Original Article

Management of Fistula-in-Ano

Operative Management of Fistula-in-Ano: A Four Year Retrospective Outcome Analysis

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ABSTRACT

Objective: To evaluate fistula types, surgical strategies, healing, recurrence and continence. This evaluation was conducted in a non-tertiary setting.

Study Design: A retrospective analysis.

Place and Duration of Study: This study was conducted at the surgical department, Shaqra General Hospital, Shaqra, Kingdom of Saudi Arabia between November 2021 and October 2025.

Methods: This study was analysed the 56 consecutive adult patients (48 males, 8 females). The median age of patients was 44 years who underwent surgery for anal fistula. Fistulas were classified using Parks criteria with preoperative endoanal ultrasound, MRI and examination under anaesthesia. Simple fistulas were treated by fistulotomy/fistulectomy, and complex fistulas were managed with LIFT, cutting or loose Seton (Crohn's disease).

Results: The cryptoglandular fistulas comprised 94.6% of patients and crohn's-related patients were 5.4% of the total study sample. Low intersphincteric fistulas were found to be most commonly occurring (55.4%), followed by high transsphincteric fistula (30.4%). Out of the total study sample, simple fistulas accounted for 66.1% and complex were 33.9%. In 47 patients primary healing was achieved (83.9%) at a median follow up time of 22 months (92.9% traceability). Recurrence was found in five patients (8.9%), all these cases of recurrence happened within 6 months. No major complications were recorded during the study.

Conclusion: High healing rates (83.9%) were found in patients treated with conventional techniques tailored to each fistula anatomy in the general colorectal unit with a low recurrence rate (8.9%). The outcomes of this study support the efficacy of established procedures in routine practice.

Key Words: Rectal fistula surgery, Fistula-in-Ano, Recurrence, Fecal Incontinence, Parks Classification, Seton.

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INTRODUCTION

Fistula-in-ano is a very common anorectal disorder in colorectal surgical practice. The disease affects the quality of life of the patient due to recurrent pain, purulent discharge and pruritus.

The disease has an annual incidence rate of estimated 1.2–2.8 cases per 10,000 individuals in Europe and males between the ages of 20-50 are found to be more prone to get the disease[1]. The incidence rate according to a large population based analyse reported comparable incidence rates in the UK and US where the incidence was 1.69-2.5 per 10,000 cases[2].

The disease typically originates from cryptoglandular sepsis, which is an infection of the small glands within anal crypts which then presents with an epithelialized tract connecting the anal canal to the perianal skin. Over 90% of cases originate from obstruction and infection of the intersphincteric anal glands leading to abscess formation and fistulous extension. The remaining (5–10%) cases are usually due to Crohn's disease, tuberculosis, trauma, radiation therapy and malignancy[3,4]. Early diagnosis of the underlying etiology directly informs surgical strategy and prognostic expectations.

The foundation of treatment planning and outcome prediction is the precise classification of anal fistulas and the Parks classification (1976) is the most widely adopted system of fistula categorization. The parks classification categorizes fistulas based on trajectory

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relative to the anal sphincter complex: intersphincteric (20–45% of cases), transsphincteric (subdivided into low and high), suprasphincteric and extrasphincteric[5, 6]. The St. James University Hospital MRI based system and American Society of Colon and Rectal Surgeons guidelines also enhance complexity assessment by integrating secondary extensions, horseshoe configurations and abscesses[7]. Gender specific anatomy plays a role in male and female incidence rates because the anterior anal canal in females is shorter than males. This puts males on higher risk of the disease.

Accurately mapping the fistula and its relation to the sphincter muscle is essential to heal it completely while protecting bowel control before surgery. The first step of clinical evaluation is a thorough exam is looking at the perianal area, digital rectal exam and proctoscopy Goodsall's rule is not reliable for complex or anterior fistula evaluation[8]. 3D endoanal ultrasound detects internal openings and main tracts with 97% accuracy in initial assessment[9, 10]. Pelvic MRI has more than 90% accuracy and is considered the gold standard for complex fistula cases[7, 11].

