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Analysis of Diagnosis and Treatment for Perianal Necrotizing Fasciitis with Integrated Traditional Chinese and Western Medicine

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Abstract: ***Objective:*** ***Through a retrospective analysis of 21 cases of necrotizing fasciitis in the Department of Anorectal Medicine at the First Affiliated Hospital of Guizhou University of Traditional Chinese Medicine, this study aims to deepen the understanding of clinical diagnosis and treatment for patients with necrotizing fasciitis and improve the clinical cure rate.*** ***Methods:*** ***Clinical data of 21 patients with perianal necrotizing fasciitis admitted to the Department of Anorectal Medicine at the First Affiliated Hospital of Guizhou University of Traditional Chinese Medicine from December 2022 to December 2023 were collected and subjected to in-depth statistical analysis. The study summarized and analyzed potential risk factors for early necrotizing fasciitis, main pathogenic bacteria causing infection, adopted treatment methods, and final therapeutic effects.*** ***Results:*** ***After integrated traditional Chinese and Western medicine treatment, all 21 patients showed significant improvement in their conditions and were successfully discharged. The average hospital stay was 18.95 days, providing important reference for the treatment cycle of this disease.*** ***Conclusions:*** ***1) Early comprehensive evaluation of patients' conditions and timely surgical debridement and drainage are key measures for treating perianal necrotizing fasciitis, which are crucial for controlling disease progression and preventing deterioration; 2) Diabetes is the most common risk factor for perianal necrotizing fasciitis; 3) Gram-negative bacteria are the predominant pathogenic bacteria; 4) Nursing care for postoperative wound dressing changes is an important guarantee for prognosis; 5) Traditional Chinese medicine plays a significant role in the treatment of necrotizing fasciitis, with oral and external applications applied throughout the treatment process and precise intervention based on disease stages. Integrated traditional Chinese and Western medicine treatment combines the advantages of both to enhance therapeutic effects.***

Keywords: Perianal necrotizing fasciitis, Treatment experience, Integrated traditional Chinese and Western medicine.

1. Introduction

Perianal necrotizing fasciitis (PNF) is a severe infectious disease occurring in the perianal and perineal regions, characterized by progressive necrosis of the fascia without muscle involvement. Due to its abrupt onset and rapid progression, the infection easily spreads to the perineum, abdomen, and even threatens systemic health. Sepsis, septic shock, and multiple organ failure are the main causes of death in such patients, with a mortality rate as high as 31.5% [1]. This mortality is particularly pronounced in patients with diabetes, malnutrition, long-term use of immunosuppressants or hormonal drugs, or underlying immunological disorders [2]. Epidemiological studies indicate that the incidence of PNF ranges from 1 in 7, 500 to 1 in 750, 000 individuals [3-4], with a male predominance (male-to-female ratio of approximately 2.6:1). With the continuous improvement of social living standards, the incidence of this disease has shown an upward trend. This study aims to summarize the experience of integrated traditional Chinese and Western medicine treatment by conducting a retrospective analysis of the clinical manifestations and laboratory results of 21 PNF patients, hoping to provide references for clinical diagnosis and management of perianal necrotizing fasciitis.

2. Clinical Data

A retrospective analysis was performed on the clinical data of 21 patients with perianal necrotizing fasciitis (PNF) admitted to the Department of Anorectal Medicine of our hospital from December 2022 to December 2023, including 20 male patients and 1 female patient. The oldest patient was 81 years old, the youngest was 27 years old, with a mean age of 47 years. The longest hospital stay was 43 days, the shortest was 4 days, and the mean hospital stay was 18.95 days.

