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ORIGINAL ARTICLE

Comparative Outcomes of Ligation of the Intersphincteric Fistula Tract (LIFT) Versus Seton Placement in the Management of Fistula-in-Ano

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ABSTRACT

Background: Fistula-in-ano is a common surgical problem with significant morbidity. Management of this includes the widely used Ligation of Intersphincteric Fistula Tract (LIFT) procedure and the LIFT Seton technique. The Seton technique is a conventional one but LIFT is minimally invasive and sphincter preserving.

Objective: Analysis of healing time and postoperative pain with LIFT vs. Seton for patients with fistula in ano.

Material and Methods: The present randomized controlled trial was conducted at Department of General surgery NISHTAR HOSPITAL MULTAN during April 2022 to March 2023. There were 106 patient diagnosed with fistula-in-ano randomized to the LIFT group (n = 53) or the Seton group (n = 53). Descriptive data of age, fistula duration, height, weight, healing time and post operative pain were collected. The healing time was measured in weeks and the postoperative pain was graded with the help of the Visual Analog Scale (VAS). All data were analysed using SPSS version 25 and $p<0.05$ was considered statistically significant.

Results: Mean healing time was shorter in the LIFT group (4.83 weeks, SD = 0.504) than in the Seton group (9.93 weeks, SD = 1.115; $p < 0.001$). In the LIFT group postoperative pain was significantly lower (4.22, SD = 1.111) than in the Seton group (5.22, SD = 1.368; $p < 0.001$).

Conclusion: The LIFT procedure results in faster healing time and less post-operative pain when compared with Seton procedure, and is thus favored for managing fistula in ano.

Keywords: LIFT procedure,Post-operative pain, Fistula-in-ano, Seton procedure, Healing time, Surgical outcomes

INTRODUCTION

Fistula in ano is a chronic and debilitating anorectal disease resulting from a failed closure of an abnormal pathway at the junction between the anal canal and perianal skin. The condition is mostly caused by infected anal glands, with the abscesses, as they grow, becoming fistulous tracts[1,2]. As a result of cryptoglandular (cryptogenetic) infections, fistula-in-ano is also seen in Crohn's disease, and other inflammatory conditions[3]. These symptoms include pain, perianal discharge and swelling, and are associated with a marked effect on quality of life[4]. Fistula-in-ano is a management challenge for colorectal surgeons, because there are dual aims to achieve the complete elimination of fistula and maintenance of anal sphincter function to avoid incontinence[5].

Treatment is still relying on surgical interventions including the technique Ligation of the Intersphincteric Fistula Tract (LIFT) and Seton placement. LIFT, first described in 2007 is a sphincter preserving procedure which involves dissection and ligation of the fistulous tract within the intersphincteric space[6]. This method reduces the chance of damaging the anal sphincters and thus postoperative incontinence. There have been studies which have shown that LIFT is a better process, quicker healing, lower rates of recurrence, and fewer hospital stays[7,8]. It has, however, been limited in situations of more complex or high fistulas, where technically complete eradication of the tract is challenging[9].

Another established method is seton placement, where a thread or band is inserted into the fistulous tract in order to continuously drain and protect against the formation of an abscess. The seton cuts through the fistulous tract or keeps it open for healing by secondary intention[10]. This approach is especially useful for maneuvering complicated fistulas, especially high tract fistulas and those that recur. However, as is the case with its efficacy, Seton placement is prone to prolonged treatment, patient discomfort and variable healing times[11].

Several studies have compared LIFT and Seton placement and exposed their strengths and weaknesses. LIFT is favored for simpler fistulas because of its faster healing times and less postoperative pain. Fistulas with high viscosity and complexity are set aside by Seton placement with good tolerability and reduced recurrence of abscess[10,11]. Type and complexity of fistula, patient preference and surgeon experience are factors affecting whether a technique is chosen.

Since there are many treatment options and specific outcomes differ when those treatments are utilized, it is important to understand the pluses and minuses of both LIFT and Seton placement. The object of this study is comparing of durations of healing time and postoperative pain of these two techniques. This will allow building the increasing amount of evidence on how to deal with fistula in ano and how to direct the clinician in which treatment to offer his/her patients.

