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Comparing Outcomes of Lateral Internal Sphincterotomy and Laser sphincterolysis in the Management of Chronic Anal Fissure

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ORIGINAL ARTICLE

Comparing Outcomes of Lateral Internal Sphincterotomy and Laser sphincterolysis in the Management of Chronic Anal Fissure

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Abstract

Background: ***Anal fissure is a frequent peri-anal condition causing bleeding, itching, and pain due to poor endodermal perfusion due to high resting anal pressure.***

Objectives: ***To compare laser sphincterolysis vs. open lateral sphincterotomy in the management of chronic anal fissures.***

Patients and methods: This research was done on 100 cases and was separated into two groups: Open LIS Group (N=55) and Laser Group (N=45).

Results: ***Our findings showed a statistically significant difference in Wexner Score between the studied groups in Continent, Gas, and Liquid, while there was no statistically significant variance among the studied groups as regarded as Solid. Moreover, there was a substantial difference in the Healing period between the studied groups in the first and second weeks. At the same time, there was no statistically significant variance among the studied groups in the third week. The present research revealed a statistically substantial statistically significant recurrence variance following six months between the studied groups.***

Conclusion: ***The findings showed, laser sphincterolysis is more promising than open lateral sphincterotomy laser, it has less operation time, less blood loss during surgery, and no or minimal post-operative pain so that discharge may be given the same day of operation, and patients can go back on to routine work within few days due to fast recovery.***

Keywords: Anal Fissure, Sphincterotomy, Open laser therapy

1. Introduction

An anal fissure is a common peri-anal condition presenting with bleeding, itching, and pain of varying severity.[1] It usually results from poor endodermal perfusion due to an elevated resting anal pressure.[2] The internal sphincter spasm is the main factor in the pathogenesis of chronic anal fissures. Therefore, the treatment of this condition aims to reduce internal sphincter hypertonia.[3]

Lateral internal sphincterotomy is the most frequently performed surgical procedure for the treatment of chronic anal fissures. It acts by sphincter hypertonia which is the main etiological factor in the development of chronic anal fissures. However, sphincterotomy also carries a significant risk of incontinence.[3] In comparison to lateral internal sphincterotomy, less invasive strategies have been advocated for sphincter relaxation, including local application of nitroglycerin or diltiazem hydrochloride and injection of botulinum toxin into the internal sphincter, resulting in a temporary chemical or medical sphincterotomy until the fissure heals. These methods are increasing in popularity. [4,5]

In a study by Arroyo A et al., compared both treatment options were compared among 80 patients with anal fissures. Compared to the toxin botulinum group, which had a healing rate of 45%, the open sphincterotomy group had a rate of 92.5% (P0.05). However, the recurrence rate at two months follow-up was 2.5% in cases treated with open sphincterotomy and 15% in cases treated with the Botulinum toxin group ($p < 0.05$).[6,7] Lateral internal sphincterotomy is routinely practiced. Some have shown no difference between the two techniques, while others have shown better outcomes with botulinum toxin. Others are in favor of open sphinctrotomy . [8]

This work aimed to compare laser sphincterolysis vs open lateral sphincterotomy in the management of chronic anal fissures

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2. Patients and methods

This research was done on 100 cases, divided into the Open LIS Group (N=55) and the Laser Group (N=45).

2.1.Inclusion criteria: CAF patients diagnosed are determined by the presence of induration around the margins, the visibility of the horizontal fibers of the internal anal sphincter, and a sentinel tag of skin on the back of the ulcer. Symptoms (after defecatory or nocturnal discomfort, bleeding, or both) continue for more than two months. Patients of both sexes. Age range: eighteen years and up to sixty years old.

2.2.Exclusion criteria: Patient refusal to share or follow up. Cases with acute anal fissure. Patients with complicated bleeding anal fissures. Patients with age >60 or <18 years old. Recurrent surgically treated patients. Associated complicated piles. Atypical anal fissure. Specific pathology: i., abnormal anal function and previous anal surgery or rectal surgery.

