

# Zinc oxide, lidocaine, hot water, and lateral internal sphincterotomy for fissure-in-ano: Randomized controlled study

Serden Ay<sup>1</sup>, Mehmet Ali Eryilmaz<sup>2</sup>, Ahmet Okus<sup>3</sup>, Nergis Aksoy<sup>1</sup>, Baris Sevinc<sup>2</sup>, Omer Karahan<sup>4</sup>

<sup>1</sup>KTO Karatay University, Faculty of Medicine, Department of General Surgery, Konya, Turkey

<sup>2</sup>Saglik Bilimler University, Department of General Surgery, Konya, Turkey

<sup>3</sup>Medicana Konya Hospital, General Surgery, Konya, Turkey

<sup>4</sup>Usak University, Faculty of Medicine, Department of General Surgery, Usak, Turkey

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## Abstract

**Aim:** Aim of this study is to compare the effect of zinc oxide pomade, lidocaine pomade, hot water sitting bath and lateral internal sphincterotomy for treatment of chronic anal fissure in terms of healing and complications.

**Material and Methods:** One hundred and forty five patients who were diagnosed with chronic anal fissure between May 2011 and September 2012 at our clinic were enrolled for this prospective randomized trial. All cases were randomized into four groups. Group 1: The patients would apply 15% of zinc oxide pomade twice a day after the 10 minutes of hot water sitting bath. Group 2: The patients would apply 5% of lidocaine pomade twice a day after the 10 minutes of hot water sitting bath. Group 3: The patients would make only 10 minutes of hot water sitting bath twice a day. Group 4: Lateral internal sphincterotomy was performed to the patients. Healing rates, recurrences, changes in symptoms after the treatment and complications were recorded.

**Results:** There were not any difference within the groups in terms of age and gender. The healing in the Sphincterotomy group significantly much more when compared to the other groups at both the third and the sixth weeks ( $p < 0,001$ ). The other groups were similar with the each other ( $p > 0,05$ ).

**Conclusion:** LIS is superior to zinc oxide, lidocaine or hot water applications. There was no difference between the non-operative treatments.

**Keywords:** Zinc Oxide; Chronic Anal Fissures; Medical Treatment.

## INTRODUCTION

An anal fissure is among the most common disease of the anal region and is an ulcer in the form of a linear cut or tear between the anal verge and linea dentata. Anal fissures can be classified as acute and chronic fissures. Although seen in all age groups, they are more common in young and middle-aged patients. It affects both sexes equally. Although conservative approaches and medicinal treatments are successful within the acute period, surgery is prevalent in the chronic stages.

Medical and surgical treatments have been mainly used in the treatment of fissures. In the medical (chemical sphincterotomy) treatment, agents like topical glyceryl trinitrate (GTN), calcium channel blockers like nifedipine

or diltiazem, Botulinum toxin, L-arginine and gonyautoxin have been tried. In a review by Nelson et al., 15 pharmacological agents have been tested so far to treat chronic anal fissure disease (1). Zinc repairs tissues and facilitates quick healing of wounds and is a necessary trace element for the human body (2). Zinc can be administered orally (3) or topically. Zinc oxide pomade was used for the skin irritations, external ulcers (decubitus, varicose, diabetic), sunburn, non-infected wounds and burns (4,5).

There is no study about zinc oxide for the healing of chronic anal fissure in literature. So we aimed to compare the effects of zinc oxide pomade, lidocaine pomade, plain sitz bath and lateral internal sphincterotomy on the treatment and complications of chronic anal fissures (CAF).

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**Corresponding Author:** Serden Ay, KTO Karatay University, Faculty of Medicine Department of General Surgery, Konya, Turkey  
E-mail: serdenay@yahoo.com

