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Evaluation of Combined Ligation of Intersphenictreic Fistula Tract with Mucosal Advancement Flap in Treatment of Complex Anal Fistula

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Abstract: Background: The use of ligation intersphincteric fistula tract in combination with mucosal advancement flap are relatively easy procedure, which is safe and effective at the same time. It can be ideal for treating complex perianal fistulas in patient with no previous intervention.

Objectives: To evaluate effectiveness of combined ligation of intersphenictreic fistula tract (LIFT) and mucosal flap advancement in treatment of complex perianal fistula.

Methods: This is a prospective study of patient underwent combined ligation intersphenictreic fistula tract and mucosal flap advancement in treatment of complex perianal fistula in Zagazig University hospital during the period from July 2019 to December 2021 on 24 patients with a diagnosis of complex fistula-in-ano.High fistulas (19),Branched fistula (3),and two anterior fistulas in females.

Results: Post operative wound infection occurred in three patients 12.5% drainage of seroma was done and proper antibiotic according to culture and sensitivity. one of them the infection subcide completely with complete healing and the other two patients develop recurrent fistula one in the same site of original fistula site ,the other is 2cm from original fistula site. Recurrence after surgery and Incontinence to flatus only occurred in 8.3% of cases, 4.2 % of the studied patients respectively.

Conclusion: Using The combination of ligation of the intersphincteric fistula tract &mucosal advancement flap can be used in treatment of complex anal fistula with promising results and minimal affection on anal sphincter & continence

Keywords: *Combined Ligation, Intersphenictreic Fistula Tract, Mucosal Advancement Flap, Complex Anal Fistula*

Introduction

Anal fistula is an abnormal pathological tract between the anal Canal and the perianal skin. **(1).** The classification of the anal fistula has shown variabilities, but the simplest and the most widely used one is the Park's classification. In this classification five main types are described according to the relationship of the fistula to the anal sphincter muscles in to intersphincteric, transsphincteric, suprasphincteric, extrasphincteric and superficial fistulas **(2).**

The anal fistulas are also described as simple or complex fistulas by American Gastroenterological Association. The simple fistulas originate below the dentate line (low type) and involves small part of the sphincter includes superficial, low intersphincteric or low transsphincteric fistulas Conversely complex fistulas originate above the dentate line (high type), and involves the significant part of the sphincter mechanism include anterior fistula in women, recurrent fistula, fistulas with multiple tracts, and patients with preexisting incontinence . **(3)**.

As there is no single technique is appropriate for the treatment of all fistula-in-ano there are variable surgical procedures for the management of anal fistula including fistulotomy, fistulectomy, ligation of intersphincteric fistula tract, setons, fibrin glue, fibrin plug, and endo advancement flap.**(4).**

Ligation of intersphincteric fistula tract (LIFT) procedure was first described in 2006 by Rojanasakul.(**5).** Modifications was done of original LIFT procedure included LIFT with partial coring out fistulectomy and an additional transanal advancement flap, there was no recurrence and no changes in continence levels. **(6).** Coring out of fistula tract from the external opening of the fistula tract to the lateral border of the external sphincter. It was described by Sirikurnpiboon "LIFT PLUS, there was no recurrence and no changes in continence levels. **(7) .** LIFT Plug, which involve insertion of a plug in the external portion of the track**,** there was no recurrence only one (5%) patient reported with incontinence for gas **(8).** LIFT with partial coring out fistulectomy and insertion of Seton during operation with no recurrence occurred one reported failure in form of wound dehiscence **(9).**

Advancement flap may be summarized as elevating a flap, coring out of an infected gland, as well as an epi-thelized internal opening, suturing of the internal sphincter defect, closing the wound with a flap, and providing effective drainage. **(10).**

We aimed at this study to evaluate effectiveness of combined ligation intersphenictreic fistula tract and mucosal flap advancement in treatment of complex perianal fistula.

