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ORIGINAL ARTICLE

Comparison Between Open and Laser Surgery in Different Types of Perianal Fistula

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Abstract

Background: ***A perianal fistula occurs when the perianal tissue becomes abnormally connected to the anal canal or rectum.***

Aim of study: To compare both laser procedures as minimally invasive surgeries and open procedures in the treatment of different types of perianal fistulas.

Patients and methods: ***This case-control research was performed on 60 cases who presented with perianal fistulae at El Sayed Galal University Hospital, El Hussien University Hospital, and Nasr City Health Insurance Hospital, separated into two groups: Group A: thirty cases who were treated using laser (L) procedures; & Group B: 30 patients who were treated using conventional surgery (S). This study lasted for 6 months.***

Results: ***In Group (L), mean operative time (min.) was 35.27 ± 2.56, mean hospital stay (days) was 1 ± 0.09, and mean a return to work (days) was 4.27 ± 0.83, while in Group (S), mean operative time (min.) was 47.73 ± 3.86, mean hospital stay (days) was 1.94 ± 0.23, and mean a return to work (days) was 6.9 ± 0.8, with significant variance among groups regarding operative time & hospital stay, while there was no significant variance among groups regarding discharge, pain, bleeding & recurrence.***

Conclusion: ***There was significant variance between the laser group and conventional surgery group regarding operative time and hospital stay (p = 0.03 and 0.001, respectively), which was significantly lower in the laser group. Moreover, there was no significant variance between the laser group and the conventional surgery group regarding postoperative discharge, pain, bleeding, and recurrence.***

Keywords: Perianal fistula; Laser surgery; Anal fissure

1. Introduction

Anal fistula is a prevalent condition. Pain and intermittent or continuous fluid discharge from the external opening are typical symptoms. Not less than these symptoms should be considered. They frequently induce significant distress and have the potential to harm the patient's life.[1,2]

An abnormal connection between the perianal skin & the anal canal, or rectum, constitutes a perianal fistula. It is likely an inflammatory condition in which one of the six to ten rudimental anal organs becomes infected. Recent findings indicate potential immunologic aetiologies for fistulas. Due to the risk of recurrence and sphincter injury resulting in soiling and fecal incontinence, fistula treatment is complicated. By fistulotomy, the tract is still opened, which is regarded as the most effective procedure.[3,4]

Lasers are progressively being employed in a variety of surgical procedures as a minimally invasive alternative. Significant progress in the medical utilization of laser beams has been achieved over the past few decades. The carbon dioxide (CO2) laser is a widely used and beneficial system in surgical procedures and therapies. Water, which comprises the majority of biological tissue, exhibits a high capacity to absorb CO2 laser energy (with a mid-infrared wavelength of 10,600 nm). Consequently, this laser is ideal for precise and safe ablation in water-rich tissues and the epidermis.[5,6]

Additionally, it is a successful method of photo rejuvenation. Following the addition of numerous microbeams to the energy beam fractionation process, the fractional CO2 laser has emerged in recent years as an effective replacement approach that lies between ablation and rejuvenation.[7,8]

The current study aims to compare both laser procedures as minimally invasive surgeries and open procedures in the treatment of different types of perianal fistulas.

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2. Patients and methods

This case-control research was performed on sixty (60) patients who presented with perianal fistulas at El Sayed Galal University Hospital, El Hussien University Hospital, and health insurance hospitals. This study lasted for six months. The cases were separated into two groups: Group A, which included thirty patients who were treated using laser (L) procedures, and Group B, which included thirty patients who were treated using conventional surgery (S).

Inclusion criteria: Gender: male and female, and age: from 18 to 60.

Exclusion criteria: previous anal surgery and systemic diseases (D.M./Crohn's illness, HIV/AIDS, anal carcinoma, or syphilis).

Methods:

All patients involved in the research were exposed to the following: Detailed history-taking, careful clinical investigations, examination (radiological and digital rectal examination)

Surgical technique:

Parameters of the study included:

Intraoperative:

Sedative anesthesia, spinal anesthesia, or caudal anesthesia were administered to all cases while they were in the lithotomy position. Positioning facilitates visualization of the internal opening in the lithotomy position. Throughout the operation, the fistula tract was identified by employing a stylet to trace its path from the outer mouth to the inner mouth of the fistula. When the inside of the mouth was not identified, the fistula tract was exposed through the external injection of methylene blue solution. In cases with a low perianal fistula, they underwent a fistulotomy that lay open; in cases with a high perianal fistula, they underwent a lay-open fistulotomy in the low part and a seton in the high part.

