

Outcome of Modified Ligation of Intersphincteric Fistula Tract Procedure in Patients with Transsphincteric Anal Fistula

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Introduction: Fistula in ano is a common anal disease that is problematic to both the patient and the surgeon. Various treatment modalities have been introduced to treat fistula in ano without compromising anal sphincter function.

Aim of work: In our study we aim to assess the outcomes of modified Ligation of Intersphincteric fistula tract in patients with transsphincteric fistula as one of the sphincter sparing modalities.

Patients and methods: This is a cross sectional study that included 50 patients who were diagnosed with transsphincteric fistula tract and treated with modified Ligation of Intersphincteric Fistula Tract. Patients with recurrent fistula, perianal abscess, Crohn's disease or any other perianal disease were excluded from our study.

Results: The mean age of participants was 39.92 years and more than half of them were males (Males; n = 32 while females; n = 18). The mean operative time was 30.30 ± 7.09 and mean healing time was 5.38 ± 1.31 weeks. No incontinence was observed throughout the follow up period (0%). Total of three patients had incomplete healing and persistent perianal discharge (6%) while four patients showed recurrence after complete healing (8%).

Conclusion: The modified Ligation of Intersphincteric fistula tract technique is an effective sphincter-sparing procedure that has shown lower incidence of recurrence without affecting anal continence.

Key words: Intersphincteric Fistula Tract, Transsphincteric Anal Fistula, Perianal Fistula, Modified.

Introduction

Fistula in ano is defined as abnormal communication, lined by granulation tissue, between the anal canal and the exterior i.e. the skin, which causes a chronic inflammatory process.¹

Anal fistula is almost always a consequence of an anorectal abscess that was drained. The abscess represents the acute phase of the disease,² while anal fistula is the chronic phase of anorectal sepsis.³ So that, the initial management strategy – prior to any definitive treatment – is local control of perianal sepsis, particularly if an abscess exists. This may include draining an abscess cavity or placing a draining seton into the fistula to allow the area to be drained and cleaned before surgery.⁴

Surgery is the basic treatment of anal fistula and the goal is to eradicate the septic focus and any associated epithelialized tracts and the same time to preserve anal sphincter function and to prevent recurrence. However, no single technique achieves all these aims for all types of anal fistulas. It is often necessary to balance the degree of sphincter division and continence disturbance.³ Classic treatment is associated with a high recurrence rate or insufficient protection of anal sphincter, especially in complex and multiple fistulas.⁵ Fistulotomy – which is the most commonly used technique - can be associated with significant risk of faecal incontinence in about 30% of patients.^{6,7}

Cutting seton or staged fistulotomy has rates of

faecal incontinence of 5 – 30% in spite of gradual cutting of the sphincter. Also, advancement flaps – which are performed by occluding the internal fistula opening with a mucosal flap – have minimal injury to internal sphincter but recurrence rates of 7–37% and incontinence of 5–8%.⁸ The severity of faecal incontinence increases with the complexity of the fistula.^{6,7} This is why, in such cases, the surgeon can resort to other sphincter sparing procedures which seem to preserve faecal continence.⁹ Some of which are LIFT (Ligation of Intersphincteric Fistula Tract) and its modification. It is stated in some literature that when compared to LIFT, the modified technique shows reduced postoperative failure and recurrence rate of complex fistula in ano with acceptable long term outcomes.⁵

Therefore, further studying of such modification and its effects will be studied and assessed in the current study regarding the rate of recurrence and fecal incontinence.

Patients and methods

This was a cross sectional study that included 50 patients diagnosed with transsphincteric fistula and were followed up after being treated with modified approach of Ligation of the Intersphincteric fistula tract (M LIFT). Patients were diagnosed with perianal fistula clinically and by MRI fistulogram.

Patients with transsphincteric fistula whether high or low fistula were included in our study. The exclusion criteria was: patients with ongoing perianal abscess,

recurrent fistula, Crohn's disease and any other perianal diseases.

Patients were given a brief explanation of the study and its objectives. We have proceeded with the study after receiving ethical approval from the ethical committee of the Faculty of Medicine, October 6 University as well as an informed consent from each participant.

A full history was taken from each patient, in addition to their physical examination with digital rectal examination to detect the internal opening site, the fistula tract pathway, the external opening and exclude any other ongoing anal problem. In addition, magnetic resonance imaging (MRI) fistulogram was done in all cases for proper mapping of fistulous tract and recording of the level and severity of the fistulous tract.

