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Factors Affecting Postoperative Complications and Recurrence in High Trans-sphincteric Fistula-in-Ano

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Abstract **Original Research Article**

Background: High trans-sphincteric fistula-in-ano presents significant management challenges owing to its complex anatomy and high risk of recurrence. Despite advancements in surgical techniques, postoperative complications and recurrences remain major concerns. Identifying the factors that influence these outcomes is crucial for optimizing the treatment strategies. This study aimed to evaluate factors affecting postoperative complications and recurrence in patients undergoing surgery for high transsphincteric fistula-in-ano. ***Methods:*** This prospective observational study was conducted at the Department of Colorectal Surgery, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh, from June 2021 to May 2022. Total 36 patients who underwent surgical management for high transsphincteric fistula-in-ano were included in this study. Patient demographics, fistula characteristics, surgical outcomes, and postoperative complications were also analyzed. ***Results:*** The recurrence rate was 19.4%, and wound infection was significantly associated with recurrence (P =0.033). No significant association was found between fistula location and recurrence (p>0.05). Postoperative continence outcomes were favorable, with 91.2% of the patients maintaining Grade A continence. Suture line dehiscence was observed in 11.1% of cases. These findings emphasize the critical role of infection control in preventing recurrence. ***Conclusion:*** Wound infection was a significant predictor of recurrence in patients with high transsphincteric fistula-in-ano, underscoring the need for stringent perioperative infection control. This study supports the effectiveness of sphincter-preserving techniques for maintaining continence. Further research with larger cohorts and longer follow-up periods is needed to optimize treatment strategies and improve patient outcomes.

Keywords: High transsphincteric fistula, recurrence, postoperative complications, wound infection.

INTRODUCTION

The anorectal condition fistula-in-ano exists as a common difficult disorder which develops when cryptoglandular infections produce long-lasting tracts that connect the anal canal with perianal skin [1]. High trans-sphincteric fistulas create substantial therapeutic barriers because their deep intrusion into the sphincter complex leads to management difficulties [2]. Multiple treatments exist for optimal outcome management of fistula-in-ano including fistulotomy alongside advancement flap repair and seton placement as well as current minimally invasive procedures [3, 4]. However, postoperative complications such as fecal incontinence, recurrence, and delayed healing remain major concerns [5].

Traditional surgical treatments such as fistulectomy and fistulotomy treat anal fistulas but scientists have found that they lead to sphincter damage and cause urinary incontinence [6]. The mucosal advancement flap procedure combined with fibrin glue application provides sphincter-preserving treatment methods for inflammatory bowel disease but achieves different success levels [7, 8]. The current surgical approaches struggle to achieve effective fistula treatment while preserving the sphincter function because recurrence rates remain high even though more studies are needed to find predictive indicators for treatment outcomes [9]. The use of laser closure techniques and the ligation of the intersphincteric fistula tract (LIFT) procedure show promising results although studies have not provided conclusive evidence for long-term effectiveness [10].

Multiple studies explore factors that determine postoperative outcomes through assessment of the complexities associated with fistulas alongside previously performed interventions and abscess occurrence and also account for patient-related elements such as diabetes mellitus and tobacco use [11, 12]. Several studies document unpredictable recurrence rates and complication frequencies which indicate healthcare providers still lack critical understanding about the combined effects of various factors on patient prognosis [13]. A lack of investigation exists regarding the effectiveness comparison between new surgical procedures [14].

This study evaluates the factors which trigger postoperative complications and recurrence in patients who receive high trans-sphincteric fistula-in-ano surgery. The evaluation of surgical results together with the identification of vital predictive elements helps us to provide evidence-based guidance for enhancing treatment approaches. This research will lead to more specific techniques for dealing with complex anal fistulas which will produce enhanced patient results along with lower recurrence frequencies.

Objective

The objective of this study was to evaluate the factors affecting postoperative complications and recurrence in patients undergoing surgery for high trans-sphincteric fistula-in-ano.

METHODOLOGY & MATERIALS

This prospective observational study was conducted at the Department of Colorectal Surgery, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh, from June 2021 to May 2022. Total 36 patients with high transsphincteric fistula who underwent colorectal surgery during the study period were selected for this study.

Inclusion criteria:

All adult population with high trans-sphincteric fistula in ano diagnosed clinically and confirmed by MRI who are willing to participate in the study.

Exclusion criteria:

1. Simple fistula in ano.
2. Extra-sphincterand suprasphincteric fistula.
3. Fistula of malignancy, Crohn's disease, TB and post traumatic fistula.
4. Fistula with preoperative incontinence.

