

Ligation of Intersphincteric Fistulous Tract versus Fistulotomy in Low Trans-Sphincteric Perianal Fistula

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Abstract

Background: Anal fistula, which causes periodic swelling and pain in the perianal area followed by spontaneous leakage, is an abnormal connection between the anal canal and the perianal skin. The majority are connected to the development of abscesses, with a perianal fistula existing at the time of presentation in one-third of patients with an anorectal abscess.

Objectives: to determine the safety and efficacy of the Ligation of Intersphincteric Fistulous Tract operation (LIFT) in comparison with fistulotomy.

Patients and methods: On 60 patients with low trans-sphincteric perianal fistulas, this prospective, randomized comparative research was done at the General Surgery Department of Qena Faculty of Medicine. Patients were split into two groups: Group (A): 30 patients underwent LIFT techniques. Group (B): 30 patients underwent fistulotomy. The duration of the study ranged between 6-12 months,

Results: Body Mass Index (BMI) was statistically substantial greater in patients treated by LIFT than those treated by fistulotomy. While pain score and healing time were statistically substantial lower in patients treated by LIFT than those treated by fistulotomy. There is no statistically substantial variation between patients treated by fistulotomy and LIFT as regard the development of complications as recurrence or incontinence.

Conclusion: In comparison to open fistulotomy, the LIFT operation is a successful and preferred sphincter-saving method for fistula-in-ano, with a quicker healing period and a decreased frequency of postoperative anal leakage.

Keywords: Ligation; Intersphincteric Fistulous Tract; Fistulotomy; Low Trans-Sphincteric Fistula.

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Introduction

Anal fistula is an improper link between the anal canal and the perianal skin that causes intermittent swelling and discomfort in the perianal area followed by spontaneous leakage or continuous purulent discharge (Emile et al., 2020). The majority are connected to the development of abscesses, with one-third of patients who have an anorectal abscess presenting with a perianal fistula (Hong et al., 2014). Additionally, conditions like Crohn's disease, ulcerative colitis, TB, diabetes, HIV, a history of anal trauma, and prior radiation treatment to the anal area are risk factors for their development (Groof et al., 2016). Because there is a chance of fecal incontinence and recurrence, treating a perianal fistula may be challenging (Abuo-zeid et al., 2011). The goal of anal fistula therapy should be to achieve full healing without compromising anal continence. Fistulotomy may be used to treat low-lying fistulas involving a small amount of the sphincter muscles, but treatment might be difficult when a greater section of the sphincter muscles is included. The following procedures are now available to protect the sphincter muscle: Anorectal advance flap, loose seton, fibrin glue, anal fistula plug, and ligation of intersphincteric fistulous tract (LIFT) (Elfeki et al., 2018). Fecal incontinence after trans-sphincteric fistulotomy varies according to the thickness of the sphincter mechanism covering the fistula (Mushaya et al., 2012). The use of cutting seton or staged fistulotomies with seton intended to lower the proportional incontinence rates have not been successful. As a consequence, efforts have been made to develop new sphincter-sparing procedures. (Ratto et al., 2016). Sphincter-saving surgery known as LIFT has rates of success ranged from 57 to 94%. The Aim of Work of our research was to compare the LIFT procedure's safety and effectiveness to that of fistulotomy. (Groof et al., 2016).

Patients and methods

With a dependability of 0.05 and a power of 80%, we determined the sample size. We discovered that there should be 30 patients in each group. 420 subjects were initially planned for the trial in order to account for potential patient and data loss. A computer-generated random number generator split the 350 eligible patients into two groups, group 1 (LIFT) and group 2 (fistulotomy). 35 patients were allocated to each group for the intervention; 5

patients from each group were removed, leaving 30 patients in each group who were still eligible to participate in the trial (Fig.1).

Inclusion criteria: diagnosis of low trans-sphincteric anal fistula by MRI, informed written consent by the patients or their relatives, age 18-65 yrs and ASA score grade I II III.

