

Modified LIFT via a Lateral Approach Versus Standard LIFT for Transsphincteric Anal Fistula: A Prospective Randomized Study

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AIM: To compare the early clinical outcomes of modified ligation of the intersphincteric fistula tract (LIFT) via a lateral approach with those of standard LIFT in patients with magnetic resonance imaging (MRI)-confirmed transsphincteric anal fistula.

METHODS: This single-center prospective randomized study included adult patients with transsphincteric anal fistula who were treated between January and May 2024 and were followed through August 2024. Among 96 patients assessed for eligibility, 46 met the eligibility criteria, and 40 consenting patients were randomized at a 1:1 ratio to standard LIFT or modified LIFT via a lateral approach. Follow-up was performed at postoperative weeks 1, 4, 8, and 12. The primary outcome was wound healing time. Secondary outcomes included early recurrence or persistence, postoperative pain assessed using the visual analog scale (VAS), and continence evaluated using the Cleveland Clinic Fecal Incontinence Scale.

RESULTS: A total of 40 patients were analyzed, with 20 patients in each group. Baseline demographic and available clinical characteristics were comparable between the groups. The median wound healing time was significantly shorter in the modified LIFT group than in the standard LIFT group (13 [interquartile range, 10–17] days vs. 29.5 [26–32] days; $p < 0.001$). No early recurrence or persistence was observed in the modified LIFT group by week 12. In the standard LIFT group, recurrence/persistence was observed in 3 of the 20 patients (15.0%) at week 8 and in 6 of the 20 patients (30.0%) at week 12 (Fisher exact test at week 12; $p = 0.020$). The median VAS pain scores were low and comparable in the standard LIFT versus modified LIFT groups at week 1 (0.90 vs. 0.95; $p = 0.942$) and week 4 (0.00 vs. 0.00; $p = 0.115$). No case of fecal incontinence was noted in either group during follow-up.

CONCLUSIONS: In selected patients with transsphincteric anal fistula, compared with standard LIFT, modified LIFT via a lateral approach was associated with faster early wound healing and a lower rate of early recurrence/persistence within 12 weeks, without an observed increase in postoperative pain or fecal incontinence. Larger studies with longer follow-up are warranted before definitive conclusions can be drawn regarding long-term recurrence.

TRIAL REGISTRATION: ClinicalTrials.gov: NCT07603635.

Keywords: transsphincteric anal fistula; modified LIFT; lateral approach; sphincter-preserving surgery; wound healing; early recurrence

Introduction

Anal fistula is a chronic manifestation of anorectal sepsis and remains a frequent benign anorectal condition with high burdens on quality of life, outpatient follow-up, and work productivity. The main goal of surgery is to eradicate the fistula tract while preserving continence.

The relationship between the tract and the anal sphincter complex is central to surgical decision-making. Intersphincteric and low transsphincteric fistulas may be treated effectively with fistulotomy in selected patients. However, surgical procedures involving the sphincter are less suitable

for the treatment of high transsphincteric or complex fistulas because of the risk of postoperative fecal incontinence. Standard ligation of the intersphincteric fistula tract (LIFT), first described by Rojasasakul et al. [1], is designed to interrupt the fistula tract in the intersphincteric plane without dividing the sphincter muscles. Although LIFT is widely used as a sphincter-preserving technique, delayed wound healing and recurrence remain clinically relevant limitations. These limitations have prompted technical modifications of the original procedure that aim to improve early wound healing and reduce persistence while preserving its sphincter-sparing advantage; one such modification is a lateral approach to the fistula tract.

High ligation of the anal fistula tract by a lateral approach has been proposed as a modification of LIFT. With dissection along the tract from the external opening toward the intersphincteric space, this technique may facilitate the excision of a longer tract segment while preserving the sphincter complex.

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The present study compared the early outcomes of standard LIFT with those of modified LIFT via a lateral approach in patients with magnetic resonance imaging (MRI)-confirmed transsphincteric anal fistula.

Methods

Study Design

This prospective, single-center, randomized, parallel-group comparative study was conducted in the General Surgery Department of Kayseri City Training and Research Hospital. According to the ethics approval form, this study was classified as a single-center nondrug clinical research study. This study was approved by the Kayseri City Hospital Clinical Research Ethics Committee (Decision No. 944). Written informed consent was obtained from all participants before enrollment. The study was retrospectively registered at ClinicalTrials.gov (NCT07603635, <https://clinicaltrials.gov/study/NCT07603635>). This study adheres to the CONSORT guidelines (**Supplementary Material**). The study period extended from January to August 2024, with enrollment and surgical treatment completed between January and May 2024 and the final 12-week follow-up completed in August 2024.

Patients

Between January and May 2024, 96 patients presented to the general surgery outpatient clinic with perianal discharge, palpable swelling, or a history of emergency drainage for perianal abscess and were assessed for eligibility. Fifty patients were excluded after screening: 33 were unable to comply with the prespecified follow-up schedule because of residence outside the city or personal or social constraints, 11 had a non-transsphincteric fistula on MRI, 3 had recurrent anal fistula, 2 had a horseshoe fistula, and 1 had suspected Crohn disease that was subsequently confirmed. After application of the clinical, MRI-based, and follow-up feasibility criteria, 46 patients met the eligibility criteria; 6 declined participation, and 40 provided written informed consent and were randomized (Fig. 1).

