

Clinical Study on the Effectiveness of Xian Fang Huo Ming Yin for Treating Cutaneous Infections and Promoting Wound Healing in Patients with Perianal Abscess

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Abstract: *Objective:* To explore the effect of the Xian Fang Huo Ming Yin (XFHM) for treating cutaneous infections and promoting wound healing in patients with perianal abscesses. *Methods:* Sixty-one patients with perianal abscesses who were admitted to our hospital (Xinghua City People's Hospital) from May 2022 to May 2023 were selected and randomly divided into two groups, a control group (30 cases) and a study group (31 cases). Both groups received surgical treatment. The control group received conventional treatment and warm water fumigation, sitz bath, and surgical dressing change after surgery, while the research group received XFHM based on the control group. XFHM was taken orally and replaced with warm water for fumigation and sitz bathing. Both groups received treatment for 4 weeks but discontinued sitz bathing after 2 weeks. Various clinical indicators between the two groups were compared. *Results:* The total clinical effective rate and wound recovery rate of the study group were higher than that of the control group. There were differences in the wound pain scores, surrounding tissue edema, and wound secretions at different time points. Both groups experienced wound pain. The scores of wound pain, surrounding tissue edema, and wound secretions of the study group were lower than those of the control group, 7 and 14 days after surgery. The serum interleukin 6 (IL-6), tumor necrosis factor- α (TNF- α) levels, and pH values of the study group were lower than those of the control group 10 days after surgery ($P < 0.05$). *Conclusion:* The application of XFHM for treating cutaneous infections and promoting wound healing in patients with perianal abscesses improved the treatment outcome, alleviated clinical symptoms, and promoted healing.

Keywords: Perianal abscess; Xian fang huo ming yin for treating cutaneous infections; Interleukin; Tumor necrosis factor; Wound healing

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1. Introduction

Perianal abscess is mostly caused by anal gland obstruction and infection and requires prompt treatment. If treatment is delayed, septic shock may occur. In severe cases, it may pose a significant threat to the patient's safety. Domestic treatment options for perianal abscesses mainly include incision and drainage. However, the

surgery is invasive. Due to the unique nature of the operation site and the high amount of bacteria in feces, the wound can be easily contaminated during excretion, resulting in poor patient prognosis. Therefore, improving the quality of postoperative wound healing has always been the focus of clinical research. Routine postoperative treatment options include antibiotics, warm water fumigation, sitz baths, and surgical dressing changes. Although antibiotics can eliminate perianal inflammation, they can also easily cause local hardness and swelling in the lesions. They can adversely affect the balance of intestinal flora and cause constipation, thus affecting wound healing. Warm water fumigation and sitz bathing utilize water temperature and drugs to promote local blood circulation, enhance immunity, and promote tissue recovery. However, the effect is limited and cannot effectively alleviate the patient's wound healing process and pain during dressing change ^[1]. Perianal abscess is known as anal carbuncle in traditional Chinese medicine (TCM). Abscesses are formed due to the accumulation of dampness and heat, poison, and yin deficiency. The main treatment option is surgery. Over time, TCM has effectively promoted myogenesis and removed putrefaction due to its unique effect in promoting wound healing and skin regeneration. Xian Fang Huo Ming Yin (XFHM) is a heat-clearing agent containing *Angelica dahurica*, *Bulbus fritillaria*, *Saposhnikovia radix*, and other medicinal ingredients, which can reduce swelling and dissipate knots, clear away heat and detoxify, promote blood circulation, and relieve pain. This study aims to explore the effect of XFHM in treating cutaneous infections and promoting wound healing in patients with perianal abscesses.

2. Materials and methods

2.1. General information

Sixty-one patients with perianal abscesses admitted to our hospital from May 2022 to May 2023 were selected and randomly divided into a control group (30 cases) and a study group (31 cases). The control group consisted of 24 males and 6 females aged 23–42 years old, with an average age of 33.51 ± 5.47 years. The wound area ranged from 7–17 cm², with an average of 12.46 ± 2.33 cm². The study group consisted of 22 males and 9 females aged 25–44 years old, with an average age of 34.65 ± 5.54 years. The wound area ranged from 6–18cm², with an average of 12.83 ± 2.12 cm². A comparison of the baseline data between the two groups showed no significant difference ($P > 0.05$).