All patients were subjected to Complete history taking focusing on pain, bleeding, constipation, pruritus, and discharge. Full general and local examination. Routine lab investigations include CBC, bleeding and clotting times, INR, serum creatinine, LFT, and FBS. Pre-operatively, all patients received Metronidazole, 500mg three times per day two days before the operation, and a low residual diet one day before the operation.

2.3.Operative Assessment: (a) Lateral internal sphincterotomy (LIS) group: The patients of this group were subjected to surgical treatment of CAF in the form of open LIS; The internal sphincter muscle fibers are exposed in the open method by a tiny incision made on either the left or right side of the anal skin. Then utilize a knife or thermal cautery to separate the internal anal sphincter muscle after lifting it. The anus pressure can be reduced, and the fissure can be healed by severing the muscle. The operation was done under general anesthesia without muscle relaxants or with spinal anesthesia. The patient started a liquid diet four hours after the operation, and the anal dressing was removed eight hours after the operation with the application of local anesthetic cream before defecation. In this group, the patients were discharged on the next postoperative day with instructions concerning a great residue diet, analgesics & warm sitz baths. (b) Laser therapy group: This group comprised patients who did not want to undergo surgery despite having indications for surgical treatment. Laser therapy was carried out using a Diode laser. Treatment in this group consisted of sessions that lasted 5-10 minutes. The fissure's base and edges were laser-beamed to remove fibrotic and granulation tissues. Then, spots were made on the sphincter by the laser in its continuous mode; somehow, they were passed through the full thickness of the sphincter without interrupting its continuance. The patients did not receive any other medical treatment during laser treatment. Patients in both groups were re-examined six months after the end of the treatment and followed up and recorded in a specific checklist.

2.4.Statistical Analysis

Version 20 of the Statistical Package for Social Sciences (SPSS) for Windows was utilized to incorporate and statistically evaluate the data obtained. It was determined that numbers and percentages constituted the definition of qualitative data. The Chi-Square and Fisher's exact tests were utilized to compare categorical variables. Using the Kolmogorov-Smirnov test, quantitative data were examined to determine whether or not they were normal. The independent sample t-test, the paired t-test, and the ANOVA test were utilized when contrasting the groups. The normal distribution of the variables was characterized using the mean and the standard deviation (SD). It was determined that a P value of 0.05 or less was regarded to be statistically significant.

3. Results

Table 1 showed that in Open LIS Group the mean age was 37.7± 10.9 while mean was 37.54±10.86 in Laser Group and 28(50.9%) was male, 27(49.1%) was female in Open LIS Group while 23 (51.1%) was male, 22(48.9%) was female in Laser Group. And there was no statistical significance variance among the studied groups concerning age and gender.

Table 1. Demographic data among the studied groups.

	OPEN LIS GROUP (N=55)	LASER GROUP (N=45)	T / X^2	P VALUE
AGE	37.7± 10.9	37.54±10.86	0.0731	0.9418
GENDER				
MALE	28(50.9%)	23 (51.1%)	0	1
FEMALE	27(49.1%)	22(48.9%)		

P value <0.05 is statistically significant, SD: standard deviation, t: t test, X2: Chi-Square test

Table 2 showed that there was statistical significance difference in pain distribution between the studied groups in first day, day 7 pain and second week pain while there was no statistical significance variance among the studied groups in preoperative pain and third week pain.

Table 2. Pain distribution among the studied groups at different times.

		OPEN LIS GROUP (N=55)	LASER GROUP (N=45)	X^2	P VALUE
PREOPERATIVE PAIN	Positive	55(100%)	45(100%)	0	1
	Negative	0(0%)	0(0%)		
FIRST DAY	Positive	50(90.9%)	4(8.9%)	67.029	≤0.001
	Negative	5(9.1%)	41(91.1%)		
DAY 7 PAIN	Positive	44(80%)	3(6.7%)	53.43	≤0.001
	Negative	11(20%)	42(93.3%)		
SECOND WEEK PAIN	Positive	23(41.8%)	0(0%)	24.44	≤0.0001
	Negative	32(58.9%)	45(100%)		
THIRD WEEK PAIN	Positive	0(0%)	0(0%)	0	1
	Negative	55(100%)	45(100%)		

