

# Pulling Seton: Combination of mechanisms

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## Abstract

**Background:** Seton-based techniques are among popular methods for treating high type anal fistula. These techniques are categorized to cutting and noncutting regarding their mechanism of action. In this report we are about to describe a new technique, which is a combination of both mechanisms; we call it Pulling Seton.

**Materials and Methods:** In this technique after determining internal and external orifice of fistula, fistulectomy is done from both ends to the level of external sphincteric muscle. Finally, a remnant of fistula, which remains beneath external sphincteric muscle is excised, and Seton is passed instead of it and tied externally. After the wound heals, patient is asked to pull down the Seton for 3–4 min, 4 times a day. We prospectively enrolled 201 patients with high type anal fistula in this study.

**Results:** Seton gradually passes through external sphincteric muscle till it is displaced outwards or removed by a surgeon via a small incision. 94% of patients treated by this method accomplished their treatment completely without recurrence. None of the patients developed permanent fecal or gas incontinence. Only 5% of patients developed with recurrence of fistula. Since Seton traction is not permanent in this technique, Seton cuts external sphincter slowly, and minimal rate of incontinence is reported.

**Conclusion:** Pulling Seton seems to be an efficient way in treating high type anal fistula with minimal rate of recurrence and complications such as incontinence and authors suggest further randomized studies to compare its efficacy with other Seton-based techniques.

**Key Words:** Anal fistula, external anal sphincter, incontinence, Seton

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## INTRODUCTION

Regarding American society of colon and rectum surgeons guideline, the aim of treating anal fistula is to obliterate the internal orifice and all associated epithelialized tracts with minimal sphincter division. Using Seton converts an inflammatory reaction to a foreign body reaction with subsequent perisphincteric fibrosis.<sup>[1]</sup> Treating anal fistula with Seton was first described by Hippocrates, who used horse hair as

Seton.<sup>[2]</sup> The technique developed during the time and now has lots of modifications. Using Seton is associated with the least rate of complications such as incontinence and recurrence.<sup>[2]</sup> However, the recurrence rate of 22–39% is considered in different studies using Seton.<sup>[3]</sup>

Lots of Seton-based techniques have been described in managing anal fistula based on the variation in Seton material, insertion technique, way of maintaining

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tension on Seton and Seton mechanism of action. Regarding their mechanism of action, Setons are considered loose (or noncutting)<sup>[4]</sup> versus tight (or cutting).

Loose Seton works as a drain, which may remain in place for a long-time. Sometimes, it makes the fistula persistent by stimulating fibrosis around it. Tight Seton has its own complications. It needs to be tightened several times after surgery. Moreover, tight Seton may cause severe pain and results in fecal or gas incontinence due to a short-time for healing of sphincter after cutting it.<sup>[5,6]</sup>

This report introduces a new Seton-based method in managing anal fistula, which its mechanism is an alternative for both loose and tight Seton. The aim of this study is to introduce “Pulling Seton” technique and reveal the outcome of the procedure in patients with high type anal fistula.

## MATERIALS AND METHODS

In this study, from September 2004 to September 2011, 201 out of 700 patients who were referred to our colorectal clinic and diagnosed as a high type perianal fistula underwent this method of treatment.

Patients who suffered from severe underlying diseases such as cancer, immune deficiency disease, diabetes mellitus, inflammatory bowel disease (IBD), cirrhosis, renal failure or steroid consumption were excluded.

This study was approved by the Ethic Committee of Shiraz University of Medical sciences. A written consent form was taken from all patients who accepted to be included in this study.

All operations were performed under general anesthesia in lithotomy and gat knife position. After skin preparation and draping, an incision was given at the site of external orifice of fistula through skin and subcutaneous tissue to external sphincteric muscle. Furthermore, an incision was given at the site of the internal orifice of fistula through mucosa, skin, internal sphincteric muscle and subcutaneous tissue to external sphincteric muscle. As a result, only external sphincter muscle was preserved. Then the whole fistulus tract was dissected free and removed. After that a nylon number 1 United States Pharmacopeia was passed through the site of fistulous tract beneath external sphincteric muscle as a Seton and the ends of nylon were tied with multiple knots but with no pressure on external sphincteric muscle. It is important to tie nylon in a way to create

a handle of about 10 cm for future manipulation by patient [Figures 1 and 2].

After surgery, daily sitz bath helped the wound heal by retraction of fistulous space interior and exterior to external sphincter muscle. Process of healing took about 2–4 weeks depending on the length and depth of the wound.

When the wound was healed partly, all patients were asked to pull down the Seton 4 times a day, each time for about 4 min. During pulling down the Seton, patient must feel the pressure on her/his sphincteric muscle. This pressure causes little necrosis, which cuts off the sphincteric muscle fibers slowly till Seton is completely displaced out. During intervals of pulling down there is no pressure on the sphincter.

