



Effectiveness of Partial Fistula Tract Excision with Loose Seton Implantation to Treat Perianal Fistula

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ABSTRACT

Objective: Perianal fistula is an anorectal disease that can significantly impair quality of life. The course of the disease can include chronic exacerbation and recurrence. Many surgical techniques have been developed to treat perianal fistula, but reappearance of the fistula is still a major problem. The aim of the present study was to evaluate the results of partial fistula tract excision (partial fistulectomy) and loose seton application in the treatment of primary and recurrent perianal fistula.

Materials and Methods: Forty-two patients with a primary or recurrent perianal fistula who underwent a partial fistulectomy with loose seton placement at a single clinic between January 2015 and March 2020 were included. Clinical and demographic characteristics including the fistula location, postoperative recurrence, anal incontinence, and satisfaction rate were evaluated retrospectively.

Results: Of the 42 patients, 15 were female and 27 were male. The mean age was 43.4±13.1 years and the median follow-up period was 10 months (range: 5–21 months). No statistically significant difference in disease recurrence was found in terms of age, sex, American Society of Anesthesiologists classification, smoking, abscess history, fistula type, or primary/recurrence status ($p>0.05$). Total anal incontinence did not develop in any patient during the follow-up period. Recurrence of perianal fistula was observed in 2 patients (4.8%).

Conclusion: The results of the present study indicated that partial fistula tract excision and loose seton implantation remains the primary treatment method of choice due to the low rate of recurrence and incontinence coupled with high patient satisfaction.

Keywords: Loose seton, partial fistulectomy, perianal fistula, surgery

Cite this article as:
Subaşı Ö, Ercan M, Aziret M, Biricik A, Kahraman YS, Demir H, et al. Effectiveness of Partial Fistula Tract Excision with Loose Seton Implantation to Treat Perianal Fistula. Erciyes Med J 2022; 44(2): 167-72.

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Submitted
24.06.2021

Accepted
15.08.2021

Available Online
19.01.2022

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INTRODUCTION

A main characteristic of a complex or high perianal fistula is the involvement of all 3 anatomical layers of the external anal sphincter (subcutaneous, superficial, and deep) (1). In a simple or low fistula, the internal orifice of the fistula begins below the puborectalis and the track usually passes through few or no sphincter muscle fibers and is relatively close to the skin. However, in a high fistula, the internal orifice begins above the puborectalis and a track usually passes through or above a good number of muscle fibers; the route may be more complicated and further away from the skin.

Currently, the success rate in the treatment of primary perianal fistula is >90%. However, despite advanced and innovative techniques, the rate falls to <70% when the perianal fistula is complex (2). Moreover, no treatment algorithm has been established for high fistulas.

In patients with complex or high perianal fistulas, treatment is complicated by extended fistulas and/or multiple canals of the fistula tract and can result in incontinence. The method of treatment is frequently an individual choice with little standardization. Though a simple fistulectomy was the preferred treatment option in the past, it has lost popularity due to the high rate of recurrence (3).

In the present study, a partial fistulectomy was performed to reduce the fistula tract to <3 cm, thus converting complex fistulas into simple ones, and a loose seton was placed in the remaining fistula tract to prevent incontinence. After 6–8 weeks, the recurrence rate and level of patient satisfaction were evaluated to assess the effectiveness of the loose seton technique.

MATERIALS and METHODS

This study was approved by the Sakarya University Faculty of Medicine Ethics Committee on June 15, 2020 (no: 382).



Figure 1. Revealing the fistula tract with a stylet

The data of 42 patients with a primary or recurrent perianal fistula who underwent a partial fistulectomy with loose seton insertion in a single clinic between January 2015 and March 2020 were retrospectively analyzed. Demographic data from patient files, computer records, and operation notes were reviewed for comorbidities, presence of abscess, smoking habit, location of the fistula, duration of the operation, postoperative complications, patient satisfaction, and recurrence.

Fistula Classification

Rectosigmoidoscopy and contrast-enhanced pelvic magnetic resonance imaging were used preoperatively to reveal the location of the fistula and exclude other pathologies. The perianal fistulas were classified according to international classification system criteria (4). Patients with an atypical localization or a history of inflammatory bowel disease underwent a total colonoscopy. An experienced radiologist was consulted to determine the anatomy of complex fistulas.

