



Research Article

DISTAL LASER PROXIMAL SLOFT (DLPS) – A NEW APPROACH FOR MANAGEMENT OF FISTULA IN ANO

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Aim: Recurrence and anal incontinence, are the commonest complications associated after fistula surgery. Cause of recurrence has been attributed to the inability to find or tackle the internal opening. Various surgical procedures- both sphincter cutting and sphincter saving, have been used to manage the internal opening. The aim of our study was to develop a technique to achieve internal opening closure with separation of distal tract containing the cryptoglandular infection, followed by laser coagulation.

Method: A total of 31 patients with anal fistula underwent distal laser proximal modified SLOFT procedure. The patients were having either primary or recurrent intersphincteric or trans-sphincteric fistulas. The surgical technique opted for these patients were internal opening ablation with laser energy followed by primary closure of internal opening, distal tract was separated and laser coagulated to deal with cryptoglandular infection. Patients having suprasphincteric, extrasphincteric or high fistulas or fistulas with fistula tract length of less than four cms, were excluded in this study.

Result: Out of 73 patients with anal fistula operated from April 2017 to March 2019, 42 patients underwent FiLaC procedure with 7 patients having recurrence indicating a success rate of 84%. Remaining 31 patients were taken for DLPS out of which 2 patients had recurrence leading to a better success rate of 93.6%.

Conclusion: Distal laser with proximal modified SLOFT appears to be a safe sphincter saving procedure for the treatment of inter-sphincteric and trans-sphincteric anal fistula where internal opening can be well defined. Results seem promising as per current data. This minimal invasive technique should be encouraged as a part of sphincter saving procedure for the treatment of fistula in ano.

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INTRODUCTION

Anal fistula is an epithelialized tract that communicates the anal canal to the perianal skin. It is the second most common non-cancerous condition affecting the anal canal after haemorrhoids. It is prevalent in both men and women in the ratio of 2:1 to 7:1 respectively¹. Most patients with anal fistula are between the ages of 20 and 60 with the mean age of 40. In a report men were afflicted twice as frequently as women (12.3% vs. 5%)². The protective effects of estrogen may be a reason for fewer women than men developing anal fistulas. It has been reported that an anal fistula that is untreated for more than 10 years puts one at increased risk of glandular cancer³.

Anal fistula is associated with cryptoglandular infection in about 95% of cases and in 5% of cases diseases like Tuberculosis, Crohn's disease, HIV, Radiation, Trauma and Malignancy play a role.

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According to Park's classification the fistulas are divided into four main groups-intersphincteric, transsphincteric, suprasphincteric and extrasphincteric (Fig.1)⁴

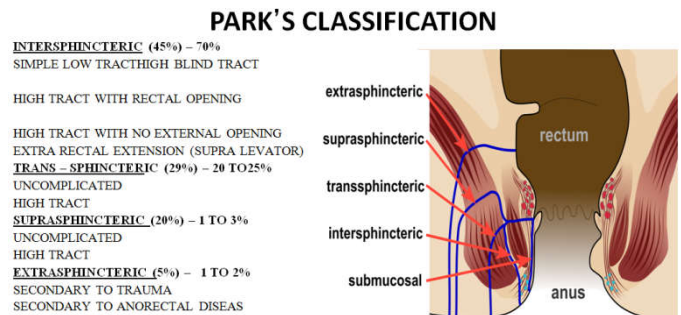


Fig1 Park's Classification (Revised percentage after Cochrane study)

The management of fistula has always been a challenge for colorectal surgeons. Commonest procedures performed are Fistulotomy and Fistulectomy. New methods for the management of fistula like LIFT, VAAFT, Fibrin Glue, Fistula

Plug, Fistula Laser Closure (FiLaC) have been introduced which are minimally invasive and sphincter saving⁵

Hill & Colleagues in 1943 published and stressed the role of anal glands in the pathogenesis of anorectal infection⁶. Similarly Kratzer in 1950 stressed the clinical significance of anal ducts & glands⁷. These references conclusively support the role of anal glands in the etiology of fistula in ano. Anal glands produce secretions that lubricate the anal canal for the smooth passage of the stool. A gland can be clogged by faecal matter and infected by bacteria to form an anal abscess leading to fistula formation⁸.