Data collection: Data were collected by a predesigned pro-forma involves questionnaire, clinical finding, preoperative investigations and operative finding. Informed written consent was taken from all patients meeting the inclusion and exclusion criteria.

Ethical Consideration: Ethical approval was obtained from the Institutional Review Board (IRB) of BSMMU. This study adhered to the Helsinki Declaration from 1964 to protect patient rights and ensure voluntary participation. All participants provided written consent while the study maintained strict confidentiality. The procedures did not expose patients to new safety risks. The research created no conflicts of interest as it focused solely on educational purposes.

Statistical analysis: Statistical analyses were performed using the Statistical Package for Social Sciences (version 23.0). Descriptive analysis was conducted for all data. Mean values were calculated for continuous variables. Quantitative observations were indicated by frequencies and percentages. Fisher exact test analyzed categorical variables, shown with cross tabulation. P values <0.05 were considered statistically significant.

RESULTS

Table 1: Patients baseline characteristics (n=36)

Characteristics		Frequency (n)	Percentage (%)
Age (years)	≤30	3	8.3
	31-40	18	50.0
	41-50	12	33.3
	>50	3	8.3
Mean ±SD		39.4±7.9	
Gender	Male	31	86.1
	Female	5	13.9

Table 1 shows that half (50.0%) of the patients belonged to age 31-40 years. The mean age was found 39.4±7.9 years with range from 20 to 57 years. Majority (86.1%) patients were male and 5(13.9%) patients were female. Male female ratio was 6.2:1.

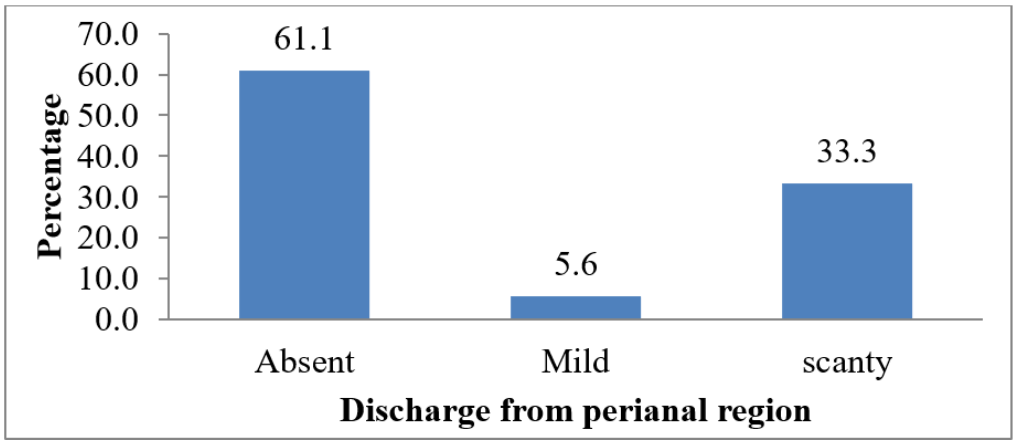

Figure 1: Distribution of the study patients according discharge from perianal region (n=36)

Fourteen patients were found discharges from perianal region among them 2 cases were mild and 12 were scanty.

Table 2: Location of fistula Ext opening of the study patients (n=36)

Location of fistula Ext opening	Frequency (n)	Percentage (%)
Anterior	12	33.3
Posterior	24	66.7

Table 2 shows that two third (66.7%) patients were found in posterior and 12(33.3%) in anterior.

Table 3: Suture line dehiscence of the study patients (n=36)

Suture line dehiscence	Frequency (n)	Percentage (%)
Not occurred	32	88.9
Occurred	4	11.1

Table 3 shows that 4(11.1%) patients were found suture line dehiscence.

Table 4: Postoperative continence status with wound infection (n=36)

Postoperative continence status	Wound infection				P value
	Not occurred (n=34)		Occurred (n=2)		
	n	%	n	%	
Grade-A	31	91.2	2	100	0.838
Grade-B	3	8.8	0	0	

Table 4 shows that 2(100.0%) patients was found postoperative continence of grade A in wound infection and 31(91.2%) in without wound infection group. The difference was not statistically significant (p>0.05) between two groups.

