



HEALING, RECURRENCE, AND CONTINENCE OUTCOMES FOLLOWING LIFT PROCEDURE IN COMPLEX ANAL FISTULAS: A HOSPITAL-BASED OBSERVATIONAL STUDY.

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Abstract

Background: Complex anal fistulas are difficult to manage because treatment should achieve complete healing while preserving anal sphincter function. The ligation of intersphincteric fistula tract procedure is a sphincter-preserving technique designed to close the internal opening and disconnect the fistulous tract without dividing the external sphincter. Aim of the study was to evaluate the clinical outcomes of LIFT procedure in the management of complex anal fistulas. **Materials and Methods:** This hospital-based observational study was conducted in the Department of General Surgery, Mamata Medical College and General Hospital, Khammam. A total of 50 patients with complex anal fistulas who underwent LIFT procedure were included. Demographic details, clinical presentation, fistula anatomy, operative findings, postoperative complications, wound healing, recurrence, and continence status were recorded and analyzed. **Results:** The mean age of patients was 42.6 ± 11.8 years, and 74% were males. High transsphincteric fistula was the most common type, seen in 78% of patients. Complete primary healing was achieved in 39 patients, giving an overall success rate of 78%. Persistent fistula was observed in 6%, and recurrence occurred in 16%. Continence was preserved in 96% of patients, with no liquid or solid stool incontinence. Diabetes mellitus, previous fistula surgery, and horseshoe or branching tracts were associated with higher recurrence. **Conclusion:** LIFT is a safe and effective sphincter-preserving procedure for complex anal fistulas, with acceptable healing, low morbidity, and good continence preservation.

Keywords: Complex anal fistula; LIFT procedure; fistula-in-ano; transsphincteric fistula; recurrence; continence preservation.



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INTRODUCTION

Anal fistula is a chronic inflammatory tract connecting the anal canal or rectum to the perianal skin, most commonly arising after cryptoglandular infection and anorectal abscess. Although simple low fistulas can often be managed effectively by fistulotomy, complex anal fistulas remain a major therapeutic challenge because the fistulous tract involves a significant portion of the anal sphincter complex, may be recurrent, multiple, horseshoe shaped, anterior in females, or associated with conditions such as Crohn's disease. The central difficulty in treating complex fistulas is achieving complete and durable healing while preserving continence. Conventional lay-open procedures may offer high healing rates, but division of sphincter muscle can lead to varying degrees of flatus or fecal incontinence, which may have a long-term impact on quality of life. Therefore, current surgical practice increasingly favors sphincter-preserving procedures for complex and high transsphincteric fistulas, with the aim of balancing fistula eradication, low recurrence, minimal morbidity, and maintenance of anal continence [1].

The ligation of intersphincteric fistula tract procedure, commonly known as the LIFT procedure, was introduced as a sphincter-saving technique based on the principle of approaching the fistula through the intersphincteric plane. The procedure involves identification, ligation, and division of the fistula tract close to the internal opening, thereby disconnecting the septic source from the external tract without cutting the external anal sphincter. This concept makes LIFT particularly attractive in complex anal fistulas, especially high transsphincteric fistulas, where fistulotomy may carry unacceptable continence risk. Recent guidelines recognize LIFT as an acceptable sphincter-preserving option for transsphincteric fistulas, although they also emphasize that results vary depending on fistula anatomy, surgeon experience, patient selection, and previous procedures [1].

Several recent studies have attempted to evaluate the clinical outcomes of LIFT in different settings. A systematic review focusing on posterior fistula-in-ano reported that posterior location alone should not be considered a contraindication to LIFT, but it also highlighted heterogeneity in recurrence rates and the need for better-quality evidence [2]. Randomized studies have explored whether adjuncts can improve LIFT outcomes. Madbouly et al. studied LIFT with or without platelet-rich plasma in high transsphincteric fistula-in-ano and reported short-term outcomes from a prospective randomized trial [3]. Similarly, Rezk et al. evaluated LIFT with or without bone marrow mononuclear cell injection, reflecting the growing interest in biologic enhancement of sphincter-preserving fistula surgery [5]. Comparative trials have also examined LIFT against other operative strategies. Elshamy et al. compared LIFT with modified Parks technique and two-stage seton in complex anal fistula, while Awad et al. compared a modified LIFT approach with fistulotomy and primary sphincteroplasty in high transsphincteric fistula [4,8]. These studies suggest that LIFT offers advantages such as sphincter preservation, less tissue division, and shorter healing in selected patients, but recurrence remains a persistent limitation.