Exclusion criteria: Patients with known lower abdominal malignancies, inflammatory bowel diseases, fecal incontinence, rectal prolapse and history of anal surgery within the last three months. The current study has been approved by the Ethics Committee of Faculty of Medicine, South Valley University, Qena, Egypt, and the Ethical Approval No (SVU-MED-SUR11-1-21-8-229)

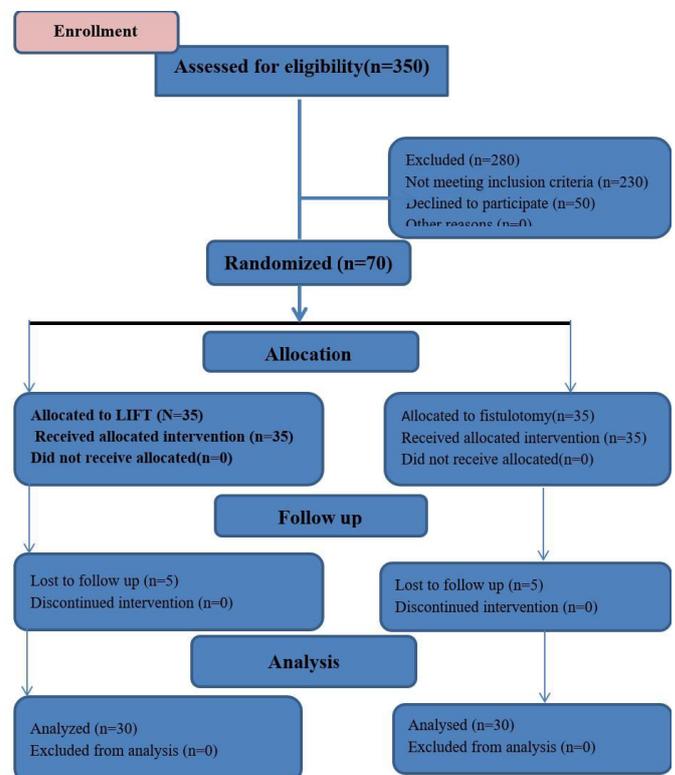


Fig.1. Patient recruiting and selection procedure shown in a consort flow chart.

All patients included in the study were subjected to the following

1-Detailed history taking including: Personal data: Name, age, sex, past history of previous interventions (of anal fissure, perianal abscess drainage,..) and medical history (DM, Inflammatory bowel disease, on steroids,...)

2-Careful clinical examination: General and local .

3- Investigations

Laboratory investigations include preoperative investigations as: Complete blood picture (CBC), renal function tests, coagulation profile (INR, PT, PC), random blood sugar, serology and ECG and surgical fitness. **Imaging:** MRI pelvis and perineum.

4- Surgical technique:

- **Fistulotomy procedure:** In order to promote exposure, patients were positioned in the prone jackknife posture with the buttocks taped apart. The use of spinal anesthetic was made. The secondary opening, fistula tract, and original opening were detected using inspection, palpation, digital rectal evaluation, and anoscopy. To identify the tract, conventional fistula probes or lacrimal probes were used (**Fig. 2A & B**). When there is doubt about the internal entrance, it is possible to investigate the tract from the main opening using a crypt hook or to see "bubbles" at the fistula tract's beginning by injecting hydrogen peroxide into the secondary opening. The trans-sphincteric fistula was looped with a loosely knotted seton once the fistula tract was defined. Distal to the secondary hole, the skin and subcutaneous tissue were incised for drainage. A mushroom catheter or a "doubled" vascular loop was used to drain any accompanying abscess cavities or horseshoe extensions, and these were then surgically removed after 1-2 weeks. Patients with concomitant abscess or cellulitis were given intravenous and oral antibiotics preoperative and postoperative. Following an initial postoperative evaluation, patients underwent clinical follow-up every two to three weeks, during which time they were checked for any signs of lingering or recurrent abscess brought on by incorrect placement of the index seton, omission of a secondary tract, or premature healing around the seton that prevented drainage. We evaluated the thickness of the muscle bundle that involves the fistula as well as the muscle that will remain after the fistulotomy is completed. If the fistula involves the lower third of the muscle bundle and the primary opening was at the dentate line but seems too thick for primary fistulotomy,

especially in obese patients, a portion of the muscle in the fistula tract may be surgically severed and the seton replaced; the patient's condition was observed with respect to abscess formation and continence status. The patient's condition was monitored in terms of abscess formation and continence status. When these clinical parameters had improved after 6–8 weeks, we went ahead and performed the final fistulotomy and marsupialization.

