

Evaluation of the use of Ligation of Intersphincteric Fistula Tract Technique (LIFT) as a Management of Transsphincteric Anal Fistula

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ABSTRACT

Background: Surgical treatment is considered to be the best therapeutic modality for treatment of low transsphincteric anal fistula. Different surgical methods aim to decrease postoperative recurrence and anal incontinence. The aim of this study was to evaluate the use of ligation of the intersphincteric fistula tract (LIFT) technique in the management of low transsphincteric anal fistula as regards postoperative recurrence, anal incontinence and hospital stay. **Patients and Methods:** This study included thirty one patients with low transsphincteric anal fistula. They were prospectively randomized into two groups. Group (1) included fifteen patients who underwent the ligation of the intersphincteric tract (LIFT) technique and group (2) included sixteen patients who underwent the traditional fistulotomy procedure. The patients were examined at days 7,10 and 15 and were followed up for eight to thirteen months following surgery. Recurrence was assessed by history, examination and MRI if needed. Anal incontinence was assessed using clinical continence grading (grade a, b, c or d). **Results:** A total of fifteen patients (14 males, 1 female) were randomized to receive ligation of the intersphincteric tract (LIFT) technique and sixteen patients (14 males, 2 females) underwent traditional fistulotomy procedure. The mean age in both groups were 34.33 ± 6.63 , 36.93 ± 5.59 respectively. Postoperative recurrence was more frequent in group (2) than in group (1) (37.5% versus 13.3% respectively). Anal incontinence (which does not necessitate surgical interference) was also more encountered in group (2) than group (1). (25% versus 0%, respectively). **Conclusion:** LIFT technique may become the gold standard in treating transsphincteric fistulas. As it is a feasible, minimally invasive, cheap and relatively easy procedure, which is safe and effective at the same time.

INTRODUCTION

The word fistula originated from Latin (pipe, flute, fistula), the plural is fistulas or fistulae.¹ Anal fistula, fistula-in-ano or the sometimes called perianal fistula is a hollow tract lined with granulation tissue, connecting a primary opening inside the anal canal to a secondary opening in the perianal skin. Secondary tracts may be multiple and can extend from the same primary opening.²

Fistula-in-ano is nearly always caused by a previous anorectal abscess. Anal canal glands situated at the dentate line afford a path for infecting organisms to reach the intramuscular spaces. The cryptoglandular hypothesis states that an infection begins in the anal gland and progresses into the muscular wall of the anal sphincters to cause an anorectal abscess. Following surgical or spontaneous drainage in the perianal skin, occasionally a granulation tissue-lined tract is left behind, causing recurrent symptoms. Multiple series have shown that the

formation of a fistula tract following anorectal abscess occurs in 7-40% of cases.^{3,4}

Other fistulas develop secondary to trauma, Crohn disease, anal fissures, carcinoma, radiation therapy, actinomycoses, tuberculosis, and Chlamydial infections.⁵

Diagnosis is clinical and it is aided by imaging techniques like fistulography, endoanal/endorectal ultrasonography, MRI, CT scan and Barium enema/small bowel series.

Over the centuries, the probing of the fistula tract was the procedure of choice for final identification of its anatomy and planning the treatment. Laying open a fistulous tract (fistulotomy) was the treatment of choice. Use of seton is a traditionally favored method for treating high fistulae, and those associated with inflammatory bowel conditions such as Crohn's disease, to minimize the incontinence problem. More complex surgical procedures in the form of local advancement flaps have met moderate success.¹

Perianal fistula, like other benign anorectal conditions, has a well-recognized incidence of fecal incontinence and recurrence after surgical treatment. Therefore, all recent advances are geared towards better evaluation and effective management of the fistula.⁶

Over the last 30 years, many authors have presented new techniques and case series in an effort to minimize recurrence rates and incontinence complications, but despite 2500 years of experience, fistula-in-ano remains a confusing surgical disease.²

In 1993, Matos and his coworkers described a technique of total anal sphincter preservation in high fistula in ano, which is based on the concept of excision of intersphincteric anal gland infection through the intersphincteric approach.⁷

In 2007 Rojanasakul, a Thai colorectal surgeon, and his coworkers presented a modified approach called "ligation of intersphincteric fistula tract" or LIFT procedure. It is based on secure closure of the internal opening and removal of infected cryptoglandular tissue through the intersphincteric approach.⁸

Aim of work:

This study aims to assess the feasibility of LIFT technique, to identify the early and late post-operative course, to detect the effect on anal continence, to record up one year recurrence rate, and to compare these findings to the standard techniques of fistula management, namely the fistulotomy for the management of transsphincteric fistulas.

