



# Evaluation of Fistulotomy with Immediate Sphincteric Reconstruction in the Treatment of High Transsphincteric Perianal Fistula

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## Abstract

**Background** High perianal fistula treatment remains challenging, mainly due to the variability in success and recurrence rates as well as continence impairment risks. So far, no procedure can be considered the gold standard for surgical treatment. Yet, strong efforts to identify effective and complication-free surgical options are ongoing. Fistulotomy can be considered the best perianal fistula treatment option, providing a perfect surgical field view, allowing direct access to the source of chronic inflammation. Controversy exists concerning the risk of continence impairment associated with fistulotomy. The present study aimed to assess the outcomes of fistulotomy with immediate sphincteric reconstruction regarding fistula recurrence, incontinence, and patient satisfaction.

**Methods** This interventional study was performed at the General Surgery Department of Zagazig University Hospital during the period from July 2018 to December 2019 on 24 patients with a clinical diagnosis of high transsphincteric fistula-in-ano. The fistulous tract was laid open over the probe placed in the tract. After the fistula tract had been laid open, the tract was curetted and examined for secondary extensions. Then, suturing muscles to muscles, including the internal and external sphincters, by transverse mattress sutures.

**Results** Our study showed that 2 patients develop incontinence to flatus ~ 8.3% and only one patient develop incontinence to loose stool, 4.2%. Complete healing was achieved in 83% and recurrence was 16.6%.

**Conclusion** Fistulotomy with immediate sphincteric reconstruction is considered to be an effective option in the management of high perianal fistula, with low morbidity and high healing rate with acceptable continence state.

## Keywords

- ▶ high perianal fistula
- ▶ anal sphincteroplasty
- ▶ fecal incontinence

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## Introduction

Perianal fistula is a common disorder, estimated to occur in 12.3 per 100,000 men and 8.6 per 100,000 women.<sup>1</sup> The ideal management of perianal fistulae is based on control sepsis, closure of the fistula, and maintenance of continence.

The best treatment option for high fistula has not been identified yet. However, technical procedures in the treatment of anal fistulae include placement of a seton, fibrin glues, platelet-rich plasma, plugs, and an endorectal flap are used.<sup>2,3</sup>

In 1985, Parkash et al.<sup>4</sup> published their results on primary closure and reconstruction after fistulotomy, an approach intended mainly to reduce the healing time and to prevent postoperative anal deformity. Since then, fistulotomy with primary sphincteroplasty has been adopted also for complex anal fistulas, to obtain low recurrence rates without compromising continence as the lay-open technique does. Recently, the interest in fistulotomy with primary sphincteroplasty has been increasing gradually.<sup>5</sup>

Perianal fistula is termed complex when the track crosses more than 30 to 50% of the external anal sphincter (high-transsphincteric, suprasphincteric, and extrasphincteric), when it is anterior in a female, recurrent, has multiple tracks, is caused by local irradiation or the patient has preexisting incontinence, or Crohn disease.<sup>6</sup>

The present study aimed to assess the outcomes of fistulotomy with immediate sphincteric reconstruction as regard fistula recurrence, incontinence, and patient satisfaction.

## Patients and Methods

A case series study was conducted on 24 patients with high transsphincteric perianal fistula. This study was performed at the GIT surgical unit of the General Surgery Department at Zagazig University Hospital in the period from July 2018 to December 2019.

Written informed consent was obtained from all participants, and the study was approved by the ethical committee of the Faculty of Medicine at Zagazig University.

The inclusion criteria were: 1) All patients with a diagnosis of high transsphincteric perianal fistula; 2) Gender: both male and female; 3) Ages from 16 to 70.

The exclusion criteria were 1) Patient refusal; 2) Patients with low perianal fistula; 3) Preoperative continence impairment; 4) Patients with perianal fistula secondary to Crohn disease; 5) Patients with age > 70 or < 16; 6) Patients with active perianal infection.

Preoperative investigation of all patients included complete blood count (CBC), prothrombin time (PT), partial thromboplastin time (PTT), international normalized ratio (INR), liver and kidney functions, hepatitis B, C viral markers, and random blood sugar. Besides, magnetic resonance imaging (MRI) was done for 8 patients (7 patients with recurrent fistula, and 1 female patient with anterior perianal fistula). Magnetic resonance imaging was not done if the anatomy of the perianal fistula (internal opening, external

opening and the track) could be identified by clinical examination.

All patients received preoperative oral metronidazole 500 mg, 3 times per day, 5 days before the operation. Patients were instructed to eat low residual diet a day before surgery and to shave and do an enema on the morning of the day of surgery.

**Surgical procedure:** The procedure was performed under spinal or general anesthesia, with the patient in lithotomy position. Complete digital rectal examination was conducted to identify the external opening and the fistulous tract. The identification of the internal opening was performed by irrigating the fistulous tract with diluted methylene blue through the external opening and observing the dye come out of the internal opening, while a proctoscope was inserted through the anus. After probing of the fistulous tract, the fistula tract was laid open over the probe placed in the tract. The anal sphincter over the fistulous tract was cut. After the fistula tract had been laid open, the tract was curetted and examined for secondary extensions. Any granulation tissue at the floor of the fistula was removed by curettage with copious irrigation with hydrogen peroxide and saline.