Eligible patients were adults aged 18–75 years with MRI-confirmed transsphincteric anal fistula. The exclusion criteria were previous definitive perianal fistula surgery other than abscess drainage, perianal Crohn disease, horseshoe fistula, colorectal cancer, malnutrition, recurrent fistula, previous radiotherapy or chemotherapy, chronic medication use that could impair wound healing such as steroids or colchicine, and inability to attend the prespecified postoperative follow-up visits.

Eligibility and fistula classification were based on the official MRI reports available before randomization. At the study institution, pelvic MRI examinations were interpreted through a rotating remote-reporting service. The Parks classification was consistently available, whereas tract length, the proportion of external sphincter involvement, standardized MRI grade, and secondary extensions were not con-

sistently documented. Because a standardized retrospective re-review by the original reporting radiologists was not feasible, only variables documented in the official reports and clinical records were included in the research dataset; undocumented verbal consultations during routine clinical care were not used for research classification.

No formal a priori sample size calculation was performed. The sample size was based on the number of eligible and consenting patients treated during the study period; therefore, the findings should be considered exploratory.

Randomization and Allocation

Using a computer-generated randomization system, patients were assigned at a 1:1 ratio to either standard LIFT or modified LIFT via a lateral approach. All patients were examined and diagnosed by the same surgical team, and all operations were performed by a single surgeon experienced in proctology. Allocation concealment was not formally documented in the source records. Because of the surgical nature of the interventions, the operating surgeon and participants could not be blinded. A formal blinded outcome assessment was not documented in the source records; outcomes were assessed at prespecified postoperative follow-up visits.

Surgical Procedures

All patients underwent operations in the lithotomy position. In the standard LIFT group, the intersphincteric plane was approached, and the fistula tract was identified, ligated, and divided according to the standard LIFT principle. In brief, the internal opening was identified, a curvilinear incision was made over the intersphincteric groove, and the intersphincteric plane was developed to encircle and isolate the fistula tract. The tract was then ligated close to the internal opening and divided; the intersphincteric portion was excised, the distal tract was curetted, and the external wound was left open for drainage. The modified lateral-approach technique is summarized schematically in Fig. 2.

The modified LIFT procedure consisted of five principal stages corresponding directly to panels A–E in Fig. 3: (A) the external and internal openings were identified and the fistula tract was delineated by introducing a stylet through the external opening and advancing it through the internal opening; (B) the external opening and distal tract were circumferentially dissected; (C) the tract was mobilized to the intersphincteric plane and the proximal tract was highly ligated close to the internal opening; (D) the tract was divided, and the external opening together with the mobilized distal tract was excised, leaving the resulting lateral defect; and (E) the lateral wound was closed.

Postoperative Care and Follow-up

All patients were discharged on postoperative day 1 and received oral ciprofloxacin (500 mg twice daily) plus metronidazole (500 mg three times daily) for 7 days. Patients were

