

ORIGINAL RESEARCH

Assessing the Long-term Efficacy of Ligation of Inter-sphincteric Fistula Tract (LIFT) in the Management of Trans-sphincteric Anal Fistula

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Received: 19 August, 2023

Accepted: 22 September, 2023

ABSTRACT

Background: Following the formation of an abscess, the development of an anal fistula often ensues, typically attributed to a crypto-glandular infection. This study aimed to assess the impact of closing the inter-sphincteric fistula tract on the overall outcome of trans-sphincteric fistula surgery. **Methods:** In this prospective cohort study, patients diagnosed with perianal trans-sphincteric fistulas were subjected to ligation of the inter-sphincteric fistula tract (LIFT). All participants received the same anesthetic approach, and the study involved a two-year follow-up period after the LIFT procedure. **Results:** The length of the fistulous tract significantly influenced the outcome, while the presence of piles alongside the fistula in the studied patients did not impact the results. The average operative time was 30.2 minutes, and postoperative pain was generally mild for most patients. The concurrent presence of anal fissure or piles did not affect the final outcome of the LIFT procedure. The average time for wound healing was four weeks. Among the patients, 6 had hidradenitis suppurativa, and no unusual histopathological findings were observed in the excised parts. **Conclusion:** Ligation of the inter-sphincteric fistula tract (LIFT) emerged as an effective and uncomplicated sphincter-preserving technique for the treatment of straightforward trans-sphincteric anal fistulas, showcasing excellent long-term control. However, further studies with a larger patient cohort are necessary to comprehensively evaluate the efficacy of this surgical approach for trans-sphincteric fistulas.

Keywords: fistula, hidradenitis, anesthetic, piles.

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INTRODUCTION

An anal fistula is an abnormal connection that forms between the mucosa of the anal canal and the perianal skin.¹ This condition is commonly a consequence of an infection in the anal glands, leading to the development of an abscess and subsequent fistula formation, a phenomenon often explained by the crypto-glandular theory. The classification of anal fistulas depends on their relationship with the sphincters, encompassing inter-sphincteric, trans-sphincteric, supra-sphincteric, and extra-sphincteric categories. Various factors, including trauma and specific pathologies such as cancer, inflammatory bowel disease, tuberculosis, and peri-anal

actinomycosis, may contribute to the development of fistula-in-ano. The paramount goal in treating fistula-in-ano is to achieve healing with a low recurrence rate and minimal risk of incontinence. Currently, surgical treatment and fistulotomy are the procedures of choice for the vast majority of cases.² However, when dealing with more complex fistulas using the same surgical approach, healing may still be attainable, albeit with differing levels of fecal incontinence. As medical knowledge advances, ongoing research and clinical studies are crucial to refining treatment strategies and exploring alternative approaches for managing anal fistulas, particularly those of a more intricate nature.

In addressing the challenge of achieving comparable cure rates to fistulotomy while mitigating the risk of fecal incontinence in more complex cases, several alternative procedures have been explored within the medical community.³ Despite these efforts, a clear and optimal alternative has yet to be unequivocally identified. In 2007, Rojanasakul and colleagues proposed a novel therapeutic strategy for such complex cases, offering encouraging initial results. This strategy involved the application of the LIFT (Ligation of the Intersphincteric Fistula Tract) technique, which has since garnered attention for its potential advantages. Notably, the LIFT technique has demonstrated effectiveness in achieving outcomes comparable to traditional methods, without the theoretical risk of causing fecal incontinence.⁴ This theoretical advantage stems from the fact that the LIFT procedure does not involve the division of any part of the sphincter. The LIFT technique involves the identification and ligation of the intersphincteric fistula tract, aiming to promote healing while preserving sphincter integrity. Several studies have reported favorable results with the LIFT procedure, highlighting its potential as a valuable alternative in the surgical management of anal fistulas. Its applicability extends to patients with Crohn's disease and anal fistulas, where the LIFT technique has demonstrated a higher rate of healing, suggesting its efficacy in challenging clinical scenarios. However, it is essential to acknowledge that while the LIFT technique holds promise, further research is needed to establish its long-term efficacy, safety profile, and suitability for a diverse range of patients.^{5,6} Comparative studies against traditional methods and other emerging techniques will contribute to a more comprehensive understanding of the LIFT procedure's place in the spectrum of anal fistula treatments. Continuous exploration and refinement of surgical approaches underscore the dynamic nature of medical advancements in addressing complex conditions such as anal fistulas.

