

Evaluating Surgical Outcomes: Anterior Colporrhaphy vs. Transobturator Tape Surgery on Urinary Incontinence and Sexual Function

Ufuk Atlıhan¹, Bilgin Öztürk², Mehmet Uğur Mungan³

¹Manisa Merkezefendi State Hospital, Clinic of Obstetrics and Gynecology, Manisa, Türkiye

²Başkent University Training and Research Medical Center, Department of Urology, İzmir, Türkiye

³Dokuz Eylül University Faculty of Medicine, Department of Urology, İzmir, Türkiye

What's known on the subject? and What does the study add?

Urinary incontinence symptoms are quite common among women. It has a significant impact on quality of life, and creates personal and social financial burdens. Stress urinary incontinence (SUI) is considered the most common type of urinary incontinence, especially in women of menopausal and reproductive age. Various quality of life questionnaires, such as the Female Sexual Function Index (FSFI) and the 12-question Pelvic Organ Prolapse Urinary Incontinence Sexual Questionnaire (PISQ), have been developed to assess the impact of SUI. This study investigated the effects of various surgical treatments for SUI on FSFI and PISQ results, as well as the effectiveness of these results in monitoring treatment response.

Abstract

Objective: Sexual desire is considered to be the sum of positive and negative components of sexuality. The aim of our study was to compare the effects of anterior colporrhaphy and transobturator tape (TOT) surgery on urinary incontinence and sexual function.

Materials and Methods: One hundred and eighty-eight patients who were admitted to our hospital between January 2018 and October 2023, diagnosed with stress urinary incontinence (SUI) and pelvic organ prolapse and who were then operated on, were evaluated retrospectively. The patients were divided into two groups: anterior colporrhaphy and TOT, and the presurgery and postsurgery the Female Sexual Function index (FSFI) and Pelvic Organ Prolapse Urinary Incontinence Sexual Questionnaire (PISQ) scores of the two groups were evaluated retrospectively.

Results: No significant difference was found between the groups when PISQ scores were compared in the pre-surgery and post-surgery periods according to surgery type ($p>0.05$). No significant difference was found between the groups when FSFI scores were compared in the pre-surgery and post-surgery periods, according to surgery type, ($p>0.05$). When the presurgery and postsurgery periods were compared within both groups, a significant increase in the PISQ score was found in the postsurgery period ($p<0.05$). A significant increase in sexual satisfaction score was found in the TOT group in the post-surgery period ($p=0.016$).

Conclusion: It has been found that anterior colporrhaphy and TOT surgeries are effective in the treatment of stress urinary incontinence, and have significant effects on urinary incontinence complaints during sexual intercourse. Sexual function is multifactorial, and anatomical corrections made with surgical methods alone are not sufficient to correct different aspects of sexual function such as orgasm, sexual desire, sexual problems in the partner, and satisfaction. PISQ and FSFI measurements may provide insight into the evaluation of sexual function after SUI and pelvic organ prolapse surgery.

Keywords: Anterior colporrhaphy, FSFI, pelvic organ prolapse, transobturator tape, sexual function, stress urinary incontinence

Correspondence: Ufuk Atlıhan MD, Manisa Merkezefendi State Hospital, Clinic of Obstetrics and Gynecology, Manisa, Türkiye

