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CLINICAL ARTICLE

A 5-year follow-up study comparing Burch colposuspension and transobturator tape for the surgical treatment of stress urinary incontinence

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ABSTRACT

Objective: To compare the effectiveness of transobturator tape (TOT) and Burch colposuspension in the treatment of stress urinary incontinence (SUI). *Methods:* The present retrospective study included 770 patients who underwent SUI surgery with Burch colposuspension (n = 498) or TOT (n = 272). Clinical follow-up occurred at 2 weeks, 3, 6, and 12 months, and annually thereafter. Objective and subjective cure rates and intra- and postoperative complications were assessed. *Results:* Among patients who had SUI surgery without another concomitant procedure, the Burch group had a significantly longer mean operation time (41.48 ± 10.61 minutes versus 23.77 ± 10.49 minutes; $P < 0.001$) and a significantly longer length of hospital stay (3.11 ± 0.49 days versus 1.98 ± 0.40 days; $P < 0.001$), compared with the TOT group. The rates of unintended functional outcomes were lower among women undergoing TOT than among those undergoing the Burch procedure (long-term voiding dysfunction 0.7% versus 4.2%, $P = 0.007$; urinary retention 10.7% versus 26.9%, $P < 0.001$). The 5-year cure rates were similar in the 2 groups (objective cure rate, 73.9% versus 77.5%, $P = 0.574$; subjective cure rate, 76.8% versus 81.7%, $P = 0.416$). *Conclusion:* In terms of efficacy, TOT appears equal to Burch colposuspension; however, TOT has fewer unintended functional outcomes than Burch colposuspension.

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1. Introduction

Stress urinary incontinence (SUI) is defined as involuntary urine leakage during efforts that increase intra-abdominal pressure, such as coughing. This symptom can have a dramatic effect on the quality of life and affects a considerable number of women. The prevalence of SUI among adult women varies between studies, but it may be as high as 25% [1].

Surgery is often offered as the primary treatment option for moderate or severe SUI if conservative therapy has failed. However, debate remains regarding the ideal procedure with the highest effectiveness, the lowest morbidity, and the highest cost-effectiveness. In 1961, Burch colposuspension was described as an effective surgical treatment of SUI [2]. However, it is usually associated with symptoms of the lower urinary tract [3]. Ulmsten and Petros [4] presented the tension-free vaginal tape (TVT) procedure in 1995. In 2001, Delorme [5] described the transobturator tape (TOT) procedure ("outside–inside" technique), demonstrating a high success rate with few perioperative complications. Midurethral sling operations seem to have similar cure rates to Burch colposuspension, and their popularity has increased [6].

Several randomized trials and numerous cohort studies [7–10] have compared the effects of Burch colposuspension and TVT in the surgical treatment of SUI. By contrast, only 2 randomized controlled trials [11,12] have compared the efficacy of TOT and Burch colposuspension. The major limitation of these studies is that their postoperative follow-up period did not exceed 24–28 months.

The current study represents our 5-year clinical experience with Burch colposuspension and TOT for the surgical treatment of women with SUI.

2. Materials and methods

The present retrospective study was carried out on 770 patients with a diagnosis of SUI who underwent incontinence surgery at 2 education and research hospitals (Bakirkoy Women's and Children's Teaching Hospital and İstanbul Training and Research Hospital) in Istanbul, Turkey, between January 1, 2007, and February 28, 2012. The study protocol was approved by the local ethics committee.

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The study included patients with SUI for whom conservative therapy (including pelvic floor exercises and electrical stimulation) had been unsuccessful, as proven by urodynamic assessment. All participants gave written informed consent. Exclusion criteria were urogenital prolapse greater than stage 1, urinary retention, SUI with intrinsic sphincter deficiency, neurologic bladder, history of anti-incontinence surgery, prescription of anticoagulant or antipsychotic treatment (because urinary retention can develop during antipsychotic treatment [13]), pregnancy, and loss to follow-up (patients who did not regularly attend control visits).

All participants completed a form providing information on age, parity, body mass index, existing comorbidities, history of previous hysterectomy, and menopausal and hormone replacement status. In addition, the women were assessed for the presence of pelvic organ prolapse; a prolapse was staged according to the Pelvic Organ Prolapse Quantification system [14]. Further assessments included a cough stress test (patients were placed in a supine position and asked to cough after their bladders were filled with 300 mL of saline; the test was considered to be positive if leakage occurred during coughing), cotton swab test, urinalysis, urine culture, and urodynamic evaluations.

Urodynamic studies included uroflowmetry, multichannel cystometry, measurement of Valsalva leak-point pressure, and urethral pressure profilometry; these studies performed using Dantec Jive equipment (Dantec Medical, Bristol, UK). The Valsalva leak-point pressure was determined in the 45° upright sitting position at a bladder volume of 200 mL, using a 7-Fr catheter. For the performance of urethral pressure profilometry, the 7-Fr catheter was fitted with a transducer (the intra-abdominal pressure was measured transvaginally) [15].

