#### Original Article

# Effects of External Washing Using Traditional Chinese Medicine Compared to Those of Using Sitz Baths in Post-hemorrhoidectomy Care

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#### Key Words

Hemorrhoidectomy; Traditional Chinese Medicine; Sitz bath **Purpose.** Surgery is considered if conservative treatment fails in patients with hemorrhoids. However, postoperative pain is the most common symptom that affects the quality of life of patients. Our study explored whether Traditional Chinese Medicine washing was more beneficial than warm sitz bath alone after hemorrhoidectomy.

*Material and Methods.* This prospective study recruited patients from June 2018 to 2019. We included patients (irrespective of gender) who were aged  $\geq$  20 years, and had undergone hemorrhoidectomy after being examined and diagnosed with hemorrhoid by physicians practicing Western medicine. The patients were divided into an external washing group and a warm sitz bath group after undergoing hemorrhoidectomy, and completed questionnaires daily for 15 days. The questionnaires included visual analog scale scores and the daily frequency of analgesic use. Afterwards, the level of healing was assessed by a surgeon 1 week postoperatively.

**Results.** Overall, 50 patients were included in this study, comprising 30 patients in the external washing group and 20 patients in the warm sitz bath only group. The mean daily visual analog scale score in post-operative day 5 to 8 were significantly lower in the external washing group (external wash group:  $3.01 \pm 1.94$  vs. warm water sitz bath group:  $4.31 \pm 1.94$ ; p = 0.02). A significant decrease in the dosage of analgesics from post-operative day 3 was also observed in the external washing group (external wash group: 3.13 tab  $\pm 0.46$  vs. warm sitz bath group: 3.70 tab  $\pm 1.09$ , p = 0.04). No significant difference was observed in the level of healing between both groups.

**Conclusion.** External washing in Traditional Chinese Medicine is effective in relieving postoperative pain and reducing the use of analgesics in the early postoperative period, without affecting healing.

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Several anorectal disorders including hemorrhoids, anal abscesses, fistulas, and anal fissures, are commonly encountered in clinical practice. Although treat-

ment methods may vary according to the severity and type of disorder, surgery may be considered if conservative treatment fails, as perpatients' choices, or

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in recurrent cases. However, postoperative pain, anal swelling, bleeding, infection, and even poor healing often occur.<sup>2,3</sup> Postoperative care includes regular warm sitz baths (twice a day and after each bathroom visit), antibiotic therapy, and use of ointments to promote wound healing; however, warm sitz baths are used routinely as adjunctive therapy.

Since hemorrhoidectomy often affects the quality of life of patients,5 with pain being the most common symptom, the pain relief effects of warm sitz baths may be beneficial in alleviating patients' pain after anorectal surgery. Additionally, a warm sitz bath may relax the internal anal sphincter, thereby reducing the pressure at the rectal neck, which has been speculated to be due to the thermosphincteric reflex. Moreover, warm sitz baths can promote anal blood circulation to facilitate wound healing.

However, an increasing number of studies have shown that warm sitz baths are not as good as previously reported in improving postoperative pain and wound healing,8 and that it would only increase patient satisfaction.9 Therefore, there is insufficient evidence regarding the effectiveness of postoperative warm sitz baths.

Traditional Chinese Medicine (TCM) has a long history, and has been widely used to treat several diseases worldwide, especially in China and many Asian countries, including Taiwan. Sitz baths in TCM has been recorded as an effective treatment for anorectal disorders as early as in the Recipes for Fifty-Two Ailments in the Han Dynasty. 10 For example, in the external application of TCM in patients with hemorrhoids, most treatment methods adopted Chinese herbal medicines with effects, such as promoting blood circulation, cooling the blood, clearing heat and detoxification, regulating Qi, and dissipating knots. These effects corresponded with the pathogenesis of hemorrhoids as believed in TCM, including Qi and blood stasis, endogenous damp-heat, and diffusion of dampness-heat downwards. Placing drugs in hot water and applying such solutions in a sitz bath allows the drugs to directly act on the target site via direct contact with the lesion as the actions of the drugs. Certain active ingredients in the liquid drug may be absorbed via the skin or granulation tissue on the wound surface to exert its pharmacological effects.<sup>11</sup>

