



Original Research

Complex Anal Fistula: Long-Term Results of Modified Ligation of Intersphincteric Fistula Tract=LIFT

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Abstract

Objectives: The anal fistula is a permanent infectious tunnel formed between the anal canal and skin in the perianal region. Fistulas are treated by surgery at any stage. Many surgical methods have been reported to treat anal fistula. One of the promising surgical methods with a high success rate is ligation of the intersphincteric fistula tract, which is performed in anatomical spaces without damage to the internal and external sphincters. We evaluated the success rate of a modified ligation of the intersphincteric fistula tract procedure for complex anal fistulas in which the technical differences were minimized by the surgery being performed by the same surgical team.

Methods: In this study, Data of the 56 patients were retrospectively collected. Data regarding patient history, visual and digital anal examination, Cleveland Clinic Florida Fecal Incontinence (CCF-FI) score, anal-phase pelvic magnetic resonance imaging (MRI), rectosigmoidoscopy or colonoscopy and anal manometry were recorded. The changes in data recorded during the preoperative and postoperative periods were compared in each other.

Results: The mean age of the patients was 41 ± 15.5 years. The number of patients for each fistula type compromised in this study was as follows in accordance with frequency: high transsphincteric fistula, high intersphincteric fistula, and horseshoe abscess. The fistula recurred in seven patients during postoperative follow-up and the success rate of modified LIFT was calculated as 87.5%. The change in the mean \pm SD preoperative and postoperative CCF-FI scores and anal pressure was not statistically significant.

Conclusion: One promising advantage of the ligation of the intersphincteric fistula tract procedure is that it turns a complex fistula into a simple fistula that can be treated with minimal risk of sphincter damage.

Keywords: Anal fistula; complex anal fistula; lift; ligation of the intersphincteric fistula tract.

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The anal fistula is a permanent infectious tunnel formed between the anal canal and skin in the perianal region. Abscesses and anal fistulas constitute approximately 70% of the suppurative diseases of the perianal region.^[1] Perianal abscesses have a nearly 40% chance of causing a perianal fistula.^[2] Perianal fistulas occur mostly after perianal abscess drainage due to cryptoglandular drainage. Crohn's disease, trauma, radiation exposure, or malignancy also

can be underlying causes.^[3] Zanotti et al.^[4] reported that the incidence of fistula in the European Union varies between 1.20 and 2.80/10.000 people per year, according to data from four European countries.

According to the Parks classification, anal fistulas are divided into four main groups:^[5] (i) intersphincteric (extension of the abscess in the intersphincteric plane to the anal edge); (ii) transsphincteric (starts from the intersphincteric area,

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through the external sphincter, to the ischioanal fossa, and then opening to the perianal skin—a small part of the external sphincter is affected); (iii) suprasphincteric (starts from the intersphincteric space and passes over the external sphincter and puborectal muscle); and (iv) extrasphincteric fistulas (reaches the rectal wall through the perineal skin, fat of the ischioanal, and levator ani muscles). The incidence of fistulas, according to subtype, is 50%, 30%, 15%, and 5%, respectively. Fistulas are treated by surgery at any stage. However, possible sphincter damage may make decision-making difficult.

Transsphincteric, suprasphincteric, and extrasphincteric fistulas are called complicated fistulas and are treatment-resistant diseases of general surgery due to the recurrence rate. Many surgical methods (fistulotomies, fistulectomies, seton application, rectal advancement flap, fibrin glue, and collagen plugs) have been reported.^[6] No procedure for perianal fistula treatment has definitively been superior to others, and searches for new treatment methods have been ongoing due to the low success rate of the reported methods. In 2007, Rojanasakul et al.^[7] reported a new sphincter-preservation technique called ligation of the intersphincteric fistula tract (LIFT), which is performed in anatomical spaces without damage to the internal and external sphincters. A 94% success rate with no change in continence was observed in 18 patients. Given these promising initial results, the LIFT procedure has gained great popularity among surgeons. In contrast, success rates are lower in the current experience. Various surgeons have reported a decreased recovery rate by up to 57%.^[8] The fact that such a difference in success rates exists is due to the lack of homogenization of patients. The most common cause of recurrent fistulas is a poorly drained collection, especially in the supralelevator region. In case of relapse, various factors, such as abscess, local sepsis, when the tract is not mature enough for transection, the need for seton placement before LIFT, or the presence of a fistula tract longer than 3 cm, also may affect the success.^[9–11]

We evaluated the success rate of a modified LIFT procedure for complex anal fistulas in which the technical differences were minimized by the surgery being performed by the same surgical team.

Methods

Study Protocol

We retrospectively collected data for 56 patients who underwent a modified LIFT for a complex anal fistula between January 2013 and January 2018. The study protocol was approved by the local institutional review board of the University of Health Sciences Sisli Hamidiye Etfal Education

and Research Hospital (approval code: 1394). This study was conducted in accordance with the tenets of the 1964 Declaration of Helsinki. Written, informed consent was obtained from all subjects before participation, and all methods were performed in accordance with the relevant guidelines and regulations of our institutional review board.

