Evaluation of ligation of intersphincteric fistula tract technique in treatment of simple transsphincteric fistula

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Objective
To evaluate the success rate of ligation of intersphincteric fistula tract (LIFT) operation in the treatment of simple transsphincteric anal fistula.
Background
LIFT is a new effective sphincter-preserving technique. One of the main advantages of the technique is the low possibility of an impaired sphincter function (as there is no resection of the sphincter).
Patients and methods
This is a prospective descriptive clinical study of 30 patients with simple transsphincteric anal fistula. In this variety of fistula, the tract passes from the intersphincteric plane through the external sphincter into the ischioanal fossa, and to the skin. Patients with transsphincteric anal fistulas of cryptoglandular origin with no previous surgical interventions were included. Patients with anal fistulas from another sources, such as Crohn's disease, tuberculosis, anal cancer, and recurrent fistulas, were excluded. All patients underwent the same technique and were evaluated for 6 months postoperatively.
Results
We evaluated 30 patients. Their mean age was 42.1 years. The outpatient follow-up was 6 months. The healing time observed in this study ranged from 5 to 8 weeks after the procedure (mean±SD) 6.47±1.19. A primary healing rate of 80% (24 patients) was observed, and the recurrence rate was 20% (six patients). Recurrence occurred in the incision for ligation of the fistulous tract, that is, the fistula turned into intersphincteric type. The postoperative wound infection occurs in five (16.7%) patients. Postoperative urine retention occurred in one (3.3%) patient. No bleeding occurred in any patient. No patient experienced postoperative incontinence to stool.
Conclusion
LIFT was effective sphincter-preserving technique in the treatment of simple transsphincteric anal fistulas.

Keywords:
anal fistula, ligation of intersphincteric fistula tract, simple transsphincteric anal fistula, sphincter preserving

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Introduction

Anal fistula is a difficult problem that physicians have struggled with since the time of Hippocrates [1]. Anal fistula constitutes an epithelized path establishing a communication between the rectum or anal canal and perianal region. Fistula incidence is estimated in 8.6/100 000 individuals with predominance in males by 2 : 1. The disease is more frequent between the third and fifth decades of life. In up to 90% of the cases, the origin of the fistula is cryptoglandular. In only 10%, Crohn's disease, trauma, malignancies, infection, or radiation therapy can be the cause of disease [2]. The etiology of persisting perianal suppuration and fistula formation is the presence of anal glands or epithelial debris in the central and intersphincteric spaces. These buried 'epithelial element', in the presence of infection, act as multiple sequestra which harbor and maintain the infective process. Infection starts in central space and works its way to the other anorectal spaces, leading to different types of fistulas [3]. The clinical manifestations of anal fistula are anal itching, discomfort, and pain, associated with a recurrent mucopurulent discharge sometimes with blood [2]. In 1961, Parks and Stitz [4] divided fistulas into intersphincteric, transsphincteric, suprasphincteric, and extrasphincteric. The Standards Committee for the American Society of Colon and Rectal Surgeons published practice parameters for the management of perianal abscess and anal fistula in 2011 in which

fistulas can also be classified as 'simple' or 'complex' with simple fistulas including intersphincteric and low trans-sphincteric fistulas that cross 30% of the external sphincter. Complex fistulas include high transsphincteric fistulas with or without a high blind tract, suprasphincteric and extrasphincteric fistulas, horseshoe fistulas, and those associated with inflammatory bowel disease, radiation, malignancy, preexisting incontinence, or chronic diarrhea, as well. Given the attenuated nature of the anterior sphincter complex in women, fistulas in this location deserve special consideration and may be considered complex as well [5]. The ideal surgical treatment for anal fistula should eradicate sepsis and promote healing of the tract, while preserving the sphincters and the mechanism of continence [6]. For the simple fistulae, conventional surgical treatment such as lay open of the fistula tract as a complete transection of the tissue between the fistula tract and anoderm is very effective [6]. Fistulectomy involves coring out of the fistula. It allows better definition of fistula anatomy, especially the level at which the tract crosses the sphincters [7]. Some surgeons will continue to use the cutting seton, convinced of its merits, whereas others are completely against its use, claiming high incontinence and recurrence rates [8]. Recently, a number of new sphincter-preserving techniques have been developed and proposed, all with the common goal of minimizing the injury to the anal sphincters and optimizing the functional outcome [6],