Patients and Methods

This is a prospective study of patient underwent combined ligation intersphenictreic fistula tract with mucosal flap advancement in treatment of complex perianal fistula in Zagazig University hospital. This interventional study was carried out at the General Surgery Department, Zagazig University Hospitals during the period from July 2019 to December 2021 on 24 patients with a diagnosis of complex fistula-in-ano.High fistulas (19),Branched fistula (3),and two anterior fistulas in females, Selected by Random Sample way.

Inclusion criteria:

Patients with high perianal fistula who underwent surgical repair using LIFT with mucosal advancement flap: Men and women with complex perianal fistulas of crypto glandular source, High fistulas, Anterior fistula in women, Recurrent fistula, Fistulas with multiple tracts, Fistulas with no previous surgical intervention

Exclusion Criteria

Patients with fistulas secondary to tumor, inflammatory bowel disease, TB or trauma, Patients with horseshoe fistulas, Patients with active infection of the fistula or with uncontrolled DM, Patients with Preexisting incontinence**,** Patients with bleeding tendencies or on anticoagulant therapy, patients with sub mucous, subcutaneous ,vaginal, and extrasphinectric fistula.

Preoperative evaluation:

Full history taking and clinical examination, for detection of the type of fistula, location of external and internal openings, extent of sphincter involvement, presence of sepsis and exclusion of other anorectal diseases or continence problems.

Local examination:

The physical examination of patients with fistulas begins by optimizing patient placement; place the patient in the left lateral decubitus position with knees drawn up toward the chest. Bidigital rectal examination in a patient with a perianal fistula may reveal an indurated tract or cord. External opening of fistula can be identified

by small circles of granulation tissue, which exude pus when compressed if tissue is patent. A fistulous tract that opens internally can be visualized with the aid of an anoscope.

investigations: Complete Blood Count, Coagulation profile: Prothrombine Time , International Normalized Ratio,Bleeding Time ,Clotting Time, Liver and kidney function, Viral marker (HCV, HBV, HIV), Random blood sugar.

MRI was done for all patients: Parameters were established with the Signa Excite 1.5-T system

Saddle block was done for all patients. All patients were operated with combined ligation intersphenictreic fistula tract with mucosal flap advancement in the same setting for treatment of complex perianal anal fistula.

1-Indentification of external fistula opening using a blunt ended probe . **Fig**(1).

Fig (1): Identification of external fistula opening and probing of fistula tract.

2- Identification of internal opening using (3-5 ml) of hydrogen peroxide or methylene blue after using a proctoscope. Fig: (2)

Fig: (2) , Indentification of internal opening

3- Identification of the intersphincteric tract.The skin over the intersphincteric groove is marked, with the probe in place. Using blunt dissection in the intersphincteric plane, the internal and external sphincter muscles were separated to expose the fistula tract. Once the tract is dissected free, it is encircled and the probe can be removed. Next, the fistula tract is divided and ligated. Ligation of intersphincteric tract close to the internal opening. Using vicryl 0-0 with transfixing single suture with short cute ends. **Fig:(3).**

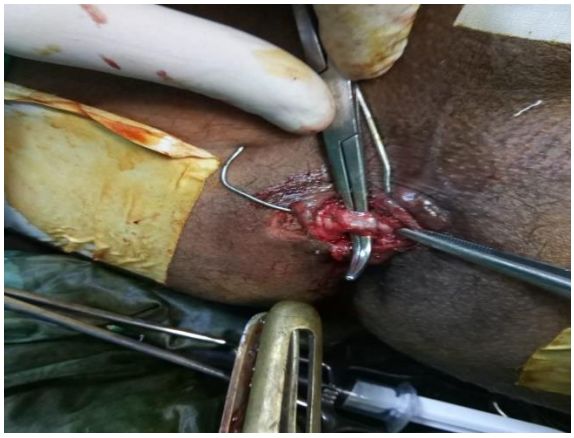

Fig (3), Identification of the intersphincteric tract

4- Conization of external parte of fistula tract till the distal cute part of fistula tract,.Fig (4) :

Fig (4),,Excised external part of fistula tract.

