

Voiding Dysfunction

Transobturator Tape Operation Is More Effective in Premenopausal Women than in Postmenopausal Women with Stress Incontinence

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Purpose: Midurethral synthetic slings for female stress urinary incontinence are minimally invasive polypropylene mesh tapes that are inserted under the midurethra with trocars. In the past decade, this new technology has become the most commonly performed procedure for female stress urinary incontinence, replacing the traditional open procedures. However, its effectiveness in pre- and postmenopausal women has not previously been compared.

Materials and Methods: We assessed the clinical outcome of the transobturator tape (TOT) procedure in premenopausal (n=45) and postmenopausal (n=49) women by means of self-report and the Urinary Distress Inventory 6 (UDI-6) questionnaire.

Results: The mean age of the pre- and postmenopausal women was 44 and 60 years, respectively. Mean parity was 2.4 and 3, respectively. There were no significant differences with respect to mean operation time, duration of hospitalization, or intraoperative and postoperative complications. However, premenopausal women were more satisfied with the operation than were postmenopausal women (p=0.014). Also, UDI-6 scores were significantly better in premenopausal women (p=0.027).

Conclusions: The TOT operation appeared to be more effective in premenopausal women with stress urinary incontinence. However, further studies with larger sample sizes are needed to confirm our results.

Key Words: Postmenopause; Premenopause; Suburethral slings; Urinary incontinence, stress

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INTRODUCTION

Stress urinary incontinence (SUI) is defined as the involuntary leakage of urine on effort, exertion, or coughing [1]. The reported prevalence of SUI is variable, but several studies have suggested that it may be as high as one in four adult women [2]. SUI in most cases is caused by loss of urethral support, resulting in hypermobility and lower pressure transmission to the urethra than the bladder, which is surgically curable.

In the past decade, midurethral synthetic slings like the transobturator tape (TOT) have become the most popular procedure for female SUI. Although many other different surgical procedures (colposuspension, traditional slings, and injectables) are commonly used, these procedures are

associated with significant morbidity and resource use or low success rates.

It is now well demonstrated that the urogenital organs are highly sensitive to the influence of estrogen. In fact, estrogen receptors have been found in the urethra and bladder trigone as well as in the round ligaments and levator ani muscles [3,4]. Following those findings, the idea arose of a possible relation between SUI and the causes of decreased estrogen status, such as menopause. Although SUI increases in parallel to age, number of vaginal deliveries, and menopausal status, it is known that it can be seen in young premenopausal women as well. The TOT procedure may therefore also be a valid alternative for these young patients.

In this study, we aimed to summarize our experience

TABLE 1. Type of operations performed

Type of operation performed	Menopausal status	
	Premenopausal	Postmenopausal
Transobturator tape (%)	9 (20)	22 (44.9)
Transobturator tape+colporrhaphy anterior and posterior (%)	18 (40)	10 (20.4)
Transobturator tape+hysterectomy (%)	15 (33.3)	15 (30.6)
Transobturator tape+other operations (%)	3 (6.7)	2 (4.1)

Percentages are described within the group of their own menopausal status.

with the TOT procedure and its outcome for a mean period of 42 months by use of the Urinary Distress Inventory 6 (UDI-6). We also compared the effectiveness of the TOT operation between the premenopausal and postmenopausal women. To the best of our knowledge, the effectiveness of the TOT procedure has not previously been compared in pre- and postmenopausal women.

MATERIALS AND METHODS

Patients operated on consecutively between 2004 and 2010 were analyzed in this retrospective study. Ninety-four patients who complained of SUI and had other uro-gynecologic complaints including different kinds of pelvic relaxation were subjected to different kinds of operations including the TOT procedure alone and other operations combined with the TOT procedure. Patients found to have other kinds of incontinence (urge or mixed) and patients who had symptoms of overactive bladder were not subjected to the TOT procedure. Patients' demographic variables such as age, menopausal status, gravida, parity, and operative information such as the type of operations, duration of operations and hospitalizations, and type of complications were extracted from the patients' files and hospital records. All TOT procedures were performed in the outside-in manner as described previously by Delorme [5].

