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Original Research Article

DLPL Sphincter Saving Laser Surgery for Complex Anal Fistula - A Gold Standard Procedure. Study of 40 Cases

Prof. Dr. Kazi Sohel Iqbal[1*], Dr. Tanvir Ahmed Shohan[2], Dr. A M Kamrul Hasan[3], Dr Raka Mustary Khan[4], Dr Tamanna Ahmed[5], Dr. Md. Jamaluddin[6], Dr. Riditta Mustika[7], Dr. Sourov Hossain[8]

[1]Professor & Head, Department of Surgery, MH Samorita Medical College & Hospital, Dhaka, Bangladesh
[2]Consultant, Department of ICU & Anesthesia, Enam Medical College & Hospital, Dhaka, Bangladesh
[3]Classified Specialist Anesthesiologist, Department of Anesthesia, Combined Military Hospital (CMH), Dhaka, Bangladesh
[4]Assistant Professor, Depaetment of Surgery, MH Samorita Medical College and Hospital, Dhaka, Bangladesh
[5]Assistant Professor, Burn and Plastic Surgery Unit, Department of Surgery, MH Samorita Medical College and Hospital, Dhaka, Bangladesh
[6]Assistant Professor, Department of Surgery, MH Samorita Medical College & Hospital, Dhaka, Bangladesh
[7]Registrar, Department of Surgery, MH Samorita Medical College & Hospital, Dhaka, Bangladesh
[8]Assistant Registrar, Department of Surgery, MH Samorita Medical College & Hospital, Dhaka, Bangladesh

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Abstract: ***Introduction:*** Complex anal fistula (CAF) is a complex condition to treat because of the possibility of recurrence and impoverished continence. DLPL (Distal laser proximal ligation), is a novel approach to treating difficult anal fistula that involves suturing the proximal portion of the fistula tract close to the internal opening and using a diode laser to close the distal part of the fistula tract. This study aimed to evaluate the clinical efficacy and safety of DLPL Sphincter Saving Laser Surgery for Complex Anal Fistula. ***Aim of the study:*** The aim of this study was to evaluate the clinical efficacy and safety of DLPL Sphincter Saving Laser Surgery for Complex Anal Fistula - A Gold Standard Procedure in a study of 40 cases. ***Methods:*** This study was a prospective observational study that investigated the outcomes of DLPL (Distal Laser Proximal Ligation) for patients with complex anal fistula. The patients met clinical diagnosis of complex anal fistula according to the Parks classification, age of 10 years or more, and failure of previous conservative or surgical treatments. The patients were followed up at 3 and 6 months after the surgery, and assessed using fistulogram, endo anal ultrasound, MRI. ***Result:*** The study enrolled 40 patients (35 males and 5 females) with mean age being 31.25 years. 31 (77.50%) patients had non-specified histopathology. 2 (5.00%) patients had Chron's disease, 2 (5.00%) patients had F.B Granuloma, and 5 (12.50%) patients had Tuberculosis. The patients were assessed using fistulogram, endo anal ultrasound, MRI. After 6 months, the patients were followed up and 38 (95.00%) patients had no recurrence, only 2 (5.00%) patients had recurrence. ***Conclusion:*** The results showed high success rate and low complication rate of DLPL for complex anal fistula. Therefore, this study concluded that DLPL is a safe and effective sphincter-saving technique for complex anal fistula, and that it may be considered as a gold standard procedure for this challenging condition.

Keywords: DLPL (Distal Laser Proximal Ligation), Complex anal fistula, Sphincter-saving technique, Laser surgery, Crohn's disease.