5- Coring out of the epithelized internal opening, Using elliptical incisone around the internal opening using scalpel 15 with the help of diathermy . **Fig(5),**

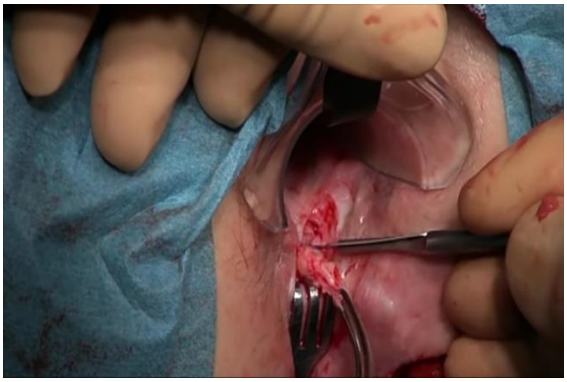

Fig (5), cored out internal opening with scalpel.

6- Elevating a mucosal flap, Elevate upper and lower flap of mucosal tissue with (,5-1) cm in length around the excised internal opening **Fig (6),**

Fig (6): Elevating a mucosal flap

7- Suturing of the internal opening defect using vicryl 3-0 with two or–three interrupted suture including the muscles with another two or three interrupted suture secure closing it with a mucosal flap.
8-Anal pack is put for 12hs to 24hs postoperatively.

Post operative follow up:

Patients hospital stay varies from 18 hs to 24 hs with the initial postoperative assessment was undertaken for twenty-four hours following surgery.including patient vital signs as ,puls,blood pressure temperature,and Pain control, 13 patients with mild pain postoperatively receiving non steroidal antiinflmatory druges such as dicofinac sodium IM injection every 12 hs ,and this was the higher percent of patient and 8 patients had moderate pain receiving acompination of oral and IM of NSAIDS . Three patients suffered of severe pain,and pain control required use of opoids as nalpufine IV infusion . patients received broad spectrum antibiotics as quinolons 500mg tab orally and cefotaxime 1gm parentally,metronidazole drip every 12hs.these medications continues on discharge of patient at home .
During each follow-up visit,(visit weekly in 1st month then every two weeks in the next two months then monthly for the next nine months the patient was assessed for pain, wound infection, and anal incontinence. Postoperative wound discharge was defined as a non-infected sero-sanguinous secretion from the open postoperative wound. Wound infection was defined as the presence of erythema, induration surrounding the wound or constitutional symptoms such as fever. Time required for complete healing of the postoperative wound, which was defined as the time for complete healing to take place without an unepithelized surface area, was noted. The patients were observed for recurrence of the fistula during the follow-up period.The severity of postoperative pain was assessed on a scale of 0 to 10 with help of the subjective pain scale.

1- Postoperative pain:

The severity of postoperative pain was assessed on a scale of 0 to 10 with help of the subjective pain scale. **(11).**

2-Postoperative continence :

Patients were asked about anal incontinence. The Jorge-Wexner score is the most widely used instrument in assessing the efficacy of surgical therapies for anal incontenence,. This scoring system determines frequencies and different anal incontinence presentations (Gas/Liquid/Solid/Pad use/Need for lifestyle alterations) and sums the returned score to a total of 0–20 (where 0 = perfect continence and 20 = complete incontinence). **(12)**.
During each follow-up visit, the patient was assessed for pain, wound infection, and anal incontinence. Postoperative wound discharge was defined as a non-infected sero-sanguinous secretion from the open postoperative wound. Wound infection was defined as the presence of erythema, induration surrounding the

wound or constitutional symptoms such as fever. Time required for complete healing of the postoperative wound, which was defined as the time for complete healing to take place without an unepithelized surface area, was noted. The patients were observed for recurrence of the fistula during the follow-up period.

3-Postoperative infection:

Postoperative wound discharge was defined as a non-infected sero-sanguinous secretion from the open postoperative wound. Wound infection was defined as the presence of erythema, induration surrounding the wound or constitutional symptoms such as fever.