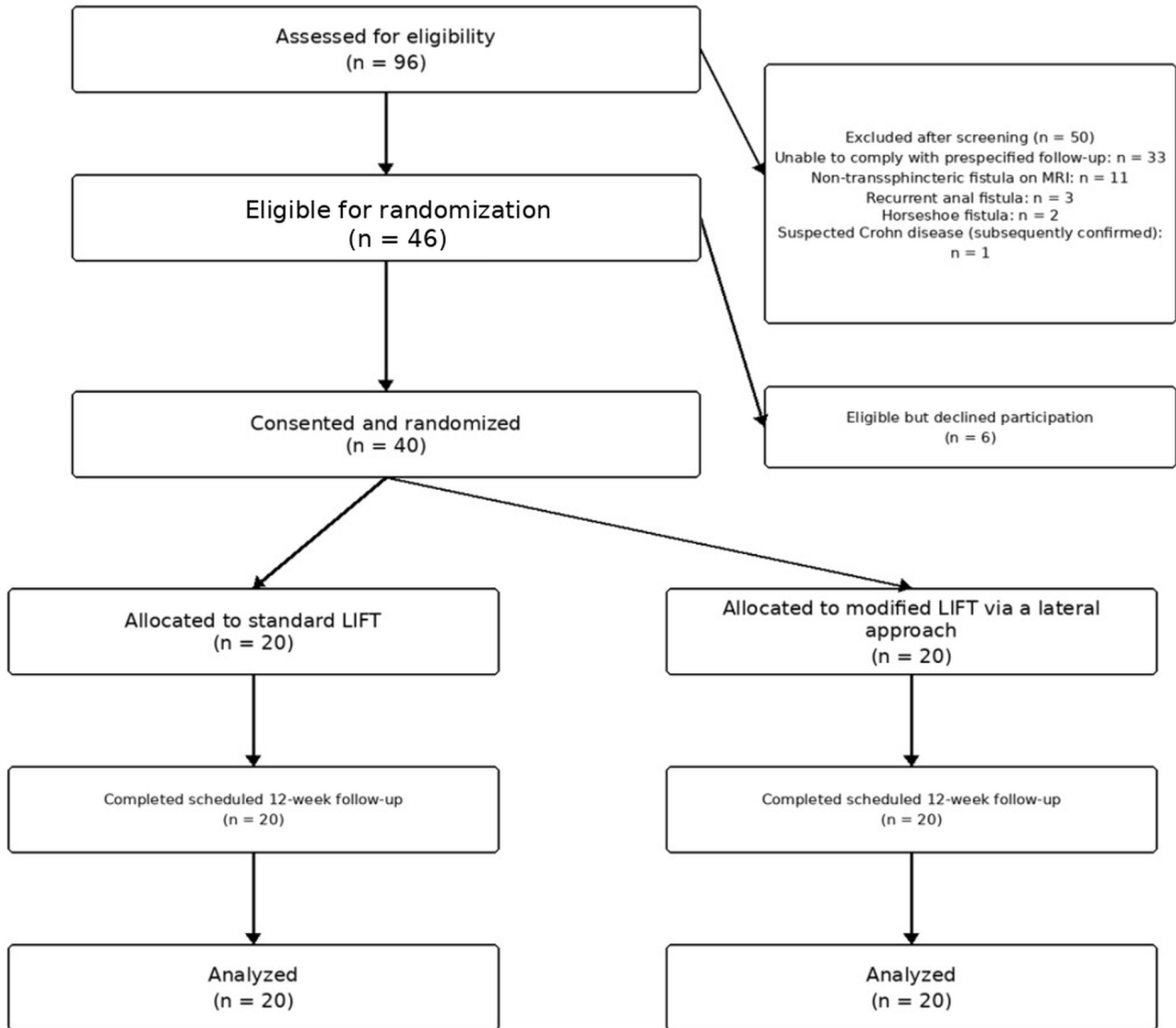


Fig. 1. Participant flow diagram. LIFT, ligation of the intersphincteric fistula tract.

instructed to cleanse the perianal region with warm water for at least two minutes twice daily and after each defecation.

Follow-up was scheduled at postoperative weeks 1, 4, 8, and 12. At each follow-up point, symptoms, physical examination findings, wound status, pain, and continence were assessed. Pain was assessed using a 0–10 visual analog scale (VAS), with 0 indicating no pain and 10 indicating the worst imaginable pain; scores were treated as continuous data. Continence was evaluated using the Cleveland Clinic Fecal Incontinence Scale.

Outcomes

The primary outcome was wound healing time, defined as the number of days from surgery to complete clinical epithelialization without discharge. The secondary outcomes included early recurrence or persistence within 12 weeks,

postoperative pain, postoperative fecal incontinence, postoperative bleeding, pruritus (itching), and wound infection. Persistence was defined as continued fistulous discharge or failure of the external opening to heal during follow-up. Recurrence was defined as reappearance of fistulous discharge or an external opening after initial clinical healing. Because the follow-up period was 12 weeks, recurrence-related results are reported as early recurrence or persistence rather than long-term recurrence.

Statistical Analysis

Statistical analyses were performed using SPSS version 23.0 (IBM Corp., Armonk, NY, USA). The distribution of continuous variables was assessed for normality using the Shapiro–Wilk test, which is more suitable than the Kolmogorov–Smirnov test for the small sample size in this study ($n = 20$ per group). Homogeneity of variance was