**Immediate sphincteric reconstruction:** the anal sphincter was sutured from the floor of the fistula to the submucosa of the anal canal including the internal and external sphincters by transverse mattress stitches using polydioxanone suture (PDS) 3/0. The repair was constructed so as not to leave a dead space in the depth of the wound. The skin and subcutaneous tissue, as well as the anoderm, were kept open to allow drainage.

## Follow Up

All patients were followed up for a total duration of 6 months during the postoperative period at the outpatient clinic. Patients were followed up at weekly intervals for the initial 6 weeks and at 2-week intervals for another 6 weeks and, then, monthly for 3 months. During each follow-up visit, patients were assessed for postoperative pain, wound infection, recurrence, and anal incontinence.

## Statistical Analysis

All patients' data were collected, checked, and analyzed by using the IBM SPSS Statistics for Windows, Version 19.0 (IBM Corp., Armonk, NY, USA). Data were expressed as mean  $\pm$  standard deviation (SD) and frequency with (%) according to the type of variable.

## Results

A case series study was conducted on 24 patients with high transsphincteric perianal fistula. All patients underwent fistulotomy and immediate sphincteric reconstruction,

The age of our patients ranged from 18 to 65 years, with a mean age of  $42.16 \pm 13.2$  years. Eighteen (75%) patients were male and 6 (25%) were female (**Table 1**).

Fourteen patients (58.3%) had a history of perianal abscess. Seven patients (29.2%) gave a history of a recurrent

**Table 1** Age and gender distribution among the studied patients

		Age	
Mean ± SD		42.16 ± 13.2	
Median (range)		42.0 (18–65)	
		N	%
Sex	Male	18	75.0
	Female	6	25.0
	Total	24	100.0

Abbreviation: SD, standard deviation.

anal fistula or recurrent abscess. Five patients (20%) had diabetes mellitus, 4 (16.6%) were hypertensive, and 8 (33.3%) were smokers (►Table 2).

The operative time was 34.66 ± 9.93, with minimum and maximum duration of 26 minutes and 60 minutes, respectively (►Table 3).

Regarding wound healing, 29.1% had complete wound healing in 3 weeks, 6 patients (25%) had complete healing in the 4<sup>th</sup> week, 3 (12.5%) had complete wound healing in the 5<sup>th</sup> week, 2 (8.3%) had complete wound healing in the 6<sup>th</sup> week, and another 2 (8.3%) had delayed wound healing, taking longer than 6 weeks. Four patients (16.6%) had failure of complete wound healing for 6 months, which was considered persistent anal fistula (►Table 4).

The major complication was infection (4/24 16.7%) followed by dehiscence and incontinence to flatus (8.3%; 2 cases each), and incontinence to loose stool in just 1 case (4.2%). There were no cases of incontinence to hard stool reported. The overall number of complicated cases was 8/24 (33.3%) (►Table 5).

**Table 2** Associated comorbidities among the patients in the study

History	N (%)
Diabetes mellitus	5 (20.8%)
Hypertension	4 (16.6%)
Smoking	8 (33.3%)
History of perianal abscess	14 (58.3%)
History of ano-rectal surgery (recurrent abscess or recurrent fistula)	7 (29.2%)

**Table 3** Operative time distribution in minutes among the studied patients

Operative time	Mean	SD	Minimum	Maximum
	34.67	9.93	26	60

Abbreviation: SD, standard deviation.

**Table 4** Time until complete wound healing

Items	N = 24
Complete wound healing week1	0
Complete wound healing week2	0
Complete wound healing week3	7 (29.1%)
Complete wound healing week4	6 (25%)
Complete wound healing week5	3 (12.5%)
Complete wound healing week6	2 (8.3%)
Complete wound healing > 6 weeks	2 (8.3%)
wound unhealing	4 (16.6%)

**Table 5** Shows complication distribution among studied patients

	Nr.	Percentage
Infection	4	16.7
Dehiscence	2	8.3
Incontinence to flatus	2	8.3
Incontinence to loose stool	1	4.2
Incontinence to hard stool	0	0
Recurrence	4	16.7

## Discussion

Perianal fistula is a benign anorectal condition, but it is considered a major problem for surgeons to cure. Fistula-in-ano usually results from an anorectal abscess that bursts spontaneously or after inadequate drainage. Acute infection of the anal crypt leads to an anorectal abscess, and fistula-in-ano represents the chronic form of this infection.<sup>7</sup>

In the present study, the history of perianal abscess was 14/24 patients (58.3%). In the study of Ratto et al., in 2013,<sup>1</sup> the history of perianal abscess in 72 patients with perianal fistula was 8 (12%), while Litta et al., in 2019, reported a history of perianal abscess drainage in 56/203 (28%).<sup>2</sup>

Our study showed that 7 patients (29.2%) had history of previous anorectal surgery (recurrent fistula or recurrent abscess drainage). In a study by Perez et al.,<sup>8</sup> they reported 6 /16 patients (~ 37.5%).