4- Postoperative recurrence:

Recurrence of fisula or abcesses after complete or in complete healing in the same site or in another site of original fistula

Statistical analysis

The collected data were analyzed by computer using Statistical Package of Social Services version 24 (SPSS), Data were represented in tables and graphs, Continuous Quantitative variables e.g. age were expressed as the mean ± SD & median (range), and categorical qualitative variables were expressed as absolute frequencies (number) & relative frequencies (percentage). Chi square test was used to calculate difference between qualitative variables, to compare between means of 2 groups Mann-Whitney test was calculated for non-parametric data. Spearman correlation: was used to compare 2 numerical variables. The significance Level for all above mentioned statistical tests done. P value of >0.05 indicates non-significant results. P value of <0.05 indicates significant results.

Results

Table (1): Demographic data of the studied patients

Demographic data	**Studied patients (N=24)**	
	No.	**%**
Sex		
Male	*18*	75.0
Female	*6*	25.0
Age (years)		
Mean ± SD	39.17 ± 10.93	
Median (Range)	37.5(23-62)	

This table shows that the mean age of the studied patients was 39.17 ± 10.93 years old, with a range from 23 to 62years old, ¾ of the studied patients were male (75.0%) and 25% were females.

Table (2): Operation time and Hospital stay among the studied patients

Variable	**Studied patients (N=24)**
Operation time (Min.)	
Mean ± SD	*38*.13 ± 5.86
Median (Range)	37.5(30 -50)
Hospital stay (Hrs.)	
Mean ± SD	19.75 ± 2.78
Median (Range)	18(18 -24)

This table shows that the mean of Operation time was *38*.13 ± 5.86 Mins, with a range from 30- 50 minutes, and Hospital stay post operatively ranged from 18 to 24 hours.

Table (3): Postoperative pain and healing time among the studied patients

Variable	**the studied patients (N=24)**	
	No.	**%**
Postoperative pain		
• Mild	14	58.3
• Moderate	7	29.2
• Severe	3	12.5
Healing time (weeks)		
Mean ± SD	4.13 ± 0.99	
Median (Range)	4(3-6)	

This table shows that about 1/3 of patients complaining of moderate postoperative pain (29.2%), more than half of them had mild post operative pain (58.3%), as shown in figure (2), as regard healing time it ranged from 3 to 6 weeks post operatively.

Table (4): Post-operative complications among the studied patients

variable	**Studied patients (N=24)**	
	No.	**%**
Recurrence after surgery		
▪ No	22	91.7
▪ yes	2	8.3
Anal continence		
▪ Continent	23	95.8
▪ Incontinent to flatus only	1	4.2

This table shows that most of the studied case had no complications, recurrence after surgery and Incontinent to flatus only occurred in 8.3% of cases, 4.2 % of the studied patients respectively.

Table (5): Post operative complications among the studied patients

Correlation coefficient		**Operative time**	**Hospital stay**
Hospital stay	r	0.747**	
	p-value	0.000	
Healing time	r	0.440*	0.105
	p-value	0.031	0.626

**correlation significant at 0.01, *correlation significant at 0.05

This table showing that there was statistically significant strong positive correlation between operative time and hospital stay, hospital stay increased with longer operative time, also there was statistically significant strong positive correlation between operative time and healing time delayed healing occurs with longer operative time (r=0.440, p-value < 0.05), there was no correlation between hospital stay and healing time.