PATIENTS AND METHOD

This prospective randomize study was conducted at Ain Shams university Hospitals and Saudi German Hospital, Jeddah between March 2014 to May 2015.

Patients:

Thirty one patients (convenient sample) suffering of anal fistula participated this study.

Eligibility:

Ages Eligible for Study: 16 years. Genders Eligible for Study: Both

Criteria:

Inclusion Criteria:

All patients included in this study:

- Were suffering from low transsphincteric fistula

- Were elder than 16 years old and below 75 years.
- Were able to understand and accept proposed investigations and treatment.
- Signed a detailed informed consent document, as well as latest patient information leaflet.
- Were fit for a suitable type of anesthesia.

Exclusion Criteria:

These patients were not included in this study:

- Patients suffering from one of these types of perianal fistula:
 - Subcutaneous type (for its simplicity)
 - Extra, intra and Suprasphincteric fistulas.
 - Horse-shoe type (for fear of missing tracts).
 - High transsphincteric fistula.
 - Branched or complex by MRI.
- Patients with a history suggestive of one of the following conditions (may suggest a complex fistula):
 - Inflammatory bowel disease
 - Previous radiation therapy for prostate or rectal cancer
 - Tuberculosis
 - Steroid therapy
 - Human immunodeficiency virus (HIV) infection
 - Below the age of 16 years, or above 75 years
 - Patients with any degree of fecal incontinence.
 - Not fit for anesthesia.
 - Approval from Ain-Shams University Hospitals ethical committee was obtained.

Methods:

Patients were divided randomly into 2 parallel groups by simple randomization; **Group (1)** (n=15) the "patients treated using LIFT technique group" and **Group (2)** (n=16) "patients treated using fistulotomy procedure",

All patients subjected to:

1. Full history taking.
2. Full clinical assessment, including digital examination to assess the integrity of the anal sphincter muscles.
3. Assessment of clinical continence for patients complaining from symptoms of incontinence using *Clinical continence grading*.⁹
4. MRI for anal region and perineum if needed.
5. Preoperative labs and assessment.

For patients treated with the fistulotomy procedure operative technique was as follows:

- Regional or general anesthesia with muscle relaxation and endotracheal intubation were administered.
 - The procedure was performed in a lithotomy position.
 - Identifying the external opening.
 - Identifying internal opening.
 - Then, probing and lay open fistulotomy.¹
- For patients treated using LIFT technique, the operative technique was:

- Regional or general anesthesia with muscle relaxation and endotracheal intubation were administered.
- The procedures were performed in a lithotomy position.
- Identifying the external opening.
- Identifying the internal opening, by digital examination and probing, hydrogen peroxide was used in some of the cases.
- Entering the intersphincteric plan at the site of fistulous tract via curvilinear incision.
- Identifying intersphincteric tract.
- Tract ligation close to the internal sphincter with 3-0 absorbable suture.
- Tract was divided distal to the point of ligation.
- Reinjection of water through the external opening once more to confirm that the tract was correctly divided.
- The fistulous tract was thoroughly curetted. With excision of the external opening.
- Reapproximation of the intersphincteric incision wound with absorbable 3-0 suture.



Fig. (1): Opening the intersphincteric plan

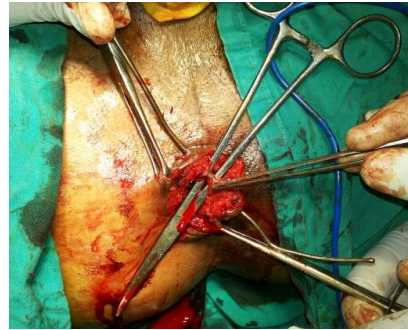


Fig. (2): Identification of the fistulous tract



Fig. (3): Ligation of the intersphincteric fistula tract



Fig. (4): Approximation of the wound

Early postoperative assessment of the course and complications was done. Long term patient follow-up continued was at least 8 months to detect cases of recurrence and assessment of incontinence.

Recurrence was assessed by history, clinical examination and MRI if needed.

