Evaluation of Cutting Seton as A Surgical Treatment for High Anorectal Fistula-a Retrospective Observational Study

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Abstract

Objective: To determine the frequency of postoperative fecal incontinence and recurrence in patients with high anorectal fistulae after surgical treatment using Polypropylene as a cutting Seton.

Method: The retrospective observational single center study was conducted at Department of Surgery, Service Hospital, Lahore from September, 2018 to September, 2020. After applying inclusion criteria, data of 170 patients were reviewed for postoperative fecal incontinence and recurrence.

Results: The mean age of patients was 41.59 ± 7.61 years with minimum and maximum age as 15 and 50 years. There were 99 (58.2%) male and 71(41.8%) female cases. The mean duration of fistula was 8.03 ± 1.39 weeks with minimum and maximum duration as 6 and 10 weeks. Patients were followed up for two years, 5 (2.9%) patients had recurrence and 2 (1.4%) cases had fecal incontinence.

Conclusion: The frequency of postoperative fecal incontinence and recurrence in patients with high anorectal fistulae after surgical treatment using Polypropylene as a cutting seton was minimal, hence, cutting setone seems to be an effective and relatively safe treatment for high anal fistula with low rate of incontinence.

Keywords: Fecal incontinence, recurrence, high anorectal fistulae, Polypropylene, cutting seton

How to cite: *Qureshi AB, Naseer N, Taqi H. Evaluation of Cutting Seton as A Surgical Treatment for High Anorectal Fistula-a Retrospective Observational Study. Esculapio - JSIMS 2022;18(02):129-133*

DOI: ***https://doi.org/10.51273/esc22.251825***

Introduction

Anorectal fistula is an abnormal passage which is lined by granulation tissue, connecting two epithelium lined surfaces, anorectal lumen and skin.[1] Majority of fistulas arise as chronic sequelae of anorectal suppuration in which anal crypt glands present at the level of dentate line in inter sphincteric plane are infected.[2] After surgical or spontaneous drainage in the perianal skin, a granulation tissue–lined tract is occasionally left behind, causing recurrent symptoms. Other fistulas develop secondary to trauma (e.g. rectal foreign bodies), Crohn's disease, carcinoma, anal fissures, radiation therapy.[3]

In high fistulae primary opening originates above the dentate line and puborectalis with fistulous tract involving more than 30% of internal sphincter muscle fibers.[4] Management of high variety of anorectal fistulae requires balance between the eradication of sepsis and preservation of continence. Cutting Seton consists of a non-absorbable suture or a rubber band that is placed through the internal and external opening of the fistula and intermittently tightened.[5]

Tightening the seton results in gradual division and fibrosis of the sphincter, thus eliminating the fistula while maintaining continuity of the sphincter. Using Seton is associated with the least rate of complications such as incontinence and recurrence.[6] Despite the presence of already conducted work on this topic, there is conflict in results between international and local literature.[7,8] In a study conducted in the D. I. Khan, it was observed that recurrent fistula was noted in one patient

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Submission Date: 17-02-2022
1st Revision Date: 27-02-2022
Acceptance Date: 27-04-2022

(3.3%) at 5 months while none (0%) developed incontinence.[8] Another study found that postoperative fecal incontinence in 0% cases as well as no fistula recurrence occurred with cutting seton with healing rate 100%.[7] While in an Egyptian study, it was reported that recurrence rate was 9.8% while no fecal incontinence observed.[2]

Therefore, we retrospectively analyzed the data of patients that were managed with cutting seton at the Department of Surgery, SIMS Lahore. Patients with high anorectal fistulae were operated from September, 2018 to September, 2020. On the basis of findings of this study, it is presumed that current practice guidelines can be updated for successful treatment of high anal fistula.

Cutting Setons

Cutting Setons are used by securing the Seton tightly within the fistula tract with purposeful pressure on the tract itself. The Seton can then be serially tightened in the office over time. This is a general high school science phenomenon in which a paper clip or wire is applied on an ice chunk and this ice piece maintain its shape as the wire progresses.[9] Flatus incontinence is most common with 12-26% of incontinence rate of stool accompanied by liquid stool.[10,11] Previous studies indicated the average rate flatus incontinence should be 9.7% and solid stool is 5%.