Ligation of intersphincteric fistula tract (LIFT) is a new sphincter-preserving technique for the treatment of transsphincteric fistulas that was described by Rojanasakul *et al.* [9], with an initial healing rate of 94.4%. The procedure consists of opening and dissection of the intersphincteric space and identification of the fistula tract crossing that space. The tract is then ligated and cut, leaving both internal and external sphincter intact [10]. Subsequent studies have revealed a healing rate ranging from 68 to 83%, with an average healing time from 6 to 7 weeks. Modifications of the LIFT technique have been described to increase its success rate. A recent study of 41 cases compared the LIFT technique with LIFT along with the additional step of coring fistulectomy, which was done from the external opening till the anal sphincter [11]. No significant difference in success rate was noted (85 vs. 81%).

Another study of 41 patients, to determine whether adding an advancement flap to the LIFT technique would help in increasing the success rate, revealed an overall healing rate of 71% [12]. Reinforcing the LIFT with a bioprosthetic graft, has been used to significantly improve the success rate of LIFT (75–94%) [13,14]. There have been many articles comparing the result of LIFT with other sphincter-preserving technique .The results with advancement flap as a standalone procedure range from 59 to 72% [15,16]. Continence can deteriorate in 9–14% of patients after this procedure. The success rates of fibrin glue are however very diverse and low. In a paper, which reviewed papers from 1966 to 2004, showed a success rate that varied from 0 to 100% [6]. Subsequent papers have revealed success rate between 38 and 41% for simple fistulas and a much lower rate for complex fistulas [17,18]. In 2006, Meinero and Mori [19] described the video-assisted anal fistula treatment technique for fistula-in-ano. He published his results in 2012. The procedure was performed in 136 patients over a period of 5 years. In a mean follow-up of 13 months, primary healing was achieved in 72 (73.5%) patients at the end of 3 months. At the end of 1 year, 87.1% of fistulas had healed [20]. Autologous adipose-derived stem cells can be used in combination with fibrin glue for management of fistula. The results at 1 year vary from 50 to 71% [21,22].

The aim of this study was to evaluate the success rate of LIFT operation in the treatment of simple transsphincteric anal fistula.

Patients and methods

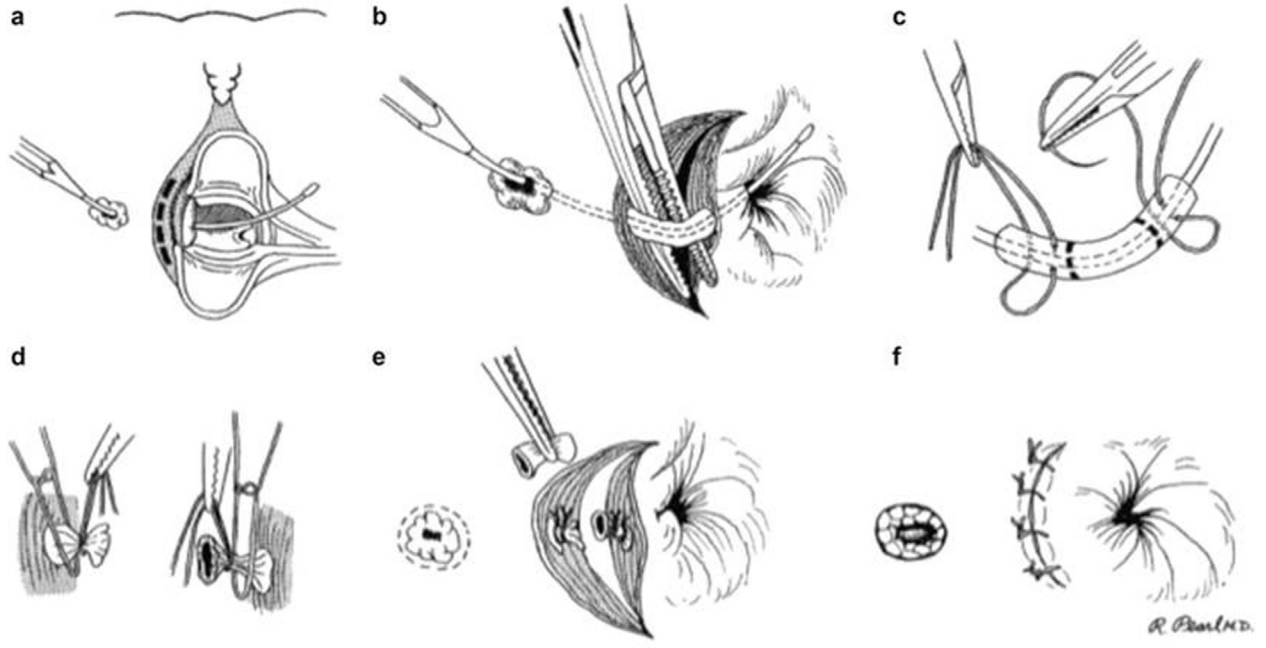
This is a prospective descriptive clinical study that included 30 patients complaining of simple anal fistula, of age ranging from 20 to 60 years old and from both sexes attending the Menoufia University Hospital and Nasser Institute Hospital during the period from May 2017 to May 2018, and all patients underwent treatment with LIFT technique. Inclusion criteria were patients with cryptoglandular, simple transsphincteric fistula. Exclusion criteria were active anorectal sepsis; intersphincteric, suprasphincteric and extrasphincteric fistulas; horseshoe fistulas; rectovaginal fistula; traumatic fistula; and those associated with inflammatory bowel disease, specific infection (e.g. tuberculosis), radiation, malignancy, preexisting incontinence or chronic diarrhea, patients younger than 18 years, and pregnancy. Informed consents were obtained from all patients included in the study. The study was approved by the Local Ethics Committee of General Surgery Department of Faculty of Medicine Menoufiya University and Nasser Institute Hospital. Medical history and clinical data were obtained from each patient with special emphasis on the presenting