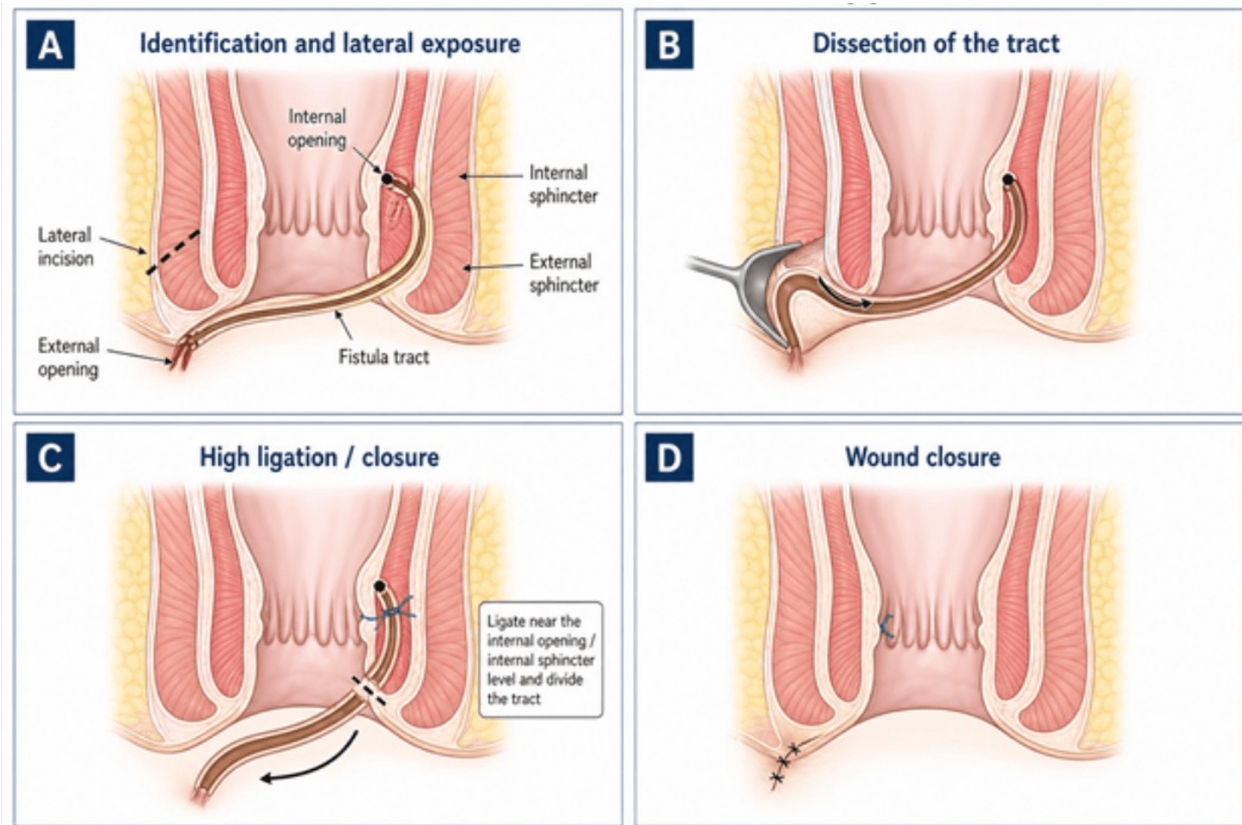


Fig. 2. Schematic of modified LIFT via a lateral approach. (A) Identification of the external opening and lateral exposure; (B) circumferential dissection and mobilization of the fistula tract toward the intersphincteric plane; (C) high ligation and closure of the proximal tract at the intersphincteric level close to the internal opening, followed by division and excision of the mobilized distal tract; (D) closure of the resulting lateral wound. The figure were prepared and assembled using Canva (https://www.canva.com/zh_cn/; Canva Pty Ltd, Sydney, Australia).

assessed using the Levene test. Normally distributed continuous variables are presented as mean $\pm$ standard deviation, and they were compared using the independent-samples Student's *t* test. When the Levene test indicated unequal variances, the Welch correction was applied. Non-normally distributed continuous variables are presented as medians (interquartile ranges), and they were compared using the Mann–Whitney U test. Categorical variables are presented as numbers (percentages) and were compared using the Pearson chi-square test or Fisher exact test when expected cell counts were small. All early recurrence/persistence comparisons were conducted using the Fisher exact test. For the primary outcome and between-group recurrence/persistence comparisons, effect estimates are additionally reported with their 95% confidence intervals. A two-sided *p* value of <0.05 was considered to indicate statistical significance.

Results

Participant Flow and Baseline Characteristics

All 40 randomized patients completed the scheduled 12-week follow-up and were included in the final analysis; no participant was lost to follow-up (Fig. 1).

Baseline demographic and available clinical characteristics are presented in Table 1 and were comparable between the two groups.

Wound Healing

Wound healing time was not normally distributed in the modified LIFT group (Shapiro–Wilk $p = 0.002$) and was therefore summarized as the median (interquartile range) and compared using the Mann–Whitney U test. The median wound healing time was 29.5 (26–32) days in the standard LIFT group and 13 (10–17) days in the modified LIFT group ($p < 0.001$). The Hodges–Lehmann median difference was 16 days (95% confidence interval, 13–19 days).

Early Recurrence or Persistence

No recurrence or persistence was recorded in either group at postoperative week 1 or 4. At week 8, recurrence/persistence was recorded in 3 of the 20 patients (15.0%) in the standard LIFT group and in 0 of the 20 patients in the modified LIFT group (Fisher exact $p = 0.231$; risk difference, 15.0%; 95% confidence interval, –4% to 36%). By week 12, recurrence/persistence was recorded in 6 of the 20 patients (30.0%) in the standard LIFT group and