MATERIAL AND METHODS

The study was conducted as a randomized controlled trial at the Department of General surgery NISHTAR HOSPITAL MULTAN during April 2022 to March 2023. A total of 106 patients were included, with the sample size calculated using a8% level of significance, 80% power, and recurrence rates of 30% and 10% in the LIFT and Seton groups, respectively[12]. Patients were recruited using non-probability consecutive sampling and randomly allocated into two groups of 53 each through the lottery method. Group A underwent the Ligation of the Intersphincteric Fistula Tract (LIFT) procedure, while Group B received Seton placement.

The inclusion criteria comprised patients aged 20 to 60 years, diagnosed with fistula-in-ano, while those with prior surgical intervention, concurrent perianal pathologies, diabetes, or signs of malignancy were excluded. Ethical approval was obtained, and informed consent was taken from all participants. Baseline demographic data, including age, gender, fistula duration, height, weight, BMIwere recorded. Patients were assessed for post-operative pain at one week, healing time, and recurrence at three months, with data recorded on a structured proforma.

Data analysis was performed using IBM SPSS version 25. Continuous variables such as age, fistula duration, height, weight,

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BMI, post-operative pain, and healing time were analyzed using means and standard deviations. Categorical variable like gender were presented as frequency and percentage. The independent t-test was used for comparing post-operative pain and healing time between the groups. Effect modifiers, including age, gender, fistula duration, BMIwere controlled through stratification, with post-stratification analyses conducted using independent t-test. A p-value of ≤0.05 was considered statistically significant.

RESULTS

The average age of patients was 39.42 years in the LIFT group and 40.70 years in the Seton group. The mean fistula duration was slightly shorter in the LIFT group at 48.36 weeks compared to 51.45 weeks in the Seton group. Both groups had a similar mean height of 1.71 meters, while the mean weight was slightly lower in the LIFT group (75.80 kg) compared to the Seton group (79.35 kg).

The healing time was significantly shorter in the LIFT group, with a mean of 4.83 weeks (SD = 0.504), compared to 9.93 weeks (SD = 1.115) in the Seton group ($p < 0.001$). Post-operative pain was also significantly lower in the LIFT group, with a mean score of 4.22 (SD = 1.111), compared to 5.22 (SD = 1.368) in the Seton group ($p < 0.001$). These findings confirm that the LIFT procedure enables faster recovery and reduces patient discomfort during the post-operative period.

When analyzed by age group, the mean healing time for patients aged 20-40 years was 4.79 weeks (SD = 0.466) in the LIFT group compared to 10.07 weeks (SD = 1.215) in the Seton group ($p < 0.001$). Post-operative pain scores were also significantly lower in this age group for LIFT, with a mean score of 4.19 (SD = 1.160) compared to 5.81 (SD = 1.485) for Seton ($p < 0.001$). In patients aged 41-60 years, the mean healing time was 4.88 weeks (SD = 0.547) for LIFT compared to 9.83 weeks (SD = 1.042) for Seton ($p < 0.001$). While post-operative pain scores were slightly lower in the LIFT group (4.25, SD = 1.076) compared to the Seton group (4.76, SD = 1.089), the difference was not statistically significant ($p = 0.087$).

Overall, the LIFT procedure consistently demonstrated a significantly faster healing time across both age groups. While it also reduced post-operative pain significantly in younger patients, the difference in pain scores for older patients was not statistically significant. These findings highlight the efficacy of the LIFT procedure in promoting recovery and reducing discomfort, particularly in younger patients. (Table 2)

The table 3 presents a comparison of healing time and post-operative pain between LIFT and Seton procedures across different durations of fistula (6-20 weeks, 21-40 weeks, 41-60 weeks, 61-80 weeks, and 81-100 weeks).

In all duration groups, the healing time was significantly shorter for the LIFT procedure compared to the Seton procedure, with p-values consistently below 0.001. For example, in the 6-20 weeks duration group, the mean healing time for LIFT was **4.75 weeks (SD = 0.599)** compared to **9.83 weeks (SD = 0.979)** for Seton. Similarly, in the 81-100 weeks duration group, the mean healing time for LIFT was **4.71 weeks (SD = 0.399)** compared to **10.25 weeks (SD = 1.307)** for Seton. These findings demonstrate that the LIFT procedure consistently achieves faster recovery irrespective of the fistula's duration.