Digital examination was done to assess the integrity of the anal sphincter muscles. Assessment of Clinical Continence was done using *Clinical continence grading*.⁹

- Category A: continent of solid and liquid stools and flatus (i.e. normal continence)
 - Category B: continent of solid and usually liquid stools but not flatus (no fecal leakage)
 - Category C: acceptable continence for solid stool, but no control over liquid stool or flatus (intermittent fecal leakage)
 - Category D: continued fecal leakage
- Collected data were analyzed and statistically using SOFA Statistics version 1.4.3.

Analysis was conducted using Mean, Standard deviation, Unpaired student T-test and Chi-square test. Assuming significance if $p < 0.05$.

RESULTS

Thirty one patients participated in this study, 28 (90.3%) were males. And their distribution in the groups is shown in table (1) and **Figure: (5)** without statistical significant difference between the 2 groups.

Table (1): Comparative analysis between the 2 groups as regard sex

| Groups | Male | Female | Total | χ^2 | P |
|---------|------------|-----------|-----------|----------|-------|
| Group 1 | 14 (93.3%) | 1 (6.7%) | 15 (100%) | 0.301 | 0.583 |
| Group 2 | 14 (87.5%) | 2 (12.5%) | 16 (100%) | | |
| Total | 28 (90.3%) | 3 (9.7%) | 31 (100%) | | |

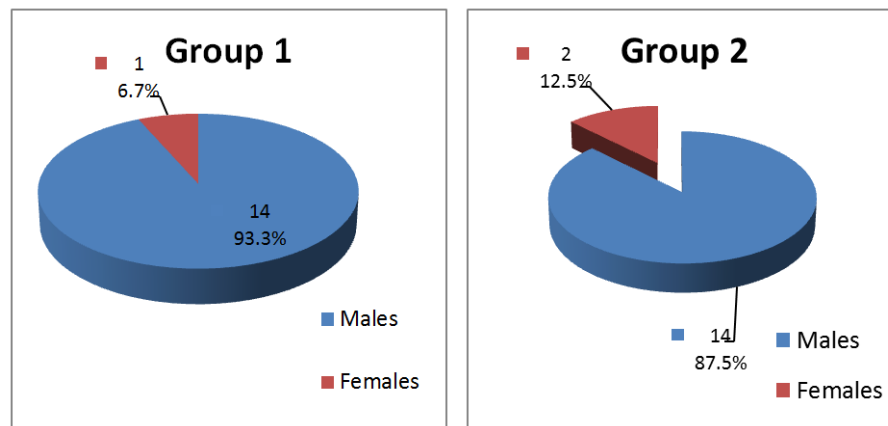


Fig. (5) Pie chart showing the male to the female percentage in the 2 groups

As regards age there was no statistical significant difference between the 2 groups. Table (2) and **Figure. (6)**.

Table (2): Comparative analysis between 2 groups as regards age

| Groups | Mean (Years) | Standard Deviation | Min | Max | T-test | P |
|---------|--------------|--------------------|------|------|--------|-------|
| Group 1 | 34.33 | ± 6.63 | 27.0 | 47.0 | 1.185 | 0.246 |
| Group 2 | 36.93 | ± 5.59 | 29.0 | 46.0 | | |

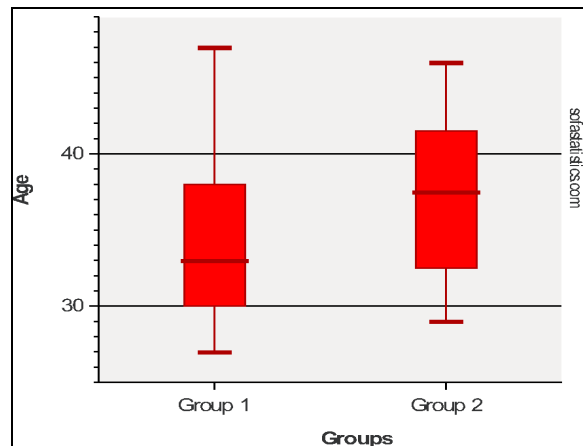


Fig. (6) Comparative analysis between 2 groups as regards age

Regarding hospital stays, they ranged from 0.5 day (day case) to 2 days for **Group (1)** and from 1 to 2 days for **Group (2)** without a statistically significant difference. Table (3).