Preparation for Surgery, Surgical Technique, and Loose Seton Application

The bowel was prepared preoperatively using a laxative enema. All operations were performed by a single surgeon. The patients were operated on under general or spinal anesthesia in the lithotomy position. The anal zone was assessed with an anoscope and physical examination. The internal opening of the fistula tract was determined by administering diluted hydrogen peroxide through the external opening of the fistula. In some cases, when the inner opening could not easily be determined, methylene blue was used.

In cases of a low fistula, after detection of the inner opening, the section of the fistula tract as far as the sphincter muscle was partially excised using monopolar cautery and a circular incision at the outer mouth of the fistula (Fig. 1, 2). After excision of the anal mucosa along the fistula tract, the internal and external muscles were suspended using tape passed through the inner and outer openings of the fistula tract. For a high perianal fistula, the fistula tract was excised while still preserving the sphincter muscles. The setons used were composed of vascular tape for low fistulas, and 5–10 mm diameter Penrose drains for high fistulas. Tension-free suturing was used to secure the seton in place (leaving approximately 5 mm clearance) (Fig. 3).



Figure 2. Partial excision of the fistula tract



Figure 3. Loose seton placement

Postoperative Follow-up

All of the patients were discharged on the first postoperative day without any complications and were requested to return to the outpatient department to assess the status of the surgical site and the placement of the seton every 2 weeks for the first 3 months. Any anal incontinence was measured using the Cleveland Clinic Incontinence Score (5). In some cases, the seton tension was gradually tightened at weekly intervals, and in others, a fistulotomy was performed 6–8 weeks after the placement of the loose seton. Follow-up visits continued every 2 months once the fistula had healed completely (after 3 months). Fistula healing was defined as no complaints related to the perianal area and complete epithelialization of the wound without perianal discharge. Recurrence was defined as a re-diagnosis in a symptomatic patient whose fistula had not resolved.

Table 1. Patient characteristics and demographic data

Features (n=42)	n	%
Age (years, Mean±SD)	43.4±13.1	
Gender		
Male	27	64.3
Female	15	35.7
ASA class		
I	18	42.9
II	22	52.4
III	2	4.8
Comorbidity		
None	32	76.1
1 chronic disease	6	14.2
2 chronic diseases	3	7.1
≥3 chronic diseases	1	2.4
Diabetes	3	7.1
Hypertension	8	19.04
Crohn's disease	2	4.8
Asthma	2	4.8
Smoker		
Yes	18	42.9
No	24	57.1
Primary/recurrence		
Primary	32	76.2
Recurrence	10	23.8

SD: standard deviation; ASA: American Society of Anesthesiologists

Statistical Analysis

All of the statistical analyses were performed using IBM SPSS Statistics for Windows, Version 20.0 (IBM Corp., Armonk, NY, USA). The Shapiro-Wilk test was used to assess the normality of distribution. Continuous variables were presented as the mean±SD or median (25th–75th percentile). Categorical variables were summarized as the number (percentage). When the normality hypothesis was not valid, comparisons of continuous variables between groups were made using the Mann-Whitney U test. The relationship between 2 categorical variables was examined using a chi-squared test. All statistical analyses were performed with 5% significance and a 2-sided p value of <0.05 was considered statistically significant.

RESULTS

Of the 42 patients with a perianal fistula who underwent a partial fistulectomy with loose seton insertion, 15 were female (35.7%) and 27 were male (64.3%). The mean age was 43.4±13.1 years. A preoperative abscess was detected in 13 patients (30.9%). The most common complaints were purulent discharge (78.5%), pain in the perianal area (73.8%), swelling (33.3%), and bleeding (4.7%). Of the 42 patients, 2 (4.8%) had concomitant Crohn's disease, while the etiology of the remaining 40 patients (95.2%)

