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Comparison of LIFT and cutting seton methods in the treatment of high transsphincteric anal fistulas

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Abstract

Objective: Many treatment modalities have been recommended for high transsphincteric anal fistulas, but none have been proven to be ideal. This study aims to compare the ligation of intersphincteric fistula tract (LIFT) and cutting seton methods in the treatment of high transsphincteric anal fistulas.

Materials and methods: This study was conducted in the general surgery department of Health Sciences University Gazi Yaşargil Training and Research Hospital. Retrospective data of patients who underwent surgery for perianal fistula in our clinic were reviewed. Patients diagnosed with high transsphincteric anal fistulas were included in the study. According to the treatment method, patients were categorized into two groups: LIFT (Group 1) and cutting seton (Group 2). The groups were compared in terms of recovery time, recurrence rate, postoperative pain, and incontinence.

Results: There were a total of 60 patients in the study, with 30 patients in each group. The mean recovery time was significantly shorter in Group 1. At the end of 1-year follow-up, successful results were obtained in 21 (70%) patients in Group 1 and in 24 (80%) patients in Group 2 (p=0.371). While there was no significant difference between the groups in the visual analog scale evaluation in the preoperative period (p=0.398), there were significantly higher pain scores in Group 2. There was no difference between the two groups in the Wexner score at preoperative, postoperative 4th and 12th weeks.

Conclusion: Both LIFT and cutting seton procedures exhibit similar long-term healing, recurrence, and continence preservation rates in patients with high transsphincteric anal fistulas. However, LIFT has the advantage of less postoperative pain and shorter recovery time.

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Introduction

Anorectal fistula is a chronic perianal disease characterized by persistent drainage, abscess formation, associated pain, and either spontaneous or assisted drainage. It is commonly classified according to the Park classification, taking into account the anatomical location (1). High cure rates (close to 90%) obtained with fistulotomy in simple fistulas (1) cannot be obtained in complicated fistulas involving the sphincter complex, and the risk of incontinence is a major concern for the patient and the physician. A variety of techniques with widely varying cure and recurrence rates are advocated in the literature for surgical treatment. The use of cutting setons, one of them, may result in significant incontinence (2).

Promising short-term success rates have been reported for fibrin glue injection into the fistula tract, but longer-term follow-up (10 months) has shown recurrence rates of 36–86% (3,4). Similar long-term results have been reported for fistula plugs, with recurrence rates of 17–57% (5-7) while mucosal advancement flaps have achieved long-term healing rates of 62–77% (8,9).

The ligation of intersphincteric fistula tract (LIFT) procedure is a sphincter-preserving technique in which the fistula tract is ligated and divided at the intersphincteric plane. In studies examining various types of anal fistula, the recurrence rate of LIFT varies between 6% and 43% (10-12). However, recent studies with longer follow-up periods ranging from 16 to 26 months have reported recurrence rates of 38–60% (13-15).

Although reports confirm that the LIFT procedure is technically relatively simple and less morbid with fewer complications and risk of incontinence (16-18), it remains unclear whether LIFT offers any proven advantage in reducing the recurrence rate of complex anorectal fistulas.

The aim of our study is to compare the effects of the cutting seton method and the LIFT technique on surgical efficacy, healing, recurrence rate and anal incontinence in patients operated on for high transsphincteric fistula.

Table 1: Patients and fistula characteristics

			Group 1	Group 2	P value
Age			36 ± 9	37.3±9.8	0.807
Gender		Male	27 (90%)	28 (93.3%)	0.640
		Female	3 (10%)	2 (6,7%)	
Comorbidities		DM	3 (10%)	2 (67%)	0.640
		HT	2 (6.7%)	1 (3.3%)	0.554
		COPD	1 (3.3%)	0	0.313
Smoking			10 (33.3%)	10 (33.3%)	1
BMI			25.3±5	25.4±5.3	0.572
Symptom duration (months)			8.7±5.2	8.2±5.9	0.385
Complaint	Discharge		30 (100%)	30 (100%)	
	Pain		17 (56.6%)	18 (60%)	0.793
	Pruritus ani		6 (20%)	5 (16.7%)	0.739
Localization	Anterior		8 (26.6%)	11 (36.6%)	0.405
	Posterior		22 (73.3%)	19 (63.3%)	
Tract length (cm)			4.9±1	4.8±0.9	0.719

DM: Diabetes Mellitus, HT: Hypertension, COPD: Chronic Obstructive Pulmonary Disease, BMI: Body Mass Index, cm: centimeter

Material and methods

Study design

Our study was evaluated by the Scientific Research Ethics Committee of Health Sciences University Gazi Yaşargil Training and Research Hospital and received ethics committee approval with the decision numbered 907 dated 08.10.2021. The records of patients who underwent surgery due to perianal fistula in our general surgery clinic between January 2018 and December 2020 were retrospectively reviewed.

