International Journal of Science and Research (IJSR)
ISSN: 2319-7064
Impact Factor 2025: 7.089

Ligation of the Intersphincteric Fistula Tract (LIFT) for Complex Cryptoglandular Fistula-in-Ano: A Prospective Study of Healing Outcomes, Continence Preservation, Pain Reduction, and Functional Recovery

Dr. Manik Gedam[1], Dr. Gunjan Khandait[2]

Abstract: ***Background: Complex fistula-in-ano remains a challenging surgical condition because successful treatment requires eradication of the fistulous tract while preserving anal sphincter function and continence. The Ligation of the Intersphincteric Fistula Tract (LIFT) procedure has emerged as a promising sphincter-preserving technique for managing complex anal fistulas. Methods: This prospective observational study included 60 patients with complex fistula-in-ano who underwent the LIFT procedure at a tertiary care teaching hospital between March 2024 and November 2025. Primary outcomes included healing and recurrence rates. Secondary outcomes included postoperative pain assessed using the Visual Analogue Scale (VAS), continence preservation assessed using the Wexner incontinence score, time to return to daily activities, time to return to work, and postoperative complications. Results: Transsphincteric fistulas constituted 73.3% of cases. Normal wound healing was achieved in 71.7% of patients, while recurrence occurred in 10.0%. Mean VAS scores decreased significantly from 6.18 ± 1.69 preoperatively to 2.82 ± 1.96 postoperatively ($p<0.001$). Mean Wexner scores improved from 2.82 ± 1.77 to 1.53 ± 1.63 ($p<0.001$), with no cases of moderate or severe incontinence. Patients resumed daily activities within 9.12 ± 3.39 days and returned to work within 13.73 ± 4.37 days. Postoperative complications were infrequent and predominantly minor. Conclusion: The LIFT procedure is a safe, effective, and sphincter-preserving treatment for complex fistula-in-ano, providing favorable healing rates, low recurrence, significant pain reduction, continence preservation, and rapid functional recovery.***

Keywords: Anal fistula; Complex fistula-in-ano; LIFT procedure; Sphincter-preserving surgery; Continence preservation; Recurrence; Pain reduction; Functional recovery.

1. Introduction

Anal fistula, or fistula-in-ano, is a chronic anorectal condition characterized by an abnormal epithelialized tract connecting the anal canal to the perianal skin. Approximately 90% of anal fistulas arise from cryptoglandular infection of the anal glands located at the dentate line, resulting in persistent inflammation, recurrent sepsis, and chronic drainage [1,2]. Despite being a benign disease, anal fistula remains one of the most challenging conditions in colorectal surgery because successful treatment requires eradication of the fistulous tract while preserving anal sphincter function and continence [3].

Globally, the incidence of anal fistula ranges between 1 and 2 cases per 10,000 population annually, with a prevalence of approximately 18–23 cases per 100,000 individuals in Western populations [4]. The disease predominantly affects men during the third to fifth decades of life, resulting in substantial socioeconomic burden due to recurrent hospital visits, repeated procedures, work absenteeism, and impaired quality of life [4,5]. Patients commonly experience persistent purulent discharge, pain, recurrent abscess formation, local irritation, social embarrassment, and psychological distress, all of which contribute significantly to reduced health-related quality of life [6].

Complex fistula-in-ano represents a particularly demanding clinical entity. High transsphincteric, suprasphincteric, extrasphincteric, recurrent, horseshoe, and multiple-tract fistulas frequently involve a substantial portion of the external anal sphincter, making definitive treatment difficult [7]. The principal challenge in managing these fistulas lies in balancing durable fistula healing against preservation of continence, as excessive sphincter division can result in irreversible functional impairment [3,7].

Historically, fistulotomy has been regarded as the gold standard treatment for simple anal fistulas because of healing rates exceeding 90% [3]. However, its use in complex fistulas is limited by the need for sphincter division and the associated risk of postoperative fecal incontinence, which has been reported in up to 40% of patients in selected series [8]. Similarly, cutting setons were developed to gradually divide the sphincter while promoting fibrosis, but long-term continence disturbances remain a significant concern [9]. Draining setons provide effective control of sepsis and are frequently used as a staged approach; however, they often require prolonged treatment, multiple outpatient visits, and delayed definitive management [10].

The endorectal advancement flap was subsequently introduced as a sphincter-preserving alternative and has demonstrated healing rates ranging from 55% to 80% [11]. Nevertheless, advancement flap procedures are technically demanding and have been associated with recurrence, wound complications, and varying degrees of continence impairment due to manipulation of the internal sphincter [11,12]. Other sphincter-preserving modalities, including fibrin glue, anal fistula plugs, fistula tract laser closure, and video-assisted anal fistula treatment, have shown

inconsistent long-term outcomes and often require specialized equipment or increased procedural costs [13,14].

Recognition of these limitations has driven the evolution of sphincter-preserving surgery. Contemporary management strategies increasingly emphasize preservation of anorectal function while maintaining acceptable healing rates [15]. Within this context, the Ligation of the Intersphincteric Fistula Tract (LIFT) procedure, first described by Rojanasakul and colleagues in 2007, has emerged as one of the most promising sphincter-preserving techniques for complex fistula-in-ano [16].

