



EFFICACY OF LIGATION OF INTERSPHINCTERIC FISTULA TRACT (LIFT) PROCEDURE IN MANAGEMENT OF FISTULA-IN-ANO – A PROSPECTIVE OBSERVATIONAL STUDY

General Surgery

Monali Priyadarshini	Post Graduate Trainee Academic Junior Resident Department of General Surgery Kalinga Institute of Medical Sciences Bhubaneswar-24 Odisha
Sudhir Kumar Panigrahi*	Professor Department of General Surgery Kalinga Institute of Medical Sciences Bhubaneswar-24 *Corresponding Author
Saroj Kant Sahoo	Professor Department of General Surgery Kalinga Institute of Medical Sciences Bhubaneswar-24

ABSTRACT

An anal fistula is a common benign anal condition and its surgical treatment runs the risk of anal incontinence and recurrence rates. However, the Ligation of the intersphincteric Fistula Tract (LIFT) devised in 2007 results in zero sphincter damage and shorter hospital stay compared to conventional fistulotomy. The study aimed to find the efficacy of the LIFT procedure in patients suffering from trans-sphincteric fistula-in-ano in terms of wound infection, anal incontinence, and recurrence rate. A prospective, observational study was carried out among 40 patients of either sex diagnosed with anal fistula in the Department of Surgery, Kalinga Institute of Medical Sciences, Bhubaneswar over a period of about 2 years. Statistical analysis was done by student t-test. The mean age group was 42.48 ± 10.33 years and 90% were male. Out of all the trans sphincteric fistula-in-ano, 82.5% were posterior & 60.6% were posterior left side while the rest were anterior. The mean duration was 54.88 ± 10.17 mins. On average, hospital stay was 4.65 ± 1.37 days and the mean time to wound healing was 2.80 ± 1.02 weeks. Anal continence was 100% preserved in all patients. Only 3 (7.5%) patients had recurrence as observed at 6 months of follow-up. The LIFT procedure is an effective surgical procedure in terms of preventing wound infection and anal incontinence. The hospital stay was less, with early wound healing and a low pain score.

KEYWORDS

Intersphincteric fistula-in-ano, Ligation of the Intersphincteric Fistula Tract (LIFT), Anal incontinence

INTRODUCTION

Fistula-in-ano is a benign anorectal disorder that dates to antiquity with a prevalence of 12–28 per 100,000 per year with men predominating (M: F; sex ratio: 2:1). [1] & its prevalence rises between the ages of 30 and 50. [1] Due to the risk of recurrence and sphincter damage during surgery causing fecal incontinence (FI), the management of the fistula is challenging and demands a thorough anatomic knowledge of the region. The fistulotomy, or opening up the tract, is still regarded as the most effective surgery [2]. However, reports of postoperative incontinence range from 4 to 62%, with the average incidence being 13%. [2]

Several methods are suggested to treat the fistulas while maintaining continence. The incidence of FI is the same following primary fistulotomy and cutting setons depending on how complex the fistula is, ranging from 25.2 to 67% [4,5]. Sphincter-saving techniques for managing difficult anal fistulas include Seton implantation, fistula plug, anal advancement flap, Ligation of Intersphincteric Fistula Tract (LIFT), video-assisted anal fistula treatment, and laser ablation. [6] Rojansakul first invented the LIFT treatment in 2007. His initial success rates for this procedure were 94%. [7]

The objective of our study is to determine the efficacy of LIFT surgery by assessing the proportion of patients who are cured of anorectal sepsis, and also to study the success rate of preservation of anal continence and the reduction rate of the recurrence of fistula-in-ano.

MATERIALS AND METHODS

A prospective, observational study was conducted between November 2020 to October 2022 inclusive of 6 month follow-up period, after obtaining approval from the Institutional Ethics Committee (KIIT / KIMS / IEC / 478 /2020) at Department of General Surgery, Pradyumna Bal Memorial Hospital, Kalinga Institute of Medical Sciences, Bhubaneswar, Odisha. A total of 40 patients were included in the study as per the inclusion criteria. Patients between 18-60 years of age with non-specific cryptoglandular anal infections manifesting as trans sphincteric fistula as determined by fistulogram and/or MRI were included in the study.