The primary objective was to compare recurrence after the initial treatment during a 12-month follow-up period. Secondary objectives were comparison of time to wound healing (defined as complete epithelisation of the wound) and fecal incontinence assessed by Wexner fecal incontinence score.

Inclusion criteria: Patients aged ≥18 years and with high transsphincteric fistula detected by MRI were included in the study.

Exclusion criteria: Patients with low transsphincteric fistula, intersphincteric fistula, suprasphincteric fistula, multiple fistula, inflammatory bowel disease (such as Crohn's, Tbc), a history of anal surgery, and fecal incontinence were excluded from the study.

Group distribution: The patients were divided into two groups as patients who underwent LIFT (Group 1) and those who underwent cutting seton (Group 2).

Preoperative evaluation

The diagnosis of anal fistula was made by detailed medical history, anal examination and digital rectal examination. Proctoscopy was used to exclude associated anorectal lesions. Continence of the patients was evaluated with the Wexner incontinence questionnaire. All patients underwent MRI to assess the type and complexity of anal fistula and to detect secondary tracts and supralevator extensions.

Surgical technique

Written informed consent was obtained from all patients. Each procedure was clearly explained to patients, along with its potential benefits and complications. Patients were instructed to perform a brief mechanical bowel preparation in the form of a rectal enema the night before and the morning of surgery and to restrict oral intake for 12 hours before the procedure. The procedure was started with all patients under spinal anesthesia, in the prone-jackknife position, and 1 gram of 3rd generation cephalosporin was administered intravenously during induction.

LIFT: The fistula tract was cannulated with a small, blunt-tipped and flexible metal probe. A curvilinear incision of approximately 2 cm was made in the intersphyteric groove above the tract site. The incision was deepened with scissors, blunt dissection and cautery until the white fibrous fistula tract was identified with the metal probe inside. After isolation of the tract at the intersphincteric groove, the metal probe was removed and the fistula tract was returned intact. After tract ligation proximally and distally close to the sphincters, the intervening tract was excised. It was confirmed with a probe inserted through the external opening that no false tract was made and the tract was ligated correctly. The tract was curetted through the external opening, washed with betadine and granulation tissue was curetted. The intersphincteric incision was closed with absorbable sutures (Figure 1).

Table 2: Complete healing and recurrence rates

	Group 1	Group 2	P value
Complete recovery after surgery (number)	26 (86.6%)	28 (93.3%)	0.389
Average recovery time (days)	25.2±8.1	85.5±20.6	0.001[x]
Recurrence (n)	5 (19.2%)	4 (14.3%)	0.626
Recurrence time (weeks)	29.2±8	34.7±11.3	0.462
Success after one year follow-up (n)	21 (70%)	24 (80%)	0.371

x: Mann-Whitney U test showed a significant difference between the two groups (p<0.005).

Table 3: Preoperative and postoperative functional results

	Preoperative			4th week postoperatively			12th week postoperatively		
	Group 1	Group 2	p-value	Group 1	Group 2	p-value	Group 1	Group 2	p-value
Continent	28 (93.3%)	27 (90%)	0.640	28 (93.3%)	24 (80%)	0.129	28 (93.3%)	27 (90%)	0.640
Incontinent (gase)	2 (6.7%)	3 (10%)		2 (6.7%)	6 (20%)		2 (6.7%)	3 (10%)	
Wexner score	0.16±0.64	0.3±0.95	0.622	0.16±0.64	0.5±1.07	0.136	0.16±0.64	0.3±0.95	0.622

Seton procedure: First, methylene blue was administered through the external orifice and the tract was cannulated by trying to determine the internal orifice with the help of anoscope. In patients in whom the inner opening could be found, the tract up to the sphincter complex was incised and curetted. Then, the seton procedure was performed by an elastic vascular sling being passed through the remaining tract. The seton was tied in such a way that minimal pressure was applied to the sphincters. It was ligated with a silk suture to prevent opening of the seton and the procedure was terminated (Figure 2).

