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A CROSS-SECTIONAL STUDY ON LONG-TERM EFFECTS OF LIGATION OF INTER-SPHINCTERIC FISTULA TRACT (LIFT) FOR TREATING TRANS-SPHINCTERIC ANAL FISTULA.

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ABSTRACT

Background

The Ligation of Inter-Sphincteric Fistula Tract (LIFT) procedure represents a significant advancement in the treatment of trans-sphincteric anal fistulas (TSAF), balancing effective treatment with the preservation of sphincter integrity. The technique primarily aims to maintain continence while achieving a high rate of healing by identifying and ligating the fistula tract within the intersphincteric space, thereby minimizing damage to the sphincter muscles. The study seeks to estimate the long-term efficacy and outcomes of the LIFT procedure as a management strategy for TSAF.

Methods

A cross-sectional study was carried out and involved sixty participants with trans-sphincteric peri-anal fistulas of cryptoglandular origin confirmed by MRI fistulogram were included. The surgical procedure involved identifying, ligating, transecting, and excising the fistula tract within the inter-sphincteric space. Data on peri-operative infection rates, healing time, discomfort levels, fecal continence, and recurrence rates were collected and analyzed using SPSS software version 22.

Results

The study included 60 participants (40 males, 20 females) with an average age of 42.5 years. The average healing time post-surgery was 32.4 days. The peri-operative infection rate was 8.3%, and the recurrence rate was 5%. No significant changes were noted in fecal continence post-surgery (p=0.43). The degree of discomfort and recovery time had a strong positive link, according to Pearson's correlation test.

Conclusion

The LIFT procedure is an effective and safe treatment option for TSAF, demonstrating high healing rates, low recurrence, and preservation of continence.

Recommendations

Future research should explore modifications of the LIFT technique to further reduce discomfort and improve healing times. Long-term follow-up studies are recommended to assess the durability of surgical outcomes.

Keywords: *LIFT Procedure, Trans-Sphincteric Anal Fistula, Sphincter Preservation, Healing Rates, Surgical Outcomes.*
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INTRODUCTION

The Ligation of Inter-Sphincteric Fistula Tract (LIFT) procedure marks a significant advance in the surgical treatment of trans-sphincteric anal fistulas (TSAF), balancing effective treatment with the preservation of sphincter integrity. By locating and ligating the fistula tract within the intersphincteric space, this approach primarily attempts to preserve continence while attaining a high rate of healing and minimising injury to the sphincter muscles. The long-term outcomes of the LIFT procedure have demonstrated its effectiveness and safety, making it a valuable option for patients.

Studies consistently show high healing rates associated with the LIFT procedure, with clinical success observed in a majority of cases. For example, research indicates a healing rate of 96.2% in patients treated with LIFT combined with a bioprosthetic plug over a median follow-up period of over two years [1]. Such high healing rates underscore the procedure's efficacy in resolving anal fistulas.

Furthermore, the LIFT technique is associated with low recurrence rates, further supporting its long-term effectiveness. Various studies report recurrence rates below 20%, highlighting the procedure's reliability [2]. Additionally, the preservation of anal continence is a critical benefit of the LIFT procedure, with postoperative incontinence being exceedingly rare. This aspect emphasizes its advantage as a sphincter-sparing procedure, offering patients minimal postoperative complications and maintaining quality of life [3].

The LIFT procedure stands out as an effective and safe treatment option for TSAF. Its ability to preserve sphincter function, combined with high healing rates and a low risk

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of recurrence, makes it an ideal choice for patients seeking a minimally invasive solution with robust long-term outcomes.

Therefore, the aim of the study was to evaluate the long-term efficacy and outcomes of Ligation of Inter-Sphincteric Fistula Tract (LIFT) as a management strategy for trans-sphincteric anal fistulas.

METHODOLOGY

Study Design

A prospective cross-sectional study was conducted.

Study setting

The study was carried out from September 2022 to March 2024 at Jawahar Lal Nehru Medical College and Hospital (J.L.N.M.C.H.), Bhagalpur, Bihar, India.

Participants

A total of 60 participants were enrolled in the study.

Inclusion criteria

The inclusion criteria consisted of patients with TSAF of cryptoglandular origin as confirmed by MRI fistulogram, with no history of previous fistula surgery.

Exclusion criteria

Exclusion criteria comprised individuals with recurrent fistulas, specific pathologies like Crohn's disease, or other types of peri-anal fistulas. Patients with severe or unusual skin manifestations of the perianal area were referred for dermatology consultation.

Bias

Efforts were made to minimize bias by following strict inclusion and exclusion criteria, obtaining informed written consent from each participant, and conducting assessments in a standardized manner.

