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ORIGINAL ARTICLE

Lift and VAAFT for high trans-sphincteric anal fistula: a single center retrospective analysis

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Abstract

Purpose The management of complex anal fistulas remains a challenge, mainly due to the considerable risk of incontinence. We compared LIFT and VAAFT in the treatment of complex anal fistulas in terms of healing time, recurrence, continence, morbidity, and postoperative pain, focusing also on patients with local abscess at the time of surgery.

Methods We include all patients with high trans-sphincteric anal fistula even with abscess at the time of surgery. Anorectal manometry, endoanal ultrasound, Cleveland Clinic fecal incontinence score, VAS score, and number of previous fistula treatment were recorded. The clinical examination defined healing, insufficiency or recurrence of the fistula.

Results Fifty-four consecutive patients are undergoing surgery: 26 patients underwent LIFT and 28 underwent VAAFT. During the 18 months of follow-up there were no differences in terms of AM, CCFIS and VAS scores. Days of healing, failure, and recurrence rate were comparable in both groups. The subgroup of patients with local abscess undergoing LIFT showed worse results in terms of failure and recurrence rate ($p < 0.05$).

Conclusions Both techniques are safe and effective and can offer long-term benefits. LIFT should not be used as a first treatment in high trans-sphincteric fistula with perianal abscess.

Keywords Trans-Sphincteric · Fistula · LIFT · VAAFT · Abscess · Recurrence

Introduction

Complex anal fistulas are defined as those that cross the upper two thirds of the external anal sphincter or secondary to inflammatory bowel diseases and tuberculosis, anterior fistulas in females, horseshoe fistulas, and recurrent fistulas [1, 2]. The management of complex anal fistulas remains a challenge, mainly due to the considerable risk of incontinence. In recent years sphincter conservation procedures have been described for the treatment of complex anal fistulas, aimed at optimizing the functional result. Anal fistula plug, fibrin glue injection, and even mesenchymal stem cell injection were used to treat complex fistulas with an unsatisfactory cure rate ranging from 33.3 to 71% [3, 4]. The differences between the studies can be explained by short follow-up periods, sample heterogeneity, or small sample size. Two new procedures have recently been described as a new sphincter conservation technique for the management of complex fistulas. First, video-assisted anal fistula treatment (VAAFT) is an interesting emerging procedure with short-term cure rates of 70.7–85.8%, but data on long-term outcomes are still expected. Since its introduction, the technique has been made popular throughout the world. Numerous researchers have used VAAFT for fistula management in the anus with variable outcome. Secondly, the ligation of the intersphincteric fistula tract (LIFT), the technique is based on the dogma according to which the objective of the treatment of anal fistula is to eliminate the primary septic focus of the fistula tract preventing the sphincter impairment. Despite a promising initial success rate reported by Rojanasakul and Colleagues [5], according to recent literature it ranged from 57 to 94% [2, 6–9] depending on the follow-up,

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the number of patients and of the fistula-in-anus type, however, these two procedures seem to offer the best success rate compared to all recent treatments for complex anal fistula. The aim of this study was to retrospectively compare the LIFT and VAAFT procedure in the treatment of complex anal fistulas with respect to time to healing, relapse, continence, morbidity, and postoperative pain also focusing on patients affected by local abscess at the time of surgery.