INTRODUCTION

Complex anal fistula (CAF) is a complex condition to treat because of the possibility of recurrence and impoverished continence. CAF is characterized as a fistula with several tracts, an anterior fistula in a female, a high trans sphincteric fistula, or a supra- or extra sphincteric fistula [1]. The most common cause of CAF is cryptoglandular infection, but additional factors include Crohn's disease, tuberculosis, malignancy, trauma, and foreign body [2]. Perianal discharge, which can be purulent, bloody, or feculent, is the primary sign of CAF. Incontinence, swelling, pain, and pruritus are further symptoms [3]. Recurrence, which can range from 0 to 40% depending on the

***Corresponding Author:** Prof. Dr. Kazi Sohel Iqbal
Professor & Head, Department of Surgery, MH Samorita Medical College & Hospital, Dhaka, Bangladesh

method used, is the most prevalent side effect following surgery for complex anal fistula. Incontinence, infection, bleeding, anal stenosis, and perianal sepsis are additional concerns [4].

Surgery is the primary treatment for anal fistula, although it can be challenging to recover and result in incontinence [5, 6]. Classical surgical treatments for Crohn's disease fistulas have been extrapolated from cryptoglandular fistulas therapy, which have different etiology, and this may interfere with its effectiveness. Furthermore, they raise the risk of fecal incontinence [6]. Fistulotomy is frequently used for small fistula, but not for complex ones because it could sever the sphincter and lead to incontinence [7]. The endorectal flap is used to cover the fistula opening; however, it has a high failure rate and can result in bleeding, infection, and necrosis of the flap [2-9]. VAAFT uses an endoscope and electrocautery or laser to destroy the fistula, but it has a high recurrence rate and may miss secondary tracts or abscesses [10]. The fistula is sealed with fibrin glue or bioprosthetic plugs, although these procedures have lowest success and recurrence rates [11, 12].

DLPL (Distal laser proximal ligation), is a novel approach to treating difficult anal fistula. It involves suturing the proximal portion of the fistula tract close to the internal opening and using a diode laser to close the distal part of the fistula tract [13]. Compared to other surgical choices, DLPL is a less invasive treatment that offers a shorter hospital stay, less pain after surgery, and a speedier recovery.

The aim of this study was to evaluate the clinical efficacy and safety of DLPL Sphincter Saving Laser Surgery for Complex Anal Fistula - A Gold Standard Procedure in a study of 40 cases. This study also aimed to explore the potential mechanisms of action of DLPL surgery.

Objectives

- To evaluate the clinical efficacy and safety of DLPL Sphincter Saving Laser Surgery for Complex Anal Fistula - A Gold Standard Procedure in a study of 40 cases.

METHODOLOGY & MATERIALS

This prospective observational study was conducted at the Department of Surgery, MH Samorita Medical College & Hospital, Hi-Tech Surgicare Hospital & piles Centre, Savar Specialized Hospital, Lab Zone Hospital Savar, Dhaka, Bangladesh, from January 2020 to June 2022. The study population consisted of patients of both sexes with complex anal fistula. The inclusion criteria were clinical diagnosis of complex anal fistula according to the Parks classification, age of 10 years or more, and failure of previous conservative or surgical treatments. The exclusion criteria were simple anal fistula, active infection or abscess, inflammatory bowel disease, immunosuppression, malignancy, or pregnancy. The patients were enrolled consecutively and underwent DLPL (Distal Laser Proximal Ligation) as the only sphincter-saving technique for complex anal fistula. The patients were informed about the aims, objectives, procedures, risks and benefits of the study and gave written consent. The preoperative assessment included fistulogram, endo anal ultrasound, and MRI to determine the type, length, and size of the fistula tract. The surgery was performed under spinal or general anesthesia. The patients were followed up at 3 and 6 months after the surgery. The data were analyzed using SPSS (V-25) software and Microsoft.

