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Title: THE EFFECT OF INCREASING OF INTRAABDOMINAL PRESSURE ON THE POSITION OF THE BLADDER NECK IN ULTRASOUND IMAGING

Aims Of Study:

The position and the mobility of the bladder neck are important factors in the aetiology of genuine stress incontinence (GSI). The aim of this study was to evaluate the effects of the different intraabdominal pressures (30cm and 60 cm H_2O as well as maximal intraabdominal pressure) on the position and mobility of the urethrovesical junction (UVJ) and to determine the changes of other ultrasound parameters of lower urinary tract.

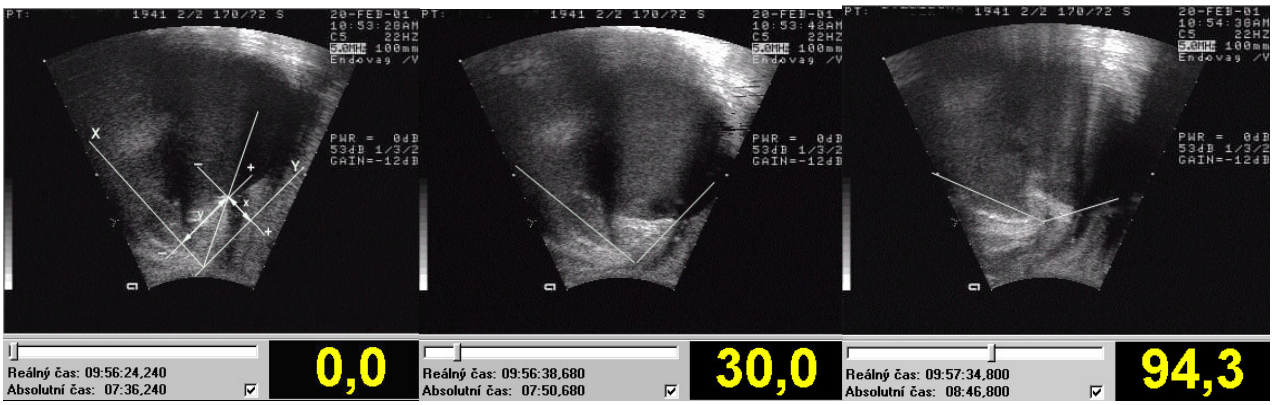
PATIENTS AND METHODS

Twenty women with proven genuine stress incontinence (GSI) participated in the 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). Our diagnosis of GSI consisted of physical examination, urodynamics, and pad-weight test. Then, perineal and introital ultrasound examinations in the sagital plane and manometric measurement in the patients in supine position, (by Acuson 128 XP 10, curved array probe 5 MHz and 7 MHz sector vaginal probe) were performed. The measurements of ultrasound parameters were performed during the different abdominal pressures (30cm and 60 cm H_2O as well as maximal intraabdominal pressure). Manometric results and ultrasound imaging were evaluated on a computer. The position and mobility of UV- junction were described by the following parameters: γ is the angle between the line connecting the inferior point of symphysis with bladder neck and the axis of symphysis (X), p is the distance between the inferior point of symphysis and UV- junction, x is the distance between UV-junction and axis Y, y is the distance between UV - junction and axis X. The axis X is axis of symphysis and Y is perpendicular to axis X in the inferior point of symphysis (Figure 1). The bladder was filled with 300 ml of sterile saline. The measurement of intraabdominal pressure was performed by a special transrectal balloon catheter. Funneling was described as the increase in distance between the inner edges of proximal urethra during Valsalva.

Results:

Based on our ultrasound imaging, we found a statistically significant difference in the position of the urethrovesical junction during increasing of intraabdominal pressure on 30cm H_2O and on the maximal intraabdominal pressure (the mean value = 93cm H_2O, $p \leq 0{,}001$). UV-junction during increasing of intraabdominal pressure on the maximal intraabdominal pressure is lower, distances x is 10mm (SD=5,51), y is 11,9mm (SD=6,77), p is 16,7mm (SD=5,1). These distances are shorter and the gama angle is larger than during increasing of intraabdominal pressure on 30cm H_2O (Tables 1and 2).

Figure 1



X - the axis of symphysis *Y - the perpendicular to axis X in the inferior point of symphysis*

p - distance between the inferior point of symphysis and UVJ

x - distance between UV- junction and axis Y

y - distance between UV- junction and axis X (the position of UVJ on the axis X,Y is indicated by + or -)

γ angle - the angle between the line connecting the inferior point of symphysis with bladder neck and the axis of symphysis

Tab.1 Ultrasound of the lower urinary tract - angle γ

Intraabdominal pressures		0 cmH_2O	30cm H_2O	60cm H_2O	Max.press.
angle γ	**x**	**81,7**	**95,7**	**128,8**	**129,9**
SD	x	8,02	26,63	24,13	24,07

Tab.2 Changes of US parameters during different intraabdominal pressures

Intraabdominal pressures		**0 cmH_2O**	**30cm H_2O**	**60cm H_2O**	**Max.press.**
Parameter					
x	x	-5	0,9	9,7	10,0
y	x	28,7	20,8	11,8	11,9
p	x	30	24,4	16,5	16,7
funneling	x	4,12	4,13	5,66	5,83

x - the mean value

Conclusions:

Our preliminary results suggest that the intraabdominal pressure 30 cm H_2O for evaluation of mobility UVJ, as a standard is not accurate for evaluation of maximal mobility (and funneling) of UVJ. We would like to recommend the maximal intraabdominal pressure for better evaluation of maximal mobility and funneling of UVJ.

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