

URODYNAMIC SURROGATE FOR ASSESSMENT OF URETHRAL HYPERMOBILITY IN WOMEN WITH STRESS URINARY INCONTINENCE: A PRELIMINARY REPORT

Hypothesis / aims of study

Urethral hypermobility, which can be assessed with Q-tip test, has been considered to be partly responsible for pathogenesis of women with stress urinary incontinence (SUI). Nonetheless, Q-tip test has lost favor due to patient discomfort [1]. Thus, the purpose of this study was to search a surrogate for assessment of urethral hypermobility by correlating the Q-tip angle and the urodynamic variables in women with SUI.

Study design, materials and methods

Between 2014 and 2017, all women with SUI and underwent Q-tip testing were reviewed. Patient characteristics, degree of prolapse determined by Pelvic Organ Prolapse Quantification system, Q-tip angle, the results of urodynamic studies, the Urinary Distress Inventory (UDI-6) Questionnaire and Incontinence Impact (IIQ-7) Questionnaire were reviewed from their medical records. Spearman correlation test, and univariate and multivariate backward stepwise linear regression analysis were performed as appropriate.

Results

A total of 29 women were reviewed in the study (Table 1). Age and pressure transmission ratio (PTR) at maximal urethral pressure (MUP) were negatively correlated with the Q-tip angle, whereas both maximum urethral closure pressure and score of Question 1 of IIQ-7 questionnaires were positively correlated with the Q-tip angle (Table 2). In multivariate backward stepwise linear regression, PTR at MUP was the only significant independent factor for predicting the Q-tip angle (Table 3, Fig 1).

Interpretation of results

Pelvic floor muscle weakens with advanced age, which is a plausible explanation for the decreased mobility of urethra. Besides, SUI women with urethral hypermobility may have an intact muscle tone from the finding of good correlation between Q-tip angle and maximum urethral closure pressure. SUI women with urethral hypermobility also complained of significant negative impact on doing house chores.

Concluding message

PTR at MUP is predictive of the Q-tip angle in women with SUI, which makes it a potentially surrogate for assessment of urethral hypermobility.

Table 1. Baseline data of women with stress urinary incontinence (n=29)

Variables	Values
Age (years)	55.7±11.9
Parity	2.9±1.1
Q-tip angle (degree)	47.0±15.9
POP-Q	
Ba	-2.1±1.3
C	-5.6±1.8
Clinical diagnosis	
Stress urinary incontinence	20 (69)
Mixed incontinence	9 (31)
Urodynamic diagnosis	
Urodynamic stress incontinence	29 (100)
Bladder oversensitivity	15 (52)
Detrusor oversensitivity	6 (21)
Functional bladder outlet obstruction	3 (10)
Pad weight (g)	41.0±60.7
Maximum flow rate (mL/s)	34.0±42.5
Voided volume (mL)	292±136
Post-void residual (mL)	91±73
Voiding time (s)	46±26
Strong desire (mL)	303±88
PdetQmax (cmH ₂ O)	23±14
MUCP (cmH ₂ O)	49.5±17.4
Functional profile length (cm)	2.4±0.8
PTR at MUP (%)	54.9±29.7
UDI-6	12.8±3.5
IIQ-7	14.7±5.7

Values are expressed as mean ± standard deviation or number (percentage). IIQ-7 = Incontinence Impact Questionnaire; MUCP = maximum urethral closure pressure; MUP = maximum urethral pressure; PdetQmax = detrusor pressure at maximum flow rate; POP-Q = Pelvic organ prolapse quantification system; PTR = pressure transmission ratio; UDI-6 Urogenital Distress Inventory Questionnaire.

Table 2. Correlations of Q-tip angle with clinical and urodynamic variables

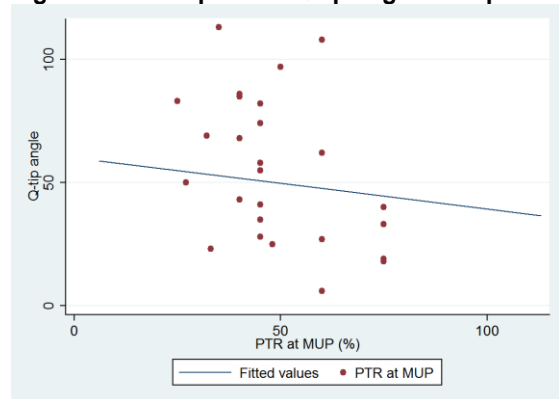
Variables	Spearman's rho	p
Age (years)	-0.42	0.02
Parity	-0.02	0.91
Ba	0.30	0.12
C	0.06	0.77
Pad weight (g)	0.12	0.55
Maximum flow rate (mL/s)	0.27	0.15
Voided volume (mL)	0.20	0.29
Post-void residual (mL)	-0.10	0.60
Voiding time (s)	-0.02	0.91
Strong desire (mL)	0.07	0.70
PdetQmax (cmH2O)	-0.14	0.54
MUCP (cmH2O)	0.49	0.009
Functional profile length (cm)	0.14	0.49
PTR at MUP (%)	-0.44	0.02
UDI	0.09	0.72
IIQ	0.22	0.40
IIQ Q1	0.51	0.03

Values are expressed as mean \pm standard deviation or number (percentage). Q1 = Question 1. The other abbreviations are as in Table 1.

Table 3. Clinical and urodynamic factors to predict Q-tip angle

Variables	Univariate analysis		Multivariate analysis	
	Coefficient	p†	Coefficient	p‡
Age	-0.64 (-1.10 to -0.28)	0.009	-	-
MUCP	0.40 (0.07 to 0.74)	0.02	-	-
PTR at MUP	-0.21 (-0.40 to -0.02)	0.03	-0.21 (-0.40 to -0.02)	0.03

R² = 0.18. Abbreviations are as in Table 1. Data are expressed as the coefficient (95% confidence interval). †Univariate linear regression analysis. ‡ Multivariate backward stepwise linear regression

Fig 1. Scatter fit plots of Q-tip angles and pressure transmission ratio (PTR) at maximum urethral pressure (MUP)

References

1. Parker-Autry CY, Barber MD, Kenton K, Richter HE. Measuring outcomes in urogynecological surgery: "perspective is everything". Int Urogynecol J. 2013;24:15-25.

Disclosures

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