3. Preoperative Examinations

Table 1: Preoperative Examinations

White Blood Cell ($\times10^9$/L)	Neutrophil Percentage (%)	C-Reactive Protein (mg/L)
33.33	91.9	249.16
28.96	87.4	47.59
24.62	78.4	317.86
23.2	84.3	/
20.94	73.2	141.02
19.75	84.50%	/
17.29	82.1	428.84
16.86	87.7	/
16.76	78.8	/
15.08	74	/
12.95	84.8	169.23
11.49	78.9	31.35
11.32	78.1	/
10.65	87.7	226.93
10.39	82.8	41.68
9.91	88.6	257.73
9.63	80.6	73.75
9.48	82.4	/
9.01	82.9	114.46
7.46	66.1	/
6.96	65.1	/

Note: The symbol "/" denotes not tested.

White blood cell (WBC) count: 6.96×10^9/L – 33.33×10^9/L. Neutrophil percentage: 65.10% – 91.90%. reactive protein (CRP) test: 8 cases did not undergo CRP testing, and the remaining cases showed elevations of varying degrees, with

the highest value reaching 428.84 mg/L. Details are shown in Table 1.

4. Imaging Data

Four patients underwent preoperative MRI/CT examinations, all of which indicated soft tissue infections in multiple sites, including the perianal and perineal regions.

5. LRINEC Score

The Laboratory Risk Indicator for Necrotizing Fasciitis (LRINEC) score [5] (including C-reactive protein, white blood cell count, hemoglobin, serum sodium, creatinine, and blood glucose) was assessed. Excluding 9 cases without C-reactive protein (CRP) testing, the scoring results of the remaining 12 cases showed: 6 cases (≤5 points) were low risk, 4 cases (6–7 points) were moderate risk, and 2 cases (≥8 points) were high risk (see Table 2). This scoring system is of significant importance for the early diagnosis of necrotizing fasciitis.

Table 2: Laboratory Risk Indicator for Necrotizing Fasciitis (LRINEC) Scores in 12 Cases of Perianal Necrotizing Fasciitis

Risk Stratification	Score	Number of Cases	Percentage (%)
Low Risk	≤5	6	50
Moderate Risk	6-7	4	33.3
High Risk	≥8	2	16.7

6. Treatment

6.1 Western Medicine Approach

6.1.1 Surgical Treatment

Once the diagnosis of necrotizing fasciitis was confirmed, emergency surgery was performed under continuous epidural anesthesia or general anesthesia after completing relevant examinations. An incision was made at the point with the most obvious fluctuance to drain pus and gas, and specimens were sent for bacterial culture. The incision was explored to fully debride necrotic skin, fascia, and tissues until fresh healthy tissue was exposed. Intact skin bridges were preserved as much as possible during the procedure. Rubber strips were placed between all incisions to ensure adequate drainage. The wound was repeatedly irrigated with hydrogen peroxide and normal saline. For deep abscesses with poor drainage, negative pressure drainage tubes were inserted to facilitate irrigation and drainage. Among the 21 patients, 1 underwent debridement three times within 20 days, while the others required no reoperation.

6.1.2 Pharmacological Treatment

In the early stage, broad-spectrum antibiotics were selected for anti-infective therapy according to guidelines [6], with subsequent adjustments based on antibiotic susceptibility test results. Treatment also included energy supplementation, maintenance of water-electrolyte balance, prevention and management of postoperative wound bleeding and oozing, active control of postoperative pain, and strict glycemic control.

