

Comparison between the laparoscopic Burch and transobturator tape procedures in surgical management of stress urinary incontinence

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Surgical management of urinary incontinence

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Abstract

Aim: To compare the results of Laparoscopic Burch and Transobturator Tape (TOT) procedures in patients with stress urinary incontinence.

Material and Methods: In this study which utilized a retrospective cohort study, medical records of patients who underwent TOT (n=33) and Laparoscopic Burch (n=19) procedures at Okmeydanı Prof. Dr. Cemil Tascioglu City Hospital between 2019 and 2023 were evaluated. Surgical outcomes of the two techniques, including postoperative recurrence rate, intraoperative complications, and efficacy, were comparatively analyzed between the groups.

Results: There were no significant differences were observed with regard to age, gravida, intraoperative complications, efficacy, and postoperative recurrence rate of the patients. The surgery duration was significantly shorter in favor of TOT (p<0.05).

Discussion: Although Laparoscopic Burch operation seems to be an important alternative for those who continue stress incontinence after sling operations, the "long learning curve, operation time and perioperative organ injuries" constitute its most important disadvantages. Our study suggests that TOT is associated with shorter operation time compared to the Laparoscopic Burch. While the short learning curve and operation time are important advantages of TOT procedure, complications such as mesh erosion constitute its disadvantages.

Keywords

TOT, SUI, Burch

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Introduction

Stress urinary incontinence is defined as the unintentional loss of urine that occurs during physical activities like exertion, sneezing, or coughing [1]. When investigating the causes of SUI, the primary factors include urethral hypermobility due to diminished pelvic floor support in women and intrinsic sphincter deficiency stemming from structural damage to the urethral sphincter [2]. The popularity of mid-urethral sling procedures has increased over the past two decades and has become the leading choice for treating stress urinary incontinence (SUI) in women. The success rates for the minimally invasive technique have been reported between 70 and 95%. It was commonly viewed as the gold standard until recently due to its ease of use and effectiveness for the short-to-medium term [3]. One of the main factors contributing to this is the ease of implementation, the minimally invasive nature, and results that are comparable to other more comprehensive procedures such as Burch urethropexy [4]. However, as the use of synthetic mesh increased, complications related to its implantation have surfaced. Among the most frequent complications of mesh surgery are mesh erosion into the vagina and dyspareunia [5]. More rare and serious complications are bladder, urethra, and intestinal perforations. The incidence of mesh erosion in the literature is between 0% and 0.6% [Dec 6].

Approximately 50% of women presenting with postoperative symptomatic complaints in patients who have had a mid-urethral sling require secondary surgical treatment after a failed mid-urethral sling operation [7]. When conservative measures fail to adequately treat a complication, surgical removal or revision of the mid-urethral sling (MUS) has been proven to provide relief of symptoms associated with a mesh complication. But sometimes this condition might cause the incidence of stress urinary incontinence to recur or worsen.

Burch operation; Two to 3 permanent or delayed absorbable sutures are inserted through the endopelvic fascia lateral to the mid-urethra and bladder neck, followed by the ipsilateral Cooper's ligament and connected with a slight tension [8]. A short-term cure rate ranging from 73 to 92% (indicating complete continence) and a success rate between 81% and 96% (indicating either cure or recovery percentage) have been reported [9]. The effectiveness of this technique is maintained in the long term; after 5 to 10 years, about 70% of patients are still continent [9, 10]. Our objective in this study is to compare the results of patients who have undergone TOT surgery and laparoscopic Burch urethropexy surgery due to urinary incontinence.

Material and Methods

This retrospective study was performed between February 2021 and December 2023 on a total of 52 patients aged 40-70 years who underwent mid-urethral sling (TOT) (n:33) or laparoscopic Burch (n:19) for stress incontinence in the tertiary gynecology surgical unit. Six months after the first surgery, patients underwent a 1-hour pad test and a cough test for stress urinary incontinence.

