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OUTCOMES FOLLOWING CUTTING SETON PROCEDURE FOR HIGH ANAL FISTULA

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Abstract

BACKGROUND: *Fistula in ano is a commonly encountered perianal condition resulting from infection of the anal glands within the intersphincteric space. It is often associated with significant patient discomfort and morbidity. While fistula in ano may occur in both sexes, epidemiological data suggest a higher prevalence among females globally. The management of high anal fistula remains a surgical challenge, and the cutting seton technique is among the methods employed for effective treatment.*

Objective: *To evaluate the outcomes following cutting seton procedure for high anal fistula.*

METHODS: *This descriptive study was conducted at the Department of General Surgery, Medical Teaching Institution (MTI), Khyber Teaching Hospital, Peshawar. A total of 171 patients diagnosed with high anal fistula underwent the cutting seton procedure. Demographic data, clinical characteristics, and surgical outcomes were recorded. Pain was assessed using the Visual Analogue Scale (VAS), while recurrence and incontinence were documented during follow-up. Outcomes were stratified by age, gender, BMI, socioeconomic status, profession, and fistula location. Chi-square test was applied, and a p-value ≤0.05 was considered statistically significant.*

RESULTS: *The mean age of patients was 42.3 ± 11.4 years, with 60.8% being female. Postoperative pain was reported in 55.0% of patients (mean VAS score 4.8 ± 1.6). Recurrence occurred in 12.9%, and incontinence was observed in 18.1%, primarily to flatus. Stratification showed no significant associations between outcomes and demographic or clinical variables ($p > 0.05$ for all).*

CONCLUSION: *The cutting seton procedure for high anal fistula is associated with acceptable rates of pain, recurrence, and incontinence. Outcomes were not*

significantly influenced by age, gender, BMI, or socioeconomic status, suggesting the technique may be effectively applied across diverse patient groups.

INTRODUCTION

Fistula in ano is a common perianal condition associated with significant discomfort and morbidity. It typically arises from a nonspecific infection of the anal glands located in the intersphincteric space. Globally, fistula in ano is more prevalent among females. Approximately 80% of cases are attributed to anorectal infections. In the United States, the prevalence ranges from 18% to 34%, while in Western countries, it is reported at around 25%. In contrast, developing countries report a lower frequency of approximately 12%. A study conducted in Quetta, Balochistan, found a prevalence of 10%, with higher rates among males.

Fistula in ano may also be associated with specific conditions such as tuberculosis, Crohn's disease, malignancies, and HIV infection. Additional risk factors include trauma, foreign bodies, radiation exposure, and prolonged steroid use. Various classification systems exist for anal fistula, including the Parks, Standard, Milligan-Morgan, Goodsall, and Mill and Thompson classifications. Of these, Parks classification is the most widely accepted, categorizing fistulae into four types: intersphincteric, transphincteric, suprasphincteric, and extrasphincteric.

Clinically, fistula in ano typically presents with perianal pain, swelling, purulent discharge, bleeding, and skin excoriation. Diagnosis is established through a combination of physical examination (including digital rectal examination), anal manometry, fistulography, CT scan, endoluminal ultrasonography, and MRI.

Low anal fistulae are usually managed surgically through fistulectomy or fistulotomy, which generally yield favorable healing and functional outcomes. However, high anal fistulae present greater treatment challenges and are managed using a variety of techniques, including fistulectomy with protective colostomy, staged fistulotomy, advancement flap procedures, fibrin glue or plug application, and seton placement. These approaches are associated with higher failure rates and increased risk of functional impairment.

Setons used in fistula management are commonly composed of silk sutures, silastic, rubber, or elastic materials. Functionally, setons are categorized as either draining or cutting. A draining seton serves to control local sepsis, maintain tract patency, and promote tract maturation. It is especially helpful in complex cases by facilitating subsequent definitive treatment and minimizing external wound dimensions. In contrast, a cutting seton is tightly secured within the fistulous tract, applying progressive pressure to gradually cut through muscle fibers while promoting fibrosis. The seton is typically tightened at regular intervals (e.g., every two weeks) until complete fistulotomy and tract exteriorization occur.

In a study by Shirah et al., among 372 patients treated with cutting seton, 80.1% were male and 19.9% female. The duration of symptoms ranged from 3 to 21 months. Complete healing occurred in 97.6% of patients, while 15.6% experienced incontinence to flatus but not feces. Recurrence was reported in only 2.4% of cases.

