



Case Study



Outcome of Surgery for the Management of High Perianal Fistulae Using Elastic Seton

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ARTICLE INFO

Keywords:

High Perianal Fistulae, Elastic Seton, Fistulectomy, Sphincter Reconstruction

How to Cite:

Jamil, T., Islam, M., Jan, M. A., & Nazir, A. (2025). Outcome of Surgery for the Management of High Perianal Fistulae Using Elastic Seton: Elastic Seton Outcomes in High Anal Fistula. *Pakistan Journal of Health Sciences*, 6(9), 159-164. <https://doi.org/10.54393/pjhs.v6i9.3471>

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Received Date: 24th July, 2025

Revised Date: 13th September, 2025

Acceptance Date: 22nd September, 2025

Published Date: 30th September, 2025

ABSTRACT

High perianal fistulae are complex infections often originating from anal glands, requiring sphincter-preserving surgical approaches. Elastic seton offers controlled tract closure with reduced need for postoperative adjustments compared to traditional cutting setons.

Objectives: To evaluate the outcomes of elastic seton in managing high perianal fistulae, focusing on pain, healing, hospital stay, and continence preservation. **Methods:** This descriptive case series was conducted from February 2025 to May 2025 at the Department of Surgery, Surgical Unit III, Sir Ganga Ram Hospital, Lahore. Forty-five patients with high perianal fistulae were enrolled using consecutive non-probability sampling. An elastic seton from a latex glove was placed under spinal anesthesia. Follow-ups at 1 week, 4 weeks, 3, and 6 months assessed pain (VAS), wound healing, complications, and analgesic use. Data were analyzed with SPSS v24.0 using Chi-square and ANOVA, with $p < 0.050$ significant. **Results:** Of the 45 patients (64.4% male; mean age 31.3 ± 8.4 years), the mean symptom duration was 11.8 ± 4.1 weeks, and average seton cut-through time was 6.3 ± 0.9 weeks. VAS scores significantly decreased from 5.13 (Week 1) to 0.40 (6 months) ($p < 0.001$). Complete wound healing occurred in 82.2% of patients, while complications declined from 42.2% to 17.8%. **Conclusion:** Elastic cutting seton with staged fistulotomy ensured safe, effective high anal fistula management with reduced pain, rapid healing, and preserved continence.

INTRODUCTION

Anal fistulae represent an abnormal communication between the anal canal and the perianal skin. The majority of perianal fistulae (PF) encountered in surgical practice are due to persistent infection of the anal glands located in the intersphincteric space, a concept known as the cryptoglandular hypothesis [1]. However, fistulae may also be associated with specific underlying conditions such as inflammatory bowel disease, Crohn's disease, tuberculosis, malignancy, actinomycosis, lymphogranuloma venereum, anal fissures, trauma, foreign bodies, previous radiation therapy, or surgical interventions [2]. Approximately 33% of patients who experience an anorectal abscess will subsequently develop a fistula [3]. PFs are more common in males, with a male-

to-female ratio of 2:1, and typically occur between the ages of 30 and 50 years [4]. Diagnosis of PF involves a combination of clinical and radiological modalities including digital rectal examination, proctoscopy, anal manometry, fistulography, rectosigmoidoscopy, MRI, and CT scan to assess the anatomy and complexity of the tract [5]. Among the various classification systems proposed, the most widely accepted is Park's classification, which categorizes fistulae into four types: intersphincteric, trans-sphincteric, suprasphincteric, and extrasphincteric [6]. The intersphincteric type is the most common, accounting for about 45% of cases [7]. Surgery remains the mainstay of treatment for PF. The ideal surgical approach should eradicate the fistula tract while preserving



sphincter function, minimizing recurrence, and preventing postoperative fecal incontinence [8]. Low and simple fistulae are typically managed with fistulotomy. However, complex and high fistulae often require sphincter-sparing techniques such as draining or cutting setons, advancement flaps, rerouting procedures, two-stage seton fistulotomy, fistulectomy with or without sphincter reconstruction, ligation of the intersphincteric fistula tract (LIFT), anal fistula plugs, and fibrin glue application [9, 10]. Recent studies have explored modifications to the cutting seton technique to improve outcomes and reduce complications. One such modification is the use of an elastic seton. Previous studies reported that an elastic material obtained from surgical gloves could serve as an effective seton with low recurrence and acceptable continence outcomes, with a mean hospital stay of 1.27 days and a general recovery rate of 93.9% [11]. A study on 128 patients concluded that the hybrid elastic seton allows for slow and stable sphincter division, preserving continence and eliminating the need for postoperative adjustment. Complete healing was achieved in 100% of cases within three months, and quality of life was significantly improved. [12]. Previous researches supported the use of elastic setons, finding them simple to use with satisfactory therapeutic outcomes. Healing time ranged from 14 days to 6 months (mean 4 months) [13]. Additionally, a study noted that 52.2% of patients experienced pain, and the mean duration of seton cut-through was 8 weeks (range: 5–11 weeks) [14]. Given the lack of local data, this study aims to evaluate the effectiveness of the elastic seton in managing high perianal fistulae in our population. Elastic seton, with its flexibility and consistent pressure, may reduce the need for postoperative adjustments, a major limitation of traditional cutting setons, while offering better outcomes in terms of continence preservation and patient comfort. This study is therefore designed to generate local evidence on surgical outcomes, focusing on postoperative pain, seton cut-through time, and hospital stay, as well as assessing feasibility, safety, and impact on quality of life. Although previous studies have reported favorable results, they were conducted in different healthcare settings that may not reflect our demographics, disease patterns, or surgical practices. Hence, evaluating elastic seton outcomes in our context is essential to guide clinical practice.

