

The Influence of Body Mass Index on the Success Rate of Transobturator Tape Procedure among Egyptian Women

Abou-Gamrah A. (MD)

Department of Obstetrics and Gynecology – Ain Shams University

* Correspondence: Amgad Abou-Gamrah – Assistant professor of Obstetrics and Gynecology
Faculty of Medicine, Ain Shams University, Abbasyia – Cairo.

E-MAIL: migoa1@hotmail.com

Abstract

The goal of this study is to assess the impact of body mass index (BMI) on the outcome of transobturator tape (TOT) procedure among Egyptian women. A prospective interventional study conducted at Ain Shams Maternity teaching hospital (Urogynecology Department). Ninety seven women consented to participate in this study. Clinical details were noted and urodynamic studies were carried out. Body mass index (BMI) was defined as normal (<25 kg/m²), overweight (25 – 29 kg/m²) and obese (≥30 kg/m²). 97 patients undergoing TOT were finally reviewed. BMI was stratified into normal weight (n=28), overweight (n=37), and obese (n=32) groups. Pre- and postoperative evaluations were compared, which included subjective and objective outcome of TOT, complications, and assessment of quality of life by validated questionnaires. After a median follow-up of 15 months, the three groups did not differ significantly as regards the cure rates whether objectively or subjectively, neither the quality of life nor the postoperative complications in patients undergoing TOT.

Keywords

Body mass index – urinary incontinence - Transobturator tape.

I. Introduction

The prevalence of obesity is increasing. The world health organization reported that about 1 billion individuals are obese, with more than 300 million people meeting the criteria for obesity. Twenty nine percent of women from ages 20 to 39 are obese and 26% are overweight [1]. The Middle East countries in general and Egypt in particular, are similar to many middle income developing nations that have suffered a fast increase in the occurrence of obesity. Reports from the Demographic and Health Surveys revealed that in 1992, women during the child bearing period had an average BMI of 26.9. By 2005, this had increased to an average BMI of 30.1, with almost half of Egyptian mothers with young children being classified as obese. It is evident that Egypt is facing unusual changes in the incidence of overweight and obese individuals in a relatively short period of time [2]. Being overweight is a modifiable risk factor for the occurrence of SUI with many epidemiological studies evaluating its effect on urinary incontinence prevalence. Obesity is a potential risk factor for urinary incontinence (UI) among women of all ages. Although few would doubt that obesity has a role in UI, there are many uncertainties regarding weight as a risk factor. However, sparse data on the effect of increased BMI on patient symptoms, urodynamic profile and physical factors that may affect UI in obese and non-obese women are available [3- 4].

The TOT procedure was developed by Delorme as a modification of

TVT sling procedure [5]. TOT is increasingly used worldwide because it is safe and is well documented as an effective procedure in improving incontinence-related quality of life [6]. However, there have been few studies assessing this procedure in overweight and obese women. The aim of this study was to assess the objective and subjective outcomes of the TOT procedure amongst the spectrum of normal weight, overweight, and obese women.

II. Patients and Methods

This was a prospective interventional study done at Ain Shams Maternity University Hospital (Urogynecology Department). Women with SUI between January 2011 and December 2015, who were scheduled for treatment by TOT surgery using the outside-in technique as described by Delorme [5], were recruited.

Evaluations included a detailed personal history, pelvic examination with cough stress test and urinalysis. Exclusion criteria included genital prolapse greater than stage 1 (according to the Pelvic Organ Prolapse Quantification system) [7], urge or mixed incontinence, intrinsic sphincter deficiency and concomitant pelvic reconstruction surgery. The local institutional ethics and research committee accepted the study. All women gave informed written consent.

Urodynamic testing was performed using the Dantec 5500 uro-dynamic apparatus (Dantec Medical, Bristol, UK) with a multichannel system; it included cystometry, urethral pressure profilometry, uroflowmetry and

measurement of the Valsalva leak point pressure (VLPP). Urodynamic SUI was identified on the basis of the occurrence of involuntary urine leakage with elevated intra-abdominal pressure—without the occurrence of detrusor muscle contractions—during filling cystometry. Detrusor overactivity was identified by the presence of provoked or spontaneous involuntary detrusor muscle contractions during filling cystometry. Intrinsic sphincter deficiency was indicated by a VLPP < 60 cm H₂O or a maximum urethral closure pressure < 20 cm H₂O [7].

All tapes used were Monarc tape (American Medical Systems, Minnetonka, MN, USA). Cystoscopy was performed only if a bladder injury was suspected. All participants received preoperative chemoprophylaxis (1 g of a first-generation cephalosporin). Both general and regional anesthesia was used.