Cases that were excluded were fistulas that are superficial or subcutaneous, recurrent fistula, anal fistulas following perianal surgery or trauma or radiation therapy, a complex fistula, often known as a horseshoe fistula, has numerous internal holes, actinomycosis, tuberculosis, cancer, and anorectal Crohn's disease. A proctoscopy examination was performed after a thorough history, general examination, systemic examination, and local examination to

determine the external perianal and internal openings, assessment of the anal sphincter tone by digital rectal examination, and evaluation of the underlying aggravating conditions. Fistulogram and/or Magnetic resonance imaging (MRI) were conducted in all cases.

Selected trans-sphincteric fistula cases were taken up for the LIFT surgery under spinal/general anesthesia with the appropriate pre-operative bowel preparation after receiving informed permission and preoperative assessment.

The details of the surgical procedures, difficulty in identifying the tract, site of the internal opening, course, and length of the tract, multiple tracts, an exit point of the external opening around the anal canal, and peri-operative complications related to anesthesia and surgery such as bleeding, sepsis, wound disruption, and anal incontinence, as well as post-operative care and recovery were studied and documented.

The patients were counselled for the OPD follow-up routine on post-operative days 30, 3, and 6 months to document the anal continence and fistula healing status. There were no intraoperative complications and immediate postoperative recovery was good. VAS Score was noted on different postoperative days. Patients were subjected to 1st, 3rd & 6th-month follow-up visits & surgical outcomes were measured. The presence of complications was noted.

Statistical Analysis was conducted by using –SPSS software in categorical data and Continuous data. Mean and standard deviation was used in continuous data and Categorical data was presented in the form of frequency and percentage. Significance level was measured between different procedures and different parameters by student t-test and a p-value less than 0.05 was considered to be significant.

RESULTS

Among all the 40 patients, the mean age was 42.48 ± 10.33 years with a minimum of 25 years and a maximum of 64 years. Age group-wise distribution suggested that 47.5% of patients were less than 40 years of age, while 25% of patients belonged to the 40 – 50 years and 27.5% were in the ≥ 50 years age bracket. The predominance of male participants was 90%. All the patients enrolled had trans sphincteric fistula-in-ano (100%). Out of them, 82.5% were posterior while the rest were anterior trans sphincteric fistula-in-ano. Among the posterior transsphincteric fistula-in-ano, 60.6% were left side. (Table 1)

Table 1: Fistula characteristics of the study participants (N= 40)

Characteristics	Frequency	Percentages
Type		
Anterior	7	17.5
Posterior	33	82.5
Side (n= 33)		
Right	13	39.4
Left	20	60.6

All the patients underwent the LIFT for Trans sphincteric Fistula-in-ano. The majority received spinal anesthesia (92.5%) while only 7.5% received general anesthesia. None of the patients had an intraoperative complication and all of the patients had a good post-operative recovery. Only 11 patients had some form of immediate postoperative complication, such as spinal headache (7.5%), postoperative nausea and vomiting (PONV-7.5%), and surgical site bleeding (5%). Details are given in Table 2 & Figure 1.

Table 2: Description of surgical procedure among the study participants (N = 40)

Characteristics	Frequency	Percentages
Type of anesthesia		
Spinal	37	92.5
General	3	7.5
Procedure		
LIFT	40	100
Intraoperative complication		
None	40	100
Postoperative recovery		
Good	40	100
Immediate post-operative complication		
Spinal headache	3	7.5
PONV	3	7.5
Surgical site bleeding	2	5.0

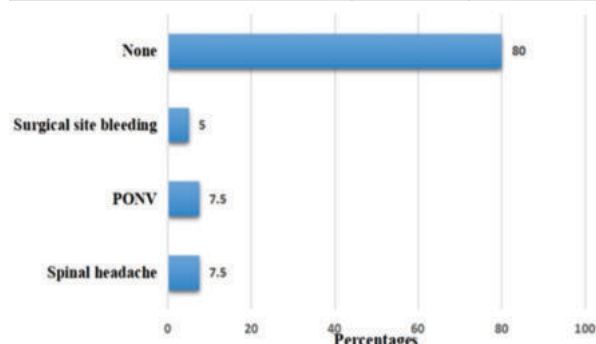


Figure 1- Frequency of postoperative complications among the study participants (N=40)

The mean duration of the surgical procedure was 54.88 ± 10.17 mins. On average, hospital stay was 4.65 ± 1.37 days, and the mean time to wound healing was 2.80 ± 1.02 weeks. The mean pain score was less at 3.87 ± 1.02 , as shown in table 3.