Despite advancements in surgical techniques for high perianal fistulae, postoperative pain, delayed healing, and risk of incontinence remain significant challenges. Most studies on elastic setons have been conducted in different populations and healthcare settings, with limited local data reflecting our demographic and clinical context. Therefore, there is a need to evaluate the effectiveness, safety, and

patient-centered outcomes of elastic seton placement specifically in our population. This study aims to evaluate the outcomes of elastic seton in managing high perianal fistulae, focusing on pain, healing, hospital stay, and continence preservation.

METHODS

This descriptive case series was conducted at Surgical Unit I, Sir Ganga Ram Hospital, Lahore, over three months, from February 2025 to May 2025, after obtaining approval from the College of Physicians and Surgeons, Pakistan (Ref. No. CPSP/REU/SGR-2021-059-12970). Ethical approval (Ref. No 254-Research-Surgery/ERC) was obtained from the institutional review board of Fatima Jinnah Medical University, Lahore, and all participants provided written informed consent prior to inclusion. A total of 45 patients were enrolled using consecutive non-probability sampling. The sample size was calculated by using the WHO sample size calculator using a 95% confidence level, a 5% margin of error, and an expected frequency of fistula healing in patients as 97.6%, by using the formula: $n = \frac{Z^2 \cdot P \cdot (1 - P)}{d^2}$ [15]. Patients included were aged above 15 years, of either gender, and presented with perianal sepsis/fistulae diagnosed through clinical examination and Pelvic MRI was performed on a 1.5 Tesla Siemens Magnetom Avanto (Siemens Healthcare, Erlangen, Germany) scanner using T1-weighted, T2-weighted, and STIR sequences in axial, coronal, and sagittal planes to delineate the primary tract and identify secondary extensions. Exclusion criteria included patients with known inflammatory bowel disease, tuberculosis, malignancy, actinomycosis, lymphogranuloma venereum, foreign body-related fistulae, anticoagulant or antiplatelet use, prior perineal trauma or obstetric sphincter injury, or those who were immunocompromised or malnourished. All surgeries were performed under spinal anesthesia in the lithotomy position after obtaining informed consent. High perianal fistula was confirmed through clinical and MRI findings. Examination under anesthesia (EUA) included digital rectal examination and proctoscopy. The digital examination was performed using a well-lubricated gloved finger to assess sphincter tone, tenderness, and internal opening, followed by rigid proctoscopy (St. Mark's proctoscope) to visualize the internal orifice and mucosal condition. A metal probe was gently introduced through the external opening to locate the tract and internal opening, avoiding false passage creation. The tract was excised up to the intersphincteric or suprasphincteric level, preserving the external sphincter. An elastic seton, prepared from a 2–3 mm latex strip cut from a sterile surgical glove, was passed through the tract and tied over the sphincter with minimal

tension. Hemostasis was achieved, and the wound was packed with pyodine- and xylocaine-soaked gauze for eight hours before applying a pressure dressing. Postoperatively, patients were advised limited mobility for one week and daily SITZ baths. Medications included metronidazole (400 mg TID), ciprofloxacin (500 mg BID), diclofenac sodium (50 mg PRN), and omeprazole (40 mg OD). Patients were educated about wound care, expected discharge, and signs of complications such as fever, pain, or fecal incontinence. Follow-up visits were scheduled at 1 week, 4 weeks, 3 months, and 6 months. At each visit, symptoms, pain scores, wound healing, and postoperative complications were recorded using a structured follow-up form. Pain intensity was assessed using the Visual Analogue Scale (VAS), a validated 10-point scale where 0 indicates no pain and 10 represents the worst imaginable pain [16]. Patients also documented total analgesic use. Wound healing was assessed clinically at each visit based on the presence of healthy granulation tissue, absence of discharge, epithelialization of wound margins, and complete closure of the external opening. Postoperative complications, including infection, bleeding, fever, incontinence, recurrence, and delayed wound healing, were documented through clinical observation and patient reports. Recurrence was defined as persistent or recurrent drainage beyond six months of follow-up. Outcome measures included VAS scores at follow-ups, time to seton cut-through (weeks), and length of hospital stay (days). Data confidentiality was maintained throughout the study. Data were analyzed using SPSS v24.0. Qualitative variables such as gender, complications, and wound healing were reported as frequencies and percentages, while quantitative variables such as age, symptom duration, hospital stay, duration of symptoms, total analgesic consumption, and seton cut-through time were presented as mean ± SD. Fisher's exact test was applied to compare postoperative complications and wound healing while one-way ANOVA was used for pain at follow-ups, with a p-value <0.050 considered statistically significant.

