

# Tension-Free Vaginal Tape

1

: tension-free vaginal tape (TVT)

: TVT 34  
49 (32-75 )  
9.5 (5-19 ) 가

Valsalva

: TVT  $134.7 \pm 5.9^\circ$   
 $146.8 \pm 8.5^\circ$ ,  $12.2 \pm 7.3^\circ$ ,  
 $125.6 \pm 7.5^\circ$ ,  $132.5 \pm 8.3^\circ$ ,  
 $7.0 \pm 5.0^\circ$  가 ( $p < 0.01$ ).  
 $17 \pm 7.0$  mm,  $7.7 \pm 4.1$  mm 가  
( $p < 0.01$ ).  $5.6 \pm 1.4$  mm,  $5.5 \pm 1.1$  mm

: TVT

14% 가 (3-5).

(1).

가

가

(6).

(2).

50%

가

가 (1).

tension-free vaginal tape (TVT)

(7).

TVT

80 - 90%

TVT

1

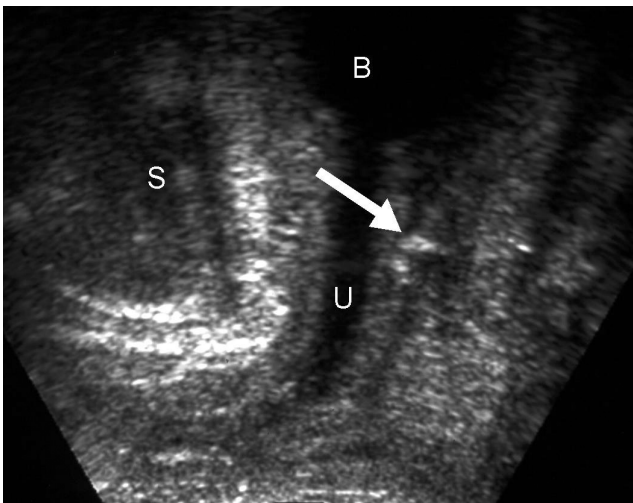
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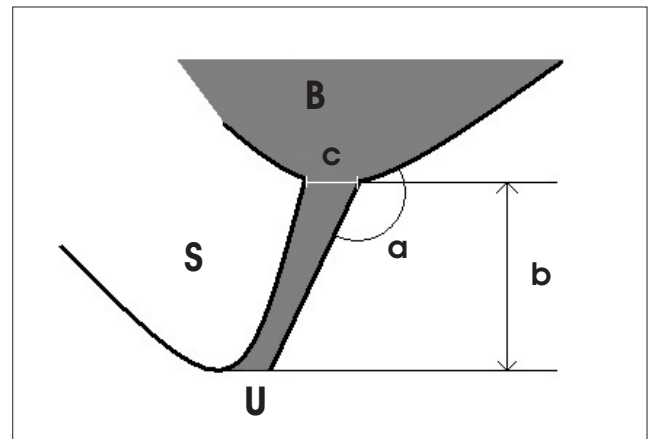
2004 11 4

1 TVT 45 TVT 34 , Q - tip test, Valsalva  
leak point pressure (VLPP)  
32 75 49 2.4  
, 4  
5 - 19 9.5  
Stamey 가  
grade I, grade II,  
grade III , grade I 18 (53%),  
grade II 14 (41%), grade III 2 (6%)  
Ulmsten (3).  
diazepam 10 mg  
fentanyl 50  $\mu$ g  
midazolam 1 mg  
5% bupivacaine hydrochloride 50 ml 5  $\mu$ g  
epinephrine 18 G Retzius  
1.5 cm  
3 cm

1 cm , 1.5 cm  
0.5 cm 가  
0.5 - 1.0 cm , straight  
inserter 가  
TVT가 가  
fentanyl 50  $\mu$ g 가  
prolene U  
TVT (Fig. 1).  
2 - 4  
TVT Stamey VLPP ,  
TVT Stamey 가  
가  
HDI 3000 Ultramark - 9 (Advanced  
Technology Laboratories, Bothell, WA) 4 - 7 MHz  
가