The LIFT procedure is based on the cryptoglandular theory of fistula pathogenesis and targets the intersphincteric component of the fistulous tract, which represents the source of ongoing infection [16]. Through careful dissection within the intersphincteric plane, the tract is identified, ligated, and divided without disrupting either the internal or external anal sphincter [17]. This approach offers the theoretical advantages of eliminating septic communication while preserving continence and minimizing tissue trauma.

Since its introduction, numerous studies, systematic reviews, and meta-analyses have demonstrated healing rates ranging from 70% to 90%, with exceptionally low rates of postoperative incontinence [18–20]. Comparative studies have further shown that LIFT provides outcomes comparable to advancement flap procedures while offering superior continence preservation and reduced postoperative morbidity [20,21]. Moreover, the technique requires no expensive biological materials or specialized equipment, making it particularly attractive in resource-constrained healthcare settings [22].

Despite growing evidence supporting the efficacy of LIFT, important knowledge gaps remain. Most published studies have focused primarily on fistula healing and recurrence, whereas relatively few have comprehensively evaluated patient-centered outcomes such as postoperative pain, continence preservation, return to work, and functional recovery [21–23]. These outcomes are increasingly recognized as critical indicators of treatment success because they directly influence patient satisfaction, quality of life, and socioeconomic productivity.

In developing countries, where many patients depend on daily physical labor for income, prolonged postoperative disability may have substantial economic consequences. Therefore, evaluation of postoperative pain reduction, maintenance of continence, and speed of functional recovery is essential for establishing the true clinical value of sphincter-preserving procedures such as LIFT [22,23].

Accordingly, the present prospective study was undertaken to evaluate the effectiveness of the LIFT procedure in patients with complex fistula-in-ano by assessing healing outcomes, postoperative pain trajectories, continence preservation, recurrence patterns, and time required for return to normal activities and employment. We hypothesized that LIFT would achieve high healing rates while preserving continence, minimizing postoperative pain, and facilitating early functional recovery, thereby representing an effective and patient-centered treatment strategy for complex fistula-in-ano.

2. Materials and Methods

Study Design and Setting

This prospective observational study was conducted in the Department of General Surgery at a tertiary healthcare teaching institution in India. The study was designed to evaluate the safety and efficacy of the Ligation of the Intersphincteric Fistula Tract (LIFT) procedure in patients diagnosed with complex fistula-in-ano. Data collection was carried out over a 21-month period from March 2024 to November 2025.

Study Population and Patient Selection

All consecutive patients presenting to the surgical outpatient department with clinically diagnosed fistula-in-ano and fulfilling the study eligibility criteria were screened for participation. Eligible patients were recruited after obtaining written informed consent.

Inclusion Criteria

Patients fulfilling any of the following criteria were included:

1) Patients presenting with fistula-in-ano associated with persistent pus discharge and pain resulting in limitation of daily activities.
2) Complex fistulas, including:
   - Fistulas involving more than 30–50% of the external anal sphincter.
   - Recurrent fistulas.
   - Fistulas with multiple extensions or secondary tracts.
   - Anterior fistulas in women.
3) Patients of either sex willing to participate in the study.

Exclusion Criteria

Patients were excluded if they met any of the following criteria:

1) Refusal to provide informed consent.
2) Medically unfit for surgery.
3) Pregnancy.
4) Anal fistula secondary to malignancy.
5) Tubercular fistula or multiple discharging sinuses suggestive of specific etiology.
6) Hemodynamic instability.
7) Uncorrected coagulation disorders.

Sample Size Calculation

The sample size was calculated using the formula for estimation of a single population proportion:

$$n = Z^2pq/d^2$$

where:

- $Z = 1.96$ corresponding to a 95% confidence interval
- p = anticipated healing rate of 80% based on previous literature
- $q = 1 - p$
- d = absolute precision of 10.1%

Based on this calculation, a minimum sample size of 60 patients was required for adequate statistical precision.

Preoperative Assessment

At enrollment, detailed demographic and clinical information was recorded, including age, sex, body mass index, occupation, comorbid illnesses, duration of symptoms, and fistula characteristics. A comprehensive clinical examination was performed to determine fistula type and complexity.

Baseline pain severity was assessed using the Visual Analogue Scale (VAS), where scores ranged from 0 (no pain) to 10 (worst imaginable pain). Baseline continence status was documented using the Cleveland Clinic Florida Fecal Incontinence Score (Wexner Score).

Surgical Technique

All patients underwent LIFT surgery under regional anesthesia using a standardized surgical protocol.

After identification of the external and internal fistula openings, a curvilinear incision was made over the intersphincteric groove. Careful dissection was performed within the intersphincteric plane to identify the fistula tract. The intersphincteric portion of the tract was isolated, doubly ligated using absorbable sutures, and divided between the ligatures. The distal tract was curetted thoroughly, and adequate drainage of the external opening was ensured. The intersphincteric wound was closed with absorbable sutures, while the external opening was left open for secondary healing.

All procedures were performed using standard anorectal surgical instruments according to established LIFT principles.

Follow-up Protocol

Patients were evaluated prospectively during scheduled postoperative follow-up visits between 2 and 4 weeks after surgery.

During each follow-up visit, the following parameters were assessed:

- Postoperative pain severity using VAS.
- Wound healing status.
- Presence of persistent discharge.
- Evidence of recurrence.
- Time taken to resume routine daily activities.
- Time taken to return to formal employment.
- Continence status using the Wexner incontinence score.

