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Article

Comparison of Laparoscopic and Laparotomic Burch Colposuspension in the Treatment of Stress Urinary Incontinence

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Abstract: Objective: The aim of our study was to evaluate patients who underwent burch colposuspension due to stress-type urinary incontinence (SUI) in terms of laparoscopic and laparotomy approaches. **Materials and Methods:** 74 patients aged 40-70 years who were admitted to our hospital with symptoms of SUI between 2017 and 2024, who underwent surgical treatment for SUI, and who met the inclusion criteria were included. Women included in the study were divided into two groups as those who received laparotomy (L/T) and laparoscopic (L/S) burch colposuspension. To assess the impact of SUI on quality of life, several quality of life questionnaires, such as the urinary distress inventory (UDI-6), the incontinence impact questionnaire (IIQ-7), physical component summary (PCS), and mental component summary (MCS), were evaluated. **Results:** The operation time and estimated blood loss in the L/S-Burch colposuspension group was significantly lower than in the L/T-Burch colposuspension group ($p<0.001$ and $p<0.001$, respectively). The 6th and 48th hour VAS score in L/S-Burch colposuspension group was found to be significantly lower than in the L/T-Burch colposuspension group ($p<0.001$ and $p<0.001$, respectively). There was a significant decrease in UDI-6 and IIQ-7 score in patients who underwent L/S-Burch colposuspension and L/T-Burch colposuspension in the 6th-month follow-up ($p<0.001$ and $p<0.001$, respectively). At the 6th-month follow-up, SF-36 MCS score was significantly lower in the L/S-Burch colposuspension group compared with the L/T-Burch colposuspension group ($p=0.014$). **Conclusion:** In our study, the results of burch colposuspension methods are consistent with the literature. L/S-burch colposuspension is superior in terms of operation time, blood loss, hospital stay, pain management and recovery time. The significant decrease in UDI-6 and IIQ-7 scores at 6-month follow-up shows that both methods provide improvement in urinary incontinence symptoms and increase quality of life.

Keywords: Burch colposuspension; laparoscopic; laparotomic; stress urinary incontinence

Introduction

Stress-type urinary incontinence (SUI) is a common health problem among women and negatively affects quality of life [1]. Surgical treatment offers an effective solution in SUI cases that do not respond to conservative methods. Burch colposuspension has been preferred as a procedure with proven reliability and effectiveness for many years in this context [2]. Traditionally performed via laparotomy (L/T), burch colposuspension can now be performed using minimally invasive methods with the development of laparoscopic (L/S) techniques [3]. The advantages of laparoscopic surgery, such as smaller incisions, less postoperative pain, faster recovery time and shorter hospital stay, have increased the preference for this method [4]. However, the technical difficulties of the laparoscopic approach and the length of the surgical learning curve make it important to compare its effectiveness and safety with the laparotomy method [5,6]. Laparotomic surgery is still preferred by some surgeons because it offers a wider field of view and requires

relatively less experience. Evaluation of the advantages and disadvantages of laparoscopic and laparotomy burch colposuspension may contribute to determining the optimal approach in the surgical treatment of stress urinary incontinence [7,8]. The aim of our study was to evaluate patients who underwent burch colposuspension due to stress-type urinary incontinence (SUI) in terms of laparoscopic and laparotomy approaches.

