International Journal of Life Sciences, Biotechnology and Pharma Research Vol. 14, No. 1, January 2025 Online ISSN: 2250-3137
Print ISSN: 2977-0122

DOI: 10.69605/ijlbpr_14.1.2025.49

ORIGINAL RESEARCH

To compare the efficacy between ligation of intersphincteric fistula tract (LIFT) and fistulotomy procedures in Anorectal Fistula, An Observational study

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Received: 19 November, 2024 Accepted: 22 December, 2024 Published: 16 January, 2025

ABSTRACT

Background- Fistula in the perianal region is a tract present in between superficially on the skin around the anus and deeply in the anal canal or rectum and this tract is lined by granulation tissue. In majority of Fistula-In-Ano cases fistulotomy is done but in cases of complex fistulas, fistulotomy is not recommended as due to increase risk of re-occurrence and incontinence. One of the popular sphincter sparing method is LIFT (ligation of intersphincteric fistulous tract).The present study was done to compare the efficacy of open fistulotomy and ligation of intersphincteric fistula tract (LIFT) procedure based on its post-operative outcomes. **Method-** An comparative study that was done by the Surgery Department clinic at National Institute of Medical Science Research and Hospital, Jaipur between June 2022 to November 2023.Randomized sampling was done by box and chit method and the patients were allocated to one of two study groups i.e.Group A- Ligation of Intersphentric Fistulous Tract (LIFT) and Group B- Fistulotomy. Patients were operated according the group allotted. **Results-** The maximum patients from the age group of 25-55 years in both the groups. The male category in both the groups were highest. The mean postoperative pain andthe mean duration of hospital stay was significantly higher in Group B. The healing rate was faster (< 25 days) in Group A and recurrence was less. **Conclusion-** Postoperative morbidity assessed in terms post-operative pain, postoperative pus discharge, postoperative bleeding, recurrence and healing was better inpatients who undergo LIFT and was statistically significant.

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INTRODUCTION

Fistula in ano is an abnormal communication, lined by granulation tissue between the anal canal and the skin, which causes chronic inflammatory response. Most commonly these fistulae develop following an anal abscesses secondary to infection of an anal gland. It is the most common cause of seropurulent discharge in perianal region.[1]Fistula in the perianal region is a tract present in between superficially on the skin around the anus and deeply in the anal canal or rectum and this tract is lined by granulation tissue.[2] Location of anal fistula categorized depending upon its location relative to the anal sphincter muscles.[3]

One of the chronic phases of ano rectal infection is Fistula-In-Ano, it is a very common but potentially complex disease process. Fistula-In-Ano has a close association with anorectal abscess of about 26-35%.[4] Fistula-In-Ano are characterized by chronic purulent discharge with pain and abscess re-accumulation followed by intermittent spontaneous decompression. They are mainly of crypto-granular origin with more association with male than women.[5]

Best way to eradicate the sepsis in Fistula-In-Ano is the surgical management while maintaining continence. For Fistula-in-Ano surgical management is divided into two types:

1. Sphincter sacrificing
2. Sphincter saving
3. In Sphincter Sacrificing they have high healing rates but have high incidence of post operative

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DOI: 10.69605/ijlbpr_14.1.2025.49

incontinence.[6] In Sphincter Saving there is varying healing rates but almost no post operative incontinence.

In majority of Fistula-In-Ano cases fistulotomy is done but in cases of complex fistulas fistulotomy is not recommended as due to increase risk of re-occurrence and incontinence. Incontinence has an effect on quality of life, thus sphincter sparing methods are now popular. One of the popular sphincter sparing method is LIFT (ligation of intersphincteric fistulous tract).[6] As in LIFT we create a secure closure to the internal opening, removal of infected crypto-glandular tissue in the intersphincteric plane and preserve the anal sphincter muscle. Once isolated these tract is ligated and divided to prevent the entry of fecal material into the fistula tract.[6]

The present study aims at comparing the efficacy of open fistulotomy and ligation of intersphincteric fistula tract (LIFT) procedure based on its post-operative outcomes.