E-mail: cfl.ufuk@gmail.com **ORCID-ID:** orcid.org/0000-0002-2109-1373

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Introduction

Sexual desire can be expressed as the sum of the factors that push us towards or away from sexuality. Sexual desire should be evaluated in a wide range of aspects such as disgust, reluctance, interest, a need and passion. Many individuals have a characteristic pattern of desires throughout their adult life, and this spectrum can change significantly, influenced by various factors (1). The World Health Organization (WHO) defines sexual health as "a state of physical, emotional, mental and social well-being related to sexuality". It does not define sexual health as the absence of any disease, dysfunction or disability (2). WHO defines sexual health as the integration and harmony between the mind, emotion, and body, which leads to the development of social, intellectual, communication, and love aspects of an individual's personality. Therefore, any disorder that causes inconsistency, dissatisfaction, and withdrawal from sexual intercourse can lead to sexual dysfunction (3). In various studies, the prevalence of sexual dysfunction among sexually active women is between 30% and 50% (4–7). In our country, the prevalence of sexual dysfunction was determined to be 29.5% (8). Studies in the literature have shown that sexual dysfunctions affect the quality of life of women and that the evaluation of sexual function plays an important role in assessing quality of life (9,10). Sexual dysfunction is a prevalent problem in women. Studies in the literature have shown that pelvic floor disorders such as urinary incontinence and pelvic organ prolapse affect sexual function (11–13). The study by Tok et al. (14) showed that pelvic organ prolapse affects some aspects of sexuality, but not others, such as orgasm and sexual satisfaction. Population studies conducted in many countries have reported that the prevalence of urinary incontinence varies between approximately 5% and 70%, while most studies indicate it is in the range of 25–45% (15). Urinary incontinence is one of the factors affecting sexual function and can lead to feelings of shame and guilt in women during or after sexual intercourse due to incontinence during intercourse. Stress urinary incontinence (SUI) has a prevalence of between 4% and 35% in the population. The clinical definition of SUI has been established by the International Continence Society (16). Its epidemiological definition has not yet been established, resulting in a wide range of prevalence rates reported in studies (16). Although urinary incontinence is not directly related to sexual function, it plays a crucial role in affecting human sexual function. Sexual health is integral to the overall quality of life and should be emphasized because it is linked to a woman's self-esteem, emotional well-being, and even cognitive function (17). There is currently no highly effective medical treatment for urinary incontinence. Drugs such as estrogens, alpha-adrenergic receptor agonists, beta-adrenergic receptor agonists, and tricyclic antidepressants are used in the treatment of urinary incontinence, and their potential for effectiveness is low. In

these patients, surgery is considered an alternative treatment option. The main purpose of urinary incontinence surgery is based on the logic of correcting the urethrovesical angle to prevent the urethra from descending by providing support when intra-abdominal pressure increases (18). In incontinence surgery, sling placement surgeries under the urethra, including the classic pubovaginal sling using autologous sling materials (such as rectus fascia and fascia lata), anterior colporrhaphy, and tension-free vaginal tape and transobturator tape (TOT) are performed. Various quality of life questionnaires, such as the International Incontinence Consultation Questionnaire, the Incontinence Severity index, and the Incontinence impact questionnaire, have been developed to assess the impact of SUI on quality of life, but their results may vary. The aim of our study was to compare the effects of anterior colporrhaphy and TOT surgery on urinary incontinence and sexual function.

Materials and Methods

Our study was designed as a retrospective cohort study. The study was designed according to the Helsinki Declaration and informed consent forms were obtained from all patients. The study was initiated after receiving approval dated 09/10/24 and numbered KA-24/311 from the Başkent University Rectorate Medical and Health Sciences Research Board. In our study, 248 patients diagnosed with SUI and pelvic organ prolapse between January 2018 and October 2023 were evaluated retrospectively. Sixty patients, who had incomplete data, lacked a sexual function questionnaire test, and met the exclusion criteria, were excluded from the study. Data from 188 patients who underwent anterior colporrhaphy and TOT were evaluated retrospectively. Ninety-eight patients were included in the anterior colporrhaphy group and ninety patients in the TOT group. While TOT was performed on patients with stress urinary incontinence, anterior colporrhaphy was performed on patients with anterior compartment defect. The questionnaire forms, used to evaluate the sexual function of all patients preoperatively and at 6 months postoperatively, were evaluated retrospectively. Body mass index (BMI), gravida, parity, education level and delivery method of all patients were evaluated retrospectively. Inclusion criteria included patients giving consent to participate in the study, stress urinary incontinence, active sexual life, and pelvic organ prolapse. Exclusion criteria included having given birth within the last year, history of pelvic and breast surgery, history of narcotic drug or antidepressant use in the patient or partner, history of diabetes, hypertension and heart disease in the patient or partner, and sexual problems in the partner (premature ejaculation and impotence). In the anterior colporrhaphy method, the patient is placed in the lithotomy position after spinal anesthesia is applied. An incision is made in the anterior wall of the vagina from the bladder neck level