RESULT

The present single-centered, prospective observational study was conducted between the periods of January 2020 and June 2022 for a duration of two and a half years at the Department of Surgery, MH Samorita Hospital Ltd., Dhaka, Bangladesh. All patients admitted to the Department of Surgery, aged 10 to 60 years, with both sexes clinically diagnosed as complex anal fistula, were the study population. A total of 40 patients with complex anal fistula were included in the study. In this study, the age of the patients ranges from 10-60 years. Maximum age incidence was found in the 20-30 and 30-40 year age groups, and the average age was 31.25 years (Table 1). Out of 40 patients, 35 (87.50%) were male and 5 (12.50%) were female. Male are more likely to suffer from the complex anal fistula than female (Figure 1). 31 (77.50%) patients had non-specified histopathology. 2 (5.00%) patients had Chron’s disease, 2 (5.00%) patients had F.B Granuloma, and 5 (12.50%) patients had Tuberculosis (Table 2). The diagnostic modalities used for the study patients were fistulogram, endo anal ultrasound, and MRI. The type of fistula tract was categorized as single, multiple, or horseshoe. Out of 40 patients, 20 (50.00%) had a single fistula tract, 10 (25.00%) had a multiple fistula tract, and 10 (25.00%) had a horseshoe fistula tract according to fistulogram. According to endo anal ultrasound, 18 (45.00%) had a single fistula tract, 12 (30.00%) had a multiple fistula tract, and 10 (25.00%) had a horseshoe fistula tract. According to MRI, 15 (37.50%) had a single fistula tract, 15 (37.50%) had a multiple fistula tract, and 10 (25.00%) had a horseshoe fistula tract. The distribution of the type of fistula tract among the diagnostic modalities is shown in Table 3. The recurrence rate of DLPL for complex anal fistula was 5.00% at 6 months follow-up. Out of 40 patients, only 2 (5.00%) had recurrence within 3 and 6 months, respectively. The rest 38 (95.00%) patients had no recurrence (Table 4).

Table 1: Age of the study patients (N = 40).

Age	No. of patients	Percentage (%)
10-20	1	2.50%
20-30	17	42.50%
30-40	15	37.50%
40-50	5	12.50%
50-60	2	5.00%

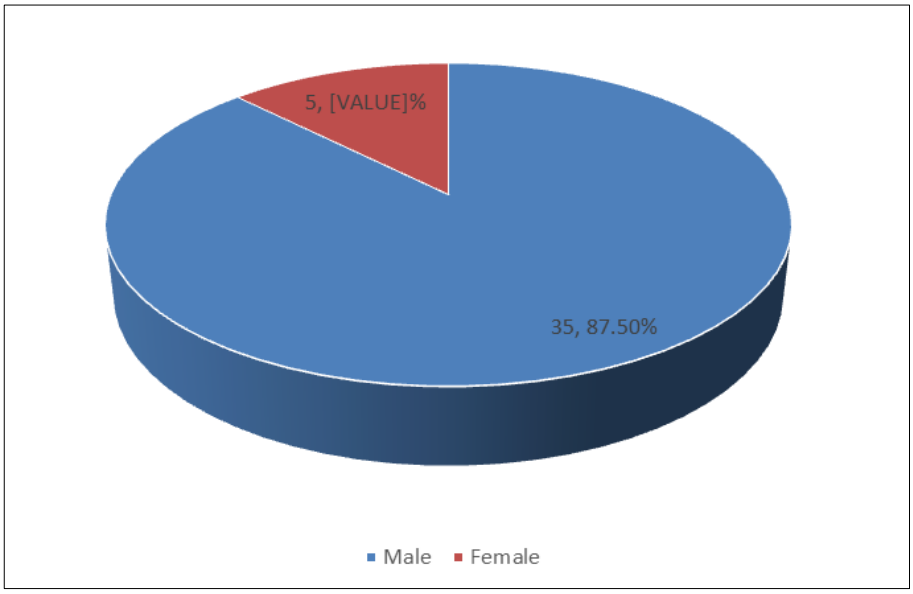

Figure 1: Gender of the study patients (N = 40).

Table 2: Histopathological findings of the study patients (N = 40).

Histopathology	No. of patients	Percentage (%)
Non specified	31	77.50%
Chron's disease	2	5.00%
F.B Granuloma	2	5.00%
Tuberculosis	5	12.50%

Table 3: Diagnostic modalities used for the study patients (N = 40).

