

Treatment of Pyoderma Gangrenosum by Combination of Traditional Chinese and Western Medicine: A Case Report

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Abstract: Pyoderma gangrenosum is a chronic, necrotizing, ulcerative, scarring and painful skin disease, which often occurs in combination with other underlying systemic diseases such as ulcerative colitis, Crohn's disease, acute myeloid leukemia and rheumatoid arthritis. It is relatively rare in clinical practice, and a complete therapeutic regimen has not yet been formed in modern medicine, so its treatment has a certain challenge. This article reports a case of ulcerative colitis complicated with pyoderma gangrenosum that treated at the dermatology department of the third affiliated hospital of Chengdu university of T. C. M. The ulcer on the patient's left calf was basically cured after oral administration of modified Bazhen decoction and Simiao powder and external application of the experience prescription for treating carbuncle. The case report provides clinical ideas for the diagnosis and treatment of similar ulcerative diseases by integrated traditional Chinese and western medicine, and aims to improve the cognition and understanding of clinicians on this disease and reduce misdiagnosis.

1. Introduction

Pyoderma gangrenosum (PG) is a neutrophil dermatosis, characterized by non-infectious painful ulcers on the skin, which often occurs in combination with other systemic diseases. The disease is relatively rare in clinical practice, and because of the lack of standardized diagnosis and treatment plan, PG's treatment is difficult. This article reports a case of pyoderma gangrenosum complicated with ulcerative colitis in our department from medical records, treatment plans of traditional Chinese and western medicine, TCM syndrome differentiation analysis, etc., to provide clinical treatment ideas of integrated traditional Chinese and western medicine.

2. Medical Records

Ms.Zhou, 33 years old, went to the dermatology of our hospital on November 13,2022. Chief complaint "Swollen and painful left calf for 20 days,ruptured for 10 days". 20 days earlier,

erythema had developed on the patient's left calf without an obvious trigger, after few days, the scope of the erythema expanded with swelling and pain, no erosion, fluid seepage, and ulcers in the red and swollen area. 10 days ago, the center of the red swelling of the left calf became soft, ruptured, and drained pus. The patient was diagnosed with "skin infection" in another hospital and did not improve after oral antibiotics. Present symptoms: severe pain in the left calf, accompanied by fatigue, no fever, chills, dizziness, nausea and other discomfort, urine is normal, stool is loose and 1-2 times a day. The patient denied the history of hypertension, diabetes, hepatitis tuberculosis and other infectious diseases. Physical Examination: No significant positive signs were found in the heart and lungs. The abdomen was flat and soft, mild tenderness was found in the lower abdomen, and the bowel sounds were 6-7 times/min. TCM tongue pulse: tongue is light, thin and white fur, deep thready pulse. Dermatology physical examination: The left anterior tibial erythema was swollen with unclear boundaries, covering an area of about 10cm×13cm. There were multiple circular ruptures on the erythema in a honeycomb shape and 8 ulcerated surfaces of about 0.5cm×0.8cm in size, and a large amount of purulent tissue was visible on the wound with obvious tenderness (see Fig 3).

Blood routine examination: WBC $9.68 \times 10^9/L$, RBC $3.54 \times 10^{12}/L$, HGB 99.0 g/L, NEUTP 83.5%; hs-CRP: 62.02 mg/L; Stool routine: red blood cells ++++/HP P, white blood cells +++/HP P, phagocytic cells 6-7/HP P, OBT +. The bacterial culture of pyogenic fluids showed a small number of gram-positive bacteria growth, no fungal growth. Considering that the patient had been diagnosed with "skin infection" in another hospital, and anti-infection and local symptomatic treatment were ineffective, according to the auxiliary examination results, further follow-up medical history was learned that the patient had intermittent abdominal pain, repeated diarrhea, and occasional pus and blood stools half a month before admission, which was not paid attention to. Therefore, the patient was considered as a possible case of pyoderma gangrenosum (PG) according to the symptoms. Pathological examination and Electronic colonoscopy are required to confirm the diagnosis. Pathological examination of left anterior tibial ulceration showed: Ulcer formation was observed in the superficial layer of the epidermis, and a large number of mixed inflammatory cells infiltrated in the base of the ulcer (see Fig 1). Atypical proliferative cell nests were found under the dermis (see Fig 2).