Materials and Methods

This study was designed as a retrospective observational study. The study was initiated after receiving ethics committee approval (Date: 27/03/25, Number: 22-11/26) from the hospital ethics committee. The study was designed according to the Helsinki Declaration and informed consent was obtained from all patients. In our study, 74 patients aged 40-70 years who were admitted to our hospital with symptoms of SUI between 2017 and 2024, who underwent surgical treatment for SUI, and who met the inclusion criteria were included. Women included in the study were divided into two groups as those who received L/T and L/S Burch colposuspension. Patients who underwent L/S-burch colposuspension surgery (Group 1) and L/T-burch colposuspension surgery (Group 2) were classified as follows. In patient selection, previous pelvic surgery, active pelvic infection, neurogenic bladder, history of malignancy and pregnancy were considered as exclusion criteria. All surgeries were performed by experienced pelvic surgeons and the same surgical protocols were followed. The presence of preoperative SUI in all women participating in the study was confirmed from patient files. Anamnesis, physical examination, cystourethroscopy and urinalysis data of all women were evaluated retrospectively. Physical examination includes bimanual pelvic examination and focused neurological examination. SUI was defined as the involuntary loss of urine through the urethra attributable to a sudden increase in intra-abdominal pressure. All patients were evaluated for the type of incontinence, presence and degree of cystocele, rectocele, enterocele, and other pelvic floor abnormalities such as uterine hypermobility. All data, including age, parity, body mass index (BMI), menopausal status, hormonal replacement status, delivery type, incontinence type, concomitant diseases, operative time, intraoperative blood loss, intraoperative fluid requirements, preoperative and postoperative hematocrit, postoperative analgesic requirements, length of hospital stay, and complications, were obtained from patient records. Exclusion criteria were considered as history of SUI operation, intrinsic sphincter deficiency in SUI, urinary retention, neurogenic bladder, suspected malignancy, urge incontinence only, chronic cystitis, pelvic inflammatory diseases, urinary tract infection, use of anticoagulant drugs, anti-psychiatric drugs, coagulation disorders. Visual Analog Scale (VAS) was performed after the 6th and 48th hours of the procedure to assess postoperative pain. On the VAS scale, 0 represents the lack of symptoms and 10 represents the worst conceivable illness. Dyspareunia was scored by participants on a range of 0 to 10 [9]. In the clinical examination, cough stress test data were evaluated during the 6th month postoperative control to evaluate the response to treatment. In addition, at the 6th month control, the urinary distress inventory (UDI-6) and incontinence impact questionnaire (IIQ-7) data were examined to evaluate the subjective response to treatment [10]. Data were evaluated both at baseline and at 6 months postoperatively using the Short Form-36 (SF-36) [11]. This form compares eight scales that can be combined into two summary measures assessing physical and mental health, the physical component summary (PCS) and mental component summary (MCS), respectively. In addition, the SF-36 has a general health question (excellent, very good, good, fair, and poor). Only the summary scales and the general health question are reported in this study [11]. Lower scores using the SF-36 questionnaire indicate better general, physical, and mental health. These instruments assess symptom distress and life impact of urinary incontinence, respectively. Genitourinary treatment satisfaction scale (GUTSS) was used to evaluate satisfaction with the surgery at the 6th month postoperative follow-up [12,13]. The GUTSS consists of ten items on two scales measuring satisfaction with care and outcome. The scale range is 0–32, with higher scores indicating greater satisfaction.

Statistical Analysis

Statistical analysis was carried out by employing the SPSS 26.0 (IBM, Inc. Chicago, IL-USA). The distribution normality was measured with the Kolmogorov Smirnov Test. The quantitative data of the patients were reported as mean ± Standard Deviation (SD). Number (n) and percentage (%) were used for evaluating categorical data. The independent test was used to compare the pair groups in the study data evaluation, the matched test was used to ascertain the changes that occurred before and after the treatment, and the Chi-square test was used to compare qualitative data. The results were evaluated at a 95% Confidence Interval (CI). The p-value, <0.05, was regarded as statistically significant.

Results

The mean age of the women included in the study was 49.58 ± 7.16 years, and the mean body mass index (BMI) score was 25.57 ± 4.45 kg/m2. The mean parity of the women was 3.05 ± 1.12, and the mean gravidity was 3.61 ± 1.35. No significant difference was found between the groups in terms of demographic and obstetrics characteristics (Table 1).

Table 1. Comparison of demographic and obstetrics characteristics of participants.

	L/S-Burch colposuspension n=34	L/T-Burch colposuspension n=40	p-value
	Mean±SD		
Age (year)	49.76 ± 7.38	49.44 ± 6.98	0.82
BMI (kg/m²)	25.62 ± 4.58	25.52 ± 4.34	0.84
Gravidity	3.68 ± 1.42	3.56 ± 1.32	0.56
Parity	3.06 ± 1.08	3.04 ± 1.15	0.62
Smoking, n (%)	16 (47%)	20 (50%)	0.36
*Type of delivery, n (%)			
NSVD	27 (79.4%)	33 (82.5%)	0.32
C/S	7 (20.6%)	7 (17.5%)	

BMI: Body mass index, NSVD: Normal spontaneous vaginal delivery , C/S: Caesarean section.