symptoms. The examination included perineal inspection, palpation, digital rectal examination, and proctoscopic evaluation. Continence status of the patients of the study was assessed by Wexner incontinence score system. (The scale takes into account the frequency of the incontinence, the type of incontinence (solid stool, liquid, or gas), the use of a pad, and the effect on daily living. Scoring for the scale ranges from 0 to 20. Patients with a score below 8 have mild incontinence; 9–14, moderate incontinence; and 15–20, severe incontinence. A score of 9 or higher has been associated with a negative effect on quality of life [23]. All patients were admitted to the hospital at least 1 day before surgery. The anal region was shaved. On the morning of the operation, the rectum was evacuated with the aid of a disposable enema. All patients were operated under spinal anesthesia after antibiotic prophylaxis with ceftriaxone 1 g intravenously and metronidazole 500 mg intravenously at time of induction. With the patient in lithotomy position, inspection and identification of the site of external opening was done, and proctoscopy was applied for detection of internal opening and the fistula tract. Injection of methylene blue in the external opening to identify the presence and site of internal opening was done. A probe was passed in the external opening to define the direction of the fistula tract to the internal opening and to classify the fistula according to Park's classification. A curvilinear incision was made just outside the intersphincteric groove. Dissection was continued in the intersphincteric plane until the fistula track was encountered. After its isolation, the probe was removed and the track was ligated with absorbable sutures (3/0 Vicryl) close to the internal and external anal sphincters. The track was then transected between the two ligation points. The wound was loosely closed with interrupted, absorbable sutures. Subsequently, both external and internal openings were gently curetted to remove any granulation tissue and then left open for drainage (Fig. 1) [24]. The operating time for the procedure was calculated from the start of the methylene blue test to the beginning of dressing of the postoperative wound. The patients were evaluated weekly for 8 weeks then once monthly for 4 months (total follow-up of 6 months) at the outpatient clinic and were assessed for severity of postoperative pain on a scale of 0–10 with the help of the Visual Analogue Scale (VAS), time of hospital stay, postoperative time needed for complete healing, continence status (by Wexner score system), recurrence, and postoperative complications (urine retention, bleeding and wound infection). The results had been collected, evaluated, calculated, tabulated, and statistically analyzed using a computer statistical package SPSS 19.0 (SPSS Inc., Chicago, Illinois, USA). Descriptive statistics in the form of mean, SD, number and percentage were applied.