Table (6): Post operative complications among the studied patients

Variable	**Recurrence after surgery**	**Test**	**p-value**

	No (N= 22)		**Yes (N=2)**			
	No.	**%**	**No.**	**%**		
Sex						
• Male	*16*	76.2	*2*	66.7	Fisher's exact	1.000
• Female	*5*	23.8	*1*	33.3		
Age (years)						
• Mean ± SD	38.05 ± 10.85		*47*± 9.53		[a]*14*.500	0.138
• Median (Range)	36(23-62)		42(41-58)			
Operation time (Min.)						
• Mean ± SD	37.86 ± 5.61		40 ± 8.66		[a] 24.500	0.527
• Median (Range)	35(30-50)		45 (30-45)			
Hospital stay (Hrs.)						
• Mean ± SD	19.43 ±2.62		22 ± 3.46		[a] 18.000	0.135
• Median (Range)	18(18-24)		24(18-24)			
Healing time (weeks)						
• Mean ± SD	4.05 ± 0.92		4.67 ± 1.52		[a] 22.500	0.407
• Median (Range)	4(3-6)		5(3-6)			
Post operative pain	χ^2					
• Mild	13	61.9	1	33.3	1.578	0.454
• Moderate	6	28.6	1	33.3		
• Severe	2	9.5	1	33.3		
Anal continence						
▪ Continent	*21*	*100*.0	2	66.7	Fisher's exact	0.007*
▪ Incontinent to flatus only	*0*	0.0	1	33.3		

[a] ***Mann whitney test*** χ^2 **:** ***chi-square test*** ****p-value is significant***

This table shows that patients with recurrence were older with longer operation time, hospital stay and healing time with no statistical significance , Incontinent to flatus only was statistically higher among cases of recurrence than patients without recurrence (33.3% vs zero %)respectively.

Discussion

Although fistula in ano is a benign anorectal condition, it became a major problem for surgeon. Fistula-in-ano usually results from an anorectal abscess which bursts spontaneously or after inadequate surgery. Acute infection of the anal crypt leads to an anorectal abscess and fistula-in-ano represents the chronic form of this infection **(13)**.

A fistula in ano is termed complex when the tract crosses >30% of the external sphincter, is recurrent, has multiple tracts, is associated with preexisting anal incontinence, has a history of local radiation, is secondary to diseases such as Crohn's disease, tuberculosis, HIV, and malignancy, or is anterior in females .The management of complex fistula in ano remains a major surgical challenge and carries significant morbidity on account of damage to the anal sphincter**.(14).**

Complex anal fistula is defined as these fistulae which open into the anal canal at or above the internal ring and whose treatment poses an increased risk for a change in continence still represent a challenge. Complex are anatomically higher, involve significant portions of the sphincter musculature, may have multiple tracts, involve other organs (e.g. vagina) and may be associated with radiation or inflammatory bowel disease. Recurrent fistulas are usually considered as high anal fistula as well. Fistulae that traverse a significant portion of both sphincters are called trans-sphincteric and are part of group of complex fistulae. (**15).**

Complex perianal fistula treatment remains challenging, mainly due to variability in success and reccurrence rates as well as continence impairment risks. So far, no procedure can be considered the gold standard for surgical treatment. Yet, strong efforts to identify effective and "complication- free" surgical treatment options are ongoing. **(16)**

The goal of surgical treatment of perianal fistula is permanent eradication of the suppurative process without compromising anal continence. There are several surgical options for the treatment of perianal fistula, and the best choice is determined by the anatomy of the fistula: fistulotomy with opening and unroofing of the fibrous portion of the tract, fistulectomy with excession of the tract **(17)**, or seton may be used as a drain placed through a fistula to maintain drainage and/or induce fibrosis **(18).**

As there is no single technique is appropriate for the treatment of all fistula-in-ano there are variable surgical procedures for the management of anal fistula including fistulotomy, fistulectomy, ligation of intersphincteric fistula tract, setons , fibrin glue, fibrin plug, and endo advancement flap.**(4).**

The treatment of complex fistula in ano has evolved over the past few decades. Conventional methods such as fistulotomy and setons were associated with high postoperative morbidity, incontinence, and recurrence. The importance of the intersphincteric space being the focus of sepsis in complex fistulas was emphasized by **Kurihara et al. (14)** and **Zhang et al (19)**. Newer modalities like AFP, VAAFT, OTSC clip, fibrin glue, and the fistula-tract laser closure (FiLaC) device fail to address this source of sepsis, resulting in failure of fistula closure**.**

There are three main goals in the treatment; the first is to eliminate the fistula tract as a source of chronic infection, discharge, and sepsis; the second is to prevent recurrence; and the third is to preserve anal functions **(20)**.