All observations were recorded using a predefined study proforma.

Outcome Measures

Primary Outcomes

Complete Healing Rate: Primary healing was defined as complete epithelialization and closure of both internal and external fistulous openings, accompanied by complete cessation of discharge and absence of local sepsis at follow-up.

Recurrence Rate: Recurrence was defined as reappearance of fistulous discharge, abscess formation, reopening of a healed tract, or development of a new fistulous communication after initial healing.

Secondary Outcomes

1) **Postoperative Pain:** Pain intensity was measured using the Visual Analogue Scale (VAS; range 0–10). Reduction in pain scores from baseline was considered an indicator of treatment efficacy.
2) **Continence Preservation:** Anal continence was evaluated using the Wexner Incontinence Score. The score assesses continence for solid stool, liquid stool, flatus, lifestyle alteration, and pad usage. Total scores range from 0 (perfect continence) to 20 (complete incontinence). Patients with a postoperative score greater than zero were considered to have some degree of continence impairment.
3) **Time to Return to Work:** The total number of days from surgery until resumption of formal employment was recorded.
4) **Time to Return to Normal Daily Activities:** The total number of days required for patients to resume routine daily activities without limitation was documented.
5) **Postoperative Complications:** Postoperative complications including wound infection, persistent discharge, delayed wound healing, abscess formation, wound dehiscence, and continence disturbances were documented prospectively.

Statistical Analysis

Data were entered into Microsoft Excel and analyzed using Statistical Package for Social Sciences (SPSS) software.

Continuous variables were assessed for normality using the Shapiro–Wilk test. Normally distributed variables were expressed as mean ± standard deviation, whereas non-normally distributed variables were presented as median and interquartile range.

Categorical variables were summarized as frequencies and percentages.

Preoperative and postoperative VAS scores were compared using the paired Student's t-test for normally distributed data or the Wilcoxon signed-rank test for non-parametric data.

Healing rates, recurrence rates, complication rates, and continence outcomes were expressed as proportions with 95% confidence intervals.

A two-sided p-value <0.05 was considered statistically significant.

Ethical Considerations

The study protocol was reviewed and approved by the Institutional Ethics Committee and the Maharashtra University of Health Sciences (MUHS), Nashik. Written informed consent was obtained from all participants prior to enrollment. The study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki and local institutional guidelines.

3. Results

A total of 60 patients with fistula-in-ano underwent the Ligation of the Intersphincteric Fistula Tract (LIFT) procedure and completed postoperative follow-up. The study evaluated patient demographics, fistula characteristics, postoperative pain reduction, continence preservation, functional recovery, surgical safety, and healing outcomes.

Table 1: Baseline Clinical Characteristics of the Study Population (N = 60)

Variable	n (%)
Diabetes Mellitus	14 (23.3)
Hypertension	12 (20.0)
Thyroid Disorder	4 (6.7)
Bronchial Asthma	2 (3.3)
No Comorbidity	32 (53.3)

Table 1 More than half of the study population had no significant systemic comorbidity. Among patients with underlying illnesses, diabetes mellitus was the most common condition, followed by hypertension. These findings indicate that the majority of patients undergoing LIFT were medically fit, thereby minimizing confounding effects of severe systemic disease on wound healing and postoperative recovery.

Table 2: Distribution of Fistula Types

Fistula Type	n	%
Transsphincteric	44	73.3
Intersphincteric	16	26.7
Total	60	100

Table 2 Transsphincteric fistulas represented nearly three-fourths of all cases, confirming that the study population predominantly comprised complex fistula disease. This distribution supports the clinical relevance of evaluating a sphincter-preserving procedure such as LIFT.

Table 3: Comparison of Preoperative and Postoperative VAS Pain Scores

Parameter	Mean ± SD	Minimum	Maximum
Preoperative VAS Score	6.18 ± 1.69	4	9
Postoperative VAS Score	2.82 ± 1.96	0	7
Mean Reduction	3.37 ± 1.16	—	—

Table 3 Patients experienced a substantial reduction in pain following LIFT surgery. The mean VAS score decreased from 6.18 to 2.82, representing a clinically meaningful improvement of 54.5%. Statistical analysis demonstrated a highly significant reduction in postoperative pain, confirming the effectiveness of LIFT in alleviating fistula-related symptoms.

Table 4: Functional Recovery Following LIFT Surgery

Outcome	Mean ± SD (days)	Minimum	Maximum
Return to Daily Activities	9.12 ± 3.39	3	14
Return to Work	13.73 ± 4.37	7	21

Table 4 Patients resumed normal daily activities within approximately 9 days and returned to employment within 14 days after surgery. These findings demonstrate rapid functional recovery and suggest that LIFT minimizes postoperative disability and socioeconomic burden.

Table 5: Continence Outcomes Assessed by Wexner Score

Parameter	Mean ± SD	Minimum	Maximum
Preoperative Wexner Score	2.82 ± 1.77	0	5
Postoperative Wexner Score	1.53 ± 1.63	0	7

Table 5 The mean Wexner score decreased significantly after surgery, indicating improvement rather than deterioration in continence status. The proportion of patients with perfect continence increased from 13.3% preoperatively to 33.3% postoperatively, while no patient developed moderate or severe incontinence. These findings strongly support the sphincter-preserving nature of the LIFT procedure.