Variables

The variables assessed included peri-operative infection rates, healing time, discomfort levels, changes in fecal continence, and recurrence rates.

Sample Size Determination

Using a 95% confidence level and a five percent margin of error, the

Data Collection

Data on demographic characteristics, clinical history, surgical details, and post-operative outcomes were collected using standardized forms during patient visits and follow-ups.

Procedure

All cases underwent surgery under spinal block with morphine. The surgical procedure involved identifying the fistula using hydrogen peroxide injection and anoscope examination, followed by probing the fistulous tract for proper identification in the inter-sphincteric plane. A perpendicular skin incision was made at the inter-sphincteric zone for dissection and identification of the fistula. Ligation, transection, and excision of the tract were performed in the inter-sphincteric space, followed by confirmation of closure and cauterization of the internal opening.

Statistical Analysis

For the parameters, descriptive statistics were computed, including means, standard deviations, and frequencies. P-values were ascertained by doing Pearson's correlation test, two-sided Chi-square, and Student's t-tests. $P < 0.05$ was used as the statistical significance threshold. Version 22 of the SPSS programme was used to analyse the data.

Ethical considerations

The study protocol was approved by the Ethics Committee and written informed consent was received from all the participants.

RESULT

The study initially screened 68 individuals, excluding 8 due to specific pathologies like Crohn's disease (2 participants), recurrent fistulas (3 participants), severe skin manifestations (2 participants), and incomplete information (1 participant). This process resulted in 60 final participants.

A total of 60 individuals (40 males, 20 females) with trans-sphincteric peri-anal fistulas were involved in the study. The mean age of the participants was 42.5 years (SD ± 8.3).

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Table 1: Demographic profile of study population

Characteristics	Values
Total participants	60
Gender	
- Males	40
- Females	20
Mean age (SD)	42.5 (8.3)
Mean BMI (SD)	26.8 (3.5)

Table 2: Surgical Outcomes and Complications

Parameter	Mean (SD) or Frequency (%)
Peri-operative infection rate	5 (8.3%)
Mean healing time (days)	32.4 (± 6.7)
Discomfort level (1-10 scale)	3.2 (± 1.1)
Recurrence rate	3 (5%)

Table 3: Correlation Between Discomfort Level and Healing Time

Discomfort Level	Mean Healing Time (days)
Low (1-3)	28.6 (± 5.2)
Moderate (4-6)	34.8 (± 7.3)
High (7-10)	41.2 (± 8.9)

Out of the 60 participants, 5 individuals (8.3%) experienced peri-operative infections. The mean healing time post-surgery was 32.4 days with a standard deviation of ±6.7 days. Participants reported a mean discomfort level of 3.2 on a scale of 1 to 10, with a standard deviation of ±1.1. There were no significant changes noted in fecal continence post-surgery. The recurrence rate was observed in 3 participants (5%).

The statistical analysis revealed no significant differences in surgical outcomes based on gender ($P = 0.314$) or age ($P = 0.721$). Pearson's correlation test revealed a considerable correlation between discomfort level and healing time ($r = 0.632$, $P < 0.001$).

An analysis of the correlation between discomfort level and healing time revealed interesting trends. Participants with low discomfort levels (rated 1-3 on a scale) had a mean healing time of 28.6 days (±5.2 days). Those with moderate discomfort levels (rated 4-6) had a mean healing time of 34.8 days (±7.3 days). Participants reporting high discomfort levels (rated 7-10) had a longer mean healing time of 41.2 days (±8.9 days). The Pearson's correlation test specified a substantial positive correlation between discomfort level and healing time ($r = 0.632$, $P < 0.001$).

Table 3: Post-operative Follow-up Outcomes

Time Point	Outcome
1 month	Wound healing progress, no complications
6 months	Complete wound healing, no recurrences
1 year	No complications, good functional outcomes
1.5 years (phone)	No recurrences reported, satisfactory outcomes

During the post-operative follow-up period, at the 1-month mark, participants showed progress in wound healing with no reported complications. At the 6-month follow-up, complete wound healing was observed, and there were no recurrences reported. By the end of the first year, participants continued to have no complications, and functional outcomes were reported as good. The 1.5 years follow-up conducted via phone calls indicated no recurrences reported, with participants expressing satisfactory outcomes overall.

DISCUSSION

The study enrolled a total of 60 participants with trans-sphincteric peri-anal fistulas, with 40 being males and 20 females, and the average age of the participants was 42.5 years. Surgical outcomes revealed that 8.3% of participants experienced peri-operative infections, and the mean time for complete healing post-surgery was 32.4 days with a standard deviation of ±6.7 days, indicating some variability in healing times among participants. On average, participants reported a discomfort level of 3.2 on a scale of 1 to 10, suggesting a moderate level of

discomfort following the procedure. Notably, there were no significant changes in fecal continence post-surgery, and a recurrence rate of 5% was observed among participants.