Table 3: Outcome of the surgical procedure among the study participants (N = 40)

Characteristics	Mean	SD
Duration of procedure (in mins)	54.88	10.17
Pain score	3.87	1.02
Day to discharge from hospital (days)	4.65	1.37
Wound healing time (in weeks)	2.80	1.02

At the first follow-up (after 1 month), 3 (7.5%) patients had mild wound infection but on subsequent visits, it subsided. Anal continence was preserved in all the patients at each follow-up. Only 3 (7.5%) patients had recurrence as observed at 6 months of follow-up. Details are given in Table 4 and Figure 2.

Table 4: Efficacy of the treatment procedure among the study participants (N = 40)

Characteristics	1st follow-up	2nd follow-up	3rd follow-up	P value
Wound infection	3 (7.5)	0 (0)	0 (0)	0.564
Anal continence	40 (100)	40 (100)	40 (100)	0.999
Recurrence	0 (0)	0 (0)	3 (7.5)	0.564

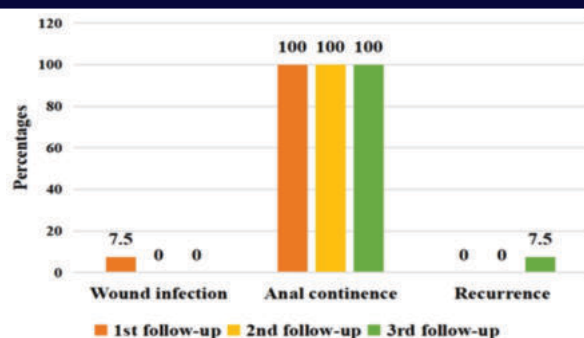


Figure 2: Bar graph showing the Efficacy of the treatment procedure among the study participants (N = 40)

Table 5: Association of age & gender with the outcome of the surgery

	Age < 40 years	Age ≥ 40 years	P value	Male	Female	P value
Type of fistula n(%)						
Anterior	3 (15.8)	4 (19.0)	0.787	6 (16.7)	1 (25.0)	0.552
Posterior	16 (84.2)	17 (81.0)		30 (83.3)	3 (75.0)	
Post-op complication n(%)						-
Spinal headache	2 (100)	1 (16.7)	0.108	3 (37.5)	0 (0)	
PONV	0 (0)	3 (50.0)		3 (37.5)	0 (0)	
Bleeding	0 (0)	2 (33.3)		2 (25.0)	0 (0)	
Wound infection n (%)	0 (0)	3 (14.3)	0.087	3 (8.3)	0 (0)	0.548
Recurrence n (%)	0 (0)	3 (14.3)	0.087	3 (8.3)	0 (0)	0.548
Duration of procedure (in mins)	53.63 ± 8.60	56.0 ± 11.49	0.469	54.31 ± 10.42	60.0 ± 6.05	0.294
Pain score	3.79 ± 0.97	3.95 ± 1.07	0.619	3.81 ± 1.03	4.50 ± 0.57	0.199
Day to discharge from hospital (days)	4.32 ± 1.25	4.95 ± 1.43	0.144	4.64 ± 1.43	4.75 ± 0.50	0.089
Wound healing time (in weeks)	2.58 ± 0.50	3.0 ± 1.30	0.195	2.86 ± 1.04	2.25 ± 0.50	0.260

Association of age & gender with the type of fistula, postoperative complication, wound infection, recurrence, duration of the procedure, pain score, hospital stay, and wound healing time was not found to be significant (Table 5)

Wound infection was significantly higher in the anterior fistula (28.3%) as compared to the posterior fistula (3.0%) (p-value=0.020). Similarly, the recurrence rate was significantly higher in the anterior fistula (28.3%) compared to the posterior fistula (3.0%) with a p-value of 0.020. The duration of the procedure was 66.71 ± 14.2 mins in anterior fistula patients while it was 52.36 ± 7.12 mins in the posterior fistula. This difference in the mean of the duration of surgery was statistically significant with p-value < 0.001. Similarly, pain score and day-to-discharge was significantly higher in anterior fistula patients compared to posterior fistula patients (P value < 0.05). We did not notice any statistically significant difference in complications and wound healing time with the location of transsphincteric fistula. (Table 6)

