Comparison of Efficacy of Stress Urinary Incontinence Surgeries: Tvt alone vs Tvt Plus Concomitant Surgery

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Abstract

Objectives: Urinary incontinence is one of the most common functional pathology for women during the pre- and post-menopausal periods. Tension-free vaginal tape (TVT) is a commonly performed surgical technique for stress urinary incontinence (SUI). The aim of this study is to evaluate the efficacy and success rate of TVT operation performed alone with comparison to TVT plus concomitant procedure of vaginal hysterectomy (VH).

Methods: We reviewed patients with SUI from January 2012 to December 2014. 105 patients underwent TVT operation alone (group 1) and 94 patients underwent TVT and VH operation (Group 2). All patients filled The International Consultation on Incontinence Questionnaire-Short Form (ICIQ-SF) pre and postoperatively. Each patient underwent physical examination and urodynamic study. The primary outcome measure was the objective cure rate of SUI following TVT. Secondary outcome measure was subjective cure rate of SUI and this was evaluated by ICIQ-SF. Intra-operative and postoperative complications were also recorded.

Results: There were no significant differences between the two groups with respect to patients’ demographic characteristics. Postoperative SUI was seen significantly lower in group 1 than group 2 (5.71% vs 14.89%, p<0.05). Complication rate was statistically higher for group 2 (4.76% vs 18.08% respectively, p<0.05). Post-voiding residual urine volumes were significantly lower for group 1 than group 2 both preoperative and postoperatively.

Conclusion: Patients in both groups had benefit from TVT surgery but when the groups were compared according to subjective and objective results, it was apparent that the TVT alone group had statistically higher success rates than TVT+VH group.

Keywords: Prolapse; Stress urinary incontinance; Tension-free vaginal tape; Urinary retention; Vaginal hysterectomy

Abbreviations: TVT: Tension-Free Vaginal Tape; SUI: Stress Urinary Incontinence; VH: Vaginal Hysterectomy; ICIQ-SF: Incontinence Questionnaire-Short Form; POP-Q: Prolapsus Quantification System

Introduction

Urinary incontinence is one of the most common functional pathology for women during the pre- and post-menopausal periods [1]. Urethral hypermobility is the main anatomic abnormality in the pathogenesis of incontinent women [2]. Tension-free vaginal tape (TVT) is a commonly performed surgical technique for stress urinary incontinence (SUI). It ensures a suburethral vaginal hammock and its short-term results confirms that TVT procedure is a safe and effective technique, when performed alone [3,4].

Women undergoing surgical treatment of SUI generally need accompanying surgical procedures related to pelvic relaxation such as uterine prolapse, rectocele or cystocele. Performing TVT during other pelvic surgical procedures have some advantages such as lower cost, reduced risk of anesthesia related morbidity and a shorter hospital stay [5]. However there are controversial on the safety of concomitant surgeries and the success rates of TVT performed during other pelvic surgeries.

The aim of this study is to evaluate the efficacy and success rate of TVT operation performed alone with comparison to TVT plus concomitant procedure of vaginal hysterectomy (VH).

Material and Methods

We reviewed 240 patients with stress incontinence from January 2012 to December 2014, but we could not reach 41
patients’ data so 199 patients were enrolled for the study. Approval for the study was given by the hospital’s ethical committee. 105 patients underwent TVT operation alone (Group 1) and 94 patients underwent TVT and vaginal hysterectomy operation (Group 2). All patients filled The International Consultation on Incontinence Questionnaire-Short Form (ICIQ-SF) pre-operatively and post-operatively according to data record policy of our urogynecology clinic. ICIQ-SF is validated for Turkish speaking population. It is a subjective measure for evaluating the severity of urinary loss. This questionnaire consists of three components measuring:

i. Frequency,

ii. Severity, and

iii. Quality of Life.

Validity, reproducibility and responsiveness of the test have recently been investigated by several authors [6]. TVT operations were performed as described by Ulmsten et al. [7]. A non-elastic monofilament polypropylene tape was used in the mid-urethral sling procedure (Betamix vaginal sling, Betatech laboratories, TURKEY).

Before TVT operation, each patient underwent physical examination and urodynamic study. Physical examination was performed with the patient in the lithotomy position. Patients were hydrated two hours before physical examination. Loss of urine was tested during coughing and stress. A positive cough stress test was defined as the involuntary loss of urine during cough. The stress test was performed during moderate coughing in lithotomy when the bladder volume measured 300-350ml, in 3 dimensions using ultrasound guidance. The stage of the prolapse was assessed in the lithotomy position while the patient performed a valsala maneuver. The degree of pelvic organ prolapse was assessed by the pelvic organ prolapse quantification system (POP-Q) during gynecologic examination [8].