Ligation of intersphincteric fistulous tract (LIFT) procedure

It is a one-day operation. Prior to the procedure, no bowel preparation or antibiotics were administered. The LIFT operation was carried out while sedated in the lithotomy position. The procedure involves making an incision in the intersphincteric groove (**Fig. 3**), identifying the intersphincteric portion of the tract, thoroughly cleaning the tract, ligating the intersphincteric tract close to the internal opening, removing the intersphincteric portion of the tract, core out the external tract and the external opening, and stitching the defect at the intersphincteric side of the external sphincter muscle (**Fig. 4**). The classic approach had to be modified if the tract could not be dissected safely (a very thick tract, too much fibrosis around the tract, proximal curving of the tract, and immediate branching of the tract at the intersphincteric site). The intersphincteric tract was then cut, as opposed to being dissected, and the tract was sutured after the intersphincteric segment had been removed. The suture was placed at the level of the internal sphincter muscle. During the procedure, hydrogen peroxide was injected into the internal fistulous opening to ensure that the fistula tract was completely sealed. The day after surgery, the patients were discharged. Ibuprofen and paracetamol were recommended for pain relief.

5- Post-operative follow up

1-Follow up in the ward: postoperative pain according to visual analogue score, using NSAIDs, morphia, Antibiotics as 3rd generation cephalosporin, bleeding, oral intake within three hours post-operative and discharge one day after surgery.

Follow up at outpatient clinic: wound infection, delayed wound healing, incontinence, recurrence.



Fig. 2. Identifications of fistulous tract (A & B)



Fig.3: Incision in the intersphincteric space tract

Fig. 4: Ligation of intersphincteric fistulous

Results

The current study included 60 patients; 53.3% of them are males and 46.7% are females. Their age ranged from 20 – 58 years with median value of 38.217 ± 11.025 years. There is no

statistically significant difference between patients treated by fistulotomy and LIFT as regard age and sex, (**Table .1**).

Table 1. Comparison of age and sex between patients treated by fistulotomy and LIFT

Variables		LIFT	Fistulotomy	P-value
		No. = 30	No. = 30	
Age (years)	Range	21 – 57	20 – 58	0.539
	Median [interquartile range]	39 [18.25]	36.5 [20.75]	

Age distribution	31-40 years	8 (26.7%)	8 (26.7%)	0.654
	41-50 years	10 (33.3%)	6 (20%)	
	51-60 years	4 (13.3%)	6 (20%)	
Sex	Female	16 (53.3%)	12 (40%)	0.301
	Male	14 (46.7%)	18 (60%)	

Independent student t test, chi square test

Among our studied patients, 90% presented by discharge only, 8.3% presented by pain and discharge while 1.7% presented by pruritis and discharge. The duration of symptoms ranged

between 3- 48 months. BMI was no statistically significant in patients treated by LIFT than those treated by fistulotomy(Fig.5)., (Table.2).

Table 2. Comparison of clinical data between patients treated by fistulotomy and LIFT

Variables		LIFT	Fistulotomy	P-value
		No. = 30	No. = 30	
Past medical history	No	27 (90%)	26 (86.7%)	0.601
	DM	3 (10%)	3 (10%)	
	On steroid	0 (0%)	1 (3.3%)	
Past surgical history	No	2 (6.7%)	1 (3.3%)	0.554
	Abscess	28 (93.3%)	29 (96.7%)	
Clinical presentation	Discharge	27(90%)	27 (90%)	0.549
	Pain + Discharge	3 (10%)	2 (6.7%)	
	Pruritis + Discharge	0 (0%)	1 (3.3%)	
Duration of symptoms (months)	Range	3 – 48	3 – 48	0.549
	Median [IQR]	15 [24.75]	12 [18.75]	
BMI	Range	23.2 – 36.8	20 – 34.3	0.549
	Median [IQR]	28 [4.42]	25.9 [3.13]	

Independent student t test, Mann Whitney test, *chi square test

Operative time pain score and healing time were significantly lower in patients treated by LIFT than those treated by fistulotomy, (Table .3). There is no statistically significant difference between patients treated by fistulotomy and LIFT as regard the development of complications.no incontinence shown among the patients in this study, (Table .4).

