

Management of Postoperative Perianal Scar Deformities in Patients with Concomitant Rectal Fistulas

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Abstract:

Background: Postoperative perianal scar deformities with concurrent rectal fistulas are challenging surgical conditions due to extensive fibrosis, distorted anatomy, and a high risk of recurrence. One-stage combined reconstruction may improve functional and clinical outcomes.

Methods: This prospective observational study included 188 patients treated over 1 year. All patients underwent one-stage combined surgery involving fistula excision, scar tissue removal, sphincter repair where indicated, anoplasty, and local skin flap reconstruction. Operative time, blood loss, hospital stay, postoperative complications, scar deformity, and continence outcomes were evaluated during follow-up.

Results: The mean operative time was 91.2 ± 14.1 minutes, with a mean blood loss of 61.3 ± 16.2 mL. The average hospital stay was 5.9 ± 1.5 days, and postoperative complications occurred in 17 patients. Mean scar deformity decreased from 5.6 ± 2.7 cm² preoperatively to 3.9 ± 1.8 cm² at 3 months. Anal incontinence improved from 28 patients preoperatively to 17 patients at 1 month and resolved completely by 3 months.

Conclusion: One-stage combined reconstruction is a safe and effective technique for managing postoperative perianal scar deformities with concurrent rectal fistulas, providing favorable healing, restoration of continence, and a low complication rate.

Keywords: Perianal scar deformity; Rectal fistula; One-stage surgery; Anoplasty; Skin flap reconstruction.

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Introduction

Perianal sepsis encompasses a spectrum of anorectal disorders ranging from acute suppurative infections involving the perianal skin and subcutaneous tissues to chronic anal or rectal fistulas. In the majority of cases, these conditions arise from a cryptoglandular infection originating within the intersphincteric space, and surgery remains the cornerstone of management despite the availability of multiple operative techniques [1,2]. Although surgical intervention is generally effective, postoperative complications such as perianal scar deformity and recurrent fistulas continue to present significant clinical challenges. Postoperative perianal scar deformity is characterized by fibrotic scarring and distortion of the perianal region, with or without extension into the anal canal, often resulting in functional impairment and technical difficulties during subsequent interventions [2,3].

The management of postoperative perianal scar deformities associated with recurrent rectal fistulas is particularly demanding because of extensive fibrosis, distorted anatomical landmarks, and the difficulty of achieving complete fistula eradication while preserving sphincter function. Successful

treatment requires meticulous identification and excision of all fistulous tracts, adequate closure of tissue defects, and careful selection of an appropriate reconstructive technique. Failure to address any of these aspects may result in early fistula recurrence, worsening anorectal deformity, or varying degrees of fecal incontinence, thereby adversely affecting patient outcomes [2-4].

Various reconstructive procedures have been proposed to restore perianal anatomy following excision of scar tissue, including Y-V anoplasty, diamond-shaped flaps, House flaps, and rotational S-shaped flaps [1,5,6]. However, no single reconstructive technique has proven universally applicable, as the choice of flap depends on the size and location of the defect, the extent of fibrosis, and local tissue availability. Consequently, individualized surgical planning that combines definitive fistula management with appropriate plastic reconstruction has emerged as an important strategy for optimizing wound healing, preserving anorectal function, and reducing the risk of recurrence. Evaluating the effectiveness of such one-stage combined reconstructive approaches

remains clinically relevant in improving outcomes for patients with postoperative perianal scar deformities and concurrent rectal fistulas.

Methods

Study Design and Participants: This prospective observational study was conducted over a period of 1 year in the Department of General Surgery. A total of 188 patients with postoperative perianal scar deformities associated with concurrent rectal fistulas who underwent one-stage combined surgical reconstruction were included. Patients were evaluated for demographic characteristics, fistula type, and the extent of perianal scar deformity. Written informed consent was obtained from all participants prior to enrolment.

Preoperative Assessment: All patients underwent a comprehensive preoperative evaluation according to institutional protocols, including routine clinical investigations, magnetic resonance imaging (MRI) of the pelvis, or fistulography when MRI was contraindicated, along with anoscopy and rigid sigmoidoscopy as indicated. Fistulas were classified as simple or complex based on the extent of sphincter involvement in accordance with established clinical guidelines. Standard bowel preparation using oral polyethylene glycol was administered before surgery. Procedures were performed under spinal anesthesia, with combined intravenous anesthesia used when required, and patients were positioned in the lithotomy position.