AIMS AND OBJECTIVES

To compare the efficacy of open fistulotomy and ligation of intersphincteric fistula tract (LIFT) procedure in terms of:

1. Healing rates
2. Post operative pain
3. Post operative recurrence
4. Hospital stay

MATERIAL AND METHODS

Study area: All patients diagnosed with fistula in ano admitted in General Surgery Department, National Institute of Medical Sciences & Research, Jaipur.

Study population: Patients of age group 18-70 diagnosed with fistula in ano.

Study technique: Box & Chit technique

Study design: Comparative Analytical study

Study period: June, 2022 to November, 2023

Time frame: 18 Months.

Selection Criteria

Inclusion Criteria

1. Patients diagnosed with Fistula in ano by Magnetic Resonance Imaging (MRI).
2. Inter-Sphincteric fistula
3. Trans Sphincteric fistula

Exclusion Criteria

1. Branching fistula
2. Multiple fistulas
3. Inflammatory Bowel Disease as Crohn's disease
4. Chronic infections like Tuberculosis, Actinomycosis
5. History of fecal incontinence
6. Previous radiation
7. High fistula

Sample size and sampling technique

$$n = \frac{(Z_{\alpha/2})^2 \times (P_1q_1 + P_2q_2)}{(P_2 - q_1)^2}$$

$$n = \frac{(1.96)^2 \times [(0.8 \times 0.2) + (0.933 \times 0.067)\}}{(0.933 - 0.8)^2} = 48.3 \sim 48$$

where,

Zα/2 = Inverse possibility at 95% confidence interval of Normal distribution.

P1&p2 = healing rate after LIFT & Fistulotomy procedure.

Sample Size: n=96

Total samples = 96

Each group : 48 samples

Research question

Whether the LIFT procedure is as effective as sphincter-saving technique for fistula-in-ano with shorter healing time, as compared to fistulotomy?

Research hypothesis

LIFT procedure is as effective as compared to fistulotomy in management of fistula-in-ano.

Methodology

- An comparative study that was done by the Surgery Department clinic at National Institute of Medical Science Research and Hospital, Jaipur between June 2022 to November 2023.
- Clearance from Institutional Ethical committee was taken prior to start study.
- All routine investigations were done.
- We included patients who had a confirmed diagnosis of Fistula in ANO by MRI pelvis with their consent
- According to inclusive & exclusion criteria, 96 patients were included in the study.
- Randomized sampling was done by box and chit method and the patients were allocated to one of two study groups i.e.

– Group A- Ligation of Intersphentric Fistulous Tract (LIFT)

– Group B- Fistulotomy

- Patients were operated according the group allotted.
- Pre-op and post op data was collected.
- Regular clinical follow up of all Patients were carried out and side effects of all groups were assessed.
- Follow up was done after-

– 1Week

– 1 month

– 3 months after surgery

All patients were a full bowel preparation with oral lavage solution before operation. The patients were placed in the prone jackknife position with the buttocks taped widely apart. Spinal anesthesia was given by anesthesiologist. The details of the procedure is explained to the patient.

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LIFT (Ligation of Intersphincteric Fistulous Tract)

Basic steps are as follows:

1. A probe is maneuvered from the external opening to internal through the fistula tract. The skin over the intersphincteric groove is marked with the probe in place.
2. Using blunt dissection in the intersphincteric plane, the internal and external sphincter muscles were separated to expose the fistula tract.
3. Care is taken not to divide any sphincter muscle. Once the tract is dissected free, it is encircled and the probe can be removed.
4. Next, the fistula tract is divided and ligated. The incision was closed with absorbable sutures after the wound was irrigated. The external opening was left open to drain. All patients received antibiotics after operation. Broad-spectrum II antibiotics (Cefathiamidine) and antianaerobic were used for 2 days after surgery. All the patients routinely used Potassium Permanganate and benzalkonium chloramine to clean perianal wounds.

FISTULOTOMY

Identification of the fistula tract and internal opening by injecting dye or hydrogen peroxide. Insert the fistula probe, cut on the site of the fistula remove the entire infected area, plus the pus and other fluids; then stitch the area and leave it to heal. In some cases, we have to leave it open and pack or cover the area with gauze.