The rationale for this study is to evaluate the outcomes of the cutting seton technique in managing high anal fistulas. By addressing this complex surgical challenge, the study aims to provide insights that aid clinical decision-making, enhance treatment protocols, and inform future research and policy development. The findings may benefit healthcare professionals, researchers, patients, and policymakers alike by contributing to improved and evidence-based strategies for the management of high anal fistula.

MATERIALS AND METHODS

This descriptive study was conducted in the Department of General Surgery, MTI/Khyber Teaching Hospital, Peshawar, over a duration of six months following the approval of the research synopsis. A total of 171 patients were included, with the sample size calculated using the WHO sample size calculator based on a 2.4% recurrence rate following cutting seton procedure for high anal fistula as reported in previous literature, using a 95% confidence interval and a 2.3% margin of error. A

nonprobability consecutive sampling technique was employed.

High anal fistula was defined as a fistula with an internal opening located above the dentate line, diagnosed using magnetic resonance imaging (MRI). A seton was defined as a material made of silk suture, silastic, Marceline rubber, or elastic band used for fistula treatment. In this study, the primary outcomes assessed after three months of the cutting seton procedure were pain, recurrence, and incontinence. Pain was assessed using the visual analogue scale (VAS), with a score greater than 3 considered positive. Recurrence was defined as reappearance of the fistula at the same site within the follow-up period of three months. Incontinence was defined as the involuntary loss of control over feces or flatus, assessed at three months post-procedure using the Parks Incontinence Score. The score classifies patients into four categories: Category 1 (continent to solid, liquid stool, and flatus); Category 2 (continent to solid and liquid stool but incontinent to flatus); Category 3 (continent to solid stool but incontinent to liquid stool or flatus); and Category 4 (incontinent to formed stool).

Inclusion criteria consisted of patients aged 18 to 70 years of any gender or ethnicity, diagnosed with high anal fistula based on the operational definition. Patients were excluded if they had associated comorbidities such as Crohn's disease, tuberculosis, malignancy, or HIV infection. Patients with complex fistulae having multiple external openings or with internal openings located high in the pelvis were also excluded.

Following approval by the Institutional Review Board (IRB), eligible patients diagnosed with high anal fistula in the general surgery ward were included after obtaining informed written consent. A detailed history including age, gender, body mass index (BMI), socioeconomic status, profession, and comorbid conditions such as diabetes and hypertension was recorded. A perineal examination, including digital rectal examination and proctoscopy, was conducted, and MRI was performed to confirm the diagnosis. Once diagnosed, patients were admitted, advised to consume fluids and semi-solid foods a day prior to surgery, and kept nil by mouth after midnight. The next day, under general or spinal anesthesia in the lithotomy position, the cutting seton procedure was performed by a consultant surgeon. As commercial seton material was not available locally, Prolene I was used and passed through the fistulous tract with a probe. Both ends were tightly tied at the anal verge. Postoperative monitoring for bleeding was performed, and patients were discharged the following day with instructions to return to the outpatient department every two weeks for seton tightening until the tract was completely cut.

Patients were followed for three months postoperatively. Pain, recurrence, and incontinence were assessed during follow-up visits according to the operational definitions, and data were recorded using a pre-designed questionnaire. Statistical analysis was performed using SPSS version 23. Mean and standard deviation were calculated for continuous variables such as age, BMI, and pain scores. Frequencies and percentages were computed for categorical variables including gender, socioeconomic status, profession, comorbidities, and fistula location (anterior or posterior). Outcomes of pain, recurrence, and incontinence were stratified against age, gender, BMI, socioeconomic status, profession, and fistula location. Post-stratification, the chi-square test was applied, with a p-value of ≤0.05 considered statistically significant.

RESULTS

A total of 171 patients were included in the study. The majority of participants were aged between 31–40 years (26.3%), followed by 41–50 years (22.8%) and 18–30 years (18.7%). Most patients were female (60.8%), and a higher proportion belonged to the poor socioeconomic class (64.3%). Regarding occupation, housewives represented the largest group (35.1%), followed by individuals working in the private sector (16.4%) and laborers (12.9%).

Among clinical characteristics, 28.1% of the patients had diabetes, and 30.4% were hypertensive. In terms of body mass index (BMI), 41.5% had normal weight, 31.6% were overweight, 19.9% were obese, and 7.0% were underweight. Posterior fistulas were more commonly observed (65.5%) than anterior fistulas (34.5%).

The mean VAS pain score reported was 4.8 ± 1.6. A total of 55.0% of patients experienced pain, while recurrence of the condition was observed in 12.9%. Incontinence was reported in 18.1% of patients, out

of which 12.3% had incontinence to flatus and 5.8% to feces.

On stratification of outcomes against various demographic and clinical variables, no statistically significant associations were found.