There are a number of sphincter-sparing methods for the treatment of perianal fistula such as fibrin glue injection, anal fistula plug, endorectal muscular or mucosal advancement flap, core-out fistulectomy, radiofrequency ablation, ligation of the intersphincteric fistula tract, and, video-assisted anal fistula treatment **Sirikurnpiboon** (**7**).

The aim of this study is to evaluate effectiveness of combined ligation intersphenictreic fistula tract and mucosal flap advancement in treatment of complex perianal fistula. We will measure the success rate after the procedure. Success is defined as closure of all secondary openings, an absence of fistula drainage, and an absence of abscess formation. Also we will measure the development of anal incontinence. This interventional study was carried out at the General Surgery Department, Zagazig University Hospitals during the period from July 2019 to December 2021 on 24 patients with a diagnosis of complex fistula-in-ano.

Advancement flap may be summarized as elevating a flap, coring out of an infected gland, as well as an epi-thelized internal opening, suturing of the internal sphincter defect, closing the wound with a flap, and providing effective drainage. **(10).**

Full history taking and complete clinical examination were done to every patient. that the mean age of the studied patients was 39.17 ± 10.93 years old, with a range from 23 to 62years old, ¾ of the studied patients were male (75.0%) and 25% were females.

The initial postoperative assessment was undertaken at twenty-four hours following surgery. The severity of postoperative pain was assessed on a scale of 0 to 10 with help of the visual analogue scale (VAS). During each follow-up visit, the patient was assessed for postoperative pain, wound infection, collection, local recurrence , and anal incontinence.

All patients were followed up for a total duration of 12 months during the postoperative period. Patients were followed up at weekly intervals for the initial *4* weeks and at 2-week intervals for another *8* weeks,then monthly for next 9 months (patients follow up for one year postoperative) .

During each follow-up visit, the patient was assessed for pain, wound infection, and anal incontinence. Postoperative wound discharge was defined as a non-infected sero-sanguinous secretion from the open postoperative wound. Wound infection was defined as the presence of erythema, induration surrounding the wound or constitutional symptoms such as fever. Time required for complete healing of the postoperative

wound, which was defined as the time for complete healing to take place without an unepithelized surface area, was noted. The patients were observed for recurrence of the fistula during the follow-up period.

Postoperative incontinence and local recurrence was the primary outcome while healing time, size of the operative wound, operating time, postoperative pain, patient satisfaction, terms of physical, social and sexual activities were secondary outcomes.

Our study showed that the mean age of the patients was that the mean age of the studied patients was 39.17 ± 10.93 years old, with a range from 23 to 62years old, ¾ of the studied patients were male (75.0%) and 25% were females.

Our study showed that there were two patients had branching tract the first was diagnosed preoperatively by MRI and the second was diagnosed intraoperative. One of the two patients had developed recurrent fistula and the other did not, so large sample of patients with complex branching fistula will be needed to assess this technique in treatment of branching fistula. The majority of patients had high transsphincteric anal fistula and had the internal opening above dentate line.

Our study showed that Operation time was *38*.13 ± 5.86 Mins, with a range from 30- 50 minutes, and Hospital stay post operatively ranged from 18 to 24 hours. showing that there was statistically significant strong positive correlation between operative time and hospital stay, hospital stay increased with longer operative time, also there was statistically significant strong positive correlation between operative time and healing time delayed healing occurs with longer operative time ($r=0.440$, p-value < 0.05), there was no correlation between hospital stay and healing time.

Our study showed that there was 13 patients with mild pain postoperatively and this the higher percent of patient and 8 patients had moderate pain. Three patients suffered of severe pain. that about 1/3 of patients complaining of moderate postoperative pain (29.2%), more than half of them had mild post-operative pain (58.3%), as regard healing time it ranged from 3 to 6 weeks post operatively.