RESULTS

Among 45 patients, 64.4% were male (n=29) and 35.6% were female (n=16). The mean age of the participants was 31.31 years (SD±8.35)(Table 1).

Table 1: Demographic Characteristics of the Study Participants

Variables	Category	N (%) / Mean±SD
Gender	Female	16 (35.6%)
	Male	29 (64.4%)
Age (years)	—	31.31 ± 8.35

The average duration of symptoms before treatment was

11.76 weeks (SD±4.07). On average, the time to seton cut-through was 6.31 weeks (SD±0.93). The mean total analgesic consumption was 853.78 mg (SD±91.31), while the average length of hospital stay was 2.51 days (SD±0.70) (Table 2).

Table 2: Clinical Characteristics and Treatment Outcomes (N=45)

Variables	Mean ± SD
Duration of Symptoms (weeks)	11.76 ± 4.07
Time to Seton Cut-through (weeks)	6.31 ± 0.93
Total Analgesic Consumption (mg)	853.78 ± 91.31
Length of Hospital Stay (days)	2.51 ± 0.70

The mean VAS score progressively decreased from Week 1 (5.13) to 6 Months (0.40), indicating significant pain reduction post-treatment. The ANOVA test showed a highly significant difference in pain scores over time (F(3,176) =280.73, p<0.001), confirming that pain improvement was statistically significant across follow-ups (Table 3).

Table 3: Comparison of Mean ± SD VAS Scores During Follow-Up Visits Among Patients Treated for High Anal Fistula

Follow-Up Time Point	Mean ± SD	p-Value
Week 1	5.13 ± 1.14	<0.001
Week 4	3.22 ± 0.90	
3 Months	1.40 ± 0.50	
6 Months	0.40 ± 0.50	
Total	2.54 ± 1.98	

A significant trend was observed in wound healing progression over time (p <0.001, Chi-square test for trend). Initially, at Week 1, only 8 patients (17.8%) had fully healed wounds, while 25 (55.6%) remained unhealed. By Week 4, the number of completely healed patients rose slightly to 10 (22.2%). Marked improvement was evident at the 3-month follow-up, where 28 patients (62.2%) achieved complete healing. At 6 Months, this figure further increased to 37 (82.2%), indicating continued and substantial recovery. Correspondingly, the number of patients with unhealed wounds declined steadily from 25 (Week 1) to just 3 by the 6-month. There was a statistically significant association between time and wound healing status (p-value<0.050) (Figure 1).

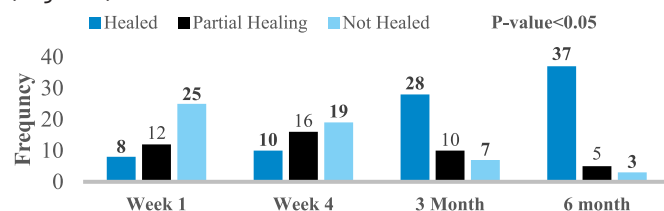


Figure 1: Weekly Follow-Up of Wound Healing Status Among Patients Over 6 Months (N=45 at Each Time Point)

Initially, in Week 1, 42.2% (n=19) of patients reported complications such as mild bleeding (n=5), pain (n=5), infection (n=5), and discharge (n=4), while 57.8% (n=26) had

no complications. By Week 4, the proportion of patients without complications had slightly improved to 60% (n=27), and pain had become the most frequently reported issue (n=10), suggesting a transient peak in discomfort. At the 3-month follow-up, the majority of patients (64.4%, n = 29) were complication-free. Pain remained the most common complaint (n=14), but all other complications had resolved or significantly reduced. By 6 months, 82.2% (n=37) of patients reported no complications, with only minor reports of pain, infection, and discharge. There is a significant reduction in the frequency of complications over time, particularly from Week 1 to Month 6, indicating progressive wound healing and patient recovery. Pain showed a temporary increase at 3 months but eventually declined, while bleeding and infection resolved earlier in the follow-up period (Figure 2).