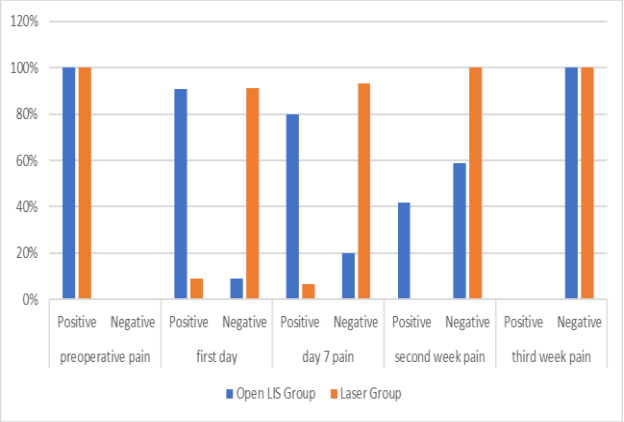

Figure 1. Show pain distribution between studied groups.

Table 3 showed that there was statistical significance difference in Wexener Score between the studied groups in Continent, Gas and Liquid while there was no statistical significance variance among the studied groups as regarded solid.

Table 3. Wexener Score regard incontinence among the studied groups.

		OPEN LIS GROUP (N=55)	LASER GROUP (N=45)	X^2	P VALUE
CONTINENT	Positive	22(40%)	42(93.3%)	30.55	≤0.001
	Negative	33(60%)	3(6.7%)		
GAS	Positive	34(61.8%)	4(8.9%)	29.43	≤0.0001
	Negative	21(38.2%)	41(91.1%)		
LIQUID	Positive	12(21.8%)	1(2.2%)	8.403	0.003
	Negative	43(78.2%)	44(97.8%)		
SOLID	Positive	0(0%)	0(0%)	0	1
	Negative	55(100%)	45(100%)		

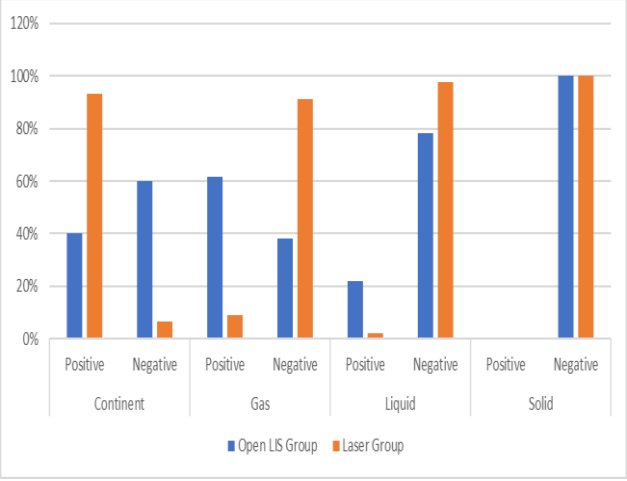

Figure 2. Show Wexener Score between studied groups.

Table 4 showed that there was statistical significance difference in Healing period between the studied groups in first week and second week while there was no statistical significance variance among the studied groups in third week.

Table 4. Healing period distribution among the studied groups.

		OPEN LIS GROUP (N=55)	LASER GROUP (N=45)	X^2	P VALUE
FIRST WEEK	done	9(16.4%)	41(91.1%)	55.31	≤0.001
	not yet	46(83.6%)	4(8.9%)		
SECOND WEEK	done	29(52.7%)	45(100%)	28.7	≤0.0001
	not yet	26(47.3%)	0(0%)		
THIRD WEEK	done	55(100%)	45(100%)	0	1
	not yet	0(0%)	0(0%)		

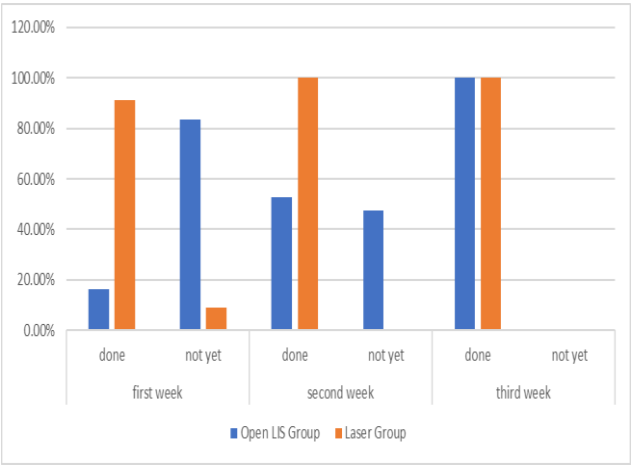

Figure 3. Show Healing period between studied groups.