Our study showed that post-operative wound infection was in three patient about 12.5% drainage of seroma and proper antibiotic according to culture and sensitivity was done. One of them, the infection completely subcide completely with complete healing and the other two patients develop recurrent fistula one in the same site of original fistula site ,the other is 2cm from original fistula site. Possible reasons for non healing or recurrence after an advancement flap procedure could be due to unrecognized extensions with insufficient drainage, local infection beneath the flap or impaired blood flow due to tension or too narrow base of the flap leading to devascularisation.

Wound infection, recurrence and flatus incontinence is noted in patients with branched perianal fistula so large sample of patients with complex branching fistula will be needed to assess this technique in treatment of branched fistulas. Recurrence after surgery and Incontinent to flatus only occurred in 8.3% of cases, 4.2 % of the studied patients respectively. Major causes of recurrence include preoperative causes such as specific fistulas or poor identification of fistulous tract and openings, operative causes such as poor technical aspects of surgery as tight sutures, sutures with long cut edges, flap thickness, and postoperative causes such as poor postoperative wound healing

Patients were asked about anal incontinence. The Jorge-Wexner score is the most widely used instrument in assessing the efficacy of surgical therapies for anal incontenence, Although it has yet to undergo formal validation studies during specific treatments. This scoring system determines frequencies and different anal incontinence presentations (Gas/Liquid/Solid/Pad use/Need for lifestyle alterations) and sums the returned score to a total of 0–20 (where 0 = perfect continence and 20 = complete incontinence).

Wael Khafagy et al (21) used partial rectal wall advancement flap and mucosal advancement flap in treatment of complex anal fistulas , Participants were randomly allocated to receive Group I: Fistulectomy, closure of internal sphincter and rectal advancement flap includes mucosa, submucosa, and circular muscle layer sutured 1 cm below the level of internal opening or Group II: The same as group one but the flap includes only mucosa and submucosa. Study variables included fistula closure rate, continence, morbidity, postoperative pain, hospital stay and quality of life. Forty patients with high transphincteric perianal fistula were randomized and

completed the study. Operative time was 31.6 ± 6.8 min in group I, and 29.4 ± 4.7 min in group II (P = 0.783). Hospital stay was significantly more in group 2 (96.35 ± 9.5 vs. 105.8 ± 13.23) (P = 0.014) Immediate postoperative complications, occurred in one patients (5%) exposed to disruption in group I and 6 patients (30%) in group II. Recurrence occurred in 2 patients (10%) in the group I and 8 patients (40%) in group II. Two patients (10%) in group I developed incontinence for flatus and no patients in the group II develop such complication.with Conclusion that Partial thickness advancement flap is better than mucosal advancement flap. But our study shows promising results by adding LIFT technique in the treatment with Recurrence after surgery and Incontinent to flatus only occurred in 8.3% of cases, 4.2 % of the studied patients respectively.

Metin Ertem,et al (22), used Application of Advancement Flap After Loose Seton Placement: A Modified Two-Stage Surgical Repair of a Transsphincteric complex Anal Fistula , 13 patients (10 males, 3 females) Included in his study were with a mean age of 42 years who underwent a two-stage seton and advancement flap surgery for transsphincteric anal fistula between June 2008 and June 2013. In the first stage, a loose seton was placed in the fistula tract, and in the second stage, which was performed three months later, the internal and external orifices were closed with advancement flaps. All the patients were discharged on the first postoperative day. The mean follow-up period was 34 months. Only one patient reported anal rigidity and intermittent pain, which was eventually resolved with conservative measures. The mean postoperative Wexner incontinence score was 1. No recurrence or complications were observed, and no further surgical intervention was required during follow-up.

Salah M et al (23), used cutting seton in treating complex perianal fistula, Fifty-one patients underwent cutting seton insertion for complex fistula in ano. With higher recurrence rate 9.8%. and higher postoperative rate of incontinence was 15.7% to flatus and 5.9% to fluid stools. There was no incontinence to solid stools.