Table 6: Surgical Safety and Healing Outcomes

Outcome	n	%
No Intraoperative Complication	55	91.7
Minor Bleeding	5	8.3
Normal Healing	43	71.7
Wound Infection	7	11.6
Recurrence	6	10.0
Persistent Discharge	4	6.7

Table 6 The LIFT procedure demonstrated an excellent safety profile, with 91.7% of surgeries completed without intraoperative complications. Normal wound healing was achieved in 71.7% of patients, whereas recurrence occurred in only 10.0% of cases. The low complication and recurrence rates support the efficacy and safety of LIFT for fistula-in-ano management.

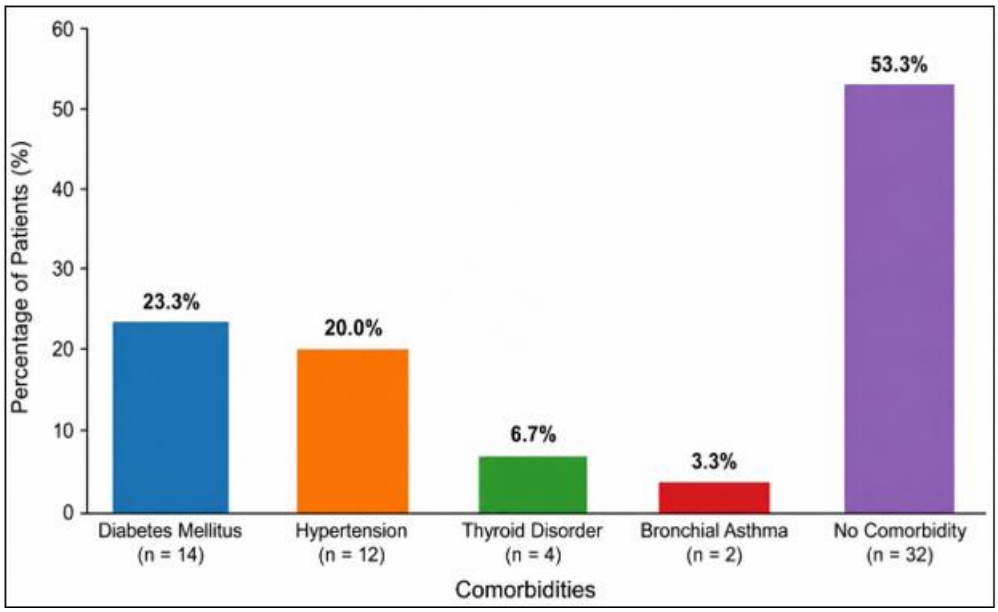

Figure 1: Distribution of Comorbidities Among Study Participants

Figure 1 illustrates the distribution of pre-existing medical comorbidities among the 60 patients included in the study. More than half of the participants (53.3%, n = 32) had no associated systemic illness. Among patients with comorbid conditions, Diabetes Mellitus was the most prevalent, affecting 23.3% (n = 14) of patients, followed by Hypertension in 20.0% (n = 12). Thyroid disorders and Bronchial Asthma were less frequently observed, accounting for 6.7% (n = 4) and 3.3% (n = 2) of cases, respectively. The predominance of patients without significant comorbidities suggests a relatively healthy study population, while the presence of diabetes and hypertension in a substantial proportion of patients highlights the need to consider these conditions when evaluating postoperative healing and recovery outcomes following the LIFT procedure.