Ligation of the Intersphincteric Fistula Tract (LIFT) is a progressive and patient-centric surgical technique that has gained prominence in the realm of anal fistula management. Recognizing the complexities and potential complications associated with traditional approaches, the LIFT procedure is meticulously designed to address anal fistulas while minimizing the risk of postoperative fecal incontinence—a critical consideration for patients seeking not only resolution of their condition but also preservation of optimal bowel function.⁷ The LIFT procedure unfolds with a thorough identification of the intersphincteric fistula tract, the abnormal channel that connects the anal canal mucosa to the perianal skin. Once this pathway is pinpointed, the surgeon employs a ligating or tying-off approach to effectively close the fistula tract. What sets LIFT apart is its unique emphasis on the preservation of the anal sphincters. Unlike certain conventional techniques that involve cutting or

dividing parts of the sphincters, LIFT operates on the theoretical premise that by avoiding such interventions, the risk of postoperative fecal incontinence is significantly reduced. This nuanced approach aligns with the overarching goal of ensuring that patients not only recover from their condition but do so with minimal impact on their quality of life. Scientific literature and clinical experiences have consistently demonstrated positive outcomes with the LIFT procedure. It has proven to be as effective as, if not superior to, traditional surgical techniques in addressing a spectrum of anal fistulas, ranging from simpler cases to more complex scenarios. The adaptability of the LIFT technique positions it as a valuable alternative, particularly in situations where preserving sphincter function is paramount for long-term patient well-being. Furthermore, the success of the LIFT technique extends to challenging cases, such as anal fistulas associated with Crohn's disease. The encouraging results obtained in these instances underscore the potential of LIFT to navigate and achieve positive outcomes in complex clinical scenarios that often pose unique challenges.⁸ Despite its success, ongoing research is imperative to solidify the long-term efficacy and safety profile of LIFT across diverse patient populations. Comparative studies that systematically evaluate LIFT against existing surgical methods contribute to a nuanced understanding of its role in the broader treatment landscape of anal fistulas. In essence, LIFT represents a significant leap forward in the surgical management of anal fistulas. Its patient-centric approach, aiming for both effective resolution and preservation of functional outcomes, positions it as a valuable addition to the evolving repertoire of surgical interventions for anal fistulas. As medical knowledge continues to advance, LIFT exemplifies the commitment to refining and tailoring treatments to enhance patient outcomes and experiences in the realm of colorectal surgery.

MATERIALS AND METHODS

This prospective study unfolded within the confines of the general surgery department, spanning a duration of one year subsequent to obtaining ethical approval. The meticulous inclusion criteria were tailored to incorporate both male and female participants harboring trans-sphincteric peri-anal fistulas, as validated by MRI fistulogram, emanating from a crypto-glandular source. Notably, individuals with no precedent of fistula surgery were deemed eligible for inclusion, emphasizing the study's focus on primary occurrences. Conversely, exclusion criteria encompassed patients with recurrent fistulae, those grappling with specific pathologies like Crohn's disease, and individuals with alternative types of peri-anal fistulas. Any participant presenting with severe or unusual skin manifestations in the perianal area, such as marked redness, soreness, crust, or severe itching around the anal opening, underwent a thorough

dermatology consultation to ensure a comprehensive understanding of their condition. Prior to any involvement in the study, participants underwent a critical step of informed written consent, emphasizing ethical standards and respect for individual autonomy in the research process.