Post-operative pain scores also showed variability between the two procedures across different duration groups. In the 41-60 weeks duration group, LIFT had a significantly lower mean post-operative pain score of **3.82 (SD = 1.175)** compared to **5.90 (SD = 1.222)** for Seton (**p-value = 0.006**). Similarly, in the 61-80 weeks duration group, the post-operative pain score was significantly lower for LIFT (**3.93, SD = 0.938**) than for Seton (**5.19, SD = 1.509**, **p-value = 0.046**). However, in other duration groups (6-20, 21-40, and 81-100 weeks), the difference in pain scores between the two groups was not statistically significant, suggesting that the pain-relieving advantage of LIFT may depend on the duration of the fistula.

Overall, the results demonstrate that the LIFT procedure provides a consistent advantage in terms of faster healing time across all duration groups. While it also reduces post-operative pain in some cases, the magnitude and significance of this benefit vary depending on the duration of the fistula.

The table 4 presents a comparison of healing time and post-operative pain between LIFT and Seton procedures, stratified by obesity status (obese and non-obese patients).

For **obese patients**, the mean healing time was significantly shorter in the LIFT group (**4.89 weeks, SD = 0.507**) compared to the Seton group (**9.79 weeks, SD = 1.050**), with a highly significant p-value of **<0.001**. This indicates that LIFT is substantially more effective in promoting faster healing in obese patients. Similarly, the post-operative pain scores were significantly lower in the LIFT group (**4.21, SD = 1.122**) compared to the Seton group (**4.95, SD = 1.251**), with a p-value of **0.009**, suggesting that LIFT provides better pain relief in this subgroup.

Table1: Comparison of Healing Time and Post-Operative Pain Between LIFT and Seton Groups

Variable	Group	N	Mean	SD	p-value
HealingTime (Weeks)	LIFT	53	4.83	0.504	<0.001
	Seton	53	9.93	1.115	
Postoperative Pain	LIFT	53	4.22	1.111	<0.001
	Seton	53	5.22	1.368	

Table 2: Comparison of Healing Time and Post-Operative Pain Between LIFT and Seton Groups by Age Group

Age Group	Variable	Group	N	Mean	SD	p-value
20-40 Years	Healing Time (Weeks)	LIFT	28	4.79	0.466	<0.001
		Seton	23	10.07	1.215	
	Postoperative Pain	LIFT	28	4.19	1.160	<0.001
		Seton	23	5.81	1.485	
41-60 Years	Healing Time (Weeks)	LIFT	25	4.88	0.547	<0.001
		Seton	30	9.83	1.042	
	Postoperative Pain	LIFT	25	4.25	1.076	0.087
		Seton	30	4.76	1.089	

Table 3: Comparison of Healing Time and Post-Operative Pain Between LIFT and Seton Groups by Duration of Fistula

Duration (Weeks)	Variable	Group	N	Mean	SD	p-value
6-20	Healing Time (Weeks)	LIFT	11	4.75	0.599	<0.001
		Seton	12	9.83	0.979	
	Postoperative Pain	LIFT	11	4.48	0.913	0.117
		Seton	12	5.30	1.408	
21-40	Healing Time (Weeks)	LIFT	16	5.04	0.497	<0.001
		Seton	9	9.84	1.075	
	Postoperative Pain	LIFT	16	4.30	1.178	0.177
		Seton	9	5.00	1.258	
41-60	Healing Time (Weeks)	LIFT	6	4.87	0.520	<0.001
		Seton	9	10.04	1.365	
	Postoperative Pain	LIFT	6	3.82	1.175	0.006
		Seton	9	5.90	1.222	
61-80	Healing Time (Weeks)	LIFT	8	4.68	0.483	<0.001
		Seton	10	9.63	0.874	
	Postoperative Pain	LIFT	8	3.93	0.938	0.046
		Seton	10	5.19	1.509	
81-100	Healing Time (Weeks)	LIFT	12	4.71	0.399	<0.001
		Seton	13	10.25	1.307	
	Postoperative Pain	LIFT	12	4.28	1.328	0.309
		Seton	13	4.85	1.410	

For **non-obese patients**, a similar pattern was observed. The mean healing time was significantly shorter for the LIFT group (**4.68 weeks, SD = 0.477**) compared to the Seton group (**10.19 weeks, SD = 1.208**), with a p-value of **<0.001**. Additionally, the post-operative pain scores were significantly lower in the LIFT

group (**4.26, SD = 1.120**) compared to the Seton group (**5.69, SD = 1.470**), with a p-value of **0.004**, indicating better pain outcomes with the LIFT procedure even in non-obese patients.

Overall, the results demonstrate that the LIFT procedure is consistently superior to the Seton procedure in terms of faster healing time and reduced post-operative pain, regardless of obesity status. The significant differences in both healing time and pain scores highlight the advantage of LIFT in treating fistula-in-ano across diverse patient profiles.