## MATERIAL and METHODS

This prospective randomized trial was conducted on 145 patients who were diagnosed with chronic anal fissure between May 2011 and September 2012 at our clinic. The trial was approved by a legally qualified ethics review committee. The study was completed with 138 patients as 7 of the patients could not be reached after the treatments and thus were removed from the study. Information recorded on the patients within the scope of this study consist of the age, sex, symptoms (pain and bleeding), the quadrant where the fissure is located in the physical examination, the treatment applied, the changes in symptoms (pain and bleeding) after the treatment, the changes observed in the post treatment physical examination, the complications arising from the treatment (perianal irritation, incontinence, postoperative hemorrhage). The patients were informed of the procedures and informed consent forms were received. Chronic anal fissure was defined as a fissure where the pain and bleeding complaints last over 6 weeks with sentinel pile, hypertrophied anal papillae and the visible exposure of the anal sphincter fibers at the ulcer floor. Patients under the age of eighteen or those with hemorrhoids, Crohn's disease, tuberculosis, sexually transmitted disease and anal cancer were not included in the study. Patients with systemic diseases, those being treated for another disease, and those who were pregnant and lactating, were also not included in the study. Patients were randomly divided into 4 groups following simple randomization procedures (computerized random numbers).

Group 1: Patients were instructed to sit in sitz baths twice a day for 10 minutes at a time for 6 weeks, after drying themselves, apply 15% zinc oxide pomade (Zinc oxide pomade, Bikar İlaç San. Ve. Tic. Ltd. Şti., Istanbul, Turkey) the size of a rice grain around the anus and up to 1 cm into the anal canal twice a day.

Group 2: Patients were also instructed to sit in sitz baths for 10 minutes a day for 6 weeks and were told to apply 5% lidocaine pomade (Anestol pomade, Sandoz Ürünleri İlaç Gıda Kimya ve Tohum San. A.Ş. Istanbul, Turkey) the size of a rice grain around the anus and up to 1 cm into the anal canal twice a day.

Group 3: The patients were only advised to sit in the sitz bath twice a day for 10 minutes. No additional treatment was applied.

Group 4: Patients were operated in the lithotomy position under the influence of spinal anesthesia. Dermis and subcutaneous tissue were passed with an incision at 3 o'clock position about 1 cm from the anus and 1 cm in size. Through this incision, the internal anal sphincter was freed with a dissection from subdermal and intersphincteric area to the pectineal line. The internal sphincter was removed with a clamp and cut under direct vision. Excision of the anal papilla, fissure and sentinel pili was not performed.

All groups were instructed to feed on fiber-rich food and,

if necessary, stool softeners were prescribed. No pain medication was administered to the patients. All patients were invited for controls by the same surgeon at 3 and 6 weeks and were evaluated for symptoms (pain, bleeding and itching), physical examination and complications. Recovery was considered as the absence of symptoms and the absence of (in the physical examination) fissures (re-epithelization). Patients with improvement were evaluated for recurrence after 3, 6, 12 months. In all patients, pain was the most important complaint. For this reason, the pain was assessed according to the visual analogue scale (VAS) before the treatment and 3 and 6 weeks after treatment.

MedCalc® v12.6.1. software program was used for statistical analysis while evaluating the findings of the study. The mean standard deviation was used in the evaluation of the data from the study. ANOVA analysis was used for comparisons between groups while Tukey's test was used in sub group comparisons, paired t-tests were used in evaluating the values of a group before and after the treatment, Chi-square test was used in the qualitative analysis of the data. The results were evaluated in a 95% confidence interval and a significance level of  $p < 0.05$ .

## RESULTS

Group 1 consisted of 38 patients treated with zinc oxide, group 2 with 37 patients treated with lidocaine pomade, group 3 with 31 patients treated with only sitz baths, and group 4 with 32 patients treated with sphincterotomy. There were no age and gender differences between the groups ( $p > 0.05$ ). The demographic distributions of the groups are summarized in Table 1.

The most common symptom in all groups was pain. There was no significant difference between the groups in terms of symptoms ( $p > 0.05$ ).

In the evaluation of all groups, the fissure was usually found to be located posteriorly. However, there was no statistically significant difference between groups in terms of the location of the fissure ( $p > 0.05$ ).

There was no difference between sentinel pile and hypertrophied anal papilla when assessing fissure components ( $p > 0.05$ ). When the mean symptom durations were considered, the groups were similar ( $p > 0.05$ ). All data are summarized in Table 2.

There was no statistically significant difference between groups according to pain scores before and after treatment (VAS) ( $p > 0.05$ ) (Figure 1); the decrease in the pain scores at both the 3rd week and the 6th week after treatment when compared to the pain scores before treatment in both groups was statistically significant ( $p < 0.01$ ).