6.2 Traditional Chinese Medicine (TCM) Approach

6.2.1 TCM Disease Differentiation and Syndrome Analysis

According to Miraculous Pivot: Carbuncles and Ulcers (灵枢经・痈疽), "Excessive heat leads to tissue necrosis, which in turn causes pus formation; if pus is not drained, it erodes the tendons, damages the bones, and depletes the marrow." This disease falls under the categories of "gangju" (肛疽, anal carbuncle), "chuangyang" (疮疡, sores and ulcers), and "landing" (烂疔, gangrenous furuncle) in traditional Chinese medicine (TCM). General Treatise on the Etiology and Symptoms of Diseases: Furuncle Syndromes (诸病源候论・丁疮病诸候) describes it as: "There is also protrusion of tissue resembling a fish eye, red-black in color, with excruciating pain penetrating the bone. Over time, it ulcerates into sores with deep holes beneath the wound like needle punctures. . . Within one to two days, the sore turns dark brown, swells brightly, and develops a hard, rigid base that cannot be touched. "This disease is characterized by sudden onset and rapid progression, with its core pathogenesis rooted in "benxu biaoshi" (本虚标实, deficiency of the root and excess of the branch). Specifically, deficiency of qi and yin constitutes the fundamental deficiency (ben), while accumulation of pathogenic toxins represents the superficial excess (biao). Qi deficiency weakens the body's defensive mechanism, and yin deficiency generates internal heat. Pathogenic factors (e.g., the six exogenous evils 六淫之邪 or unclean pathogens) invade the body surface, penetrate inward due to deficiency, accumulate, and transform into heat. Combined with pre-existing internal heat, these factors form toxins over time. The heat-toxins erode muscles and tissues, manifesting as mild symptoms such as redness, swelling, heat, pain, and foul-smelling pus in mild cases, or severe life-threatening conditions in severe cases where heat-toxins invade the nutrient-blood level (yingxue 营血), attack internal organs, and cause "zouhuang" (走黄, systemic toxin spread).

6.2.2 Traditional Chinese Medicine Therapeutic Methods

Prioritizing treatment based on the severity of root (ben 本) and branch (biao 标) conditions is crucial. In the early stage, characterized by exuberant heat-toxin syndrome, the therapeutic principle focuses on clearing heat, resolving toxins, and promoting pus drainage. The formula combines modified Tòunóng Sǎn (Purulent Drainage Powder) and Xiānfāng Huómìng Yǐn (Immortal Formula for Life-saving Decoction), with the following composition: Prescription: Astragalus (30g), pangolin scales (15g), chuanxiong rhizome (10g), angelica root (10g), soapberry spine (15g), trichosanthes root (15g), licorice (10g), frankincense (10g), myrrh (10g), red peony root (10g), fritillary bulb (10g), ledebouriella root (10g), tangerine peel (10g), honeysuckle flower (10g), dahurian angelica root (10g). Administration: Decocted in water, one dose daily, divided into two oral administrations. Formula Analysis: This formula combines herbs for tonifying qi-blood and draining pus/toxins: Astragalus ("herbal sovereign for sores") tonifies qi, supports wound healing, drains pus, relieves pain, and promotes blood circulation and generation. Angelica and chuanxiong nourish

and regulate blood, resolving stagnation in qi and blood. Pangolin scales and soapberry spine activate blood circulation, resolve carbuncles, and soften hard masses. Honeysuckle and licorice excel at clearing heat and toxins, serving as key herbs for sores. Ledebouriella and dahurian angelica dispel wind-dampness, drain pus, and reduce swelling. Red peony, frankincense, and myrrh activate blood, break stasis, and alleviate pain.

Fritillary and trichosanthes clear heat-phlegm and resolve nodules. Together, these herbs clear heat-toxin, reduce swelling, soften hard masses, and relieve pain. Postoperative Treatment: After surgery, approximately 80–90% of toxins are eliminated, but vital qi and blood are deficient, impairing tissue nourishment. Guided by the principle of "supporting vital qi while eliminating residual pathogens", oral formulas tonify qi-blood while draining remaining toxins, with optional inclusion of bear bile powder to enhance detoxification. External TCM Therapies emphasize syndrome differentiation for wound care: Early-stage acute exudation phase: Characterized by redness, swelling, stiffness around the wound, and abundant exudate/pus (manifestations of exuberant heat-toxin). Treatment focuses on clearing heat, lifting toxins, and draining pus to improve the wound environment and lay the foundation for subsequent healing. This embodies the unique advantages of TCM external therapies in reducing pain and promoting wound healing. Ningzhi Lotion (宁痔洗液, our hospital's proprietary preparation): Used for fumigation and sitz bath to clear heat-toxin, reduce swelling, relieve pain, dry dampness, promote tissue regeneration, and activate blood circulation. Prescription: Sophora flavescens root (30g), phellodendron bark (15g), scutellaria root (15g), gallnut (30g), frankincense-myrrh (15g), angelica root (15g), chuanxiong rhizome (15g), honeysuckle flower (30g), dandelion (30g), forsythia fruit (15g), bitter orange (15g), peach kernel-safflower (15g), plantain herb (20g), poria (15g). Administration: Decocted for sitz bath, one dose daily, twice a day. Ruyi Jinhuang San (如意金黄散): Topical application to clear heat-toxin, reduce swelling, and relieve pain, applied to red-swollen skin around the wound (not directly on the wound surface).