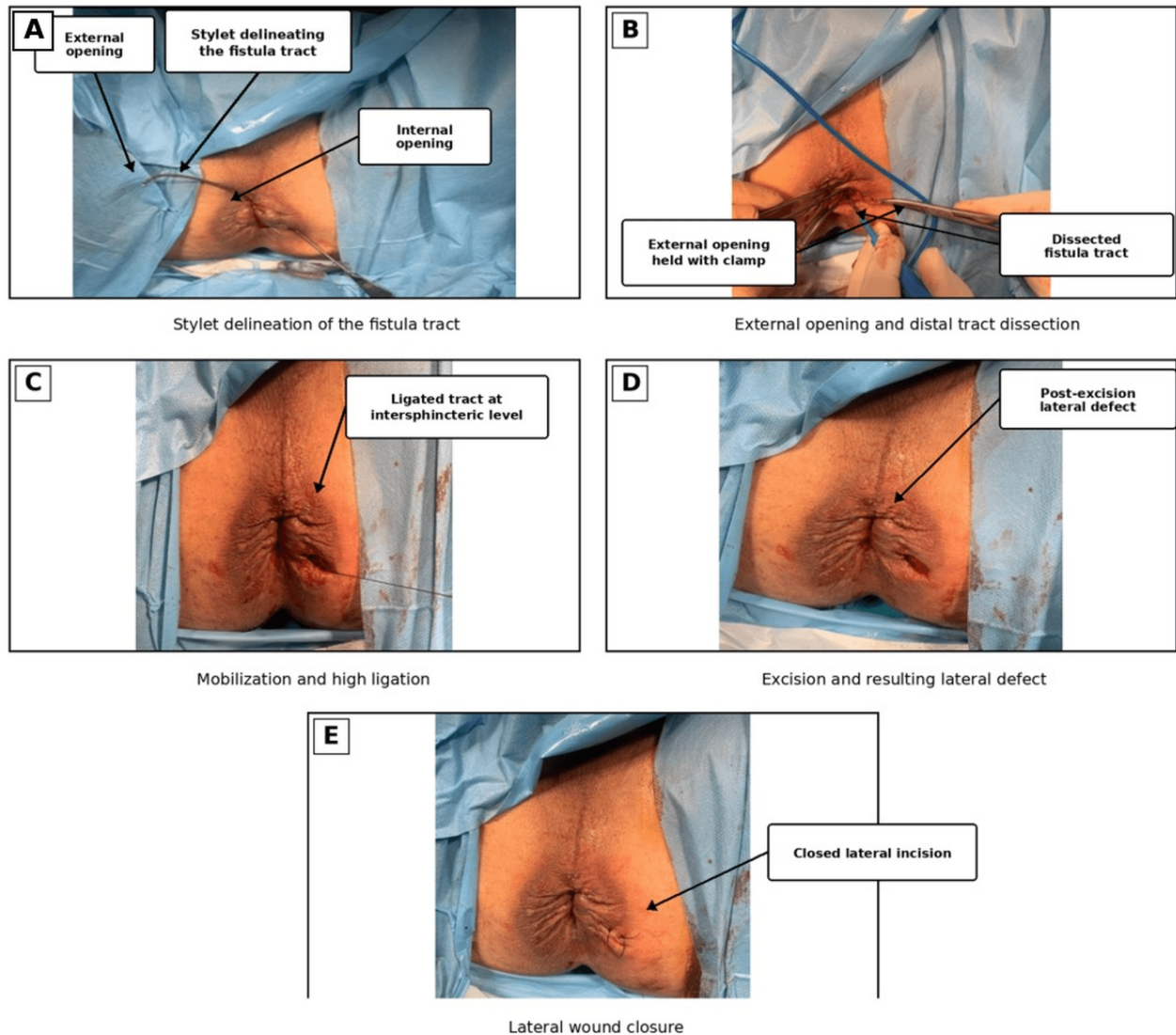


Fig. 3. Operative steps of modified LIFT via a lateral approach. (A) Identification of the external and internal openings and stylet delineation of the fistula tract; (B) circumferential dissection of the external opening and distal fistula tract; (C) mobilization to the intersphincteric plane and high ligation of the proximal tract close to the internal opening; (D) excision of the external opening and mobilized distal tract, demonstrating the resulting lateral defect; (E) closure of the lateral wound. Arrows identify the external opening, internal opening, stylet delineating the tract, external opening held with a clamp, dissected fistula tract, ligated tract at the intersphincteric level, post-excision lateral defect, and closed lateral incision.

in 0 of the 20 patients in the modified LIFT group (Fisher exact $p = 0.020$; risk difference, 30.0%; 95% confidence interval, 8% to 52%) (Table 2).

Pain and Continence

Median visual analog scale (VAS) scores were comparable between the groups: 0.90 (IQR, 0.70–1.18) in the standard LIFT group versus 0.95 (IQR, 0.53–1.25) in the modified LIFT group at week 1 (Mann–Whitney U test, $p = 0.942$), and 0.00 (IQR, 0.00–0.50) versus 0.00 (IQR, 0.00–0.00) at week 4 ($p = 0.115$). VAS scores were 0 in both groups at weeks 8 and 12. No patient in either group developed fecal incontinence, and Cleveland Clinic Fecal Incon-

tinence Scale scores remained 0 at every scheduled assessment (postoperative weeks 1, 4, 8, and 12)(Table 3).

During the 12-week follow-up period, no major postoperative adverse events, readmissions, reoperations, bleeding requiring intervention, or clinically significant wound infections were observed. Specifically, no episode of postoperative bleeding, pruritus (itching), or wound infection was recorded in either group (0 of the 20 patients in each group).

Discussion

Perianal fistula remains a challenging benign anorectal disease to treat because definitive healing must be achieved without compromising continence. Clinical challenges ex-

Table 1. Baseline demographic and clinical characteristics.

Variable	Standard LIFT (n = 20)	Modified LIFT (n = 20)	p value
Age, years	32.95 ± 11.12	34.90 ± 10.94	0.58
BMI, kg/m ²	30.86 ± 3.73	31.25 ± 4.07	0.757
Male sex, n (%)	13 (65%)	13 (65%)	—
Symptom duration, months	7.5 (6.0–9.0)	6.0 (3.75–10.25)	0.587
Current smoking, n (%)	13 (65%)	14 (70%)	1.000
Previous perianal abscess drainage, n (%)	8 (40%)	9 (45%)	1.000
Any comorbidity, n (%)	3 (15%)	3 (15%)	1.000
MRI-confirmed transsphincteric fistula, n (%)	20 (100%)	20 (100%)	—
Single external opening, n (%)	20 (100%)	20 (100%)	—

Note: Values are presented as mean ± standard deviation, median (interquartile range), or number (%). Age and body mass index were compared using independent-samples *t*-tests; symptom duration was compared using the Mann–Whitney U test; categorical variables were compared using the Fisher exact test when applicable. The em dash (—) denotes that no comparison was performed because the values were identical in both groups. BMI, body mass index; LIFT, ligation of the intersphincteric fistula tract; MRI, magnetic resonance imaging.

Table 2. Postoperative wound healing and early recurrence/persistence.

Outcome	Standard LIFT (n = 20)	Modified LIFT (n = 20)	p value
Wound healing time, days	29.5 (26–32)	13 (10–17)	<0.001
Early recurrence/persistence, week 1	0/20 (0%)	0/20 (0%)	—
Early recurrence/persistence, week 4	0/20 (0%)	0/20 (0%)	—
Early recurrence/persistence, week 8	3/20 (15.0%)	0/20 (0%)	0.231*
Early recurrence/persistence, week 12	6/20 (30.0%)	0/20 (0%)	0.020*

Note: Values are presented as median (interquartile range) or number (%). Wound healing time was compared using the Mann–Whitney U test. *Two-sided Fisher exact test was used for recurrence/persistence comparisons because of small expected cell counts. The em dash (—) denotes that a between-group comparison was not performed because no events occurred in either group (zero variance).