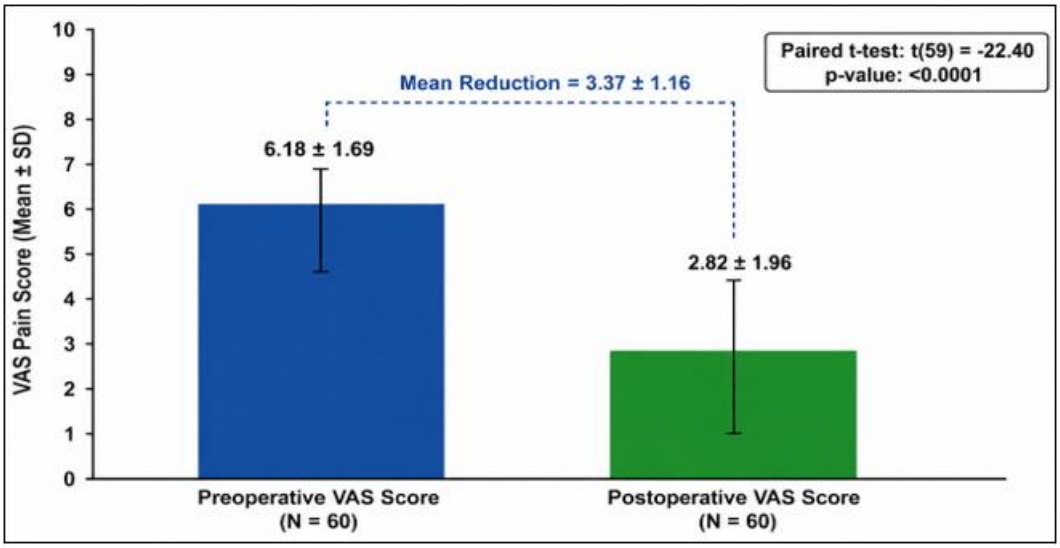

Figure 2: Comparison of Preoperative and Postoperative VAS Pain Scores

Figure 2 illustrates the comparison between preoperative and postoperative Visual Analogue Scale (VAS) pain scores among patients undergoing the LIFT procedure for fistula-in-ano. The mean preoperative VAS score was **6.18 ± 1.69**, indicating moderate-to-severe pain before surgical intervention. Following surgery, the mean postoperative VAS score significantly decreased to **2.82 ± 1.96**, reflecting substantial symptomatic improvement. The mean reduction in pain score was **3.37 points**, corresponding to a clinically meaningful decrease in pain intensity. Statistical analysis using the paired t-test demonstrated that this reduction was highly significant (**$t(59) = -22.40$, $p < 0.0001$**). These findings indicate that the LIFT procedure is highly effective in alleviating fistula-related pain and contributes significantly to improved postoperative patient comfort and quality of recovery.

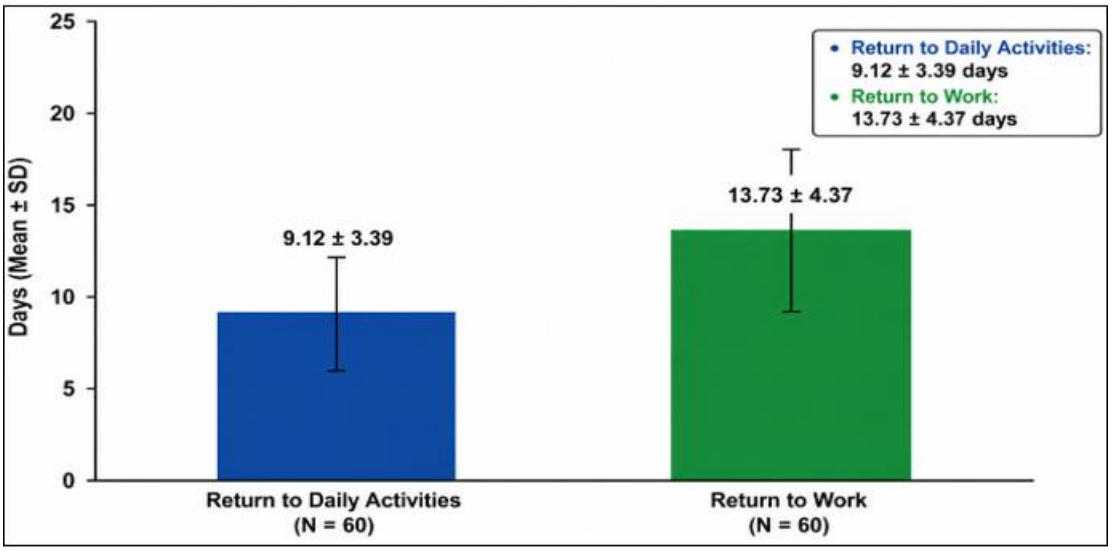

Figure 3: Functional Recovery Following LIFT Surgery

Figure 3 illustrates the postoperative functional recovery of patients following the LIFT procedure by depicting the mean duration required to resume normal daily activities and return to work. Patients returned to their routine daily activities within a mean duration of 9.12 ± 3.39 days (range: 3–14 days), while the mean time required to resume employment was 13.73 ± 4.37 days (range: 7–21 days). The relatively short recovery period observed in this study highlights the minimally invasive nature of the LIFT procedure and its favorable impact on postoperative rehabilitation. Early restoration of functional independence and occupational activity represents an important patient-centered outcome, reducing both physical disability and socioeconomic burden. These findings suggest that LIFT facilitates rapid recovery while maintaining effective disease control, thereby enhancing overall postoperative quality of life.