Fig 1: *Application of Cutting Seton 58*

Material and Methods

The study was a mono-center retrospective observational study conducted in Department of Surgery, SIMS Lahore from September, 2018 to September, 2020. All the surgical procedures were performed in a single surgical unit by the same surgeon (associate professor). After reviewing the database of the Hospital, only 170 patients were fitted in the selection criteria. Inclusion criteria was age between 15-50 years both genders and patients with high anorectal fistulae, patients excluded were with recurrent fistulae, Immuno-compromised, previous history of irradiation or on steroid during last 2 weeks. The anthropometric data, history of smoking, diabetes mellitus and duration of fistula were noted. Patients in the cohort were operated using Seton (Prolene No. 1), under general or spinal anesthesia. Metallic Probe was gently passed through the fistulous tract. Elliptical incision around the external opening was made, tract outside the sphincters were dissected and excised. The Seton (Prolene No.1) was then passed through the remaining tract and tied over itself on the sphincter muscles. Postoperatively patients were advised to take Sitz-bath, with oral ciprofloxacin and metronidazole for 7 days. Follow up on a weekly basis for the tightening of Seton was carried out, till the Seton drops by itself. After 1 month of Seton drop patients were contacted to assess the fecal incontinence and recurrence. Data were analyzed using SPSS for windows (Version 22.0 IBM Corp, Armonk, USA). The normal distributions of data were assessed using Kolmogorov Smirnov test Means and standard deviation were calculated for quantitative variables like age, BMI and duration of fistula. For qualitative variables (gender, diabetes, smoking, postoperative recurrence and fecal incontinence), data were expressed as frequency and percentage. Data were further stratified for age, gender, BMI, diabetes, smoking, and duration of Seton drop to control effect modifiers. Chi-square test was applied to compare outcome in stratified groups. Significance level was predetermined at $p \leq 0.05$.

Results

Mean age of patients was 41.59 ± 7.61 years ranging from 15 to 50 years. The mean BMI was 27.95 ± 3.21 ranging from 22 to 34. The mean duration of fistula was 8.03 ± 1.39 weeks (range: 6 and 10 weeks). Only twenty-one (12.4%) patients were 15-35 years-old and 149 (87.6%) were 36-50 years-old. Data showed that our cohort was predominantly comprised of males than the females. Only 50 (29.4%) patients had diabetes mellitus. Fifty-two (30.6%) patients were smokers. A total of 89 (52.4%) patients had duration of seton drop as <10 days and 81(47.6%) had seton drop as 10-30 days (Table 1). Only 5 (2.9%) patients had postoperative recurrence and 2 (1.4%) patients had fecal incontinence (Table 1). When data was stratified for age, gender, smoking, BMI and duration of seton drop, the frequency

Table 1: *Frequency distribution of patients (n = 170)*

Characteristics	Number of patients
Age (years)	
15-35 years	21
36-50 years	149
Gender	
Male	99
Female	71
History of Diabetes Mellitus	
Yes	50
No	120
History of Smoking	
Yes	52
No	118
Duration of Seton Drops	
<10 days	89
10-30 days	81
Post-operative recurrence	
Yes	5
No	165
Fecal Incontinence	
Present	2
Absent	158

Table 2: *Comparisons of Postoperative Recurrence with Respect to Multiple Factors*