Postoperative follow-up

Patients were discharged the next day after being instructed on wound care and hygiene. Laxatives and oral antibiotics were prescribed for the first postoperative week. Outpatient follow-up was planned first in the 1st and 2nd postoperative weeks, then at 1, 3, and 6 months. In the seton group, the seton was tightened under local anesthesia at two-week intervals depending on the healing status of the wound and made incisive. The remaining tract and surrounding tissue were cut spontaneously within 6-18 weeks and the seton fell out.

The fistula was considered healed when the external wound healed completely and there was no complaint of discharge. Persistent or intermittent discharge two months after the procedure was considered as recurrence. Pain was rated by the patients using a visual analogue scale (0: no pain, 10: worst imaginable pain) preoperatively and at 1 and 4 weeks postoperatively. Additionally, all patients were evaluated with the Wexner incontinence questionnaire before the operation and at the 4th and 12th weeks after surgery.

Statistical analysis

Data management and statistical analysis were conducted using SPSS 21 (IBM, Armonk, New York, USA). Numerical data are expressed as means and standard deviations. Categorical data were expressed

Figure 1: LIFT procedure

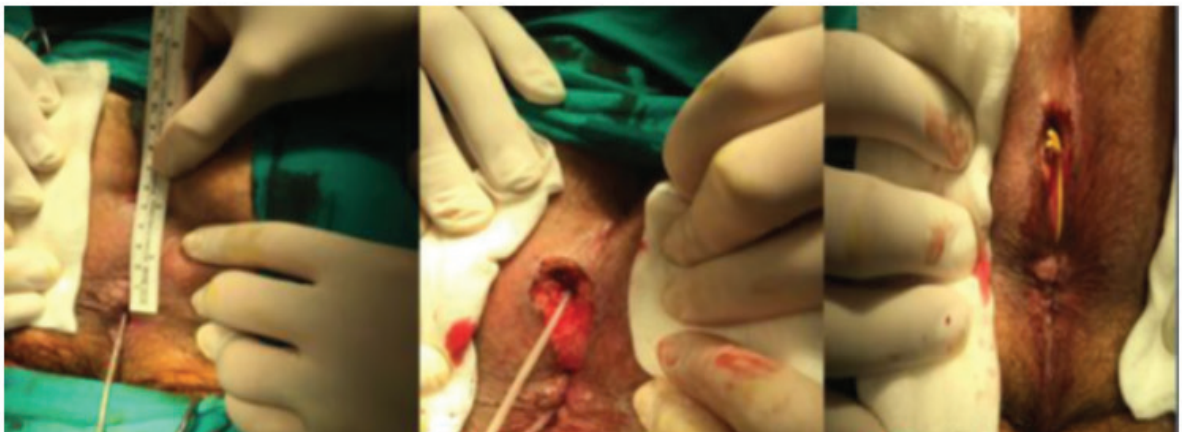

Figure 2: Seton procedure

as numbers and percentages. Comparisons between the two groups were performed using the Mann-Whitney U test for numerical data and the Chi-square test for categorical data. All p-values were two-tailed, and values less than 0.05 were considered statistically significant.

Results

Between January 2018 and December 2020, a total of 132 patients underwent surgery for high transsphincteric anal fistulas in our clinic. Of these, 60 patients met the inclusion criteria and were included in the study.

Patients were divided into two groups based on the surgical technique used: LIFT (Group 1) and cutting seton (Group 2). There were 30 patients in both groups. The patients consisted of 55 males (91.7%) and 5 females (8.3%) with a mean age of 36.9±9.3 years.

All patients (100%) complained of perianal discharge, 35 (58.3%) of anal pain, and 13 (21.6%) of itching. The mean duration of complaints was 8.5±5.5 months. Five patients had diabetes mellitus, three patients had hypertension, and one patient had chronic obstructive pulmonary disease. A total of 20 (33.3%) patients had a history of smoking. The mean body mass index (BMI) was calculated as 24.9±4.7.