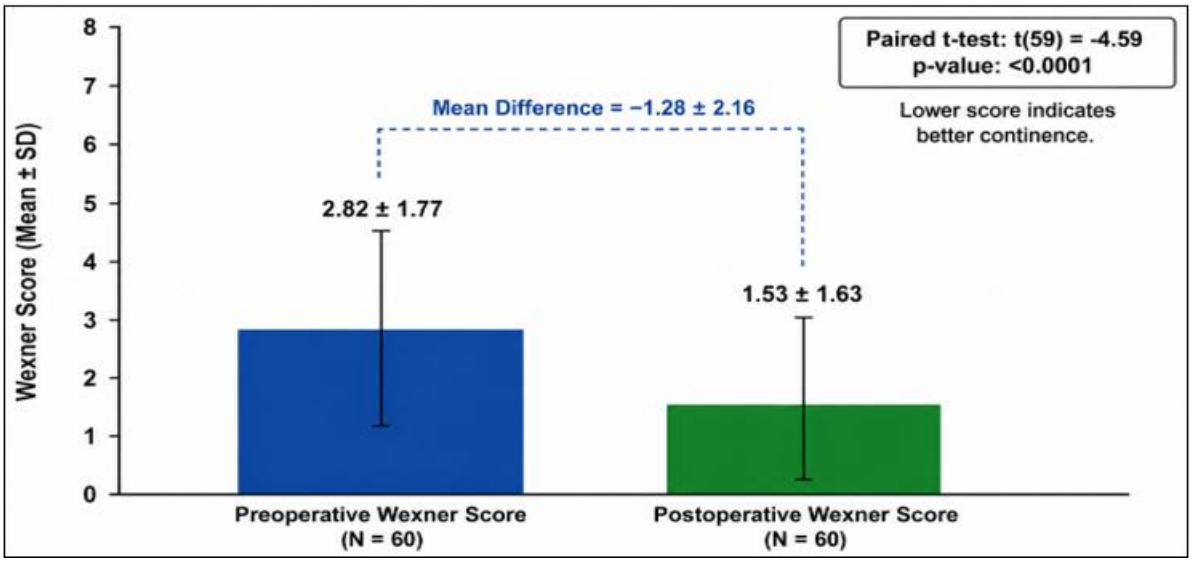

Figure 4: Comparison of Preoperative and Postoperative Wexner Scores

Figure 4 illustrates the comparison of preoperative and postoperative Wexner incontinence scores among patients who underwent the LIFT procedure. The mean preoperative Wexner score was 2.82 ± 1.77, which decreased significantly to 1.53 ± 1.63 following surgery. The mean reduction in score was 1.28 points, indicating an overall improvement in continence status after treatment. Statistical analysis demonstrated that this reduction was highly significant ($t(59) = -4.59$, $p < 0.0001$).

4. Discussion

The management of complex fistula-in-ano remains a significant challenge in colorectal surgery because the ideal procedure must achieve complete fistula healing while preserving anal continence and minimizing recurrence. Conventional procedures such as fistulotomy and fistulectomy provide satisfactory healing rates but are associated with varying degrees of sphincter injury and postoperative incontinence, particularly in high transsphincteric fistulas. Consequently, sphincter-preserving procedures have gained increasing acceptance, among which the Ligation of the Intersphincteric Fistula Tract (LIFT)

procedure has emerged as a promising therapeutic option [23,24]. The present prospective study evaluated healing outcomes, continence preservation, postoperative pain reduction, functional recovery, and recurrence following LIFT surgery in patients with fistula-in-ano.

In the current study, transsphincteric fistulas constituted 73.3% of cases, indicating that the majority of patients had complex disease. This finding is comparable to previous reports by Shanwani et al. and Sirikurnpiboon et al., who observed that transsphincteric fistulas represent the most common indication for LIFT because they involve a significant portion of the sphincter complex and are associated with a higher risk of continence impairment when treated with conventional sphincter-dividing procedures [25,28]. The predominance of complex fistulas in our cohort highlights the clinical relevance of evaluating a sphincter-preserving strategy.

The principal outcome of the present study was the favorable healing profile achieved following LIFT. Normal wound healing was observed in 71.7% of patients, while recurrence occurred in only 10.0% of cases. These findings are consistent with the original report by Rojanasakul et al., who introduced the LIFT procedure as a total sphincter-saving technique and demonstrated excellent healing outcomes with preservation of continence [23]. Subsequently, Rojanasakul further refined the technique and emphasized secure ligation of the intersphincteric tract as the key determinant of success [24]. The biological rationale of the procedure is based on eradication of the cryptoglandular source of infection through ligation and division of the fistulous tract within the intersphincteric plane while maintaining sphincter integrity [24].

Our healing rate is comparable to that reported in the systematic review and meta-analysis by Emile et al., which demonstrated pooled healing rates ranging between 70% and 80% across multiple studies [26]. Similarly, Hong et al. reported a pooled success rate of approximately 76% following LIFT, with low rates of postoperative continence impairment [27]. The similarity between our findings and those reported in international literature suggests that the effectiveness of LIFT is reproducible across different healthcare settings and patient populations. Minor differences in healing rates among studies may be attributable to variations in fistula complexity, previous surgical interventions, surgeon experience, and duration of follow-up.

The recurrence rate of 10.0% observed in the present study compares favorably with published literature. Sirikurnpiboon et al. reported that recurrence following LIFT is often associated with missed secondary tracts, horseshoe extensions, persistent sepsis, and inadequate identification of the internal opening [28]. Van Oostendorp and colleagues, in their long-term evaluation of LIFT outcomes, emphasized that recurrence may become evident only after prolonged follow-up and therefore recommended extended postoperative surveillance [29]. The relatively low recurrence observed in our study may reflect careful patient selection and adherence to standardized operative technique. Nevertheless, longer follow-up is necessary to determine long-term durability of fistula closure.

A notable finding of the present study was the significant reduction in postoperative pain. The mean VAS score decreased from 6.18 ± 1.69 preoperatively to 2.82 ± 1.96 postoperatively, representing a highly significant improvement ($p < 0.0001$). This finding confirms that successful fistula eradication results in substantial symptomatic relief. Pain reduction following LIFT can be explained by elimination of chronic infection, drainage of inflammatory foci, and avoidance of extensive sphincter division. Unlike fistulotomy, which creates a large surgical wound through the sphincter complex, LIFT limits dissection to the intersphincteric plane, thereby minimizing tissue trauma and postoperative nociceptive stimulation [24,26]. Similar reductions in postoperative pain have been reported in studies evaluating sphincter-preserving techniques, further supporting the minimally invasive nature of LIFT [27].