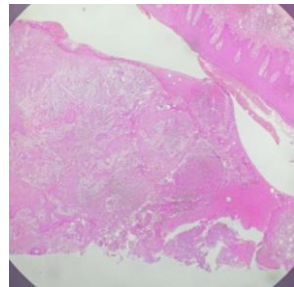


Figure 1: Inflammatory cell infiltration

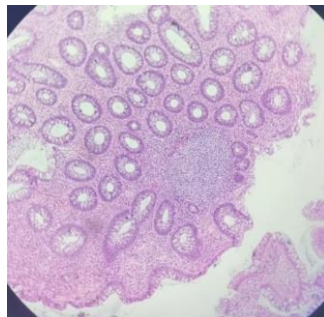


Figure 2: Atypical hyperplasia cells

The morphology was considered pyoderma gangrenosum, but malignant tumors should be excluded. Immunohistochemistry showed "left lower limb": Combined with the morphology, malignant tumor was not supported and pyoderma gangrenosum was considered. Electronic colonoscopy showed: Colonic mucosal changes, morphological changes predispose to inflammatory bowel disease, please consider the clinical situation comprehensively. After initial exclusion of vasculitis, extraneous ulcers and skin malignancies through medical history combined with auxiliary examination. Diagnosis: ① Pyoderma Gangrenosum; ② Ulcerative Colitis. TCM diagnosis: Carbuncle (syndrome of deficiency of Qi and blood).

3. Treatment Plan

3.1 Western Medicine's Treatment plan

After the preliminary diagnosis was confirmed, our department immediately discussed and analyzed the case, and formulated a comprehensive treatment plan of integrated Chinese and western medicine, as follows: The wound of the patient showed a large amount of purulent tissue and obvious tenderness, which required routine disinfection. After local infiltration and anesthesia, hemostatic forceps and scissors were applied to remove the necrotic tissue and purulent secretions on the ulcer surface, and then the wound was rinsed with normal saline and hydrogen peroxide. When no necrotic tissue and secretions were found, the wound was covered with sterile gauze. Methylprednisolone sodium succinate 40mg ivgtt bid, Clindamycin injection 0.3g ivgtt bid, mesalazine enteric-coated tablet 1.0g po qid for intestinal anti-inflammatory.

3.2 TCM's Treatment plan

TCM's treatment based on syndrome differentiation: Due to the patient's poor physical condition, healthy qi in her body is insufficient. When pathogenic factors such as mental stimulation, improper diet and abnormal changes of the weather (that always known as six excesses, including wind, cold, summer-heat, dampness, dryness and fire) attack the body, the patient's healthy qi is too weak to fight against them. Such a struggle between healthy qi and pathogenic factors leads to dysfunction of the viscera inside and the rupture of the skin outside. And because the main physiological functions of the spleen are to govern transportation and transformation, control blood and dominate muscles and limbs. If the spleen and stomach are damaged, the dampness of the water can not be transferred, and the accumulation of dampness will block the meridians. The stagnation of that dampness produces heat which leads to the redness, swelling and ulceration of the patient's left calf. Combined with the patient's general fatigue, light tongue, thin and white fur, deep thready pulse, TCM differentiation: deficiency of qi and blood is the root cause, local heat-dampness is the manifestation. So the principles of TCM treatment are supplementing Qi and nourishing blood, clearing heat and removing dampness, treating both manifestation and root cause of disease. Modified Bazhen decoction and Simiao powder were given orally: Dangshen (*Codonopsis*) 20g, Baizhu (*Rhizoma Atractylodis Macrocephalae*) 20g, Fuling (*Poria Cocos*) 15g, Danggui (*Angelica*) 15g, Chuanxiong (*Ligusticum Wallichii*) 15g, Shu Dihuang (*Prepared Rehmannia Root*) 15g, Zhi Gancao (*Prepared Licorice Root*) 10g, Cangzhu (*Rhizoma Atractylodis*) 15g, Chuan Niuxi (*Radix Achyranthes*) 15g, Huangbai (*Cortex Phellodendri*) 15g, Yiyiren (*Coix Seed*) 30g, Zhi Huangqi (*Radix Astragali Preparata*) 15g. The dosage form is traditional Chinese medicine particle prescription in our hospital, a total of 6 doses, 1 dose per day, divided into 3 oral doses, each time with 200ml hot water.