The operation time in the L/S-Burch colposuspension group was significantly lower than in the L/T-Burch colposuspension group (p<0.001). The estimated blood loss in the L/S-Burch colposuspension group was significantly lower than in the L/T-Burch colposuspension group (p<0.001). The duration of hospital stay in L/S-Burch colposuspension group was found to be significantly lower than in the L/T-Burch colposuspension group (p=0.036). The 6th hour VAS score in L/S-Burch colposuspension group was found to be significantly lower than in the L/T-Burch colposuspension group (p<0.001). The 48th hour VAS score in L/S-Burch colposuspension group was found to be significantly lower than in the L/T-Burch colposuspension group (p<0.001). The return to normal activity time in L/S-Burch colposuspension group was found to be significantly lower than in the L/T-Burch colposuspension group (p<0.001) (Table 2).

Table 2. Comparison of operative and postoperative characteristics of participants.

	L/S-Burch colposuspension n=34	L/T-Burch colposuspension n=40	p-value
	Mean±SD		
Operation time (min)	94.38 ± 11.46	62.18 ± 12.58	<0.001
Estimated blood loss (ml)	74.26 ± 21.58	108.58 ± 20.52	<0.001
Hospital stays (days)	2.08 ± 0.88	2.56 ± 0.78	0.036

6.hour VAS (Pain)	5.12 ± 0.76	7.22 ± 0.82	<0.001
48.hour VAS (Pain)	3.12 ± 0.56	5.82 ± 0.64	<0.001
Return to normal activity time (days)	18.26 ± 2.36	25.32 ± 3.28	<0.001

VAS: Visual analog scale.

There was a significant decrease in UDI-6 score in patients who underwent L/S-Burch colposuspension and L/T-Burch colposuspension in the 6th-month follow-up ($p<0.001$ and $p<0.001$, respectively). There was a significant decrease in IIQ-7 score in patients who underwent L/S-Burch colposuspension and L/T-Burch colposuspension in the 6th-month follow-up ($p<0.001$ and $p<0.001$, respectively). There was no significant baseline to follow-up improvementt in general health. There was a significant increase in SF-36 PCS score in patients who underwent L/S-Burch colposuspension and L/T-Burch colposuspension in the 6th-month follow-up ($p=0.014$ and $p=0.046$, respectively). At the baseline, SF-36 MCS score was significantly lower (43.26 ± 10.18) in the L/S-Burch colposuspension group compared with the L/T-Burch colposuspension group (47.38 ± 10.36) ($p=0.018$). At the 6th-month follow-up, SF-36 MCS score was significantly lower (43.68 ± 10.26) in the L/S-Burch colposuspension group compared with the L/T-Burch colposuspension group (47.88 ± 10.42) ($p=0.014$). No significant dif fference was found between the groups in terms of GUTSS at the 6th month follow-up (Table 3).

Table 3. Comparison of intergroup and intragroup results before and after treatment.

		L/S-Burch colposuspension n=34	L/T-Burch colposuspension n=40	<i>p-value</i>
		Mean±SD		
UDI-6	Baseline	51.16 ± 18.92	50.32 ± 19.26	0.68**
	6 months later	24.86 ± 11.62	25.12 ± 10.92	0.72**
	p	<0.001***	<0.001***	
IIQ-7	Baseline	49.82 ± 19.84	49.52 ± 19.52	0.84**
	6 months later	24.12 ± 10.71	23.82 ± 11.12	0.78**
	p	<0.001***	<0.001***	
General health	Baseline	2.82 ± 1.12	2.42 ± 1.21	0.016**
	6 months later	2.71 ± 1.03	2.32 ± 1.06	0.012**
	p	0.11***	0.08***	
SF-36 PCS	Baseline	44.26 ± 11.84	44.42 ± 11.78	0.76**
	6 months later	47.36 ± 10.92	47.24 ± 10.68	0.82**
	p	0.014***	0.046***	
SF-36 MCS	Baseline	43.26 ± 10.18	47.38 ± 10.36	0.018**
	6 months later	43.68 ± 10.26	47.88 ± 10.42	0.014**
	p	0.76***	0.82***	
GUTSS (Median-IQR)	6 months later	28.5 ± 6.8	28.1 ± 7.2	0.56**

** Independent-T test; ***Match-T test; UDI-6: urinary distress inventory; IIQ-7: incontinence impact question naire; SF-36 PCS: physical component summary; SF-36 MCS: mental component summary; GUTSS: Genitourinary treatment satisfaction scale; IQR, interquartile range.