Surgical Procedure: All patients underwent a standardized one-stage combined surgical approach.

The procedure included identification and delineation of the fistulous tract, complete excision of the fistula along with the surrounding scar tissue, sphincter repair when indicated, anoplasty, and reconstruction of the perianal defect using an appropriately designed local skin flap. Skin flaps were mobilized after assessment of tissue viability and secured using interrupted sutures to minimize ischemia, facilitate postoperative drainage, and reduce tension across the reconstructed wound.

Postoperative Follow-up: Operative duration, length of hospital stay, and postoperative complications were recorded for all patients. Clinical and proctological assessments were performed at 2, 4, and 12 weeks after surgery, with subsequent follow-up visits scheduled as required. Patients also underwent a final evaluation at 6 months to assess wound healing, recurrence, continence status, and overall surgical outcomes.

Results

A total of 188 patients were included in the study, with a mean age of 42.3 ± 8.2 years. The study population comprised 127 (67.6%) men and 61 (32.4%) women, indicating a predominance of male patients. Most participants had simple fistulas (144, 76.6%), while 44 (23.4%) presented with complex fistulas. Regarding the extent of postoperative perianal scar deformity, the majority of patients (110, 58.5%) had scars measuring 2–6 cm², followed by 61 (32.5%) with deformities larger than 6 cm², whereas only 17 (9.0%) had scar areas smaller than 2 cm² (Table 1).

Table 1: Baseline Characteristics of Patients (n = 188)

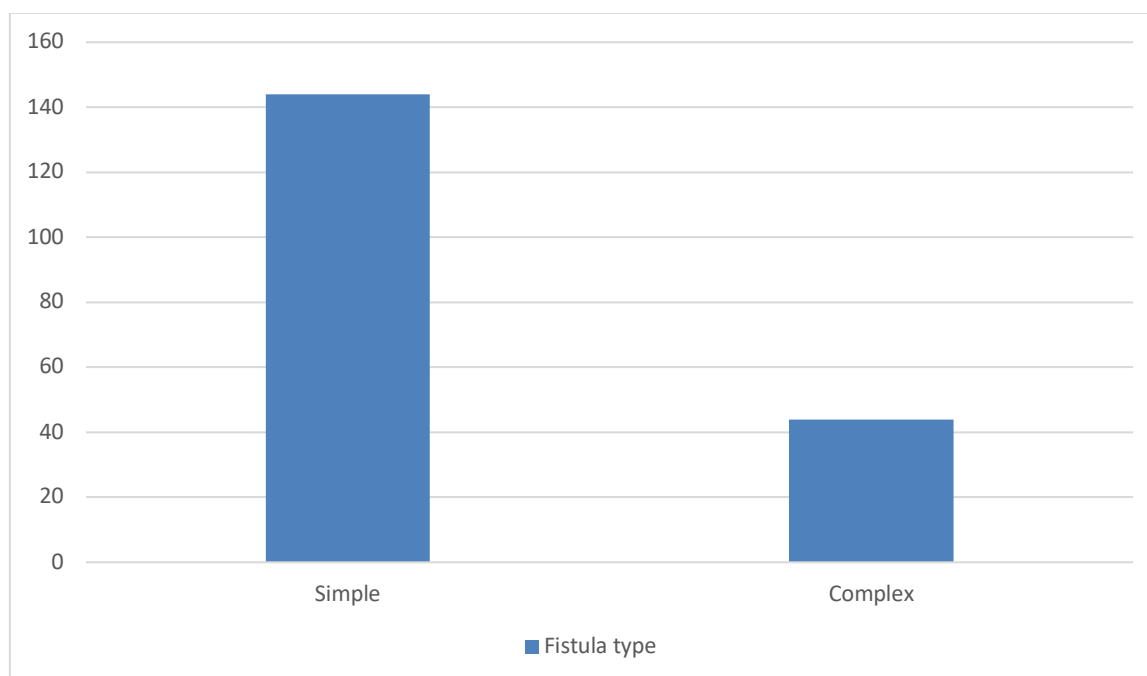
Characteristic	Value
Age (years), mean $\pm$ SD	42.3 $\pm$ 8.2
Sex	
Male	127 (67.6%)
Female	61 (32.4%)
Type of fistula	
Simple	144 (76.6%)
Complex	44 (23.4%)
Area of scar deformity (cm²)	
<2	17 (9.0%)
2–6	110 (58.5%)
>6	61 (32.5%)