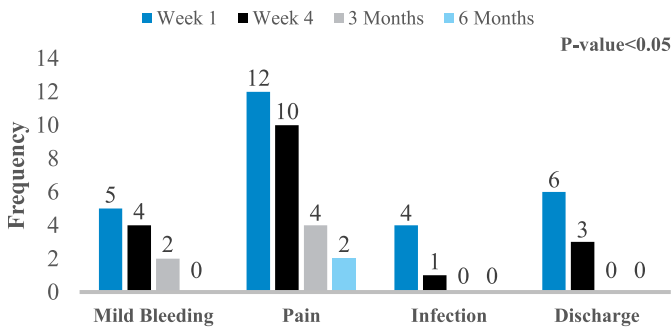


Figure 2: Frequency of Postoperative Complications Over Time

DISCUSSION

Anal fistula is a common sequela of anal abscess, with reported incidence rates ranging from 26% to 38%, meaning nearly one-third of patients with an abscess may eventually develop a chronic fistula requiring surgical treatment [17]. In the present study, the demographic distribution aligns with previous literature. Males comprised 64.4% (n=29) of the participants, while females accounted for 35.6% (n=16), reflecting the established male predominance in fistula-in-ano cases, where males are affected approximately twice as often as females [18]. The mean age of patients in our study was 31.31 years (SD ± 8.35), which is slightly younger than the commonly reported mean age of 40 years but still falls within the broader age range of 20 to 60 years [19]. These findings are consistent with existing epidemiological trends and highlight the relevance of age and gender in the clinical presentation of anal fistula. Anal fistula surgery aims to eliminate the tract, prevent recurrence, and preserve sphincter function. Setons, particularly in complex cases, aid drainage and minimize incontinence risk. In the current study, an elastic seton made from a 2–3 mm latex glove strip was tied with minimal tension, consistent with prior methods [20, 22]. In the current study, the average duration of symptoms was

11.76 weeks (SD ± 4.07), the mean time to seton cut-through was 6.31 weeks (SD ± 0.93), average analgesic consumption was 853.78 mg (SD ± 91.31), and the mean hospital stay was 2.51 days (SD ± 0.70), reflecting the feasibility and clinical effectiveness of this technique. Similarly, a previous study reported a 71% healing rate in the Seton group, along with lower complication rates (9%) and reduced fecal incontinence (4%) compared to fistulectomy [23]. These findings are consistent with the present results, reinforcing that elastic seton placement is a safe, cost-effective, and sphincter-preserving approach for managing complex anal fistulae. In the current study, a significant association was observed between time and wound healing status (p<0.001). Wound healing progressed steadily, with complete healing increasing from 17.8% at Week 1 to 82.2% at 6 months. This trend highlights the effectiveness of the treatment approach and the sustained improvement in wound resolution over time. Another study reported a notably higher healing rate of 97.6%, with a mean seton cut-through time of 8 weeks and complete wound closure achieved in approximately 9 weeks. Although 15.6% of patients experienced minor incontinence to flatus, there were no cases of fecal incontinence, and the recurrence rate was low at 2.4% [24]. These results highlight the efficacy of the cutting seton technique in promoting successful outcomes with minimal complications. Compared to the present study, which showed slightly longer healing times and lower incontinence rates, both findings collectively support the use of seton placement as an effective, sphincter-preserving treatment for complex anal fistulas.

The study has several limitations; it uses non-probability sampling, lacks a control group, depends on self-reported pain scores, and may experience losses in follow-up. Future research with larger, multicenter randomized trials is warranted to confirm these findings, assess long-term recurrence rates, and explore patient quality-of-life outcomes. Such studies could further refine elastic seton techniques and optimize postoperative care protocols.

CONCLUSIONS

The use of an elastic cutting seton with staged fistulotomy proved to be an effective and safe technique for managing high anal fistulae. The procedure resulted in a significant reduction in postoperative pain, progressive wound healing, and a marked decline in complication rates over six months of follow-up. Most patients achieved complete healing without notable functional impairment, indicating good sphincter preservation and favourable clinical outcomes. Overall, this method offers a reliable, minimally invasive, and reproducible approach for treating high perianal fistulae, with high healing rates and minimal

morbidity when performed under careful surgical and postoperative supervision

Authors' Contribution

Conceptualization: TJ

Methodology: MI, MAJ, AN

Formal analysis: TJ, AN

Writing and Drafting: MI, MAJ, AN

Review and Editing: MI, MAJ, AN, TJ

All authors approved the final manuscript and take responsibility for the integrity of the work

Conflicts of Interest

All the authors declare no conflict of interest.

Source of Funding

The author received no financial support for the research, authorship and/or publication of this article.

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