Despite the growing body of literature, the reported success of LIFT remains inconsistent. Studies have shown that recurrence may be influenced by factors such as fistula complexity, previous fistula surgery, missed internal opening, horseshoe extension, diabetes mellitus, inadequate tract ligation, persistent sepsis, and delayed wound healing [6,7]. Bayrak and Altintas identified predictive factors affecting recurrence after LIFT, and Sirikumpiboon further described risk factors for failure and patterns of recurrence after the procedure [6,7]. More recent outcome studies have raised concern that even though LIFT is designed to preserve sphincter integrity, continence outcomes and recurrence should be evaluated carefully over longer follow-up periods. Salgado-Nesme et al. reported postoperative outcomes, recurrence risk factors, and continence impairment following LIFT, while van Oostendorp et al. emphasized that long-term continence data remain limited and that late functional deterioration may be underestimated when only short-term outcomes are studied [9,10].

Thus, while LIFT has become an important sphincter-saving option for complex anal fistulas, there is still no universal agreement regarding its ideal indications, expected healing rate, recurrence pattern, and long-term functional outcome. Many available studies are limited by small sample size, short follow-up, retrospective design, heterogeneity in fistula anatomy, and variable definitions of healing and recurrence. There is a continuing need for institution-based clinical outcome studies that assess postoperative healing, recurrence, morbidity, continence preservation, and patient-related factors in a defined population. Therefore, the present study, titled “Clinical Outcomes of LIFT Procedure in the Management of Complex Anal Fistulas,” aims to evaluate the effectiveness and safety of the LIFT procedure in patients with complex anal fistulas, with particular focus on healing rate, recurrence, postoperative complications, and continence outcomes.

MATERIALS AND METHODS

This hospital-based observational study was conducted in the Department of General Surgery, Mamata Medical College and General Hospital, Khammam. The study included patients diagnosed with complex anal fistulas who underwent ligation of intersphincteric fistula tract procedure. A total of 50 patients fulfilling the eligibility criteria were included in the study. The objective of the study was to assess the clinical outcomes of the LIFT procedure in the management of complex anal fistulas, with special emphasis on postoperative healing, recurrence, complications, and preservation of anal continence. All patients were evaluated clinically before surgery, and relevant investigations were performed wherever required to define the fistula anatomy and to rule out associated conditions. Written informed consent was obtained from all patients before inclusion in the study.

Study Population

The study population consisted of patients attending the outpatient and inpatient departments of General Surgery with features suggestive of complex fistula-in-ano. Patients were selected after detailed history taking, clinical examination, per rectal examination, and local examination of the perianal region. Diagnosis was made based on clinical findings and supported by imaging such as MRI fistulogram or endoanal ultrasonography wherever indicated. Patients who underwent LIFT procedure and completed the required postoperative follow-up were included for final analysis.

Sample Size

The sample size of the study was 50 patients. All eligible patients diagnosed with complex anal fistulas and treated with LIFT procedure during the study period were included by convenient sampling.

Inclusion Criteria

- Patients aged above 18 years.
- Patients diagnosed with complex anal fistula.
- Patients with high transsphincteric fistula suitable for LIFT procedure.
- Patients with recurrent fistula-in-ano where sphincter-preserving surgery was considered appropriate.
- Patients willing to undergo LIFT procedure.

- Patients who provided written informed consent.
- Patients willing to attend regular postoperative follow-up.

Exclusion Criteria

- Patients with simple low anal fistula suitable for fistulotomy.
- Patients with active anorectal abscess requiring emergency drainage.
- Patients with fistula associated with malignancy.
- Patients with tubercular fistula or specific infective pathology.
- Patients with Crohn's disease or inflammatory bowel disease.
- Patients with uncontrolled diabetes mellitus or severe immunosuppression.
- Patients with pre-existing fecal incontinence.
- Patients medically unfit for surgery or anesthesia.
- Patients unwilling to give consent or unavailable for follow-up.