Bowel preparation was done by using suppository Bisacodil for all patients the day before surgery. Antibiotic prophylaxis (Metronidazole 1.5 g) were also administered.

After anaesthesia, the patient was placed in the lithotomy position. The fistula tract was identified with mixture of saline and hydrogen peroxide injected through the external opening along the tract (**Figs. 1,2**).



Fig 1: (Left): Showing the external opening and its position from the anal verge.



Fig 2: (Right): Saline and hydrogen peroxide injected in external opening to identify internal opening.

The tract is then curetted using a Volkmann spoon double ended for granulation tissue and then probed (**Fig. 3**).



Fig 3: Probed fistulous tract.

An incision is made into the intersphincteric groove using diathermy then intersphincteric tract is dissected bluntly by curved artery and hold by right-angle forceps (**Figs. 4,5**). Ligating suture (Using vicryl 3/0) is done at the side close to the internal sphincter and another at the side close to the external sphincter then the tract between the two ligating sutures is cut (**Fig. 6**).

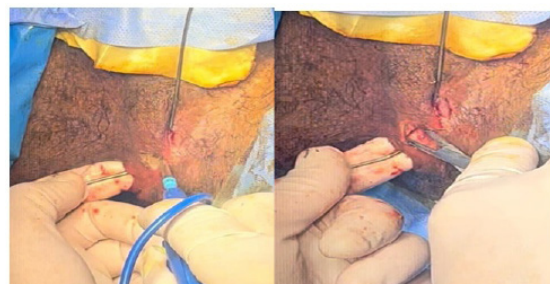


Fig 4: Dissecting into intersphincteric groove by diathermy then dissection of the intersphincteric tract by artery forceps.



Fig 5: Intersphincteric track is identified and dissected (Hold by right angle forceps).

The distal part of the ligated fistula tract is then carefully dissected till the external sphincter and removed leaving the cored out wound open for drainage and healing with secondary intention as well as the incision into the intersphincteric groove (**Fig. 7**).

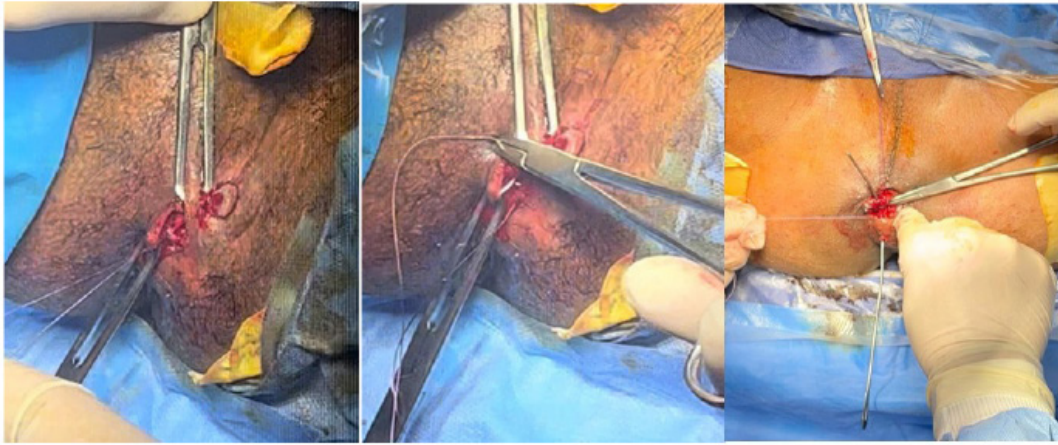


Fig 6: Ligating suture of the tract.

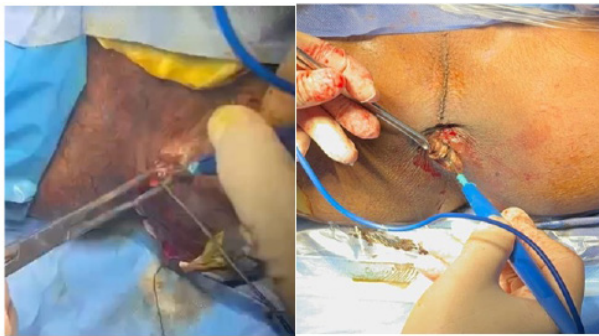


Fig 7: Coring out of distal part of fistulous track from external opening till external sphincter by diathermy.

Intraoperatively, when branching was identified from the main tract, they were laid open through the incision accessing the intersphincteric groove and curetted and left for drainage and healing with secondary intention.