Results

This study was conducted on 30 patients, comprising 20 (66.7%) male and 10 (33.3%) female. The mean±SD

Figure 1



Ligation of intersphincteric fistula tract.

age was 42.1±18.6 years. All patients were complaining of cryptoglandular, simple transsphincteric anal fistula and all were treated by LIFT operation. Discharge was the main complaint, and it was present in all patients in the study. Pain was present in 22 (73.3%) patients in the study. Swelling was present in 22 (73.3%) patients in the study. Pruritus ani was present in only 12 (40%) patients in the study (Table 1). The operative time ranging between 35 and 40 min, with a mean±SD of 38.0±2.54. There were no intraoperative complications. In each case, the patient was discharged within 24 h. The post-LIFT outpatient follow-up was 6 months. Severity of postoperative pain was assessed on a scale of 0–10 with the help of the VAS. The VAS mean±SD was 3.3±1.4. Subsidence of pain (VAS mean<1) was noted at ~3 weeks postoperatively. The healing time observed in this study ranged from 5 to 8 weeks after the procedure (mean±SD 6.47±1.19). In this series of cases, a primary healing rate of 80% (24 patients) was observed, and the recurrence rate was 20% (six patients) (Fig. 2). Postoperative wound infection occurred in five (16.7%) patients. Postoperative urine retention occurred in one (3.3%) patient. No bleeding occurred in any patient. No patient experienced postoperative incontinence (Table 2).

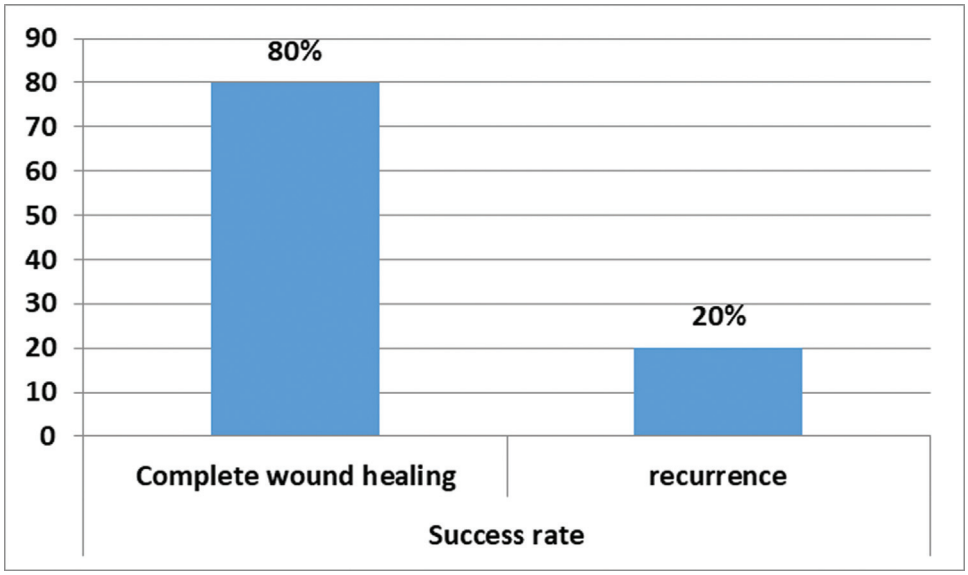
Table 1 Distribution of sociodemographic data among study group and the main presenting complaints

Age (years)	
Mean±SD	42.1±18.6
Median	43
Range	24–60
Sex (*N*=30) [*n* (%)]	
Male	20 (66.7)
Female	10 (33.3)
Complaints (*N*=30) [*n* (%)]	
Discharge	30 (100.0)
Pain	22 (73.3)
Swelling	22 (73.3)
Pruritus	12 (40.0)