Moreover, local and systemic blood and lymph circulationis promoted by heat, and this improves nutrient supply to local tissue and improves systemic function to promote drug penetration, which allows the drug to clear heat and remove toxins, and induce diuresis to improve edema, as well as have anti-infective, relieve pain, healing, and improve muscle tone to the greatest extent. Additionally, warm stimulation may reduce the excitability of pain receptors, alleviate inflammation and edema, and release the pressure on local nerve terminals to relax muscles, tendons, ligaments, and other tissues to obtain an obvious reduction of swelling and pain.<sup>11</sup>

Fumigation and washing using TCM are not only suitable for acute episodes of hemorrhoids, local swelling, and pain, but also for the promotion of repair and healing of wound surfaces postoperatively. Warm water vapor, as well as the fumigation and washing with medicinal liquids, can also warm the local Qi and blood meridians, promote local blood circulation, and strengthen the resistance of local tissues to diseases, thereby improving and restoring local function. Furthermore, fumigation and washing can be used to maintain local cleanliness, control lesions, reduce adverse stimulation, and promote repair and healing of wound surfaces. Optimal pain relief has also been observed when sitz bath is performed after the first defecation. 12 After collecting literature and classics, the compositions of various external bathing prescriptions were found to be similar. The drugs used in many classics are generally referred to for the formulation ideas, such as Ouedu decoction in The Golden Mirror of Medicine ("Yi Zong Jin Jian"), the Compound Sophora flavescens (CSF) in Experience Gained in Treating External Diseases ("Yang Ke Xin De Ji"), 10 and Wubeizi decoction in Selections in Treating External Diseases ("Yang Ke Xuan Cui").12

Adjustments were made based on the abovementioned formulas to develop a bathing formula with different combinations. For example, Portulaca oleracea from Quedu decoction for clearing heat, detoxifying and cooling the blood, and reducing edema; Zanthoxylum for detoxifying and relieving itching; and Saposhinkoviae Radix and Platycladus orientalis for dispelling pathogenic wind and removing dampness, which also helps to treat wind in the intestines and remove toxins from the viscera. The fistular onion stalk has a pungent odor and is warm by nature; hence, it helps to warm and smoothen the meridian. Radix Sophorae Flavescentis, Amur Corktree Bark, and Lonicera japonica in the CSF<sup>13</sup> are herbal medicines for clearing away heat, and for detoxification and clearing dampness-heat. Cnidium monnieri, Fructus Kochiae Scopariae, and Acorus calamus clear damp heat and relieve itching. The combination of various drugs was mainly aimed at resolving pre- and postoperative complications, relieving pain, and preventing postoperative wound infection. Studies have shown that most external washing formulas can relieve wound pain and provide local comfort. Moreover, they can also provide certain therapeutic effects by promoting wound healing and eliminating edema.<sup>11</sup>

Although many studies have analyzed various external washing prescriptions and warm sitz baths, rigorous empirical evidence are still insufficient. Therefore, this study incorporated the external washing prescriptions for hemorrhoids in ancient classics, with certain adjustments, along with warm sitz baths to explore whether it can improve postoperative pain, accelerate healing, and reduce the risk of postoperative infection, as well as to determine the postoperative efficacy of external washing formulas in patients with hemorrhoids.

# Materials and Methods

The protocol of this study was fully reviewed and approved by the Institutional Review Board of E-Da Hospital (EDAHP-107-048). The study was a single institution open-label randomized trial. Recruitment of participants began on June 1, 2018 and lasted for 1 year. Patient consent was provided to every patient who's willing to be included in the study. Overall, 64 patients were recruited and randomized to the TCM external washing group and the warm sitz bath group. Ten participants were excluded from the TCM external washing group. Four of them were excluded due to incomplete data; three of them cannot keep sitz bath twice per day; and three of them felt skin itching after TCM used. Four participants were excluded from the warm sitz bath group due to incomplete data. Hence, 30 participants were finally enrolled in the TCM washing group and 20 participants were enrolled in the warm sitz bath group (Fig. 1).