The surgical technique adopted for all cases was executed under spinal block anesthesia coupled with morphine administration. The methodical sequence involved fistula identification through the injection of hydrogen peroxide (H₂O₂) into the external opening, concomitant with an anoscope examination to identify the internal opening within the anal canal. A metallic probe was then employed for precise probing of the fistulous tract, aiding in its accurate identification within the intersphincteric plane. Following this, a perpendicular skin incision, approximately 1 cm in length, was performed at the intersphincteric zone. Dissection between the internal and external sphincters ensued, further facilitating the identification of the fistula. Subsequent steps included ligation and transection of the tract within the intersphincteric space, followed by excision of a segment for subsequent histopathological examination. A trans-fixation suture was strategically applied near the internal mucosal opening of the divided tract using polyglactin suture 2/0 to ensure closure, and the insertion of a probe served to verify the closure of the tract segments. The residual part of the tract underwent curettage up to the external opening and was left for spontaneous healing. The internal opening at the crypt was meticulously cauterized using electrocautery.

The postoperative phase was characterized by a thorough outpatient follow-up, during which several crucial parameters were evaluated. These included the occurrence of peri-operative infection, the duration of

healing, levels of discomfort experienced by patients, alterations in fecal continence, and the potential recurrence of the fistula. This meticulous assessment aimed to provide a comprehensive understanding of the outcomes and challenges associated with the surgical approach employed in this study, contributing valuable insights to the evolving landscape of anal fistula management.

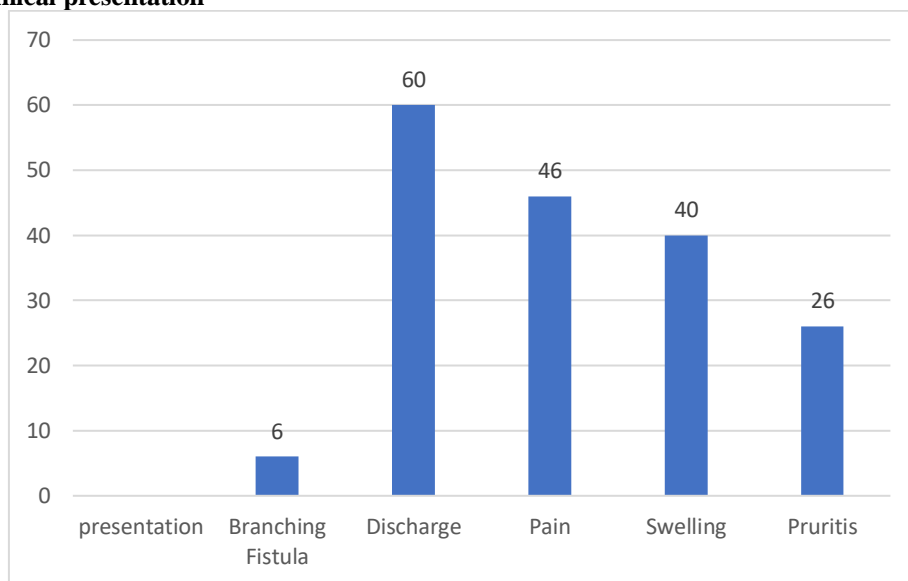
RESULTS

The study group's characteristics, encompassing socio-demographic data, comorbidities, and primary presenting complaints, are succinctly presented in Table (1). This tabular representation offers a consolidated view of participant backgrounds, existing health conditions, and the primary reasons motivating them to seek medical attention. The table likely includes details such as age, gender distribution, and potentially additional socio-economic factors, shedding light on the diverse makeup of the study population. Comorbidities, denoting pre-existing health issues, are outlined to provide insights into the participants' overall health status. Additionally, the main presenting complaints section elucidates the primary symptoms or concerns that prompted individuals to participate in the study, offering a clinical perspective on the research cohort. Presenting this information in tabular form serves to streamline access to crucial details, allowing researchers and readers to efficiently grasp the socio-demographic diversity, prevalent comorbidities, and key health concerns within the study group. This contextualization is pivotal for a comprehensive understanding of the study's findings, facilitating the identification of patterns, potential influencing factors, and the broader health context in which the research is situated.