Postoperatively, prophylactic intravenous antibiotics (Ceftriaxone 1g/day & Metronidazole one tab/8 hours/ day) were given during the first three postoperative days, since the surgical wound was regarded as contaminated followed by oral Metronidazole (500 mg/8 h) plus ciprofloxacin (500mg/12h) was prescribed for a week.

Regarding oral intake; oral liquid and semisolids intake were started on operative day and normal diet on the first day postoperatively. Making sure that patients are having regular semi-solid bowel motion, not hard exaggerating post-operative pain and not liquid causing wound contamination and soiling.

All patients had no immediate postoperative complication that entitled hospitalization; as severe ongoing bleeding or severe pain not responding to analgesics and were discharged on the first postoperative day.

The patients were followed up for 12 months and assessed for continence using Wexner score

as well as recurrence and their postoperative satisfaction regarding pain and perianal discharge. The assessment was done through a scheduled outpatient clinical examination once weekly till complete wound healing then once monthly. Phone interviews were also used for better compliance and avoiding attrition.

Results

Demographic characteristics: Mean age of patients was 39.92 years with more than half of them were males (n = 32, 64%). Most of the patients didn't have known medical problem (n = 37, 74%) except eight patients which were hypertensive (16%) and three patients were diabetic (6%).

All patients reported history of perianal abscess that was either self-drained or surgically drained.

Operative data: Mean operative time was 50 minutes with range (40 – 60 min). Mean blood loss intraoperative is 25.9 ml with range (6 – 50 ml) **(Table 1).**

Early post-operative period: Hospital stay was 12 – 24 hrs, and none of the patients needed longer stay or further close medical care. Only two patients complained of urine retention and had to be catheterized by a Nelaton urine catheter. All patients had their first motion within (8 – 24 hrs) post-operative. Postoperative pain was with average of 5 on pain scale (Visual Analogue scale).

During the follow up period till wound healing (Table 2): Complete wound healing took a period of time with mean 5.38 weeks (Range 3 – 8 weeks). During this period, follow up has shown no change of faecal continence compared to preoperative assessment. All patients were continent to flatus and liquid and solid stool. Postoperative pain started with mean score 5.20 (Range 3 – 7) on day one and decreased gradually with each visit till it reached no pain with no need for analgesics by the time of complete wound healing. Perianal discharge started to decrease from mean 2.28 gauze / day used

(range 2-3 gauze/ day) to no perianal discharge by the time of wound closure. However, three of fifty patients (6%) had persistent wound with persistent perianal discharge for more than 6 month post-operative.

By the end of the study (Table 3): No change was recorded in patient's Wexner score. All patients stayed continent to flatus, liquid stool and solid stool.

Perianal discharge has decreased gradually till it stopped by the time of complete wound healing in 47 patients (94%). Other symptoms accompanied the perianal discharge is perianal discomfort, pruritus and social stigma due to fear of soiled under garment.

Three patients (6%) had failed wound healing and persistent discharge for more than 6 months after surgery with unhealed intersphincteric wound. While four patients (8%) had complete wound healing but started to have recurrence of perianal discharge at 9, 10 and 11 months after surgery presented with recurrence of perianal discharge and perianal discomfort. By examination they had an external opening at the surgical site – three at site of intersphincteric wound and one near the site

of the core out fistulectomy. MRI was done to those patients, results has shown that the three patients with persistent unhealed wound; two of them had low intersphincteric fistula while one had an abscess sinus while the four patients with recurrent perianal discharge and external opening; three of them had low intersphincteric fistula while one had a low transsphincteric fistula.

Patients with abscess sinus had the abscess drained and followed up till complete healing. Those with low intersphincteric fistula have undergone fistulotomy and were followed till complete healing while the recurrent transsphincteric fistula was managed with cutting seton.

Relation between different factors and incidence of recurrence: There was no statistically significant association between patient's age, sex and associated co-morbidities and risk of recurrence (Table 4).

When different types of fistula were compared regarding incidence of recurrence, there was no statistical significance in incidence of recurrence between high and low fistulas and between different directions of the high fistulas (Table 6).