#### **Inclusion criteria**

Participants were included using the following criteria: (1) Both male and female patients; (2) patients who were over 20 years of age (inclusive); (3) patients whose medical history was obtained, had undergone physical examination, were diagnosed with

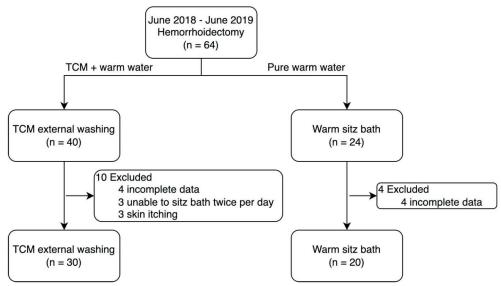


Fig. 1. Flowchart of patient selection. TCM, Traditional Chinese Medicine.

hemorrhoid by physicians practicing Western medicine, and had undergone hemorrhoidectomy; and (4) patients who were conscious and could voluntarily decide whether to participate in the study.

#### **Exclusion criteria**

(1) Patients under the age of 20 years; (2) pregnant or breastfeeding women; (3) patients with a history of kidney failure, liver cirrhosis, atrial fibrillation, chronic rheumatic heart disease, heart valve replacement surgery, low platelets, or mental illness; (4) patients with poor drug compliance; and (5) patients with acute infections, bleeding, or unstable vital signs.

# Protocol of post-operative care

Each patient took Ultracet (Tramadol 37.5 mg + Acetaminophen 325 mg/tab) 0 to 4 times per day for pain control. Depend on the severity of the pain, dosage of Ultracet was adjusted by patient. Besides, they also took Magnesium oxide (250 mg/tab) as stool softeners to keep stool passage once per day. All patients were educated to have warm sitz bath with or without TCM for 20 minutes twice per day, which was after defecation (or after getting up), and before going to bed. After hemorrhoidectomy, these patients were followed up at outpatient department every week. The condition of wound healing would be assessed by one colorectal surgeon until the wound was totally healed.

#### **Drug preparation**

The composition of each dose of the TCM drug is presented in Table 1.

#### **Treatment procedures**

One dose was prepared daily. After heating and concentrating the decoction to 100 mL, 3 L of water were added, and the mixture was placed in a hot water pot. When the temperature of the water was approximately 37 °C as measured by a thermometer. Use 1.5 L of the medicinal liquid at a time, and the entire anus should be soaked in the liquid for 20 minutes.

#### Assessment procedures

Eligible participants were asked to complete a questionnaire after taking a warm sitz bath or sitz bath with external washing daily from postoperative day 1 to day 15. The questionnaire included the postoperative daily visual analog scale (VAS) score and number of analgesics in the experimental and control groups.

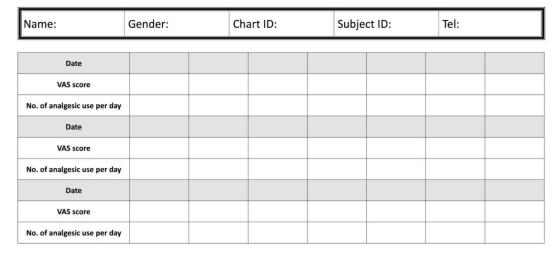
Meanwhile, the baseline data of the participants were recorded, including their basic data (such as age, gender, height, weight, and BMI), hemorrhoids, surgical procedure, operation time, whether a surgeon performed the operation, degree and scope of the operation, antibiotic use, analgesics, type of stool softeners, bowel habits, and level of healing (Fig. 2). The condition of wound healing would be recorded by colorectal surgeon.

# Statistical analysis

SPSS version 22.0 was used for statistical analysis. Categorical data, such as gender, bowel habits, and postoperative healing, were analyzed using chisquare tests. Continuous data such as age and body mass index (BMI), were analyzed using t-tests. Numeric data, including VAS score and analgesic dosage, were analyzed using t-tests to compare the intergroup differences. A p-value < 0.05 indicated a statistically significant difference.