to the vaginal arch, and the vaginal epithelium and endopelvic fascia are dissected from each other. After the dissection, the endopelvic fascia on both sides is closed and repaired with 2-0 Vicryl sutures using the interrupted technique. 0-number chromic suture is used for primary repair of the vaginal mucosa. In the presence of urinary incontinence, the urethra is angled using Kelly sutures in the endopelvic fascia below the bladder sphincter. In the TOT method, the patient is placed in the lithotomy position after spinal anesthesia is applied. First, the guide point is determined where the line intersects the femoral line 1 cm above the clitoris. A 2 cm incision is made in the vaginal mucosa in the suburethral region, below the urethral os point. The paraurethral space is then opened from the vagina, and the finger is directed behind the symphysis pubis. After ensuring that the obturator space is entered, TOT is placed using the TOT applicator from the determined point from the outside to the inside, using the TOT applicator from the determined point the vaginal mucosa is primarily repaired. A Foley catheter is inserted for 24 hours to evaluate the quality and quantity of urine. The 12-question Pelvic Organ Prolapse Urinary Incontinence Sexual Questionnaire (PISQ) consists of questions covering three main points: behavior and excitement (4 questions); physical factors such as urinary incontinence during sexual intercourse, feelings of fear, feelings of shame and guilt, and lack of comfort in the bedroom (5 questions); and factors related to the sexual partner (3 questions). The PISQ is scored on a Likert scale from 0 to 4 as "never", "rarely", "sometimes", "usually", and "always" (19,20). The Female Sexual Function Index (FSFI) questionnaire, assessing six different domains: desire, arousal, lubrication, orgasm, satisfaction, and pain/discomfort, which used a scale from 0 (no sexual activity in the last 4 weeks) and 1 (very dissatisfied) to 5 (very satisfied) at weeks 0, 4, 8, and 12. Throughout the study, a full-scale score ranging from 2.0 (severe dysfunction) to 36.0 (no dysfunction) was employed to evaluate sexual function,

with increased FSFI scores considered to be associated with symptom improvement (21). An optimal cut-off score of 26, reported by Wiegel et al. (22), is used to distinguish women with and without current sexual dysfunction.

Statistical Analysis

Statistical analysis was conducted by utilizing the SPSS 26.0 (IBM Inc., Chicago, IL, USA). The normality of the distribution was evaluated with the Kolmogorov-Smirnov test and Shapiro-Wilk test. Data analysis was done using the chi-squared test, independent t-test, and paired t-test. The quantitative data of the patients were reported as mean \pm standard deviation (SD) (minimum-maximum). The results were evaluated with a 95% confidence interval. The p-value <0.05 was regarded as statistically significant. The G * Power 3.1 program (Erdfelder, Faul and Buchner, Düsseldorf, Germany) was used for post hoc power analysis. The α error probability, effect size, and power of the study were 0.05, 0.3, and 0.95, respectively. The total required sample size was calculated as 176.

Results

The mean age of the women in our study was 42.7 ± 25.8 , and the mean BMI was 30.7 ± 4.76 kg/m². Among the operated patients, improvement in complaints was observed in 176 (93.6%) women. No significant difference was found between the groups in terms of demographic and obstetric data (Table 1).

