

# Evaluation of the cutting seton as a method of treatment for perianal fistula

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**BACKGROUND:** Perianal fistulas are distressing for the patient and sometimes a challenge for the surgeon. Different methods for the treatment of perianal fistulas have a range of success rates and use of the cutting seton is still debatable.

**OBJECTIVES:** We evaluated the recurrence, success rate and incontinence with the cutting seton method for treating perianal fistula.

**DESIGN:** Prospective, descriptive study.

**SETTING:** Al-Hada Armed Forces Hospital, Department of General Surgery, Taif, Saudi Arabia.

**PATIENTS AND METHODS:** We studied all patients with high perianal fistula admitted to the department of general surgery in our hospital with a diagnosis of perianal fistula in the period from December 2012 to December 2013 (12 months). Patients were followed for postoperative recurrence and incontinence rate.

**MAIN OUTCOME MEASURE(S):** The primary outcome measured was either complete cure or recurrence.

**RESULTS:** Fifty-one patients underwent cutting seton insertion for fistula in ano. The recurrence rate was 9.8%. The postoperative rate of incontinence was 15.7% to flatus and 5.9% to fluid stools. There was no incontinence to solid stools.

**CONCLUSION:** The cutting seton is a valid option for a complex fistula in ano, but in female patients and those with previous peri-anal surgery, other surgical options are advised.

**LIMITATIONS:** Patients with low perianal fistula, Crohn's disease, acute perianal abscess and patients with major incontinence were excluded.

Perianal fistulas are common and have a troublesome pathology. The condition is distressing for the patient and sometimes a challenge for the surgeon.<sup>1</sup> The most widely accepted theory is that anal abscess is caused by infection of an anal crypt gland. Suppuration moves from the anal gland to the intersphincteric space, forming an abscess leading to the development of a fistula. The incidence of fistula following an abscess is nearly 33%.<sup>2</sup> A fistula can cause pain, perianal swelling, discharge, bleeding, and other nonspecific symptoms. The diagnosis of fistula-in-ano may include a digital rectal examination, anal manometry, fistulography, CT, and MRI.<sup>3</sup> The ideal treatment is based on three central tenets: control of sepsis, closure of the fistula and maintenance of continence.<sup>4</sup> The management of complex fistulas needs to balance the outcomes of cure and continence. Success is usually determined by identification of the primary opening

and dividing the least amount of muscle as possible.<sup>5</sup> There is a risk of sphincter muscle damage during fistulotomy, which can lead to an unacceptable risk of anal incontinence of varying degrees.<sup>6</sup>

In contrast to fistulotomy for low anal fistulas, a well-accepted, simple, safe, and efficient method is still lacking for high anal fistulas. Seton techniques are important in the treatment of high anal fistulas. A seton can be any type of foreign material inserted through a fistulous track. Setons have been used since Egyptian times; Hippocrates first detailed a method of application in the anal fistula.<sup>7</sup> Setons are useful in the treatment of trans-sphincteric anal fistula because they permit the drainage of acute inflammation and preserve the anal sphincter.<sup>2</sup> Different materials have been used as setons, including silk, wire, elastic bands, a Penrose drain, and nylon.<sup>7</sup> The definition of cutting seton treatment used in this study is any seton intended to cut through

tissue, either by mechanical or chemical means. The purported advantages of the technique include its ability to drain the region with prevention of recurrent abscess and promotion of fibrosis around the seton during slow division of the sphincter. In theory, the formation of fibrosis prevents retraction of the sphincter behind the advance of the seton. The objective of our study was to evaluate recurrence, success rates and incontinence after use of the cutting seton for treating perianal fistula.

## PATIENTS AND METHODS

From December 2012 to December 2013, patients admitted to the general surgery department with a diagnosis of high perianal fistula were included in this prospective study. Patients with a known low perianal fistula, Crohn disease, acute perianal abscess and patients with major incontinence were excluded. All patients were examined by a colorectal surgeon in the outpatient clinic. The pre-treatment evaluation included a history of previous surgeries in the perianal area and symptoms, clinical examination of the perineum and ano-rectum, and proctoscopy. The degree of continence was evaluated and magnetic resonance was performed. Fistulae were classified on the basis of operative findings according to Parks' classification. Written informed consent was obtained from all subjects after a full explanation of the procedure.