Table 2. Type and opening position of the fistula

	n (%)
Location	
Transsphincteric	29 (69)
Intersphincteric	6 (14.3)
Suprasphincteric	4 (9.5)
Extrasphincteric	3 (7.1)
Clock position	
1 o'clock	1 (2.3)
2 o'clock	0
3 o'clock	2 (4.6)
4 o'clock	4 (9.5)
5 o'clock	5 (11.9)
6 o'clock	9 (21.4)
7 o'clock	5 (11.9)
8 o'clock	6 (14.3)
9 o'clock	4 (9.5)
10 o'clock	3 (7.1)
11 o'clock	2 (4.6)
12 o'clock	1 (2.3)
Perioperative findings	
Operation time (minutes)	25 (20–42)
Follow-up (months)	10 (5–21)
Time until seton removal (days)	43 (20–72)
Time until normal activity (weeks)	3.6±1.5
Complications	
Recurrence	2 (4.8)
Reoperation due to early displacement of seton	2 (4.8)

was idiopathic. Most of the patients (76.1%) had no concomitant disease and the most common comorbidity was hypertension (19.04%). The majority of the patients had an American Society of Anesthesiologists (ASA) preoperative risk score of Class II. In all, 32 (76.2%) patients had primary and 10 (23.8%) had recurrent perianal fistulas (Table 1). The fistula location according to the Parks classification (4) was transsphincteric (69%), intersphincteric (14.3%), suprasphincteric (9.5%), or extrasphincteric (7.1%). From the lithotomy position, the most common site of the external opening of the fistula was at the 6 o'clock (21.4%), 8 o'clock (14.3%), or 7 o'clock (11.9%) positions (Table 2).

There was no statistical significance in terms of recurrence of complaints according to age, sex, ASA score, smoking, abscess history, fistula type, or primary/recurrent fistula ($p>0.05$). A statistically significant association was found between recurrence of complaints and patient satisfaction and the use of a loose seton. Overall, the patients expressed satisfaction and had few complaints ($p<0.001$) (Table 3).

The median operating time was 25 minutes (range: 20–42 minutes). No major postoperative complications were detected in any patients, although the seton came out prematurely in 2 (4.8%) pa-

Table 3. Comparison of recurrence of complaints and patient characteristics

	Recurrency of complaint (n)	p
Gender		0.999
Female	0	
Male	2	
ASA class		0.438
I	1	
II	1	
III	0	
Smoker	1	0.623
Abscess	2	0.08
Type of fistula		0.792
Intersphincteric	0	
Extrasphincteric	0	
Transsphincteric	1	
Suprasphincteric	1	
Reoperation	1	0.184
Satisfied after seton insertion		<0.001
Yes	0	
No	2	

ASA: American Society of Anesthesiologists

tients who were re-operated on for loose seton replacement. The setons were in place for 3–8 weeks, with a median duration of 6 weeks. The median length of time for the seton to fall out was 43 days (range: 20–72 days), but was longer in cases of a suprasphincteric or extrasphincteric fistula (mean: 50 days).

The median follow-up time was 10 months (25th–75th percentile: 5–21 months). The mean time until return to normal daily activity was 3.6±1.5 weeks, and the satisfaction rate of patients after surgery was 90.5%. Recurrence was detected in 2 (4.8%) patients during follow up. One of these patients underwent seton re-insertion, while the other went to another hospital. Finally, partial gas incontinence was detected in 2 (4.8%) patients, but it resolved spontaneously in both. There were no cases of total incontinence among the study patients during the follow-up period.

DISCUSSION

Perianal fistula is a benign chronic condition that can progress and significantly impair quality of life. While medical treatment is often helpful in relieving symptoms in patients with a perianal abscess, surgical treatment can provide a more effective solution (6, 7). A fistulotomy or fistulectomy for superficial or anal fistulas that involve <30% of the external sphincter have a success rate of up to 92%–97% (8, 9). Treatment is more complex in patients with a perianal fistula involving >30% of the external sphincter, suprasphincteric fistula, extrasphincteric fistula, or relapse. In these cases, several techniques, such as tight or loose seton application, ligation of the intersphincteric fistula tract, video-assisted anal fistula therapy, fistula tract medialization, endorectal flap repair, and anal fistula plugs, are available, although there is no consensus regarding

a single gold standard technique (10–13). Consequently, decisions about the surgical treatment of a complex or high perianal fistula often depend on the surgeon's preference.

The loose seton technique is an alternative to one-stage fistulotomy and preserves anal sphincter function better, allowing the secondary fistula canal to heal and leaving only the main fistula tract. The tight seton technique gradually divides the sphincter. Seton placement has been recommended in the literature to prevent anal incontinence (14). Silastic tubing, silk suture, a rubber band, braided polyester, a vascular ring, and nylon or propylene sutures can all be used for the seton (15). Different seton materials have been reported to produce varying rates of incontinence and recurrence (15, 16). In our experience, the use of inflexible materials and knots can cause skin irritation and discomfort.