Table (3): Comparative analysis between the 2 groups as regards hospital stay

| Groups | Mean (Days) | Standard Deviation | Mins | Max | T-test | p |
|---------|-------------|--------------------|------|-----|--------|-------|
| Group 1 | 1.03 | ±0.3 | 0.5 | 2 | 1.206 | 0.238 |
| Group 2 | 1.19 | ±0.4 | 1 | 2 | | |

LIFT technique was performed for all patients of **Group (1)** with 86.7% overall cure rate. None of the cases were complicated by incontinence, but 13.3% of cases had recurrence. In **Group (2)** the overall cure rate was 56.3% with 18.7% of the cases had recurrence, 6.3% of the cases were complicated with incontinence, and 18.7% with both recurrence and incontinence. The difference in the overall cure rate between the 2 groups is statistically non-significant. Table (4) and **Figure. (6)**

Table (4): Comparative analysis between 2 groups as regards overall cure.

| Groups | Cured | Not Cured | Total | X ² | p |
|---------|------------|-----------|-----------|----------------|-------|
| Group 1 | 13 (86.7%) | 2 (13.3%) | 15 (100%) | 3.476 | 0.062 |
| Group 2 | 9 (56.3%) | 7 (43.7%) | 16 (100%) | | |
| Total | 22 (71%) | 9 (29%) | 31 (100%) | | |

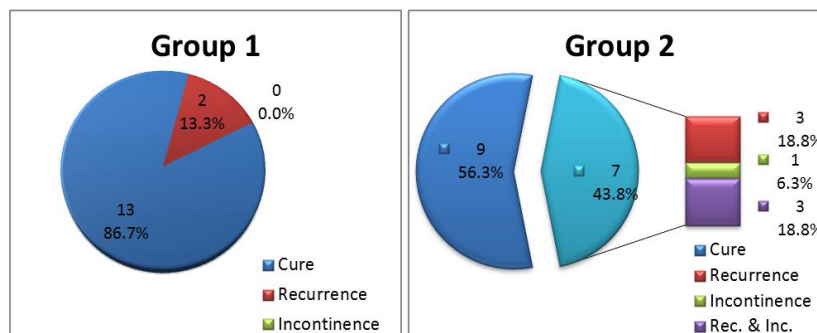


Fig. (6): Comparative analysis between 2 groups as regards overall cure.

As regards the recurrence after surgery, there were no statistical significant difference between the 2 groups or between **Group (1)** (LIFT) and main subset of **Group (2)** (Fistulotomy). Table (4) and Figure (7).

Table (5):(Comparative analysis between 2 groups as regard recurrence.

| Groups | Non | Recur. | Total | χ^2 | P |
|---------|------------|-----------|-----------|----------|-------|
| Group 1 | 13 (86.7%) | 2 (13.3%) | 15 (100%) | 2.362 | 0.124 |
| Group 2 | 10 (62.5%) | 6 (37.5%) | 16 (100%) | | |
| Total | 23 (74.2%) | 8 (22.6%) | 31 (100%) | | |

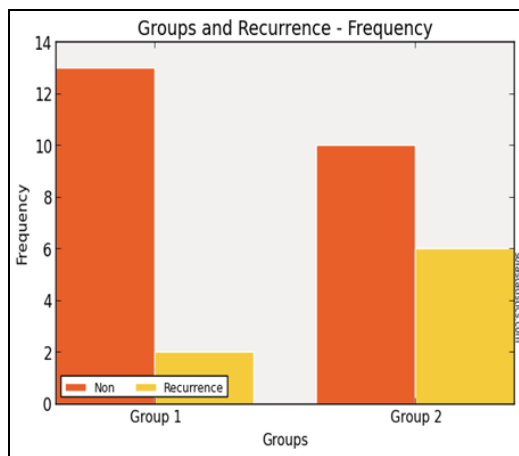


Fig. (7): Comparative analysis between 2 groups as regards recurrence

But regarding the incontinence, there were statistical significant differences between the 2 groups; as well as between **Group (1)** and main subset of **Group (2)** (Fistulotomy). All the 4 cases of incontinence were under category B according to the *Clinical continence grading*; and all of them reported improvement without intervention. Table (6) and Figure (8).