Table 6: Association of location of fistula with the outcome of the surgery

	Anterior	Posterior	P value
Post-op complication n (%)			
Spinal headache	0 (0)	3 (50.0)	0.108
PONV	2 (100.0)	1 (16.7)	
Bleeding	0 (0)	2 (33.3)	
Wound infection n(%)	2 (28.3)	1 (3.0)	0.020
Recurrence n(%)	2 (28.3)	1 (3.0)	0.020
Duration of procedure (in mins)	66.71 ± 14.2	52.36 ± 7.12	< 0.001
Pain score	4.86 ± 0.90	3.67 ± 0.92	0.004
Day to discharge from hospital (days)	5.71 ± 1.49	4.42 ± 1.25	0.021
Wound healing time (in weeks)	3.29 ± 1.60	2.70 ± 0.84	0.167

DISCUSSION

The current study was carried out to find the efficacy of the LIFT procedure in patients suffering from trans-sphincteric fistula-in-ano in terms of wound infection, anal incontinence, and recurrence rate. Surgical management of fistula-in-ano is the most practiced treatment modality as it provides complete eradication of fistula and anorectal sepsis. The major challenge is to maintain the sphincter muscle function.[8] Due to this factor, the efficacy of the surgery in patients with fistula in ano is measured by two indicators namely recurrence and anal incontinence.[9] In the current study majority of the patients were in their middle age (42.48 ± 10.33 years) which was similar to the study conducted by Khalid et al., who reported a higher incidence of fistula-in-ano among patients in their late thirties and forties.[10] The majority of the patients in our study were males. A study by Buchanan G et al. found that out of 20 subjects 17 were male and only 3 were females. [11] Similarly, a study by Saif et al. reported a higher proportion of males (91%) with fistula in ano compared to females (9%) which are similar to our study. [12] They also concluded that almost 10 times higher incidence of fistula-in-ano among males compared to females. The reason for this may be the presence of intramuscular glands among males while females have more cystic or ramifying glands. In the present study majority of the cases, the fistulas found were posterior. A study conducted among 199 patients found that the majority of the patients, the external opening of the fistula in ano was posterior in the location which is similar to our study. [13]

In the present study, all patients underwent the LIFT procedure for anal fistula and achieved 93% success rate while only three patients had a recurrence. Along with it, we found no anal incontinence among the patients who underwent LIFT. An immediate postoperative complication was limited to spinal headache (7.5%), postoperative nausea and vomiting (7.5%) and surgical site bleeding (5%). hospital stays were minimal and wound healing was faster than other methods. The mean pain score was less (3.87 ± 1.02). Anal continence was preserved in all the patients at each follow-up with minimal recurrence within 6 months. Our study finding was similar to a study conducted by Huda et al., who in their study achieved 100% cure rate with the LIFT procedure and did not report a single case of incontinence.[14] Sileri et al, in a prospective observational study among 18 patients reported a success rate of 83% and none of the patients reported anal incontinence.[15] This finding was similar to our study. A similar finding was reported by Baghdadi et al, with a success rate of 90% and none of the patients reported anal incontinence. [16]

We did not find any significant association of age with respect to the type of fistula, post-operative complication, wound infection, recurrence, duration of procedure, pain score, hospital stay and wound healing time. Duration of procedure was significantly higher (p -value=0.001) in anterior fistula (66.71 ± 14.2) patients than in posterior fistula (52.36 ± 7.12 mins). Similarly, pain score and duration of hospital stay were significantly higher in anterior fistula patients compared to posterior fistula patients (P value < 0.05). We did not notice any statistically significant difference in complications and wound healing time in relation to the location of transphincteric fistula.