In contrast to the statistically substantial negative relation between operating time(Fig.6), pain score, and healing time, there is a statistically substantial positive connection between surgery time and BMI and between healing time(Fig.7) and pain score(Fig.8).

Table 3. Comparison of the operative data between patients treated by fistulotomy and LIFT

Variables		LIFT	Fistulotomy	P-value
		No. = 30	No. = 30	
Operative time(min)	Range	20 – 40	20 – 33	<.0001
	Median [IQR]	33 [6]	22.5 [5]	
Pain score (visual analogue score)	Range	1 – 5	3 – 7	<0.0001
	Median [IQR]	3 [2]	5 [2]	

Healing time(days)	Range	14 – 30	20 – 45	<0.0001
	Median [IQR]	20 [6]	30 [8.5]	

Independent student t test

Table 4. Comparison of complications between patients treated by fistulotomy and LIFT

Variables	LIFT	Fistulotomy	P-value
	No. = 30	No. = 30	
Recurrence	1 (3.3%)	3 (10%)	0.301
Infection	2 (6.7%)	2 (6.7%)	>0.05
Retention	4 (13.3%)	4 (13.3%)	>0.05

P-value >0.05: Non substantial (NS); P-value <0.05: substantial (S); P-value< 0.01: highly substantial (HS). •: chi square test

