

## A URETHRAL PULL-DOWN PROCESS (UPDP) INCREASES INTRABODY TAPE LENGTH AND PREVENTS POSTOPERATIVE VOIDING DIFFICULTY IN TVT PROCEDURE

### Hypothesis / aims of study

The original description of TVT (tension-free vaginal tape) procedure postulated that tape adjustment based on an intraoperative stress test could produce continence without causing voiding difficulty. However, the urethra is sometimes oversuspended by the friction associated with insertion of the TVT device through the retropubic space and removal of the plastic sheath. Accordingly, 2-3% of patients reportedly undergo release of the TVT tape because of refractory voiding dysfunction. The aim of this study was to investigate the effect of urethral pull-down process (UPDP; pulling down the urethra with a urethral bougie repeatedly during tape positioning) on the intrabody tape length and postoperative voiding difficulty.

### Study design, materials and methods

This study was done on 155 consecutive women with urodynamic stress urinary incontinence who underwent TVT procedure without concomitant gynecological operations. Thirty-nine of them also had symptomatic urge incontinence. The intrabody tape length, postoperative residual urine, and uroflowmetry were prospectively analyzed in all patients. In group 1 (February 1999 - June 2000, n = 17), the TVT procedure was carried out as originally described by Ulmsten. In group 2 (July 2000 - April 2003, n = 50), tension adjustment based on a stress test was performed before and after removal of one side of the plastic sheath with repeated UPDP. In group 3 (May 2003 - March 2006, n = 88), this procedure was also performed after partial removal of the contralateral side of the plastic sheath. The results were compared between groups with Chi Square tests, and the correlations were analyzed by linear regression.

### Results

There were no significant differences among the three groups in age, parity, body mass index (BMI), and severity of 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 and 100% (88/88) in group 3 ( $p < 0.001$ ). There was a positive correlation between the intrabody tape length and BMI in each group ( $p < 0.001$ ), and furthermore, the tape length was adjusted more loosely as the operative techniques including UPDP were revised (Fig. 1). The mean tape length in groups 1, 2, and 3 were  $18.5 \pm 2.5$ ,  $19.6 \pm 2.7$ , and  $21.7 \pm 2.4$  cm, respectively (mean  $\pm$  standard deviation). The postvoid residual urine became less than 50 ml within 24 hours in 35% (6/17) of the patients in group 1, 54% (27/50) of those in group 2, and 91% (80/88) of those in group 3 ( $p < 0.001$ ). Intermittent self-catheterization was necessary in 24% (4/17) of the patients in group 1, 2% (1/50) of those in group 2, and none of those in group 3 ( $p < 0.001$ ). Patients who had prolonged increase of residual urine tended to have short tape length in relation to BMI (Fig. 2). The preoperative and 3-month postoperative maximum flow rates were  $30.8 \pm 12.6$  and  $21.9 \pm 9.2$  ml/s in group 1,  $36.6 \pm 14.5$  and  $25.3 \pm 10.5$  ml/s in group 2, and  $38.1 \pm 14.9$  and  $32.6 \pm 13.5$  ml/s, respectively. The subjective and objective cure rates of stress incontinence did not show differences among the three groups. In patients with mixed incontinence, symptomatic urge incontinence was cured or improved in 33% of the patients in groups 1 (1/3) and 2 (3/9), and 74% (20/27) of those in group 3 ( $p = 0.05$ ).

### Interpretation of results

By applying UPDP, oversuspension of the urethra by the friction associated with insertion of the TVT device and removal of the plastic sheath was appropriately restored, resulting in positive intraoperative stress tests before tension adjustment, looser positioning reflected to longer intrabody tape length, decrease of residual urine, and better uroflow. The intrabody tape length may be used as a parameter to investigate urethral oversuspension as the patients with prolonged voiding difficulty tend to have a short tape length in relation to BMI. Avoiding obstruction may widen the indications for TVT operation to include more patients with mixed incontinence when stress incontinence significantly precedes urge incontinence.

### Concluding message

UPDP with stepwise removal of the plastic sheath is a small but useful intervention to prevent urethral indentation by the tape and postoperative voiding difficulty in the TVT procedure. The intrabody tape length positively correlated with BMI, and may become a parameter to investigate over-tightness of the tape.

Fig. 1 Intrabody tape length and BMI  
(group 1: green, group 2: pink, group 3: blue)

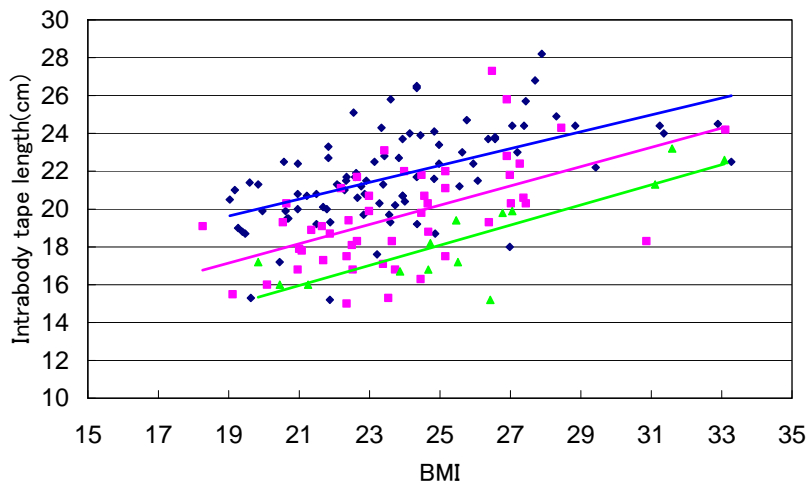
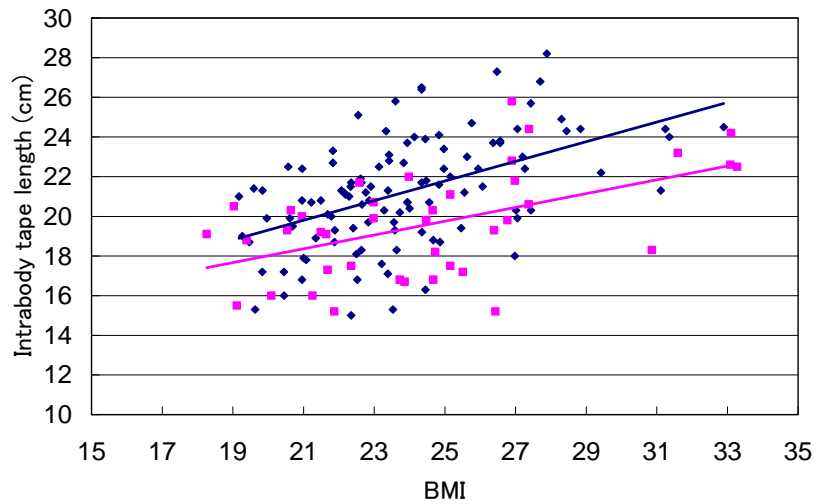


Fig. 2 Intrabody tape length and BMI in patients whose residual urine became less than 50ml within 24 hours (blue) and others (pink)



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**HUMAN SUBJECTS:** This study did not need ethical approval because part of normal clinical activity but followed the Declaration of Helsinki Informed consent was obtained from the patients.