Inclusion criteria: (1) Patients who were diagnosed with perianal abscesses according to The American Society of Colon and Rectal Surgeons Clinical Practice Guidelines for the Management of Anorectal Abscess, Fistula-in-Ano, and Rectovaginal Fistula in Western Medicine, and the Guidelines for Diagnosis and Treatment of Common Anorectal Diseases of Traditional Chinese Medicine in TCM ^[2,3]; (2) no history of perianal surgery; (3) meet the surgical indications and can tolerate the surgery; (4) no immune system diseased or diabetes; (5) consented. Exclusion criteria: (1) Patients with severe perianal eczema; (2) presence of infectious diseases; (3) history of perianal trauma; (4) malignant tumors. This study was approved by the hospital's medical ethics committee.

2.2. Method

All patients underwent radical resection of the perianal abscess. A comprehensive assessment of the condition was conducted before surgery and surgical treatment was provided promptly. Local anesthesia or sacral anesthesia was performed after routine disinfection. A radiation incision was made at the obvious fluctuation point of the abscess and a bulb-ended probe was used. The probe was used to penetrate the incision to locate the position of the internal opening. The incision was extended along the probe to incise the internal and external opening tissue to open the wound, and the wound edge was trimmed to create a fusiform appearance to facilitate

water drainage.

The control group was given conventional treatment which included warm water fumigation, sitz bath, surgical dressing change, and postoperative antibacterial treatment. Ceftriaxone Sodium produced by Hebei Huamin Pharmaceutical Co., Ltd. of North China Pharmaceutical (National Drug Approval No. H20184098, Specification: 0.5 g) was used for intravenous infusion, 2 g/time, 2 times/d, with continuous infusion for 3 days. One day after surgery, the patient was given warm water fumigation and a sitz bath. After the sitz bath, the wound with a yellow decay was surgically removed. Subsequently, a myogenic ruby gauze was packed to the base of the wound, and a small amount was pulled out to stimulate granulation growth and maintain smooth drainage.

The study group was given XFHM based on the control group's treatment plan. The XFHM consisted of: Bulb of *Fritillaria thunbergii* (5 g), *Trichosanthis Radix* (5 g), *Angelica dahurica* (6 g), *Angelica sinensis* (6 g), *Paeoniae radice rubra* (6 g), myrrh (6 g), *Saposhnikoviae radix* (6 g), *Spina gleditsiae* (6 g), *Radix glycyrrhizae* (6 g), honeysuckle (18 g), raw astragalus (18 g), and tangerine peel (18 g). The concoction was taken twice a day, 400 mL/dose, with a total of 800 mL per day. One dose was taken orally in the morning and evening, 200 mL/time. The remaining 1 dose (400 mL) was mixed with 2000 mL of warm water to replace the warm water fumigation and sitz bath in the control group. Both groups continued treatment for 4 weeks but discontinued sitz bathing after 2 weeks, and the dressings were changed 2–3 times a week.

2.3. Observation indicators

The judgment criteria for clinical efficacy were formulated according to reference [4]. The wound healing condition is divided into 43 standards: recovered (epithelial coverage, wound healing, and generation of solid scar), markedly effective (the degree of wound healing > 75%, fresh granulation tissue is generated), effective (the degree of healing is 25%–75%, with a small amount of fresh granulation tissue growth), and ineffective (the degree of wound healing is < 25%, with only very little granulation growth). The total effective rate (%) = 1 - ineffective rate.

Wound recovery was measured based on the time of disappearance of edema and exudate, wound healing time, and length of hospitalization.

Postoperative symptoms and signs including wound pain, surrounding tissue edema, and wound secretions between the two groups were analyzed. Wound pain was assessed using the visual analog scale (VAS) with a score of 10 [5]. The greater the pain, the higher the VAS score. Surrounding tissue edema was evaluated according to the Diagnostic and Efficacy Standards for Anorectal Diseases of Traditional Chinese Medicine [6]. It is divided into 0–5 points according to the severity. The higher the score, the greater the severity. Wound secretions were evaluated according to their exudation from a score of 0–3. A score of 3 indicates a large amount of wound secretion, soaking ≥ 2 pieces of gauze. A score of 2 indicates a moderate amount of wound secretion, soaking up 1 piece of gauze. A score of 1 indicates a small amount of wound secretion, soaking up 1 piece of gauze. A score of 0 indicates no secretions.

For the measurement of serum interleukin (IL)-6, tumor necrosis factor (TNF)- α levels, and acid-base (pH) values, 5 mL of blood was extracted from the patient 1 day and 14 days after surgery. The blood sample was centrifuged at 3000 r/min, and the levels of IL-6 and TNF- α were detected by the enzyme-linked immunosorbent assay. The pH value of the wound secretions was detected by pH test paper.