In the anterior colporrhaphy group, behaviour and emotions scores were found to be significantly higher in the after-surgery period compared to the before-surgery period. Mean behavior and emotions scores increased from 7.67 to 10.96 ($p < 0.001$). In the anterior colporrhaphy group, physical factor scores and total score were found to be significantly higher after surgery compared to before surgery. Mean physical factor scores

Table 1. Comparison of demographic and obstetric data of patients

Variables	Anterior colporrhaphy group (n=98)	TOT group (n=90)	p-value
	Mean \pm SD		
Age (year)	42.60 \pm 26.54	42.94 \pm 25.18	0.86
BMI (kg/m ²)	30.84 \pm 4.64	30.58 \pm 4.88	0.77
Parity	2.88 \pm 1.18	2.92 \pm 1.24	0.82
Gravidity	3.14 \pm 1.29	3.11 \pm 1.31	0.79
*Level of education (n-%)			0.89
Middle and high school	71 (72.4%)	64 (71.1%)	
University	27 (27.6%)	26 (28.9%)	
*Mode of delivery (n-%)			0.87
NSVD	63 (64.2%)	59 (65.5%)	
C/S	35 (35.8%)	31 (34.5%)	
TOT: Transobturator tape, BMI: Body mass index, NSVD: Normal spontaneous vaginal delivery, C/S: Cesarean section, SD: Standard deviation			

Table 2. Comparison of PISQ measurements between and within groups			
Variables	Anterior colporrhaphy group (n=98)	TOT group (n=90)	**p-value
	Mean \pm SD		
Behaviour and emotions			
Before surgery	7.67 \pm 1.82	8.15 \pm 2.16	0.78
After surgery	10.96 \pm 1.36	11.22 \pm 1.18	0.84
*p-value	<0.001	<0.001	
Physical factor			
Before surgery	14.82 \pm 1.18	14.14 \pm 1.86	0.69
After surgery	16.60 \pm 1.08	16.35 \pm 1.72	0.72
*p-value	<0.001	<0.001	
Factors related to sex partner			
Before surgery	5.22 \pm 1.54	5.14 \pm 1.25	0.88
After surgery	5.60 \pm 1.66	5.50 \pm 1.32	0.92
*p-value	0.68	0.72	
Total score			
Before surgery	27.71 \pm 4.28	27.43 \pm 5.09	0.86
After surgery	33.16 \pm 4.08	33.07 \pm 4.18	0.92
*p-value	<0.001	<0.001	
*: p-value: Match test; **: p-value: Independent test, SD: Standard deviation, TOT: Transobturator tape, PISQ: Pelvic Organ Prolapse Urinary Incontinence Sexual Questionnaire			

increased from 14.82 to 16.60 ($p<0.001$). Total score increased from 27.71 to 33.16 ($p<0.001$). In the TOT group, scores for behavior and emotions were found to be significantly higher in the after-surgery period compared to the before-surgery period. Mean behaviour and emotions scores increased from 8.15 to 11.22 ($p<0.001$). In the TOT group, physical factor scores and total scores were found to be significantly higher in the after-surgery period compared to the before-surgery period. Mean physical factor scores increased from 14.14 to 16.35 ($p<0.001$). Total score increased from 27.43 to 33.07 ($p<0.001$) (Table 2).

In the TOT group, sexual satisfaction scores were found to be significantly higher in the after-surgery period compared to the before-surgery period. Mean FSFI score increased from 3.88 to 4.24 ($p=0.016$) (Table 3).