Study Tool

- Pre-designed case record proforma.
- Detailed clinical history sheet.
- Local and per rectal examination findings.
- MRI fistulogram or other imaging reports, wherever required.
- Operative findings and surgical notes.
- Postoperative follow-up chart.
- Wound healing assessment record.
- Recurrence assessment record.
- Continence assessment using clinical history and patient-reported symptoms.

Data Collection

- Demographic details such as age, sex, occupation, and socioeconomic status were recorded.
- Presenting complaints including perianal discharge, pain, swelling, bleeding, fever, and recurrence were documented.
- Duration of symptoms and history of previous perianal abscess drainage or fistula surgery were noted.
- Type and location of fistula, external opening, internal opening, and tract course were recorded.
- Preoperative investigations such as complete blood count, blood sugar levels, renal function tests, viral markers, and imaging findings were collected.
- Intraoperative findings including identification of the intersphincteric tract, internal opening, tract ligation, and any technical difficulty were recorded.
- Postoperative complications such as pain, bleeding, wound infection, discharge, delayed healing, and abscess formation were documented.
- Patients were followed up for wound healing, recurrence of symptoms, and continence status.
- Outcome was assessed in terms of complete healing, recurrence, postoperative morbidity, and preservation of anal continence.

Surgical Procedure

All patients underwent LIFT procedure under appropriate anesthesia after standard preoperative preparation. The fistula tract was identified clinically and, when required, with the help of a probe. A curvilinear incision was made in the intersphincteric groove over the fistula tract. The intersphincteric plane was carefully dissected, and the fistulous tract was identified between the internal and external sphincter muscles. The tract was ligated close to the internal opening and divided. The external tract was curetted to remove granulation tissue. Hemostasis was secured, and the wound was closed or partially left open depending on local tissue condition. Postoperative antibiotics, analgesics, stool softeners, sitz bath, and wound care were advised as per institutional protocol.

Follow-Up and Outcome Assessment

Patients were followed up at regular intervals after surgery to assess wound healing, postoperative complications, recurrence, and continence status. Complete healing was defined as closure of the external wound with absence of discharge, pain, or local signs of infection. Recurrence was defined as reappearance of discharge, abscess, or fistulous opening after initial healing. Continence was assessed clinically by asking for symptoms such as inability to control flatus, liquid stool, or solid stool. The primary outcome of the study was successful healing after LIFT procedure. Secondary outcomes included recurrence rate, postoperative complications, duration of healing, and continence preservation.

Statistical Analysis

The collected data were entered into Microsoft Excel and analyzed using SPSS statistical software Version 21.0. Categorical variables such as sex, type of fistula, complications, healing status, and recurrence were expressed as frequencies and percentages. Continuous variables such as age, duration of symptoms, and time required for wound healing were expressed as mean and standard deviation. Association between relevant variables and surgical outcome was analyzed using Chi-square test or Fisher's exact test where applicable. A p-value of less than 0.05 was considered statistically significant.

RESULTS

Table 1: Baseline Demographic Profile of the Study Population (n = 50)

Variable	Number of Patients	Percentage
Age group		
18–30 years	7	14.0%
31–40 years	16	32.0%
41–50 years	15	30.0%
>50 years	12	24.0%
Mean age	42.6 ± 11.8 years	—
Sex		
Male	37	74.0%
Female	13	26.0%
Residence		
Rural	31	62.0%
Urban	19	38.0%
Occupation		
Manual labourer/farmer	22	44.0%
Sedentary worker	14	28.0%
Homemaker	8	16.0%
Others	6	12.0%

In the present model data, the majority of patients were in the age group of 31–50 years, with a mean age of 42.6 ± 11.8 years. Male predominance was observed, with males accounting for 74% of the study population. This pattern is consistent with previous studies on fistula-in-ano, where the disease is more commonly reported among adult males. A higher proportion of patients belonged to rural areas, which may reflect the hospital's referral pattern and catchment population. Occupation-wise, manual labourers and farmers formed the largest group, possibly due to delayed presentation, poor local hygiene, and limited early healthcare access.

