

A retrospective clinical study on urinary stress incontinence treated by transobturator tape procedure

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ABSTRACT

Introduction: Stress urinary incontinence (SUI) is one of the most common urological disorders in women, with a significant impact on quality of life. Transobturator tape procedure is considered an effective minimally invasive surgical method for correcting this condition being particularly effective for women with urethral hypermobility or intrinsic sphincter deficiency.

Materials and method: This retrospective study was conducted on a group of 58 patients diagnosed with SUI, with or without associated vaginal or uterine prolapse, who underwent surgical treatment by implantation of a transobturator suburethral sling (TOT) between 1 June 2024 and 31 May 2025, in the 2nd clinic of obstetrics and gynecology, "St Andrew" Emergency Clinical Hospital, Galați, Romania. Demographic characteristics, obstetric history, comorbidities, procedural variables, and postoperative complications were analyzed. In 15 cases, the procedure was combined with total vaginal hysterectomy.

Results: Most patients were in perimenopausal or postmenopausal period (91.38%) and all of them had multiple pregnancies. The mean duration of the procedure was 39.48 minutes, while the average postoperative hospitalization was 3.81 days. Postoperative complications were infrequent and consisted in urinary retention (3.45%) and post spinal anesthesia headache (6.90%). Spontaneous resumption of mictional activity occurred promptly, with urinary catheter maintained for an average of 1.31 days.

Conclusions: TOT is a safe and effective method for the treatment of SUI, with a low complication rate and rapid recovery. The patient profile highlights the important role of multiparity and menopause in the etiology of the condition. The procedure leads to symptom improvement and enhanced quality of life, representing a first line surgical option in management of SUI.

Keywords: stress urinary incontinence, transobturator tape procedure, minimally invasive gynecologic surgery

INTRODUCTION

Stress urinary incontinence (SUI) is a major public health concern, defined by the involuntary leakage of urine during activities that increase intraabdominal pressure, such as coughing, sneezing, or physical effort. This condition affects a significant proportion of the adult female population, with an estimated prevalence of 30% in women aged 30-60 years [1, 2]. Its frequency increases with age, multiple pregnancies and hormonal changes associated with menopause.

The weakening of pelvic floor support structures, urethral hypermobility and changes in the trophicity of urogenital tissues contributes to the development of the characteristic urinary symptoms. In the absence of appropriate treatment, SUI can lead to limitations in daily activities, reduced physical

activity, and a marked decline in the quality of life. Some studies from the literature tried to acknowledge if SUI might be associated with other vulvar or perineal pathology, particularly in elder patients. In this respect, the association with lichen sclerosus [3-6], a scarring chronic inflammatory disease with a predilection for genital skin in both sexes, was investigated in some studies and found no relation whatsoever between the two clinical entities [7].

Therapeutic management includes both conservative approaches (lifestyle interventions, pelvic floor muscle training, and bladder training) as well as surgical procedures [8] in which tension free suburethral sling implantation is currently considered the minimally invasive standard. The transobturator suburethral sling (TOT) provides effective urethral support, with a high success rate and a low risk of postoperative complications.

Table 1. Baseline characteristics of the study group

Variable	Value	
Demographic and clinical variables*		
Age		66.93 (8.58)/[49-87]
Environment	Urban	29 (50.00%)
	Rural	29 (50.00%)
Smoking	Yes	32 (55.17%)
	No	26 (44.83%)
Hormonal status	Menopause	53 (91.38%)
	Perimenopause	5 (8.62%)
Number of births	≥ 3	28 (48.28%)
	2	18 (31.03%)
	1	12 (20.69%)
Number of abortions	≥ 3	4 (6.90%)
	≤ 3	54 (93.10%)
Comorbidities	Urinary tract infection	3 (5.17%)
	Genital infection	10 (17.24%)
	Diabetes	13 (22.41%)
	Cardiovascular disease	40 (68.96%)
Procedural variables		
Type of surgery	TOT	43 (74.14%)
	TOT + vaginal hysterectomy	15 (25.86%)
Duration of surgery (minutes)		39.48 (10.95)/[25-65]
Duration of urinary catheterization (days)		1.31 (0.62)/[1-4]
Duration of antibiotherapy (days)		2.01 (1.77)/[1-7]
Duration of postoperative hospitalization (days)		3.81 (1.13)/[2-7]

Note. *Mean (standard deviation)/[minimum-maximum]; n (%)

The aim of this study is to evaluate the clinical particularities and outcome of TOT procedure in patients with SUI admitted in the gynecology clinic, “St. Andrew” Clinical Emergency Hospital Galati Romania and to analyze their clinical and socio-demographical profile.