RESULTS AND OBSERVATIONS

Total 48 patients were included in study in each group. As shown in table 1, the maximum patients are in the age group of 25-55 years in both the groups and similar number of patients in both groups from the age group of 35-45 years. The average age for Group A was 39.88±12.326 years and for Group B was 40.98±10.193 years. There was no significant difference in age distribution between both the groups (P=0.06).The male category in both the groups were highest. Using chi-square test, this results was statistically not significant difference between both the groups (P>0.05; P=0.217).

As shown in table 2, the anal fistula was found on maximum left side in Group A (66.7%), followed by the right side in Group B (62.5%). Using chi-square test, this results was statistically highly significant difference between both the groups (P<0.01; P=0.004)

The mean postoperative pain according to VAS score was significantly higher in Group B (2.88±0.937) compared to Group A (1.83±0.781). Using t-test, this results was statistically highly significant difference between both the groups (P<0.01; P=0.000) as shown in table 3.

The mean duration of hospital stay in days was significantly higher in Group B (4.38±0.703) compared to Group A (3.23±1.036). Using t-test, this results was statistically highly significant difference between both the groups (P<0.01; P=0.000).

During follow-up, as shown in table 4 the highly mature wound status at 1st week was found mostly 87.5% patients in Group A and mature wound status was found mostly 93.8% patients in Group B. Using chi-square test, this results was statistically highly significant difference between both the groups (P<0.01; P=0.000).

During follow-up, the highly mature wound status at 1st month was found mostly 91.7% patients in Group A, followed by mature wound status was found mostly 70.8% patients and immature wound status was found mostly 25% patients in Group B. Using chi-square test, this results was statistically highly significant difference between both the groups (P<0.01; P=0.000).

During follow-up, the clear & normal wound status at 3rd month was found mostly 95.8% patients in Group A and 77.1% in Group B. The mature wound status was found mostly 22.9% patients in Group B. Using chi-square test, this results was statistically highly significant difference between both the groups (P<0.01; P=0.007).

The healing rate was faster (< 25 days) was recorded mostly 93.8% patients in Group A compared to Group B. The slow healing rate (> 25 days) was found overall patients in Group B. Using chi-square test, this results was statistically highly significant difference between both the groups (P<0.01; P=0.000) as shown in table 5.

The recurrence of LIFT procedure was present in only 4.2% patients and 22.9% patients in Group B. Using chi-square test, this results was statistically highly significant difference between both the groups (P<0.01; P=0.007).

Table 1: Age distribution of both the groups

Age group	Group A: LIFT		Group B: Fistulotomy		P value
	No.	%	No.	%	
≤ 25	9	18.75%	1	12.08%	χ^2=5.571 P=0.06 (S)
25-35	9	18.75%	17	25.42%	
35-45	11	22.92%	11	22.92%	
45-55	13	27.08%	17	35.42%	
> 55	6	12.50%	2	4.17%	
Total	48	100.0%	48	100.0%	
Mean±SD	39.88±12.326		40.98±10.193		

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DOI: 10.69605/ijlbpr_14.1.2025.49

Table 2: Gender and side distribution of both the groups

Gender	Group A: LIFT		Group B: Fistulotomy		P value
	No.	%	No.	%	
Male	44	91.7%	40	83.3%	$\chi2=1.524$ P=0.217 (NS)
Female	4	8.3%	8	16.7%	
Left	32	66.7%	18	37.5%	$\chi2=8.181$ P=0.004 (S)
Right	16	33.3%	30	62.5%	
Total	48	100.0%	48	100.0%	

Table 3: Mean postoperative pain according to VAS Score and mean hospital stay in days

Group	N	Mean	Std. Deviation	P value
Group A: LIFT (VAS Score)	48	1.83	.781	0.000 (S)
Group B: Fistulotomy (VAS Score)	48	2.88	.937	
Group A: LIFT (Hospital stay)	48	3.23	1.036	0.000 (S)
Group B: Fistulotomy (Hospital stay)	48	4.38	.703	