The primary outcome measure was the objective cure rate of SUI following TVT. Patients were considered objectively cured when no SUI was evident during post operative period determined as stress test negative. Secondary outcome measure was subjective cure rate of SUI and this was evaluated by ICIQ-SF. Intra operative and postoperative complications were also recorded.

All the prolapse patients enrolled in the study had documented objective SUI.

In patients who needed concomitant VH and/or colporrhaphy, the TVT sling was inserted after with the anterior vaginal wall incision extended to reach the level of the mid-urethra. A Foley catheter was always inserted for 24 hours for bladder drainage after the procedure and postvoid residual urinary volumes were measured by intermittent catheterization until patients resumed spontaneous voiding with a postvoid residual volume of less than 100ml during two consecutive micturitions.

Statistical analysis was performed using Student’s t test and Mann-Whitney U test for parametric and non-parametric continuous variables respectively and the Chi-square test or Fisher’s exact test, where appropriate for categorical variables. p-value <0.05 was considered statistically significant.

Results

There were no significant differences between the two groups with respect to patients’ demographic characteristics (mean age, mean gravida, BMI, menopausal status) and urodynamic indices (Table 1).

Table 1: Demographic characteristics.

|                | TVT (n=105) | TVT+VH (n=94) | P    |
|----------------|-------------|---------------|------|
| Age            | 50.72±7.88  | 52.95±9.02    | 0.065|
| Gravidity      | 5.08±2.48   | 4.93±2        | 0.640|
| Parity         | 4.1±2.13    | 4.23±2.18     | 0.653|
| BMI            | 29.04±3.15  | 29.21±3.15    | 0.711|
| Vaginalbirth   | 97 (92.38%) | 80 (85.11%)   | 0.062|
| C/S            | 8 (7.62%)   | 14 (14.89%)   |      |
| Premenopause   | 46 (43.81%) | 30 (31.91%)   | 0.101|
| Postmenopause  | 59 (56.19%) | 64 (68.09%)   |      |
| Systemic disease+ | 59 (56.19%) | 37 (39.36%)  | 0.119|
| Systemic disease- | 46 (43.81%) | 57 (60.64%)  |      |
| Control length (Month) | 15.04±4.7    | 14.74±3.74  | 0.622|
| Urodynamic VLPP| 73.58±17.51 | 69.85±10.99  | 0.078|

BMI: Body Mass Index
VLPP: Valsalva Leak Point Pressure

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The mean duration of follow-up was 15, 04±4, 7 months in the TVT group and 14, 74±3, 74 months in the TVT+VH group.

Group 1 underwent a total of 154 concomitant procedures: 90 anterior colporrhaphies, 48 posterior colporrhaphies and 16 cervical amputations. Group 2 underwent a total of 230 concomitant operations beside vaginal hysterectomy: 94 anterior colporrhaphies, 82 posterior colpoperineorrhaphies, 54 sacrospinous ligament fixation of the vaginal vault.

In group 1, two bladder perforations (2/105) occurred and one patient experienced mesh rejection and mesh was removed 5 months after the operation. Urinary retention longing more than 5 days occurred for 2 patients, urethral catheterization was performed for these patients and mesh was removed from one patient 20 days after the operation and overall complication rate for group 1 was 4.76% (5/105).

In group 2, four bladder perforations (4/94) occurred during surgery. Urinary retention longing more than 5 days occurred for 5 patients, urethral catheterization was performed for these patients and mesh was removed from two patients 15 and 20 days after the operation, respectively. 1 cuff infection, 1 rectovaginal hematoma, 2 pelvic discomfort occurred. 2 patients needed postoperative blood transfusion and the overall complication rate for group 2 was 15.95% (15/94). Complication rate was statistically higher for group 2 (4.76% vs 18.08% respectively, p<0.05). Distribution of all complications developed during surgeries are shown in Table 2.

Table 2: Complications developed during surgeries.

| Complication                  | TVT (n105) | TVT+VH (n94) | Total  |
|-------------------------------|------------|--------------|--------|
| Bladder perforation           | 2          | 4            | 6      |
| Urinary retention             | 2          | 5            | 7      |
| Cuff infection                | 0          | 1            | 1      |
| Mesh rejection                | 1          | 2            | 3      |
| Pelvic discomfort             | 0          | 2            | 2      |
| Rectovaginal hematoma         | 0          | 1            | 1      |
| Blood transfusion             | 0          | 2            | 2      |
| Total                         | 5/105 (4.76%) | 17/94 (10.88%) | p<0.05 |

Table 3: Comparison of objective results.

| SUI                         | TVT (n105) | TVT+VH (n94) | P     |
|-----------------------------|------------|--------------|-------|
| Postop SUI Negative         | 99         | 80           | 85.11%| 0.033 |
| Postop SUI Positive         | 6          | 14           | 14.89%|      |

Postoperative SUI was seen significantly lower in group 1 than group 2 (5.71% vs 14.89%) and success rate was higher in group 1 (94.29% vs 85.11% respectively, p<0.05) (Table 3).