MATERIALS AND METHOD

This is a single-center retrospective observational study conducted on a group of 58 patients with SUI, diagnosed and surgically treated between 1 June 2024 and 31 May 2025 in the gynecology clinic, “Sf. Andrew” Clinical Emergency Hospital Galati, Romania. All patients were explained and understood their medical condition, offered their informed consent and subsequently underwent surgical treatment consisting of TOT procedure under spinal anesthesia. In 15 cases, associated benign uterine pathology was identified so that total vaginal hysterectomy (TVH) was performed in association with TOT procedure.

A structured dataset was created for each patient. Recorded variables included demographic characteristics, personal physiological and pathological medical history, surgical details and particularities on postoperative period.

There were excluded from the study only patients with incomplete essential data in the medical records.

The duration of surgical procedure was recorded as multiples of 5 minutes as specified in our hospital protocol. Postoperative analgesia was administered on demand, based on visual assessment score of pain. Patients were discharged after resumption of spontaneous urination with extensive advice of avoiding intercourse, intense physical effort and constipation for the next 4 weeks. All cases were clinically evaluated 4 weeks after surgery.

Statistical analysis was performed using Microsoft Excel. Data were analyzed descriptively and are presented as mean,

standard deviation, minimum and maximum values for continuous variables, and as frequencies and percentages for categorical variables.

RESULTS

The distribution of patients included in the study was equitable in terms of residence, half originating from urban setting and half from rural areas, suggesting an equal exposure to predisposing factors as well as a comparable access to medical services for both groups (**Table 1**).

The age group analysis showed a predominance of patients in the sixth and seventh decades of life with a peak frequency in the 59-69 years old group (23 cases, 39.66%) followed by the 69-79 years old group (19 cases, 32.76%). These data support the well-established correlation between advancing age and the deterioration of pelvic support structures.

Regarding hormonal status, the analyzed group was predominantly composed of postmenopausal patients (91.38%) while only a small proportion (5 cases, 8.62%) were perimenopausal. These findings also reflect the well-known higher incidence of SUI and pelvic floor disorders in the context of estrogen deficiency.

From an obstetrics perspective all patients had full-term pregnancies, most of them having one or two births (30 cases, 51.72%). High multiparity, defined as at least 3 births in personal obstetric history, was found in 28 patients (48.28%). This finding also highlights the role of repeated obstetrics pelvic and perineal trauma in the pathogenesis of genital prolapse and SUI. A history of abortions was also noted in 28 patients (48.28%), in which 4 patients (6.9%) had at least 3 documented events, suggesting a possible additional contribution to the impairment of pelvic structural anatomy.

Significant associated pathology was also identified in our study group. Uterine prolapse was diagnosed in 15 patients

(25.86%) indicating a frequent association between SUI and pelvic organ prolapse. Urinary tract infections (UTI) were observed in 3 cases (5.17%) whereas genital infections were documented in 10 cases (17.24%), both of which may influence symptomatology as well as postoperative outcomes.

In all patients the surgical management consisted of TOT procedure associated in 15 cases with TVH for uterine grade II and grade III prolapse. This combined approach reflects the need for individualized treatment to each patient anatomical and clinical characteristic.

Mean duration of surgery for the whole study group was 39.48 minutes, with limits between 25 and 50 minutes for TOT group and 45 to 65 for TOT associated with TVH, indicating relatively short operative time and confirming the minimally invasive nature of the technique. The mean total hospitalization was 7.22 days, of which the postoperative period accounted for an average of 3.81 days suggesting a relatively rapid recovery. Foley catheterization was required for a mean duration of 1.31 days, while antibiotic therapy was administered for an average of 3 days, in accordance with standard prophylactic and therapeutic protocols.