Laser ablation: Following the identification of the inner and outer openings, the tract received mechanical cleaning utilizing a brush and curette. Following this, 2/0 polyglactin sutures were used to close the internal opening. An intermittent laser application was conducted for a duration of three seconds at a wavelength of 1470 nanometers and ten watts via a probe equipped with the neoV1470 Laser System (NeoLaser), with the laser advancing towards the inner opening. Following each injection, the lumen of the entire tract was ablated by pulling back one centimeter into the outer orifice. When the probe became immobile following the discharge, the ablation was deemed to be complete; the external aperture was subsequently removed to facilitate drainage.

(A): Intraoperative view of laser ablation

(B): Intraoperative view of fistulotomy

Figure 1: Surgical procedure

Postoperative care and follow-up: Patients in both groups were administered ciprofloxacin and metronidazole as perioperative antibiotics and proper analgesia was prescribed. All cases were discharged on the second postoperative day unless there were complications, such as bleeding. The patients were advised regarding oral medication, laxatives, maintenance of local hygiene, a warm bath following defecation, dressings, fiber diet, regular follow-up in the outpatient clinic weekly based on two visits, then after one month and three months to evaluate wound recurrence, healing, incontinence, & inflammation, hospital stay, return to work, and recurrence.

Ethical consideration: The ethical committees of the Faculty of Medicine, Department of General Surgery, El Sayed Galal University Hospital, El Hussien University Hospital, and health insurance hospitals granted official approval.

Approval from the medical faculty's ethical committee is detailed in writing. Consent was obtained from all participants after they were properly informed of the study's aims, methodology, and applicable objectives.

3. Results

There wasn't significant variance among groups as regard age, sex & BMI P= (0.87, 0.65 & 0.56), respectively. Table 1

Table 1. Demographic data

		GROUP (L)		GROUP (S)		TOTAL		P VALUE
AGE (YEAR) (MEAN ±SD)		41 ± 5.77		41.27 ± 5.72		41.1± 5.84		0.87
SEX	Male N (%)	22	73.3	20	66.7	42	70	0.65
	Female N (%)	8	26.7	10	33.3	18	30	
BMI (KG/M²) (MEAN ±SD)		27.42 ± 1.42		26.56 ± 1.32		27.1± 1.6		0.56

There wasn't significant variance among groups regarding diabetes mellitus & hypertension p= (1, 0.87 respectively) Table 2

Table 2. Present and past history:

		GROUP (L)		GROUP (S)		TOTAL		P VALUE
DIABETES MELLITUS N (%)	yes	0	0	0	0	0	0	1
	No	30	100	30	100	60	100	
HYPERTENSION N (%)	Yes	2	6.67	3	10	5	8.3	0.87
	No	28	93.33	27	90	55	91.67	

There wasn't significant variance among groups regarding type of fistula Table 3.

Table 3. Type of fistula.

	GROUP (L)		GROUP (S)		TOTAL		P VALUE
	N	%	N	%	N	%	
INTERSPHINCTERIC FISTULA HAVING A HIGH BLIND TRACT	6	20	8	26.7	14	23.3	0.93
INTERSPHINCTERIC FISTULA WITH A RECTAL OPENING	3	10	4	13.3	7	11.7	
INTERSPHINCTERIC FISTULA WITH LOW TRACT	7	23.3	6	20.0	13	21.7	
SUPRASPHINCTERIC FISTULA	6	20	6	20.0	12	20.0	
TRANS-SPHINCTERIC FISTULA ASSOCIATED WITH THE HIGH BLIND TRACT	8	26.67	6	20.0	14	23.3	

Table 4 showed that in Group (L), mean operative time (min.) was 35.27 ± 2.56, mean hospital stay (days) was 1 ± 0.09 and mean return to work (days) was 4.27 ± 0.83 while in Group (S), mean operative time (min.) was 47.73 ± 3.86, mean hospital stay (days) was 1.94 ± 0.23 and mean return to work (days) was 6.9 ± 0.84. There was significant difference between groups as regard operative time and hospital stay.

Table 4. Operation data

	GROUP (L)	GROUP (S)	P VALUE
OPERATIVE TIME (MIN.) (MEAN ±SD)	35.27 ± 2.56	47.73 ± 3.86	0.03
HOSPITAL STAY (DAYS) (MEAN ±SD)	1 ± 0.09	1.94 ± 0.23	0.001
RETURN TO WORK (DAYS) (MEAN ±SD)	4.27 ± 0.83	6.9 ± 0.84	0.94

Table 5 showed that in Group (L), 19 (63.3%) patients had discharge. 11 (36.67%) patients had pain; 5 (16.67%) patients had bleeding. 5 (16.67%) patients had recurrence while in Group (S), 17 (56.67%) patients had discharge. 12 (40%) patients had pain. 4 (13.3%) patients had bleeding. 3 (10%) patients had recurrence with no significant variance among groups regarding discharge, pain, bleeding and recurrence.