Table 1: Demographic characteristics of study participants

		No. = 50
Age	Mean±SD	39.92±11.53
	Range	19 – 59
Sex	Females	18 (36.0%)
	Males	32 (64.0%)
Comorbidites	No	35 (70.0%)
	HTN	8 (16.0%)
	DM	5 (10.0%)
	Both	2 (4.0%)
Results of MRI	Anterior high transsphincteric fistula	11 (22.0%)
	Posterior high transsphincteric fistula	7 (14.0%)
	Lateral high transsphincteric fistula	20 (40.0%)
	Anterior low transsphincteric fistula	5 (10.0%)
	Posterior low transsphincteric fistula	2 (4.0%)
	Lateral low transsphincteric fistula	5 (10.0%)

Table 2: Findings of follow up till wound healing

Follow up till wound healing		Total no. = 50
Complete healing	No	3 (6.0%)
	Yes	47 (94.0%)
Time of complete healing (weeks)	Mean ± SD	5.38 ± 1.31
	Range	3 – 8
Persistent discharge	No	47 (94.0%)
	Yes	3 (6.0%)
Wexner score	No	50 (100.0%)
	Yes	0 (0.0%)

Table 3: Long-term follow up period

At the end of follow up period (12 months)		Total no. = 50
Persistent discharge (unhealed wound)	No	47 (94.0%)
	Yes	3 (6.0%)
Recurrence	No	46 (92.0%)
	Yes	4 (8.0%)
Time of recurrence	Mean±SD	10 ± 0.82
	Range	9 – 11
Wound infection or abscess formation	No	49 (98.0%)
	Yes	1 (2.0%)

Table 4: Distribution of recurrence according to age, sex and comorbidities

		Recurrence		Test value	P-value	Sig.
		No recurrence	Recurrence			
		No. = 43	No. = 7			
Age	Mean±SD	40.16±11.47	38.43±12.67	0.366•	0.716	NS
	Range	19 – 59	21 – 57			
Sex	Females	14 (32.6%)	4 (57.1%)	1.579*	0.209	NS
	Males	29 (67.4%)	3 (42.9%)			
Comorbidites	No	31 (72.1%)	4 (57.1%)	3.340*	0.342	NS
	HTN	7 (16.3%)	1 (14.3%)			
	DM	3 (7.0%)	2 (28.6%)			
	Both	2 (4.7%)	0 (0.0%)			

P>0.05: Non significant (NS); P <0.05: Significant (S); P <0.01: Highly significant (HS).

*: Chi-square test; •: Independent t-test; #: Mann-Whitney test.

Table 6: Distribution of recurrence according to course and level of transsphincteric fistula

		Recurrence		Test value	Pvalue	Sig.
		No recurrence	Recurrence			
		No. = 43	No. = 7			
Results of MRI	Anterior high transsphincteric fistula	9(20.9%)	2 (28.6%)	7.221*	0.205	NS
	Posterior high transsphincteric fistula	4 (9.3%)	3 (42.9%)			
	Lateral high transsphincteric fistula	18(41.9%)	2 (28.6%)			
	Anterior low transsphincteric fistula	5 (11.6%)	0 (0.0%)			
	Posterior low transsphincteric fistula	2 (4.7%)	0 (0.0%)			
	Lateral low transsphincteric fistula	5 (11.6%)	0 (0.0%)			
Results of MRI	High transsphincteric fistula	31(72.1%)	7(100.0%)	2.570*	0.109	NS
	Low transsphincteric fistula	12(27.9%)	0 (0.0%)			
High transsphincteric fistula	Anterior	9 (29.0%)	2(28.6%)	3.726*	0.155	NS
	Posterior	4 (2.9%)	3(42.9%)			
	Lateral high	18(58.1%)	2(28.6%)			

P>0.05: Non significant (NS); P <0.05: Significant (S); P <0.01: Highly significant (HS).

*: Chi-square test; •: Independent t-test; #: Mann-Whitney test.

Discussion

The present study was a cross sectional study that included 50 patients with transsphincteric perianal fistula who underwent m LIFT. Patients were recruited from multiple colorectal surgery specialized centers.

Demographic characteristics presented in this study were patients with mean age 39.92 and the majority were male (64%). Such characteristics were consistent with patients' characteristics described by Jayarajah and colleagues who conducted a prospective analysis on 34 patients whose median age was 42.5 years (range 22 – 63) and the majority of patients were males (88%).¹⁰

Faecal incontinence is a known threat for surgeons while performing surgical treatment for anal fistula, since there is a risk of disturbance of faecal continence of up to 53% when the anal sphincter is divided.¹¹

Hence we assessed mLIFT technique's impact on patients' continence to flatus, liquid stool and hard stool using Wexner score. Wexner score is a valid symptom scoring system for evaluation of the frequency and severity of faecal incontinence where it takes into consideration the type and frequency of incontinence and the extent to which it alters the patient's life.