The standard preoperative protocol included a phosphate enema given 12 hours before surgery and 500 mg of metronidazole with 1.5 gm of cefuroxime given intravenously at the beginning of surgery. The patient was placed in a prone jack-knife position under general or spinal anaesthesia. The rectosigmoid area was checked with a rigid sigmoidoscopy before starting the procedure. After antisepsis of the operative site, inspection was followed by a digital rectal examination and proctoscopy. The site of the external opening was probed to define the internal opening. Identification was aided, if necessary by a dilute hydrogen peroxide injection through the external opening. The track of the fistula was identified (**Figure 1 and 2**), curettage performed, and a size 1/0 silk seton was inserted, and kept tight (**Figure 3 and 4**). After discharge, patients were scheduled for outpatient visits at 1, 3 and 6 months. Additional visits were arranged for cases with prolonged discharge or to arrange for retightening of the seton. Data on baseline characteristics, details of presentation, fistula etiology and anatomy, surgery and surgical outcomes were analyzed. During the follow-up period, details of wound healing, postoperative complications (bleed-

ing, nausea, vomiting, urinary dysfunction) and time of resumption of work were recorded. Late complications such as fistula recurrences were defined as persistent discharge from the perianal wound after/during the first year postsurgery. Flatus and liquid incontinence and re-interventions were assessed and recorded.

SPSS version 16 (IBM, United States) was used for data analysis. The chi-square or Fisher exact test was used to compare categorical variables, an unpaired *t* test for continuous parametric data, and the Spearman rank correlation test for correlation of variables. A *P* value <.05 was considered statistically significant and *P*<.01 was considered highly statistically significant.

## RESULTS

Of 51 patients, 43 were male (84.3%) and 8 were female (15.7%). The mean age was 44 years (range 31-57 years). Thirteen (25.5%) were diabetic, 27 smoked tobacco (52.9%) and 21 (41.2%) had previous perianal surgery (**Table 1**). Forty-eight (94.1%) patients had normal resting and squeeze tone (**Table 2**). Incontinence to flatus occurred in 8 (9.9%) patients post-operatively and incontinence to fluid stools in 3 (5.9%) patients postoperatively. There was no statistically significant difference between pre- and post-operative continence (**Table 3 and Figure 5**). Ten (19.7%) cases re-



**Figure 1.** High perianal fistula.



**Figure 2.** High perianal fistula.



**Figure 3.** Application of cutting seton.



**Figure 4.** Application of cutting seton.

**Table 1.** Demographic and clinical characteristics.

Variables	No.	%
Gender		
Male	43	84.3
Female	8	15.7
BMI		
Under weight	0	
Average	18	35.3
Overweight	16	31.4
Obese	15	29.4
Morbid obesity	1	3.9
Comorbid conditions		
DM	13	25.5
BPH	1	1.9
CABAG/IHD/HTN	1	1.9
HTN	2	3.8
MVR	1	1.9
BA	1	1.9
Renal Transplant	1	1.9
SLE	1	1.9
Tobacco smoking	27	52.9
Previous perianal surgery	21	41.2
Steroid	4	7.8
Age (mean and standard deviation)	44 (13)	(20-74)

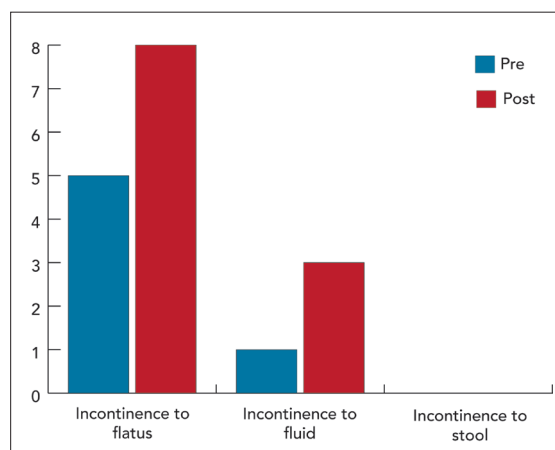
**Table 2.** Preoperative data.

Variables	No.	%
Resting tone		
Normal	48	94.1
Mild	3	5.9
Moderate	0	0
Severe	0	0
Squeeze tone		
Normal	48	94.1
Mild	3	5.9
Moderate	0	0
Severe	0	0

**Table 3.** Pre and postoperative changes in continence.

Variables	Preoperative	Postoperative	P
Incontinence to flatus	5 (9.8)	8 (15.7)	.37
Incontinence to fluid stool	1 (2)	3 (5.9)	.23
Incontinence to solid stool	0	0	-

Values are number (%).