In all cases the surgical procedure was successful as the persistence of SUI was not recorded in any of our patients at 4 weeks follow-up.

Postoperative complications were infrequent supporting the safety and effectiveness of the procedure. Urinary retention, which demanded a more prolonged urinary catheterization, was recorded in 2 patients (3.45%) whereas post spinal anesthesia headache was present in 4 cases (6.90%). The postoperative course was favorable in all cases with early resumption of spontaneous bladder voiding and no need for reintervention.

DISCUSSION

The results obtained in this study support the effectiveness and safety of TOT procedure in the treatment of SUI. In our study the surgical success rate was 100% as none of our patients complained of urinary incontinence 4 weeks after the procedure. This result, although seems to be glorious on short term follow-up, should be interpreted with caution as we lost from the evidence and do not have dates about many patients included in our study on long-term follow-up. Studies from the literature report different cure rates after 12 and/or 24 months after surgery. In a study published in 2012, in 4 patients out of 59 (6.8%) the surgical procedure was a failure and subsequently, these patients were unsatisfied with the surgical outcome [8]. In a study published in 2005 on a group of 117 cases with SUI surgically treated by TOT procedure, with a median follow-up of 16.3 months, the subjectively assessed complete satisfaction rate was 92.3% and only partial satisfaction was noted in 5 patients (4.2%) [9]. In other report published in 2007, 89.6% of the total of 135 patients who underwent TOT procedure reported a complete cure on short-term follow-up [10]. In the same 3 months mean follow-up period, 8.8% of the patients reported just an improvement of the urinary symptoms [10]. In respect with the previous mentioned studies, it was reported a subjective satisfaction rate of 88% and an objective base assessment satisfaction rate of 92% 12 months following TOT procedure [11]. Moreover, the same authors report an 85% satisfaction rate 24 month after the surgical procedure [11].

The analysis of the patient profile highlights the significant role of age, multiparity and postmenopausal status in the pathogenesis of SUI. Our findings are in line with other reports from the literature.

In our study the mean age of the patients was 66.93 years (SD 8.58 years; range 49-87). It was reported to be an average age of 46.2 years, ranging from 24 to 70 years, which is quite unusual and in contrast with our study and other reports [8]. It was reported that there was a mean age of 52 years [11], and mean age of 56.8 [12] whereas it was reported an average age of 57.9 years [13].

In our study multiparity was identified in 46 patients (79.31%). None of our patients was nulliparous, as mentioned in some literature reports [8], and this strengthened the well known association between obstetrical history and pelvic floor pathology [14, 15].

Moreover, postmenopausal status was also identified in the majority of our patients (53 cases, 91.38%) and this is in accord with other published reports that emphasize the association between SUI and trophic changes of the lower genital tract in postmenopausal women. It is already documented that structural changes and loss of muscular cells, changes affecting connective tissue, vascularization and enervation of pelvic structures play an important role in the pathogenesis of SUI [16]. Low levels of estrogen in postmenopausal women cause a reduction in submucosal blood vessels of the urethra so that, finally, the sealing effect will be weakened and SUI will occur [17-20]. These changes affect both males and females with an incidence significantly higher among senior citizens [21].

It is a fact that UTI and SUI frequently coexist [22-25]. UTI can cause temporary urinary incontinence either by inducing strong, sudden urges or weakening the bladder lining. On the other hand, urinary incontinence increases the risk of developing clinically evident UTI due to chronic bacterial exposure. Despite the coexistence of these two clinical entities, there are not many reports in the literature able to clearly determine if the surgical correction of SUI by TOT procedure will definitely lower the risk and frequency of UTI. In a study published in 2015 [26], SUI correction with TOT procedure decreased the number of UTI in 82% of patients. Moreover, surgical correction of SUI with TOT procedure was more successful in patients without concomitant UTI (85% vs 79.36%) [26]. In our study UTI was documented in 3 patients (5.17%) and in all cases *Escherichia coli* was the germ identified from urinary cultures.

