

A URETHRAL PULL-DOWN PROCESS PREVENTS OVERCORRECTION OF URETHRAL HYPERMOBILITY IN TVT PROCEDURE

Aims of Study

Tension-free vaginal tape (TVT) – a less-invasive variation of the suburethral sling – has increased in popularity in the treatment of female stress urinary incontinence. The intraoperative cough stress test under local anesthesia has been used to adjust the tape position, but the TVT procedure is still associated with some risk of prolonged urinary retention, especially in the learning phase. We investigated whether a urethral pull-down process (UPDP) – pulling down the urethra with a urethral bougie repeatedly during tape positioning – prevents overcorrection of urethral hypermobility.

Methods

This study involved 54 consecutive women who had urodynamically proven stress urinary incontinence and who underwent a TVT procedure by one surgeon without other concomitant gynecological operations. The TVT procedure was carried out as described by Ulmsten et al. (1996) under local anesthesia and intravenous sedation in group 1 ($n=17$), and a UPDP was added to those in group 2 ($n=37$) who were operated on after June 2000. In group 2, the anterior vaginal wall was pulled downwards using Allis forceps and substantial traction was applied to rotate a 24-Fr urethral bougie downwards before beginning an intraoperative stress test. This process was performed repeatedly during tension adjustment and the removal of each side of the plastic sheath. Pre- and 3-months-postoperative evaluations were performed according to a protocol involving vaginal examination with stress test, 60-min pad test, uroflowmetry, videourodynamics, and chain cystourethrography in a standing position.

Results

There were no significant differences between the two groups in age (58 ± 11 years vs 58 ± 9 years, mean \pm SD), parity (2.4 ± 0.9 vs 2.1 ± 1.0), body mass index (26 ± 4 kg/m² vs 24 ± 3 kg/m²), and severity and duration of stress incontinence. The rate of positive intraoperative stress tests before tension adjustment increased from 65% (11/17) in group 1 to 97% (36/37) in group 2. The period of postoperative voiding difficulties (postvoid residual urine >50 ml) was significantly shorter in group 2 (see the table): this occurred within 2 days in 10 patients (59%) in group 1 and in 33 patients (89%) in group 2. Postoperative stress test, 60-min pad test, and videourodynamics showed an objective cure and stress incontinence was denied subjectively in all cases. Although the posterior urethrovesical (PUV) angle became smaller postoperatively in both groups, the change was much less in group 2. The postoperative angle of inclination to the vertical of the proximal urethral axis (urethral inclination) reduced in group 1 but did not change significantly in group 2. Persistent urinary retention occurred in one patient in group 1 and in no patients in group 2. This patient underwent partial removal of the tape and a second TVT procedure using the UPDP 2 years later, which resolved the urinary retention without recurrence of stress incontinence. Patients with preoperative mild symptoms of overactive bladder (two patients in group 1 and eight patients in group 2, none of whom showed detrusor overactivity in urodynamics) exhibited persistent postoperative symptoms. No patient developed de novo urgency or detrusor overactivity.

Conclusions

The TVT procedure was designed to achieve tension-free hammock-like support of the midurethra by tape positioning based on an intraoperative stress test. However, the bladder neck may be oversuspended by the friction associated with passing the TVT device through the retropubic space and removal of the plastic sheath, resulting in a negative stress test before tension adjustment and movement of the tape from the desired position. By pulling down the urethra repeatedly during tape positioning, it was easier to produce a positive stress test, which allowed correct positioning and to compensate for the upward movement of the

tape by friction. Chain cystourethrography in the standing position, though being a classical examination, made it clear that TVT procedure restricts urethral mobility; however, overcorrection must be avoided to prevent postoperative voiding dysfunction. The UPDP is a minor but useful intervention to limit the amount of correction of urethral hypermobility, and it may contribute to shorten the learning curve of the TVT procedure.

	Group 1 (n=17)	Group 2 (n=37)	p-value (between groups)
Positive intraoperative stress test	11 (64.7%)	36 (97.3%)	<0.001
Period of voiding difficulties (days) (postvoid residual urine >50 ml)	5.4 ± 8.9*	1.0 ± 1.4	0.005
< 2 days	10 (58.8%)	33 (89.2%)	<0.001
3- 7 days	2 (11.8%)	4 (10.8%)	
8-30 days	4 (23.5%)	0 (0.0%)	
persistent	1 (5.9%)	0 (0.0%)	
Maximum flow rate: pre-op (ml/s)	30.8 ± 12.6	37.3 ± 15.5	n.s.
post-op	21.9 ± 9.2*	24.1 ± 10.7*	n.s.
60-min pad test: pre-op (g/hr)	51.5 ± 81.3	31.2 ± 52.5	n.s.
post-op	0.6 ± 0.6*	0.5 ± 0.6*	n.s.
PUV angle: pre-op (at rest)	141.7 ± 15.8	143.7 ± 22.8	n.s.
post-op	87.8 ± 21.1*	118.7 ± 21.2*	<0.001
PUV angle: pre-op (on Valsalva)	153.6 ± 15.5	163.0 ± 22.5	n.s.
post-op	80.5 ± 26.1*	118.8 ± 28.5*	0.001
Urethral inclination: pre-op (at rest)	20.6 ± 17.6	15.8 ± 17.2	n.s.
post-op	-1.3 ± 15.3*	14.3 ± 16.2	0.004
Urethral inclination: pre-op (on Valsalva)	29.9 ± 25.3	30.8 ± 23.7	n.s.
post-op	4.8 ± 19.5*	21.9 ± 19.4	0.01

*: Statistically significant differences between pre- and postoperative values.

†: One patient with persistent urinary retention was excluded from analysis.