Table 1. Ingredients of TCM herbal washes

Chinese name of the drug	Scientific name	Dose
馬齒莧 (Ma Chi Xian)	Portulaca oleracea	2 g
川椒 (Chuan Jiao)	Zanthoxylum	1 g
防風 (Fang Feng)	Saposhinkoviae Radix	1 g
側柏葉 (Ce Bai Ye)	Platycladus orientalis	2 g
黃柏 (Huang Bai)	Amur Corktree Bark	1 g
苦參 (Ku Shen)	Radix Sophorae Flavescentis	2 g
金銀花 (Jin Yin Hua)	Lonicera japonica	1 g
蛇床子 (She Chuang Zi)	Cnidium monnieri	1 g
地膚子 (Di Fu Zi)	Fructus Kochiae Scopariae	1 g
菖蒲 (Chang Pu)	Acorus calamus	1 g



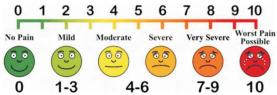


Fig. 2. Visual analog scale.

# Results

# Participants' data

A total of 50 participants were enrolled in this study, including 30 participants who used external washes and 20 who used warm sitz baths only. All participants received wedge hemorrhoidectomy. No significant differences were observed in age, BMI, gender, number of surgical quadrants, bowel habits, first-day

postoperative VAS scores, initial analysesic dose postoperatively, and the level of healing in the first week postoperatively (Table 2) between both groups.

#### VAS score

The average daily VAS scores were significantly different between the two groups on the 6th, 7th, 8th, and 9th days postoperatively (external wash group:  $3.33 \pm 2.13$ ,  $2.77 \pm 1.86$ ,  $2.10 \pm 1.81$ ,  $1.97 \pm 1.76$  vs.

Table 2. Basic data of the participants

Basic data	External washing with TCM		Warm sitz bath		.1
	(n = 30)	%	(n = 20)	%	<i>p</i> -value
Age (year)	51.8 ± 15.3		$50.15 \pm 12.06$		0.67
BMI $((Kg)/(M^2) \pm SD)$	$24.97 \pm 3.71$		$25.14 \pm 3.99$		0.87
Gender					0.19
Male	17	56.67	15	75.00	
Female	13	43.33	5	25.00	
No. of surgical quadrants					0.81
1 quadrant	11	36.67	8	42.11	
2 quadrants and above	19	63.33	11	57.89	
Bowel habit					0.49
Constipation or diarrhea	21	70.00	17	85.00	
Normal	9	30.00	3	15.00	
VAS score	$6.37 \pm 2.71$		$6.55 \pm 2.64$		0.79
Analgesic dosage (tab)	$3.30 \pm 0.92$		$3.55 \pm 0.83$		0.07

warm sitz bath group:  $4.65 \pm 1.59$ ,  $4.10 \pm 1.70$ ,  $3.70 \pm$  $1.79, 3.25 \pm 1.58, p = 0.03, .002, 0.00, and 0.01, re$ spectively). No significant differences were observed between the first 5 days (days 1-5) and the last 5 days (days 10-15) postoperatively (Fig. 3).

# Four-day mean VAS score

The mean VAS scores were significantly different between the two groups 5-8 days postoperatively (external wash group,  $3.01 \pm 1.94$  vs. warm water sitz bath group,  $4.31 \pm 1.94$ ; p = 0.02) (Fig. 4).

# Dosage of analgesics (tab)

Significant differences in the dosage of analgesics were observed between the two groups starting from 3 days postoperatively (external wash group:  $3.13 \pm$ 0.46 vs. warm sitz bath group:  $3.70 \pm 1.09$ , p = 0.04). Significant differences were also observed between

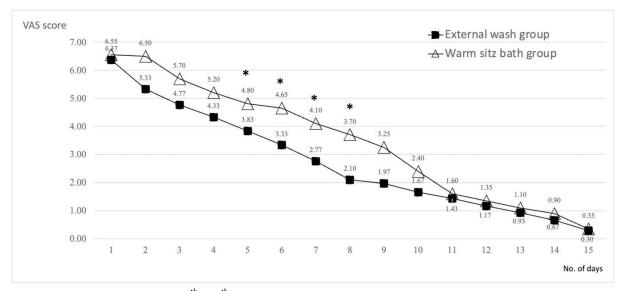


Fig. 3. VAS scores. VAS scores at  $5^{th}$  to  $8^{th}$  day are significantly lower in TCM external wash group. \* p-value < 0.05.