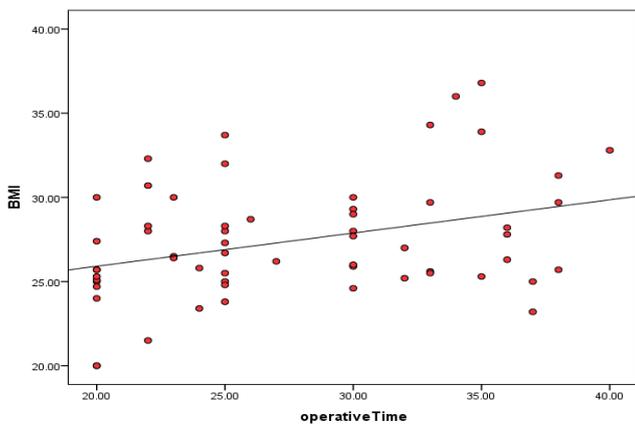


Fig. 5. Correlation between surgery time and fair BMI

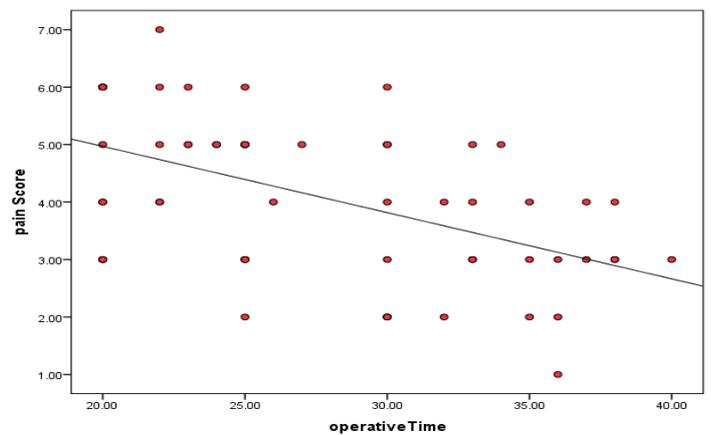


Fig. 6. Correlation between surgery time and pain score

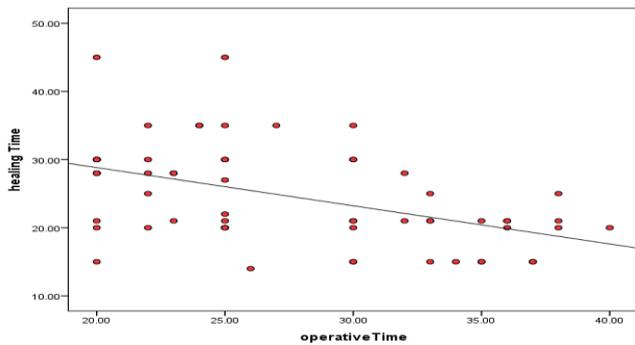


Fig. 7. Correlation between surgery time and healing time

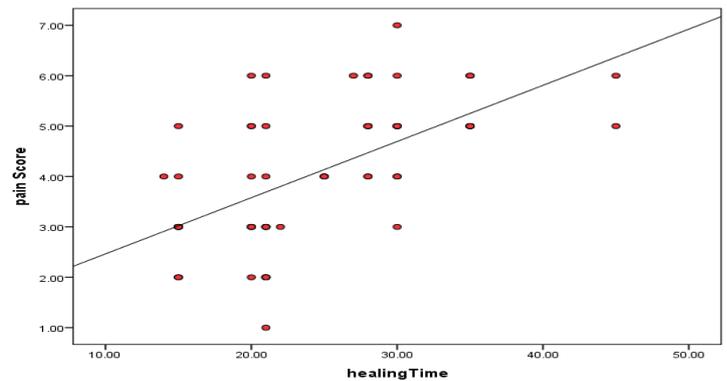


Fig. 8. correlation between healing time and pain score

Discussion

An inappropriate connection between the perianal skin and the rectum or anal canal is known as a perianal fistula. It is most likely an inflammatory disorder in which one of the 6–10 primitive anal glands become infected. Recent discoveries point to potential immunologic fistula causation (Ratto et al., 2016).

Due to the possibility of recurrence and sphincter injury that causes soiling and fecal incontinence, fistula therapy is complicated. Fistulotomy is still regarded as the most efficient method for laying open the tract. Postoperative incontinence, on the other hand, has been documented at rates of 4 to 62% and typically occurs at 13%. Approaches like mucosal advancement flap (MAP) are advised for large and more complicated fistulae (CF), since they are more likely to cause the continence mechanism to become disrupted following fistulotomy (Ratto et al., 2015).

The current study included 60 patients; 53.3% of them are males and 46.7% are females. Their age ranged from 20 – 58 years with mean value of 38.217 ± 11.025 years. There is no statistically significant difference between patients treated by fistulotomy and LIFT as regard age and sex. Our results were in agreement with study of Al Sebai et al., (68) as they reported that the study was submitted on 30 patients with trans-sphincteric perianal fistula. Of these 30 patients, 27 (90%) were males and 3 (10%) were females. The mean age was (34.4) in group (I, LIFT) and (35.07) in the group (II, fistulotomy). There was no statistically significant between patients treated by fistulotomy and LIFT as regard age and sex. The present study showed that among our studied patients, 90% presented by discharge only, 8.3% presented by pain and discharge while 1.7% presented by pruritis and discharge. The duration of symptoms ranged between 3- 48 months with mean value of 18.833 ± 13.941 month.

In accordance with our results study of Al Sebai et al., 2020 as they reported that the biggest issue that all research participants had was discharge. In 15 of the study's subjects, pain was evident. Because it was found in 7 (46.7%) and 8 (53.3%) patients in groups I and II, respectively. Swelling was detected in 10 research participants; it was found in 4 (26.7%) of group I participants and 6 (40%) of group II participants. Only 5 research participants had pruritis ani, which is

comparable to Elkaffas' 2020 study. This discharge was observed in all research participants' patients. Pain was another significant complaint made by research participants, and it was experienced by 15 of them (or 50%) of them, It is comparable to the research conducted by Elsebai et al., 2016, Zuhair.2012, Baghdadi et al., 2019 whereby, correspondingly, pain was experienced by 20 patients (66.7%), 45 patients (60%) and 15 patients (60%).

The current study revealed that the surgery time was statistically significant higher in patients treated by LIFT (33 minutes in average) than those treated by fistulotomy (22 minutes in average). While pain score and healing time were significant lower in patients treated by LIFT than those treated by fistulotomy.