The mean operative time was 91.2 ± 14.1 minutes, with an average intraoperative blood loss of 61.3 ± 16.2 mL, reflecting the feasibility of the one-stage combined surgical procedure. Postoperative pain scores improved substantially from 5.1 ± 1.6 on the first postoperative day to 1.1 ± 0.9 at discharge. The mean duration of hospital stay was 5.9 ± 1.5 days, and postoperative complications occurred in 17 patients (9.0%). Progressive improvement in wound

healing was demonstrated by a reduction in the mean scar deformity area from 5.6 ± 2.7 cm² preoperatively to 4.9 ± 2.4 cm² at one month and 3.9 ± 1.8 cm² at three months. Similarly, the prevalence of anal incontinence decreased from 28 patients (14.9%) before surgery to 17 patients (9.0%) at one month, with no cases reported at the three-month follow-up, indicating favorable functional outcomes following surgical reconstruction (Table 2).

Table 2: Surgical Outcomes (n = 188)

Outcome	Value
Operative time (min), mean $\pm$ SD	91.2 $\pm$ 14.1
Estimated blood loss (mL), mean $\pm$ SD	61.3 $\pm$ 16.2
Postoperative pain score (VAS, 0–10)	
Day 1	5.1 $\pm$ 1.6
At discharge	1.1 $\pm$ 0.9
Hospital stay (days), mean $\pm$ SD	5.9 $\pm$ 1.5
Postoperative complications	17 (9.0%)
Mean scar deformity area (cm²)	
Preoperative	5.6 $\pm$ 2.7
1 month	4.9 $\pm$ 2.4
3 months	3.9 $\pm$ 1.8
Anal incontinence	
Preoperative	28 (14.9%)
1 month	17 (9.0%)
3 months	0

