Results

The data are shown in Tables I and II. All normal volunteers had a median score of 4 except in two cases with a score of 3. In the incontinent group ten cases had a score of 2 and five cases had a score of 1. The Mann-Whitney rank sum test showed that the differences between the ultrasound scores in the two groups was statistically significant (chi-square 22.694, P > chi-square < .0000).

Conclusions

We can affirm that color ultrasound imaging of the urethra seems to be feasible and useful in association with UPP in the diagnosis of ISD even if the color ultrasound imaging of the urethra cannot replace the UPP measurement.

Table I: Echographic score in normal volunteers

Pts	Age	Echographic score
GA	39	4
PA	23	4
IR	25	4
AM	25	4
FP	35	3
CL	30	4
MT	28	4
LV	20	4
CM	27	4
RR	29	3
AS	31	4
LR	32	4
DG	33	4
Mean value	29.0	3.8

Table II: Echographic score and MCUP in patients affected by ISD

Pts	Age	Echographic score	MCUP (cm H_2O)
BA	72	1	24.6
CG	65	1	37.5
ZA	47	1	21.2
TG	58	2	38.2
FA	81	1	24.1
ZV	71	2	29.0
BL	76	2	20.9
GA	67	2	23.2
DG	42	2	25.7
RN	60	1	27.5
LP	64	2	33.3
RB	47	2	25.0
CA	62	2	27.3
BB	74	2	28.0
DS	72	2	26.5
Mean value	63.9	1.6	27.4

56

Author(s):

M. Otcenasek, M. Halaska, J. Zizka*, A. Martan, J. Masata

Institution, city, country:

Department of Obstet. and Gynecol, 1st Medical Faculty, Charles University, Prague, Czech Republic.
Department of Radiodiagnostics, Hradec Kralove, Czech Republic*.

COMPUTER ASSISSTED ULTRASOUND EVALUATION OF THE MOBILITY OF WHOLE URETHRA –THE USE OF THE METHOD IN TVT, BURCH KOLPOSUSPENSION AND HEALTHY VOLUNTEERS – PILOT STUDY.

Aims of Study

Good tissue resolution and wide accessibility makes the ultrasound an excellent method for assessment of mobility of female urethra and bladder neck. However, several problems hinder the scientific validity of the standard ultrasound examination:

1. The upper pole of the symphysis, a necessary structure for setting of coordinates, is not always clearly visible. The visualization of symphysis as a reference structure during pressure maneuvers is not easy.
2. During the examination, the probe is sometimes pressed to hard. This can artificially influence the examined structures. To be able to delineate the distal urethra in its non disturbed position, it is necessary to press the probe very gently.

We have developed a method for ultrasound assessment of the mobility of distal urinary tract at our experience with dynamic MRI. It avoids the mentioned drawbacks of standard ultrasound examination.

The aim of the study was to test the feasibility of our method on incontinent and healthy patients and to prove its possible use in larger a clinical study.

Methods

A short section of the ventral border of the symphysis, and the central echo of the discus interpubicus (Figure 1)

can be used to reconstruct the position of the symphysis in each image (Figures 2-6). This reduces the need for visualization of the whole symphysis and direct estimation of its axis, thus leaving the examiner free to gain a clear, non distorted image of the urethra and bladder base. The outlines of urethra, bladder neck and symphysis then mounted into one picture with the symphysis as a reference structure. Thus, a system of coordinates which is universal to all pictures is established. Standard x and y axes are then used to describe the position of urethra and bladder neck. Vector analysis of mobility of bladder neck, middle urethra and external urethral meatus and the presence of funneling is assessed.

20 consecutive women with proved genuine stress incontinence (GSI) and 5 healthy volunteers were examined. After emptying via catheter, the bladder was filled with 300 cc of sterile saline. Perineal ultrasound examination was performed in supine position with 5 MHz curved array probe. In the GSI group, 10 women underwent Burch kolposuspension and 10 were assigned to TVT. The patients were reexamined 1-3 months after the surgery. Four images were used for the study: at rest, during Valsalva, during squeezing and one focused solely at symphysis. We

Results

Interesting information about mobility patterns of anterior pelvic compartment and its change after anti-incontinence surgery were noted and statistically analyzed.

The mobility of urethra and bladder neck has changed after both Burch kolposuspension and TVT procedure. Each procedure has its distinct change of the mobility of proximal, middle and distal urethra.

Conclusions

The method gives data suitable for mechanical analysis, and is a valuable tool for study both normal and pathological function of the distal urinary tract.

Figure 1 US sagital image of symphysis.

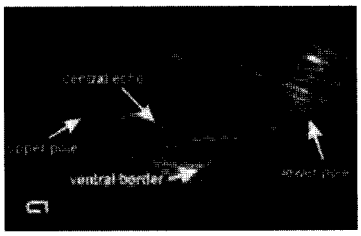


Figure 2 Outlines of important structures.

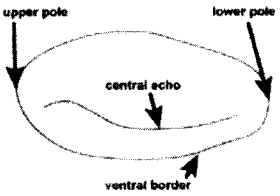


Figure 3 – Urethra during Valsalva maneuver.

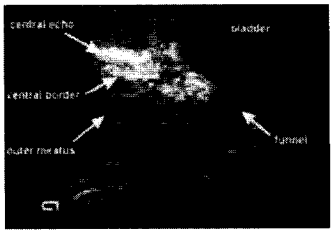


Figure 4 – Outlines of previous picture.

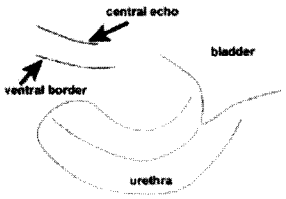


Figure 5 Composed drawing during Valsalva maneuver.

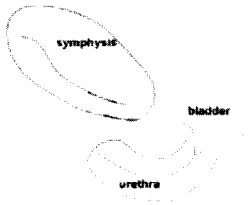
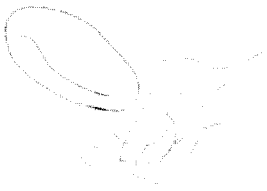


Figure 6 Difference between rest and Valsalva.



This work was supported by the Grant Agency of the Ministry of Health of Czech Republic grant No. 4855.