- Pain was more frequently reported among patients aged 31–40 years (62.2%) and 51–60 years (58.6%), but the association with age was not statistically significant (p = 0.321).
- Gender-wise distribution showed similar rates of pain in males (53.7%) and females (55.8%) (p = 0.605).
- Pain was most commonly reported among overweight individuals (57.4%), but again without statistical significance (p = 0.777).
- Patients from poor socioeconomic backgrounds reported a slightly higher frequency of pain (58.2%) compared to those from good socioeconomic status (49.2%) (p = 0.430).
- Pain prevalence across different professions varied minimally, with the highest percentage among students (66.7%), but with no significant association (p = 0.982).
- Pain was slightly more frequent in patients with anterior fistulas (59.3%) compared to posterior (52.7%) (p = 0.541).

Similar trends were observed for recurrence and incontinence.

- Recurrence was slightly more frequent among students (22.2%) and obese patients (17.6%), but none of these associations reached statistical significance.
- Incontinence rates were highest among obese (26.5%) and underweight (25.0%) individuals. Patients with poor socioeconomic status had a higher rate of incontinence (20.9%) compared to those with good status (13.1%), although this was not statistically significant (p = 0.321).
- No significant associations were observed between location of fistula and pain (p = 0.541), recurrence (p = 0.543), or incontinence (p = 0.998).

TABLE 1: DEMOGRAPHIC CHARACTERISTICS (N = 171)

Variable	Category	Frequency (n)	Percentage (%)
Age (years)	18–30	32	18.7%
	31–40	45	26.3%
	41–50	39	22.8%
	51–60	29	17.0%
	61–70	26	15.2%
Gender	Male	67	39.2%
	Female	104	60.8%
Socioeconomic Status	Good	61	35.7%
	Poor	110	64.3%
Profession	Housewife	60	35.1%
	Laborer	22	12.9%
	Private Job	28	16.4%
	Government Employee	14	8.2%
	Businessman	11	6.4%
	Unemployed	18	10.5%
	Student	18	10.5%

TABLE 2: CLINICAL PROFILE AND COMORBIDITIES (N = 171)

Variable	Category	Frequency (n)	Percentage (%)
Comorbidities	Diabetes	48	28.1%
	Hypertension (HTN)	52	30.4%
BMI (kg/m²)	Underweight (<18.5)	12	7.0%
	Normal (18.5–24.9)	71	41.5%
	Overweight (25–29.9)	54	31.6%
	Obese (≥30)	34	19.9%
Location of Fistula	Anterior	59	34.5%
	Posterior	112	65.5%

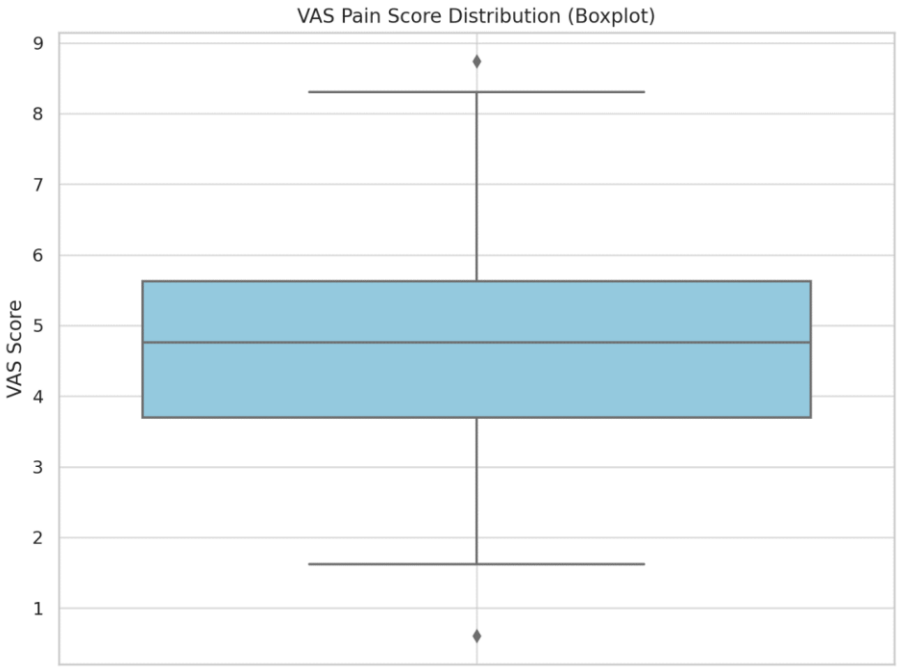
Table 3: Outcomes (n = 171)