**Fig. 1.** Perineal ultrasonogram shows a vaginal tape (white arrow) applied in the mid-urethra without tension.



**Fig. 2.** Schematic drawing of sagittal perineal ultrasonogram. (B: Bladder, S: Symphysis pubis, U: Urethra, a: Posterior urethrovesical angle (PUVA), b: descent of the bladder neck, c: diameter of proximal urethra)

2D cine mode

가

1 cm

1 cm

Valsalva T - test

TVT 22 , 10 , 2

94.1% (32/34) , 31.2

1.3

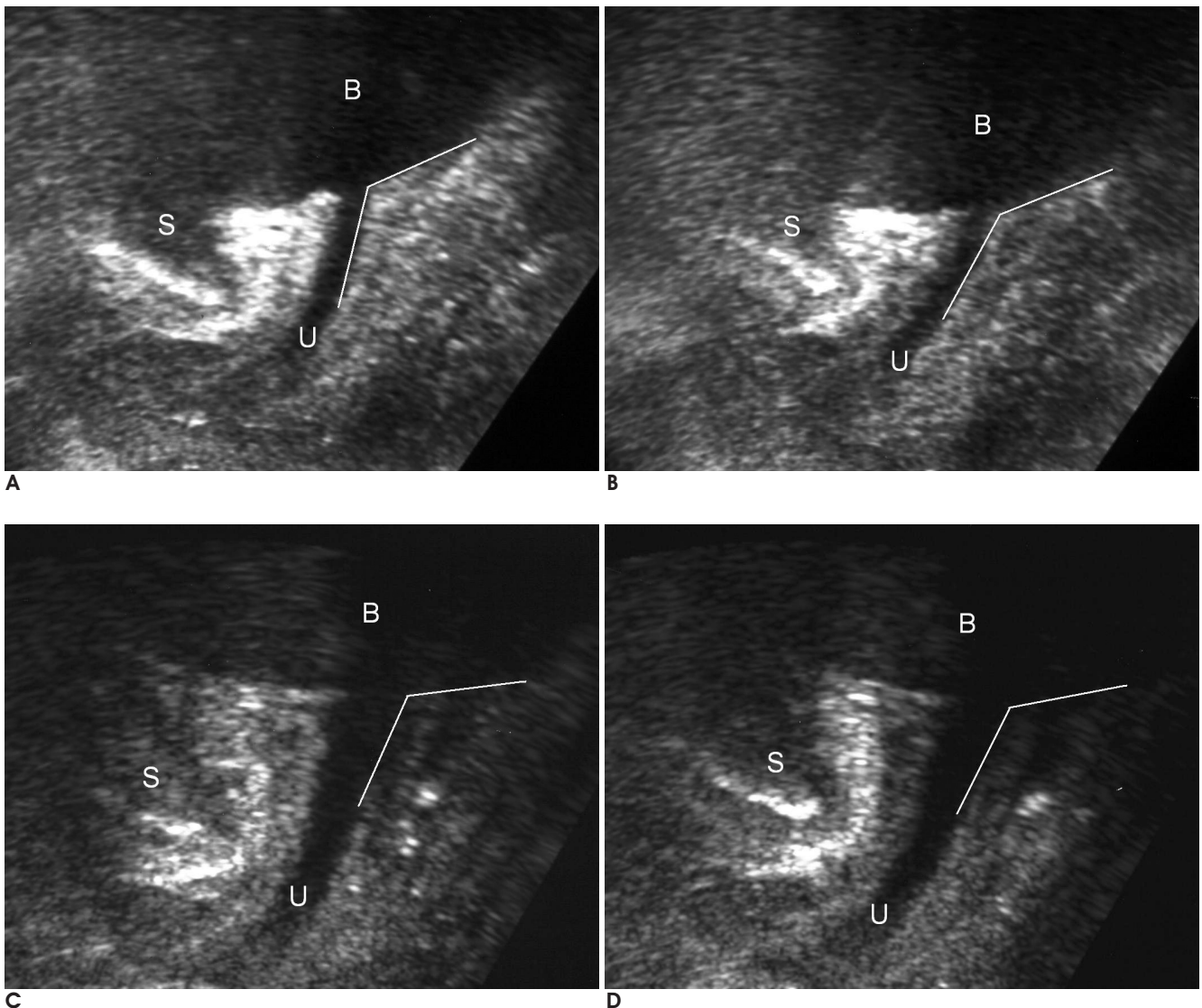
2 1 TVT

2 , 2 ,

1 가 ,

prolene mesh

(Fig. 2).