Factor		Postoperative Recurrence		
		Yes (%)	No (%)	P-Value
Age (Years)	15-35	1(4.8%)	20(95.2%)	0.598
	36-50	4(2.7%)	145(97.3%)	
	Total	5(2.9%)	165(97.1%)	
Gender	Male	2(2%)	97(98%)	0.401
	Female	3(4.2%)	68(95.8)	
	Total	5(2.9%)	165(97.1)	
Body Mass Index (Kg/m^2)	Obese	1(2.1%)	47(97.9%)	0.678
	Non-Obese	4(3.3%)	118(96.7)	
	Total	5(2.9%)	165(97.1%)	
History of Diabetes Mellitus	Yes	1(2%)	49(98%)	0.639
	No	4(3.3%)	116(96.7%)	
	Total	5(2.9%)	165(97.1)	
History of Smoking	Yes	2(3.8%)	50(96.2%)	0.643
	No	3(2.5%)	115(97.5%)	
	Total	5(2.9%)	165(97.1%)	
Duration of Seton drop (days)	<10 days	3(3.4%)	86(96.6%)	0.728
	10-30 days	2(2.5%)	79(97.5%)	
	Total	5(2.9%)	165(97.1%)	

of postoperative recurrence and fecal incontinence was statistically similar in all strata (Tables 2, 3).

Table 3: *Comparisons of Fecal Incontinence with respect to multiple factors*

Factor		Fecal incontinence		
		Yes	No	P-Value
Age (years)	15-35	1(4.8%)	20(95.2%)	0.816
	36-50	9(6%)	140(94%)	
	Total	10(5.9%)	160(94.1%)	
Gender	Male	6(6.1%)	93(93.9%)	0.907
	Female	4(5.6%)	67(94.4)	
	Total	10(5.9%)	160(94.1%)	
Body Mass Index (Kg/m^2)	Obese	2(4.2%)	46(95.8%)	0.551
	Non-Obese	8(6.6%)	114(93.4%)	
	Total	10(5.9%)	160(94.1%)	
History of Diabetes Mellitus	Yes	2(4%)	48(96%)	0.501
	No	8(6.7%)	112(93.3%)	
	Total	10(5.9%)	160(94.1%)	
History of Smoking	Yes	4(7.7%)	48(92.3%)	0.506
	No	6(5.1%)	112(94.9%)	
	Total	10(5.9%)	160(94.1%)	
Duration of Seton drop (days)	<10 days	3(3.4%)	86(96.6%)	0.145
	10-30 days	7(8.6%)	74(91.4%)	
	Total	10(5.9%)	160(94.1%)	

Discussion

In almost 80% of cases, anal fistula arises as secondary condition to abscess coming from affected anal glands.[10] High and low classification depends upon the height of the tract as it navigates from the sphincter muscle rather point of internal opening which is almost at the dentate line.[12] There are many options for the treatment of anal fistula which include fistulotomy, seton application, fistula plug, ligation of the inter sphincteric fistula tract, anorectal advancement flap, dermal island flap, and fibrin injection.[12] Seton is a string type substance which is tied after passing through the fistula tract and initiate the inflammatory and fibrotic process to save and avoid retraction of sphincter upon its division. So, it helps to retain the continuity of sphincter during cutting procedure.[13] There are different types of Setons including braided polyester, nylon, rubber bands, silk, polypropylene. Among these, the proline seton is less expensive, provide convenient tightening, and can be applied easily in a clinic without use of analgesia.[14] Different types of seton have recurrence rate range from 0-16% with an incontinence rate of 0-62%.[10,15]

The cutting seton is also a string like substance which is applied in fistula tract and tightened gradually. It results

into slow transection of the external sphincter which leads to pressure necrosis with an insignificant splitting of the cut ends. Thus, it can restore the continuity during the cutting procedure.[14]