**Figure 1: Distribution of Patients According to Fistula Type.**

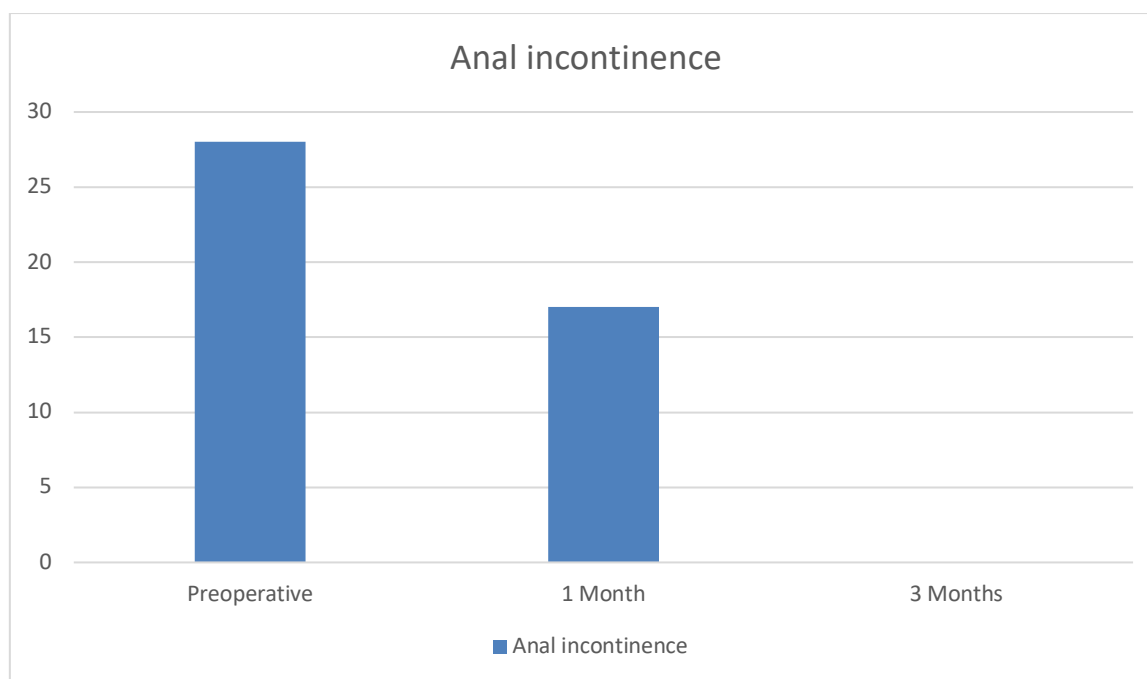


Figure 2: Postoperative Anal Incontinence Over Time (n = 188).

Discussion

Postoperative perianal scar deformity is a challenging complication following anorectal surgery because it can result in pain, functional impairment, cosmetic concerns, and a marked reduction in patients' quality of life [7,8]. The coexistence of postoperative scar deformity with rectal fistulas further complicates management, as extensive fibrosis and distorted anatomy make complete fistula eradication and tissue reconstruction technically demanding. Although numerous treatment options are available for isolated anal fistulas, including fistula plugs, fibrin glue, video-assisted anal fistula treatment (VAAFT), and conventional open procedures, recurrence remains a significant concern, particularly in patients with associated scar deformities [6-8]. In the present study, one-stage combined surgical reconstruction yielded favorable clinical outcomes, with a low postoperative complication rate (9.0%) and complete resolution of anal incontinence by the three-month follow-up, indicating satisfactory restoration of anorectal function.

Published evidence regarding the management of combined postoperative perianal scar deformities and concurrent rectal fistulas remains limited, with most available studies focusing primarily on anal stenosis rather than scar deformities without significant sphincter dysfunction [9]. Consequently, there is no standardized surgical approach for this complex condition. Our surgical strategy involved complete excision of the scar tissue and fistulous tract, followed by simultaneous sphincter reconstruction, anoplasty, and local flap reconstruction. This comprehensive approach

addressed both the underlying pathology and the resultant tissue defect within a single operative session, thereby minimizing the need for staged procedures and promoting favorable functional recovery.

Selection of an appropriate reconstructive flap remains a crucial determinant of surgical success. Although several techniques, including House flap, diamond flap, Y-V/V-Y advancement flaps, and rotational S-flaps, have been described, none has demonstrated universal superiority [5,9-11]. Unlike traditional approaches that rely mainly on the severity of anal stenosis, our reconstructive planning was guided by the size of the postoperative scar defect after complete fistula excision. This individualized approach facilitated adequate wound coverage while reducing tension on the reconstructed tissues and preserving sphincter integrity. Furthermore, comparisons with studies involving isolated anorectal pathology should be interpreted cautiously because combined scar deformities and fistulas typically require more extensive dissection and reconstruction.

Postoperative complications following flap reconstruction are primarily related to flap ischemia, partial flap necrosis, wound infection, and wound dehiscence [12-13]. Despite the complexity of the cases included in the present study, complications were infrequent and comparable to those reported for established flap techniques in the literature. Progressive reduction in scar deformity, improvement in continence, and acceptable postoperative recovery suggest that one-stage combined reconstruction is a feasible and effective option for selected patients [9,12,14]. Nevertheless,

larger prospective studies with longer follow-up are warranted to validate these findings, compare different reconstructive techniques, and establish evidence-based guidelines for the management of postoperative perianal scar deformities associated with rectal fistulas.

Conclusion

One-stage combined surgical management of postoperative perianal scar deformities with concurrent rectal fistulas is a safe and effective treatment approach that provides favorable functional and clinical outcomes. Complete excision of the fistulous tract and scar tissue, combined with sphincter reconstruction, anoplasty, and individualized local flap reconstruction, resulted in a low complication rate, progressive reduction in scar deformity, improvement in continence, and satisfactory wound healing. Careful preoperative assessment and appropriate selection of reconstructive techniques are essential to optimize surgical outcomes. Further multicenter studies with larger sample sizes and longer follow-up are needed to confirm the long-term efficacy and establish standardized treatment protocols for this complex condition.

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