

THE NEW QUANTITATIVE TOT TECHNIQUE: METALLIC BOUGIES WERE INSERTED TO FIND OUT THE LENGTH BETWEEN THE TOT TAPE AND THE MID-URETHRA, WHICH COULD BECOME A FACTOR OF PROPER PLACEMENT OF THE TOT TAPE.

Hypothesis / aims of study

Sling surgery has evolved in many ways during a quarter of a century. The original indications for the sling procedure were incontinence associated with poor urethral sphincter function. The original purpose of the sling procedure was to increase urethral resistance but at the cost of increased urinary obstruction and urgency symptoms. Of the anatomic abnormalities present in incontinent woman, urethral hypermobility (UH) is the main factor. Using the integral theory, a new surgical technique called the tension-free vaginal tape (TVT) was proposed for stress urinary incontinence (SUI). The TOT (transobturator tape) sling procedure, a minimally invasive procedure with low complication rates and high cure rates, has now become the gold standard for SUI surgical treatment recently. But therapeutic strategies of surgical treatment including TOT for intrinsic sphincter deficiency (ISD) or cystocele are not standardized yet. Even placing without tension at the level of the mid urethra, complications after TOT are not uncommon, including voiding difficulties, urinary retention and urge symptoms, which suggest inadequate tension on the suburethral tape or misplacement of the tape. It has been reported that surgical outcomes vary greatly depending on the surgeon's experience but not been reported to place the suburethral TOT tape adequately with quantitative methods. We explored the new TOT technique to place the tape without excessive tension with quantitative methods which were created by inserting various sizes of metallic bougies between the TOT tape and the mid-urethra to estimate the length between them. The usefulness of this method for UH, ISD and cystocele was also examined.

Study design, materials and methods

This retrospective study included 13 female patients with urodynamically proven SUI who had undergone a TOT outside-in procedure at our department from January 2008 to February 2010. Our protocol included history and ICIQ-SF, physical examination, urinalysis, uroflowmetry, post void residual urine measurement, a 1-hour pad test, chain urethrocystography, cough stress test and urodynamic studies with pressure flow study and abdominal leak point pressure (ALPP) measurements. Severe pelvic prolapse (stage 2 to 4 on POP-Q system) was excluded in this protocol because we initially performed TVM alone in this case. ISD was indicated by both low ALPP less than 50 cm H₂O and radiological bladder neck opening at rest. Excess cystocele was radiologically determined by descending bladder neck more than 34 mm at straining. This case was indicated as cystocele group. All patients in this group were stage 1 on POP-Q system. The TOT procedure was performed using local anesthesia and was performed by the same one urologist. The cough stress test before and after tape placement were tried during surgery in all patient. Various sizes of metallic bougies (from Fr 6 to Fr 18) were inserted between the TOT tape and the mid-urethra to determine the length between the tape and the urethra. The catheter was removed next day. When post-void residual urine volume was more than 100ml continuously, medication (2 month maximally) or catheterization (3 days maximally) were performed. These cases were indicated as a group of voiding difficulties. The surgical results were evaluated by ICIQ-SF and the cough stress test, 1-hour pad test. Cure of incontinence after the surgery was defined as an absent of leakage both subjectively and objectively.

Results

Two patients were ISD and the other 11 patients were urethral hypermobility (UH). Radiological findings divided UH as two groups, one is cystocele (5 patients) and the other is non-cystocele (6 patients). The mean patient age was 69.5 years (57-77 years old). The mean 1-hour pad test value was 18 gr (0-65.7gr). The cases of previous TVM surgery and Stamey needle suspension are four and one respectively. The number of patients on UH without cystocele, UH with cystocele and ISD were 6, 5 and 2 respectively. In the first case of UH without cystocele, the length between the TOT tape and the mid-urethra was 3 mm (equal to a diameter of Fr. 9 bougie) which was determined by decreasing leakage when performing cough stress test during surgery. The length between them was 5 mm (equal to a diameter of Fr. 15 bougie) in the latter five cases of UH without cystocele. There was no decreasing leakage even after placing TOT tape with a length of 5 mm from the urethra. In the five cases of UH with cystocele, the length between the tape and urethra was 5 to 6 mm (equal to a diameter of Fr. 15 to 18 bougie). Urodynamic obstruction and cystocele was not observed and urodynamic excellent detrusor contraction was observed in both two patients of ISD, which made us challenged to perform TOT with stronger resistance to urethra. The length between the tape and urethra was 2 mm (equal to a diameter of Fr. 6 bougie) which was determined by decreasing leakage when performing cough stress test during surgery in two cases of ISD. All 13 patients cured from SUI. There are no complications such as perforation of urinary tract during surgery, transfusion, hematoma, vaginal wall erosion, infection and urinary retention after surgery. Voiding difficulties were happened in 4 cases. All 4 cases were UH with cystocele group. One patient complained severe urgency symptoms, the other three did not complain.

Interpretation of results

It has been widely known that new surgical treatments with integral theory such as TVT or TOT sometimes happens incidences of increased urinary obstruction or urgency symptoms. The cough stress test during TVT surgery were recommended to avoid excess tension, but urinary obstruction or urgency symptoms occasionally occurred even though cough stress test was performed. It has been reported that surgical outcomes vary greatly depending on the surgeon's experience. This could be a first report that described how to place the suburethral TOT tape adequately with quantitative methods which was performed by general urologist. Even if small number of cases, this surgical method for ISD and cystocele made good effort, which might suggests the possibility of effectiveness of TOT for ISD and cystocele.

Concluding message

Inserting various sizes of metallic bougies between the TOT tape and the mid-urethra to estimate the length between them made proper placing the TOT tape without excessive tension with quantitative methods. Five mm (equal to a diameter of Fr. 15

bougie) length between the TOT tape and the mid-urethra created an anti-incontinent effect without voiding difficulties in the cases of UH without cystocele. But in the cases of UH with cystocele, 5 to 6 mm length between them occurred some voiding difficulties. These results suggest that more attention not to make excess tension could be needed for cystocele. Decreasing leakage on cough stress test after placing TOT tape during surgery was not important. Oppositely, 2 mm length between them which might mean some tension to the mid-urethra created an anti-incontinent effect without voiding difficulties in the cases of ISD with urodynamic non-obstruction and good detrusor contraction. These results suggest that this modified TOT procedure has possibility of effects to ISD.

<i>Specify source of funding or grant</i>	none
<i>Is this a clinical trial?</i>	No
<i>What were the subjects in the study?</i>	HUMAN
<i>Was this study approved by an ethics committee?</i>	Yes
<i>Specify Name of Ethics Committee</i>	Ethics Committee of NHO Kanazawa Medical Center
<i>Was the Declaration of Helsinki followed?</i>	Yes
<i>Was informed consent obtained from the patients?</i>	Yes