Table (6): Comparative analysis between 2 groups as regard incontinence

| Groups | Non | Incon. | Total | χ^2 | P |
|---------|------------|-----------|-----------|----------|-------|
| Group 1 | 15 (100%) | 0 (0%) | 15 (100%) | 4.306 | 0.038 |
| Group 2 | 12 (75%) | 4 (25%) | 16 (100%) | | |
| Total | 27 (87.1%) | 4 (22.6%) | 31 (100%) | | |

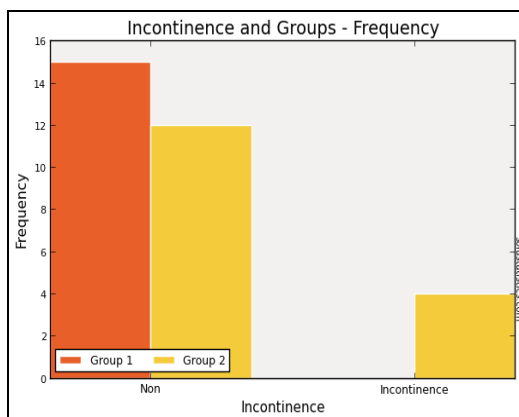


Figure (8) Comparative analysis between 2 groups as regard incontinence

DISCUSSION

The goal of surgical management for perianal fistula is to effectively eradicate current and recurrent septic foci, associated epithelialized tracts and preserve continence. No single technique achieves these aims for all types of anal fistulas. It is often necessary to balance the degree of sphincter division and continence disturbance. An ideal procedure for treating a fistula-in-ano should be minimally invasive with minimal failure rates and morbidity.¹⁰

Based on the data available from the meta analysis studies published by Vergara-Fernandez and coworker¹¹, Murugesan and coworkers¹², Simpson and coworkers¹³, who had gathered most of the published clinical trials on the LIFT technique, and also based on our search in the Cochrane Library,¹⁴ there is a single Randomized Control Trial published on the LIFT technique, performed by Mushaya and coworkers,¹⁰ since the technique was described by Rojanasakul in 2007⁸. The rest of studies were either retrospective case series or prospective cohort studies.

The study of Mushaya and his coworkers compared LIFT procedure to advancement flap for complex anorectal fistulas requiring initial seton drainage.¹⁰ Our study is a randomized control study comparing LIFT procedure to fistulotomy as gold standard for the treatments of the perianal fistula.

This study was performed on 31 patients with perianal fistula. Many studies performed on the LIFT technique were performed with figures near to this figure; like that of Ellis⁵ who also recruited the same number of patients, and that of Han and coworkers¹⁵ and Lui and coworkers¹⁶ who recruited 38 patients for each of their studies.

We followed-up patient participated in our study for a period ranged from 8 to 13 months with a mean of 10.5 months. Murugesan and coworkers¹² found that the follow-up range in the studies collected for their meta analysis was 0–67 months, but they didn't calculate the mean for the follow-up periods. On reviewing their data, a single study only had this lengthy follow up period of 67 months, it was for Tan and coworkers¹⁷, and was a retrospective study, so this may explain the cause of lengthy follow-up period. Most of the prospective studies choose a follow-up period less than 12 months, for fear of

attrition, especially when the condition is completely cured.

In our patient series, recurrence after performing the LIFT technique occurred in 13.3% of the patients. In their study, Shanwani and coworkers¹⁸ reported recurrence in 17.7% of the cases treated with the LIFT procedure. While Tan and coworkers⁶ reported only 6.4% recurrence.

Ooi and coworkers¹⁹ reported 28% recurrence rate after the LIFT technique, all those cases had intersphincteric fistulas. This emphasizes the fact that although the LIFT is safe procedure, it's not suitable for all types of fistulas.

There were no cases of incontinence after performing the LIFT technique in all our patients. This was also reported by Rojanasakul and coworkers.⁸

Shanwani and coworkers¹⁸ and Sirikurnpiboon and coworkers²⁰ all of them reported no cases of incontinence in their case series.

This indicates the safety of the procedure on the sphincters.

As regards to fistulotomy, in our study, 30.8% of the cases underwent fistulotomy had developed recurrence. The recurrence rate after fistulotomy was reported to be 0-2% in simple fistulas by Simpson and coworkers¹³.

The incontinence rates with fistulotomy were reported by Dudukgian and his coworkers²¹ to be ranging from 12-50%. This variation is according the level of fistula to be treated, fistulotomy of low fistulae usually causes no incontinence while the reverse is true for high fistulas. In our patients treated with fistulotomy the incontinence rate was 23.1% of the patients. And as mentioned before, it was incontinence to gas only, and it was improved by time with no specific treatments.

CONCLUSION

LIFT technique may become the golden standard in treating transsphincteric fistulas. As it is a feasible, minimally invasive, cheap and relatively easy procedure, which is safe and effective in same time.

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