Patients with detrusor overactivity, urge incontinence, and neurogenic bladder or patients requiring additional surgery due to prolapse were excluded from the study. All patients after the operation of mid-urethral sling(TOT) or laparoscopic Burch surgery had urodynamics. Patients with systemic hypo/hyperthyroidism, hyperprolactinemia, endocrine abnormalities such as diabetes insipidus, Cushing's syndrome, and congenital adrenal hyperplasia who received drug therapy (glucocorticoid therapy), patients with malignancy, those who had previously received pelvic radiation therapy, and patients with known psychiatric problems were excluded from the study.

Detailed clinical evaluation, pelvic and abdominal physical examination, and ultrasonographic evaluation results were recorded for all

patients included in the study. The age, gravida, duration of surgery, intraoperative complications, efficacy, and postoperative recurrence rates of the patients were documented using data extracted from hospital records. The primary outcome of this study was recovery from SUI (no symptoms), improvement of SUI symptoms, and surgical success, defined as a negative stress test and urine leakage of less than 2 g in a one-hour pad test.

Statistical Analysis:

Statistical analyses were performed using SPSS 15.0 for Windows. Descriptive statistics were summarized as frequencies and percentages for categorical variables, while numerical variables were described using means, standard deviations, ranges (minimum and maximum), and medians. For numerical variables, independent group comparisons were executed using the Student t-test for normally distributed data and the Mann-Whitney U test for non-normally distributed data. The threshold for statistical significance was established at $p < 0.05$.

Ethical Approval

The study was approved by the Ethics Committee of Istanbul Health Sciences University Prof. Dr. Cemil Tascioglu Clinical Research (Date: 2024-02-19, No: 31).

Results

Characteristic and demographic data of patients who underwent laparoscopic surgery are shown in Table 1.

Characteristic and demographic data of patients who underwent TOT are shown in Table 2.

The mean duration of the LS Burch was 57.1 minutes (ranging from 41 to 88 minutes), while the TOT procedure averaged 21.1 minutes (15-31 minutes) ($p < 0.05$). The surgical time was significantly shorter for the TOT procedure. Regarding perioperative complications in our patients, bladder injury occurred in 2 cases for LS Burch and in 2

Table 1. Characteristics of 19 Women Who Underwent Laparoscopic Burch

	Median (25 – 75 Quartile)
Age	60 (55,75, 68)
Parity	2 (2,3)
Body Mass Index	30.35 (26,4, 33,8)
Pre-op Stress Test	1 (1,1)
Surgery times	57.1 (41,88)
Intraoperative Complication	2
Postoperative Complication	2
Pre-op Pad Weight (g)	130 (90,180)

Table 2. Characteristics of 33 Women Who Underwent TOT

	Median (25 – 75 Quartile)
Age	59.7 (48,25, 66)
Parity	2 (2,1)
Body Mass Index	30.95 (27,7, 34,6)
Pre-op Stress Test	1 (1,1)
Surgery times	21.1 (15,31)
Intraoperative Complication	2
Postoperative Complication	2
Pre-op Pad Weight (g)	130 (90,180)

cases of TOT, and all were treated perioperatively laparoscopically or vaginally. 3 of the patients with LS Burch complications had previous abdominal surgeries. Four patients with LS Burch had a previous sling operation. There was no bleeding requiring conversion to laparotomy in the present patients. In cases with bladder perforation, urethral catheters were removed at the 12th postoperative hour, except in patients with urethral catheter insertion on the 7th postoperative day. Clean intermittent catheterization was performed in 2 patients who could not urinate spontaneously in the postoperative period. After 1 month, the symptoms disappeared. One patient experienced new onset of urge and urge incontinence, which was completely resolved with anticholinergic treatment by the 6-month postoperative follow-up. The average postoperative length of stay was 1.5 days and 30 ml for LS Burch and 1.2 days and 30 ml for TOT ($p=0.68$). No statistically significant difference was observed between the groups. However, a significant improvement was noted in both groups in patients with stress urinary incontinence, as reflected in the effort test and pad weight during the postoperative follow-up ($p<0.05$).