Diagnostic	Type of fistula tract	No. of patients	Percentage (%)
Fistulogram	Single	20	50%
	Multiple	10	25%
	Horseshoe	10	25%
Endo anal usg	Single	18	45%
	Multiple	12	30%
	Horseshoe	10	25%
MRI	Single	15	37.50%
	Multiple	15	37.50%
	Horseshoe	10	25%

Table 4: Recurrence rate of DLPL for complex anal fistula (N = 40).

Recurrence	Recurrence time	No. of patients	Percentage (%)
Yes	within 3 months	1	2.50%
Yes	within 6 months	1	2.50%
No	N/A	38	95%

DISCUSSION

The present single-centered, prospective observational study was conducted between the periods of January 2020 and June 2022 for a duration of two and a half years at the Department of Surgery, MH Samorita Hospital Ltd., Dhaka, Bangladesh. The

present study assessed the efficacy of DLPL sphincter saving laser surgery in 40 cases of complex anal fistula.

The patients in the study were between the ages of 10 and 60. The mean age was 31.25 years. In the study conducted by Giamundo et al., the mean age at the time of the operation was 46.8 years (range 19-76 years) [14]. Out of 40 patients, 35 (87.50%) were male and 5 (12.50%) were female. Male are more likely to suffer from the complex anal fistula than female. 75% of the patients in the Giamundo et al., research were male, while 25% of the patients were female [14].

The histopathology of the fistula tract was categorized as non-specified, Chron's disease, F.B Granuloma, or Tuberculosis. Out of 40 patients, 31 (77.50%) had non-specified histopathology (Table 3). 2 (5.00%) patients had Chron's disease, 2 (5.00%) patients had F.B Granuloma, and 5 (12.50%) patients had Tuberculosis. In the study of Ji L et al., same result was achieved with 40 patients [15]. In another study by Gupta K *et al*., the healing rate was higher for Chrohon's disease was slightly higher in the same sample population [16].

In contrast to our study, which used Fistulogram, Endo Anal USG, and MRI to evaluate the type and number of fistula tracts in 40 patients who underwent DLPL surgery for complex anal fistula, Al Wadees a *et al*., used only Endo Anal USG and MRI to assess the same variables in 50 patients who received different surgical techniques [17].

The recurrence rate of DLPL for complex anal fistula was 5.00% at 6 months follow-up. Out of 40 patients, only 2 (5.00%) had recurrence within 3 and 6 months, respectively. The rest 38 (95.00%) patients had no recurrence. DLPL sphincter saving laser surgery enables the patients to heal the fistula tract without causing bowel or anal incontinence. The recurrence rate of conventional surgical treatments for complex anal fistula ranges from 20% to 40% [18].

The healing rate of DLPL for complex anal fistula was 95.00% at 6 months follow-up. Out of 40 patients, 38 (95.00%) had complete healing of the fistula tract. The rest 2 (5.00%) patients had persistence of the fistula tract. DLPL sphincter saving laser surgery offers a shorter hospital stay, less postoperative pain, and faster recovery compared to other surgical options. In the study of Giamundo et al., the healing rate was 83.3% at 12 months follow-up [14].

The findings of this study were consistent with other studies that used similar methods and measurements. The results showed that DLPL is a promising technique for complex anal fistula, with a low recurrence rate and a high healing rate. The procedure is minimally invasive, sphincter-preserving, and does not cause bowel or anal incontinence.

Limitations of the Study

This study has some limitations that should be acknowledged. This is a single-centered study that may not reflect the general population of patients with complex anal fistula. The results may be influenced by the local practice patterns, patient characteristics, and referral bias. Also, this study has a small sample size and a short follow-up period, which may limit the statistical power and the detection of long-term outcomes and complications.

CONCLUSION

This study assessed the clinical efficacy and safety of DLPL Sphincter Saving Laser Surgery for Complex Anal Fistula - A Gold Standard Procedure in a study of 40 cases. The results showed high success rate and low complication rate of DLPL for complex anal fistula. The patients also reported improved anal continence and quality of life after the surgery. Therefore, this study concluded that DLPL is a safe and effective sphincter-saving technique for complex anal fistula, and that it may be considered as a gold standard procedure for this challenging condition.

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