A prospective study from January 2005 to December 2014 was carried out on 372 patients with high anal fistula using 0-silk as cutting seton at Al- Asar General Hospital, Madina. Seton was tightened on weekly basis in outpatient clinics. Results revealed 298 (80.1%) males and 74(19.9%) females. Symptoms varied from 3-12 months. Full healing in 363 (97.6%) patients,58 (15.6%) had incontinence to flatus, none had to feces and 9 (2.4%) had recurrence. Hence, use of the cutting seton for high anal fistula is very effective as it instantaneously evacuates the abscess, cuts the tract of fistula, and make fibrosis on tract.[16] In the present study, we have found a higher percentage of male and other signs were comparable. Another study examined the efficacy of seton in High anal fistula, average age of the patients was 38.2±6.8 years in 57 cases.51 cases showed complete healing of fistula and 2 patients had incontinence while the recurrence was observed in 4 patients. Therefore, it can be assumed that the use of seton is comparatively safer, cheaper, and efficient solution for controlling the high anal Fistula with low rate of incontinence. Hence it can be suggested as standard treatment for the control of high anorectal fistula.[12] In another study of 2017, 68 patients (59 males and 9 females) were treated with cutting seton and followed for 12 months. Results revealed complete recovery in 55 (80.9%) unsuccessful in 13(19.1%), 9 patients (13.2%) reported slight incontinence, 6 (8.8%) to gas, 3 (4.4%) to liquid stools but none reported solid stool incontinence. Recurrence was observed in 2 patients (2.9%). Hence, it was concluded that the use of cutting seton have fairly good results regarding the treatment of fistula and have better continence in most of the cases, however, the failure risks were quite high so the use of cutting seton is not recommended in all cases of anal fistulas.[17] In another descriptive study of 2016 at Al-Hada Armed Forces hospital, Taif, 51 patients were treated with cutting seton during December 2012 to December 2013. Results showed incontinence to flatus was 15.7%, incontinence to liquid stool was 5.9%, recurrence rate 9.8%. However, incontinence for solid was zero. Hence, it is suggested that cutting setons are right treatment for complete recovery of anorectal fistula. However, other options of surgery are advised for the females and those patients which have gone through any kind of previous surgery.[18]

In another research eighteen patients comprises of 16 males and 2 females with fistula above dentate line and involvement of more than 30% internal sphincter were subjected to treatment with cutting seton for a duration of 3 years. Follow-up for fistula recurrence, incontinence, and degree of satisfaction was done. Results demonstrated postoperative incontinence in 4 of 18 patients (22.2%) gas incontinence in 3 patients (16.6%) and liquid stool incontinence in 1 patient (5.6%) and none had solid stool incontinence. There was no fistula recurrence with healing rate 100%. SO, the study concluded that cutting Seton is an effective and relatively safe management of high anal fistula with low rate of incontinence.[7] Another study was conducted to find out the recurrence rate and fecal incontinence in anorectal fistula, treated with cutting seton using polypropylene. Study involved 30 patients with high anorectal fistula treated from April 2011 to March 2014 at Mufti Mehmood Memorial Teaching Hospital, D.I. Khan.

Patients were followed for six months to monitor the recurrence, full recovery, and anal incontinence. Out of 30 patients, average age was 40 years with range of 20-66 years, full recovery took three months in all patients (100%). At 5 months, only 1(3.3%) patient reported recurrent fistula and none reported incontinence. Therefore, surgical treatment of anorectal fistula with cutting seton was linked with lower rate of anomalies. Hence, it can be suggested as standard treatment for anorectal fistula.[8] In another recent study of Sudan published in 2022, patients (n=72) were treated with cutting seton for high trans-sphincteric fistula. Results revealed that 70% patients were male. Forty-eight (66.7%) patients required two sessions of seton tightening with a duration of seton treatment of 30 days and 24 (33.3%) patients required three sessions with a duration of seton treatment of 45 days. Flatus incontinence and fistula recurrence were noted in 1.4% and 2.8% patients respectively. Twenty-six (36%) patients achieved complete healing within 30 days, while 36 (54.3%) patients healed within 60 days.[19]

Conclusion

It is concluded that the frequency of postoperative fecal incontinence and recurrence in patients with high variety of anorectal fistulae after surgical management using Polypropylene as a cutting seton was minimal. Therefore, it appears that cutting seton is an effective and relatively safe treatment of high anal fistula with low rate of incontinence.

Conflicts of Interest None

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Authors Contribution

ABQ: Conceptualization of Project
NN: Data Collection
ABQ: Literature Search
HT: Statistical Analysis
ABQ: Drafting, Revision
ABQ: Writing of Manuscript