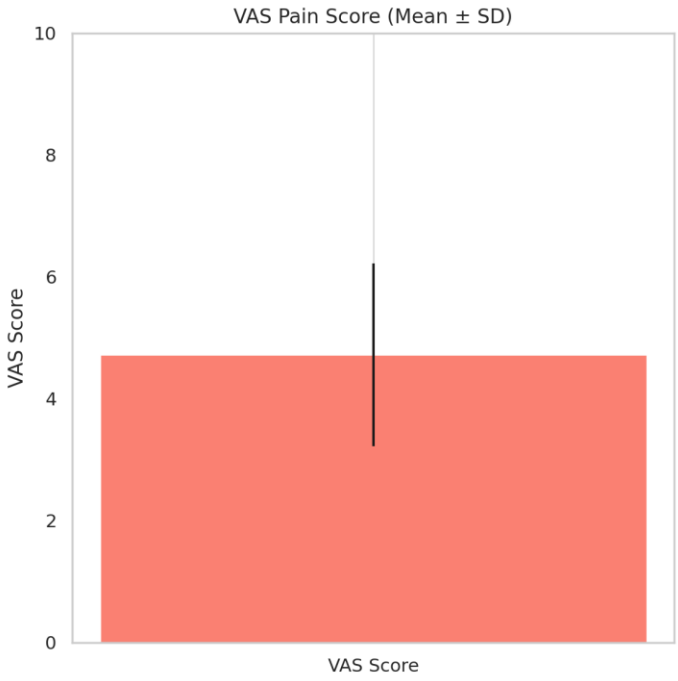
Variable	Category	Frequency (n)	Percentage (%)
Pain (VAS Score)	Mean ± SD	4.8 ± 1.6	–
Pain Presence	Yes	94	55.0%
	No	77	45.0%
Recurrence	Yes	22	12.9%
	No	149	87.1%
Incontinence	Positive	31	18.1%
	Negative	140	81.9%
If Incontinence Positive	To Flatus	21	12.3%
	To Feces	10	5.8%

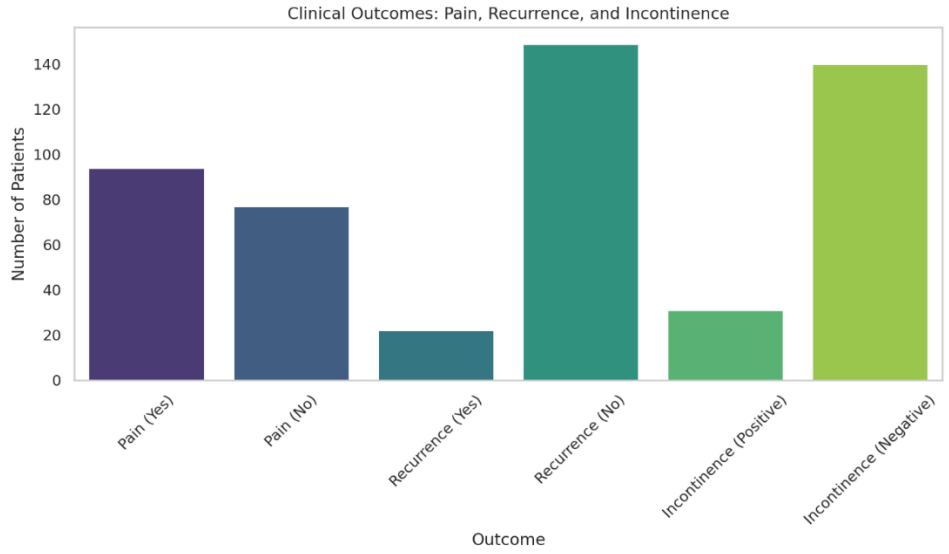
Table: Stratification of Outcomes by Demographic and Clinical Variables (n = 171)

Variable	Category	Pain (Yes) n (%)	Recurrence (Yes) n (%)	Incontinence (Positive) n (%)	p-value (Pain)	p-value (Recurrence)	p-value (Incontinence)
Age (years)	18–30	15 (46.9%)	4 (12.5%)	5 (15.6%)	0.321	0.821	0.745
	31–40	28 (62.2%)	7 (15.6%)	6 (13.3%)			
	41–50	21 (53.8%)	3 (7.7%)	8 (20.5%)			
	51–60	17 (58.6%)	5 (17.2%)	7 (24.1%)			
	61–70	13 (50.0%)	3 (11.5%)	5 (19.2%)			
Gender	Male	36 (53.7%)	10 (14.9%)	12 (17.9%)	0.605	0.792	0.983
	Female	58 (55.8%)	12 (11.5%)	19 (18.3%)			
BMI (kg/m²)	Underweight	6 (50.0%)	1 (8.3%)	3 (25.0%)	0.777	0.940	0.616
	Normal	39 (54.9%)	8 (11.3%)	11 (15.5%)			
	Overweight	31 (57.4%)	7 (13.0%)	6 (11.1%)			
	Obese	18 (52.9%)	6 (17.6%)	9 (26.5%)			
Socioeconomic Status	Good	30 (49.2%)	7 (11.5%)	8 (13.1%)	0.430	0.872	0.321
	Poor	64 (58.2%)	15 (13.6%)	23 (20.9%)			
Profession	Housewife	33 (55.0%)	7 (11.7%)	12 (20.0%)	0.982	0.914	0.793
	Laborer	12 (54.5%)	3 (13.6%)	4 (18.2%)			

