Do severe obese patients with stress urinary incontinence benefit from transobturator tape procedure? 3-year surgical outcome

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Abstract

Introduction: We evaluate the impact of severe obesity on surgical outcomes of the transobturator tape (TOT) procedure in patients with stress urinary incontinence (SUI).

Methods: In total, 32 women with severe obesity (body mass index [BMI] >35 kg/m²) were included in the study. All patients were preoperatively evaluated with history, pelvic examination, ultrasonography, and cough stress test. All patients completed the International Consultation on Incontinence Questionnaire-Short form (ICIQ-SF) preoperatively and at the postoperative follow-up. Cure of incontinence was defined as being completely dry after surgery. Cure was assessed subjectively and objectively. Subjective improvement defined as an International Consultation on Incontinence Questionnaire-Short form (ICIQ-SF) score ≤ 12 and satisfaction with surgery. Failure was defined as having no change or worsening of urinary incontinence after surgery. Postoperative patient satisfaction was assessed using a visual analog scale.

Results: The mean follow-up time and mean BMI were 40.9 ± 20.9 months and 38 ± 3 kg/m², respectively. According to preoperative ICIQ-SF questionnaire scores, 20 patients (62.5%) had severe and 12 patients (37.5%) had very severe urinary incontinence symptoms. No patient had slight or moderate symptoms. None of the patients experienced worsening symptoms after surgery. Objective cure, subjective cure, subjective improvement and patient satisfaction rates were 81.2%, 46.8%, 37.5%, and 84.3% respectively. Our overall complication rate was 9.3%. None of the patients experienced intraoperative complications.

Conclusion: In experienced hands, TOT is an effective and safe procedure to treat SUI, with minimal complications in severe obese women.

obesity, and poor collagen turnover are risk factors for SUI.² Other risk factors include history of gynecological surgery, menopausal status, smoking, and coffee and alcohol consumption.³ Obesity is an increasing health problem all over the world. In 2008, Hunskaar proposed that obesity causes SUI because increased body weight results in increased intra-abdominal pressure (IAP), which in turn leads to weakening of the pelvic floor innervation and musculature.⁴ IAP in patients with higher body mass index (BMI) results in increased intra-vesical pressure and increased pressure at maximum cystometric capacity, which may contribute to SUI in obese patients.⁵⁻⁸ Also, obesity-induced neurogenic effects on the pelvic floor may contribute to urethral dysfunction and result in urinary incontinence.⁶

In the surgical treatment of SUI, the most common procedures are tension-free vaginal tape (TVT) and transobturator tape (TOT). The TOT procedure became a mainstay SUI operation because of its high success and low complication rates.⁹ There are a few studies investigating the impact of obesity on outcomes of anti-incontinence surgery. In these studies, midurethral sling (MUS) procedures have been effective with minimal complications in obese patients.¹⁰⁻¹² However the influence of obesity on surgical outcomes of TOT procedure is still controversial and the situation is more complicated when it comes to severely obese patients.

Severe obesity is associated with many health problems, which may increase perioperative morbidity and postoperative complications in the follow-up period. The success rates and perioperative complications after incontinence surgery in severely obese patients are controversial.^{11,12} In this retrospective study, we evaluate the impact of severe obesity on surgical outcomes of the TOT procedure in patients with SUI.

Methods

The incidence of stress urinary incontinence (SUI) is considerably high and ranges from 30% to 50%.¹ Age, childbirth,

We retrospectively reviewed the medical records of 524 SUI patients who underwent TOT operation from March

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2005 to March 2013. Among these patients, 36 women with BMI >35 kg/m² were subjects of this study. Patients who had less than a 1-year follow-up period were excluded. We also excluded patients with previous incontinence and/ or pelvic organ prolapse (POP) repair surgery, POP greater than stage 1, or neurological disease history. Body weight and height were measured at the hospital, and women with a BMI >35 kg/m² were accepted as severely obese.

All patients were preoperatively evaluated with history, pelvic examination in lithotomy position, ultrasonography, and cough stress test (CST). All patients completed the International Consultation on Incontinence Questionnaire-Short form (ICIQ-SF) preoperatively and at the postoperative follow-up visits. If the patient had pure SUI history with positive CST, then we did not perform urodynamic studies (UDS). UDS were preserved for patients with mixed urinary incontinence (MUI) history and/or with post-void residual urine more than 100 mL. All patients with pure SUI and MUI with predominant SUI were included in this study.

