Int J Colorectal Dis (2017) 32:583–585
DOI 10.1007/s00384-016-2723-2

SHORT COMMUNICATION

# Effective and long-term outcome following ligation of the intersphincteric fistula tract (LIFT) for transsphincteric fistula

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Accepted: 18 November 2016 / Published online: 23 November 2016


**Abstract**
*Objective* The purpose of this study was to evaluate the efficacy and long-term outcome of the ligation of the intersphincteric fistula tract (LIFT) procedure for transsphincteric fistula-in-ano.
*Methods* A total of 43 patients that were treated with LIFT procedure and had a follow-up time of more than 1 year were included.
*Results* The median age was 37.18 years, and 32 (74.4%) of the patients were male. The median follow-up time was 26.2 months (range 13–63 months). There were 29 (67.4%) uncomplicated transsphincteric fistulas, 10 (23.3%) horseshoe transsphincteric fistulas, and 4 (9.3%) multiple fistulas. Eight (18.5%) patients presented with dehiscence or infection at the intersphincteric wound and were successfully treated with either laying open ($n$ = 5) or local application of silver nitrate ($n$ = 3). The success rate, as determined from the last follow-up time point, was 83.7% (36/43). The mean time to complete failure was 8.6 weeks (range 1–28) in 7 patients. With the exception of these 7 patients, 32/36 (88.9%) patients had a Cleveland Clinic Florida Faecal incontinence score of 0, 3 patients had a score of 1, and 1 had a score of 2. No significant association was found between laying open and incontinence in these partial failure patients.
*Conclusion* The LIFT procedure can be considered an effective sphincter-sparing procedure in the management of transsphincteric fistula with an acceptable long-term outcome.

**Keywords** Ligation of intersphincteric fistula tract · Transsphincteric anal fistula · Long-term outcome

## Introduction

Classic treatment for high anal fistulas, such as fistulotomy and/or seton placement, is associated with a high recurrence or insufficient protection of anal function [1, 2]. Sphincter-preserving techniques, on the other hand, seem to preserve faecal continence at the expense of higher recurrence rates [2, 3]. The ligation of the intersphincteric fistula tract procedure, first proposed by Rojansakul in 2007, has sparked interest due to promising short-term results [4]. A meta-analysis and a retrospective analysis indicated that the ligation of the intersphincteric fistula tract (LIFT) procedure is an effective sphincter-conserving approach for the treatment of transsphincteric anal fistula [5, 6]. The follow-up times in these studies ranged from 3.0–19.2 months; however, the majority of the studies had a relatively short follow-up time point ranging only from 3.0 to 5.0 months. Data regarding the long-term success rate of the LIFT procedure is lacking. Thus, the aim of our study is to assess the efficacy and long-term outcomes of the LIFT procedure in the treatment of transsphincteric anal fistula.

## Materials and methods

This is a retrospective review of all patients who had a LIFT procedure for transsphincteric anal fistulas with a follow-up

This manuscript has been thoroughly edited by a native English speaker from an editing company. Editing certificate will be provided upon request.

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time of more than 1 year at our institution between September 2009 and December 2014. The study was approved by the Research and Ethics Board of the Hospital Affiliated of Nanjing University of Chinese Medicine (2013NL-056-02).

Prior to the procedure, no mechanical bowel preparation or antibiotic injection was attempted. Surgery was performed under lumbar anaesthesia and jackknife position. The internal orifice was identified by injecting hydrogen peroxide ($H_2O_2$). An intersphincteric incision was made and the fistula tract was identified with or without a probe in situ. After the intersphincteric tract was isolated, the fistula tract was ligated closed to the internal anal sphincter with a 3/0 vicryl. $H_2O_2$ was injected from external opening to confirm the fistula tract if ligated properly. Following that, the fistula tract was suture ligated as close as possible to the external anal sphincter. The tract was divided between the two points of ligation, and $H_2O_2$ was injected through the external orifice to confirm no leakage in intersphincteric space. The external opening and the remnant of tract were cored out in proximity of external sphincter, and the wound was left open for drainage. The intersphincteric plane was then irrigated and closed with interrupted 3/0 vicryl.