Patient history, visual and digital anal examination, Cleveland Clinic Florida Fecal Incontinence (CCF-FI) score, anal-phase pelvic magnetic resonance imaging (MRI), and rectosigmoidoscopy or colonoscopy were performed for diagnostic purposes. In particular, MRI was used to classify anal fistula, while endoscopy was used for the differential diagnosis of inflammatory bowel diseases. Inclusion criteria were age >18 years, diagnosis of complex anal fistula, and patients without intersphincteric fistula on MRI and who provided consent for the LIFT operation. Patients diagnosed with inflammatory bowel disease and malignancy, as well as patients who did not provide consent for LIFT, were excluded from this study.

All surgical procedures were performed with the patient under the prone jack-knife position after approval for spinal anesthesia. With the guidance of MRI, the internal orifice was revealed with a metallic probe inserted through the fistula tract outer orifice. When the internal orifice was not clearly seen, we injected hydrogen peroxide from the external orifice to locate the internal orifice. After a perineal incision was made from the projection of the intersphincteric space and the fistula tract was exposed, the tract was grasped with a right-angle forceps and released from adjacent structures (Fig. 1a). The tract was ligated with 2-0 Vicryl CR SH-1 (Ethicon, Inc., Somerville, NJ, USA) from two distant points at least 1 cm away from each other and divided, and this segment was excised (Fig. 1b). The external orifice was cauterized without tract occlusion to not block the drainage. Patients were advised to eat a variety of fiber-rich foods and drink plenty of fluids. All patients were discharged one day postoperatively and were advised to use sitz baths twice a day.

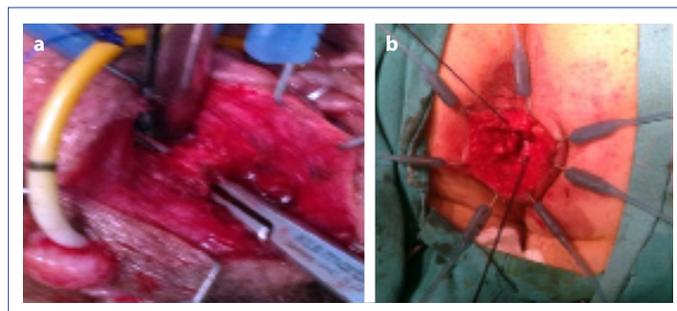


Figure 1. (a) Hanging of tract with the right angle, (b) Ligation of tract with the 2/0 Vicryl CR SH-1 (Ethicon).

Data regarding patient follow-up at two weeks and 1, 3, 6, 9, 12, and 15 months were recorded. Patients with recurrent complaints the same as during the preoperative period and purulent drainage from the external fistula tract orifice were considered to have failed the treatment. The CCF-FI scale was applied in all patients preoperatively and at six months postoperatively.^[12] The scale was scored according to the frequency and type of incontinence (solid stool, fluid, gas, pad use, and its effect on daily life; Table 1). Mild, moderate, and severe incontinence was scored as ≤ 8 , 9–14, and 15–20, respectively. Patients with a score > 9 underwent anal manometry evaluation.

Statistical Analysis

All statistical analysis was performed using SPSS version 19.0 (SPSS, Inc., Chicago, IL, USA). Data for continuous variables were reported as means \pm standard deviation (SD). Median, minimum, and maximum categorical variables were presented as numbers and percentages. Categorical variables were compared using the χ^2 test, and continuous variables were compared using the Student's t-test for normal distribution or the Mann–Whitney U test for non-normal distribution. The Wilcoxon signed-rank test was used to analyze the CCF-FI score difference between baseline and follow-up. $P < 0.05$ was considered statistically significant.

Results

A total of 56 patients (37 male, 19 female; mean age, 41 ± 15.5 years) diagnosed with complex anal fistula were included in this study and underwent the modified LIFT technique, of which 33 (58.92%) patients had a high transsphincteric fistula, 22 (39.3%) patients a high intersphincteric fistula, and one (1.78%) patient a horseshoe abscess. The etiology of the fistula was a history of perianal abscess drainage in seven (12.5%) patients. Seven (12.5%) patients had an anteriorly located external fistulous orifice. The length of the fistula tracts ranged from 1.5 to 9 cm (3.54 ± 1.46). Because

Table 1. Cleveland Clinic Florida Fecal Incontinence^[12]

Type of incontinence	Frequency				
	Never	Rarely	Sometimes	Usually	Always
Solid	0	1	2	3	4
Liquid	0	1	2	3	4
Gas	0	1	2	3	4
Wears pad	0	1	2	3	4
Lifestyle alteration	0	1	2	3	4

0= perfect; 20= complete incontinence; Never= 0; Rarely= < 1 /month; Sometimes= < 1 /week, ≥ 1 /month; Usually= < 1 /day, ≥ 1 /week; Always= ≥ 1 /day.

of active infection, a seton was placed for drainage in three patients (5.35%) preoperatively (Table 2).

