

URETHRAL PRESSURE REFLECTOMETRY BEFORE AND AFTER TENSION-FREE VAGINAL TAPE

Hypothesis / aims of study

Urethral pressure reflectometry (UPR) is a new method for simultaneous measurement of pressure and cross-sectional area along the entire length of the urethra which avoids the common artefacts encountered with conventional methods (1).

Our aim was to investigate if the UPR parameters at rest and during squeeze, in the supine and standing position were unchanged after tension-free vaginal tape (TVT).

Study design, materials and methods

Twenty-two women with bothersome stress urinary incontinence, a positive cough stress test, urodynamically proven SUI and scheduled for TVT were consecutively included in the study via the outpatient clinic.

In addition to UPR measurements, the pre- and postoperative assessment comprised a comprehensive medical history, the International Consultation on Incontinence Questionnaire on Urinary Incontinence Short Form (ICIQ-UI-SF), uroflowmetry, measurement of post-void residual urine volume and cough stress test. The patients were requested to complete a 48-hour pad test and keep a 2-day bladder diary and a 7-day incontinence diary in the week up to each visit. Cystometry was performed at enrolment if not previously conducted within the 3 months before enrolment.

UPR measurements: The UPR polyurethane bag was placed in the urethra and connected to a pump and an acoustic transmitter. The bag was inflated, distending it accordingly, and the cross-sectional area within the bag, and thus the urethra, was measured with acoustic reflectometry. Opening and closing pressure and elastance, and hysteresis were measured (figure 1). "Resting" and "squeezing" measurements were conducted in the supine and standing position before and after TVT.

The TVT procedure was carried out under local anaesthesia, with no concomitant surgical procedures, using the technique described by Ulmsten et al.

Subjective cure was defined as no reported incontinence on ICIQ-UI-SF, and objective cure was defined as negative stress test and < 5g leakage on pad test.

Results

Subjective and objective cure rates were 82% and 100%, respectively. Maximum urine flow rate decreased from 31 to 18 ml/sec ($p=0.0002$).

Supine and standing resting urethral opening and closing pressures were unchanged after TVT (table 1). There was an 18% increase in the opening and closing elastance, respectively, with the patient resting in the supine position. Supine squeezing opening pressure decreased 10%. The hysteresis was unchanged

Interpretation of results

The finding of unchanged supine, resting opening and closing pressures after TVT is consistent with the majority of studies, which have shown unaffected supine resting urethral pressures after TVT (2). Moreover, the opening pressure was unchanged in the standing position, which to our knowledge is new information.

The supine opening elastance increase after TVT indicates that the TVT sling increases the resistance against dilation of the urethra and thus improves the urethral closure function. Furthermore, the increased resistance against opening, e.g., for urine flow, probably explains the decreased maximum urine flow rate after TVT placement in this study and in previous reports in the literature (2).

Concluding message

UPR measurements confirmed that the resting urethral opening pressure is unchanged after TVT. The TVT somewhat improves the closure function by providing increased resistance against the dilation of the urethra, which probably explains the decreased maximum urine flow rate.

Figure 1:

Urethral Pressure Reflectometry (UPR) Parameters:

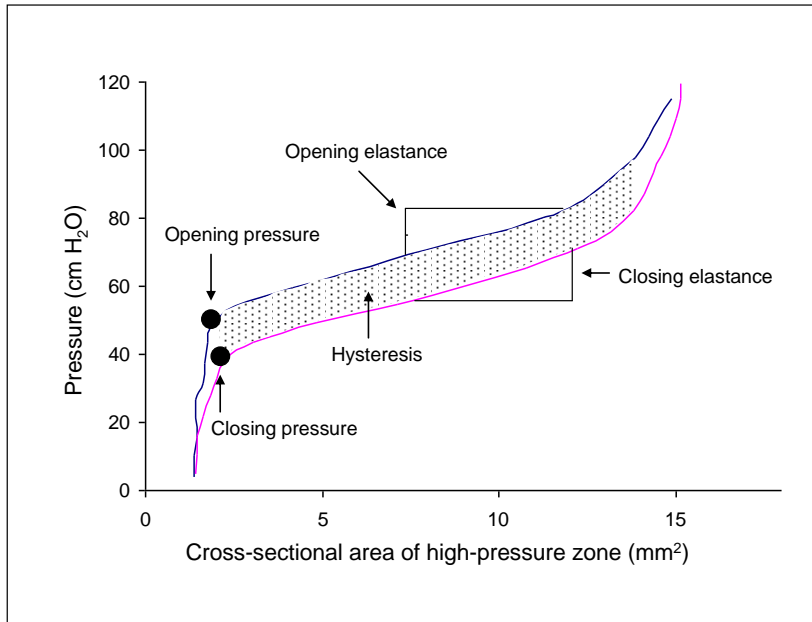


Table 1:
Urethral pressure reflectometry (UPR) Parameters Before and After TVT

n = 22		before TVT	after TVT	p value
Supine resting	opening pressure (cm H ₂ O)	46 ± 11	44 ± 10	0.2
	closing pressure (cm H ₂ O)	36 ± 8	35 ± 8	0.4
	opening elastance (cm H ₂ O/mm ²)	1.6 ± 0.5	1.9 ± 0.6	0.04*
	closing elastance (cm H ₂ O/mm ²)	1.5 ± 0.4	1.8 ± 0.4	0.01*
	hysteresis (%)	19 ± 8	19 ± 5	0.8
Supine squeezing	opening pressure (cm H ₂ O)	58 ± 14	52 ± 11	0.01*
	opening elastance (cm H ₂ O/mm ²)	1.7 ± 0.6	1.9 ± 0.7	0.4
Standing resting	opening pressure (cm H ₂ O)	72 ± 14	74 ± 12	0.5
	closing pressure (cm H ₂ O)	62 ± 13	63 ± 12	0.3
	opening elastance (cm H ₂ O/mm ²)	1.9 ± 0.5	2.0 ± 0.5	0.3
	closing elastance (cm H ₂ O/mm ²)	1.8 ± 0.5	2.0 ± 0.4	0.05*
	hysteresis (%)	13 ± 6	12 ± 5	0.4
Standing squeezing	opening pressure (cm H ₂ O)	81 ± 14	80 ± 13	0.6
	opening elastance (cm H ₂ O/mm ²)	1.9 ± 0.7	2.2 ± 0.7	0.1

Mean ± SD. * p ≤ 0.05. TVT: Tension-free Vaginal Tape

References

1. Klarskov N, Lose G. Urethral pressure reflectometry vs urethral pressure profilometry in women: a comparative study of reproducibility and accuracy. BJU Int 2007 Aug;100(2):351-6.
2. Atherton MJ, Stanton SL. The tension-free vaginal tape reviewed: an evidence-based review from inception to current status. BJOG 2005 May;112(5):534-46.

Disclosures

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