2.4. Statistical methods

Statistical analysis was performed using the SPSS 26.0 statistical software. The measurement data was expressed as mean \pm standard deviation and conformed to the normal distribution. The count data was expressed as [n (%)], where the t -tests and chi-squared tests (χ^2) were used for comparison, and the F test was used to

compare multiple time points. Results were considered statistically significant at $P < 0.05$.

3. Result

3.1. Comparison of clinical efficacy

As shown in **Table 1**, the total clinical effectiveness rate of the study group was higher than that of the control group ($P < 0.05$).

Table 1. Comparison of clinical efficacy between the two groups [n (%)]

Group	Cases, n	Recovered	Markedly effective	Effective	Ineffective	Total effective rate
Study group	30	16 (53.33)	6 (20.00)	2 (6.67)	6 (20.00)	24 (80.00)
Control group	31	25 (80.65)	5 (16.13)	1 (3.23)	0 (0.00)	31 (100.00)
χ^2						4.806
P						0.028

3.2. Comparison of wound recovery

As shown in **Table 2**, the wound recovery index in the study group was higher than that of the control group ($P < 0.05$).

Table 2. Comparison of wound recovery conditions between the two groups (mean \pm standard deviation, days)

Group	Cases, n	Edema disappearance time	Exudation disappearance time	Wound healing time	Length of hospitalization
Study group	30	8.76 \pm 2.02	8.15 \pm 1.76	20.34 \pm 2.98	15.40 \pm 3.30
Control group	31	5.07 \pm 1.54	6.07 \pm 1.44	15.44 \pm 2.72	12.96 \pm 3.05
t		8.040	5.059	6.711	3.000
P		0.000	0.000	0.000	0.004

3.3. Comparison of postoperative symptoms and signs

As shown in **Table 3**, there were differences in the scores of wound pain, surrounding tissue edema, and wound secretions at different time points. The scores of wound pain, surrounding tissue edema, and wound secretions on the 7th and 14th day after surgery in the study group were lower than those in the control group, ($P < 0.05$).

Table 3. Comparison of postoperative symptoms and signs between the two groups (mean \pm standard deviation, points)

Group	Cases, n	Wound pain			Edema of surrounding tissues			Wound secretions		
		1 day after surgery	7 days after surgery	14 days after surgery	1 day after surgery	7 days after surgery	14 days after surgery	1 day after surgery	7 days after surgery	14 days after surgery
Control group	30	6.94 \pm 2.43	4.46 \pm 1.85 ^a	2.24 \pm 0.83 ^{ab}	2.51 \pm 1.45	1.78 \pm 0.84 ^a	1.02 \pm 0.40 ^{ab}	2.61 \pm 0.33	1.88 \pm 0.37 ^a	1.08 \pm 0.44 ^{ab}
Study group	31	6.81 \pm 2.31	2.05 \pm 0.93 ^a	0.80 \pm 0.31 ^{ab}	2.71 \pm 1.05	1.10 \pm 0.51 ^a	0.41 \pm 0.13 ^{ab}	2.58 \pm 0.31	1.29 \pm 0.44 ^a	0.48 \pm 0.15 ^{ab}
t		0.214	6.460	9.033	0.619	3.836	8.064	0.366	5.659	7.175
P		0.831	0.000	0.000	0.539	0.000	0.000	0.716	0.000	0.000

Note: compared with 1 day after operation, ^a $P < 0.05$; compared with 7 days after operation, ^b $P < 0.05$.

3.4. Comparison of serum IL-6, TNF- α levels and pH value

As shown in Table 4, compared with the 1st day after surgery, the serum IL-6, TNF- α , and pH levels in the study group were lower than that of the control group, 10 days after surgery ($P < 0.05$).

Table 4. Comparison of serum IL-6, TNF- α levels, and pH values between the two groups (mean \pm standard deviation)

Group	Cases, <i>n</i>	IL-6 (ng/L)		TNF- α (ng/L)		pH value	
		1 day after surgery	10 days after surgery	1 day after surgery	10 days after surgery	1 day after surgery	10 days after surgery
Control group	30	36.43 \pm 10.33	14.50 \pm 5.23 ^a	9.05 \pm 2.96	6.99 \pm 1.77 ^a	8.54 \pm 0.25	7.94 \pm 0.98 ^a
Study group	31	37.82 \pm 10.80	9.89 \pm 3.30 ^a	9.00 \pm 3.07	3.21 \pm 1.54 ^a	8.49 \pm 0.37	7.14 \pm 0.25 ^a
<i>t</i>		0.513	4.131	0.065	8.907	0.616	4.401
<i>P</i>		0.610	0.000	0.949	0.000	0.540	0.000

Notes: ^a $P < 0.05$ compared with 1 day after surgery.