All procedures were performed by the same surgeon (TY) very familiar with incontinence and prolapse repair surgery. We used a macropore monofilament polypropylene mesh (Duzey SVT vaginal tape system, Istanbul, Turkey [22 cases]; Heine Medizin urethral support system, Düsseldorf, Germany [6 cases]; and I-STOP CL Medical, Lyon, France [4 cases]). Patients were evaluated on postoperative day 15 with urine culture and were questioned for early postoperative complaints. They were re-evaluated on month 3 and month 12, and then annually with a pelvic examination, including CST and ICIQ-SF. Postoperative additional UDS were performed only in cases of de novo overactive bladder (OAB) symptoms. The severity of urinary incontinence was classified by ICIQ-SF: slight (score 1–5), moderate (score 6–12), severe (score: 13–18), and very severe (score: 19–21).¹³

The operation was carried out under spinal anesthesia in all of the cases with the outside-in obturator tape. Cure of incontinence was defined as being completely dry after surgery. Cure was assessed subjectively and objectively. Criteria for objective cure include a negative CST, no need for pads, and no reoperation for SUI. Subjective cure was defined as an ICIQ-SF score 0, no need for pads, and no reoperation for SUI. Subjective improvement was defined as no need for additional treatment for SUI, an ICIQ-SF score ≤12 (slight or moderate symptoms), and satisfaction with surgery. Failure was defined as having no change or worsening of urinary incontinence after surgery. Postoperative patient satisfaction was assessed using a visual analog scale (VAS), where 0 points represented very dissatisfied (unbearable urinary complaints) and 100 points represented very satisfied (no urinary problems). Resolution of urgency urinary incontinence (UUI) was defined by patient reporting on the guestionnaire and discontinuation of antimuscarinic medication.

Statistical analysis

The results of this study were processed statistically through independent-sample Student's tests and one-way analysis of variance; statistical significance was set at p < 0.05.

Results

Of the 36 women with BMI>35 kg/m², 32 met the inclusion criteria. One woman died 3 months postoperatively of heart failure and 3 women were excluded due to concomitant POP repair surgery in 2 women and inadequate postoperative data in 1 woman (Table 1). Before surgery, 17 women (53.1%) had MUI with predominant SUI, and 15 (46.9%) patients had pure SUI. Among the 17 women with MUI, 6 (18.7%) had detrusor overactivity (DOA). The mean follow-up period was at least 12 months (40.9 ± 20.9) , range: 12-72 months). The post-void residual urine assessed by ultrasound preoperatively was less than 100 mL in all women. The preoperative median ICIQ-SF score was 18 (range: 12-21). According to preoperative ICIQ-SF scores, 20 patients (62.5%) had severe and 12 patients (37.5%) had very severe urinary incontinence symptoms. No patient had slight or moderate symptoms. The mean operation time was 24.7 ± 5.6 (range: 14–33) minutes. None of the patients reported worsening symptoms after surgery.

Table 2 summarizes objective cure, subjective cure, subjective improvement, and patient satisfaction rates. Five patients (15.6%) who had MUI before surgery failed and none of these patients had chronic disease. According to these results, 27 patients improved (n = 12) or were cured (n = 15)(84.3%) after TOT procedure. Three patients (9.3%) had UUI resolved postoperatively and 1 patient had de novo urgency. The median postoperative ICIQ-SF score was 5 (range: 0–19).

Our overall complication rate was 9.3%. None of the patients experienced intraoperative complications. Two patients (6.2 %) had severe groin and leg pain which resolved with nonsteroidal anti-inflammatory drugs (NSAID). Postoperatively, 1 patient (3.1%) had de novo urgency, but UDS were normal and she was treated with an antimuscarinic drug. Vaginal erosion was not documented in any of the patients.