In the present study, two patients had branching tract. The first was recurrent fistula, which was diagnosed preoperatively by MRI, and the second case was diagnosed intraoperatively. The patient with recurrent complex fistula (recurrent fistula with multiple tracks) had developed recurrent fistula, but the other did not.

The incidence of postoperative wound infection in the current study was 4/24 (16.6%). It was manifested by perianal pain, purulent discharge, and constitutional manifestations. It was managed by a broad-spectrum antibiotic (oral

ciprofloxacin 500 mg, twice daily) and oral metronidazole 500 mg 3 times daily. Then, the proper antibiotic was chosen according to culture and sensitivity as well as clinical response. In two of these patients, the infection subsided with complete healing; however, the other two patients developed wound dehiscence. Riog et al., in 2010,<sup>5</sup> found that only 1 patient from 31 cases developed wound infection. The risk of wound infection in our study was relatively higher, and this may be due to associated comorbidity, such as diabetes mellitus; 5 patients were diabetic in this study, 2 of whom developed postoperative wound infection.

Our study showed that 2 patients developed incontinence to flatus (~8.3%), and only 1 patient developed incontinence to loose stool (4.2%). None of our patients developed incontinence to hard stool. These results were nearly similar to those in most of the published papers, such as the one by Litta et al., who, in 2019,<sup>2</sup> reported an overall postoperative continence impairment of ~13%, with 10% being incontinence to flatus, for 6% being incontinence to loose stool, and 2% incontinence to hard stool. Kraemer and Picke, in 2011,<sup>9</sup> published that the overall postoperative success rate was 97.4%, and only 2.6% of their patients showed variable degrees of fecal incontinence.

In the present study, 4 (16.7%) patients had a recurrent fistula. Kraemer and Picke, in 2011,<sup>9</sup> reported that 7/38 patients (~18.4%) had recurrent fistula, and Perez et al., in 2006,<sup>8</sup> showed that 9/30 patients (~32.1%) had recurrent fistula.

In the current study, patients who had previous anal surgery (recurrent fistula or recurrent perianal abscess) were at risk to develop postoperative complications. They had an elevated incidence of complications, as 3 patients developed postoperative infection and 3 patients developed recurrence, 1 of whom developed incontinence to loose stool. Finally, the overall complications in this group were 6/8 patients (~75%).

The first study published on this technique was by Parkash et al., in 1985.<sup>4</sup> One hundred and twenty patients were involved in this study, and the overall success rate was 97.5%, with an incidence of impaired fecal continence of 3.7%. Lux and Athanasiadis, in 1991,<sup>10</sup> conducted a study on 46 patients, whose success rate was 100% and the incidence of impaired fecal continence was 21.7%. Then, Roig et al., in 1999,<sup>11</sup> reported a success rate of 90.3% and variable degrees of fecal incontinence in 20% of the patients. Perez et al., in 2006,<sup>8</sup> had a success rate of 92.9%, and an incidence of impaired fecal continence of 17.4%. Roig et al., in 2010,<sup>5</sup> published a success rate of 89% and overall fecal incontinence of 18.3%. Kraemer and Picke, in 2011,<sup>9</sup> in a study conducted on 38 patients, found a success rate of 97.3%, and fecal incontinence occurred in 9.4% of the patients. Ratto et al., in 2013,<sup>1</sup> reported a success rate of 95.7%, and overall fecal incontinence occurred in 11.6%. Litta et al., in 2019,<sup>2</sup> conducted a study on 203 patients with a success rate of 95%, and overall fecal incontinence of 13%.

Comparing fistulotomy and immediate sphincteric reconstruction to other techniques in the treatment of high perianal fistula according to recurrence rate and continence impairment and healing rate, Mushaya et al., in 2012,<sup>12</sup>

reported that the success rates for fistula healing in ligation of fistula tract (LIFT) ranged from 82.2 to 94.4%, and the recurrence rate was 8%, while success rate in anorectal advancement flap was 86%, with a recurrence rate of 7%.

Ommer et al., in 2011,<sup>13</sup> reported in a systematic review that cutting setons were identified in 35 observational studies, most of them retrospectively, and healing rates were reported between 80 and 100%, while impaired continence rates were between 0 and 60%.

The guidelines in the treatment of cryptoglandular anal fistula in the German Society for General and Visceral Surgery, in 2011, demonstrated that fistulotomy or fistulectomy with the primary reconstruction of the anal sphincter is an established technique with healing rates between 60 and 80%, (recommendation grade: A; consensus strength: strong consensus, as more than 95% of participants agree).<sup>13</sup>

## Conclusion

Fistulotomy with immediate sphincteric reconstruction is a good alternative surgical option for complex perianal fistulas, but more comparative studies with other techniques are needed.

## Recommendations

- 1 - We recommend using this surgical technique (fistulotomy and immediate sphincteric reconstruction) in the treatment of high perianal fistula.
- 2 - We recommend other studies involving larger sample sizes and longer follow-ups to assess postoperative complications, especially continence impairment and recurrence in long-term follow-up.

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### Conflict of Interests

The authors declare that there is no conflict of interests.

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