According to our objective cure results, although success rates of TVT for the treatment of SUI when performed with prolapsus surgery is not bad at all, if TVT is performed alone for SUI, its success rate is higher than when performed with vaginal hysterectomy.

Post-voiding residual urine volumes were significantly lower for group 1 than group 2 both preoperative and postoperatively (p=0.0001). Postoperative residual urine volumes were significantly higher than preoperative residual urine volumes for both group 1 and group 2 (Table 4).

Table 4: Residual urine volumes.

|        | TVT (n105) | TVT+VH (n94) | P     |
|--------|------------|--------------|-------|
| Preop Residual urine (cc) | 9.1±4.72   | 24±14.38     | 0.0001|
| Postop Residual urine (cc)| 19.6±8.62  | 29.7±19.11   | 0.0001|

When analysing the ICIQ-SF scores, our results demonstrated that TVT surgery significantly improves SUI for both groups when pre and post operative results compared. However, when we evaluated the patients according to the questions one by one, it was found that the total scores of responses that evaluated the frequency of urinary incontinence, the amount of urine that leaks and total scores were significantly higher in TVT alone group preoperatively when compared to TVT+VH group (Table 5).

Table 5: Comparison of results according to ICIQ-SF for both groups.

| ICQ-SF (SUI) | TVT (n105) | TVT+VH (n94) | P     |
|--------------|------------|--------------|-------|
| Frequency    | Preop      | 4.3±0.7      | 3.7±0.87 | 0.0001|
|              | Postop     | 0.5±0.91     | 0.7±1.09 | 0.115 |
|              | p          | 0.0001       | 0.0001  |
| Amount       | Preop      | 5±1.22       | 4.2±1.12 | 0.0001|
|              | Postop     | 0.88±1.19    | 0.98±1.49| 0.623 |
|              | p          | 0.0001       | 0.0001  |
| Quality of life | Preop     | 6.9±1.19     | 6.6±1.28 | 0.166 |
|              | Postop     | 0.98±1.4     | 1.26±2.11| 0.278 |
|              | p          | 0.0001       | 0.0001  |
| Total Score  | Preop      | 16.2±2.68    | 14.6±2.82| 0.0001|
|              | Postop     | 2.38±3.37    | 2.98±4.52| 0.294*|
|              | p          | 0.0001*      | 0.0001* |

In order to interpret more precisely the outcomes of operations, the difference between pre-post operative success rates were evaluated. Recovery differences in both groups were compared between each other, there was not a statistically significant difference for average improvement percentages (Table 6).
Discussion

TVT is a simple and effective procedure for the treatment of female SUI. Insertion of TVT is an apparently safe procedure, as demonstrated by the low complication rate in our study. Most complications were short-term, and were managed conservatively. As these patients with SUI may also have additional problems such as uterine prolapsus or myomas, concomitant surgical procedures to SUI surgery may have the potential to save time and prevent the risks of another surgery scene.

Jeffry et al reported 89.3% objective cure rate and 66% subjective cure rates with the TVT procedure and the difference between these results were statistically significant (p<0.05) [9]. On the contrary to them, our subjective cure rates were high for both groups; 86.9% for TVT alone group and 81.2% for TVT+VH group respectively (p=0.08). Yip et al. [10] reported that group having TVT with concomitant procedures have a similar cure rate when compared with the group having TVT alone after 1 year follow up (94.6% vs 93% respectively, p=0.4) [10]. Different from them we found that objective cure rates were significantly higher for TVT alone group than TVT-VH group (94.2% vs 85.1% respectively, p<0.05). Even so, our results suggest that TVT can be performed concomitantly with hysterectomy or pelvic floor reconstruction with good results.

Our mean complication rate was 18.08% (17/94) for TVT+VH group and 4.76% (5/105) for TVT group (p<0.05). Overall our complication rate was 11.05% (22/199) and it was in the ranges reported by Neuman et al. [11] and Natale et al. [12]. We experienced more bladder perforations and more postoperative urinary retentions when the TVT is performed in addition to other procedures, such as hysterectomy. Similar to us, although Houwing et al reported similar complication rates between TVT only group and TVT with prolapse repair group, they found higher estimated blood loss, longer operating time, longer length of hospital stay and longer time to normal voiding for patients TVT with prolaps repair [13]. Different from us Darai et al reported similar overall complication rates between the two groups (14/41-34% for TVT without hysterectomy group vs 14/40-30% for TVT with hysterectomy group, p=0.05) [1].