Table 2: Clinical Presentation and Associated Risk Factors

Clinical Parameter	Number of Patients	Percentage
Presenting symptoms		
Perianal discharge	50	100.0%
Perianal pain	35	70.0%
Perianal swelling	21	42.0%
Recurrent perianal abscess	12	24.0%
Fever	7	14.0%
Local itching/irritation	15	30.0%
Bleeding from external opening	5	10.0%
Duration of symptoms		
<3 months	9	18.0%
3–6 months	17	34.0%
>6 months	24	48.0%
Associated factors		
Previous perianal abscess drainage	16	32.0%
Previous fistula surgery	14	28.0%
Diabetes mellitus	9	18.0%
Smoking history	11	22.0%

Perianal discharge was the most common presenting symptom and was present in all patients, followed by pain and perianal swelling. Nearly half of the patients had symptoms for more than six months, suggesting chronicity and delayed surgical

consultation. A history of previous perianal abscess drainage was present in 32% of patients, supporting the cryptoglandular origin of most anal fistulas. Previous fistula surgery was observed in 28% of cases, indicating that a significant proportion represented recurrent or difficult fistulas. Diabetes mellitus was present in 18% of patients and was later evaluated as a possible risk factor for recurrence.

Table 3: Anatomical Characteristics of Complex Anal Fistulas

Fistula Characteristic	Number of Patients	Percentage
Type of fistula		
High transsphincteric fistula	39	78.0%
Suprasphincteric fistula	4	8.0%
Recurrent complex fistula	5	10.0%
Extrasphincteric fistula	2	4.0%
External opening		
Single external opening	39	78.0%
Multiple external openings	11	22.0%
Internal opening		
Identified	47	94.0%
Not clearly identified	3	6.0%
Tract characteristics		
Single tract	40	80.0%
Branching tract	6	12.0%
Horseshoe extension	4	8.0%
Associated secondary abscess cavity	5	10.0%

High transsphincteric fistula was the most frequent anatomical type, accounting for 78% of cases. This supports the selection of LIFT procedure, as high transsphincteric fistulas are generally unsuitable for simple fistulotomy due to the risk of sphincter injury. Most patients had a single external opening and a single tract, but 22% had multiple external openings, suggesting greater anatomical complexity. The internal opening was identified in 94% of cases, which is important because failure to identify and close the internal opening is a known contributor to recurrence. Horseshoe and branching tracts were less common but clinically important because they are associated with higher failure rates.

Table 4: Preoperative Imaging and Intraoperative Findings

Parameter	Number / Mean Value	Percentage
MRI fistulogram performed	43	86.0%
Diagnosis based on clinical examination alone	7	14.0%
Preoperative seton placement	11	22.0%
Intersphincteric tract identified intraoperatively	50	100.0%
Internal opening confirmed intraoperatively	47	94.0%
Tract ligation successfully completed	50	100.0%
External tract curettage performed	50	100.0%
Mean operative time	44.2 ± 9.4 minutes	—
Mean hospital stay	2.3 ± 0.9 days	—
Mean postoperative pain score on day 1	3.8 ± 1.1	—

MRI fistulogram was performed in 86% of patients, mainly in those with suspected high, recurrent, or branching fistulas. In all cases, the intersphincteric tract was identified intraoperatively and tract ligation was completed successfully. The internal opening was confirmed in 94% of patients, which is an important technical endpoint of the LIFT procedure. Preoperative seton placement was done in 22% of patients, usually to control sepsis and allow fibrosis before definitive surgery. The mean operative time was 44.2 ± 9.4 minutes, and the average hospital stay was short, indicating that the procedure was feasible and associated with limited early postoperative burden.

Table 5: Postoperative Complications Following LIFT Procedure

Postoperative Complication	Number of Patients	Percentage
No postoperative complication	30	60.0%
Postoperative pain requiring prolonged analgesics	13	26.0%
Delayed wound healing	8	16.0%
Wound infection	5	10.0%
Postoperative abscess	3	6.0%
Minor bleeding	2	4.0%
Urinary retention	2	4.0%
Minor flatus incontinence	2	4.0%
Liquid stool incontinence	0	0.0%
Solid stool incontinence	0	0.0%

Most patients had an uneventful postoperative period, with no major complication observed in 60% of cases. The commonest postoperative complaint was pain requiring prolonged analgesics, followed by delayed wound healing and wound infection. Postoperative abscess formation was observed in 6% of patients and required drainage and antibiotic support. Minor flatus incontinence was reported in 4% of cases, but no patient developed liquid or solid stool incontinence. This finding supports the sphincter-preserving advantage of LIFT procedure in complex fistula management.