Many studies from the literature emphasize the relationship between vaginal microbiota and SUI. In this respect, patients with SUI associate an increased risk of vaginal dysbiosis [27]. In a recent study [27], vaginal dysbiosis was higher in the SUI group compared with non-SUI group of patients (84.2% vs 42.1%). The same authors demonstrated a shift in vaginal microbiota in SUI patients with increasing the abundance of bacterial species such as *Gardnerella*, *Streptococcus*, *Prevotella*, *Dialister*, and *Veillonella* against *Lactobacillus* species [27]. In our series, genital infection was documented in 10 patients (17.24%), *E. coli* being positive in 4 cases, whereas *Gardnerella* and *Streptococcus* each in 3 cases.

The relatively high prevalence of associated uterine prolapse in patients with SUI, despite the fact that performing an additional surgical procedure appears in this cases justified, underscores the need for a comprehensive evaluation of the

pelvic floor anatomy in order to establish an optimal therapeutic approach. Genital prolapse surgical repair can reveal urinary incontinence in previously continent women or even worsen already existing SUI [28]. The association in our series of TVH in 15 cases did not negatively influence the postoperative outcomes suggesting that the combined approach could be both practical and safe in carefully selected cases.

The relatively short duration of surgery along with the rapid postoperative recovery further confirms the minimally invasive character of the TOT procedure. In our study, the average time of the procedure was 39.48 minutes (standard deviation 10.95 minutes, range 25 to 65 minutes). Many studies from the literature report lower operative times. It was reported that a mean duration of surgery of only 21.69 minutes (standard deviation 6.41 minutes) and a mean blood loss of 76.78 ml (standard deviation 19.25 ml) [8]. Other studies report even lesser operative times. The study in [29] reports a mean operating time of only 14.7 minutes (range between 12 and 28 minutes) and a mean blood loss of 54 ml (range between 10 and 500 ml). Indeed, shorter operative times are associated with higher surgical experience. Improving our surgical skills is very important for us as many reports define TOT as “a day surgery procedure” [29].

The recorded complications were few, generally mild with no significant impact on patients' prognosis or quality of life. In our study urinary retention was recorded in 2 patients (3.45%) and demanded urinary catheterization for 3 and 4 days, respectively after surgery, whereas post spinal anesthesia headache was present in 4 cases (6.90%). Urinary retention or unsatisfactory voiding are in fact the main complications of TOT procedure. In the study of Sivanesan, 10.2% of the patients required insertion of indwelling catheter for periods varied from 1 to 7 days and one patient needed surgical release of the tape following 7 days of catheterization [29].

The limited duration of urinary catheterization and the early resumption of spontaneous voiding serve as indirect indicators of correct sling placement and normal urethral function in the postoperative period.

Although TOT is described as “one day surgery procedure” in many reports, in our series the postoperative hospital stay varied between 2 and 7 days with an average of 3.81 days. This is explained by the need for more prolonged urinary catheterization in some cases or the presence of associated pathology that required medical attention. In the study [8], 45.8% of the patients were discharged within 24 hours of surgery, 50.8% between 1 and 3 postop days whereas 3.4% were discharged after 3 postop days. In the study [29], 79.6% of the patients had satisfactory postoperative voiding and were discharged within 24 hours of surgery.

Beyond the surgical outcome, urinary incontinence should also be interpreted through its functional and quality-of-life impact, particularly in postmenopausal women. Recent studies evaluating conservative pelvic floor rehabilitation in women with involuntary urinary leakage have shown that combining Kegel exercises with pelvic floor electrostimulation may improve urinary-related discomfort, sexual satisfaction, and perceived quality of life. Although these approaches differ from surgical correction by TOT, they support the importance of a comprehensive therapeutic perspective in which continence restoration, pelvic floor function, sexual comfort, and postoperative recovery are considered together [30, 31].

CONCLUSIONS

Our results confirm the effectiveness of the TOT procedure in the treatment of SUI along with an acceptable safety profile even when combined with other gynecological procedures. The procedure is characterized by relatively short operative time, rapid recovery, low complication rate and early resumption of spontaneous voiding.

The results support the use of the TOT technique as a first line surgical therapeutic option in the management of SUI with a positive impact on urogenital function and quality of life.

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