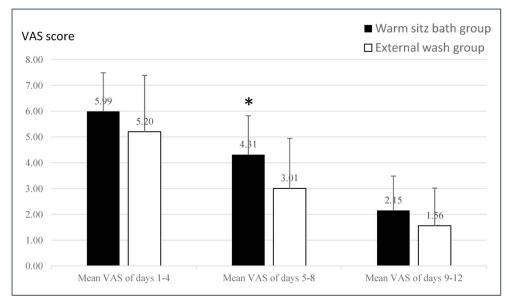


Fig. 4. Mean VAS scores. Mean VAS scores between 5<sup>th</sup> and 8<sup>th</sup> day are significantly lower in TCM external wash group. \* p-value < 0.05.

the two groups 4-7 days postoperatively (p = 0.01, 0.00, 0.01, 0.02, respectively). However, the most significant differences between the two groups were observed on the 8th and 9th days (external washing group:  $1.53 \pm 1.45$ ,  $1.23 \pm 1.43$  vs. warm sitz bath group:  $2.65 \pm 1.01$ ,  $2.55 \pm 0.97$ ; p = 0.00, 0.00, respectively). Furthermore, there was no significant difference between the two groups from day 10 to day 15 (as shown in Fig. 5).

# Level of wound healing

All patients were followed up at outpatient department for 2 to 4 weeks, according as if the wound was healed. Healing was compared between the two groups, and the participants were divided into those who were healed within 1 week and those who were healed after more than 1 week. No significant difference was observed in healing between the two groups (p = 0.42) (Table 3).

# Post-operative infection

There was no post-operative infection in both TCM external washing group and warm sitz bath group.

# Discussions

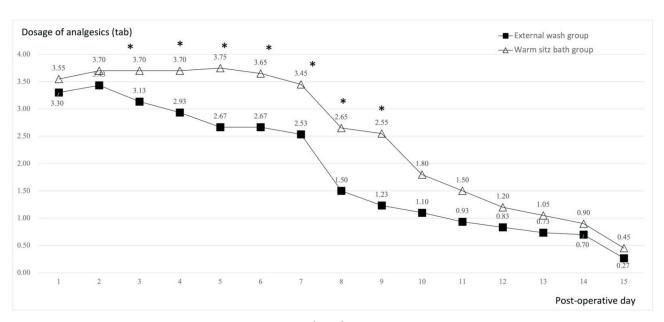
Hemorrhoidectomy is a standard and common treatment method; however, postoperative pain or obvious adverse effects, such as edema and poor wound healing, often occur. The leading causes of postoperative pain include tissue inflammation and wound infection at the site of surgical incisions. <sup>14</sup> Another cause of pain is the subsequent persistent spasm of the internal sphincter caused by inflammation and swelling. <sup>15</sup> Such pain often requires the use of analgesics during the early stages after hemorrhoidectomy.

Many Chinese herbal medicines used in TCM external washing have anti-inflammatory, antibacterial, burn repair, and wound healing effects. For example, as the main component of CSF, *Sophora flavescens* has anti-inflammatory, antibacterial, blood circulation

**Table 3.** Comparison of healing between the TCM external washing group and the warm sitz bath group

Group	TCM external washing group (n = 30)	Warm sitz bath group (n = 20)
Healed within 1 week	17	9
Healed after more than 1 week	13	11

p-values of Pearson's chi-square tests are shown.