**Figure 5.** Pre and postoperative changes in continence.

**Table 4.** Postoperative data.

Variables	No.	%
Duration of discharge (wk)	13 (6)	2-48
Intervention		
None	41	80.3
Retightening	10	19.7
Recurrence rate	5	9.8
Healing duration (wk) (mean and standard deviation, range)	10.6 (7)	4-40

quired re-tightening and 5 (9.8%) had recurrence. The mean (standard deviation) healing duration was 10.6 (7) weeks with a range of 4 to 40 weeks (Table 4). There was a statistically significant positive, but weak correlation between healing period versus distance of the external opening of the fistula from the anal verge ( $R^2=0.222$ ) (Figure 6), but no significant correlation between age and BMI (Table 5). Diabetes, smoking and previous perianal surgery were unrelated to healing time (Table 6). Incontinence was more frequent among females ( $P=.02$ ), but was unrelated to other demographic and clinical variables (Table 7). Recurrence was unrelated to demographic and clinical variables (Table 8).

## DISCUSSION

Managing a complex fistula in ano can be a daunting task for most surgeons largely due to the two major dreaded complications: recurrence and fecal incontinence.<sup>8</sup> We evaluated the cutting seton for treatment of perianal fistula. The rate of inter-sphincteric fistulae reported in literature is 70%, based on the Parks classification.

**Table 5.** Correlation between healing times for different parameters.

Variables	Healing time	
	r	P
Age	-0.14	.33
BMI	-0.09	.68
Distance from anal verge	0.47	.001

**Table 6.** Relationship between healing times and diabetes, smoking and previous perianal surgery.

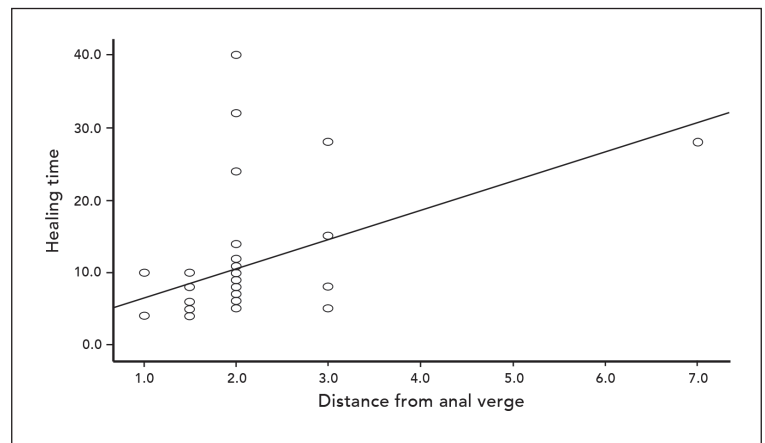
Variables	Healing time		T	P
	Mean	SD		
DM				
No	10.7	2	0.42	.55
Yes	10.1	2.3		
Smoking				
No	10	2.2	0.4	.65
Yes	11	3		
Previous perianal surgery				
No	10.9	3	0.3	.78
Yes	10.2	2.5		

Twenty-five percent of fistulae are trans-sphincteric, 5% are supra-sphincteric and 1% extra-sphincteric.<sup>1</sup> In our study, 52.9% of patients were smokers; recent smoking is a risk factor for anal abscess/fistula development. Anal abscess/fistula is one of several chronic, inflammatory cutaneous conditions associated with smoking.<sup>9</sup> Our patients were mostly male (84.3%), which is consistent with a hypothesis of increased local androgen conversion in anal glands.<sup>10</sup> Twenty-one (41.2%) of our patients had previous perianal surgery, which is a slightly higher incidence than the 33% reported by Cariati.<sup>2</sup> Current surgical techniques for treating anal fistulas are based on three main principles: identification of the tract and the internal opening, excision of the fistula tract, and preservation of anal sphincter function. Seton application is one operative method that preserves the function of the sphincter muscle and reduces incontinence when compared with other methods.<sup>11</sup> Compared with our healing rate of 90.2% by the end of the study. Montes et al<sup>12</sup> had a healing rate of 45% at 1 month post surgery and 100% by 3 months. In another study, 13 complete healing occurred in all patients within 3 months; recurrent fistula was noted in one patient (3.3%) at 5 months while none developed incontinence. They concluded that