Surgical management of anal fistula includes sepsis eradication, tract closure and perseverance of continence. Fistulotomy is particularly beneficial in low intersphincteric or transsphincteric fistulas with more than 95% healing cases but 5–15% incontinence risk[12]. High transsphincteric, suprasphincteric and recurrent fistulas always require sphincter-sparing techniques to avoid incontinence. Cutting or loose setons, advancement flaps, LIFT, VAAFT, FiLaC, OTSC and bioprosthetic plugs are some common options[13, 14, 15]. Even with these techniques recurrence rate are still 5–30% according to recent studies and continence can be impaired in up to 13% of patients in complex cases[16, 17]. Most published studies are undertaken in high volume specialized centers but the majority of fistulas worldwide are treated in regular colorectal units[18, 19]. This retrospective study analyses fistula types, operative strategies, recurrence, healing times and continence in patients treated at general colorectal unit.

METHODS

The current single center retrospective observational study included 56 adult patients. The sample had 48 males and 8 female patients with median age of 44 years with age ranging between 31–57 years. All patients underwent surgical treatment for anal fistula between November 2021 and October 2025. Among the sample, three patients (5.4%) had crohn's disease and the remaining had cryptoglandular fistulas. Seven patients had fistula surgery history. All patients either underwent clinical examination, rigid proctoscopy or examination under anaesthesia. Pre or intraoperative imaging included endoanal ultrasound in 38 (67.9%) patients and pelvic MRI in 41 (73.2%) patients. Hydrogen peroxide was used to identify the internal opening when necessary.

Fistulas were classified according to Park criteria with St James's University Hospital MRI based grading. Procedures included fistulotomy (n=18, 32.1%), fistulectomy (n=20, 35.7%), LIFT (n=9, 16.1%) and loose/cutting Seton placement (n=9, 16.1%). Setons were used as a staged approach in complex cases. Clinical healing was defined as closure of all external openings without discharge. Recurrence was defined as reappearance of symptoms or abscess after initial healing. Continence was assessed at each follow up visit. Data were analysed using SPSS version 26.0.

RESULTS

Total 56 patients were included in the study out of which 48 were male and 8 females. The median age was 44 years (range 31–57 years). All patients included in the study underwent operative treatment for anal fistula. Three patients (5.4%) had Crohn's disease in clinical remission and seven (12.5%) had recurrent fistulas after previous surgery.

According to Parks criteria, fistula classification is shown in Table 1. Intraoperative findings differed from preoperative assessment in only two cases (diagnostic accuracy 96.4%). Table 2 shows simple fistulas in 37 (66.1%) and complex in 19 (33.9%) patients (Table 2). Surgical procedures according to fistula complexity are presented in Table 3. Cutting Seton was the most frequently used technique among complex fistulas. Median postoperative hospital stay was 1 day (range 1–3 days). No major complications occurred.

Table No. 1: Fistula classification according to Parks criteria (n=56)

Fistula type	Male (n=48)	Female (n=8)	Total, n (%)
Low intersphincteric	25	6	31 (55.4)
Low transsphincteric	5	1	6 (10.7)
High transsphincteric	16	1	17 (30.4)
Horseshoe intersphincteric	2	0	2 (3.6)

Median postoperative hospital stay was 1 day (range 1–3 days). No major complications occurred. Median follow-up was 22 months (range 6–54 months) in 52 patients (92.9% traceability). Primary healing was achieved in 47 patients (83.9%). Recurrence occurred in five patients (8.9%), all within the first 6 postoperative months (Table 4). Formal continence assessment using the Cleveland Clinic (Wexner) Incontinence Score was performed in five patients. Out of the five patients four reported minor incontinence to

flatus or liquid stool (score 1–2) and one had full continence.

Table No. 2: Distribution of simple and complex fistulas (n=56)

Category	n	%
Simple	37	66.1
Complex	19	33.9

Table No. 3: Surgical procedures stratified by fistula complexity (n=56)

Procedure	Simple (n=37)	Complex (n=19)	Total, n (%)
Fistulotomy/ fistulectomy	37	0	37 (66.1)
LIFT procedure	0	5	5 (8.9)
Cutting seton	0	11	11 (19.6)
Loose seton (Crohn's disease)	0	3	3 (5.4)

Table No.4: Characteristics of patients with recurrence (n=5)

Underlying condition	Previous/current procedure	Recurrence (months)
Crohn's disease (n=2)	Loose seton	4 and 5
Cryptoglandular, recurrent	Fistulotomy	5
Cryptoglandular, recurrent (n=2)	Cutting seton	4 and 6

DISCUSSION

The present study reports the operative management of fistula-in-ano over a four year period. Most of the patients were male (85.7%) and the median age of the sample was 44 years. The demographic findings of this study align closely with large studies published recently. Recent studies consistently report a male to female ratio of 1.8–2.5:1 and peak incidence in the fourth to fifth decades of life[1, 2]. Cryptoglandular origin for cases were evident in 94.6% and this proportion is very similar to recent series from Europe and Asia (90–95%) [3, 12, 20].