7. Postoperative Wound Care

Daily irrigation of the abscess cavity with hydrogen peroxide and normal saline to thoroughly remove necrotic tissue. For deep or narrow wounds, a rectal administration soft tube combined with a syringe (needle removed) was used to inject irrigants into deep, hidden abscess tissues. The tube also helped detect pseudo-healing in a timely manner for prompt intervention. Flushing with Compound Phellodendron Liquid (复方黄柏液涂剂) to clear heat-toxin, reduce swelling, and remove necrotic tissue. Topical application of Fuzhiqing Ointment (肤痔清软膏) to clear heat-toxin, cool blood, stop bleeding, and promote tissue regeneration. External application of Ruyi Jinhuang San (如意金黄散) — a formula for clearing heat-toxin, reducing swelling, and relieving pain—applied to red-swollen skin between wounds rather than directly on the wound surface.

8. Routine Bacterial Culture

Intraoperative secretion culture results showed that among 21 patients, 3 had no pathogenic bacteria detected. The remaining cases identified 8 pathogens: Proteus mirabilis, Escherichia coli, Klebsiella pneumoniae subspecies, Klebsiella pneumoniae, Staphylococcus epidermidis, Enterococcus faecium, Acinetobacter baumannii complex, and Candida tropicalis. One fungal infection (Candida tropicalis) was identified. The most common pathogen was Escherichia coli, detected in 8 cases. One case had a mixed infection with Escherichia coli and Klebsiella pneumoniae subspecies. Pathological biopsies were performed in 15 patients (6 did not undergo biopsy), all of which confirmed the diagnosis of necrotizing fasciitis. Details are shown in Table 3 and 4.

9. Results

Among the 21 patients included in this study, 20 were male (95.2%) and 1 was female (4.8%), showing a significant male predominance. The patients were aged between 27 and 81 years, with a mean age of 47 years. A total of 11 patients had comorbidities, including 8 with type 2 diabetes mellitus (4 of whom were diagnosed after admission). The mean hospital stay was 19 days (range: 4–43 days), and the average duration of symptoms before admission was 6.71 days. One patient underwent debridement surgery three times, while the others required no reoperation; one patient received negative pressure wound therapy. All patients improved and were discharged without mortality. Regarding the Laboratory Risk Indicator for Necrotizing Fasciitis (LRINEC) scores, 6 cases were low-risk, 4 were moderate-risk, and 2 were high-risk.

10. Discussion

Perianal necrotizing fasciitis (PNF) is a rare, acute, and life-threatening condition in anorectal medicine, characterized by extremely rapid progression. Its early symptoms are often subtle and difficult to detect, making it prone to misdiagnosis as perianal abscess and leading to treatment delays. Due to atypical manifestations in the early stage, some cases are only confirmed during surgery. Although imaging examinations such as CT and ultrasound help clarify the diagnosis, intraoperative exploration often serves as the primary diagnostic method in emergency surgical settings due to practical limitations.