Table 4: Wound status at 1st week, 1 month and 3 months of both the groups

Wound status at 1st week	Group A: LIFT		Group B: Fistulotomy		P value
	No.	%	No.	%	
Normal	-	-	-	-	$\chi2=63.624$ P=0.000 (S)
Highly Mature	42	87.5%	3	6.3%	
Mature	6	12.5%	45	93.8%	
Total	48	100.0%	48	100.0%	
Wound status at 1st month	**Group A: LIFT**		**Group B: Fistulotomy**		**P value**
Normal	-	-	-	-	$\chi2=73.935$ P=0.000 (S)
Highly Mature	44	91.7%	2	4.2%	
Mature	2	4.2%	34	70.8%	
Immature	2	4.2%	12	25.0%	
Total	48	100.0%	48	100.0%	
Wound status at 3rd month	**Group A: LIFT**		**Group B: Fistulotomy**		**P value**
Normal	46	95.8%	37	77.1%	$\chi2=7.207$ P=0.007 (S)
Mature	2	4.2%	11	22.9%	
Total	48	100.0%	48	100.0%	

Table 5: Healing Rate and Recurrence of both the groups

Healing Rate	Group A: LIFT		Group B: Fistulotomy		P value
	No.	%	No.	%	
< 25 days (Fast)	45	93.8%	0	0.0%	$\chi2=84.706$ P=0.000 (S)
> 25 days (Slow)	3	6.3%	48	100.0%	
Recurrence					
Yes	2	4.2%	11	22.9%	$\chi2=7.207$ P=0.007 (S)
No	46	95.8%	37	77.1%	
Total	48	100.0%	48	100.0%	

Table 6: Overall success rate as compared to other studies

Author Name	Success Rate	No. of Patients	Follow up period
Rojanasakul et al.[5]	94%	17	4 week
Bleier et al.[16]	57%	39	NA
Shanwani et al.[17]	77%	45	9 months
Tan et al.[18]	78%	93	23 week
Sileri et al.[19]	83%	18	4 months
Ooi et al.[12]	68%	25	22 week
Wallin et al.[20]	57%	93	19 months
Abcarian et al.[21]	74%	40	18 week
van Onkelen et al.[13]	82%	22	19.5 months
Sirikurnpiboon S et al.[22]	81%	41	4 week
Present study	94%	48	3 months

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DOI: 10.69605/ijlbpr_14.1.2025.49

DISCUSSION

Total number of patients analysed for this study were 96, among which 48 patients had undergone LIFT (Ligation of Intersphincteric Fistula Tract) were grouped as group I. The other 48 patients had Fistulotomy undergone were grouped as group II.

The maximum patients from the age group of 25-55 years in both the groups The average age for Group A was 39.88±12.326 years and for Group B was 40.98±10.193 years. The male category in both the groups were highest. The anal fistula was found on maximum left side in Group A (66.7%), followed by the right side in Group B (62.5%). Using chi-square test, this results was statistically highly significant difference between both the groups (P<0.01; P=0.004), which correlate to recent studies.[6]

In our study postoperative pain according to VAS score was significantly higher in Group B (2.88±0.937) compared to Group A (1.83±0.781) (P<0.01). Previous study in contradictory to our study noted that the mean pain VAS score after among fistulotomy (7.89±0.76) versus LIFT (5.38±0.69) (p<0.05) was statistically significant.[7]Another study Dong X et al. studied the mean pain score on postoperative day between LIFT (6.72±0.53) versus Fistulotomy (7.01±0.56) (p < 0.05) and results of this study were in concordant to our study.[8]

During follow-up, the highly mature wound status at 1st week was found mostly 87.5% patients in Group A and mature wound status was found mostly 93.8% patients in Group B. At 1st month, the highly mature wound status was found mostly 91.7% patients in Group A, followed by mature wound status was found mostly 70.8% patients and immature wound status was found mostly 25% patients in Group B. At 3rd month, the clear & normal wound status at 3rd month was found mostly 95.8% patients in Group A and 77.1% in Group B. The mature wound status was found mostly 22.9% patients in Group B (P<0.01). Vaizey CJ et al.[9], Jorge JM et al.[10] and Browning GG et al.[11] studied all patients were scheduled for follow-up at 2, 4, 8 and 12 wk postoperatively, and at 4-weekly intervals thereafter. At each visit the patient's clinical continence status was evaluated, and incontinence rates were recorded.