Patients were asked to repeat this pulling down until Seton passed through external sphincteric muscle and reached to the subcutaneous tissue. Then either Seton passed through the skin by continuing the pulling down or was removed with superficial incision of skin and sub-cutaneous tissue under local anesthesia [Figure 3].

Regarding complications, all patients were followed in regular intervals till healing was complete and 2–8 years after full recovery; every 4 months in the 1<sup>st</sup> year, every 6 months in the 2<sup>nd</sup> year and annually afterwards for recurrence of fistula.

Recurrence was confirmed by the appearance of new external orifice with discharge and palpable fistulous tract or by endoanal ultrasonography and fistulography.

## RESULTS

From September 2004 to September 2011, 201 out of 700 patients suffering from the high type anal



**Figure 1:** Nylon number 1 United States Pharmacopeia passed through tracked and tied



**Figure 2:** Nylon number 1 United States Pharmacopeia passed through tracked and tied

fistula were included in this study. They were treated with our surgical technique, named Pulling Seton by consultant surgeons in the department of Colorectal Surgery of Shiraz University of Medical Sciences, Shiraz, Iran.

A total of 146 patients were male with a mean age of 38 years old and 55 were female with a mean age of 34 years old. Mean follow-up time after surgery was 66 months ranging from 2 to 8 years.

56% of patients had been operated at least once before recurrence, and 5% had been previously operated for more than 5 times using various methods of surgery. In clinical evaluation and paraclinical work ups, 195 patients (97%) had trans-sphincteric, and 6 (3%) had supra-sphincteric fistula. Mean time for treatment of fistula and removal of Seton was 11 weeks with minimum time of 4 weeks and maximum time of 13 months.

Using Wexner scoring, none of the cases presented with major fecal incontinence. Six of patients developed with transient gas incontinence, which resolved within 8 weeks. Nine patients (5%) developed with recurrence of fistula. 175 patients (87%) were treated with no need to change Seton, but 26 patients (13%) needed changing or tightening of the Seton due to loose ties. Most of the times, this was done with no anesthesia in the clinic.

In six patients (3%), we inserted the second Seton using general anesthesia because the first Seton came out before treatment was finished. In 30 cases (15%) we incised skin and subcutaneous tissue under local anesthesia to remove Seton.

Using Pulling Seton method, we observed complete treatment in 95% of patients. For the other 5% who



**Figure 3:** Seton reached to skin and subcutaneous tissue

came back with a recurrence treated was completed using other methods such as fistulectomy and advancement flap.

## DISCUSSION

This report introduces a modified Seton-based technique in the treatment of high type perianal fistulas whose efficacy has been tried in 201 patients during an acceptable follow-up. Treatment of perianal fistula, especially the high type one is always a compromise between recurrence and incontinence, and as presented above, the examined technique has low postoperative fecal incontinence and acceptable recurrence. Some studies showed that 4–5% rate of release and 0–5% rate of incontinence is accepted for any type of Setons.<sup>[7]</sup>

In different studies, rate of incontinence after Seton fistulotomy varies from 0% to 70%;<sup>[8]</sup> thus the recurrence rate of 5% for this method seems to be acceptable. Overall rate of incontinence after Seton-based surgeries for perianal fistula varies between 5.6% and 25.2%<sup>[9]</sup> while in Pulling Seton method minimal rate of incontinence is observed.

Using traditional cutting Seton is associated with high incidence of postoperation fecal incontinence. For example, 67% of patients with suprasphincteric fistula might develop fecal incontinence.<sup>[10]</sup>

Minimal damage to external anal sphincter describes the low rate of postoperative fecal incontinence in this technique. This can be due to intermittent pressure on fistulous tract since constant pressure induces rapid tearing of sphincteric muscle fibers especially in inflammations such as IBDs.<sup>[11]</sup> Although cases of IBD were excluded from this study, this method seems to be useful in the treatment of IBD related fistula.

**Table 1: Demographic features of included patients**

Feature	Number of patients (%)
Sex	
Male	146 (72.6)
Female	55 (27.3)
Mean age	
Male	38
Female	34
Location of fistula	
Trans-sphincteric	195 (97)
Supra-sphincteric	6 (3)

**Table 2: Main outcomes of using Pulling Seton method for treatment of high type perianal fistula**

Outcomes	Number of patients (%)
Recurrence	9 (5)
Incontinence	
Gas	6 (3)
Fecal	0
Accomplished treatment with Pulling Seton method	191 (95)
Need for other surgical interventions (flap, etc.)	9 (5)

Since the tension on the sphincter is put by the patient, probable prolonged healing due to low strain should be considered as a weak point of Pulling Seton method. The method of study also has some weak points such as being a noncontrolled trial and use of Wexner scoring for postoperation evaluation.

Considering the above mentioned, "Pulling Seton method" seems to be an efficient way in treating high type perianal fistula but the technique worths more investigation and authors recommend more trials

especially randomized controlled ones to demonstrate its efficacy [Tables 1 and 2].

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### Conflicts of interest

There are no conflicts of interest.

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