**Fig. 3.** A 41-year old woman with stress urinary incontinence.

**A, B.** Preoperative perineal ultrasonograms show that the PUVA is 128.8 ° at rest (**A**) and 140.5 ° during stress (**B**), and the difference is 11.7 °.

**C, D.** Postoperative follow-up perineal ultrasonograms obtained after 9 days show that the PUVA is decreased to 119.3 ° at rest (**C**) and 127.2 ° during stress (**D**), and the difference is also decreased to 7.9 °.

TVT

2

가 9 mm,

10 mm , 5 mm, 7 mm

(Table 1). TVT

125.6 ± 7.5 °, 132.5 ± 8.3 °

12.2 ± 7.3 ° 7.0

± 5.0 ° 가 ( $p < 0.01$ ) (Fig. 3).

2 131 °

126.3 °, 136.5 °, 135.7 °, 5.5 °, 9.4 °, 가

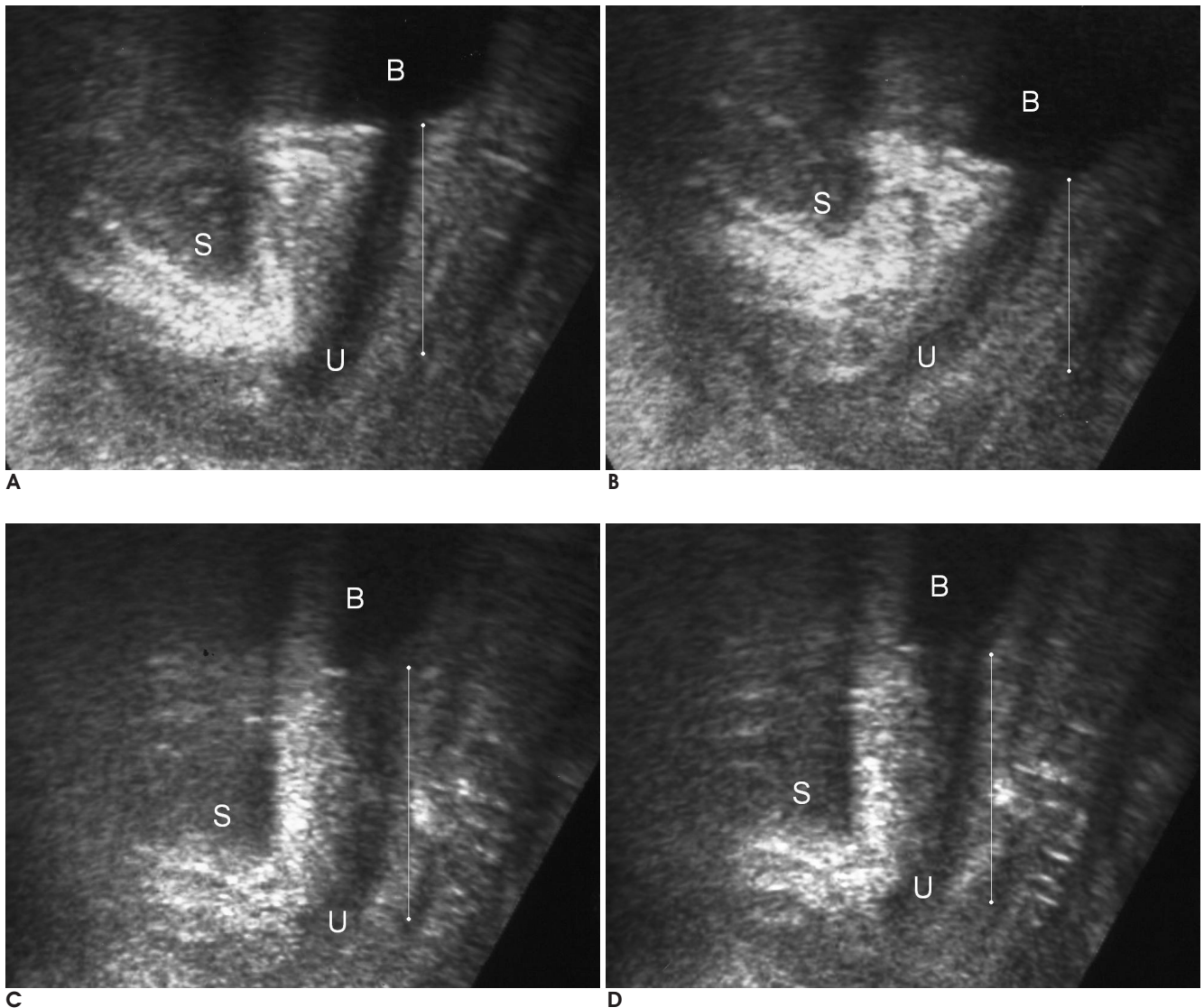
120.9 °, 125 °

124 °, 133 °, 3.1 °, 8 °

17 ± 7.0 mm 7.7 ± 4.1

mm 가 ( $p < 0.01$ ) (Fig. 4).

(hypermobility)



**Fig. 4.** A 36-year old woman with stress urinary incontinence.

**A, B.** Preoperative perineal ultrasonograms show that the distance is 32 mm at rest (**A**) and 17 mm at stress (**B**), and descent of the bladder neck is 15 mm during stress.

**C, D.** Postoperative follow-up perineal ultrasonograms obtained after 14 days show that the distance is 34 mm at rest (**C**) and 31 mm at stress (**D**), and descent of the bladder neck is decreased to 3 mm during stress.

(8). 가 (vaginal support), tape

(9). 가 TVT (hammock)

(11). 가 TVT

(4).

가

가

가 (10). TVT 1993 Petros Ulmsten “Integral”, TVT

TVT theory ”