Quality of life was assessed by the Urogenital Distress Inventory (UDI-6) and the Incontinence Impact Questionnaire (IIQ-7), by which a higher score indicated worse symptoms and poorer quality of life [8]. Postoperative follow-up was scheduled at 1 week after discharge, then at 3, 6 and 12 months thereafter and then annually. At 12 months after surgery, the women underwent full postoperative investigations including cough stress test, urodynamic studies, and completed the quality-of-life questionnaire. Objective cure was defined by a negative cough stress test. The absence of distressing urinary manifestations (urgency, urge incontinence and voiding dysfunction) was the measure of the subjective cure. The statistical analysis was performed using SPSS version 17 (SPSS Inc, Chicago, IL, USA) using one-way

ANOVA for continuous variables and the chi-square or Fisher's exact test for categorical variables. The Wilcoxon signed-rank test was used to compare paired numerical data. $P < 0.05$ was considered statistically significant.

III. Results

Initially 112 participants were recruited, 15 (13.3%) did not complete follow-up and thus were excluded from analysis. The final statistical analysis included 97 women, that were stratified into normal weight (n=28) group I, overweight (n=37) group II, and obese (n=32) group III. There was no statistically significant difference between the three groups as regards the baseline demographic data; except for the BMI (Table 1). The mean duration of follow-up was 15 months (9-44 months). Preoperatively, women of the three groups were statistically the same as regard to urodynamic parameters, UDI-6 and IIQ-7 (Table 2). The mean operative time was 30, 33 and 35 minutes for each group respectively with no statistically significant difference between them.

Surgery resulted in objective cure in 21 (75%) women in group I compared to 32 (86.5%) and 29 (90.6%) women in groups II and III respectively. Subjective success was achieved in 86.6%. There were no statistically significant differences among the three groups in terms of objective or subjective surgical

outcomes or in the incidence of de novo DO. Results of the UDI-6 and IIQ-7 after TOT were significantly improved over baseline in all three groups with no significant differences among the groups in terms of degree of improvement. The overall complication rate after TOT was 9.3%. In the normal weight group, two women had urinary retention. In the overweight group, two had a urinary tract

infection, one had urinary retention and one had tape extrusion. In the obesity group, one had a urinary tract infection and two had tape extrusion. Affected women with tape extrusion were managed by excision of the extruded portion of the tape. There were no differences in postoperative complications among the groups (Table 3).

Table (1): Clinic-demographic data of the study population

	Group I (28)	Group II (37)	Group III (32)	P- value
Age	41.26 ± 6.2	42.3 ± 4.1	41.88 ± 5.2	> 0.05
Body mass index (kg/m²)	22.1 ± 2.7	26.2 ± 1.9	35.6 ± 5.4	< 0.05
Parity	3.2 ± 0.5	3.3 ± 0.1	2.9 ± 1.1	> 0.05
Duration of marriage(yrs)	8.6 ± 2.1	9.1 ± 1.5	10.6 ± 1.8	> 0.05
Mode of delivery				
Vaginal	19	23	21	> 0.05
Cesarean	9	14	11	
Postmenopausal state	18	29	23	> 0.05
Education				
≤High school	11	18	14	> 0.05
>High school	17	19	18	
Occupation				
House wife	20	21	22	> 0.05
Employed	8	16	10	

Data are presented as mean ± standard deviation or as number (percent) of patients

Table 2: Preoperative characteristics of women undergoing TOT according to BMI

	Group I (28)	Group II (37)	Group III (32)	P- value
UDI-6	7.2 ± 1.1	6.8 ± 1.3	6.2 ± 1.4	> 0.05
IIQ-7	8.1 ± 1.2	7.6 ± 1.7	7.2 ± 1.5	> 0.05
Urodynamic parameters	149 (142 to 152)	153 (148 to 160)	152 (144 to 161)	> 0.05
First desire to void (ml)	395 (380–444)	424 (389–455)	418 (390–449)	> 0.05
Cytometric capacity (ml)	23 (21 to 25)	80 (74 to 91)	79 (73 to 90)	> 0.05
Functional urethral length (mm)	75 (66 to 92)	26 (23 to 30)	26 (21 to 31)	> 0.05
Leak point pressure (cm H₂O)	27 (23 to 29)	20 (15 to 24)	19 (10 to 30)	
Maximum flow rate (mm/s)	23 (9 to 30)			
Residual volume (ml)				

UDI-6 short form of Urogenital Distress Inventory, IIQ-7 short form of Incontinence Impact Questionnaire

Data are presented as mean ± standard deviation or as number (percent) of patients

Table 3: Urodynamic measures, objective and subjective results and quality of life among the study groups