The external opening was anterior in 21 patients (35%) and posterior in 39 patients (65%). All patients had a single internal opening at the dentate line level.

No significant difference was found between the two groups in terms of patient age, gender, comorbidities, BMI, smoking, clinical presentation, time to onset of complaints, fistula tract location and tract length. Table 1.

Operation time: There was no significant difference in terms of operation time between the two groups (mean was 26.2±5.3 minutes in Group 1 and 25.4±5.3 minutes in Group 2 (p=0.572)).

Complications: No intraoperative complications were observed in any patient. Six patients, 5 in the seton group and 1 in the LIFT group, developed postoperative complications. In the seton group, 3 patients developed gas incontinence and 2 patients developed hemorrhage that did not require surgery. In the LIFT group, 1 patient developed postoperative urinary retention. Complaints of these 3 patients who developed gas incontinence disappeared at the 3rd month follow-up. There was no postoperative mortality in this study.

Healing and recurrence: Complete healing was achieved in 26 patients (86.6%) in the LIFT group and 28 patients (93.3%) in the seton group (p=0.389) (fistula was not found to heal in 4 patients in the LIFT group and 2 patients in the seton group). The mean healing time was significantly shorter in the LIFT group (25.2±8.1 days) compared to the seton group (85.5±20.6 days) (p=0.001).

After complete healing, recurrent anal fistula was detected in 5 patients (19.2%) in the LIFT group and 4 patients (14.3%) in the seton group. There was no significant difference in recurrence between the two groups (p=0.626).

Recurrence after healing was recorded at a mean of 29.2±8 weeks in the LIFT group and 34.7±11.3 weeks in the seton group (p=0.462). At the end of 1-year follow-up, successful results were achieved in 21 patients (70%) in the LIFT group and 24 patients (80%) in the seton group (p=0.371) (Table 2).

Postoperative pain and incontinence: Pain was assessed using a visual analog scale preoperatively and at postoperative 1st and 4th weeks. There was no significant difference between the groups in the preoperative evaluation (0.5±0.63 in Group 1 and 0.77±0.97 in Group 2, p=0.398). However, after the 1st and 4th postoperative weeks, there were significantly higher pain scores in Group 2 (2.7±0.99 in Group 1 and 4.03±1.75 in Group 2 at the 1st week, p = 0.003, and 1.27±1.01 in Group 1 and 2.37±1.07 in Group 2 at the 4th week, p=0.001).

The mean Wexner incontinence scores were as follows:

- ***LIFT group:*** Preoperative: 0.16±0.64, Postoperative 4th week: 0.16±0.64, Postoperative 12th week: 0.16±0.64
- ***Seton group:*** Preoperative: 0.3±0.95, Postoperative 4th week: 0.5±1.07, Postoperative 12th week: 0.3±0.95

There was no significant difference between the groups in terms of pre- and postoperative values (Table 3).

Discussion

In our study, we compared the LIFT and cutting seton methods for the treatment of high transsphincteric anal fistulas. Recovery was significantly faster in the LIFT group (25.2 days versus 85.5 days, p=0.001). The mean postoperative pain score at the end of the 1st and 4th postoperative weeks was significantly lower in the LIFT group. After 1-year follow-up, failure rates in both groups were not statistically different (30% in the LIFT group and 20% in the seton group, p=0.371). Additionally, when the mean Wexner score was analysed, there was no significant difference between the groups in terms of preoperative and postoperative values.

The goal of surgical treatment for perianal fistula is to effectively eliminate existing and recurrent septic foci, associated tracts and maintain continence. No single technique can achieve these goals for all types of anal fistula (10). High transsphincteric anal fistula surgery is still one of the challenging procedures for many surgeons. The recurrence rate is high and the possibility of anal incontinence cannot be ignored. Due to the sensitive issue of continence, many techniques have been described in the literature.

The recommendation to address the intersphincteric space in anal fistula surgery is a result of the cryptoglandular infection theory, which describes the origin of most anal fistulas. In 1993, Matos et al first published a series of 13 cases (8 high transsphincteric and 5 suprasphincteric fistulas) that achieved complete fistula healing in 7 of 13 cases (54%) after a median follow-up of 22 months (range, 4–33) (19). After this study, Rojanasakul continued the idea of intersphincteric space surgery in 2007 and described a modified surgical technique known today as the LIFT procedure. To effectively ligate the fistula tract in the intersphincteric space, the presence of a mature fistula tract and the absence of secondary fistula mouths or active suppurative local septic foci are required (10).