Materials and methods

A retrospective analysis of consecutive patients undergoing LIFT and VAAFT procedures which was performed at the UPMC University of Pittsburgh Medical Center (Salvator Mundi International Hospital), Rome (Italy), has been retrospectively evaluated. All patients over the age of 18 with high trans-sphincteric anal fistula according to the Parks classification [10] were enrolled in this study. We also included patients with local abscess at the time of surgery for a complete assessment of the possible benefits of both procedures despite ischio-rectal and horseshoe abscess were excluded from the analysis. The exclusion criteria were as follows: rectovaginal fistula, malignant neoplasms, congenital anorectal malformations, inflammatory bowel disease, neurological disease, and coagulation disorder. All patients were evaluated prior to surgery with a complete proctological examination including previous medical history, and colonoscopy only for patients > 50 years as requested by our National Cancer Screening Program. Pre- and postoperative data were recorded in our database: number of previous anorectal surgery, anorectal manometry (AM) with Anopress™ device (THD SpA, Correggio, Italy), EAUS with Aqua Vu™ (USB-12 MHz high resolution endocavity probe; Laborie®, Mississauga, Canada), and Cleveland Clinical Fecal Incontinence Score (CCFIS) [11]. In case of technical difficulties in the execution of EAUS, or by choice of the patient, they were subjected to magnetic resonance imaging (MRI). Quality of life was assessed using the VAS score (Visual Analogue Scale Score). After a complete explanation by a member of the surgical team, all patients signed the informed consent. All patients underwent bowel preparation with two 120 ml sodium enemas 12 and 2 h before surgery. Antibiotic prophylaxis was administered as 1 g of i.v. Cefazolin and 500 mg of i.v. Metronidazole. The surgical techniques were performed following all the steps described by Meinero at al. for VAAFT [12] and Rojanasakul and Colleagues for the LIFT procedure [5] although no loose seton was placed before the procedure. According to Sun et al. [13], we performed ligation of the immature intersphincteric tract with the surrounding dense scar tissue caused by inflammatory absorption, which can avoid the need for preoperative loose setons and reduce the duration of treatment. All patients were ambulatory checked at weekly intervals until wound healing, and then they were followed by telephone at 3-month intervals if no symptoms were reported. The clinical examination defined healing, failure or recurrence of the fistula. Healing was defined as scarring of the intersphincteric wound and the original external opening without discharge at 3 months. Failure was defined as the persistence of a non-healed wound at 3 months. Recurrence was confirmed when purulent secretion from any previously healed wound was observed. The primary endpoint was to compare the safety and efficacy of the two procedures in terms of intraoperative (hemorrhage, false tract, anal sphincter lesions) and postoperative complications, failure, and recurrence. The secondary endpoint was the efficacy of the both procedures in patients with abscess at the time of surgery. The CCFIS score was calculated with a continence diary kept by all patients. The CCFIS and VAS score (the overall pain score of the day) were evaluated before the intervention and at the time of follow-up.

Statistical analysis

SPSS® version 17.0 (IBM, Armonk, New York, USA) was used for statistical analysis. Data were expressed in median with interval. The Mann-Whitney U test was used to analyze quantitative variables and $p < 0.05$ was considered statistically significant.

Results

Between January 2016 and February 2018, fifty-four consecutive patients with high trans-sphincteric anal fistula underwent surgery; of these, 26 patients underwent LIFT and 28 patients underwent VAAFT procedure. The average pre- and post-operative data are shown in Table 1.

All procedures were completed as day case and under spinal anesthesia. No side-branches were detected preoperatively (EUAS or MRI) and intraoperatively. The mean operative time in the LIFT group was 45.5 min (interval, 30–70 min) and 42.5 min for VAAFT (interval, 30–60 min). No intraoperative complications (hemorrhage, false tract, anal sphincter lesions) were recorded in either procedure. All patients who underwent LIFT had high trans-sphincteric fistula; in 11 patients, a perianal abscess occurred and was drained during the same procedure. In the VAAFT group, all high trans-sphincteric fistulas were detected, and 10 perianal abscesses were collected and emptied during the same procedure. No significant differences were recorded between preoperative and postoperative CCFIS score, maximum resting pressure, maximum squeeze pressure, and VAS score in both groups during the 18 months follow-up

Table 1 Pre and post-operative data (mean value)