Discussion

When patients who underwent surgery for pelvic organ prolapse and SUI were evaluated, no significant difference was found in the pre- and post-surgery sexual function scores of patients who underwent TOT and anterior colporrhaphy surgery, depending on the type of surgery. In the study conducted by Pauls et al. (23), despite anatomical and functional improvements after pelvic organ prolapse and urinary incontinence surgery, no change was detected in sexual function, and it was stated that this could be due to postoperative dyspareunia. Pastore et al. (24) found significant improvement in all subparameters of FSFI scores in patients who underwent surgery for SUI. In the study conducted by Zalewski et al. (25), it was revealed

that the operation significantly reduced the feeling of pain during sexual intercourse, decreased sexual arousal, and worsened vaginal wetness after urinary incontinence surgery. Horosz et al. (26) demonstrated that successful treatment of SUI significantly improves the quality of sexual life. It is thought that the difference in results between studies in the literature may be due to the difference in the number of samples and the wide spectrum of data regarding the time elapsed after surgery. In our study, after anterior colporrhaphy and TOT surgeries, significant improvements were observed in urinary incontinence during sexual intercourse, as well as fear, shame, guilt, and lack of comfort in the bedroom. These criteria are accepted as behavior and emotions, and physical factor subscales. In the study conducted by Handa et al. (11), it was determined that urinary incontinence due to SUI in women was associated with decreased libido, vaginal dryness and dyspareunia, and that the treatment of this disorder had a positive effect on these complications. Brubaker et al. (27) stated that sexual dysfunctions due to SUI improved after surgery, but this was not related to the surgical method. Our study also revealed that the type of surgery had no effect on the parameters of sexual function in the postsurgery period. Dursun et al.'s (28) meta-analysis evaluated sexual function in patients who underwent TOT, and revealed that TOT surgery improved female sexual function. Bicudo-Fürst et al. (29) state that the effect of urinary incontinence surgery on sexual function is not definitive and there is inconsistency between studies. Energin and Eric Horasanli (30) reported that short-term improvement in sexual function was achieved in women who underwent

Table 3. Comparison of FSFI measurements between and within groups			
Variables	Anterior colporrhaphy group (n=98)	TOT group (n=90)	**p-value
	Mean ± SD		
Sexual desire			
Before surgery	3.76±1.36	3.70±1.58	0.77
After surgery	3.56±1.18	3.77±1.38	0.82
*p-value	0.72	0.9	
Sexual arousa			
Before surgery	3.99±1.26	3.94±1.16	0.8
After surgery	4.08±1.36	4.09±1.21	0.94
*p-value	0.86	0.76	
Vaginal moisturizing			
Before surgery	4.26±1.41	4.12±1.39	0.82
After surgery	4.47±1.28	4.06±1.36	0.46
*p-value	0.56	0.69	
Orgasm			
Before surgery	3.99±1.64	3.76±1.18	0.78
After surgery	4.07±1.49	3.93±1.14	0.85
*p-value	0.62	0.48	
Pain			
Before surgery	4.22±1.28	4.1±1.36	0.66
After surgery	4.04±1.02	3.92±1.18	0.94
*p-value	0.82	0.07	
Sexual satisfaction			
Before surgery	3.82±1.38	3.88±1.18	0.81
After surgery	4.06±1.28	4.24±1.26	0.77
*p-value	0.18	0.016	
Total score of sexual function			
Before surgery	24.04±5.38	23.5 ±5.67	0.36
After surgery	24.28±5.98	24.01±5.22	0.76
*p-value	0.78	0.37	
*: p-value: Match test; **: p-value: Independent test, SD: Standard deviation, TOT: Transobturator tape, FSFI: Female Sexual Function Index			

anterior colporrhaphy surgery due to pelvic organ prolapse. Jafarzade and Ulu (31) found that orgasm was significantly reduced in women who underwent anterior colporrhaphy. They also stated that it is appropriate to recommend conservative or alternative treatments for the early stages of cystocele. In our study, the FSFI scales and sub-parameters were evaluated during the presurgery and postsurgery periods, and no significant difference was found between the groups according to the type of operation. However, no significant difference was found between the groups in terms of changes in FSFI scales, and subparameters in the pre-surgery and post-surgery periods. Although a significant improvement was achieved in the sexual satisfaction score in the TOT group at the 6th month follow-up, no additional supporting FSFI subgroup score could be obtained. The variable effects of surgery on sexual function reported in the literature may be attributed to the sexual index scales used