All patients were postoperatively prescribed an antibiotic for 3 days and a stool softener for 1 week. Patients changed the dressing daily until the wound healed. Patients were examined at 4 weeks after operation. Further follow-up information was obtained by phone at 6 and 12 months, according to the protocol of the study. Cleveland Clinic Florida Faecal Incontinence (CCF-FI) scores were evaluated both prior to the operation and at the time of the follow-up but were only analysed for patients who had a successful fistula closure at the last follow-up.

Three patterns of failure to heal, or fistula recurrence, after the LIFT procedure have been previously described by Tan et al. [7]. As a long-term outcome study, success was defined in this study as the closure and absence of drainage or air leakage from the external opening or intersphincteric space for at least more than 1 year and was analysed at the last follow-up.

## Results

The study included a total of 43 patients who underwent the LIFT procedure for transsphincteric fistulas with a follow-up exceeding 1 year. The demographic details and characteristics of the patients are summarised in Table 1. The type of fistula was confirmed as a transsphincteric fistula using MRI (1.5T Siemens, Germany) before operation. Four patients with multiple fistulas underwent fistulotomy for intersphincteric fistula and LIFT for transsphincteric fistula.

The median admitted time was 11 days (7–28 days). Thirty-four (79.1%) patients had an uneventful healing, one (2.3%) patient had a complete failure to develop a perianal abscess at third day post-surgery and underwent a cutting seton, and eight (18.6%) patients presented with dehiscence or infection at the intersphincteric wound. The median time period of the dehiscence or infection was 6 days (4–9 days) after operation. $H_2O_2$ was then injected through the intersphincteric wound, and a connection with the anal canal was confirmed in five patients. These patients were successfully managed with the immediate complete laying open between the intersphincteric wound and the internal opening under local anaesthesia. The others, with no communication to the anal canal, were successfully treated with local application of silver nitrate.

After a median follow-up duration of 26.2 months (13–63 months), the success rate was determined to be 83.7% (36/43). The mean time of complete failure was 8.6 weeks (1–28 weeks) in 7 patients. Four of them underwent cutting seton and fistulatomy was performed in 3 patients.

The functional outcomes have been assessed at the last time of follow-up in 36 of the 43 patients; patients shown to have complete failure were excluded. Perfect control of continence (CCF-FI score 0) was reported for 88.9% (32/36) of the patients. Four patients complained of mild disturbances to their life. Three of them reported to rarely have liquid incontinence (CCF-FI score 1), one reported to sometimes have liquid incontinence (CCF-FI score 2), which had also been present prior to the LIFT procedure. No significant association was found between laying open and incontinence in these partial failure patients.

**Table 1** Patient and fistula characteristics ($n$ = 43)

| Patient and fistula characteristics | $n$ (%) |
|---|---|
| Median age (range) | 37.1 (21 ~ 62) |
| Sex | |
| Male | 32 (74.4%) |
| Female | 11 (25.6%) |
| Previous history of operation | 12 (27.9%) |
| Smoking status | |
| Current smoker | 12 (27.9%) |
| Current non-smoker | 31 (72.1%) |
| Types of fistula | |
| Uncomplicated transsphincteric fistula | 29 (67.4%) |
| Horseshoe transsphincteric fistula | 10 (23.3%) |
| Multiple fistulas | 4 (9.3%) |
| Location of fistula ($n$ = 47) | |
| Anterior | 16 (34.0%) |
| Posterior | 11 (23.4%) |
| Lateral | 10 (21.3%) |
| Horseshoe fistula | 10 (21.3%) |
| Failure ($n$ = 15) | |
| Localised wound failure | 3 (7.0%) |
| Partial failure | 5 (11.6%) |
| Complete failure | 7 (16.3%) |

## Discussion

The goal of this study was to assess the long-term results of patients with transsphincteric perianal fistulas that had undergone the LIFT procedure. After a median follow-up duration of 26.2 months, a success rate was observed for 83.7% of those patients, which is comparable to published results [7–9].