4. Discussion

Perianal abscess is an infectious disease that mainly refers to the formation of an abscess secondary to perianal infection. Clinically, it often manifests as a swollen and painful mass in the perianal area, with obvious pain upon contact, and occasional throbbing tenderness. Surgical treatment is preferred for perianal abscesses as it can quickly and effectively drain pus and promote wound healing. However, the unique nature of the surgical site leads to a greater risk of infection. Routine postoperative treatment plans aim to create an ideal environment for wound healing. However, the nerves around the anus are abundant and highly sensitive. The inflammatory response induced by the trauma and friction caused by dressing changes will aggravate the incision pain and cause edema, and may cause lasting adverse effects.

Perianal abscesses are called anal carbuncles in TCM. They are often caused by unhealthy diets, or perianal damage and infection by bacteria. In TCM, perianal abscesses are mostly of the damp-heat toxin type and require immediate treatment. Surgery is mainly performed to drain the pus and exudate septic substances. However, the toxins may cause diarrhea after the operation, affecting the qi and blood circulation, and causing an imbalance of nutrition and immunity. This makes the wound appear hot and damp, where toxins are retained, causing qi and blood to stagnate and inhibiting wound healing. Treatment should focus on removing heat, detoxifying, unblocking meridians, and relieving pain. Ingredients used in the prescription of XFHM such as honeysuckle is good for clearing heat, detoxifying, and treating sores; angelica nourishes and activates blood; *Paeoniae radix rubra* clears heat and relieves pain; frankincense promotes blood circulation and relieves pain; myrrh dissipates blood stasis and relieves pain, and tangerine peel regulates qi and dries dampness. These ingredients exert a synergistic effect to promote qi, activate blood circulation, unblock meridians, reduce swelling, and relieve pain. The combination of *Angelica dahurica* and *Saposhnikovia radix* can dispel wind and dissipate heat, prevent stagnation, and reduce swelling; the combination of bulb of *Thunberg fritillary* and trichosanthin can clear heat and expel pus; the combination of raw *Radix astragali* and *Spina gleditsiae* can pass through the meridians, alleviate sores, and promote muscle growth. Finally, licorice can clear heat, detoxify, and harmonize the various medicinal ingredients. The results of this study showed that the total clinical effectiveness and wound recovery rate of the study group were higher than that of the control group. This indicated that XFHM for treating cutaneous infections in patients with perianal abscesses improved the treatment outcome and promoted wound healing. These findings were similar to the research results of other

scholars such as Tian ^[7].

This study also showed that the study group had a more obvious downward trend in wound pain, surrounding tissue edema, and wound secretion scores on the 7th and 14th days after surgery as compared to the control group, with lower levels of serum IL-6, TNF- α , and a lower pH value. XFHM alleviated the patient's clinical symptoms and signs, and acidified the wound, thereby promoting wound healing. This may be because the water and alcohol extract of *Spina gleditsiae* possess ideal bactericidal and antibacterial effects. Furthermore, the alcohol extract can strengthen the immune system, sterilize, and reduce inflammation ^[8]. The cyclohexanol, flavonoids, inositol, saponins, and tannins contained in honeysuckle have broad-spectrum antibacterial effects ^[9]. Compounds such as limonene, lemon yellow ketone, and sub-aromatic hydrocarbons contained in tangerine peel have antibacterial and antibacterial properties, along with inflammatory and antioxidant effects. In addition, the presence of citric acid can inhibit bacterial metabolism pathways, thereby creating a healing environment for acidified wounds ^[10]. Other drugs such as *Angelica sinensis*, *Paeoniae radix rubra*, frankincense, and *Angelica dahurica* also contain substances that are antibacterial, anti-inflammatory, and improve immune function, which effectively improves the patient's clinical symptoms and signs and promotes wound healing.

5. Conclusion

The application of XFHM for treating cutaneous infections in patients with perianal abscesses improved the therapeutic outcomes, improved clinical symptoms and signs, acidified the wound, and promoted wound healing. However, this study has certain limitations. No further follow-up was conducted to explore its recurrence and the safety of its clinical application. Further in-depth research is needed to provide more references for formulating postoperative treatment plans for patients with perianal abscesses.

Disclosure statement

The author declares no conflict of interest.

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