In our study, the healing rate was faster (< 25 days) was recorded mostly 93.8% patients in Group A compared to Group B. The slow healing rate (> 25 days) was found overall patients in Group B (P<0.01). Several studies reported similar results the healing rate improved to 95% in the LIFT with anal fistula plug procedure, but did not improve with the fistulotomy.[12,13]

In our study, the recurrence rate of LIFT procedure was present in only 4.2% patients and 22.9% patients in Group B (P<0.01). In a study comparing LIFT and fistulotomy did not note any recurrence in both the groups at 3 months of follow up; however at 6 months of follow up recurrence rate among fistulotomy group was 7.14% as compared to LIFT group (2.38%) which was statistically significant.[7] Larger metaanalysis and systematic reviews have showed LIFT procedure has reduced morbidity and recurrence.[14,15]

The overall healing success rate according to LIFT procedure compared to other studies is shown in Table 6

SUMMARY

- The maximum patients from the age group of 25-55 years in both the groups The average age for Group A was 39.88±12.326 years and for Group B was 40.98±10.193 years. The male category in both the groups were highest.
- The anal fistula was found on maximum left side in Group A (66.7%), followed by the right side in Group B (62.5%). This results were statistically significant. (P<0.01; P=0.004).
- The mean postoperative pain according to VAS score was significantly higher in Group B (2.88±0.937) compared to Group A (1.83±0.781) and was statistically significant (P<0.01; P=0.000).
- The mean duration of hospital stay in days was significantly higher in Group B (4.38±0.703) compared to Group A (3.23±1.036) which was statistically significant (P<0.01; P=0.000).
- During follow-up, the highly mature wound status at 1st week was found mostly 87.5% patients in Group A and mature wound status was found mostly 93.8% patients in Group B which was statistically significant (P<0.01; P=0.000).
- During follow-up, the highly mature wound status at 1st month was found mostly 91.7% patients in Group A, followed by mature wound status was found mostly 70.8% patients and immature wound status was found mostly 25% patients in Group B.This result was statistically(P<0.01; P=0.000).
- During follow-up, the clear & normal wound status at 3rd month was found mostly 95.8% patients in Group A and 77.1% in Group B. The mature wound status was found mostly 22.9% patients in Group B. This result was statistically significant (P<0.01; P=0.007).
- The healing rate was faster (< 25 days) in Group A compared to Group B. This resultwas statistically significant (P<0.01; P=0.000).
- The recurrence rate with LIFT procedure was present in only 4.2% patients and 22.9% patients in Group B which was statistically significant (P<0.01; P=0.007).

CONCLUSION

This study was conducted to compare the efficacy of fistulotomy and Ligation of Intersphincteric Fistula Tract (LIFT) procedures in management of fistula in ano. Recurrence rate was less in the LIFT group as compared to Fistulotomy groups, the difference was statistically significant. Postoperative morbidity

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DOI: 10.69605/ijlbpr_14.1.2025.49

assessed in terms post-operative pain, postoperative pus discharge, postoperative bleeding and healing was better inpatients who undergo LIFT and was statistically significant