Several studies have evaluated the efficacy of the LIFT technique in larger patient cohorts with longer follow-up periods. For example, Shanwani et al. reported an 82.2% success rate in their prospective study of 45 patients (20).

Malakorn et al. reported differences in healing rates of the LIFT procedure to treat different types of anal fistulas in a large study group of 251 patients. They reported rates of 92.1% for low transsphincteric fistulas, 85.2% for intersphincteric fistulas, and 40% for horseshoe fistulas (21).

Not all published studies agree with these extraordinary treatment results. Wallin et al conducted first a retrospective study in a group of 93 patients. The procedure was found to be effective in 40% of patients. 56 patients with recurrence were eligible for prospective observation. Of these, 13 underwent LIFT again. The procedure was successful in seven cases. Finally, Wallin et al. observed a cure rate of 47% (44/93 patients) (13). In a group of 35 patients undergoing LIFT treatment, Bleier et al. achieved satisfactory results in 57% of patients (11). In our study, successful results were achieved in 21 patients (70%) in the LIFT group at the end of the 1-year follow-up and were generally consistent with the literature.

In 400 BC, Hippocrates described fistulotomy using a horsehair cutting set wrapped with mohair threads. The debate about the treatment options for fistula has not yet ended, and seton is still used successfully today (22).

After seton surgery, further follow-up visits are required to check the desired effect. The healing time of fistula is generally reported to be between 2 and 3 months in the literature (23). In our study, the mean recovery time was 85.5 days, which was slightly longer than other studies. We attributed this to the fact that all patients had high transsphincteric anal fistula.

McCourtney and Finlay (24) reported a 4% recurrence rate, Lykke et al. (25) reported a 12% recurrence rate, and Kamrava et al. (26) reported a 9% recurrence rate. In our study, the recurrence rate was 20%, and we attributed this to the type of fistula and the longer follow-up period compared to other studies.

Incontinence is an undesirable consequence of the use of cutting setons in the treatment of anal fistula. The incontinence range in studies is between 0% and 67%, with an average rate of 12%. There are studies showing that this is not related to the tightening frequency or seton type (25, 26, 27). There are studies reporting incontinence rates after transsphincteric, suprasphincteric and extrasphincteric fistula treatment as 20.5%, 67% and 37%, respectively (27). In our study, gas incontinence was present in 3 (10%) patients in the seton group preoperatively. At the 4th week postoperative follow-up, it was determined that this number of patients had increased to 6 (20%). However, at the 12th week follow-up, it was determined that patients who developed incontinence after the operation had become continent.

Limitations

Limitations of our study include small sample size and one-year follow-up period. It has been reported that recurrences occur years after the initial recovery. Further studies evaluating these procedures and eliminating the above limitations are needed.

Conclusions

In our study, we found that the LIFT procedure and cutting seton tecnique had similar long-term healing, recurrence, and incontinence rates in patients with high transsphincteric anal fistula. However, LIFT offers advantages, including sphincter preserving, a significantly shorter healing time and lower postoperative pain compared to the cutting seton method. These findings suggest that LIFT is a feasible and effective sphincter-preserving technique for high transsphincteric anal fistulas.

Conflict of interest: The authors report no conflict of interest.

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Ethical approval: Our study was evaluated by the Scientific Research Ethics Committee of Health Sciences University Gazi Yaşargil Training and Research Hospital and received ethics committee approval with the decision numbered 907 dated 08.10.2021.

Informed consent: Written informed consent was obtained from all patients.

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Data availability: The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

Contributions

Research concept and design: OD, OO, EG, IH, VEA, AT

Data analysis and interpretation: OD, OO, EG, IH, VEA, AT

Collection and/or assembly of data: OD, OO, EG, IH, VEA, AT

Writing the article: OD, OO, EG, IH, VEA, AT

Critical revision of the article: OD, OO, EG, IH, VEA, AT

Final approval of the article: OD, OO, EG, IH, VEA, AT

All authors read and approved the final version of the manuscript.

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