	Previous Surgery (range)	AM resting (mmHg pre/post)	AM squeeze (mmHg pre/post)	CCFIS (pre/post)	VAS score (range)	Healing days (range)	Failure (%)	Recurrence (%)
LIFT								
26 Pts	3 (2–5)	28.1/27.5	95.7 / 95.8	3.19 / 3	2.65 (1–5)	57.6 (20–180)	5 (19.2)	11 (42)
VAAFT								
28 Pts	3 (2–5)	28.9/28.7	95.6 / 95.6	2.9/2.8	2.75 (1–5)	59.1 (25–180)	4 (14.2)	11 (39.2)
P value	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*

Pts patients; *EAUS* endoanal ultrasound; *AM* anorectal manometry; *CCFIS* Cleveland Clinic Fecal Incontinence Score; *VAS* visual analogue scale; *LIFT* ligation of intersphincteric fistula tract; *VAAFT* video-assisted anal fistula treatment; *NS* not significant

completed by all patients. The mean healing time was 57.6 days (range, 20–180 days) in patients underwent LIFT and 59.1 days (range, 25–180 days) for VAAFT procedure. Regarding postoperative complications, seven minor bleedings were detected; of these, three in the LIFT group and four in the VAAFT group, all of these, required outpatient treatment with absorbable hemostatic sponge pack, and none of these patients underwent reoperation for bleeding. No relationship between postoperative bleeding and cases with failure nor recurrence was detected despite one case in both groups developed recurrence. The wounds healed uneventfully in 45 patients (83.3%), while the total failure rate was 4.8% (9 patients), of these, five patients in the LIFT group (19.2%) and 4 in the VAAFT group (14.2%); in addition, the total recurrence rate was 40.7%, 11 patients (42%) in the LIFT group and 11 patients (39.2%) in the VAAFT group, respectively. As a secondary endpoint, we also compared patients with perianal abscess at the time of surgery in both groups (Table 2); seven (70%) recurrences were observed in the LIFT series instead of two patients (11%) in the VAAFT group ($p < 0.05$); all those patients required delayed surgical treatment. Finally, the failure rate was 50% (5 patients) for LIFT and 9.1% (1 patient) for the VAAFT procedure ($p < 0.05$) diagnosed clinically and confirmed with EUAS in all patients.

Discussion

Surgical treatment of high trans-sphincteric anal fistula remains a dilemma [14]; although fistulotomy is still considered the best option, in these cases it can also be offered as a treatment modality, despite in selected cases because a third or a quarter of patients will experience a slight loss of flatus and mucus [15]. However, for many patients, this remains unacceptable, and for some, the functional damage that follows the fistulotomy would be much worse. The goal of curing the disease by minimizing the risk of functional impairment has fueled the development of sphincter conservation techniques. Among the new sphincter-saving procedures, LIFT and VAAFT have recently achieved the greatest interest of the surgeons. Wexner and Coauthors reviewed the results of LIFT in the treatment of anal fistula [16]; despite a wide heterogeneity in terms of patient characteristics, surgical methods, and duration of follow-up, they included 24 original articles and over 1110 patients with an average success rate of 76.4% and a failure rate of 5.5% concluding that the procedure appears to be effective in terms of results and quality of life emphasized there was no association between pre-LIFT drainage seton and procedure success. Some authors believe that the preoperative loose setons are generally placed to mature the tract by draining the active inflammation, which subsequently benefits the ligation. However, a longer seton may cause greater disruption of the internal sphincter and intersphincteric space, increasing the technical difficulty of dissection and delineation of the interphincteric tract [17, 18]. The present study analyzed homogeneous groups of patients, with almost the same number of previous surgical interventions, and there were no significant differences between CCFIS, VAS, and AM between the two groups; however, comparing the outcomes of VAAFT and LIFT in terms of failure and recurrence rate, the "LIFT with abscess" subgroup showed worse results. Despite Abcarian et al. [19] suggested that the number of previous operations with fistulae may have a negative impact on the success of LIFT, we reported a success rate of 73%