	Group I (28)	Group II (37)	Group III (32)	P- value
Operative time (min.)	30 (25–32)	33 (24–35)	35 (28–37)	> 0.05
	21 (75%)	32 (86.5%)	29 (90.6%)	> 0.05
Objective cure				
De novo DO	2 (7.14%)	4 (10.8%)	2 (6.3)	> 0.05
Subjective success	23 (82.14%)	31 (83.8%)	30 (93.8%)	> 0.05
UDI-6	3 ± 1.2	4.13 ± 1.4	3.8 ± 1.1	> 0.05
IIQ-7	4.17 ± 1.8	3.18 ± 1.3	4.3 ± 2.1	> 0.05
Complications	2 (7.14%)	4 (10.8%)	3 (9.4%)	> 0.05

UDI-6 short form of Urogenital Distress Inventory, IIQ-7 short form of Incontinence Impact Questionnaire

Data are presented as mean ± standard deviation or as number (percent) of patients

IV. Discussion

This study reported that BMI has no impact on the success of TOT procedure for treating SUI and the complication rates did not differ significantly amongst the spectrum of normal weight, overweight, and obese women undergoing TOT procedure. Also, there was no significant difference in regard to improvement in the quality of life for participants in each group.

Body mass index is significantly correlated with abdominal pressure which may increase stress on the pelvic floor, perhaps contributing to the development of SUI. However, it was not found that patients with increased BMI were more likely to have SUI on follow-up. Reports of the relatively few articles of anti-incontinence surgery in obese women are conflicting [9]. One such report collected answers to a mailed questionnaire by 970 women that underwent TVT indicated the occurrence of an apparently undesired result in the 61 very obese women (BMI>35) [10].

Surgery resulted in objective improvement in 21 (75%) women in group I compared to 32 (86.5%) and 29 (90.6%) women in group II and III respectively. Subjective success was achieved in 86.6% (84 out of 97). In agreement with our results, Killingsworth et al. evaluated 195 women who underwent TVT. At 1 year of follow-up, it was found that the surgical outcome among 68 normal weight, 65 overweight, and 62 obese women, was the same [11]. Also, Skriapas et al. assessed 31 morbidly obese patients (BMI>40) and 52

patients with a normal BMI after a follow-up of 18.5 months. Objective improvement rate in the control group was 92.3% and 86.9% for morbidly obese group, a nonsignificant difference. They reported that TVT was a suitable choice for morbidly obese patients with severe urodynamic stress incontinence [12]. Discrepancies among studies may be attributed to different lengths of follow-up, variation in the type of anti-incontinence surgery, and different definitions of cure. In another study of TOT procedure, no significant link between body weight and surgical outcome at 18 months of follow-up among 43 normal weight, 81 overweight, and 73 obese women was found [13]. However, it is important to note, those investigators defined cure subjectively only. These results were similar to ours, but the merit of our study was the use of objective and subjective outcomes of cure. We noted a significant increase in UDI-6 and IIQ-7 scores in all three groups indicating that TOT techniques indeed improved quality of life irrespective of BMI.

Rafii et al., performing TVT, found a significantly higher occurrence of urge incontinence (18%) in 39 obese women, compared with only 6.4% of 62 overweight women and in 3.4% of 86 normal weight patients [14]. De novo DO occurred in 2 (7.14%) in the current study normal weight group, but it was found in 4 (10.8%) overweight and two (6.3%) obese subjects with no statistically significant difference. Liapis et al. found an objective improvement in 82.4% of 115 subjects after TOT based on

the pad test finding at 4 years postoperatively [15].

In agreement with our results, Tomasz R et al 2010 evaluated five hundred thirty-seven patients underwent a retropubic or transobturator sling procedure. Women were randomly allocated into two study groups. After 18 months, it was found that BMI does not affect the effectiveness of SUI treatment, whereas both menopausal status and ageing had a detrimental influence on the final result of surgery [16]. Similarly, it was found that the overall cure rate after 1 year for midurethral sling procedures was 87%, but was negatively affected by BMI >30, diabetes and age > 80 years. Perioperative complications were more common with the retropubic procedure than with TOT technique and when BMI < 25. Smoking did not have an impact on any of the studied outcomes [17].

In a recent study, baseline characteristics of subjects in the Stress Incontinence Surgical Treatment Efficacy Trial (SISTEr, N=655) and the Trial of Midurethral Slings (TOMUS, N=597) were analyzed. They concluded that obese women undergoing surgery for stress urinary incontinence report more incontinence attacks, more symptoms and worse quality of life despite better measure of urethral function (higher VLPP) [18].

The complications were few and this agreed with an analysis of 281 women who underwent TOT and concluded that TOT procedure was effective and safe in the long term treatment of stress incontinence, regardless of BMI [19].

The main limitation of our study was the relatively small sample size and short duration of follow up. On the other hand, our population was representative of women typically seen complaining of isolated stress urinary incontinence. Our results help confirm the effectiveness of the TOT procedure for women in a general clinical setting.

V. Conclusion

TOT procedure is safe and effective regardless of the BMI of the patient after short-term follow-up.

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VII. References

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