Stress urinary incontinence was diagnosed if the urodynamic test showed involuntary loss of urine when the intravesical pressure exceeded the intraurethral pressure, with absence of detrusor contraction. Detrusor overactivity was defined as spontaneous or provoked involuntary contractions during the filling phase of the urodynamic examination [13]. If the urodynamic study revealed both SUI and detrusor overactivity, mixed urinary incontinence was diagnosed. Intrinsic sphincter deficiency was defined as a maximum urethral closure pressure of less than 20 cm H_2O or a Valsalva leak-point pressure of less than 60 cm H_2O [16]. Urinary retention was defined as a peak flow rate of less than 15 mL/second and a post-micturition volume exceeding 100 mL.

The TOT operations were performed with a Safyre (Promedon, Cordoba, Argentina) sling according to the technique developed by Delorme [5]. Burch colposuspension was performed as described by Walters et al. [15]. After the respective procedure, the bladder was filled with 300 mL methylene blue to diagnose any bladder injury. Cystoscopy was not performed routinely during these operations. It was performed if the operator suspected bladder or urethral injury, or if the patient presented with postoperative retractable dysuria or recurrent urinary tract infection.

Both the Burch and the TOT procedures were performed by the same experienced surgical team, using the laparotomy approach. Single-dose antibiotic prophylaxis with first-generation cephalosporin was administered intraoperatively. If an infection or an intraoperative bladder perforation occurred, administration of antibiotics was continued. The Foley catheter was removed 12–24 hours after surgery in the TOT group and 36–48 hours after surgery in the Burch group. In women who underwent another vaginal surgery in addition to TOT, the Foley catheter was removed 24–36 hours after surgery.

Intraoperative and postoperative complications (bladder injury, bowel injury, wound infection, vaginal perforation, vaginal mesh erosion, and neurologic injury), duration of the operation, length of hospital stay, and estimated blood loss were recorded for all patients. The operation time was defined as the time period from the first incision to the end of wound closure. Blood loss was estimated by calculating the difference in weight of the gauze used before and after surgery and by measuring the volume of the blood removed by the aspirator. If a transfusion was performed, the volume of the transfused blood was recorded.

After removal of the catheter, the patients were discharged if 3 successive post-void residual urine volumes were less than 50 mL. Patients with a residual volume between 50–100 mL were discharged after they had received training in performing voiding trials. Patients with residual urine of more than 100 mL received an indwelling catheter. The indwelling catheter was removed after 2 days, and the voiding trial was repeated. If the residual urine volume was still more than 100 mL, the patient was discharged with an indwelling catheter and control visits were scheduled every 2 days.

All patients were followed up by control visits 2 weeks and 3, 6, and 12 months postoperatively, and every year thereafter. The surgeon carried out a clinical examination that involved sling palpation, checking the vaginal mucosa for erosion, and performance of a cough stress test. Urodynamic studies during the follow-up period were conducted on a routine basis and when indicated by urinary symptoms.

The treatment efficacy was assessed by determining the cure rates [15]. Objective cure was defined as a negative supine cough stress test after the operation and patient-reported improvement in urinary incontinence. Subjective cure was defined as patient-reported improvement in urinary incontinence with a positive supine cough stress test [15].

In addition, functional outcomes such as voiding dysfunction, de novo urgency, and recurrent infection were recorded during the follow-up period. Short-term voiding dysfunction was defined as incomplete bladder emptying occurring within the first 6 weeks following surgery. Prolonged voiding dysfunction was defined as the need for intermittent self-catheterization after 6 weeks postoperatively. De novo urgency was defined as a sudden compelling desire to pass urine that was difficult to defer. Urge incontinence was defined as involuntary leakage accompanied or immediately preceded by urgency.

The statistical analyses were performed using SPSS version 17 (IBM, Armonk, NY, USA). The χ^2 test was used to analyze categorical variables; the *t* test and the Mann–Whitney *U* test were used for continuous variables. Relative risks and 95% confidence intervals were calculated. $P < 0.05$ was considered statistically significant.

3. Results

We evaluated 498 women in the Burch group and 272 women in the TOT group. Concomitant surgery was more common in the Burch group than in the TOT group (84.9% versus 47.1%) (Table 1). This result was not surprising because in our unit Burch colposuspension is considered to be an appropriate treatment method for SUI patients with additional gynecologic pathology in whom abdominal surgery is indicated. Concomitant surgery in the TOT group included vaginal hysterectomy (41 [15.1%] women with grade 1 uterine prolapse) and anterior and/or posterior colporrhaphy (30 [11.0%] women with grade 1 cystocele or rectocele). In the Burch group, concomitant abdominal surgery (all operations were performed via laparotomy) included total abdominal hysterectomy with bilateral salpingo-oophorectomy (n = 297 [59.6%]) and myomectomy (n = 116 [23.3%]).

No significant differences were found between the groups in terms of demographic and clinical characteristics (age, body mass index, parity, hormone replacement therapy, history of previous hysterectomy, and number of patients who reached a follow-up duration of 5 years), regardless of whether concomitant surgery was performed (Tables 1 and 2).

After Foley catheter removal, urinary retention occurred in 26.9% of patients in the Burch group and in 10.7% of patients in the TOT group ($P < 0.001$) (Table 3). No significant difference was found between the groups for the incidence of short-term voiding dysfunction (5.6% in the Burch group and 3.7% in the TOT group; $P = 0.273$). However, a significant difference ($P = 0.007$) between the groups was observed for prolonged voiding dysfunction at each follow-up visit. In the Burch group, 21 (4.2%) patients had a voiding problem lasting longer than