**Fig. 5.** Dosage of analgesics. Dosage of analgesics at  $3^{rd}$  to  $9^{th}$  day are significantly lower in TCM external wash group. \* p-value < 0.05.

promotion, analgesic, and wound healing effects.<sup>13</sup> Therefore, it is often used to treat anorectal diseases and has many effects. From animal experiments, it can be seen that the mechanism of CSF in promoting wound healing may be the inhibition of inflammatory mediators, such as PGE2 and IL-8. Moreover, CSF has also been found to be effective and safe for the treatment of perianal ulcers. 10 Portulaca oleracea is commonly used in traditional Chinese medicine as an antipyretic, antiseptic, and insect repellant, with a wide range of applications. Its pharmacological effects included antibacterial, anti-ulcer, anti-inflammatory, antioxidant, and accelerated wound healing. Recent studies have focused on its anti-hemorrhoid properties, and it has been determined in animal experiments that butanolcontaining extracts of Portulaca oleracea can inhibit inflammatory substances, such as TNF-a, IL-6, and PGE2, thereby providing anti-hemorrhoid benefits.<sup>16</sup>

This study showed that external washing with TCM resulted in an earlier decrease in the VAS score. Furthermore, after the 5th day, external washing with TCM was shown to be more effective in improving the VAS score and decreasing the dosage of analgesics required compared to simply performing a warm sitz bath. However, pain relief was not obvious during the first 3 days postoperatively. Additionally, most patients had no more pain within less than 2 weeks postoperatively, and the wounds had mostly healed. Therefore, no difference was observed in pain relief during the postoperative recovery period between the TCM external washing group and the warm sitz bath group. Moreover, the two groups had no significant difference in wound healing. Therefore, it can be seen that the greatest benefits of external washing with TCM were that it alleviated postoperative pain in patients, reduced the dosage of analgesics, and enabled patients to return to normal life as soon as possible.

This study was limited by time, resources, and subject enrollment. Many factors had led to a decrease in the participants' willingness to participate in the project and increased obstacles to participating in the study. In addition, the lack of human resources to cooperate during the enrollment of participants led to an insufficient number of cases, which was another limitation of this study.

# Conclusions

External washing with TCM was effective in relieving postoperative pain and reducing the use of analgesics during the initial stage. However, this was an open study. Therefore, in addition to enrolling more cases to increase the sample size, further doubleblinded studies with placebo controls are required in future to produce better results to determine the postoperative efficacy of TCM formulas for external washing.

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# 原 著

# 中藥外洗方對於痔瘡術後患者之影響

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**目的** 在治療痔瘡時,若保守性治療失敗則需要考慮手術治療。早在漢代及記載著中藥 坐浴法為中醫治療臨床肛腸疾病的有效方法。因此,本文目的為探討是否能夠改善患者 術後疼痛、增加癒合之機會,釐清外洗方針對患者痔瘡術後的療效。

**材料與方法** 從2018年6月1日開始招募,期間持續一年。納入不分男女、大於20歲(含)、經西醫病史詢問、理學檢查以及診斷為痔瘡而進行痔瘡手術之患者。將病患分為中藥外洗組及純溫水坐浴組後,於術後15天內進行疼痛評估,並於術後一週時由外科醫師評估傷口癒合情形。

**結果** 共有 50 位病患被納入此次研究,分別為中藥外洗組 30 位及純溫水坐浴組 20 位。在術後第五到八天,術後疼痛指數之中位數在中藥外洗組皆有顯著較低(中藥外洗組 3.01 ± 1.94 vs. 純溫水坐浴組 4.31 ± 1.94, p=0.02)。從術後第三天開始,使用止痛藥的劑量在中藥外洗組也有顯著減少(中藥外洗組 3.13 顆 ± 0.46 vs. 純溫水坐浴組 3.70 顆 ± 1.09, p=0.04),而傷口癒合的狀態在兩組中並沒有顯著差別。

**結論** 在此研究中,中藥外洗配方可以在術後初期緩解疼痛並減少止痛藥的使用,而不 會影響傷口的癒合。但本次研究屬於開放性研究,未來除進一步收案擴大樣本,需要進 一步設計雙盲、加上安慰劑控制,來產生更好的結果藉此釐清中藥外洗方針對術後的療 效。

**關鍵詞** 痔瘡切除術、中藥、溫水坐浴。