Preservation of continence remains one of the most important goals in fistula surgery. In the present study, the mean Wexner score improved significantly from 2.82 ± 1.77 preoperatively to 1.53 ± 1.63 postoperatively ($p < 0.0001$). Furthermore, no patient developed moderate or severe incontinence during follow-up. These findings strongly support the sphincter-preserving characteristics of the LIFT procedure. Rojanasakul originally designed the procedure specifically to avoid sphincter injury while eliminating the fistulous tract [23,24]. Similarly, Emile et al. reported extremely low rates of postoperative continence impairment in their meta-analysis, identifying continence preservation as one of the major advantages of LIFT compared with conventional procedures [26]. Sirikurnpiboon et al. also observed favorable continence outcomes and emphasized that preservation of both internal and external sphincters contributes significantly to postoperative quality of life [28].

The favorable continence outcomes observed in our study may also be attributed to the anatomical principles underlying the procedure. The intersphincteric approach allows direct access to the fistula tract without transecting muscle fibers. Preservation of sphincter architecture minimizes disruption of anorectal physiology and maintains normal resting and squeeze pressures. Consequently, patients experience improvement in symptoms without compromising functional continence [24,28].

An important strength of the present study is the assessment of functional recovery. Patients resumed routine daily activities within 9.12 ± 3.39 days and returned to work within 13.73 ± 4.37 days. These findings indicate rapid postoperative rehabilitation and highlight the patient-centered benefits of LIFT. Early return to normal activity has become an increasingly important outcome measure because it reflects both physical recovery and restoration of quality of life. Studies evaluating modern sphincter-preserving procedures have similarly reported shorter recovery periods and improved patient satisfaction compared with traditional approaches [30–32]. The rapid functional recovery observed in our study is likely related to reduced postoperative pain, limited tissue dissection, and preservation of anorectal function.

The socioeconomic implications of these findings are particularly important in developing countries. Most patients affected by fistula-in-ano belong to the economically productive age group and depend on daily employment for financial stability. Prolonged recovery and recurrent procedures can result in significant economic hardship. By facilitating early return to work and minimizing postoperative disability, LIFT may substantially reduce indirect healthcare costs and productivity losses. Recent evidence syntheses have emphasized the importance of incorporating functional recovery and quality-of-life outcomes into the evaluation of fistula surgery [30, 31].

The safety profile of the procedure was favorable. No intraoperative complications occurred in 91.7% of patients, and only minor bleeding was observed in a small proportion of cases. Wound infection occurred in 11.6% of patients, while persistent discharge was reported in 6.7%. These findings are comparable with previously published studies that have demonstrated low complication rates following LIFT [26–29]. The relatively low morbidity associated with the procedure may be attributed to limited surgical dissection and preservation of surrounding tissue structures.

Recent comparative analyses and network meta-analyses have further strengthened the position of LIFT among sphincter-preserving procedures. Bhat et al. reported that LIFT consistently demonstrates a favorable balance between healing, recurrence, and continence outcomes when compared with alternative interventions [30]. Similarly, Warsinggih et al. concluded that although no single procedure is universally superior, LIFT remains one of the most reliable options for achieving sphincter preservation while maintaining acceptable healing rates [31]. These observations are in agreement with the outcomes observed in the present study.

The applicability of LIFT in low-resource settings deserves special consideration. Unlike newer technologies such as video-assisted anal fistula treatment (VAAFT), fistula laser closure (FiLaC), stem-cell therapy, or biological plugs, LIFT does not require expensive equipment or specialized consumables. The procedure can be performed using standard surgical instruments and conventional operative techniques. Consequently, it represents a cost-effective and reproducible treatment option in resource-constrained healthcare environments [32–34]. This characteristic is particularly relevant in developing countries where access to advanced technologies may be limited.

Despite the encouraging results, certain limitations should be acknowledged. The study was conducted at a single center with a relatively modest sample size and a limited duration of follow-up. Longer follow-up may reveal additional recurrences that were not detected during the study period. Nevertheless, the prospective design, standardized surgical technique, and comprehensive assessment of pain, continence, and functional recovery strengthen the validity of the findings.

Overall, the present study demonstrates that the LIFT procedure provides satisfactory healing rates, low recurrence, significant postoperative pain reduction, excellent continence preservation, rapid return to normal activities, and a favorable safety profile. These findings are consistent with contemporary international literature and support the role of LIFT as an effective, sphincter-preserving, and economically feasible treatment option for complex fistula-in-ano [23–34].

5. Conclusion

The present study demonstrates that the Ligation of the Intersphincteric Fistula Tract (LIFT) procedure is a safe, effective, and sphincter-preserving surgical option for the management of complex fistula-in-ano. The procedure achieved favorable healing outcomes with a low recurrence rate, significant postoperative pain reduction, excellent continence preservation, and rapid functional recovery, enabling early return to daily activities and employment. The significant improvement in VAS and Wexner scores highlights the ability of LIFT to enhance both symptom control and anorectal function without compromising sphincter integrity. Furthermore, its low complication profile, technical simplicity, and lack of requirement for specialized equipment make it particularly suitable for routine clinical practice and resource-constrained healthcare settings. Collectively, these findings support LIFT as a valuable treatment strategy for complex fistula-in-ano, offering an optimal balance between fistula healing, continence preservation, patient satisfaction, and postoperative quality of life.