In our study, eight (18.6%) of the patients had presented with dehiscence or infection at the intersphincteric wound at a median time of 6 days after operation. Among these patients egress of $H_2O_2$ within the rectum was observed in five of them; however, no leaks were observed in the external portion. This phenomenon suggests that the ligation of the intersphincteric fistula tract is not always sufficient in the internal anal sphincter and results in on-going inflammation of the intersphincteric plane [10]. It has been suggested that this was because the surgically created intersphincteric wound provides the shortest path of the least resistance for the drainage of any infected focus from the internal opening [7]. The majority of the current literature suggests that the situation should be converted to intersphincteric fistula, requiring a second fistulotomy after few months [7, 11]. However, according to the results of our study, partial failure could be successfully managed with an immediate laying open between the intersphincteric wound and the internal opening, which was shown to result in no subjective deterioration of continence function.

We assessed the continence of the patients with CCF-FI at the last follow-up time point. There was no significant association of laying open between the intersphincteric wound and anal canal to incontinence in the patients shown to have partial failure. The majority of the patients (88.9%) reported perfect control of continence. Only four patients complained of mild disturbances to their life. These results confirm that the LIFT procedure is a sphincter-preserving technique resulting in only a minimal impairment of continence.

The fact that this was a non-randomised study is one limitation of this study. Additionally, it is difficult to accurately assess fistula recurrence using phone interviews; complete healing ideally would have been documented with MRI.

## Conclusions

Based on the results of our study, the LIFT procedure can be considered an effective sphincter-sparing procedure in the management of transsphincteric fistula with an acceptable long-term outcome. The partial failure can be successfully managed with early laying open without subjective deterioration of continence function.

**Authors' contribution** Study conception and design: BLY.
Acquisition of data: HJC, GDS, and ZLZ.
Analysis and interpretation of data: BLY, PZ, and YGC.
Drafting of manuscript: BLY and HJC.
Critical revision: BLY.

**Compliance with ethical standards**

**Conflict of interest** The authors declare that they have no conflict of interest.

**Financial disclosure** This work was partially supported by the State Administration of T.C.M. of Jiangsu Province, China (LZ11181), and the Clinical Cooperation Project of National Centre of Colorectal Surgery (Kf201201).

## References

1. Cadeddu F, Salis F, Lisi G, Ciangola I, Milito G (2015) Complex anal fistula remains a challenge for colorectal surgeon. Int J Color Dis 30(5):595–603
2. Dudukgian H, Abcarian H (2011) Why do we have so much trouble treating anal fistula. World J Gastroenterol 17(28):3292–3296
3. Göttgens KWA, Smeets RR, Stassen LPS et al (2015) Systematic review and meta-analysis of surgical interventions for high cryptoglandular perianal fistula. Int J Color Dis 30(5):583–593
4. Rojanasakul A, Pattanaarun J, Sahakitrungruang C, Tantiphlachiva K (2007) Total anal sphincter saving technique for fistula-in-ano: the ligation of intersphincteric fistula tract. J Med AssocThai 90: 581–586
5. Yassin NA, Hammond TM, Lunniss PJ et al (2013) Ligation of the intersphincteric fistula tract in the management of anal fistula. A systematic review. Color Dis 15(5):527–535
6. Sirany AME, Nygaard RM, Morken JJ (2015) The ligation of the intersphincteric fistula tract procedure for anal fistula: a mixed bag of results. Dis *Colon rectum* 58(6):604–612
7. Tan KK, Tan IJ, Lim FS, Koh DC, Tsang CB (2011) The anatomy of failures following the ligation of intersphincteric tract technique for anal fistula: a review of 93 patients over 4 years. Dis *Colon rectum* 54:1368–1372
8. Lo OSH, Wei R, Foo DCC et al (2012) Ligation of intersphincteric fistula tract procedure for the management of cryptoglandular anal fistulas. Surg Pract 16(3):120–121
9. Madbouly KM, El Shazly W, Abbas KS et al (2014) Ligation of intersphincteric fistula tract versus mucosal advancement flap in patients with high transsphincteric fistula-in-ano: a prospective randomized trial. Dis *Colon rectum* 57(10):1202–1208
10. Van Onkelen RS, Gosselink MP, Schouten WR (2013) Ligation of the intersphincteric fistula tract in low transsphincteric fistulae: a new technique to avoid fistulotomy. Color Dis 15(5):587–591
11. Sileri P, Franceschilli L, Angelucci GP et al (2011) Ligation of the intersphincteric fistula tract (LIFT) to treat anal fistula: early results from a prospective observational study. Techniques in coloproctology 15(4):413–416