The main treatment method for perianal fistula is surgery. Complications such as postoperative recurrence and stool incontinence may improve during the follow-up period (15). The basic principle of surgical treatment is to remove or close the fistula canal before incontinence occurs (17–19). However, the choice of surgical management is mostly influenced by experience and personal preference. A fistulotomy and curettage may be used for fistulas involving < one-third of the sphincter (20). Fistulas involving >30% of the sphincter are difficult to treat surgically, since there is a high risk of incontinence following division of the sphincter muscle (21).

A number of different techniques have been developed to reduce the risk of incontinence in high fistula cases. One alternative to a single-stage fistulotomy is the seton technique, which is more successful in preserving functionality with its slow division of the sphincter muscles (14, 20). It also provides better drainage by preventing obstruction of the fistula tract (21). The correct choice of seton material is essential to ensure the best possible chance of recovery without damaging the patient's quality of life (22).

There are 2 types of seton technique: tight (or cutting) and loose setons. The tight seton eliminates the fistula tract without causing acute sphincter damage by creating pressure necrosis on the sphincter muscles, allowing them to gradually heal over time. However, it has disadvantages, such as the need for painful tightening sessions at certain intervals, an adverse effect on quality of life, and the likelihood of incontinence (22). The insertion of loose setons may be a suitable alternative to tight setons that eliminates these disadvantages.

The reported rate of incontinence associated with the use of loose setons ranges from 5% to 17%, and appears to be significantly lower than that of tight setons (23, 24). In our study, only 2 patients had partial gas incontinence, which resolved during follow-up. There were no cases of permanent anal incontinence. A vascular loop was used as seton material for low-lying fistulas and a Penrose drain was used for high-set fistulas, and the fistula tract was observed to be completely resolved in follow-up examinations. The seton provided a controlled fistulotomy with drainage. Mentes et al. (25) reported a recurrence rate of 5% in 20 loose seton cases. In other studies, Eitan et al. (26) and Emile et al. (27) presented recurrence rates of 19.4% and 10%, respectively. The difference in recurrence rates may be contingent on differences between patients and their indications, as well as the type of fistula and type of seton insertion. We observed a recurrence rate of 4.8%.

Many surgeons recommend loose seton application as the gold standard in complex fistula treatment (17). However, most of the studies reporting loose seton insertion results had a small sample size. Kelly et al. (28) found that most patients tolerate loose seton placement well. Garcia-Aguilar et al. (29) reported that satisfaction with the technique was related to the recurrence of fistula, incontinence, and effects on lifestyle. The rate of satisfaction with the treatment was 85%. In our study, rather than live with pain and discharge, the patients preferred to use a seton sling for a short period and the satisfaction rate was 90.5%. Though there are several considerations and alternatives, partial fistula tract excision with loose seton placement may be preferred due to the high healing rate and a greater level of continence as well as a low level of postoperative pain.

In recent years, some new treatment modalities for the management of perianal fistula have emerged, such as fibrin glue, biological fistula plugs, and endorectal advancement flaps. However, comparative studies have shown that they do not deliver any advantage in comparison with traditional treatments (30), and furthermore, the costs are far higher.

Limitations of this study include the retrospective design and a small sample size. In addition, the satisfaction level of the patients after surgery was not analyzed in detail.

CONCLUSION

A partial fistulectomy with loose seton placement appears to be well tolerated and provide high patient satisfaction with a low rate of recurrence and incontinence. Although new treatment techniques have been developed in recent years, the loose seton procedure continues to be a practical and successful method.

Ethics Committee Approval: The Sakarya University Faculty of Medicine Clinical Research Ethics Committee granted approval for this study (date: 15.06.2020, number: 382).

Informed Consent: Written informed consent was obtained from patients who participated in this study.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept – ÖS, ME; Design – ÖS, MA; Supervision – KK, HD; Resource – YSK, AB; Materials – AB, YSK; Data Collection and/or Processing – AB, ÖS; Analysis and/or Interpretation – MA, YSK; Literature Search – KK, MA; Writing – ÖZ, ME; Critical Reviews – ME, KK, HD.

Conflict of Interest: The authors have no conflict of interest to declare.

Financial Disclosure: The authors declared that this study has received no financial support.

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