The UDI-6 questionnaire was administered at the time of surgery and a mean period of 42.6 months (range, 5 to 72 months) for menopausal patients and 41.9 months (range, 5-76 months) for premenopausal patients after surgery ($p=0.886$). A self-evaluation of the level of satisfaction was also performed. To assess the rate of satisfaction from the patients' own perspective, the patients were asked a clear question during the interview of whether they were pleased and satisfied with the results of the operation. Answers were noted individually for every patient. The statistical analyses were performed by using SPSS ver. 17.0 (SPSS Inc., Chicago, IL, USA). Chi-square, one way ANOVAs, and Student's *t* test were used where appropriate. A *p*-value of 0.05 was used to express the statistical significance.

TABLE 2. UDI-6 scores in pre- and postmenopausal patients

Difference between total scores on the UDI-6 before and after	Menopausal state	
	Premenopausal	Postmenopausal
Group A 'getting better' (Very satisfied or satisfied) (%)	14 (77.8)	12 (44.4)
Group B 'worsening situation' (Not satisfied or very much not satisfied) (%)	4 (22.2)	15 (55.6)

Difference between the two groups was statistically significant ($p=0.027$). Given percentages calculated within groups.

RESULTS

The mean age of the whole study group was 52 years (range, 28 to 86 years). There were 44 (46.8%) premenopausal and 50 (53.2%) postmenopausal patients in each group, respectively. The mean age of the pre- and postmenopausal women was 43 years (range, 26 to 54 years) and 60 years (range, 47 to 86 years), respectively. Mean parity was 2.7. Parity for pre- and postmenopausal women was 2.4 and 3, respectively ($p=0.047$). Women who had vaginal deliveries only were included in the study. Mean body mass index was 27.5 and 28.9 for pre- and postmenopausal women, respectively ($p=0.20$). None of the postmenopausal patients were using any type of hormone replacement therapy. Although systemic anesthesia was used for 33 (35.1%) patients, regional anesthesia was the choice for 61 (64.9%) patients. Comorbid disease was found in 66% of patients. The most frequent comorbid illness was hypertension (33.2%). The mean operation time was 97 and 78 minutes for premenopausal and postmenopausal patients, respectively (operation time for accompanying procedure was also included). Mean urinary catheterization time was 30 hours for premenopausal and 38 hours for postmenopausal patients. TOT was used as a single procedure for 31 patients (33%). Other gynecologic operations performed with the TOT procedure are described in Table 1.

Of the 94 patients, 1 had prolonged bleeding during the operation, 1 patient had infection at the operation site, 2 had urinary retention subsequent to TOT and colporrhaphy anterior and posterior operation, and 2 patients underwent a repeat operation owing to material erosion during this time period.

Using the UDI-6 questionnaire, we created two groups according to the difference between the total score for the questionnaire before and after the operations. Group A was defined as "getting better," meaning that the patients were satisfied or very satisfied. By the same logic, group B stood for "worsening situation," meaning that the patients were not satisfied or very much not satisfied. Table 2 shows the difference in UDI-6 scores between the pre- and postmenopausal patients. Table 3 displays the difference between the premenopausal and postmenopausal patients in

TABLE 3. Patients' self-evaluation of the level of satisfaction

Degree of satisfaction	Menopausal status	
	Premenopausal	Postmenopausal
Either very satisfied or satisfied (%)	12 (66.7)	8 (29.6)
Neither satisfied nor dissatisfied (%)	5 (27.8)	8 (29.6)
Either not satisfied or very much not satisfied (%)	1 (5.6)	11 (40.7)

Difference between the three groups was statistically significant ($p=0.004$).

satisfaction with the operations from the patients' perspective.