Discussion

The three primary criteria for determining success or failure of fistula surgery are the following: recurrence, delayed healing, and incontinence [25]. A number of new sphincter-preserving techniques have been developed and proposed, all with the common goal of minimizing the injury to the anal sphincters and optimizing the functional outcome [6]. The technique that has perhaps gained the most traction in recent years is the LIFT procedure. It was first described in 1993 by Matos *et al.* [26]. It gained popularity after it was revised and reborn in 2007 by Rojanasakul *et al.* [9] and reported impressive healing rate (>94%), with no complications for transsphincteric fistulas [9]. Since then, LIFT was familiar to clinicians. Long-term success rates from studies with a long-term follow-up period report healing rates of 40–95% for LIFT [27]. This study was designed to evaluate success rate of LIFT operation in the treatment of simple transsphincteric anal fistula. In this study, a primary healing rate of 80% was observed. In American studies that included patients who failed a previous treatment, the healing rate ranged from 55 to 64% [28]. In Australia, Ooi *et al.* [29] who also included in the sample patients with recurrent perianal fistulas (40% of the sample), achieved primary healing in

Figure 2



Success rate in our study.

Table 2 Outcomes of ligation of intersphincteric fistula tract procedure

The operative time (min)	
Minimum–maximum	35.0–40.0
Mean±SD	38.0±2.54
Median	40
Postoperative pain (Visual Analogue Scale)	
Minimum–maximum	1.0–5.0
Mean±SD	3.3±1.4
Time needed for wound healing (weeks)	
Minimum–maximum	5–8
Mean±SD	6.47±1.19
Success rate (*N*=30) [*n* (%)]	
Complete wound healing	24 (80)
Postoperative complications (*N*=30) [*n* (%)]	
Recurrence	6 (20)
Wound infection	5 (16.7)
Urine retention	1 (3.3)
Bleeding	0
Incontinence	0

68.0% of cases. On the contrary, Shanwani *et al.* [30] reported cure in 82% of their sample. European studies showed resolution rates of 71–83% for primary healing, and in some of them up to 100% healing in the sample, in those studies that considered secondary healing patients [18]. This demonstrates that the healing rates obtained in this study were within the expected. The follow-up period in this series was 6 months, and the recurrence rate was 20%. In studies of Yassin *et al.* [28] and Liu *et al.* [31], the mean follow-up was 19 and 28 months, respectively, and the recurrence rate was 36 and 32%, respectively. Possibly the lower relapse seen in this paper is inferior to the other studies presented here owing to a shorter follow-up. Although most LIFT recurrences presented early, some occurred beyond 6 months and as late as 12 months after the initial procedure. Hence, the time of follow-up cannot be ignored. Currently published median follow-up ranges from 5 to 9 months, but several authors have found that late recurrences can occur 7–8 months after the surgical procedure [32]. Thus, the short-term observation may be an overestimate of the success rate. Even if the external and internal orifice is healed, it is still possible for incomplete closure presumably with a risk for recurrence. Follow-up extended to 2 or more years should clarify this point [32]. Extended follow-up is needed to better understand the long-term outcome of LIFT. Of the six patients who did not achieve a primary healing in our study, all showed recurrence in the incision for ligation of the fistulous tract, that is, their defects turned into intersphincteric fistulas, and could be subsequently treated by fistulotomy with complete resolution and with no fecal incontinence. This development has already been reported by others and can be considered as an advantage of the method, which enables a primary cure in most cases, but, when this does not occur, it at least reduces the complexity of the fistulous tract [29,33]. The healing time observed in this study ranged from 5 to 8 weeks after the procedure (mean±SD, 6.47±1.19). Ooi *et al.* [29] and Shanwani *et al.* [30] reported a mean healing time of 6 and 5 weeks, respectively. Wound infection was defined as the presence of erythema, induration surrounding the wound, or constitutional symptoms such as fever. In this study, the postoperative wound infection occurred in five (16.7%) patients. Wound infection occurs owing to bad hygiene of the patients; this infection was treated early by antibiotics and regular dressing, and there was a good response. The wound was carefully examined for bleeding. In this study, no bleeding occurred in any patient. This was owing to good hemostasis and use of diathermy during operations. In this study, postoperative urine retention occurred in one (3.3%) patient. This condition occurred temporarily in the operative day and relieved soon after analgesics and hot bath. One of the main advantages of this technique is a low or zero possibility of an impaired sphincter function (as there is no section of the sphincter). All patients in this study were assessed according to Wexner incontinence score in the follow-up period. No patient experienced postoperative incontinence to stool.

Conclusion

LIFT was effective sphincter-preserving technique in the treatment of simple transsphincteric anal fistulas. One of the main advantages of the technique is the low possibility of an impaired sphincter function.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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