**Table 7.** Relationship between incontinence and demographic and clinical variables.

Variables	Incontinence		Test statistic	P
	No	Yes		
Gender			8.23*	.02
Male	41(89.1)	2(4)		
Female	5(10.9)	3(6)		
BMI			7	.09
Under weight	17(37)	1(2)		
Average	13(28.3)	3(6)		
Overweight	15(32.6)	1(2)		
Obese	1(2.2)	0		
DM			0.61*	.37
No	35(76.1)	3(6)		
Yes	11(23.9)	2(4)		
Steroid			1.1	.34
No	43(93.5)	4(8)		
Yes	3(6.5)	1(2)		
Smoking			0.8	.89
No	21(45.7)	3(6)		
Yes	25(54.3)	2(4)		
Previous perianal surgery			3.4	.18
No	29(63)	1(2)		
Yes	17(37)	4(8)		
Age (mean and standard deviation)	44 (3)	42.6 (4.5)	0.9	.77

Values are n and percentage unless noted otherwise. Test statistic is chi-square unless noted otherwise: \*Fisher



**Figure 6.** Correlation of healing time with distance from anal verge ( $r^2=0.222$ )

**Table 8.** Recurrence versus demographic and clinical variables.

Variables	Recurrence		Test statistic*	P
	No	Yes		
Gender				
Male	37 (82.2)	5 (100)	1.06*	.41
Female	8 (17.8)	0		
BMI				
Underweight	15 (33.3)	2 (40)	.7	.81
Average	15 (33.3)	1 (20)		
Overweight	13 (28.9)	2 (40)		
Obese	2 (4.4)	0		
DM				
No	34 (75.6)	4 (80)	0.048*	.56
Yes	11 (24.4)	1 (20)		
Steroid				
No	41 (91.1)	5 (100)	.5	.70
Yes	4 (8.9)	0		
Smoking				
No	20 (44.4)	4 (80)	Fisher	.15
Yes	25 (55.6)	1 (20)		
Previous preanal surgery				
No	26 (57.8)	4 (80)	Fisher	.32
Yes	19 (42.2)	1 (20)		
Age (mean and standard deviation)	43 (3)	43.6 (4)	.67	.90 <sup>#</sup>

Values are number (percentage) unless noted otherwise. Test statistic is chi-square unless noted otherwise: \*Fisher <sup>#</sup>unpaired t test.

treatment of high fistula-in-ano with a cutting seton is associated with a low complication rate and can be recommended as the standard treatment for high fistula-in-ano. Contrary to these results, Ritchie et al<sup>14</sup> reported high incontinence rates from the use of cutting setons, suggesting that this commonly used therapy can damage the continence musculature. Also Hämäläinen and Sainio<sup>15</sup> reported that two patients (6%) had recurrence

of fistula and 22 patients (63%) reported symptoms of minor impairment in anal control. They concluded that a cutting seton yields fairly good results, but the risk of anal incontinence, even though minor, seems too high to recommend its routine use for all high fistulas. In a systematic literature review of 18 studies by Vial et al, a recurrence rate of 5.0% occurred in the patients with preservation of internal anal sphincter group (PIAS group) and 3.0% in patients with surgical division of the internal anal sphincter (SIAS group). They found also an overall fecal incontinence rate of 5.6% in the PIAS group and 25.2% in the SIAS group. They concluded that intra-operative preservation of internal anal sphincter at the time of seton insertion for anal fistula reduces postoperative fecal incontinence without a substantial increase in recurrence rates.<sup>16</sup> Another study with comparable results showed that one patient (2%) subsequently developed fecal incontinence, and four (9%) developed a recurrent or persistent fistula in the same location. They concluded that adjustable cutting setons had a high success rate and low risk of complications.<sup>17</sup>

Our study excluded patients with low fistulas, Crohn fistulas, perianal abscesses and patients with major incontinence. There is no difference in incontinence rates between the cutting seton and fistulotomy for low fistulas. Crohn disease is not treated by the cutting seton. In the setting of acute perianal abscess fistulas are not usually treated but postponed until after healing of the abscess if they persist. Patients with major incontinence will be made worse with the cutting seton.

In conclusion, some surgeons will continue to use the cutting seton, convinced of its merits while others are completely against its use, claiming high incontinence and recurrence rates. In our opinion the cutting seton can be a valid option for complex fistula in ano, but in female patients and those with previous perianal surgery, consideration of other surgical options is advised.

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