Our results were in line with study of Vinay et al., 2017 as they reported that While the LIFT procedure took 28.4 minutes on average, the fistulotomy procedure took only 19.6 minutes on average. In comparison to the LIFT treatment, the fistulotomy required an average of 8 weeks to recover.

Also, (Al Sebai et al., 2020) demonstrated that They found that group (I) managed by LIFT had a significantly longer operative time than group (II) managed by fistulotomy, with average operative times of 32.53 minutes for the LIFT group and 20.8 minutes for the fistulotomy group, respectively. Additionally, group II's mean Visual Analogue Scale (VAS) score was substantially greater than group I's (5.7), indicating that group II's management strategy was more effective (3.3). Around two weeks after surgery, discomfort subsided (VAS Mean < 1). P-value was at < 0.001*. In comparison to group (II), which varied from 4 to 8 weeks with a median of (5.67) week, the time needed for complete healing process in group (I) varied from 3 to 7 weeks with a median (4.53) week. As a result, group (I) had quicker wound healing than group (II). Furthermore, the variation was statistically substantial.

In the study in our hands, there is no statistically difference between patients managed by fistulotomy and LIFT as regard the development of complications.

In contrast to the statistically substantial negative link between operating time, pain score, and healing time, there is a statistically substantial positive relationship between operative time and BMI and between healing time and pain score.

our findings were validated by study of **Al Sebai et al.,2020** as they reported that In our research, postoperative complications were as follows: Two (13.3%) patients in group (I) and two (13.3%) patients in group (II) had post-operative wound infection, although there was no statistically significant difference. After using the LIFT technique on every patient in group I, there were no incidents of incontinence. 2 (13.3%) incidences of incontinence to gases solely after fistulotomy with a score of 4/20 were found in group II as regarding wexner score. Recurrence occurred in 1 (6.7%) patients in group I and 3 (20%) patient in group II, totaling 4 patients from both groups. In all 4 instances, an inter-sphincteric fistula represented a recurrence. Two (13.3%) patients in group (I) and two (13.3%) patients in group (II) had urine retention, but there was no substantial distinction.

On the other hand, the research done by **Vinay et al.,2017** showed that since wound infection occurred in (8% 2/25) patients in the LIFT group vs (4% 1/25) patients in the fistulotomy group, wound infections was substantially greater in the LIFT group than the fistulotomy group. Antibiotics and routine dressings were used to treat wound infections early on, with satisfactory results. In their study, post-operative urinary retention affected 4 patients in each group, occurring in 2 patients (13.3% in group I) and 2 patients (13.3% in group II) without significance level. On the day of the procedure, this situation appeared briefly and quickly became better with the use of painkillers and urinary catheterization. For the fistulotomy group, there were 6 patients (16.2%) and 1 patient (4%) for LIFT group who had temporary partial incontinence to gas, respectively. This outcome is comparable to that of **Elkaffas' 2020** research, which noted that urine retention occurred in 2/15 of the participants. **Sahai 2019** on the other hand, did not describe any cases of leakage after a fistulotomy.

In the study of **Ateya et al., 2020** they evaluate the LIFT technique for the treatment of trans-sphincteric anal fistula. This study included 20 patients with trans-sphincteric fistula. They found that there was no statistically significant relation found between postoperative complications and sex and age of the studied patients. Also, there was higher incidence of recurrent fistula in patients with postoperative complications than those without postoperative

complications but did not reach statistically significant due to lower number of patients with history of recurrent fistula. There was a statistically significant increase in BMI and DM in cases with postoperative complications than those without postoperative complications. There was no significant effect of the presence of piles with fistula among the studied patient.

Conclusion

In comparison to open fistulotomy, the LIFT operation is a successful and preferred sphincter-saving method for fistula-in-ano, with a quicker healing period and a decreased incidence of postoperative anal incontinence. Due to its simplicity, viability, and sphincter-saving method, our study suggests that the LIFT treatment be used more often in low trans-sphincteric perianal fistulas and adopted as a cornerstone surgery alongside along various and classic operations for such cases as it's easy, feasible, sphincter saving technique.

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