The Sphincter sparing method in the treatment of fistula-in-ano is now a preferred method as it has less chance of anal incontinence. There are many sphincter-sparing methods in practice but with varying results. Fibrin glue injection is a simple technique but with a extremely low success rate of 16%-25%. [17] Similarly, the use of anal plugs made of the biological or synthetic bioabsorbable mesh also acts as a sphincter-sparing method with reported success rates of as low as 29% to as high as 87%. [18] Draining seton although had a high success rate but come with another challenge of a long healing time of 3 to 9 months. [19] Endoanal advancement flaps and core out fistulectomy although provides a high success rate but are complicated procedures. [20]

Because the LIFT procedure is minimally invasive, and simple to learn, and execute in selected cases, there is currently a growing interest in it. The LIFT procedure's success rates ranged from 57% to 94%, with minimal morbidity and little to no impact on continence status. [21] In comparison to the various anal fistula treatment options, the LIFT technique has assumed a good surgical space and should continue to do so. However, the limitation of our study was less sample size and a short follow-up period. Thus, it is anticipated that additional studies using larger sample size and longer follow-up periods will confirm LIFT's efficacy and encourage more surgeons to employ it.

CONCLUSION

The current prospective observational study concluded that the LIFT procedure is a better surgical procedure in terms of preventing wound infection, where the recurrence rate was minimal (7.5%) and the success rate of the surgery was more than 90%. Since it is a sphincter-sparing procedure, anal incontinence was nil. Moreover, our study established that the hospital stay of the patient following surgery was less, wound healing time is better and the pain perceived by the patients following surgery is minimal. Although many surgical centers around the world have been using the LIFT technique for more than ten years, there is a dearth of data regarding the procedure's success rate, complications, and recurrence rate.

Acknowledgement: We would like to thank Dr. Bandita Panda, PhD, Research Scientist, Scientific Officer, Research & Development for Scientific review & editing. We would like to thank Research & Ethics Committee for reviewing research proposal.

