Conclusions: These results suggested that myogenic-dominant damages of the striated urethral sphincter may contribute to the etiology of ISD in the majority of type 3 SI.

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Author(s): HP Dietz, P.D. Wilson, K. Gillies, T. Vancaillie

Institution, city, country: Pelvic Floor Unit, Royal Hospital for Women, Sydney, Australia
Dept. of Obstetrics and Gynaecology, Dunedin Hospital, Dunedin, New Zealand

Title (type in CAPITAL LETTERS, leave one blank line before the text):

HOW DOES THE TVT ACHIEVE CONTINENCE?

Aims of Study

The tension- free vaginal tape (TVT) is now used worldwide for the surgical treatment of Genuine Stress Incontinence (GSI). Based on the "Integral Theory" (1), it is assumed that the TVT replaces defective ligamentous and muscular structures to restore normal anatomy and provide for midurethral "functional kinking". However, objective data so far is scarce (2). To elucidate the mode of action of the TVT, we assessed anatomy and function by ultrasound imaging and flowmetry and correlated this data with symptoms.

Methods

46 consecutive patients were seen on average 0.72 years (6w- 1.4 yrs) after TVT. Preoperative detrusor instability was not an exclusion criterion. A standardized questionnaire was filled in and a clinical stress test performed with a subjectively full bladder (median 367 ml). Translabial ultrasound was performed erect with a full bladder for documentation of stress leakage on colour Doppler (3) or clinical stress test. The patient was then asked to void for flowmetry.

Ultrasound was repeated supine to determine tape position and mobility. The TVT is strongly hyperechoic and easily observed on ultrasound. On Valsalva, images were taken and the position of bladder neck and superior tape margin determined relative to the inferoposterior symphyseal margin. Symptoms, Doppler/ stress test results and flowmetry data were compared with 1.) tape position relative to the internal urethral meatus, 2.) tape position relative to the symphysis pubis, and 3.) tape mobility on Valsalva.

Results

Table 1 gives symptoms and signs after average followup of 0.72 years. Table 2 summarizes bladder neck and tape position and mobility data; Table 3 correlates this data with incontinence and flowmetry. Compared to preoperative flowmetry, postoperatively the maximum and mean flow rates had dropped an average of 22 ($p<0.0001$) and 23 centiles ($p<0.0001$). A tight tape reduced the incidence of recurrent stress incontinence but also correlated moderately ($r= 0.313$, $p= 0.034$) with low maximum flow rate centiles. The lowest average flow rate centiles were seen with tapes that were close to the bladder neck in the horizontal plane, and remained above the symphysis on valsalva ($p= 0.026$).

	preop.		postop.	
	n	%	n	%
Stress Incontinence	46	100	9	20
Urge Incontinence	16*	38	23	50
Hesitancy/ poor stream	not available		24	52
Dry on Stress Test/ Doppler	0	0	41	89

Table 1: Symptoms and signs before and after TVT placement (n= 46, *n=42)

Bladder neck descent	2.2 cm	(0- 4.8)
Urethral rotation	57.4 deg	(10- 120)
Funnelling (n)	29	(63%)
Tape position rel. to symphysis (stress)	-0.5 cm	(1.5- -2.4)
Tape mobility on Valsalva (total)	1.9 cm	(0.7- 4.2)

Table 2: Bladder neck and TVT position and mobility data (n= 46). Means, range in parentheses

	SI	Max. flow rate centile
Tape tightness (horiz. dist. to bladder neck)	n.s.	p= 0.034
Tape tightness (horiz. dist. to symphysis)	p= 0.008	n.s.
Tape position (vert. dist. to symphysis (stress)	p= 0.004	n.s.
Tape mobility on Valsalva (horizontal)	p= 0.036	p= 0.087
"Pinching" on Valsalva	p< 0.00001	n.s.

Table 3: Correlation between tape position and mobility and postoperative incontinence and maximum flow rate (n= 46). All correlations are positive except for "pinching".

Conclusion

The TVT has a high cure rate for stress incontinence (SI). Both in success and failure it resembles traditional slings. It seems to be an obstructive procedure. Ultrasonic findings vary depending on dissection, placement, tensioning and coexisting cystourethrocele. In many patients hypermobility persists, and continence seems to be achieved by a kinking effect, with the urethra rotating horizontally and being compressed against and kinked around the tape. Often there is no effect on the bladder neck, as shown by a high incidence of funnelling. A "loose" tape seems to increase the risk of recurrent SI. "Tight" tapes, on the other hand, compress the urethra against the symphysis pubis (a "pinching" effect), potentially causing increased obstruction but making recurrence of SI highly unlikely.

Both position and mobility of the TVT vary considerably, and this variability seems to influence outcome. There is a need for further research regarding a reproducible tightening mechanism.

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Author(s):
N Kuuva, C-G Nilsson

Institution, city, country:
Department of Obstetrics and Gynaecology, Helsinki University Central Hospital, Helsinki, Finland

Title (type in CAPITAL LETTERS, leave one blank line before the text):
A NATIONWIDE ANALYSIS OF COMPLICATIONS ASSOCIATED WITH THE TENSION-FREE VAGINAL TAPE (TVT) PROCEDURE

Aims of Study: To evaluate therapy-associated morbidity of all patients who underwent a TVT operation by the end of the year 1999. Methods: Retrospective questionnaires about number of operations per hospital as well as intraoperative and postoperative complications were sent to every Finnish hospital where TVT operations had been independently performed after the obligatory TVT training period. The information from 38 hospitals was analyzed. One hospital which did not use the standard TVT set and the largest TVT center which functioned as the primary training center were excluded. Results: Among the 38 hospitals there were 4 university hospitals, 13 central hospitals and 21 local hospitals. The total amount of TVT operations was 1455 and in 40 cases (2.7%) one or several other operations were performed at the same time. There were 27 cases (1.9%) of intraoperative blood losses over 200 ml: eight patients were managed by a vaginal tamponade and/or manual compression, one arterial bleeding behind the sympfysis required laparotomy and tape removal. There were 56 cases (3.8%) of bladder perforations: (a) forty-eight perforations were detected during the operation, in 40 cases the needle was withdrawn and reinserted more laterally, in five cases the TVT tape was completely or partially removed, in two cases the operation was interrupted, one case was treated only with catheterization; (b) four cases of perforations were detected within a few hours up to four days after the operation, in all of these cases the tape was totally or partially removed and in one case of removal a cystotomy was needed; (c) in four cases of perforations the time of the observation has not been stated, in one of these cases an open exploration of the cavum Retzii was performed and in one case the tape was removed from the bladder by laparotomy, two cases were treated only with catheterization. Only one case (0.1%) of injury on a major vessel (epigastric) was reported and it was treated by ligation. Three cases (0.2%) of various intraoperative complications were reported: (a) an injury of