Conflict of Interest/Disclosure Statement- No conflict

Disclosure of Potential Conflicts of Interest and Financial Interests- Nil

Funding/Financial Support Statement- Nil

REFERENCES

1. Al Sebai OI, Ammar MS, Mohamed SH, El Balshy MA. Comparative study between intersphinecteric ligation of perianal fistula versus conventional fistulotomy with or without seton in the treatment of perianal fistula: a prospective randomized controlled trial. Annals of Medicine and Surgery. 2021 Jan 1;61:180-4
2. Manoj Kuma, Abhishek Arora, Alok Ranjan,Kumar Chandra Kant, Sreepriya PP , The Ligation of the Intersphincteric Fistula Tract (LIFT) Technique for Simple and Complex Fistula-in-ano. J Coloproctol 2021;41(4):406–410.
3. Buchanan G, Halligan S, Williams A, Cohen CR, Tarroni D, Phillips RK, Bartram CI. Effect of MRI on clinical outcome of recurrent fistula-in-ano. The Lancet. 2002 Nov 23;360(9346):1661-2.
4. Abbas MA, Jackson CH, Haigh PI. Predictors of outcome for anal fistula surgery. Archives of Surgery. 2011 Sep 19;146(9):1011-6.
5. 5Rojanasakul A, Pattanaarun J, Sahakitrungruang C, Tantiphlachiva K. Total anal sphincter saving technique for fistula-in-ano; the ligation of intersphincteric fistula tract. Journal-Medical Association of Thailand. 2007 Mar 1;90(3):581
6. Ayyar PV, Dharap SB. Does Treatment of Fistula-in-Ano by Ligation of Intersphincteric Fistula Tract Offer any Advantage over Standard Fistulectomy or Fistulotomy?. Journal of Clinical & Diagnostic Research. 2018 Dec 1;12(12).
7. Rao KN, Lavanya KM, Nayak SR, Ashrith P. Ksharasutra vs. fstulectomy for fstula in ano–A randomized controlled trial in East Godavari district, Andhra Pradesh, India. MRIMS J Health Sci. 2018;6(2):79
8. Dong X, Jia Z, Yu B, Zhang X, Xu F, Tan L. Efect of intersphincteric fstula tract ligation versus anal fstulectomy on pain scores and serum levels of vascular endothelial growth factor and interleukin-2 in patients with simple anal fstulas. J Int Med Res. 2020;48(9):300060520949072.
9. Vaizey CJ, Carapeti E, Cahill JA, Kamm MA. Prospective comparison of faecal incontinence grading systems. Gut 1999; 44: 77-80
10. Jorge JM, Wexner SD. Etiology and management of fecal incontinence. Dis Colon Rectum 1993; 36: 77-97.
11. Browning GG, Parks AG. Postanal repair for neuropathic faecal incontinence: correlation of clinical result and anal canal pressures. Br J Surg 1983; 70: 101-104
12. Ooi K, Skinner I, Croxford M, Faragher I, McLaughlin S. Managing fistula-in-ano with ligation of the intersphincteric fistula tract procedure: the Western Hospital experience. Colorectal Disease. 2012 May;14(5):599-603.
13. Van Onkelen RS, Gosselink MP, Schouten WR. Is it possible to improve the outcome of transanal advancement flap repair for high transsphincteric fistulas by additional ligation of the intersphincteric fistula tract? Dis Colon Rectum 2012; 55: 163-166
14. Hong KD, Kang S, Kalaskar S, Wexner SD. Ligation of intersphincteric fstula tract (LIFT) to treat anal fstula: systematic review and meta-analysis. Tech Coloproctol. 2014;18(8):685–91.
15. Alasari S, Kim NK. Overview of anal fstula and systematic review of ligation of the intersphincteric fstula tract (LIFT). Tech Coloproctol. 2014;18(1):13–22.
16. Bleier JI, Moloo H, Goldberg SM. Ligation of the intersphincteric fistula tract: an effective new technique for complex fistulas. Dis Colon Rectum. 2010 Jan. 53(1):43-6.
17. Shanwani A, Nor AM, Amri N. Ligation of the intersphincteric fistula tract (LIFT): a sphincter-saving technique for fistula-in-ano. Diseases of the colon & rectum. 2010 Jan 1;53(1):39-42.
18. Tan KK, Tan IJ, Lim FS, Koh DC, Tsang CB. 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 2011; 54: 1368-1372
19. Sileri P, Franceschilli L, Angelucci GP, D'Ugo S, Milito G, Cadeddu F, Selvaggio I, Lazzaro S, Gaspari AL. Ligation of the intersphincteric fistula tract (LIFT) to treat anal fistula: early results from a prospective observational study. Tech Coloproctol 2011; 15: 413-416.
20. Wallin UG, Mellgren AF, Madoff RD, Goldberg SM. Does ligation of the intersphincteric fistula tract raise the bar in fistula surgery? Dis Colon Rectum 2012; 55: 1173-1178
21. Abcarian AM, Estrada JJ, Park J, Corning C, Chaudhry V, Cintron J, Prasad L, Abcarian H. Ligationof intersphincteric fistula tract: early results of a pilot study. Dis Colon Rectum 2012; 55: 778-782.
22. Sirikurnpiboon S, Awapittaya B, Jivapaisarnpong P. Ligation of intersphincteric fistula tract and its modification: Results from treatment of complex fistula. World journal of gastrointestinal surgery. 2013 Apr 4;5(4):123.

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