Discussion

Women with stress urinary incontinence (SUI) have numerous surgical treatment options available. The traditional gold standards of Burch retropubic colposuspension and pubovaginal slings are still viable treatment options for some patients, but randomized controlled trials have shown that synthetic mid-urethral slings are as effective as these traditional procedures but have less associated morbidity [11].

Therefore, mid-urethral slings using either a retropubic or transobturator approach are now considered the new gold standard first-line surgical treatment for women with uncomplicated SUI. Pubovaginal slings continue to be a viable choice for women with SUI who have not had success with other procedures, face mesh complications, or need simultaneous urethral surgery. Single-incision slings offer several benefits, including shorter operative times and early return to regular activities [11]. It was observed that 4 of the patients with LS Burch had a previous sling operation. These patients were successfully operated on with LS Burch treatment. In this respect, LS Burch operation continues to be an alternative minimally invasive method for previous failed sling operations. In a prospective multicenter study conducted in the United Kingdom and Ireland, tension-free vaginal tape and colposuspension were compared as the primary treatment of stress incontinence. After 5 years of follow-up, both procedures were similar in terms of treatment of urinary incontinence and improvement of quality of life; however, posterior vaginal wall prolapse was reported to be more common in the colposuspension group [12]. Similar results were found in efficacy in our study. No de novo enterocele or cuff prolapsus was observed in our study.

The meta-analysis review indicated that laparoscopic procedures were linked to reduced morbidity, a shorter duration of hospitalization, significantly fewer postoperative complications (RR 0.74, 95%CI 0.58-0.96), less estimated blood loss, shorter catheterization time, and notably less pain. The only known disadvantage was that laparoscopic operation took longer than open colposuspension [13]. Since both methods were minimally invasive, the length of hospitalization, intraoperative complications, postoperative complications, and recovery times were similar. The only difference was observed in operation time. A study comparing TVT with laparoscopic Burch showed similar long-term efficacy. A notable percentage of patients encounter some level of urinary incontinence 4-8 years post-surgery; however, most instances of incontinence are not distressing [14]. LS Burch has significant advantages in short and long-term results without any apparent compromise [15]. Its most important advantage remains

its repeatability, especially after failed sling operations. Mid-urethral sling surgery is a minimally invasive technique that can be completed relatively quickly, involves minimal equipment, and has a shorter learning curve compared to the LS Burch procedure. As more evidence accumulates on the long-term success rates of mid-urethral silencing, it may eventually become the first-line choice for stress incontinence surgery [16, 17]. A long-term Burch colposuspension series has shown excellent durability. Since the early 1990s, laparoscopic colposuspension has been introduced as a treatment option to minimize the surgical morbidity associated with open Burch colposuspension and achieve a comparable recovery rate [18, 19]. Doret et al. found that the long-term outcomes of laparoscopic Burch colposuspension were generally favorable, though slightly less effective compared to those achieved with the traditional open technique. With an evolving technique, the effects of the learning curve should be considered when analyzing outcomes [20].

One limitation of our study was the limited size of the patient cohort. Larger prospective randomized studies will strengthen the data in this regard.

Limitation

The main limitation of our study is the small patient cohort and its retrospective nature.

Conclusion

LS Burch operation is a well-tolerated and safe surgical procedure as a secondary surgery in mid-urethral sling cases with mesh excision. The disadvantages of the LS Burch operation are the longer operating time and the need for an experienced surgeon. The disadvantages of the TOT include the difficulties in repeating it when it fails and the complications associated with the mesh.

Scientific Responsibility Statement

The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

Animal and Human Rights Statement

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

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Conflict of Interest

The authors declare that there is no conflict of interest.

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