Table 1: Demographic data and clinical presentation

Variable	Value
Age(Years)	40.6
Sex	
Male	32
Female	28
BMI(kg/m ²)	37.2
Co-morbidities	
Diabetesmellitus	10(16.67%)
presentation	
BranchingFistula	6
Discharge	60
Pain	46
Swelling	40
Pruritis	26

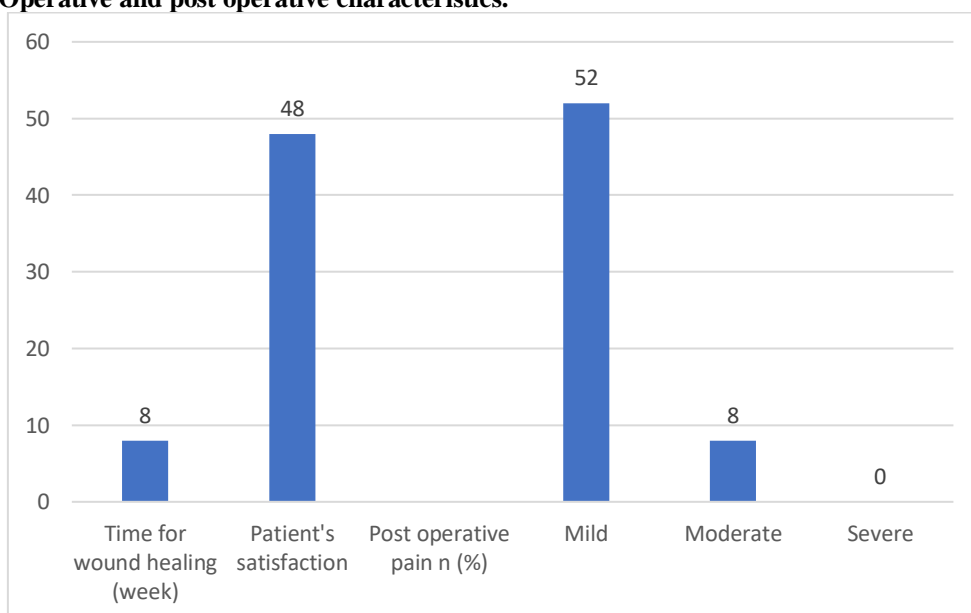
Figure1: Clinical presentation



The average age of all patients in the post-operative non-complicated group, comprising 48 individuals, was 40.2 years, with an equal distribution between males and females (1:1 male-to-female ratio). In contrast, among those in the complicated group experiencing post-operative recurrence (12 patients), the mean age was slightly higher at 40.9 years, with a male-to-female ratio of 2:1. An interesting observation was noted in the incidence of recurrent fistula, particularly in patients with branching fistulas compared to those with a single tract. Although the former group exhibited a higher recurrence rate, this difference was statistically insignificant, primarily attributed to the lower number of patients with branching fistulas in the study cohort. Significant variations were identified in terms of body mass index (BMI) and the presence of diabetes mellitus (DM)

between the non-complicated and complicated groups. The observed high significance underscores the potential influence of these factors on the development of post-operative complications and recurrence in anal fistula cases. These findings shed light on age, gender distribution, fistula characteristics, and associated health conditions as factors that may impact the outcomes of post-operative cases. The distinction in recurrence rates based on fistula branching, although statistically inconclusive in this study due to the smaller sample size, warrants further exploration in larger cohorts. Moreover, the substantial differences in BMI and the prevalence of diabetes mellitus emphasize the need for a holistic understanding of patient demographics and health status when evaluating outcomes in anal fistula surgeries.

Figure2: Operative and post operative characteristics.