As urinary retention is an embrazing result of TVT surgery, patients must be counseled about the occurrence of this preoperatively about the risk of catheterization and tape release. However, most patients in retention can attain normal voiding within less than a month after the TVT procedure.

We observed that patients were significantly received beneficial effect from SUI surgery when evaluated by the responses to the pre-post operative ICIQ-SF scores. According to the ICIQ-SF (subjective evaluation) scores, the pre-post operative recovery difference in patients underwent TVT alone were found to be statistically significantly higher than patients underwent TVT plus VH.

On the other hand, examination of patients objectively showed that the SUI positivity in postoperative period was found to be 5.71% (6/105) in TVT alone group whereas 14.89% (14/94) in TVT+VH group.

Our study showed that patients in both groups had benefit from TVT surgery but when the groups are compared according to subjective and objective results, it was apparent that the TVT alone group had statistically higher success rates than TVT+VH group.

Conclusion

In conclusion, the success rate of TVT operation is statistically significantly falling in case of incontinence surgery performed concomitantly with pelvic floor defect repair rather than TVT surgery alone.

References

1. Darai E, Jeffry L, Deval B, Birsan A, Kadoch O, et al. (2002) Results of tension-free vaginal tape in patients with or without vaginal hysterectomy. Eur J Obstet Gynecol Reprod Biol 103(2): 163-167.
2. Klutke JJ, Carlin B, Klutke CG (2000) The tension-free vaginal tape procedure: correction of stress incontinence with minimal alteration in proximal urethral mobility. Urology 55(4): 512-514.
3. Ulmsten U, Johnson P, Rezapour M (1999) A 3 years follow-up of tension free vaginal tape for surgical treatment of female stress urinary incontinence. Br J Obstet Gynaecol 106(4): 345-350.
4. Olsson I, Kroon U (1999) A three-year post-operative evaluation of tension-free vaginal tape. Gynecol Obstet Invest 45(3): 356-361.
5. Raffi A, Paolotti X, Haab E, Levardonn M, Deval B (2004) Tension-free vaginal tape and associated procedures: a case control study. Eur Urol 45(3): 356-361.
6. Avery K, Donovan J, Abrams P (2001) Validation of a new questionnaire for incontinence: the international consultation on incontinence questionnaire (ICI-Q). Neurourol Urodyn 20: 86.
7. Ulmsten U, Henriksson L, Johnson P, Vahros G (1996) An ambulatory surgical procedure under local anesthesia for treatment of female urinary incontinence. Int Urogynecol J Pelvic Floor Dysfunct 7(2): 81-85.
8. Bump RC, Mattiasson A, Bø K, Brunhaker LP, DeLancey JO (1996) The standardization of terminology of female pelvic organ prolapse and pelvic floor dysfunction. Am J Obstet Gynecol 175(1): 10-17.
9. Jeffry L, Deval B, Birsan A, Soriano D, Darai E (2001) Objective and subjective cure rates after tension-free vaginal tape for treatment of urinary incontinence. Urology 58(S): 702-706.

Table 6: Average improvement percentages, preand post opeartively for both groups (% difference).

| ICIQ-SF (SUI) Pre-Postoperative difference (%) | TVT (n105) | TVT+VH (n94) | p |
|------------------------------------------------|------------|--------------|---|
| Frequency                                      | 89.04±19.33| 80.18±30.6   | 0.015|
| Amount                                         | 84.62±21.99| 78.37±34.03  | 0.123|
| Quality of life                                | 87.37±16.97| 83.38±27.08  | 0.210|
| Total Score                                    | 86.93±18.31| 81.24±27.84  | 0.088|
10. Yip SK, Pang MW (2006) Tension-free vaginal tape sling procedure for the treatment of stress urinary incontinence in Hong Kong women with and without pelvic organ prolapse: 1-year outcome study. Hong Kong Med J 12(1): 15-20.

11. M Neuman, Y Lavy (2007) Conservation of the prolapsed uterus is a valid option: medium term results of a prospective comparative study with the posterior intravaginal slingoplasty operation. International Urogynecology Journal Pelvic Floor Dysfunct 18(8): 889-893.

12. Natale F, La Penna C, Saltari M, Piccione E, Cervigni M (2009) Voiding dysfunction after anti-incontinence surgery. Minerva Ginecol 61(2): 167-172.

13. Houwing MM, Schulz JA, Flood CG, Baydock S, Rosychuk RJ (2013) A retrospective review of tension-free vaginal tape/transobturator tape procedures done concomitantly with prolapse repair. J Obstet Gynaecol Can 35(4): 340-347.

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