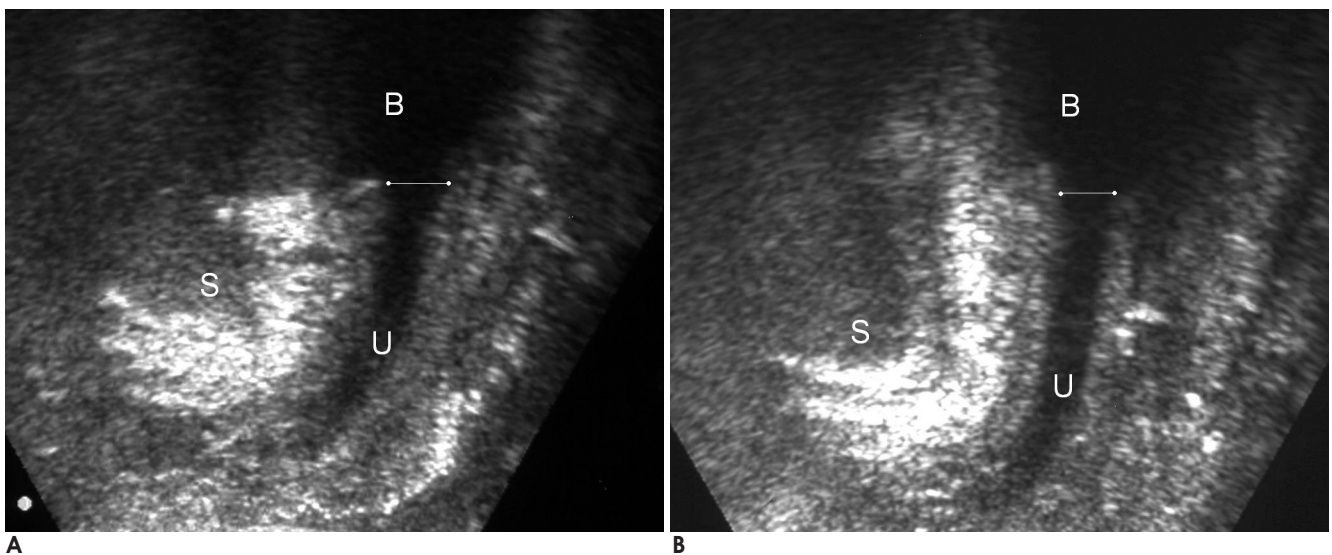
(pubourethral ligament), TVT

(pubococcygeal muscle), (1). 3 86% 84 - 100%, 11%

**Table 1.** Comparison of PUVA (Posterior Urethrovesical Angle) and Descent of the Bladder Neck at Rest and during Stress, and Diameter of Proximal Urethra at Rest before and after the TVT Procedure

	Before Procedure	After Procedure	<i>p</i> -value
PUVA(°)			
Rest	134.7 ± 5.9	125.6 ± 7.5	
Stress	146.8 ± 8.5	132.5 ± 8.3	
Difference	12.2 ± 7.3	7.0 ± 5.0	< 0.01
Descent of the Bladder Neck (mm)	17 ± 7.0	7.7 ± 4.1	< 0.01
Diameter of Proximal Urethra (mm)	5.6 ± 1.4	5.5 ± 1.1	> 0.01

Note. - Numbers are mean ± standard deviation.



**Fig. 5.** A 45-year old woman with stress urinary incontinence.

**A.** Preoperative perineal ultrasonograms show that the diameter of proximal urethra is 6 mm at rest.

**B.** Postoperative perineal ultrasonograms obtained after 14 days show that the diameter is 5 mm with minimal change.



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## Usefulness of Perineal Ultrasonography after Tension-Free Vaginal Tape Procedure for Stress Urinary Incontinence<sup>1</sup>

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**Purpose:** To evaluate the usefulness of perineal ultrasonography after a tension-free vaginal tape (TVT) procedure in women with stress urinary incontinence.

**Materials and Methods:** Thirty-four patients with stress urinary incontinence who underwent the TVT procedure were included in this study. We compared the perineal ultrasonography findings before and after the procedure. The mean age was 49 years (range: 32 - 75 years) and the mean follow-up time was 9.5 days (range: 5 - 19 days). We obtained the entire sagittal image of the bladder neck, urethra, urethrovesical junction and symphysis pubis. The posterior urethrovesical angle (PUVA) and descent of the bladder neck at rest and during stress, and the diameter of proximal urethra at rest were all evaluated. We compared these ultrasonographic changes before and after the procedure.

**Results:** Before the TVT procedure, the PUVA was  $134.7 \pm 5.9^\circ$  at rest and  $146.8 \pm 8.5^\circ$  during stress, and the difference between PUVA at rest and during stress was  $12.2 \pm 7.3^\circ$ . After the TVT procedure, the PUVA significantly decreased to  $125.6 \pm 7.5^\circ$  at rest and  $132.5 \pm 8.3^\circ$  during stress, and the difference also significantly decreased to  $7.0 \pm 5.0^\circ$  ( $p < 0.01$ ). Before the procedure, the descent of the bladder neck was  $17 \pm 7.0$  mm, while the descent significantly decreased to  $7.7 \pm 4.1$  mm after the procedure ( $p < 0.01$ ). Before the procedure, the diameter of the proximal urethra was  $5.6 \pm 1.4$  mm at rest, but the diameter was  $5.5 \pm 1.1$  mm, without significant change, after the procedure.

**Conclusion:** Follow-up perineal ultrasonography after the TVT procedure may be useful for evaluating changes including the PUVA, descent and appearance of the bladder neck.

**Index words :** Urinary Incontinence, Stress  
Surgery  
Ultrasonography

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