The fistula recurred in seven patients during postoperative follow-up (median relapse time, six months). Six of the recurrent fistulas became intersphincteric fistulas and were treated with fistulotomy, and one patient was treated with repeat LIFT.

Mean \pm SD preoperative and postoperative 6-month CCF-FI scores were 11.2 ± 4.7 and 10.3 ± 3.8 , respectively. Particular improvement was detected regarding the CCF-FI score, but there was no statistically significant difference. Table 3 shows the data regarding mean \pm SD resting and maximal anal pressures before and after LIFT. The change in anal pressures during postoperative follow-up also was not statistically significant.

Discussion

In our study, 61 LIFT procedures were performed in 56 patients. Four patients were treated with nine lifts (two transsphincteric fistulas in three patients each and three transsphincteric fistulas in one patient). During the 12-month follow-up of these LIFT patients with complicated anal fistula, the anal fistula recurred in seven patients, but the fistulas were not complicated and all were intersphincteric fistulas. Many factors affect the healing rate of anal fistulas,

Table 2. Demographics and characteristics of the patients

Sex (n, %)	
Male	37, 66.07
Female	19, 32.93
Age (mean \pm SD) year	41 ± 15.5
Fistula type (n, %)	
High transsphincteric	33 (58.92)
High intersphincteric	22 (39.3)
Horseshoe abscess	1 (1.78)
Length of fistule tract cm (n, %) (min-max)	3.54 ± 1.46 (1.5-9)
Preoperative seton application (n, %)	3 (5.35)
History of abscess drainage (n, %)	7 (12.5)
Recurrence (n, %)	7 (12.5)

Table 3. Anal manometry during preoperative period and postoperative 6th month

	Preoperative	Postoperative 6 th month	p
Resting anal pressure mmHg (mean \pm SD)	54.7 ± 13.3	52.1 ± 12.6	NS
Maximal anal pressure mmHg (mean \pm SD)	119.76 ± 23.4	117.81 ± 21.2	NS

NS: non-significant.

such as the anatomic complexity of the original fistula, unnecessary manipulation of the operative field, comorbidities, surgeon's experience with LIFT, and previous operations.^[13]

Many studies have reported on factors affecting the success of the procedure. Tan et al.^[14] stated that if the LIFT incision is small and deep, blood or effusion may accumulate and increase the possibility of postoperative infection and wound dehiscence. Van Onkelen et al.^[15] suggested that an infection may result from inadequate fistula tract ligation at the side of the internal anal sphincter. Also, Khadia et al.^[16] stated that if the fistula tract is too thin, deep, or thick, it also may lead to unsuccessful ligation and cause recurrence. In our study, we grasped the fistula tract with a right-angle forceps; after releasing it from all attachments, we sutured and ligated the tract with 2-0 Vicryl CR SH-1 from two distant points at least 1 cm away from each other. In this way, the two ends of the fistula tract did not remain open.

Liu et al.^[17] found that the length of the fistula was inversely proportional to the cure rate of LIFT surgery. The longer the fistula, the more permanent residual epithelialization and necrotic tissue residues have increased the chance of infection, resulting in difficult treatment and recurrence risk. They chose 3 cm as a cutoff and stated that a fistula tract <3 cm had a significantly high rate of healing. In our study, the mean±SD length of the fistula tract was 3.54±1.46 cm and the success rate was 87.5%. In 2009, Rojanasakul^[18] reported a 94% success rate. Despite this high success rate, studies have reported success ranging from 57% to 77%.^[19, 20] Although the success rate is relatively low, it is within acceptable limits compared to other treatment methods.

The LIFT procedure has been performed in different variations with the same basic principles in the literature since its initial report. As there is no comparison between technical variations of LIFT, determining which variation is superior to others is difficult. Bastawrous et al.^[21] performed a modified LIFT in which they ligated the fistula tract from the external sphincter level and performed fistulotomy through the internal sphincter. Unlike traditional LIFT surgery, the success rate with this method, where they removed some of the internal sphincters, was 71.42%. We used one variation of the original procedure in which we sutured and ligated the tract with 2-0 Vicryl CR SH-1 from two distant points at least 1 cm away from each other.

It is clear that the literature results have proved the successful effectiveness of the LIFT. Especially regarding correct patient choices and operations using the correct technique, the success rates have increased, just like in our series.

Conclusion

In conclusion, fistulas can be treated with curettage of the fistula tract, local silver nitrate applications, and local incision and drainage for underlying abscess along with antibiotics in case of treatment failure. One promising advantage of the LIFT procedure is that it turns a complex fistula into a simple fistula that can be treated with minimal risk of sphincter damage.

Disclosures

Ethics Committee Approval: This study started with approval of code 1394 (14/01/2020) by Şişli Hamidiye Etfal Training and Research Hospital Ethics Committee of Clinical Investigations.

Peer-review: Externally peer-reviewed.

Conflict of Interest: None declared.

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