REFERENCES

- Pommaret, E., Benfredj, P., Soudan, D., & de Parades, V. (2015). Sphincter-sparing techniques for fistulas-in-ano. *Journal of Visceral Surgery*, 152(2 Suppl), S31-6. <https://doi.org/10.1016/j.jvisurg.2014.08.002>
- Vial, M., Parés, D., Pera, M., & Grande, L. (2010). Faecal incontinence after seton treatment for anal fistulae with and without surgical division of internal anal sphincter: a systematic review. *Colorectal Disease: The Official Journal of the Association of Coloproctology of Great Britain and Ireland*, 12(3), 172–178. <https://doi.org/10.1111/j.1463-1318.2009.01810.x>
- Dudukjian, H., & Abcarian, H. (2011). Why do we have so much trouble treating anal fistula? *World Journal of Gastroenterology: WJG*, 17(28), 3292–3296. <https://doi.org/10.3748/wjg.v17.i28.3292>
- Ratto, C., Litta, F., Donisi, L., & Parello, A. (2015). Fistulotomy or fistulectomy and primary sphincteroplasty for anal fistula (FIPS): a systematic review. *Techniques in Coloproctology*, 19(7), 391–400. <https://doi.org/10.1007/s10151-015-1323-4>
- Garcia-Aguilar, J., Belmonte, C., Wong, W. D., Goldberg, S. M., & Madoff, R. D. (1996). Anal fistula surgery. Factors associated with recurrence and incontinence. *Diseases of the Colon and Rectum*, 39(7), 723–729. <https://doi.org/10.1007/bf02054434>
- Rezk, M., Emile, S. H., Fouda, E. Y., Khaled, N., Hamed, M., Omar, W., Khafagy, W., & AbdelMawla, A. (2022). Ligation of intersphincteric fistula tract (LIFT) with or without injection of bone marrow mononuclear cells in the treatment of trans-sphincteric anal fistula: A randomized controlled trial. *Journal of Gastrointestinal Surgery: Official Journal of the Society for Surgery of the Alimentary Tract*, 26(6), 1298–1306. <https://doi.org/10.1007/s11605-022-05316-x>
- Vander Mijnsbrugge, G. J. H., Felt-Bersma, R. J. F., Ho, D. K. F., & Molenaar, C. B. H. (2019). Perianal fistulas and the lift procedure: results, predictive factors for success, and long-term results with subsequent treatment. *Techniques in Coloproctology*, 23(7), 639–647. <https://doi.org/10.1007/s10151-019-02023-9>
- Toyonaga, T., Matsushima, M., Tanaka, Y., Suzuki, K., Sogawa, N., Kanyama, H., Shimojima, Y., Hatakeyama, T., & Tanaka, M. (2007). Non-sphincter splitting fistulectomy vs conventional fistulotomy for high trans-sphincteric fistula-in-ano: a prospective functional and manometric study. *International Journal of Colorectal Disease*, 22(9), 1097–1102. <https://doi.org/10.1007/s00384-007-0288-9>
- Murugesan, J., Mor, I., Fulham, S., & Hitos, K. (2014). Systematic review of efficacy of LIFT procedure in cryptoglandular fistula-in-ano. *Journal of Coloproctology*, 34(02), 109–119. <https://doi.org/10.1016/j.jcol.2014.02.008>
- Hussain K, Qureshi M, Ahmed N, Tipu S. Management of fistula in ano. *J Physicians Surg Pak*. 2002;12:361–3
- Buchanan, G. N., Owen, H. A., Torkington, J., Lunniss, P. J., Nicholls, R. J., & Cohen, C. R. G. (2004). Long-term outcome following loose-seton technique for external sphincter preservation in complex anal fistula. *The British Journal of Surgery*, 91(4), 476–480. <https://doi.org/10.1002/bjs.4466>
- Ahmad, S., & Mahmoud, T. (2003). Use of seton in complicated anal fistula: A study at Sindh Govt Hospital, Karachi. *Pak J Surg*, 19(1), 25–29.
- Sainio, P., & Husa, A. (1985). Fistula-in-ano. Clinical features and long-term results of surgery in 199 adults. *Acta Chirurgica Scandinavica*, 151(2), 169–176.
- Huda, T., & Ashok, M. (2013). Lift Technique for Fistula in ANO with Redefined Criteria-A Step towards Better Outcome. *IOSR J Dent Med Sci*, 11(1), 61–63.
- Sileri, P., Franceschilli, L., Angelucci, G. P., D'Ugo, S., Milito, G., Caddeu, F., Selvaggio, I., Lazzaro, S., & Gaspari, A. L. (2011). Ligation of the intersphincteric fistula tract (LIFT) to treat anal fistula: early results from a prospective observational study. *Techniques in Coloproctology*, 15(4), 413–416. <https://doi.org/10.1007/s10151-011-0779-0>
- Baghdadi, M., & Metwalli, A.-E. (2019). Ligation of intersphincteric fistula tract technique in the management of anorectal fistula. *The Egyptian Journal of Surgery*, 38(1), 160. https://doi.org/10.4103/ejs.ejs_171_18
- Buchanan, Gordon N., Bartram, C. I., Phillips, R. K. S., Gould, S. W. T., Halligan, S., Rockall, T. A., Sibbons, P., & Cohen, R. G. (2003). Efficacy of fibrin sealant in the management of complex anal fistula: A prospective trial. *Diseases of the Colon and Rectum*, 46(9), 1167–1174. <https://doi.org/10.1007/s10350-004-6708-9>
- Ellis, C. N., Rostas, J. W., & Greiner, F. G. (2010). Long-term outcomes with the use of bioprosthetic plugs for the management of complex anal fistulas. *Diseases of the Colon and Rectum*, 53(5), 798–802. <https://doi.org/10.1007/DCR.0b013e3181d43b7d>
- Eitan, A., Koliada, M., & Bickel, A. (2009). The use of the loose seton technique as a definitive treatment for recurrent and persistent high trans-sphincteric anal fistulas: a long-term outcome. *Journal of Gastrointestinal Surgery: Official Journal of the Society for Surgery of the Alimentary Tract*, 13(6), 1116–1119. <https://doi.org/10.1007/s11605-009-0826-6>
- Jivapaisampong, P. (2009). Core out fistulectomy, anal sphincter reconstruction and primary repair of internal opening in the treatment of complex anal fistula. *Chotmaihet Thangphaet [Journal of the Medical Association of Thailand]*, 92(5), 638–642.
- Tan, K.-K., Tan, I. J., Lim, F. S., Koh, D. C., & Tsang, C. B. (2011). The anatomy of failures following the ligation of intersphincteric tract technique for anal fistula: a review of 93 patients over 4 years. *Diseases of the Colon and Rectum*, 54(11), 1368–1372. <https://doi.org/10.1097/DCR.0b013e31822bb55e>