The improvement in the sphincterotomy group (Group 4) was significantly higher ( $p < 0.001$ ) compared to the other groups at both week 3 and week 6. The other groups were similar ( $p > 0.05$ ) (Table 3).

	Group 1 (n=38)	Group 2 (n=37)	Group 3 (n=31)	Group 4 (n=32)	p değeri
Age (yıl)	35.1±11.8	35.1±15.5	33.9±12.3	37.8±12.1	0.67
Sex (%)					
Female	24(63.1)	21(56.7)	18(58)	17(53.1)	0.86
Male	14(36.9)	16(43.3)	13(42)	15(46.9)	

	Group 1 (n=38)	Group 2 (n=37)	Group 3 (n=31)	Group 4 (n=32)	p değeri
Mean time of symptoms (week)	14.5	13.6	14.7	14.1	0.88
Position of fissure (%)					0.97
Anterior	4(10.5)	4(10.8)	2(6.5)	3(9.4)	
Posterior	32(84.2)	31(83.8)	28(90.3)	27(84.4)	
Multipl	2(5.3)	2(5.4)	1(3.2)	2(6.3)	
Symptoms					
Pain	34/38	35/37	27/31	24/32	0.10
Bleeding	18/38	22/37	19/31	22/32	0.32
Itching	7/38	5/37	8/31	7/32	0.62
Constipation	30/38	32/37	28/31	25/32	0.47
Skin tag (%)	24(63.2)	25(67.6)	23(74.1)	23(71.9)	0.76
HAP (%)	19(50)	13(35.1)	15(48.3)	18(56.3)	0.34
Skin tag+HAP	4(10.5)	8(21.6)	6(19.4)	7(21.9)	0.54

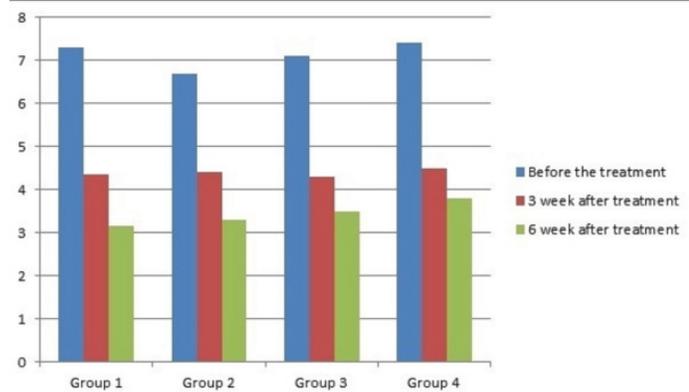


Figure 1. Comparison of VAS Scores

Group	n	Healing	Non-healing	Healing	Non-healing
Group 1	38	10(%26.3)	28(%73.7)	16(%42.1)	22(%57.9)
Group 2	37	8(%21.6)	29(%78.4)	14(%37.8)	23(%62.2)
Group 3	31	6(%19.3)	25(%80.7)	10(%32.2)	21(%67.8)
Group 4	32	29(%90.6)*	3(%9.4)	30(%93.7)*	2(%6.3)

\*p<0,001

Twelve months later, when all groups were evaluated for recurrence after treatment, this rate was found to be 6.6% in the sphincterotomy group, significantly lower than other groups (p<0.001). Other groups were similar.

When complications were considered, 2 patients in the sphincterotomy group (Group 4) were found to have a Cleveland Clinic Incontinence Score (CCIS) of 8, and better continence scores were observed at later follow-ups. None of the patients had perianal irritation or ecchymosis.

## DISCUSSION

Anal fissure is a painful ulcer formed in the anal mucosa between the mucocutaneous junction and the linea dentate. It is a common anorectal disease that can be seen in any age group. It is most commonly observed in patients in 30s and 40s age groups. It is seen in equal distribution among men and women. In our study, the age and gender of the patients were in accordance with the literature.

The most popular theory on the development of anal fissure posits that their development is ischemic. Autopsy studies most commonly observe fissures in the posterior aspect of the distal anal canal as there is minimal blood flow in this region. This is especially pronounced in patients with fissures (6). In most patients with chronic anal fissure, the anal canal resting pressure is high, which disrupts blood flow from the sphincter to the anal mucosa and preventing the healing of the fissure and increasing chronicity. The main aim of anal fissure treatment is to reduce the pressure created by the anal sphincter mechanism, to increase blood flow and to accelerate fissure healing (6-9).