Discussion

Although there are many studies in the literature on burch colposuspension, the number of studies that comprehensively evaluate L/S-burch operation and L/T-burch operation in terms of patient satisfaction in the postoperative period is limited. The findings of our study reveal that both methods effectively reduce urinary incontinence symptoms and improve patients' quality of life. However, the laparoscopic method was found to be superior to the laparotomy method in terms of operative time, estimated blood loss , length of hospital stay , and postoperative pain

management. In the study conducted by Carey et al., it was determined that the operation time was longer in patients who underwent L/S-burch colposuspension. However, estimated blood loss and postoperative pain were lower in the L/S-burch colposuspension group, and a faster return to normal activities was observed [7]. The fact that the laparoscopic approach is a minimally invasive technique is seen as one of the main advantages of this method. In addition, the fact that patients can return to their daily activities more quickly following laparoscopic surgery supports the positive effects of this method on patient comfort and satisfaction. In the study conducted by Miannay et al., no significant difference was found between the groups in terms of operation time. However, intraoperative blood loss and postoperative analgesic requirement were found to be lower in the L/S group than in the L/T group. The duration of hospital stay was found to be significantly shorter in the L/S group. At the end of the six-month follow-up, objective and subjective recovery rates were found to be similar in both groups [14]. In the study conducted by Ankardal et al., higher recovery rates were found in the L/T-Burch colposuspension group after one year. However, the L/T method revealed results such as increased blood loss, risk of urinary retention and longer hospital stay. The L/S method was found to be associated with shorter hospital stay and lower postoperative complications [15]. In the study conducted by Obaid et al., L/S-burch colposuspension provides advantages such as shorter hospital stay, less estimated blood loss, less postoperative pain and faster recovery time compared to L/T-burch colposuspension in the treatment of stress urinary incontinence. However, unlike our study, the operation time was found to be longer in the L/S method [16]. The significant decrease in UDI-6 and IIQ-7 scores in both groups at the six-month follow-up indicates that both methods improve urinary incontinence symptoms and increase the patients' quality of life. In the study conducted by Ünal et al., similar to our study, no significant difference was found between the groups in terms of subjective recovery rates (UDI-6 and IIQ-7) in the postoperative period of L/S and L/T-burch colposuspension operations [17]. The SF-36 physical component score (PCS) showed a significant increase in both groups. However, the SF-36 mental component score (MCS), which was lower at the beginning in the laparoscopic method, was also lower at 6 months compared to the laparotomy method. This suggests that psychological recovery after laparoscopic surgery may progress more slowly and should be evaluated in more detail. In the Carey et al. study, at baseline, the L/T group reported significantly better general health on the SF-36 question compared with the L/S group. Better mental health status was also identified with SF-36 scores. The baseline differences in general health between the L/T and L/S groups were maintained at follow-up [7]. In our study, no significant difference was found between the groups in terms of GUTSS scores at the 6th month follow-up. These results show that both methods have similar effects on general satisfaction and lower urinary tract symptoms. In the study conducted by Carey et al., GUTSS scores were high in both groups in terms of satisfaction with treatment results at 6-month follow-up, and no difference was found between the treatment groups [7].

Study Limitations

The main limitation of our study is that it is retrospective, and only the post-treatment 6th month data of all patients in the surgical treatment groups are available. Another limitation is that the data on the long term effectiveness of the treatment methods within themselves and between the methods have not yet been obtained. The strengths of this study are the use of various quality of life questionnaires (UDI-6, IIQ-7, PCS and MCS) and the assessment of how treatment effects affect not only symptom control but also the patient's overall quality of life.

Conclusion

Our study compares the short- and mid-term clinical results of L/S and L/T-burch colposuspension methods, and our findings are consistent with the literature. L/S-burch colposuspension is superior to the L/T method in terms of operative time, blood loss, hospital stay, pain management and recovery time. The significant decrease in UDI-6 and IIQ-7 scores in both

groups at the 6-month follow-up shows that both methods provide improvement in urinary incontinence symptoms and increase the quality of life of the patients. However, prospective studies are needed to evaluate long term results with larger patient groups.

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