Zutoia Balciscueta et al (24), do twenty six studies were included (1655patients).shows that the pooled rate of recurrence was 21%. Full-thickness flaps showed the best results concerning recurrence (7.4%), partial flaps revealed 19% and mucosal flaps 30.1%. Core-out and curettage had a similar recurrence (19 vs 21%). Regarding anal incontinence, the pooled rate was 13.3%. Mucosal- and partial-thickness flaps showed similar rates (9.3 vs 10.2%), while full-thickness flaps disturbed it in 20.4%. Most of these alterations were minor symptoms. Otherwise, core-out and curettage showed similar rates (14.3 vs 12%).

Hassan et al (25) study 21 patient with anal fistula for 18 months using LIFT technique alone show that recurrence rate was 9.5% and No postoperative changes in fecal continence.

MOSTAFA et al (26) used seton in treatment of complex perianal fistula. the result was During the study period, seventy nine patients were treated. Their age was (mean ± standard deviation) 41±10.6 years. Tightening of the seton was done with a median of six times (3-15 times range). All patients had complete healing in 11.2±5.7 weeks. Follow-up was done for all patients for a variable period with minimum of one year and none of the them had any anal incontinence. Recurrence was noticed in 4 (5%) patients.

Baocheng Zhao et al (27) used Ligation of the Inter-Sphincteric Fistula Tract Plus Bioprosthetic Anal Fistula Plug (LIFT-Plug) in the Treatment of complex Trans-Sphincteric Perianal Fistula. Show similar operative time which was 25 minutes (18 to 45 minutes). with better healing time which was 16 days (9 to 46 days). With longer hospital stay after operation which was 5 days. They had similar recurrence rate which was 4%. Perfect control of continence was recorded for 97.1% of the patients (68 out of 70 patients).

Patricio B et al (28), used Ligation of the Intersphincteric Fistula Tract (LIFT) as a first approach in the surgical treatment of transsphincetric anal fistula The study included 77 patients, of which 68% were male and 32.5% obese. Fifteen patients presented with a recurrent fistula, and preoperative seton was placed in over 80% of the cases. No intra or postoperative complications were recorded. With a median follow-up of 37 months, the success rate was 51%; LIFT failure occurred more often in younger patients. Other patient characteristics, seton placement, fistula characteristics, patient positioning, and suture used for tract ligation were not associated with treatment outcome. None of the patients referred fecal incontinence. Seventy-four percent of patients with treatment failure underwent further surgical treatment; the success rate of the second operation was 71%.he concluded that LIFT as the first operation was associated with a modest success rate with no intra

or postoperative complications. Seton placement, patient characteristics, and operative variables were not associated with failure.

Our study showed that one patient develop incontinence to flatus about 4.16%.no one develop incontinence to loose stool. And none of patient develops incontinence to hard stool. Our study showed that 2 patient had recurrent fistula in follow up about 8.3%.Our study show no significant relations between complications except patients with branched perianal fistulas showed elevation of incidence of complication as three patients developed post-operative infection and two patients developed recurrence one of them devlop incontinence to flatus only, finally the overall complications in these patients are 3 out of 24 patients about 12.5%. Our study shows better result regarding time, hospital stay, post-operative pain, financial, continence and recurrence compared with results of different techniques used in treatment of complex perianal fistulas with close results with studies using the same technique.

By studying different techniques in treatment of complex perianal fistulas results were better regarding recurrence and anal continence when using combination LIFT and mucosal advancement flap than used LIFT technique alone. Although Advancement flaps procedures has promising results but also has limitations. They are technically demanding procedures with a wide range of success rates and are not free from a risk of minor incontinence**.**

Conclusion

Using the combination of ligation of the intersphincteric fistula tract &mucosal advancement flap can be used in treatment of complex anal fistula with promising results and minimal affection on anal sphincter & continence. Advancement flap procedures have limitations. They are technically demanding procedures with a wide range of success rates and are not free from a risk of minor incontinence**.**

We recommend using this surgical technique (combination of ligation of the intersphincteric fistula tract &mucosal advancement flap).in treatment of complex anal fistula. Other studies involving larger sample sizes and longer follow-ups to assess post-operative complications especially continence impairment and recurrence on long term period.

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