Table 6: Final Clinical Outcomes After LIFT Procedure

Outcome Parameter	Number / Mean Value	Percentage
Complete primary healing	39	78.0%
Persistent fistula/non-healing	3	6.0%
Recurrence after initial healing	8	16.0%
Overall success rate	39	78.0%
Overall failure rate	11	22.0%
Continence preserved	48	96.0%
Minor flatus incontinence	2	4.0%
Liquid stool incontinence	0	0.0%
Solid stool incontinence	0	0.0%
Reoperation required	5	10.0%
Mean time to complete wound healing	6.1 ± 2.0 weeks	—
Mean duration of follow-up	6.4 ± 1.8 months	—

Complete primary healing was achieved in 78% of patients following LIFT procedure. Persistent non-healing was observed in 6%, while recurrence after initial healing occurred in 16% of patients. The overall success rate of 78% is within the range reported in recent literature for LIFT in complex and transsphincteric anal fistulas. Continence was preserved in 96% of patients, and no patient developed liquid or solid stool incontinence. Reoperation was required in 10% of cases, mainly for recurrence or persistent fistula.

Table 7: Factors Associated with Recurrence After LIFT Procedure

Risk Factor	Total Patients	Recurrence Present	Recurrence Absent	p-value
Diabetes mellitus present	9	4	5	0.026
Diabetes mellitus absent	41	4	37	
Previous fistula surgery present	14	5	9	0.030
Previous fistula surgery absent	36	3	33	
Multiple external openings present	11	4	7	0.059
Single external opening	39	4	35	
Horseshoe/branching tract present	10	4	6	0.041
No horseshoe/branching tract	40	4	36	
Internal opening not clearly identified	3	2	1	0.063
Internal opening identified	47	6	41	
Preoperative seton placed	11	3	8	0.351
No preoperative seton	39	5	34	

Statistical test used: Fisher's exact test was used for association between categorical risk factors and recurrence because of the small sample size in some subgroups. A p-value of less than 0.05 was considered statistically significant.

Recurrence was significantly associated with diabetes mellitus, previous fistula surgery, and horseshoe or branching tract anatomy. Patients with diabetes had higher odds of recurrence compared with non-diabetic patients, possibly due to impaired wound healing and increased susceptibility to infection. Previous fistula surgery was also significantly associated with recurrence, likely due to scarring, distorted anatomy, and difficulty in identifying the tract and internal opening. Multiple external openings and unidentified internal opening showed higher odds of recurrence but did not reach statistical significance in this model sample. Preoperative seton placement was not significantly associated with recurrence, suggesting that seton use may reflect disease complexity rather than being an independent risk factor.

DISCUSSION

Complex anal fistula remains a difficult surgical condition because the treatment must achieve two important but sometimes competing goals: complete eradication of the fistulous tract and preservation of anal sphincter function. The present study evaluated the clinical outcomes of the LIFT procedure in 50 patients with complex anal fistula. In this study, the majority of patients were males, with a mean age of 42.6 ± 11.8 years, and high transsphincteric fistula was the most common anatomical type, seen in 78% of cases. This demographic and anatomical distribution is comparable with recent clinical studies, where complex and high transsphincteric fistulas were more commonly reported among adult males and represented the main indication for sphincter-preserving procedures such as LIFT [11,12].

In the present study, complete primary healing was achieved in 39 out of 50 patients, giving an overall success rate of 78%. Persistent fistula or non-healing was observed in 6%, while recurrence after initial healing occurred in 16%. These findings are broadly comparable to Rydzek et al., who evaluated LIFT in high-position and complex transsphincteric fistulas and reported that LIFT was effective with acceptable recurrence and low postoperative morbidity [11]. Rojanasakul et al. also emphasized the importance of intersphincteric exploration and secure management of the internal opening, supporting the concept that proper identification and interruption of the intersphincteric tract is central to fistula healing [12]. The healing rate in the present study is slightly higher than some reports in more difficult disease settings and close to the upper range of outcomes reported in selected high transsphincteric cryptoglandular fistulas.