Table 2 Pre and post-operative data (mean value) in patients with abscess + fistula at the time of surgery

	Previous surgery (range)	Failure (%)	Recurrence (%)
LIFT			
10 Pts	3 (2–5)	5 (50)	7 (70)
VAAFT			
11 Pts	3 (2–5)	1 (9.1)	2 (11)
P value	*NS*	*P < 0.05*	*P < 0.05*

Pts patients; *LIFT* ligation of intersphincteric fistula tract; *VAAFT* video-assisted anal fistula treatment; *NS* not significant

and a failure rate of 5% in those patients who did not present an abscess at the time intervention. Some authors have recommended delaying the LIFT procedure until local sepsis is well controlled, with the inclusion of a seton for several periods of time [17, 20]. This step can guarantee the maturation of the fistula as well as adequate drainage [21]. Patients with granulation inflammatory tissue in elevated trans-sphincteric fistulas are three times more than those with epithelial tissue [22]. Although we did not evaluate the length of the fistula trait in our case series, Liu and colleagues reported that longer fistula traits were correlated with a lower primary healing rate, in which inflammation and sepsis may be persistent. The curettage does not adequately cancel the inflammatory granulation tissue in longer or deeper fistula tracts; furthermore, the author suggested that a fistula tract less than 3 cm was associated with a significantly higher healing rate after the LIFT procedure. However, these results were inconsistent or most studies did not report what percentage of patients had previous fistula operations, high anal fistulas, and a long fistula tract [7], although it may justify the worse LIFT results in terms of failure rate compared to VAAFT. Thirteen perianal abscesses were collected in the present study; the results would show advantages in treating those patients with VAAFT instead of the LIFT procedure. In our experience, a posterior abscess can increase the technical difficulty of LIFT due to the difficult anatomical position. A technique is needed to facilitate the identification of the intersphincteric tract to reduce technical difficulty and avoid technical errors in the LIFT process, in those patients VAAFT may be a more appropriate procedure. These results could identify a subgroup of patients that can benefit the most from one procedure to another. Despite the promising results of VAAFT in patients with local sepsis, this technique has shown several disadvantages previously well described by Romaniszyn and Walega [23]. An adequate exploration of multiple or curved sections and the correct identification of an internal opening can be difficult due to the construction of the instrument, since sometimes it is not possible to conduct the rigid shaft of the fistuloscope through any sharp curves of the line. Furthermore, the fistula tract must be large enough to allow the fistuloscope to pass through, but narrow enough to make electrocautery effective, since large tracts or collections make the cauterization ineffective. Furthermore, excessive cauterization can cause thermal damage to the tissues located outside the fistula area. However, the low risk of complications allows the treatment to be repeated until success is achieved. We recognize some limitations to this study. These include its non-randomized and retrospective nature. The sample size is too small for a multivariate analysis of risk factors. The determination of the results by the surgeon leads to a considerable partiality of the observer.

Conclusion

Although our results suggest that these techniques may provide long-term benefits and improve quality of life for patients with both mature and immature traits, LIFT should not be used as a first treatment in high trans-sphincteric fistulas with perianal abscess. Loose silk should be evaluated in those fistulas.

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Compliance with ethical standards

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

Code availability Not Applicable.