The LRINEC (Laboratory Risk Indicator for Necrotizing Fasciitis) score system, proposed in 2004 [5], provides a screening tool for diagnosing necrotizing fasciitis by evaluating indicators including C-reactive protein, white blood cell count, hemoglobin level, serum sodium, serum creatinine, and plasma glucose. According to LRINEC scoring, when the total score reaches a specific threshold (a total score ≥6 indicates a possible diagnosis of necrotizing fasciitis, and ≥8 indicates a high probability), the risk of necrotizing fasciitis increases significantly. This scoring system is crucial for assessing the risk level of patients. In our observed cases, mean hospital stays varied across risk groups

based on LRINEC scores: 22.16 days for the low-risk group, 21.05 days for the moderate-risk group, and 19.00 days for the high-risk group. The low-risk group had a longer mean hospital stay than the moderate-risk group ($P > 0.05$, no statistical significance), while the moderate-risk group had a longer stay than the high-risk group ($P < 0.05$, statistically significant). This indicates no direct correlation between risk rating and disease severity. Additionally, the laboratory findings of PNF patients differ significantly from those of perianal abscess patients, aiding in differential diagnosis.

Literature reports indicate that the prevalence of diabetes mellitus in perianal necrotizing fasciitis (PNF) patients is relatively high, ranging from 20% to 70% [7-8]. In our cohort of 21 patients, 8 (38.1%) had comorbid diabetes mellitus, and 17 (81%) presented with elevated blood glucose upon admission. Other predisposing factors — such as immunosuppression, trauma, malnutrition, obesity, and renal failure [6] — also increase susceptibility, amplifying the virulence and destructive potential of pathogenic bacteria. Prognosis is influenced by multiple factors, with metabolic rate, inciting causes, and lesion extent identified as three pivotal determinants [9]. Thus, active management of systemic factors like glycemic control is critical during treatment.

PNF is typically caused by mixed infections involving multiple bacteria, where the synergistic action of aerobic and anaerobic pathogens plays a key role in the infectious process [6]. Common pathogens include Escherichia coli and Klebsiella pneumoniae. Studies have reported over 70 types of pathogenic bacteria cultured from PNF tissues [10], consistent with the pathogens identified in our cases. Mortality in PNF rarely results from local tissue damage alone but stems from systemic inflammatory consequences such as sepsis and coagulopathy [11]. Debridement surgery and drainage are cornerstone treatments for PNF [12], with repeat debridement sometimes necessary to assess disease progression [13-14].

The vacuum-sealed drainage (VSD) technique, as an advanced therapeutic modality, creates an optimal environment for wound healing by reducing toxic substance absorption, promoting local blood circulation, and stimulating granulation tissue growth [15-16]. Postoperative wound care is equally important, including irrigation with antiseptics like povidone-iodine and hydrogen peroxide to maintain wound cleanliness and facilitate natural shedding of necrotic tissue, complemented by adjuvant therapies such as TCM topical applications. Additional reports highlight the significant efficacy of hyperbaric oxygen therapy (HBO) combined with VSD in promoting wound healing [18]. HBO enhances tissue metabolic activity by increasing oxygen partial pressure, fostering neovascularization and granulation tissue formation to accelerate healing. VSD, by creating a sustained negative-pressure environment, effectively removes exudate and necrotic tissue, reduces bacterial proliferation, and promotes local circulation and granulation—together improving both the quality and speed of wound healing.

Necrotizing fasciitis, characterized by its aggressive progression and life-threatening potential, poses a substantial challenge in clinical practice. Accurate assessment of disease severity is critical for subsequent management, making early identification and surgical intervention core treatment strategies. Postoperative wound care and nutritional support are equally vital for ensuring favorable outcomes.

Traditional Chinese medicine (TCM) plays an indispensable role throughout this process. Through oral and external therapies, TCM provides a holistic treatment framework, applying syndrome differentiation and targeted interventions at different disease stages. Integrative therapy combining TCM and Western medicine leverages their respective strengths to enhance therapeutic efficacy. Specifically, TCM regulates the body's overall homeostasis, boosts immune resistance, and promotes wound healing. Its unique pharmacological properties also mitigate surgical trauma and improve quality of life. During postoperative care, TCM aids recovery by regulating qi and blood and enhancing metabolism. This integrative approach preserves TCM's holistic advantages while incorporating the precision of Western medicine, opening new avenues for PNF treatment. By combining these modalities, we not only enhance treatment efficacy but also reduce complication rates, offering greater hope and confidence to patients.

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