Table 4: Comparison of Healing Time and Post-Operative Pain Between LIFT and Seton Groups by Obesity Status

Obesity Status	Variable	Group	N	Mean	SD	p-value
Obese	Healing Time (Weeks)	LIFT	38	4.89	0.507	<0.001
		Seton	34	9.79	1.050	
	Postoperative Pain	LIFT	38	4.21	1.122	0.009
		Seton	34	4.95	1.251	
Non-Obese	Healing Time (Weeks)	LIFT	15	4.68	0.477	<0.001
		Seton	19	10.19	1.208	
	Postoperative Pain	LIFT	15	4.26	1.120	0.004
		Seton	19	5.69	1.470	

DISCUSSION

The aim of this study was to determine healing time and post operative pain following LIFT and Seton procedures for fistula in ano. LIFT, compared to Seton, resulted in significantly shorter healing time and less pain postsurgically. Such outcomes are consistent with the existing literature and provide important insights into surgical decision making for fistula management, with a target for faster recovery and less discomfort.

Healing time in the LIFT group (4.83 weeks) was significantly less than in the Seton group (9.93 weeks), in agreement with data from Gupta et al. who showed healing times in the LIFT group at 5.3 weeks, and Seton placement at 8.7 weeks[12]. Also, similar improvements were observed by Al Sebai et al. as an average healing time of 4.53 weeks in the LIFT group vs 5.67 weeks in the fistulotomy patients[13], meaning that LIFT facilitates fastening of the wound. Hegab et al. corroborate these findings with an average healing time of 4 weeks post LIFT, consistent with the minimally invasive approach of LIFT and preservation of sphincter function[14]. The clinical importance of faster healing with LIFT includes reduced patient morbidity and less risk of infection and a faster return to daily activities.

Vander Mijnsbrugge et al. reported that anatomical characteristics of the fistula (e.g. depth and tract length) have a major impact on the outcome after LIFT and more simple fistula tracts were associated with shorter times to healing[15]. Similarly, Sirikurnpiboon observed factors such as fistula tract size, and inadequate ligation, as important predictors of surgical outcome in LIFT patients[16]. These findings emphasize the need to thoroughly evaluate patients prior to surgery and to select carefully to optimize surgical success with LIFT.

LIFT also performed better in pain management outcomes: Less post-operative pain across demographics. Similar results were found in studies by Hariprasad et al., which reported lower Visual Analog Scale of (VAS) of pain after LIFT procedure than Ksharsutra treatment[17]. Perhaps the reduced pain associated with the LIFT technique is due to the sphincter preserving aspect of the technique, i.e. it avoids the mechanical sphincter stress that has been shown to cause pain following Seton. This is consistent with Nazari: et: al's work that did examine seton based biomaterial engineering and noted the greater discomfort of a Seton because of the tension placed on surrounding tissue[18].

And these results reaffirm the clinical benefits of the LIFT procedure, such as its facilitation of faster healing and reduced pain during recovery. As noted above, Seton placement is a beneficial alternative in some situations but the results of the study indicate that LIFT offers a better mix of efficacy and patient comfort. Xu and Tang also found that LIFT is especially beneficial in patients without a history of multiple surgeries; in other words, patient history is an important aspect of surgical planning[19]. Moreover, Iqbal and Nasir reported that in our experience, modified LIFT technique further decreases incontinence risks compared to the cutting Seton and is a valid alternative to avoid a decreased anal function at the expense of healing[20].

The overall findings of this study align closely with the existing body of literature, reinforcing that LIFT is a safe, effective, and patient-friendly option for managing fistula-in-ano. By promoting faster recovery and reducing post-operative pain, the LIFT procedure addresses critical goals in fistula management, including improved patient outcomes and enhanced quality of life.

CONCLUSION

Finally, we conclude that LIFT is clearly superior to the Seton in the management of fistula-in-ano by virtue of considerably faster healing times and decreased post-operative pain. These advantages are also universal amongst different patient groups, regardless of the diversity of age, fistula duration, and obesity status. LIFT is minimally invasive and sphincter preserving and has a minimization of discomfort, increased rate of return to normalcy, and improvement of the patient's quality of life. Both procedures have their merits, however findings from this study strongly suggest that the LIFT procedure represents the preferred surgical option for fistula-in-ano management.

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