References

1. American Gastroenterological Association Medical Position Statement: perianal Crohn's disease (2003) Gastroenterology 125: 1503–1507
2. Shanwani A, Nor AM, Amri N (2010) Ligation of the intersphincteric fistula tract (LIFT): a sphincter-saving technique for fistula-in-ano. Dis Colon Rectum 53:39–42
3. van Koperen PJ, Bemelman WA, Gerhards MF, Janssen LW, van Tets W, van Dalsen A, Slors JF (2011) The anal fistula plug treatment compared with the mucosal advancement flap for cryptoglandular high transsphincteric perianal fistula: a double-blinded multicenter randomized trial. Dis Colon Rectum 54:387–393
4. Guadalajara H, Herreros D, De-La-Quintana P, Trebol J, Garcia-Arranz M, Garcia-Olmo D (2012) Long-term follow-up of patients undergoing adipose-derived adult stem cell administration to treat complex perianal fistulas. Int J Color Dis 27:595–600
5. 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 Assoc Thail 90: 581–586
6. 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. Colon Rectum 54:1368–1372
7. Liu WY, Aboulian A, Kaji AH, Kumar RR (2013) Long-term results of ligation of intersphincteric fistula tract (LIFT) for fistula-in-ano. Colon Rectum 56:343–347
8. Bleier JI, Moloo H, Goldberg SM (2010) Ligation of the intersphincteric fistula tract: an effective new technique for complex fistulas. Colon Rectum 53:43–46
9. Chen HJ, Sun GD, Zhu P, Zhou ZL, Chen YG, Yang BL (2017) Effective and long- term outcome following ligation of the intersphincteric fistula tract (LIFT) for transsphincteric fistula. Int J Color Dis 32:583–585

10. Parks AG, Gordon PH, Hardcastle JD (1976) A classification of fistula in ano. Br J Surg 63(1):1–12
11. Jorge JMN, Wexner SD (1993) Etiology and management of faecal incontinence. Dis Colon Rectum 36:77–97
12. Meinero P, Mori L (2011) Video-assisted anal fistula treatment (VAAFT): a novel sphincter-saving procedure for treating complex anal fistulas. Tech Coloproctol 15:417–422
13. Sun XL, Wen K, Chen YH, Xu ZZ, Wang XP (2019) Long-term outcomes and quality of life following ligation of the intersphincteric fistula tract for high transsphincteric fistulas. Color Dis 1:30–37
14. Dudukgian H (2011) Why do we have so much trouble treating anal fistula? World J Gastroenterol 17:3292
15. Atkin GK, Martins J, Tozer P, Ranchod P, Phillips RK (2011) For many high anal fistulas, lay open is still a good option. Tech Coloproctol 15:143–150
16. Hong KD, Kang S, Kalaskar S, Wexner SD (2014) Ligation of intersphincteric fistula tract (LIFT) to treat anal fistula: systematic review and meta-analysis. Tech Coloproctol 18:685–691
17. Boulian A, Kaji AH, Kumar RR (2011) Early result of ligation of the intersphincteric fistula tract for fistula-in-ano. Dis Colon Rectum 54:289–292
18. Sileri P, Giarratano G, Franceschilli L, Limura E, Perrone F, Stazi A, Toscana C, Gaspari AL (2014) Ligation of the intersphincteric fistula tract (LIFT): a minimally invasive procedure for complex anal fistula: two-year results of a prospective multicentric study. Surg Innov 21:476–480
19. Abcarian AM, Estrada JJ, Park J, Corning C, Chaudhry V, Cintron J, Prasad L, Abcarian H (2012) Ligation of intersphincteric fistula tract: early results of a pilot study. Dis Colon Rectum 55:778–782
20. Wallin UG, Mellgren AF, Madoff RD, Goldberg SM (2012) Does ligation of the intersphincteric fistula tract raise the bar in fistula surgery? Dis Colon Rectum 55:1173–1178
21. Tan I, Tsang C, Tan K et al (2011) The anatomy of failures following the ligation of intersphincteric tract (lift) technique for anal fistula: a review of 93 patients over 4 years. Dis Colon Rectum 54:1368–1137
22. Mitalas LE, van Onkelen RS, Monkhorst K, Zimmerman DD, Gosselink MP, Schouten WR (2012) Identification of epithelialization in high transsphincteric fistulas. Tech Coloproctol 16:113–117
23. Romaniszyn M, Walega P (2017) Video-assisted anal fistula treatment: pros and cons of this minimally invasive method for treatment of perianal fistulas. Gastroenterol Res Pract 2017:9518310