

PERINEAL ULTRASOUND PARAMETERS IN WOMEN WITH URINARY STRESS INCONTINENCE DUE TO URETHRAL HYPERMOBILITY

Hypothesis / aims of study

In the last years a variety of methods have been used for the assessment of urethro-vescical mobility. These include the cotton swab or Q-tip test, radiographic and ultrasonographic imaging.

Pelvic floor ultrasound is an investigational evaluation for the study of female urinary incontinence and prolapse which allows morphological and functional documentation at rest and during provocation tests. It seems relevant to establish the role of quantitative parameters as an independent variable in women with stress urinary incontinence due to urethral hypermobility.

The aim of our study was to compare the ultrasound measurements in two groups of patients with or without urethral mobility assessed with the Q-tip test.

Study design, materials and methods

In a prospective study 56 women underwent introital ultrasound. They had urinary stress incontinence. 13 women had a history of surgery for prolapse. Patient underwent an examination which included pelvic organ prolapse quantification (POP-Q) and Q-tip testing. Women with pelvic prolapse greater than second stage were excluded from the study. Urethrovescical junction hypermobility was defined by a maximum strain axis exceeding 30 degrees from the horizontal.

Perineal ultrasound was performed with an 3,5 MHz ultrasound transducer placed on the interlabial region of the vulva with the women in the supine position and a bladder filling of about 300 ml.

We used a rectangular coordinate system where the x-axis is determined by the central line of the pubic symphysis. The y-axis is constructed perpendicular to the x-axis at the lower border of the symphysis. Ultrasound measurements included the distances Dx (the distance between the y-axis and the bladder neck) and Dy (distance between the x-axis and the bladder neck), the urethral angle alfa (formed by the axis perpendicular to an reference line, such the central line of the symphysis, and by the urethral axis), the retrovesical angle beta assessed according to the recommendation of the ICI and the gamma angle (pubourethral angle between the distance between the bladder neck and the inferior border of the symphysis and the central line of the symphysis) at rest and on maximal straining (the Valsalva manouver).

Results

The mean age was 62 years (range 35-76 years). Mean body mass index (BMI) was 26. We performed then the Q-tip test in all the patients; a Q-tip >30 degrees was founded in 42 of the patients. We compared the results of Q-tip with the ultrasound parameters.

The table reports the measurements in terms of Q-tip test.

parametri	Q-tip<30°	Q-tip>30°	p value
Dx at rest	11,4	11,9	NS
Dx on Valsalva	12,6	15,7	NS
Dy at rest	27,5	16,5	NS
Dy on Valsalva	8,5	6,7	NS
alfa angle at rest	17	20	NS
alfa angle on Valsalva	38	54	0,004
beta angle at rest	102	126	0,018
beta angle on Valsalva	107	147	0,003

gamma angle at rest	106	112	NS
gamma angle on Valsalva	118	143	0,012

Interpretation of results

There were no significant differences between the 2 groups in terms of bladder neck position (distances Dx and Dy). However, there were significant differences in terms of angles. During Valsalva maneuver the urethra makes a rotational motion and were pushed far away from the symphysis as assessed by alfa and gamma angles.

Concluding message

The Q-tip test is a simple procedure to quantify bladder neck mobility. Pelvic floor ultrasound is an investigational evaluation for the study of female urinary incontinence and prolapse which allows morphological and functional documentation at rest and during provocation tests. These technique is simple, not invasive and without discomfort to the women and allows to visualise and to measure the urethral mobility.