References

[1] Parks AG, Gordon PH, Hardcastle JD. A classification of fistula-in-ano. Br J Surg. 1976;63(1):1-12.
[2] Abcarian H. Anorectal infection: abscess-fistula. Clin Colon Rectal Surg. 2011;24(1):14-21.
[3] Vogel JD, Johnson EK, Morris AM, et al. Clinical Practice Guideline for management of anorectal abscess, fistula-in-ano and rectovaginal fistula. Dis Colon Rectum. 2022;65(8):964-985.
[4] Bahardoust M, Jalali R, Latifnejad Roudsari R, et al. Global epidemiology of perianal fistula: systematic review and meta-analysis. Ann Coloproctol. 2022.
[5] Iglay K, Church J, Delaney CP, et al. Epidemiology of complex cryptoglandular fistulas. J Gastrointest Surg. 2023.
[6] Owen HA, Buchanan GN, Schizas A, Cohen R, Williams AB. Quality of life with anal fistula. Ann R Coll Surg Engl. 2016;98(5):334-338.
[7] Garg P. Comparing existing classifications of fistula-in-ano. World J Gastroenterol. 2016;22(31):6804-6815.
[8] Garcia-Aguilar J, Belmonte C, Wong WD, Goldberg SM, Madoff RD. Anal fistula surgery and risk of incontinence. Dis Colon Rectum. 1996;39(7):723-729.
[9] Ritchie RD, Sackier JM, Hodde JP. Incontinence rates after cutting seton treatment. Dis Colon Rectum. 2009;52(5):829-834.
[10] Malik AI, Nelson RL. Surgical management of anal fistulae. Clin Colon Rectal Surg. 2008;21(2):97-104.
[11] Mizrahi N, Wexner SD, Zmora O, et al. Endorectal advancement flap. Dis Colon Rectum. 2002;45(12):1616-1621.

[12] Soltani A, Kaiser AM. Endorectal advancement flap for cryptoglandular fistula. Dis Colon Rectum. 2010;53(4):486-495.
[13] Meinero P, Mori L. Video-assisted anal fistula treatment (VAAFT). Tech Coloproctol. 2011;15(4):417-422.
[14] Wilhelm A. FiLaC laser closure technique. Tech Coloproctol. 2011;15(4):445-449.
[15] Bhat A, De Robles MS, Young CJ, et al. Network meta-analysis of surgical treatments for anal fistula. Br J Surg. 2023.
[16] Rojanasakul A, Pattanaarun J, Sahakitrungruang C, Tantiphlachiva K. LIFT procedure. Tech Coloproctol. 2007;11(3):203-207.
[17] Bleier JIS, Moloo H. Current management of cryptoglandular fistula-in-ano. World J Gastroenterol. 2011;17(28):3286-3291.
[18] Emile SH, Elfeki H, Shalaby M, Sakr A. Systematic review and meta-analysis of LIFT. Surg Endosc. 2020;34(6):2389-2403.
[19] Van Oostendorp SE, et al. Long-term continence after LIFT. Colorectal Dis. 2024.
[20] Emile SH, Christensen P, et al. LIFT versus advancement flap meta-analysis. Int J Colorectal Dis. 2023.
[21] Warsinggih, et al. Network meta-analysis of complex anal fistula surgery. Int J Surg. 2024.
[22] Rao NM, et al. Functional outcomes following LIFT. Ann Coloproctol. 2025.
[23] Faiz MA, et al. LIFT versus fistulotomy: comparative outcomes. BMC Surg. 2024.
[24] Rojanasakul A. LIFT procedure: a simplified technique for fistula-in-ano. Tech Coloproctol. 2009;13(3):237-240. DOI: 10.1007/s10151-009-0522-2.
[25] Shanwani A, Nor AM, Amri N. Ligation of the intersphincteric fistula tract (LIFT): a sphincter-saving technique for fistula-in-ano. Dis Colon Rectum. 2010;53(1):39-42.
[26] Emile SH, Elfeki H, Shalaby M, Sakr A. Ligation of intersphincteric fistula tract in treatment of anal fistula: systematic review and meta-analysis. Surg Endosc. 2020;34(6):2389-2403.
[27] Hong KD, Kang S, Kalaskar S, Wexner SD. Ligation of intersphincteric fistula tract to treat anal fistula: systematic review and meta-analysis. Tech Coloproctol. 2014;18(8):685-691.
[28] Sirikurnpiboon S, Awapittaya B, Jivapaisarnpong P. Ligation of intersphincteric fistula tract and its modification: results from treatment of complex fistula. World J Gastroenterol. 2013;19(47):9162-9165.
[29] Vander Mijnsbrugge GJH, et al. Perianal fistulas and the LIFT procedure: results, predictive factors for success and long-term results. Tech Coloproctol. 2019;23:33-41.
[30] Bhat S, De Robles MS, Young CJ, Solomon MJ. Efficacy of different surgical treatments for management of anal fistula: network meta-analysis. Tech Coloproctol. 2023.
[31] Aryanti C, Warsinggih, Faruk M, et al. Optimum management for complex anal fistula: network meta-analysis of randomized controlled trials. Surg Open Sci. 2024;18:117-122. DOI:10.1016/j.sopen.2024.03.003.
[32] Charalampopoulos A, Zisimopoulos A, et al. Surgery of simple and complex anal fistulae in adults: a review. Visc Med. 2023;39(1):23-34.
[33] An Y, et al. Efficacy and safety of surgical techniques for treatment of complex anal fistula: systematic review and network meta-analysis. J Clin Gastroenterol. 2023.
[34] Garg P. Recent advances in diagnosis and treatment of complex anal fistula. Ann Coloproctol. 2024.