Table 1. Baseline characteristics of the patients			
Age, year (mean ± SD)	53.4 ± 8, 7		
BMI, kg/m² (mean ± SD)	38 ± 3		
Follow-up time, month (mean ± SD)	40.9 ± 20, 9		
Operation time, min (mean ± SD)	24.7 ± 5, 6		
Chronic disease, n (%)			
DM	6 (18.7%)		
Chronic constipation	5 (15.6%)		
Chronic cough	3 (9.3%)		
BMI: body mass index: DM: diabetus mellitus: SD: standard dev	iation		

Table 2. Outcomes of the patients after TOT procedure atmean 40.1 months and incontinence type before surgery			
		SUI	MUI
Total number, n	32	15	17
Objective cure rate, n (%)	26 (81.2)	12 (80)	14 (82.4)
Subjective cure rate, n (%)	15 (46.8)	11 (73.3)	4 (23.5)
Subjective improvement, n (%)	12 (37.5)	4 (26.7)	8 (47.1)
Patient satisfaction rate, n (%)	27 (84.3)	14 (93.3)	13 (76.5)
TOT: transobturator tape: SUI: stress urinary incontinence: MUI: mixed urinary			

TOT: transobturator tape; SUI: stress urinary incontinence; MUI: mixed urinary incontinence

Discussion

Obesity is a risk factor for SUI and may affect voiding patterns.¹⁴ BMI is significantly correlated with intra-abdominal pressure, which increases stress on the pelvic floor and contributes to the development and recurrence of SUI.⁵ The prevalence of SUI increases with higher BMI.^{15,16} Tchey and colleagues reported that obese patients had a worse grade of SUI, urgency and UUI than non-obese patients.¹⁰ According to Richter and colleauges, a possible mechanism leading to the development of urge or UUI is obesity-induced neurogenic effects on the pelvic floor.¹⁷ Because the obese female population has a high prevalence of SUI, these patients often present for surgical evaluation.

There is ongoing research on the results of SUI procedures in obese patients.¹⁸ In treating SUI in the obese population, conservative treatment modalities may reduce the frequency of episodes of self-reported UI;¹⁹ however, the most definitive strategy is surgery.²⁰ Among different techniques which can be used in SUI treatment, MUS is effective in obese patients.^{11,12} There are several studies about incontinence surgery in obese patients, but the results of these studies are contradictory. Most of the studies investigating the results of sling procedures comprise the surgical outcomes of TVT procedure. Some of these studies revealed no difference in the potential impact of obesity on TVT outcomes in shortterm follow-up (<1 year).²¹⁻²³ On the other hand, Hellberg and colleagues reported significant failure rates (52%) in the severely obese population (BMI >35) compared to non-obese women (19%) with long-term follow-up (mean 68 months).²⁴ Although TVT is a good option for severely obese patients with severe incontinence, TOT has become an acceptable alternative in the surgical treatment of SUI. Major advantages of TOT include low morbidity, reduced costs, and shorter hospital stay.⁹

In the current study, we discussed our TOT results in severely obese patients and evaluated the risk factors for surgical failure. Our objective cure rate was similar to previous studies.^{25,26} Although our subjective cure rate was relatively low, the sum of improved and cured patients was 84.3% and the patient satisfaction rate was 84.3%. Of our cohort, 5 patients (15.6%) who had MUI before surgery had no change or their symptoms worsened after the TOT proce-

dure. Frohme and colleagues compared the TOT procedure in women with pure SUI and compared patients with different BMIs. Similar to our findings, the authors found that obese patients were less satisfied with the outcome of the procedure. The overall success rate was 93%, with a cure rate of 83% and improvement in 10% of women. Unlike this study, women with MUI were included in our study and the subjective cure rate was only 23.5% in this subgroup. In addition our mean follow-up period was relatively long. Probably, these were the reasons for our relatively low subjective cure rate.²⁷

Severe obesity is associated with many health problems; however, in our study accompanying chronic diseases did not affect failure rates after the TOT procedure. We cannot generalize these results to the severely obese population due to the limited sample size in our study. Only MUI had an impact on failure rates. Ankardal and colleagues reported that the overall cure rate was lower in women with MUI (55%) compared with women with pure SUI (81%) among 707 patients at the 5-year follow-up.²⁸ These results showed that TOT procedure is a good option to treat SUI in obese patients. The most important reason for the relatively low subjective cure rate compared to previous studies was the definition used. Unlike many incontinence studies, subjective cure was defined as an ICIQ-SF score of 0. A higher rate of overactive bladder symptoms (53.1%) in severely obese patients was another potential reason. Therefore we strongly recommend urodynamic evaluation for severely obese women scheduled to undergo surgery, unless they have pure SUI. For these patients with pure SUI, additional treatment, such as antimuscarinic drugs, may be needed after the surgery.