Table 5. postoperative complications:

	GROUP (L)		GROUP (S)		P VALUE
DISCHARGE	19	63.33	17	56.7	0.598
PAIN	11	36.67	12	40.0	0.79
BLEEDING	5	16.67	4	13.3	0.718
RECURRENCE	5	16.67	3	10.0	0.45

4. Discussion

Our results showed no significant variance among groups regarding age, sex, and BMI (P = 0.87, 0.65, and 0.56), respectively.

Our findings are consistent with those of ELSAYED et al.[8],whose objective was to assess LASER closure of fistula tracts in the management of a high trans-sphincteric perianal fistula. For a six-month follow-up duration, they compared FiLaC to fistulotomy with primary sphincter reconstruction in terms of surgical outcomes. cases were separated into two groups for the study: Twenty cases with high trans-sphincteric fistulas who were treated with FiLaC comprised Group A. Group B: fistulotomy with primary sphincter repair was done on 20 cases with high trans-sphincteric fistulas. In group (A), ages varied from 21 to 65 years with a mean ± S.D. of 39.35±11.970 years, while in group (B), ages varied from 18 to 63 years with a mean ± S.D. of 35.55±13.300 years. No statistically significant distinctions existed amongst the studied groups regarding age (p = 0.348).

There wasn't significant variance among groups regarding the type of fistula, diabetes mellitus, and hypertension (p = 1, 0.87, respectively).

Our results are consistent with those of Abdel Wahed et al.,[9] who aimed to review the short-term results of FILAC as a sphincter-preserving technique in comparison with lay open fistulotomy plus immediate sphincter reconstruction (FISR) while treating high trans-sphincteric anal fistulas. They reported that there was not a significant distinction among the studied groups regarding age, sex, and BMI (p = 0.394, 0.661, and 0.566, respectively). Our findings revealed that in Group L, 0 (0%) patients had diabetes mellitus. 30 (100%) patients did not have diabetes mellitus. 2 (6.67%) patients had hypertension. 28 (93.3%) patients did not have hypertension. In Group S, 0 (0%) patients had diabetes mellitus. 30 (100%) patients did not have diabetes mellitus. 3 (10%) patients had hypertension. 27 (90%) patients did not have hypertension. There wasn't a significant distinction among groups as regards D.M. & hypertension (p = 1.0 & 0.87, respectively).

Our results showed that in Group (L), mean operative time (min.) was 35.27 ± 2.56, mean hospital stay (days) was 1 ± 0.09, and mean return to work (days) was 4.27 ± 0.83, while in Group (S), mean operative time (min.) was 47.73 ± 3.86, mean hospital stay (days) was 1.94 ± 0.23, and mean return to work (days) was 6.9 ± 0.84. There was a significant distinction among groups with regard to operative time and hospital stay.

Our findings were consistent with those of Darwish et al.[10] who reported that group A (laser group) had a significantly reduced duration of operation than group B (fistulotomy) (24.7 ± 4.33 vs. 35.1 ± 7.65 min, P < 0.01). Following surgery, patients in group A had a substantially shorter mean duration of hospital stay (one day) compared to cases in group B (2.9 ± 1.2 days, P < 0.01).

Our results disagree with those of Tümer et al.,[11] who reported that the median duration of stay in both groups was one day. In the fistulotomy group, the average time to return to work was 17.4±4.1 days, whereas in the laser group, it was 7.41±2.25 days. The study observed a statistically significant reduction in the time required to return to work in the laser group (p < 0.01).

Our results showed that in Group L, 19 (63.3%) patients had been discharged. 11 (36.67%) patients had pain. 5 (16.67%) patients had bleeding. 5 (16.67%) patients had a recurrence. This table showed that in Group S, 17 (56.67%) patients had been discharged. 12 (40%) patients had pain. 4 (13.3%) patients had bleeding. 3 (10%) patients had a recurrence, with no significant difference between groups as regards discharge, pain, bleeding, or recurrence.

In the same vein, our results agree with those of Abdel Wahed et al.,[9] who reported that there was no significant distinction among groups regarding recurrence (p = 0.255).

In contrast, Denisenko & V. L.,[12] reported that the early postoperative period proceeded without complications in all patients.

In addition, our results are in contrast with Darwish et al.,[10] The results of cases in group A who reported pain evaluation via a visual analog scale (VAS) indicated significantly reduced pain scores (3.54 ± 0.813 vs. 6.50 ± 1.389, P < 0.01).

4. Conclusion

Regarding our results, we concluded that there was a significant distinction between the laser group and the conventional surgery group regarding operative time and hospital stay (p = 0.03 and 0.001, respectively), which was significantly lower in the laser group. Moreover, there was no significant variance between the laser group and the conventional surgery group regarding postoperative discharge, pain, bleeding, and recurrence. Further studies with larger scales are needed to confirm our results.

Disclosure

The authors have no financial interest to declare in relation to the content of this article.

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