DISCUSSION

In the pursuit of an ideal surgical procedure for anal fistulas, considerations extend beyond mere closure of the fistula tract and preventing its recurrence.⁹ A paramount concern is the preservation of anal sphincter function, crucial for ensuring optimal continence outcomes. In this context, the LIFT (Ligation of the Intersphincteric Fistula Tract) procedure has emerged as a noteworthy technique, distinguished by its commitment to sphincter preservation, thus minimizing the risk of postoperative incontinence. Our assessment of the LIFT procedure revealed its effectiveness as a straightforward technique in managing simple trans-sphincteric anal fistulas, showcasing an impressive track record of long-term control over trans-sphincteric fistulas. This aligns seamlessly with the overarching goal of achieving durable and favorable outcomes for patients undergoing anal fistula surgery. Notably, one of the standout features of the LIFT procedure is its minimal impact on anal sphincter function. Unlike certain traditional techniques that may involve cutting or dividing parts of the sphincters, LIFT operates on the principle of avoiding sphincter injury altogether.¹⁰ This characteristic plays a pivotal role in maintaining continence and significantly contributes to the procedure's attractiveness in the surgical landscape. Our study delved into the procedural aspects of LIFT, revealing a mean operating time of 36 minutes. This aligns with the findings of comparable studies, such as the work by Sileri et al., establishing the LIFT procedure as not only effective but also efficient with a relatively short and reasonable operative duration. This efficiency is a notable advantage, contributing to the practicality and feasibility of the LIFT technique in a clinical setting. Another distinct advantage highlighted in our study is the median time for wound healing, which stood at 4 weeks. This rapid healing timeframe is consistent with observations from other research, including the work by Sirikurnpiboon and colleagues. The relatively small wound in the inter-sphincteric groove, a characteristic of the LIFT technique, contributes to this accelerated healing process. In essence, the LIFT procedure, through its emphasis on sphincter preservation, efficient operative time, and expedited wound healing, emerges as a promising and patient-friendly option in the surgical management of anal fistulas. As the medical community continues to refine and enhance surgical approaches, LIFT stands as a testament to the ongoing pursuit of techniques that not only address the primary pathology effectively but also prioritize the overall well-being and functional outcomes for patients.^{11,12}

In the context of our study, an essential dimension of postoperative care involved a comprehensive evaluation of patient satisfaction following the LIFT (Ligation of the Intersphincteric Fistula Tract) procedure. Remarkably, a noteworthy 80% of all

cured patients expressed satisfaction with their post-surgical experience. This high satisfaction rate can be attributed to the inherent advantages of the LIFT technique, particularly its association with minimal tissue injury. This characteristic not only accelerates the recovery process but also facilitates an earlier return to work and significantly shortens the overall healing time. A pivotal factor contributing to the observed satisfaction is the meticulous avoidance of anal sphincter division during the LIFT procedure. By preserving the integrity of the anal sphincters, the LIFT technique minimizes the risk of postoperative incontinence, a critical aspect that directly impacts patient comfort and well-being.¹³ This preservation of continence is a significant contributor to the positive experiences reported by individuals who underwent the LIFT procedure in our study. Furthermore, the statistical analysis conducted in our study revealed a noteworthy improvement in the quality of life for patients at both the 2-week and 4-week postoperative milestones. This tangible enhancement in the overall well-being of individuals undergoing the LIFT procedure underscores the procedure's positive impact on patients' lives in the immediate aftermath of surgery. Our findings align closely with those of Sileri et al., whose study similarly explored patient satisfaction at various intervals (1, 2, and 4 weeks) post-surgery. The parallel nature of these results reinforces the consistency of positive patient experiences following the LIFT procedure across different studies, substantiating the reliability and reproducibility of the outcomes. The emphasis on patient satisfaction within our study reflects the broader shift in medical research towards patient-centered outcomes. Beyond the efficacy of the LIFT procedure in treating anal fistulas, its ability to enhance patient satisfaction through minimized tissue trauma, preserved continence, and an overall positive impact on quality of life highlights its potential as a patient-centric approach in the surgical management of anal fistulas. As the medical community continues to prioritize the holistic well-being of patients, studies like ours provide valuable insights into the real-world implications and patient-reported benefits of specific surgical techniques.