Table 3. Postoperative pain and continence outcomes.

Variable	Standard LIFT (n = 20)	Modified LIFT (n = 20)	p value
VAS score, postoperative week 1	0.90 (0.70–1.18)	0.95 (0.53–1.25)	0.942
VAS score, postoperative week 4	0.00 (0.00–0.50)	0.00 (0.00–0.00)	0.115
VAS score, postoperative week 8	0.00 (0.00–0.00)	0.00 (0.00–0.00)	—
VAS score, postoperative week 12	0.00 (0.00–0.00)	0.00 (0.00–0.00)	—
Cleveland Clinic Fecal Incontinence Scale score, week 1	0 in all patients	0 in all patients	—
Cleveland Clinic Fecal Incontinence Scale score, week 4	0 in all patients	0 in all patients	—
Cleveland Clinic Fecal Incontinence Scale score, week 8	0 in all patients	0 in all patients	—
Cleveland Clinic Fecal Incontinence Scale score, week 12	0 in all patients	0 in all patients	—

Note: VAS values are presented as medians (interquartile ranges) and were compared using the Mann–Whitney U test. Cleveland Clinic Fecal Incontinence Scale scores were zero in all patients in both groups at each prespecified follow-up visit. The em dash (—) denotes that no between-group comparison was performed because the values were identical and had zero variance. VAS, visual analog scale.

tend beyond fistula closure; recurrent discharge, repeated outpatient visits, delayed wound healing, fear of incontinence, and loss of daily productivity all contribute to the disease burden. Therefore, the choice of the operation should be individualized according to the fistula anatomy, the amount of sphincter involved, the presence of secondary tracts or abscesses, prior surgery, Crohn disease status, and patient-related factors that may impair healing [2,3].

In anal fistula surgery, the central principle is ensuring the balance between eradicating the fistulous tract and preserving sphincter function. Fistulotomy and fistulectomy remain highly effective treatments for simple intersphincteric or low transsphincteric fistulas, where only a small portion of the sphincter mechanism is divided. However, in high transsphincteric, recurrent, anterior, horseshoe, or otherwise complex fistulas, direct division or wide excision of

the tract may be associated with an unacceptable risk of fecal incontinence. In these patients, sphincter-preserving strategies are preferred, even if they may require longer follow-up or staged treatment [3,4].

Endorectal or mucosal advancement flap repair is among the established sphincter-preserving alternatives for complex fistulas. Nevertheless, it is technically demanding and may be associated with postoperative pain, flap dehiscence, or continence disturbance. In a systematic review and meta-analysis comparing advancement flaps and LIFT for high perianal fistulas, the overall success and recurrence rates were broadly comparable, whereas continence preservation appeared more favorable in patients who underwent LIFT [5]. These findings support the rationale for selecting LIFT-type procedures for transsphincteric fistulas, where sphincter protection is a major priority.

Other sphincter-preserving methods, including fibrin glue, biological fistula plugs, video-assisted anal fistula treatment, fistula laser closure, clips, platelet-rich plasma, and other emerging minimally invasive approaches, aim to obliterate or close the tract while minimizing tissue trauma. However, variable results have been obtained for these methods. Current reviews emphasize that no single technique has become a universal standard for complex anal fistula, and the treatment method should be adapted to the anatomy, surgeon experience, and institutional resources [6].

Seton placement remains one of the most widely used practical strategies for treating complex fistulas, particularly when sepsis control and sphincter preservation are the immediate goals. A loose draining seton maintains drainage, reduces abscess formation, and may serve either as a bridge to definitive surgery or as a longer-term strategy in selected patients. Thus, compared with LIFT-type procedures, seton treatment is highly useful for controlling sepsis and temporizing complex disease; however, it may be a less attractive option when a single-stage definitive sphincter-preserving procedure is feasible [6].

LIFT was introduced as a total sphincter-saving technique; it involves approaching the fistula through the intersphincteric plane, identifying the tract, ligating it close to the internal opening, and separating the septic tract from the anorectal lumen [1]. Early and subsequent series reported low rates of postoperative incontinence, which is the major clinical advantage of the approach [7]. However, healing rates vary among studies, and failure may occur because of missed secondary extensions, inadequate closure of the internal opening, residual infected tract, horseshoe configuration, Crohn disease, or previous fistula surgery. Meta-analytic data also suggest that technical and disease-related factors influence LIFT failure, reinforcing the need for careful patient selection and comprehensive preoperative imaging [8].

The modified lateral-approach LIFT technique evaluated in the present study should be interpreted within this broader sphincter-preserving framework. Unlike standard LIFT,

which uses an intersphincteric incision, the lateral approach begins at the external opening and follows the fistula tract toward the intersphincteric plane. Several complementary mechanisms may explain the observed early advantage. Circumferential mobilization and excision of the external opening and distal tract may reduce residual epithelialized or chronically inflamed tissue that could maintain discharge or persistent infection. High ligation and division of the proximal tract close to the internal opening may more effectively interrupt communication with the anorectal lumen, addressing recognized causes of LIFT failure such as an inadequately controlled proximal tract or residual fistulous tissue. In addition, locating the incision farther from the anal canal may reduce fecal contamination and facilitate postoperative wound care. These mechanisms could jointly reduce persistent infection and early failure; however, they remain hypotheses because residual tract length, bacterial burden, tissue perfusion, and postoperative MRI changes were not directly measured. A previous prospective cohort study of high ligation through a lateral approach also reported encouraging healing and sphincter-preservation outcomes [9], although direct numerical comparison is limited by differences in design, patient selection, outcome definitions, and follow-up duration.