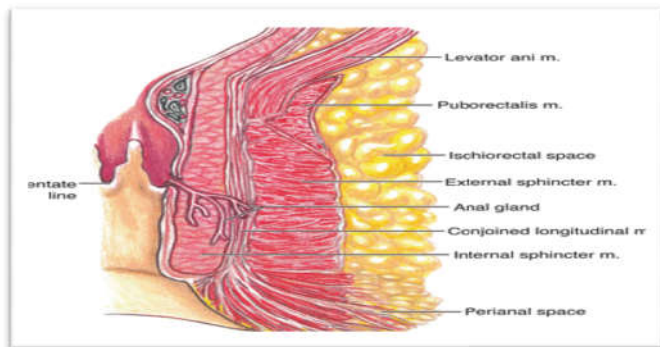


Fig 2 Anatomy of anal gland

Based on these facts, a new technique has been developed to treat fistula in ano by a minimal invasive procedure - Distal Laser and Proximal Submucosal ligation of fistula tract (SLOFT)⁹ which is a combination of Laser with modified SLOFT. In this procedure (DLPS), the internal opening is closed with vicryl 2-0. The distal part is separated, and laser coagulated to isolate cryptoglandular infection.

METHOD

Out of 73 patients with anal fistula operated from April 2017 to March 2019, 42 were taken for Fistula Laser Closure (FiLaC) and 31 patients were treated with DLPS. All patients gave informed consent to undergo laser procedure and agreed to participate in regular follow up assessment. Due to high recurrence of fistula after FiLaC, principle of combining laser with distal tract separation was carried out as a minimal invasive procedure with minimal morbidity.

Remaining 31 patients with anal fistula underwent distal laser proximal modified SLOFT procedure. The patients were having either primary or recurrent intersphincteric or trans-sphincteric fistulas. The surgical technique opted for these patients were internal opening ablation with laser energy followed by primary closure of internal opening, distal tract was separated & laser coagulated to deal with cryptoglandular infection.

Procedure

DLPS was performed on 31 patients. All patients were administered pre-operative antibiotics. Spinal anesthesia was used. The patient was placed in the lithotomy position and half cut proctoscope was inserted. Internal opening was identified by injecting hydrogen peroxide through the external opening. The tract was curetted and irrigated with normal saline. Internal opening was laser ablated with 360 degree corona radial fiber using 1470nm laser from Neo V.

Metal probe was inserted again from external opening and brought out through internal opening. Laser fiber was inserted through external opening and brought out through internal opening. A figure of eight suture was taken at the internal opening using 5/8 circle 27mm 2-0 vicryl, circumambulating the fistula tract and deep enough to take fibres of internal sphincter. (Fig.3, Fig.4, Fig.5 and Fig.6). The probe was withdrawn gently every 2-3 mm. Circumambulation led to tightening of the probe behind the suture. At the time of withdrawal of the probe from internal opening a feeling of sudden jerk indicated that suture was rightly placed behind the tract. Normal saline was injected through the external opening to check the proper closure of internal opening. The probe was reinserted in the fistula tract and the tip was palpated about 3mm proximal to the internal opening towards anal verge. At the tip of the probe, the distal tract was separated using monopolar cautery, hence isolating the cryptoglandular infection. Laser coagulation of distal tract was carried out using 360° radial fiber through external opening up to separated fistula tract for destruction of unhealthy granulation tissue and epithelial tract. The energy used was 10 watts per sec per mm in continuous mode. The pulse mode recommended in some publications¹⁰ was avoided to prevent skip areas which can lead to recurrence as unhealthy tissue is left behind (Fig. 7).

The external opening was enlarged to drain remnants of necrotic material and ablated tissue. The tract was irrigated with normal saline after 24 hours. Curetted material comprising of necrotic material were sent for histopathology examination. On histopathological examination, two cases were reported as granulomatous inflammation suggestive of tuberculosis. Remaining showed fibro collagenous tissue with few capillaries and inflammatory infiltrate composed of lymphomononuclear cells and few polymorphonuclear cells suggestive of chronic inflammatory pathology, nonspecific. These findings further suggested the role of cryptoglandular infection in the etiopathogenesis of fistula in ano.



Fig3 Laser Ablation of Internal Opening



Fig4 Circumambulation of Fistula Tract at Internal opening



Fig 5 Separation of Distal Tract

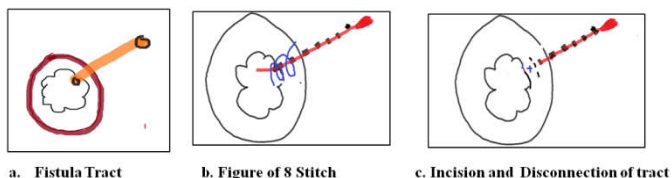


Fig 6 Internal opening closure with Figure of 8 suture

What not to do?

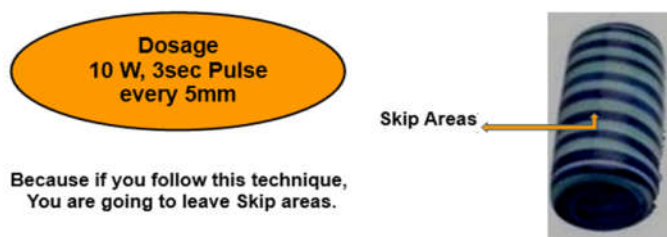


Fig.7

RESULT

73 patients with anal fistula were operated from April 2017 to June 2019. 42 patients underwent FiLaC procedure out of which 7 patients had recurrence indicating a success rate of 84%. Remaining 31 patients were taken for DLPS out of which 2 patients had recurrence leading to a better success rate of 93.6%.