In a previous study, we have shown that objective cure, subjective cure and patient satisfaction rates of the 126 women 1 year after the TOT procedure were 89.6, 86.5 and 92%, respectively. During the 5-year follow-up, objective cure rate was stable at 87.3%, whereas subjective cure and patient satisfaction rates decreased to 65.9% and 73%, respectively.9 Although the objective cure and patient satisfaction rates are also high in our study with a 40-month follow-up, the subjective cure rate is lower than the previous study. This difference can be explained by the basic characteristics of the women in the study. The rates of women with MUI before surgery in the previous study and current study were 53.1 and 38.1%, respectively. Liapsis and colleagues reported an objective cure in 82.4% of 115 patients after the TOT procedure, based on the pad test 4 years postoperatively. However there was a slightly lower objective success rate at the median follow-up of 24 months.²⁵ In another study, Hwang and colleagues reported 1-year outcomes of MUS procedures for SUI according to BMI.¹⁴ The objective and subjective cure rates for the obese group worsened after the TOT procedure (96.8% vs. 66.7%). This study had limitations because of the short-term follow-up.

Another important intriguing question is the relationship of obesity with surgical complications. There are many complications arising from the sling procedures, including bladder perforation, bleeding, hematoma, urinary retention, urinary tract infection, and de novo urgency. Our overall complication rate was 9.3%. There were no serious complications, such as bladder or intestinal perforation. Sung and colleagues performed a meta-analysis of TVT and transobturator approach studies and concluded that transobturator sling operation had a lower risk (odds ratio 0.54) of de novo bladder voiding symptoms than the TVT procedure.²⁶ Frohme and colleagues reported a 23.2% complication rate in their cohort of 116 patients. They found de novo urgency in 15 women (12.9%) and temporary obstructive voiding in 6 women (5.2%) with urinary retention in 2 women (1.7%).²⁷ In our study, there were no women with postoperative dysfunctional voiding symptoms, except 1 who had de novo urgency. We also focused too much on adjusting the sling in a tension-free manner, which may have led to the relatively low complication rate.

In the present study, 2 patients (6.2%) had severe groin and leg pain with no signs of infection, which resolved with NSAID. According to operative reports for these 2 patients, the needle passed through the obturator foramen with difficulty. In our study the mean operative time was relatively long compared to previous studies because passing the needle in the severely obese women from the obturator foramen was not as easy as in non-obese women.^{29,30}We have found that high-volume surgeons should perform these operations in severely obese women.

When passed from the outside-in, the needle is directed from a small incision lateral to the clitoris at the inferior edge of the adductor longus tendon, through the obturator foramen, around the ischiopubic ramus, and into the anterior vagina at the level of the midurethra. It passes through the following structures in the following order: gracilis, adductor brevis muscle, obturator externus muscle, obturator membrane, and beneath or through the obturator internus muscle and periurethral endopelvic connective tissue; it finally exits through the opened vagina.

Obese women usually have more muscle mass and strength,²⁹ which may have been why the needle passing was so difficult and the operation time so long. It can be expected that the difficult needle passing through the obturator foramen may lead to complications, such as hematoma, bleeding, but it was only related to severe groin and leg pain in 32 women (6.2%). The needle passing may have caused edema in the muscles that compressed the obturator nerve.

Our study has its limitations, including its retrospective nature with a heterogeneous design. Patients with pure SUI and MUI were included, yet there was no control group for randomization. Also postoperative UDS were performed only in patients with de novo OAB symptoms, not in all patients who had preoperative MUI. For cost containment, 3 different slings were used. Also, the VAS used to assess postoperative patient satisfaction was not an exact tool.

Conclusions

The results of our study showed that the TOT procedure is a good option with minimal complications to treat SUI in severely obese women. However, in these same women passing the needle from the obturator foramen is not easy and severe groin and leg pain are common postoperative complications.

Competing interests: The authors all declare no competing financial or personal interests.

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