in the evaluation and the subjective responses of patients to these scale questions. In our study, 72.3% of women had urinary incontinence during sneezing, coughing, or sexual intercourse, and 93.6% of these cases improved after surgery. Pace and Vicentini (32) reported that 67% of women experienced urinary incontinence during intercourse, 96% during penetration, and 4% during orgasm. 97.1% of women who underwent TOT reported that their urinary incontinence improved; 90.1% reported relative improvement in their sexual life, while 9.9% reported poor sexual function (32). In our study, 42.5% (80/188) of the women had desire problems, 38.2% (72/188) had arousal problems, and 44.6% (84/188) had lubrication problems. In our study, 47.8% (90/188) of the women had orgasm problems, 37.2% (70/188) had satisfaction problems, and 11.7% (22/188) had pain during sexual intercourse. Maaita et al. (33) also reported similar results regarding the prevalence

of sexual dysfunction. In the study by Kamińska et al. (34), a significant improvement was found in PISQ scores after SUI and pelvic organ prolapse surgery. In a study by Rogers et al. (35), on the contrary, sexual satisfaction was found to have decreased three and six months after surgery. In the study by Glass Clark et al. (36), women who underwent anti-incontinence surgery showed general improvement in sexual function from baseline to 24 months after surgery, without significant differences depending on the surgical procedure. Most of this improvement occurred in the first 12 months and was stated to continue for an additional 12 months, lasting a total of 24 months. In our study, significant improvement was found in PISQ total score, behaviour and emotions score, and physical factor scores regardless of the type of operation. In the study conducted by Kammerer-Doak (37) on the sexual satisfaction of women with pelvic floor problems, better performance was reported regarding physical factors and partner-related factors in women after urinary incontinence and pelvic organ prolapse surgery. Significant improvement was found in the subscales of the PISQ questionnaire. However, no significant improvement was found in sexual function measures such as orgasm and arousal. In our study, significant improvement in PISQ scores was found in the post-surgery period for both types of surgery, while no significant improvement was found in FSFI scores. The reason for this is that it is easier to see the direct effects of the operation in the PISQ group, since it includes parameters that evaluate the presence of incontinence and prolapse; this inference, however, is not valid for the FSFI questionnaire. In our study, anterior colporrhaphy and TOT surgeries were found to be effective in the treatment of stress urinary incontinence, and significant improvements were found in complaints of urinary incontinence during sexual intercourse and in feelings of shame or guilt experienced during intercourse. However, no significant difference was found in the results depending on the type of surgery. However, there is no basic element of active sexual life.

Study Limitations

One of the main limitations of the study is its retrospective design. However, the difficulties in expressing sexual dysfunction due to the ethical constraints of the patients in the study may be considered as a second reason.

Conclusion

It has been found that anterior colporrhaphy and TOT surgeries are effective in the treatment of SUI and have significant effects on urinary incontinence complaints during sexual intercourse. Sexual function is multifactorial, and anatomical corrections made with surgical methods alone are not sufficient to correct different aspects of sexual function such as orgasm, sexual desire, sexual problems in the partner and satisfaction. PISQ

and FSFI measurements may provide insight into the evaluation of sexual function after SUI and pelvic organ prolapse surgery. Prospective studies with longer follow-up periods and larger numbers of patients are needed for women who underwent anterior colporrhaphy and TOT surgeries.

Ethics

Ethics Committee Approval: The study was initiated after receiving approval dated 09/10/24 and numbered KA-24/311 from the Başkent University Rectorate Medical and Health Sciences Research Board.

Informed Consent: Declaration and informed consent forms were obtained from all patients.

Footnotes

Authorship Contributions

Surgical and Medical Practices: U.A., B.Ö., Concept: U.A., B.Ö., Design: U.A., Data Collection or Processing: B.Ö., Analysis or Interpretation: M.U.M., Literature Search: U.A., Writing: U.A., B.Ö.

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