In this study, we assessed the Wexner score for patients pre-operatively and postoperatively. Our results showed that there was no significant difference in fecal continence between pre-operative (Score = 0) and post-operative (Score = 0), where all patients were continent to flatus, liquid stools and solid stools.

We found that the results of our study were consistent with available literature on mLIFT. Wen K and colleagues performed a retrospective analysis of 62 cases with complex fistula in ano and treated with mLIFT, their results showed that all 62 cases had normal control of anal sphincter.⁵

For recurrence and treatment success, Emile SH has categorized patients after fistula surgery as patients with persistent anal fistula and patients with recurrent fistula. He defined persistence of anal fistula as failure of complete healing of anal fistula for more than 6 months after surgery while recurrence of anal fistula is the clinical re-appearance of the fistula after complete healing of the surgical wound.¹² In this study total recurrence was seven cases (14 %). Three cases presented as persistent fistula with unhealed wound for more than 6 months postoperative and four patients presented as clinical re-appearance of fistula at 9, 10 and 11 months post-operative. MRI was done for those patients.

Five patients had low intersphincteric fistulas and were treated with fistulotomy, one patient had high intersphincteric fistula and was treated with cutting seton while one patient had high transsphincteric fistula that was treated with cutting seton.

In agreement with our findings, Kang and colleagues reported that out of 28 patients treated with m LIFT for transsphincteric fistula, five patients (18%) experienced recurrence.⁸ Consistently, Wen K and colleagues stated in their study that 10 patients of 62 participants (6.2%) presented with recurrence. All recurrent fistulas were in the form of intersphincteric fistulas. Among cases of recurrence, 8 patients were cured by simple fistulotomy and 2 patients cured by cutting seton.⁵ Another study compared LIFT to m LIFT and showed three cases of recurrence among the m LIFT group (n= 20) compared to 4 cases in the LIFT group (n=21). The instances of recurrence were failure to ligate the fistula tract in 2 cases and due to an abscess formed near the operation site in one case, and fistula-in-ano occurred after incision and drainage with a new internal opening. All 6 fistula recurrence cases underwent re-operation; in 4 cases by the LIFT procedure, and 2 by the m LIFT. The patient with the sinus abscess (One of the 4 patients of the LIFT group) was managed by incision and drainage and curettage.¹³ Wu W and colleagues conducted another comparative study between LIFT and mLIFT and the results showed 4 patients had persistent unhealed wound, and 2 recurred in modified-LIFT group, while 8 patients had persistent unhealed wound, and 5 recurred in LIFT group.¹⁴

Perianal discharge is a common feature of anal surgery. In the present study the patients had minimal to moderate discharge during first week with mean 2.28 gauze/day and decreased gradually to be completely absent by the end of the first postoperative month.

Our study showed no significant association between age or sex and the risk of recurrence. Likewise, Sirikurnpiboon and colleagues studied 20 patients treated with m LIFT compared to 21 patients treated with LIFT showed no significant association between age and sex and the risk of recurrence.¹³ Although in some literature, position of the tract is included as a risk factor for recurrence, our study has shown no statistical significance between incidence of recurrence and the position of the fistulous tract.

Emile SH has stated that the factors involved in failure of anal fistula treatment and anal fistula recurrence could be the position of the fistula, degree of anal sphincter involvement and associated anal diseases as well as the existence of co-morbidities or the intake of immunosuppressant.¹²

Moreover, intraoperative failure to identify the internal

opening, extirpate the primary tract completely or missed secondary tracts are important factors that may lead to recurrence. Improper wound care post-operative and poor hygiene are also major factors that will lead to recurrence if not avoided.¹²

In our study, we suggest that the reason for the cases of recurrence were probably as follow: Preoperatively: associated co-morbidities (As some of the recurrence cases were diabetic) and high fistula. Intraoperatively: difficult identification of the internal opening which might has caused a false tract and difficult ligation of the intersphincteric tract. Post-operatively: poor hygiene and wound infection.

Conclusion

All in all, compared to other procedures used to treat transsphincteric fistula that are mentioned in literature, it had been found that mLIFT has good results regarding healing of the fistula with low – or almost no – risk of incontinence, and low risk of recurrence. However, further studies are still needed to confirm our findings and to further assess the role of such technique in the algorithm of management of transsphincteric fistula in ano.

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