. Use of ultrasound contrast medium significantly increases the sensitivity of Doppler examination, and is a possible to ascertain exactly the onset of the leakage.

The aim of our study was to evaluate the use of colour Doppler imaging (CDV) as a measurement technique for detection of Valsalva LPP.

### Methods:

20 women with urodynamically proved stress incontinence were included in the prospective pilot study. Their mean age was 63,6 years (SD-11,9), mean BMI was 24,3 (SD-1,79), and mean parity was 2 (SD-0,447). Before the ultrasound examination, the urinary bladder was filled to 300 ml with sterile saline. For the perineal examination a curved array probe 5 (3,5) MHz was used and the introital examination was performed with sector probe 7 (5) MHz (Acuson 128 XP 10). For all women, we assessed the position and mobility of the bladder neck and the presence of funneling. Funneling was described as the increase in distance between the inner edges of proximal urethra during Valsalva. The measurements were taken in supine position at rest, during Valsalva and squeezing. The same measurements were performed with special transrectal balloon catheter for the measurement of intraabdominal pressure.

Subsequently, we performed a perineal examination using an ultrasound contrast medium (Levovist, Shering). We performed the CDV for detection of urine leakage and simultaneous recording of abdominal pressure to detect VLPP. The ultrasound video signal was digitized by a frame grabber card and displayed on a computer screen. Abdominal pressure was simultaneously recorded with ultrasound signal and the pressure was superimposed on the ultrasound picture /fig. 1-3/. These pictures were stored in a computer for analysis by slow-motion playback. Measurements of VLPP were repeated three times.

**Fig. 1**

VLPP

/arrow-the beginning

**Fig. 2**

Maximal leak

/arrow- the leak/

**Fig. 3**

VLPP

/arrow-the beginning

of the leakage/

the same patient  
as in fig. 1

of the leakage/



### **Results:**

Mobility of the urethra did not differ from values common in incontinent patients as published in previous studies. The mobility was not influenced with transrectal catheter. In all patients funneling and urine leakage were diagnosed. For all patients VLLP was obtained (range 27-101 cm H<sub>2</sub>O). VLPP was reproducible in repeated measurements. The mean differences were not significant ( $p=0,62$ ).

### **Conclusions:**

Colour Doppler imaging can objectify a leak of urine. A contrast medium significantly increases the sensitivity of Doppler examination. Thus, combination of colour Doppler with contrast medium and simultaneous measurement of abdominal pressure is a new tool for VLPP measurement. The clinical use is easy and reproducible. This method has potential to increase the importance of ultrasound in examination of the lower urinary tract.

### **References:**

1. Neurourol. Urodyn. 18 (1999) : 309-310
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3. Neurourol. Urodyn. 19 (2000) : 455-456

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