DISCUSSION

SUI has been shown to cause deterioration in quality of life, poor care seeking, lifestyle restriction, limitations in social relationships, and a higher prevalence of psychological morbidity in both the pre- and postmenopausal periods [6]. The main pathophysiologic process is thought to be the loss of urethral support with advancing age and with increasing parity. This support can be regained by surgical interventions such as TOT. Two kinds of techniques have been described by two different authors. Delorme introduced the out-to-in manner in 2001 [5]; on the other hand, in 2003 de Leval came up with the in-to-out technique for transobturator placement of the polypropylene mesh [7]. We used the technique described by de Leval et al and we encountered no surgery-related complications. Debodinance found comparable efficacy and safety profiles for the outside-in and the inside-out procedures [8].

Multiple factors can be named as causes for pelvic relaxation and as a result for SUI. Gürel and Gürel found that age, marriage period, and parity are directly and strongly related to pelvic relaxation [9]. Other histopathological changes such as milder positivity of collagen stains, distribution of collagen stains in unequal intensities, and atrophy of the collagen fibers were reported previously by Luo et al [10]. On the other hand, it is well known that the prevalence of SUI increases with aging in women owing to menopause and the loss of estrogen. Furthermore, it was recently shown that the menopausal transition stage is strongly associated with developing monthly or more frequent incontinence in women [11]. However, to the best of our knowledge, the effect of menopausal status on the success of TOT operations has not been investigated properly. On the other hand, the effect of menopause on the success and failure rate of the Burch operation was described previously by Sun et al They studied the Burch operation in 258 patients and noted that age, parity, menopausal status, and use of hormone replacement therapy had no effect on the failure rate [12]. Like the report previously noted, Akpınar et al also reported that menopause had no effect

on the long-term outcome of the Burch operation [13]. On the other hand, Langer et al investigated the clinical and urodynamic short-term results after colposuspension for urinary stress incontinence in a group of young patients in whom menopause was induced surgically and compared these results with those of a similarly treated group who did not undergo surgical castration. They found that surgically induced menopause in the absence of aging had no effect on the results of colposuspension for urinary stress incontinence in the short term [14].

The only study that investigated the relationship between the success of TOT operations and menopause was reported in 2010 by Rechberger et al Those authors found that the clinical effectiveness of surgical SUI treatment did not depend on the patient's body mass index or type of mid-urethral sling, but that menopausal status and aging significantly influenced the outcome of the surgery. They also concluded that both menopause and aging had a detrimental influence on the final outcome of both the retro-pubic and transobturator sling procedure. In our study, we confirmed the results of Rechberger et al [15].

It is well known that estrogen and progesterone receptors have been found throughout the lower urinary tract [16], and many of the tissues involved in female continence have been found to be estrogen-sensitive, such as the urethra and bladder. Because estrogens are also known to have an effect on the synthesis of collagen and the metabolism of collagen in the lower genital tract, the significant difference that we found between pre- and postmenopausal patients is likely related to the loss of estrogen support of urogenital tissues [17]. Animal models have indicated that estrogen significantly decreases the amount of collagen fibers, increases the amount of muscle fibers in the detrusor muscle, and therefore decreases the collagen/smooth muscle ratio in the detrusor muscle and in the urethral muscle layer [18]. Rud et al concluded that the vascular network of the urethra plays an important role in the maintenance of urinary continence, accounting for one-third of urethral pressure [19]. These findings from the studies mentioned support both our hypothesis and the estrogen effect on the urethra and bladder, which leads to loosening of the pelvic tissues with the loss of estrogen in postmenopausal women. In the present study, we found that the TOT procedure is more beneficial for premenopausal patients.

Our study did have some drawbacks, such as the lack of urodynamic evaluation of the patients both before and after the operation and the fact that concomitant operations were performed with TOT. In conclusion, the TOT procedure appears to be more effective in premenopausal women with SUI. However, further prospective studies using pre- and postoperative urodynamic evaluations are needed to confirm our results.

Conflicts of Interest

The authors have nothing to disclose.

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