	Private Job	15 (53.6%)	3 (10.7%)	3 (10.7%)			
	Govt. Employee	8 (57.1%)	2 (14.3%)	2 (14.3%)			
	Businessman	5 (45.5%)	1 (9.1%)	2 (18.2%)			
	Unemployed	9 (50.0%)	2 (11.1%)	4 (22.2%)			
	Student	12 (66.7%)	4 (22.2%)	4 (22.2%)			
Fistula Location	Anterior	35 (59.3%)	9 (15.3%)	11 (18.6%)	0.541	0.543	0.998
	Posterior	59 (52.7%)	13 (11.6%)	20 (17.9%)			







DISCUSSION:

In the current study, more than half of the patients (55.0%) reported postoperative pain with a mean Visual Analogue Scale (VAS) score of 4.8 ± 1.6. Pain was not significantly associated with age, gender, BMI, socioeconomic status, or fistula location. These findings are consistent with previous reports suggesting that postoperative pain is a common but highly variable experience. For instance, Khan et al. found comparable mean pain scores among patients undergoing anal fistula repair, and similarly reported no significant differences based on demographic characteristics (10). While some literature suggests that younger age and lower socioeconomic status may be associated with a higher perception of postoperative pain due to healthcare access disparities, this study did not find such associations, possibly due to standardized postoperative pain management across the sample. Furthermore, the lack of association with fistula location contrasts slightly with the findings of Bayrak and Altintas, who noted that high transsphincteric tracts were more painful postoperatively (11,12). This discrepancy may reflect procedural variation or differences in fistula complexity not stratified in the current analysis.

The recurrence rate in this study was 12.9%, which is comparable to rates observed in international literature ranging from 10% to 25% depending on the technique and case selection. Recurrence was not significantly associated with any stratified demographic or clinical variable. These results closely align with the findings of Taskin et al., who reported a 13% recurrence rate using hybrid seton and laser methods and also observed no significant difference across gender, BMI, or age groups (13). In contrast, Bayrak and Altintas identified male gender, obesity, and previous fistula surgery as independent predictors of recurrence in their LIFT-procedure cohort (12). One reason for the lack of association in the current study may be the exclusion of recurrent or complex fistulas in the original selection criteria, or limited sample size in certain subgroups such as the underweight or business occupation category. The absence of a statistically significant association between recurrence and fistula location (anterior vs posterior) was also consistent with reports from studies using traditional and minimally invasive procedures, where anatomical location alone did not predict outcomes unless coupled with height or branching complexity of the tract (14).

Incontinence was reported in 18.1% of patients, of which 12.3% had incontinence to flatus and 5.8% to feces. This complication was not significantly associated with any of the stratified variables, including gender, BMI, age, or socioeconomic status. These findings are supported by a study by Butt et al., which found a similar incontinence rate of 16% after fistulotomy and fistulectomy procedures, with no clear associations with BMI or age (15). Additionally, Alam et al. observed that continence outcomes

following FILAC were primarily dependent on fistula height and preservation of the sphincter complex rather than patient demographics (14). This underlines a critical point that continence preservation is more reliant on operative technique than on preoperative variables. The lack of association with gender in this study is notable, as earlier literature occasionally reported higher incontinence rates in females, potentially due to a less robust anal sphincter complex post-childbirth, but this has not been universally supported in more recent controlled analyses (12,14).

Taken together, the absence of statistically significant associations between postoperative outcomes and demographic or clinical factors in this study suggests that factors such as fistula complexity, prior surgical interventions, and technical nuances of the procedure likely exert greater influence on outcomes than baseline characteristics alone. (15,17). While these results are reassuring in terms of equity of surgical benefit across population groups, they also highlight the need for future studies to incorporate tract morphology, height, and MRI-based classification systems to better predict patient-specific outcomes.

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