The main finding of the present study is that compared with standard LIFT, modified LIFT via a lateral approach was associated with significantly faster early wound healing in patients with MRI-confirmed transsphincteric anal fistulas. The median wound healing time was 13 days in the modified LIFT group and 29.5 days in the standard LIFT group, with a Hodges–Lehmann median difference of 16 days. This difference is clinically meaningful because prolonged perianal wound discharge is among the main drivers of patient dissatisfaction, repeated outpatient assessments, and uncertainty about whether the fistula is healing or persisting. These results support the hypothesis that excising the external opening and a larger distal tract segment, while placing the incision away from the anal canal, may improve early wound conditions.

The findings regarding early recurrence/persistence further support the potential value of the lateral approach, although they must be interpreted cautiously. In the present cohort, no recurrence/persistence was observed in the modified LIFT group up to the 12-week follow-up, whereas recurrence/persistence was observed in 3 of the 20 patients in the standard LIFT group at week 8 and in 6 of the 20 patients at week 12. Longer-term studies have also reported similar concerns about delayed failure after LIFT, and recurrence may become evident after the early postoperative period [10,11]. Therefore, the current findings should be interpreted as indicating an early recurrence/persistence advantage of modified LIFT rather than as proof of its long-term superiority.

Importantly, the faster healing and lower rate of early recurrence/persistence observed in the modified LIFT group were not accompanied by worse pain or continence out-

comes. VAS scores were comparable between the groups, and during the early follow-up period, no patient in either group developed measurable fecal incontinence on the basis of the Cleveland Clinic Fecal Incontinence Scale score. This is particularly relevant because the modified technique involves more lateral tract dissection than standard LIFT does. The absence of measurable continence deterioration suggests that the dissection remains functionally sphincter-preserving when performed carefully in selected patients with transsphincteric fistulas.

Compared with other sphincter-preserving procedures, the potential advantage of modified LIFT is its pragmatic balance between anatomical eradication and functional preservation. Compared with advancement flaps, it avoids rectal flap mobilization and may therefore offer a potential advantage in continence preservation. Compared with fibrin glue, fistula plugs, laser-based procedures, and video-assisted techniques, it does not require expensive equipment and allows direct control of the fistula tract. Compared with seton treatment, modified LIFT may offer a single-stage treatment option in selected patients without active sepsis, horseshoe extension, Crohn disease, or recurrent complex disease. Nevertheless, seton placement remains indispensable in real-world fistula practice, especially for drainage, sepsis control, staged management, Crohn disease, and anatomically complex cases that are not appropriate for immediate definitive closure [12]. These comparisons with advancement flaps, fibrin glue, plugs, laser, video-assisted techniques, and setons are based on the literature rather than on direct head-to-head comparisons with the present trial, in which patients were randomized only to standard versus modified LIFT. The findings should therefore be interpreted as contextual rather than as confirmatory evidence of the superiority of modified LIFT.

This study has several limitations. The sample size was small, the trial was single-center and single-surgeon, and no formal a priori sample size calculation was performed; therefore, the findings should be considered exploratory. The follow-up period was limited to 12 weeks, which is insufficient for definitive assessment of long-term recurrence. Allocation concealment and formal blinded outcome assessment were not documented in the source records, and blinding of the operating surgeon and participants was not feasible because of the surgical nature of the interventions. The trial was retrospectively registered after study completion. The exclusion of 33 patients who could not comply with the prespecified follow-up schedule may have introduced selection bias and may limit the generalizability of the findings to patients with fewer social or geographic barriers to follow-up. Detailed MRI-based anatomical variables, including tract length, the proportion of external sphincter involvement, standardized MRI grading beyond the Parks classification, and secondary extensions, were not consistently available in the official reports. MRI examinations were interpreted through a rotating remote-reporting service, and a standardized retrospective re-review by the

original reporting radiologists was not feasible. To avoid unverifiable post hoc classification, undocumented verbal consultations obtained during routine clinical care were not incorporated into the research dataset. Operative time and time to return to work were also not recorded. Because the study was not powered for secondary endpoints, nonsignificant between-group differences, including early recurrence/persistence at week 8 and postoperative pain scores, should not be interpreted as evidence of equivalence; a type II error cannot be excluded.

Despite these limitations, this study has the following clinically relevant strengths: prospective randomized allocation, MRI-confirmed diagnosis of transsphincteric anal fistula, balanced group sizes, a standardized surgical team, and systematic early postoperative assessment of wound healing, pain, recurrence/persistence, and continence. These findings suggest that compared with standard LIFT, the lateral-approach-modified LIFT technique may provide an early wound healing advantage while maintaining the core sphincter-preserving benefit of the LIFT concept. Larger multicenter studies with longer clinical and, ideally, MRI-based follow-up are needed to determine whether this early advantage translates into durable long-term fistula healing.