Table 5 showed that there was statistical significance difference in Recurrence after 6 months between the studied groups.

Table 5. Recurrence distribution among studied groups.

		OPEN LIS GROUP (N=55)	LASER GROUP (N=45)	X^2	P VALUE
AFTER 6 MONTHS	positive	2(3.6%)	8(17.8%)	5.499	0.02
	negative	53(96.4%)	37(82.2%)		

4. Discussion

Our findings revealed that there was a statistically significant distinction in the Healing period between the studied groups in the first week and second week, while there was no statistically important distinction among the studied groups in the third week. In Open LIS Groupthe, the mean age was 37.7± 10.9 while the mean was 37.54±10.86 in Laser Group and 28(50.9%) were male, 27(49.1%) were female in open LIS Group while 23 (51.1%) was male, 22(48.9%) was female in Laser Group. There was no statistical significance variance amongst the studied groups concerning age and gender.

Our results were supported by Ahmad et al. [9] who sought to evaluate the efficacy of Botulinum toxin against lateral internal sphincterotomy in chronic anal fissure therapy. One hundred patients were split evenly into two groups for their study. Written consent was obtained after due consideration. Fifty individuals were administered Botulinum toxin injections into their sphincters under the supervision of a doctor and a digital camera in Group A, while fifty individuals underwent internal sphincterotomy. This surgical procedure involved incising the distant internal sphincters and using electrocoagulation. Age distribution of the patients was done which

shows that 18(36%) in Group-A and 21(42%) in Group B were between 20-30 years, 22(44%) in Group-A and 20(40%) in Group B were between 31- 40 years and 10(20%) in Group-A and 9(18%) were between 41-45 years of age, the mean age was 34.76±3.12 in Group-A and 32.92±4.64 years in Group-B. Gender distribution of the cases shows that the majority of the cases in both groups were male, i.e., 37(74%) in Group-A and 41(82%) in Group B, while the remaining 13(26%) in Group-A and 9(18%) in Group-B were females. The authors reported no significance concerning age and sex amongst the studied groups.

Furthermore, our results supported Maurice et al. [10], who aimed to evaluate the effectiveness of BTX injection and laser in treating CAF. Their clinical trial included 150 patients with CAF assigned to one of the three modalities of treatment: lateral internal sphincterotomy (50 patients, BTX (50 patients), and laser sphincterolysis (50 patients). In the BTX group, 20 U was diluted in 1ml isotonic saline, and half of this dose was injected on each side of the fissure in all cases. The authors reported no siage and sex were not significant groups concerning age. There was a statistically significant difference in the distribution of pain between the studied groups in first-day, day-7, and second-week pain. At the same time, there was no statistically important distinction between the studied groups in preoperative pain and third-week pain.

Our results were also supported by Maurice et al. [10], who reported that pain was fixed among all groups pre-operation, then at day one and day seven, it was associated significantly with the open group. The laser group and the BTX group were considerably lower than at two weeks; it was associated only with an open group with a significant difference between the other two groups, and at 30 days, no considerable difference was found among groups, and all groups significantly improved regarding pain.

Our findings showed a statistically significant difference in Wexner Score between the studied groups in Continent, Gas, and Liquid; at the same time, there was no statistically important distinction among the studied groups as regarded as Solid.

Our results are supported by Ahmad et al. [9], who demonstrated that there was no significant variance among the studied groups concerning fecal incontinence.

Our results are supported by Maurice et al. [10], who demonstrated a statistically significant difference in the Wexner Score between the studied groups in Continent, Gas, and Liquid. At the same time, there was no statistically significant variance among the studied groups, which were regarded as solid.