Statistical analysis of the data showed no significant differences in surgical outcomes based on gender ($P = 0.314$) or age ($P = 0.721$), indicating that the effectiveness of the procedure was consistent across different demographic groups. However, there was a substantial positive correlation ($r = 0.632$, $P < 0.001$) between the reported discomfort level and the time taken for complete healing, with participants experiencing higher discomfort levels generally requiring a longer healing period.

Post-operative follow-up outcomes revealed promising results. At the 1-month follow-up, most participants showed progress in wound healing without complications. By the 6-month mark, all participants achieved complete wound healing, and there were no reports of recurrence, indicating the procedure's success in addressing the underlying issue. The 1-year follow-up showed continued good functional outcomes with no complications observed among participants. Importantly, during the 1.5 years follow-up conducted via phone calls, no recurrences were reported, highlighting the long-term effectiveness and durability of the surgical intervention.

Overall, the study demonstrates that the LIFT procedure is effective in managing TSAF, with favorable surgical outcomes, minimal complications, and a low recurrence rate. The findings also underscore the importance of managing post-operative discomfort, as it can impact the overall healing process and patient outcomes.

A study compares the effectiveness of the LIFT procedure with conventional techniques such as sphincter repair in treating high trans-sphincteric perianal fistulas. The findings suggest that the LIFT procedure offers shorter healing times and lower incidence of post-operative anal incontinence, although it has a slightly higher recurrence rate compared to the conventional method [4].

Another retrospective study evaluates the LIFT procedure in complex and high-position transsphincteric anal fistulas. It reports high healing rates with 83.3% of patients achieving closure of their fistulas, with minor continence disturbances observed in a small fraction of the cohort, illustrating the procedure's safety and effectiveness [5].

A study introduces a modified LIFT procedure which involves a lateral approach to address the limitations of the standard technique. It reports a successful fistula closure in 75% of patients, highlighting its potential as a sphincter-sparing alternative with minimal postoperative incontinence [6].

Similarly, a study assesses the LIFT-plug technique, which combines a bioprosthetic plug with the LIFT procedure. It reports a high clinical healing rate of 96.2%, minimal invasiveness, and quick recovery times, advocating its use for effective management of trans-sphincteric fistulas [1].

A systematic review aggregates data from various studies to evaluate the efficacy of the LIFT procedure. It confirms the procedure's high healing rates and low risk of sphincter damage, making it a viable option for the sphincter-preserving treatment of anal fistulas [7].

Additionally, the study examined the impact of augmenting the LIFT procedure with PRP injections. The research offers a comparison between the standard LIFT technique and the enhanced method involving PRP, specifically assessing their healing rates and overall postoperative outcomes. The study provides important insights into whether the addition of PRP can improve the effectiveness of the LIFT procedure in treating high TSAF, potentially leading to higher healing rates and improved patient outcomes [8].

Generalizability

The results, derived from a cross-sectional study of 60 participants, suggest that the LIFT procedure can effectively manage trans-sphincteric anal fistulas with minimal impact on fecal continence and low recurrence rates, indicating potential applicability and similar outcomes in a larger population.

CONCLUSION

In conclusion, the study evaluating the long-term outcomes of the LIFT procedure for managing TSAF demonstrated favorable results. The procedure showed effectiveness in promoting wound healing, minimizing complications such as peri-operative infections, and achieving good functional outcomes with low recurrence rates. Furthermore, the analysis highlighted the correlation between discomfort levels and healing time, emphasizing the importance of post-operative care and pain management in optimizing patient recovery. Overall, the LIFT procedure appears to be a viable and effective option for treating TSAF, providing encouraging results for both short-term and long-term patient outcomes.

LIMITATIONS

The limitations of this study include a small sample population who were included in this study. Furthermore, the lack of comparison group also poses a limitation for this study's findings.

RECOMMENDATION

Future research should explore modifications of the LIFT technique to further reduce discomfort and improve healing times. Long-term follow-up studies are

recommended to assess the durability of surgical outcomes.

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LIST OF ABBREVIATIONS

LIFT - Ligation of Inter-Sphincteric Fistula Tract
TSAF - Trans-Sphincteric Anal Fistulas
MRI - Magnetic Resonance Imaging
BMI - Body Mass Index
SD - Standard Deviation
PRP - Platelet-Rich Plasma

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CONFLICT OF INTEREST

The authors have no competing interests to declare.

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