Table 1 Patient and fistula characteristics of patients undergoing the FiLaC procedure

Number of Patients	42
Gender (M:F)	37:5
Age (Years)	45 (25-85)
Type of Fistula	
• Intersphincteric	21
• Low Trans-Sphincteric	5
• Superficial	3
• Extra Sphincteric	4
• Horseshoe Fistula	2
• Previous Fistula Surgery (Recurrence)	7

Table 2 Patient and fistula characteristics of patients undergoing the DLPS procedure

Number of Patients	31
Gender (M:F)	26:5
Age (Years)	42 (25-68)
Type of Fistula	
• Intersphincteric	21
• Low Trans-Sphincteric	2
• Large Extra Sphincteric	2
• Horseshoe Fistula	2
• Multiple External Opening	2
• Recurrence	2

DISCUSSION

Lasers have been used as a surgical tool for anal diseases since last four decades¹¹ with the first report of a CO₂ laser in 1981¹². The colorectal surgeons have always been interested in a minimal invasive fistula management technique, which balances clinical effectiveness with the absence of post-operative complications. The mechanical coring of fistula tract was first performed by Tasci in 2003¹³ which was extended by Rojanasakul and others with the ligation of intersphincteric fistula tract¹⁴. The use of diode laser for FiLaC (Fistula Tract Laser Closure), sealing and closure of fistula through laser was a further advancement in the fistula management¹⁵. The FiLaC success in healing anorectal fistulas in different studies in literature is 71 -82%¹⁶.

In the standard FiLaC procedure performed by us, the internal opening was closed with vicryl 2-0. The distal tract was laser coagulated. The results were not better than the published data so far on FiLaC. In FiLaC, different ways were tried to close the internal opening but no substantial improvement was observed (Fig.8)

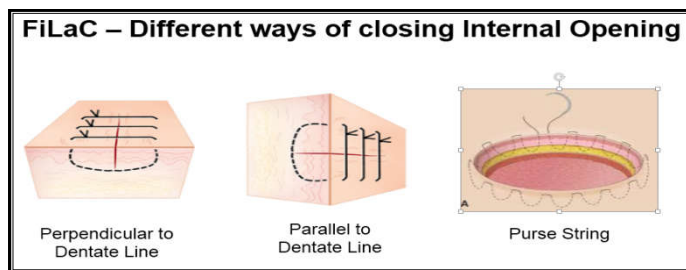


Fig 8 Closing Internal Opening

Our procedure is based on the concept that ligation and separation of whole fistula tract can isolate the entire cryptoglandular infection, decreasing the chances of recurrence. The laser energy emitted by the radial tip fiber into the fistula tract destroys the endoluminal granulation tissue leading to healing of tract by secondary intention.

In the current study, the success rate of DLPS is as high as 93.6%. This has been attributed to the fact that internal opening ablation by laser plays a vital role due to bactericidal effect of laser energy. Further separation of distal tract helped in complete eradication of infection. In our experience, in the original SLOFT procedure, the cutting of mucosa and submucosa below the dentate line to identify the underlying fistula tract was associated with bleeding because of injury to the submucosal blood vessels. In the modified SLOFT, under running of the suture was done without incising mucosa and submucosa leading to a bloodless field. Moreover in original SLOFT, aneurysm needle was used which in our opinion is more traumatic than taking a simple ligature.

LIFT is a novel sphincter saving technique, first described in 2007 by Rojanasakul. In our opinion when LIFT is done, a part of infected fistula tract is still left inside which may be the cause of recurrence. This assumption has been made based on the principle of appendectomy where a large stump left behind may lead to stumpitis (Fig.9)

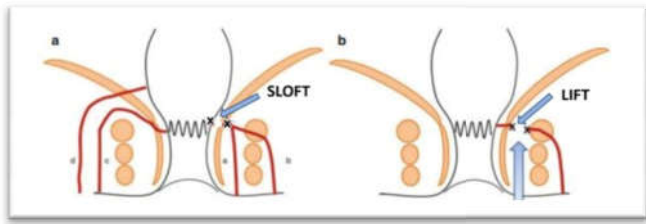


Fig.9

Follow Up

Follow up was scheduled in the outpatient clinic at 1 and 2 weeks and 1 month post operatively. However, patients were instructed to come for follow up to the outpatient clinic at any symptoms of re-occurrence. Follow up after three and five months of post-operative procedure was conducted through telephonic interview.

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