Ahmad et al. [9] demonstrated that After contrasting the two groups, it was found that 6% of Group-A patients and 10% of Group-B patients experienced fecal incontinence as a result of botulinum toxin with lateral internal sphincterotomy for chronic anal fissure treatment, while 94% of Group-A patients and 90% of Group-B patients did not, with a p-value of 0.71.

Another study by Nasr M and co-workers [11] contrasted the results of botulinum toxin injection therapy with lateral internal sphincterotomy in individuals with simple chronic anal fissures and found that the former group healed more quickly than the latter (p=0.0086 and 95% CI=7.38-45.69%). A higher incidence of anal incontinence was also associated with LIS than BT (95%CI=-1.64-27.53%; p=0.0338). Statistical analysis revealed a statistically significant distinction among the LIS and BT groups concerning the recurrence rate (95% CI=6.68-46.13%).

The results of the current research are consistent with Arroyo A et al.[6] who compared both treatment options were compared among 80 patients with anal fissures. The open sphincterotomy group had an overall healing rate of 92.5%, while the toxin botulinum group had a rate of 45% (P <0.001). It was observed that at two months follow-up, incontinence was present among 7.5% of cases treated with lateral sphincterotomy and 5% of cases treated with botulinum toxin (P >0.05). However, the recurrence rate at two months follow-up was 2.5% in patients treated with open sphincterotomy and 15% in patients treated with Botulinum toxin group (p<0.05).

Incontinence due to flatus can occur in up to 35% of individuals who have had lateral sphincterotomies, according to a major study of these patients. Patients who had lateral sphincterotomies had severe sphincter deficiencies, according to endoanal ultrasonography.[12]

In 90-95% of instances, LIS improves the circulation of the distal anal mucosa and heals CAF by lowering sphincter hypertonia. Internal anal sphincterotomy has disadvantages despite the high healing rate, including incontinence, wound-related problems, the requirement for hospitalization, and the anesthetic risk.[13]

Laser therapy's recognized effects include better microcirculation, rapid wound healing in sports injuries and accidents, and increased ATP generation, which catalyzes the bio-stimulating effect. Additionally, it has the potential to expand the collagen fibril sizes in a rat model.[14]

Our findings showed a statistically significant difference in the Healing period between the

studied groups in the first and second weeks. At the same time, there was no statistically important distinction among the studied groups in the third week.

Ahmad et al.[9] demonstrated significant variances among the studied groups concerning healing. A comparison of healing of anal fissures in both groups reveals 19(38%) in Group-A and 43(86%) were in Group B, while 31(62%) in Group-A and 7(14%) in Group B could not heal, the p-value was 0.000.

Moreover, our results supported Maurice et al.[10] who reported significant differences between the studied groups regarding healing.

The current research showed a statistically significant difference in recurrence after six months between the studied groups.

Ahmad et al.[9] support our results, demonstrating a significant distinction among the studied groups regarding recurrence.

Our results are also supported by Maurice et al. [10], who reported that there was a significant distinction amongst the studied groups concerning recurrence.

In another study by Bobkiewicz et al., this was stated that anal incontinence was more among patients treated with botulin toxin (20%) as compared to those receiving surgery (2%). [15]

In another study by Giral A et al., no significant distinction in healing rate was found, i.e., the fissures were healed in 70 % of patients in the botulinum group and 82 % in the surgery group (p>0.05). The no variance in recurrence rate was determined, i.e., 0%, in both groups. [16]

Ahmad et al. [9] demonstrated that a Comparison of the recurrence of anal fissures in both groups was made, showing 10(20%) in Group-A and 2(4%) in Group B while 40(80%) in Group-A and 48(96%) in Group-B had no recurrence, the p-value was computed as 0.02.

4. Conclusion

The findings showed a statistically significant difference in the Healing period between the studied groups in the first and second weeks. However, there was no statistically significant distinction among the studied groups in the third week. Additionally, there was a statistically significant difference between the studied groups in first-day, day-7, and second-week pain. Conversely, there was no statistically significant variance among the studied groups in preoperative and third-week pain. In conclusion, laser sphincterolysis is a promising procedure with fast recovery and minimal post-operative pain, allowing for early discharge and return to routine work.

Disclosure

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All authors have a substantial contribution to the article

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Conflicts of interest

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