In our present study, the assessment of post-operative pain revealed a mild intensity, particularly when compared to the postoperative pain experienced after other anal operations.¹⁴ This observation could account for the limited documentation of postoperative pain in many studies focusing on the LIFT (Ligation of the Intersphincteric Fistula Tract) technique. The mild postoperative pain reported in our study adds to the growing body of evidence highlighting the favorable pain outcomes associated with the LIFT procedure. Examining the efficacy of the LIFT technique, Romaniszyn and Walega conducted a study specifically investigating its effectiveness for branching and recurrent anal fistulas. Their findings demonstrated that LIFT resulted in the

healing of branching anal fistulas in nearly half of the patients, all while maintaining low morbidity. They concluded that LIFT is a safe and effective option for patients with branching and recurrent anal fistulas, producing results comparable or even superior to other sphincter-preserving techniques. Notably, the long-term recurrence rate after LIFT for trans-sphincteric fistulas was found to be lower than previously reported results in related studies, further emphasizing the positive outcomes associated with the LIFT technique. In our study, the relationship between the length of the fistula tract and the likelihood of healing failure after the LIFT procedure was explored. Our results aligned with the findings of Anaraki and colleagues, who observed that longer fistula tracts correlated with a lower primary healing rate.¹⁵ Similarly, we identified an increase in recurrence rates with the greater distance between the anal verge and external opening. The number of tracks and the presence of diabetes mellitus were also identified as risk factors for recurrence in our study, suggesting their potential as indicators of the complexity of the fistula. This observation concurs with the broader consensus that the presence of multiple tracks, diabetes mellitus, peri-anal collections, and long tracks are associated with a higher likelihood of failure in the LIFT procedure. Notably, the absence of unusual histopathology results in routinely examined specimens led to the recommendation against routine histopathology for perianal fistula tissues in our study. This recommendation, supported by the lack of unusual pathology results in our cohort, is consistent with the findings of the Wijekoon and Samarasekera study, which recorded only three unusual pathology results out of 84 cases, all of which were recurrent fistulas.¹⁶ This collective evidence suggests that routine histopathology may not be necessary for all perianal fistula cases, with considerations given to situations where recurrence or clinical suspicion of underlying diseases, such as Crohn's disease or tuberculosis, are present. In summary, our study contributes to the growing body of evidence supporting the favorable outcomes of the LIFT technique, particularly in terms of postoperative pain, efficacy for branching and recurrent fistulas, and considerations for histopathological examinations. The findings underscore the potential of LIFT as a safe and effective sphincter-preserving approach in the surgical management of anal fistulas.

CONCLUSION

The LIFT (Ligation of the Intersphincteric Fistula Tract) procedure emerges as an effective and sphincter-preserving technique, demonstrating considerable success in achieving long-term control of simple trans-sphincteric perianal fistulas with low morbidity and favorable outcomes. The key determinant influencing the success rate of the LIFT procedure, as identified in our study, is the height of

the fistula. This finding underscores the importance of considering anatomical factors, such as the height of the fistula, in tailoring the approach to perianal fistula management. The success of the LIFT technique in cases of simple trans-sphincteric fistulas suggests its viability as a reliable surgical option, particularly in preserving sphincter function and minimizing morbidity. While our study contributes valuable insights into the effectiveness of LIFT, acknowledging the need for more extensive and comparable studies is crucial. Larger-scale investigations involving a diverse patient population can further validate the findings and help establish whether the LIFT procedure stands out as the optimal choice for simple trans-sphincteric perianal fistulas in comparison to other similar techniques. Comparative studies with robust sample sizes are essential for providing a comprehensive understanding of the procedural landscape, allowing clinicians to make informed decisions based on evidence-backed outcomes. In conclusion, the evidence from our study supports LIFT as a promising and effective option for the treatment of simple trans-sphincteric perianal fistulas. However, ongoing research efforts, encompassing larger cohorts and comparative analyses, will enhance our understanding of its standing in relation to other techniques. This collaborative pursuit of knowledge is essential for refining surgical approaches and optimizing patient outcomes in the management of perianal fistulas.

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