Surgical treatment includes anal dilatation, fissurectomy, posterior sphincterotomy, open lateral internal sphincterotomy, closed lateral internal sphincterotomy and flap applications. Due to permanent anal incontinence after most commonly used surgical treatments like anal dilatation and sphincterotomy, alternative treatments have been sought (6,10-13).

In many medical facilities, GTN is used as the first step in the treatment of chronic anal fissures. However, side effects such as headache and tachyphylaxis have been reported (10,11,14-16).

Botulinum Toxin (BT) acts by inhibiting acetylcholine release from the presynaptic terminals. Nelson et al. reported that overall BT recovery was 67.5% and recurrence was around 40-50% in all BT-based studies (1,17,18). BT has complications such as anal incontinence (5-10%) and perianal thrombosis.

It should be noted that each of the methods such as nitric oxide (GTN), botulinum toxin, topical calcium channel blockers are effective; but surgical treatment is still the gold standard with achievement rates of 95-100% (11,19). In our study, the group treated with sphincterotomy was similar to the literature with a recovery rate of 93.7% and statistically exceeded the other groups. Our study showed

that the healing rates were very low with the medical treatments (lidocaine, zinc oxide and sitz bath) comparing with surgery.

Zinc repairs tissues and facilitates quick healing of wounds and is a necessary trace element for the human body (2). Zinc can be administered orally (3) or topically. In a double-blind trial, leg ulcers were reported to improve better with zinc oxide pomade compared to placebo. Antimicrobial, immunomodulator and cytoprotective properties constitute the clinical efficacy of zinc oxide (4,5,2021). No study was found for the treatment of chronic anal fissure in the literature review. In this study, zinc was chosen for its anti-inflammatory properties and as an agent that facilitates tissue healing and tissue repair and thus zinc oxide was compared with lidocaine pomade and sitz baths. Recovery rate with zinc pomade was 42,1%, although higher than lidocaine (37,8%) and sitz baths (32,2%), the difference is not statistically significant.

The sitz bath has long been used in anal pathologies such as hemorrhoids and fissures. Shafik et al have found that internal anal sphincter pressure is reduced during sitz baths (22). In patients with diseases in the anal region, this has been found to be true for 30 minutes after the end of the sitz bath (23). In this study, the recovery rate for patients treated with only sitz baths was 32,2%. There was no statistically significant difference in recovery compared to the groups treated with zinc oxide or lidocaine pomades. This suggest that reduction in the sphincter pressure alone also leads to recovery in patients.

Some studies have shown that in groups administered with lidocaine and GNT for anal fissure treatment, the number of patients reporting relief from symptoms is higher than the recovery rate, this implies that although relief from symptoms is achieved, the fissures do not heal (24,25). This brings to mind the need for a treatment that not will not only reduce sphincter spasms but also facilitate fissure healing.

Relieving anal sphincter pressure, facilitating wound healing and relieving inflammation in the region is the main goal of anal fissure treatment. It was for this reason that anal sphincter pressure was reduced with sitz baths and a pharmacologic agent to facilitate healing such as zinc oxide was chosen in this study. Although higher recovery rates were achieved with patients treated with zinc oxide and lidocaine compared to patients treated with only sitz baths, the difference is not statistically significant. We believe that for higher recovery rates, the use of pomades reducing anal sphincter pressure (such as BT, GTN, Diltiazem, ISDN etc.) in addition to zinc oxide pomades can be beneficial.

## CONCLUSION

In conclusion, LIS is superior to zinc oxide, lidocaine or hot water applications. There was no difference between the non-operative treatments.

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*Serden Ay ORCID: 0000-0001-9198-2342*

*Mehmet Ali Eryilmaz ORCID: 0000-0002-5280-3943*

*Ahmet Okus ORCID: 0000-0003-0391-2024*

*Nergis Aksoy ORCID: 0000-0002-0408-5190*

*Baris Sevinc ORCID: 0000-0001-5878-6649*

*Omer Karahan ORCID: 0000-0003-1822-9201*

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