Table 5: Association of wound infection with recurrence (n=36)

Wound infection	Recurrence				P value
	Yes (n=7)		No (n=29)		
	n	%	n	%	
Not occurred	5	71.4	29	100	0.033
Occurred	2	28.6	0	0	

Table 5 shows that 2(28.6%) patients was found wound infection in recurrence group and not found in without recurrence group. The difference was statistically significant (p<0.05) between two groups.

Table 6: Location of fistula external opening and recurrence (n=36)

Recurrence	Location of fistula Ext opening				P value
	Anterior (n=12)		Posterior (n=24)		
	n	%	n	%	
Yes	2	16.7	5	20.8	0.571
No	10	83.3	19	79.2	

Table 6 shows that 2(16.7%) patients was found recurrence in anterior group and 5(20.8%) in posterior group. The difference was not statistically significant (p>0.05) between two groups.

DISCUSSION

The research examined factors that affect complication rates and fistula relapse for patients who receive surgical intervention for a high trans-sphincteric fistula-in-ano condition. Wound infection emerged as an important factor influencing recurrence because it showed a significant statistical relationship with recurrence (p=0.033). The research confirmed that recurrence developed in 19.4% of cases. The recurrence rates between anterior and posterior fistula positions did not show statistically meaningful variations in recurrence outcomes. The postoperative continence results were positive since 91.2% of patients achieved Grade A continence status. The study results match similar research that studied fistula surgical performance in complex cases.

Research studies indicate wide variation in recurrence rates for trans-sphincteric fistula surgery where patients experienced 30-40% recurrence after traditional fistulotomy and Seton placement (Christoforidis *et al.*,) [7]. The research data from this study implies that the surgical approach showed potential success in reducing fistula reappearances yet wider patient studies must be conducted to verify these findings. Wound infections have a strong connection to fistula recurrence as researchers observed in Hall *et al.,* [10] who discovered surgical infections impair tissue healing and increase fistula recurrence probability. The research results demonstrate why healthcare organizations must maintain absolute infection control measures throughout both perioperative and postoperative phases.

Various studies have discussed the connection between fistula location and surgical recurrence rates. The present study did not identify any significant statistical relationship between anterior and posterior fistula types. Research by Malakorn *et al.,* [12] demonstrated that anatomical fistula locations by themselves do not serve as strong indicators for recurrence when surgeons perform advanced surgical procedures such as LIFT. The research from Bleier and Moloo [4] showed posterior fistulas experiencing increased recurrence rates because their external sphincter became more extensively affected by the condition. Patient selection and surgical techniques and postoperative care approaches differ and could be the cause of these divergences.

The preservation of postoperative continence stands as an essential factor when managing fistulas due to the risk of sphincter complex damages which could result in different levels of fecal incontinence. The study reported that 91.2% of patients maintained Grade A continence which validates the results from Toyonaga *et al.,* [15] who found non-sphincter splitting methods delivered better continence preservation than traditional fistulotomy. The research by Maqbool *et al.,* [16] indicates minor potential side effects on continence function after sphincter-sparing procedures thus long-term follow-up is needed to verify continence preservation.

The clinical importance of these findings supports better surgical choices which help prevent recurrence while achieving the best possible functional outcomes after surgery. Postoperative antibiotic protocols along with stringent wound care protocols should be strongly implemented because wound infections drive surgical recurrence rates. Sphincter-preserving surgical procedures retain their position in clinical practice because they help patients maintain continence after surgeries. The determination of best surgical techniques across different patient subgroups requires additional research because of patient-specific factors combined with divergent surgical methods. The study by Sileri *et al.,* [17] demonstrated that comprehensive treatment planning serves as an essential practice for managing diabetic patients and multiple failed surgery subjects.

Limitations and Recommendations

This study was limited by its small sample size, which affected the generalizability of the findings. The short follow-up period prevented comprehensive assessment of long-term recurrence and continence outcomes. Future studies should include larger multicenter cohorts with extended follow-up periods to validate these findings. Standardized surgical protocols and postoperative care strategies should be evaluated to optimize the outcomes. Further research on innovative wound-healing techniques and minimally invasive approaches is warranted to improve fistula management.

CONCLUSION

This study identified wound infection as a significant predictor of recurrence in high trans-sphincteric fistula-in-ano, while fistula location had no

statistically significant impact. These findings reinforce the importance of infection control strategies in optimizing surgical outcomes. Favorable continence rates highlight the benefits of sphincter-preserving techniques. These insights contribute to refining treatment approaches and emphasizing individualized surgical planning. Future research should focus on enhancing wound-healing strategies and the long-term efficacy of minimally invasive techniques to improve outcomes.

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