The distribution of fistula types in our cohort was 55.4% low intersphincteric, 10.7% low transsphincteric, 30.4% high transsphincteric and 3.6% horseshoe. A recent multicentre analysis included 848 MRI-assessed fistulas and found intersphincteric fistulas in 48–56%, low transsphincteric in 9–14% and high transsphincteric in 28–34%. This finding is comparable to the current study and confirms that low intersphincteric is the most frequent subtype in non-referral settings[6,21]. The diagnostic accuracy of combined preoperative imaging and examination under anaesthesia reached 96.4% in the current study. This finding is consistent with recent published literature where the rates were 92–98% when endoanal ultrasound and MRI are used together[7, 9, 11].

The presentation of simple fistulas were found in 66.1% of cases. Since this figure is within the 60–72% range and comparable results are reported in general surgical units in recently published literature[18,22]. However, tertiary referral centres often report higher complexity rates sometimes exceeding 50%[23]. This difference underscores the selection bias inherent in specialised centres and signifies the value of real world data from district level departments[7, 19].

Primary healing was achieved in 83.9% patients with a median follow up of 22 months and the overall recurrence rate was 8.9%. These outcomes are favourable when compared with similar non tertiary cohorts. Sirikurnpiboon et al. (2022) showed a healing rate of 81.4% and the recurrence was in 11.2% cases in 312 patients[18]. A retrospective series from the UK included 378 patients from district general hospitals and it documented primary healing in 79-85% with a recurrence in 9-14%[16]. The recurrence rate in the current study is also lower than the 12-18% observed in several studies[12].

Fistulotomy/fistulectomy showed 100% healing without recurrence in regular follow up for treatment of simple fistulas. These results are in agreement with recent evidence that fistulotomy remains the gold standard for low/simple fistulas and the healing rates are >95% with low incidence of minor incontinence[12, 24]. However cutting Seton was the most frequently employed technique for complex fistulas (57.9%). The technique showed complete healing in most cases but contributed to two of the five total recurrences in this study. Cutting seton is associated with gradual sphincter division but recent long term studies show recurrence rates of 5-15% with a minor incontinence of 8-20%. These findings are mirrored in our limited continence data[16, 25]. The LIFT procedure was used in 26.3% of complex cases. There was no recurrence which is consistent with recent reports of primary success rates of 68-92% and low incontinence risk[12, 20].

Crohn's related fistulas treated with loose setons showed 8.9% recurrence rate which is a well-known challenge in this subgroup. It is recommended in recent cohort studies that loose seton drainage combined with biologics should be the preferred initial strategy, with a recurrence or persistence rates of 20-40% at two years[4, 15].

Several limitations of the current study must be acknowledged. The retrospective design and relatively small sample size and the inclusion of complex and Crohn related fistulas, limit statistical power for subgroup analyses. Follow up was incomplete for objective continence assessment in most patients. The absence of standardised patient reported outcome

measures beyond the Wexner score in a minority of cases restricts full evaluation of functional impact. However, the high traceability rate of 92.9% at a median of 22 months and the detailed intraoperative classification are the strengths of the current study and make the results reliable in reporting healing and recurrence rates.

CONCLUSION

This study demonstrates that high healing rates and low recurrence can be achieved with conventional techniques, if tailored to fistula anatomy. The findings reinforce the reliability of fistulotomy/fistulectomy in simple fistulas and staged seton based approaches for complex disease in non-specialised settings.

Author's Contribution:

Concept & Design or acquisition of analysis or interpretation of data:	Muhammad Saleem Malik, Eleftherios Karamanlis, Ahmad Mustafa AlQassom
Drafting or Revising Critically:	Muhammad Israr Shahzad, Yasser Abbas Abdelrahman, Ahmad Zaghloul Alshabasy
Final Approval of version:	All the above authors
Agreement to accountable for all aspects of work:	All the above authors

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