Conclusions

Both standard LIFT and modified LIFT via a lateral approach appear to be safe sphincter-preserving procedures for selected patients with transsphincteric anal fistula. Modified LIFT was associated with significantly faster wound healing and a lower rate of early recurrence/persistence within 12 weeks, whereas postoperative pain and continence outcomes were similar between the groups. Larger multicenter studies with longer follow-up are warranted before definitive conclusions can be drawn regarding long-term recurrence.

Availability of Data and Materials

The datasets generated and analyzed during the current study are available from the corresponding author upon reasonable request, subject to ethical and institutional restrictions.

Author Contributions

TT contributed to study conception and design, patient recruitment, data collection, data analysis, literature review and manuscript drafting. YS contributed to study conception and design, clinical supervision, interpretation of the data and critical revision of the manuscript for important intellectual content. Both authors read and approved the final manuscript. Both authors have participated sufficiently in the work and agreed to be accountable for all aspects of the work.

Ethics Approval and Consent to Participate

The study was approved by the Kayseri City Hospital Clinical Research Ethics Committee (Decision No. 944). Written informed consent was obtained from all participants. The study was conducted in accordance with the principles of the Declaration of Helsinki.

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Conflict of Interest

The authors declare no conflict of interest.

Declaration of Generative AI and AI-Assisted Technologies in Manuscript Preparation

ChatGPT was used for language editing and formatting support. The authors reviewed, edited, and approved the final manuscript and take full responsibility for the accuracy, integrity, and scientific content of the work.

Supplementary Material

Supplementary material associated with this article can be found, in the online version, at <https://doi.org/10.62713/aic.4784>.

References

- [1] Rojanasakul A, Pattanaarun J, Sahakitrungruang C, Tantiphlachiva K. Total anal sphincter saving technique for fistula-in-ano; the ligation of intersphincteric fistula tract. *Journal of the Medical Association of Thailand = Chotmaihet Thangphaet*. 2007; 90: 581–586.
- [2] Sainio P. Fistula-in-ano in a defined population. Incidence and epidemiological aspects. *Annales Chirurgiae Et Gynaecologiae*. 1984; 73: 219–224.
- [3] Gaertner WB, Burgess PL, Davids JS, Lightner AL, Shogan BD, Sun MY, et al. The American Society of Colon and Rectal Surgeons Clinical Practice Guidelines for the Management of Anorectal Abscess, Fistula-in-Ano, and Rectovaginal Fistula. *Diseases of the*

- Colon and Rectum*. 2022; 65: 964–985. <https://doi.org/10.1097/DCR.0000000000002473>
- [4] Abbas MA, Jackson CH, Haigh PI. Predictors of outcome for anal fistula surgery. *Archives of Surgery (Chicago, Ill.: 1960)*. 2011; 146: 1011–1016. <https://doi.org/10.1001/archsurg.2011.197>
- [5] Stellingwerf ME, van Praag EM, Tozer PJ, Bemelman WA, Buskens CJ. Systematic review and meta-analysis of endorectal advancement flap and ligation of the intersphincteric fistula tract for cryptoglandular and Crohn's high perianal fistulas. *BJS Open*. 2019; 3: 231–241. <https://doi.org/10.1002/bjs.5.50129>
- [6] Garg P, Bhattacharya K, Yagnik VD, Mahak G. Recent advances in the diagnosis and treatment of complex anal fistula. *Annals of Coloproctology*. 2024; 40: 321–335. <https://doi.org/10.3393/ac.2024.00325.0046>
- [7] Shanwani A, Nor AM, Amri N. Ligation of the intersphincteric fistula tract (LIFT): a sphincter-saving technique for fistula-in-ano. *Diseases of the Colon and Rectum*. 2010; 53: 39–42. <https://doi.org/10.1007/DCR.0b013e3181c160c4>
- [8] Emile SH, Khan SM, Adejumo A, Koroye O. Ligation of intersphincteric fistula tract (LIFT) in treatment of anal fistula: An updated systematic review, meta-analysis, and meta-regression of the predictors of failure. *Surgery*. 2020; 167: 484–492. <https://doi.org/10.1016/j.surg.2019.09.012>
- [9] Kang WH, Yang HK, Chang HJ, Ko YT, Yoo BE, Lim CH, et al. High ligation of the anal fistula tract by lateral approach: A prospective cohort study on a modification of the ligation of the intersphincteric fistula tract (LIFT) technique. *International Journal of Surgery (London, England)*. 2018; 60: 9–14. <https://doi.org/10.1016/j.ijsu.2018.08.008>
- [10] Zhang L, Zhan C, Li L, Shao W, Sun G, Chen Y, et al. Ligation of the intersphincteric fistula tract (LIFT) for high transsphincteric fistulas: a double-center retrospective study with long-term follow-up. *Annals of Coloproctology*. 2025; 41: 77–83. <https://doi.org/10.3393/ac.2024.00024.0003>
- [11] Sirikurnpiboon S. The risk factors for failure and recurrence of LIFT procedure for fistula in ano. *Turkish Journal of Surgery*. 2023; 39: 27–33. <https://doi.org/10.47717/turkjsurg.2023.5807>
- [12] Gecse KB, Bemelman W, Kamm MA, Stoker J, Khanna R, Ng SC, et al. A global consensus on the classification, diagnosis and multidisciplinary treatment of perianal fistulising Crohn's disease. *Gut*. 2014; 63: 1381–1392. <https://doi.org/10.1136/gutjnl-2013-306709>

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