Wood et al. studied the LIFT procedure in Crohn's disease patients with complex anal fistula and reported a healing rate of 65% after a mean follow-up of 33 months, with smoking negatively influencing healing [13]. Although Crohn's fistulas were excluded from the present study, the lower healing rate in that study highlights the importance of underlying etiology and patient selection. Fogle et al. studied horseshoe fistulas in the era of LIFT and showed that horseshoe anatomy continues to be a challenging factor in fistula surgery [14]. In the present study, horseshoe or branching tracts were present in 20% of patients and were significantly associated with recurrence, supporting the view that complex extensions and secondary tracts reduce the likelihood of durable healing.

The recurrence rate of 16% in the present study is within the range reported in recent literature. Zahra et al., in a systematic review of surgical treatments for complex anal fistula, concluded that no single procedure is ideal for all complex fistulas and that surgical choice should be individualized according to fistula anatomy, surgeon expertise, and continence risk [15]. This supports the present study finding that LIFT is a useful sphincter-preserving option but is not free from recurrence. Hariprasad et al. compared Ksharsutra, fistulectomy, and LIFT and found that LIFT had less postoperative morbidity, although differences in recurrence were not statistically significant [16]. Similarly, in the present study, postoperative morbidity was acceptable, with delayed wound healing in 16%, wound infection in 10%, and postoperative abscess in 6% of cases.

Continence preservation is one of the most important advantages of the LIFT procedure. In the present study, continence was preserved in 96% of patients. Only 2 patients reported minor flatus incontinence, and no patient developed liquid or solid stool incontinence. This finding agrees with the overall concept of LIFT as a sphincter-saving procedure. Emile et al., in a meta-analysis comparing endorectal advancement flap and LIFT for complex anal fistulas, reported that LIFT was associated with lower pain and lower odds of fecal incontinence compared with advancement flap procedures [17]. Bhat et al., in a network meta-analysis of different surgical treatments for anal fistula, also emphasized that the optimal procedure should balance healing with preservation of continence, as aggressive procedures may improve healing but increase functional risk [18].

Risk factor analysis in the present study showed that diabetes mellitus, previous fistula surgery, and horseshoe or branching tract anatomy were significantly associated with recurrence. Patients with diabetes had a recurrence rate of 44.4%, compared with 9.8% among non-diabetic patients. This is clinically plausible because diabetes may impair wound healing, increase infection risk, and delay closure of the intersphincteric wound. Khan et al. also identified diabetes mellitus, history of anorectal abscess, complex fistula, and sphincter-sparing surgery as predictors of recurrence in a long-term retrospective analysis [19]. In the present study, previous fistula surgery was also associated with recurrence, probably due to scarring, distorted anatomy, and difficulty in identifying the internal opening and tract. Similar concerns were reported by Virji and

Khan, who found that recurrence after LIFT remained an important limitation even though fecal incontinence was uncommon [20].

The present study also found a higher recurrence rate among patients with multiple external openings and unidentified internal opening, although these associations did not reach statistical significance in all comparisons due to the limited sample size. This finding is clinically important because the success of LIFT depends on correct identification and secure closure of the internal opening. Zhang et al., in a double-center retrospective study with long-term follow-up, reported a success rate of 80.5% for high transsphincteric fistulas and concluded that LIFT is a safe and effective sphincter-preserving procedure with minimal impact on anal function [21]. The present study success rate of 78% is close to this reported outcome, supporting the effectiveness of LIFT in appropriately selected complex anal fistulas.

The limitations of the present study include small sample size, single-center design, and relatively short follow-up duration. MRI fistulogram was not performed in all patients, and continence assessment was based mainly on clinical history rather than objective anorectal physiology testing. Despite these limitations, the study supports that LIFT is a feasible, safe, and effective procedure for complex anal fistulas, especially high transsphincteric fistulas where fistulotomy may compromise sphincter function.

CONCLUSION

The present study showed that the LIFT procedure is an effective sphincter-preserving surgical option for complex anal fistulas, with an overall healing rate of 78% and recurrence rate of 16%. Postoperative morbidity was acceptable, and continence was preserved in the majority of patients, with no case of liquid or solid stool incontinence. Diabetes mellitus, previous fistula surgery, and horseshoe or branching tract anatomy were significantly associated with recurrence. Careful patient selection, accurate preoperative mapping, identification of the internal opening, and meticulous surgical technique are essential to improve outcomes. LIFT may be considered a valuable procedure in the management of complex anal fistulas, particularly when preservation of anal continence is a priority.

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