Experience prescription for treating carbuncle in dermatology of our hospital also be given as external application, it contains Difuzi (*Fructus Kochiae*) 20g, Huangqin (*Scutellaria Baicalensis*)

20g, Kushen(*Radix Sophorae Flavescentis*) 20g, Shechuangzi(*Fructus Cnidii*) 20g, Chishao(*Radix Paeoniae Rubra*) 20g, Chuanxiong(*Ligusticum Wallichii*) 20g, Danshen(*Salvia Miltiorrhiza*) 20g, Ganjiang(*Rhizoma Zingiberis*) 20g, Zhiqiao(*Fructus Aurantii*) 20g, Guizhi(*Ramulus Cinnamomi*) 20g, Sangzhi(*Mulberry Twig*) 20g, Xixin(*Herba Asari*) 9g. A total of 6 doses, 1 dose per day, divided into 2 doses, wet compress the wound.

4. The Process of Treatment

After 2 weeks of treatment, the patient felt less pain in the left leg and no obvious abdominal pain, urine is normal, stool is loose and 1-2 times a day. Physical examination: vital signs were stable, no obvious positive signs were found in the heart, lung and abdomen. Dermatology physical examination: The local swelling of the left anterior tibia subsided, the center of the ulcer was scattered on the skin island, and the wound was basically non-necrotic, peripherally sporadic purulent discharge with obvious tenderness (see Fig 4). The bacterial culture of pyogenic fluids showed a small amount of coagulase negative staphylococcus grew, and no fungus grew.

After 1 month of treatment, the patient felt slight pain in the left lower limb, stool once a day, and no blood in the stool. There is no special physical examination. Dermatology physical examination: More skin islands and scabs were formed in the center of the ulcer, and the wound was dry, basically healed, and light tender (see Fig 5). Reexamination of stool showed no abnormality. The patient recovered clinically and was discharged from our hospital. Discharge medicine: Prednisone acetate tablet 20mg orally once daily, modified Bazhen decoction and Simiao powder 6 doses, 1 dose per day, divided into 3 oral doses, each time with 200ml hot water.

After 1 month follow-up after discharge, there was no swelling pain in the patient's left leg, and the wound skin had all healed (see Fig 6).

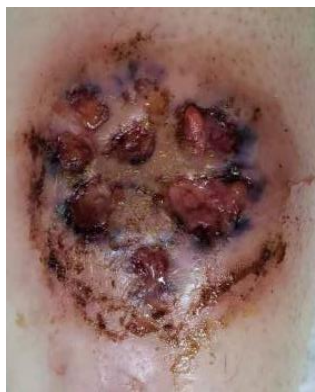


Figure 3: On the day of admission



Figure 4: With two weeks treatment



Figure 5: With one month treatment



Figure 6: One month after discharge

5. Discussion

This case is ulcerative colitis with pyoderma gangrenosum as the main manifestation. Pyoderma gangrenosum is a chronic, ulcerative and painful skin disease[1], which is divided into ulcer, bullosa and pustular types, and ulcer type is the most common[2]. The etiology of this disease is still unclear, but it is mostly believed to be related to neutrophil dysfunction, stimulation of various inflammatory factors, and genetic susceptibility[3]. PG is not a single dermatological disease, but is often co-occurring with other multi-systemic diseases, such as ulcerative colitis, Crohn's disease, rheumatoid arthritis[4]. Due to the rarity of pyoderma gangrenosum in clinic, doctors may misdiagnose PG as skin infection, ulcer and vasculitis due to lack of understanding of the disease[5]. Therefore, this case suggests that doctors should be alert to the possibility of PG if the wound continues to progress after debridement or the local ulcer does not heal for a long time after symptomatic treatment. Patients should be asked in detail about their past medical history or whether they have other discomfort, and further auxiliary examinations such as colonoscopy, microbial culture, and pathological examination should be performed to confirm the diagnosis[6].

The treatment of ulcerative colitis combined with pyoderma gangrenosum in modern medicine often uses glucocorticoids or immunosuppressants[7]. However, biologicals are easy to cause economic burden to patients, and long-term use of corticosteroids may also cause adverse reactions such as abnormal body metabolism, local skin atrophy, and induced infection[8]. Therefore, integrated Chinese and western medicine can be used to treat PG in clinical[9].

Pyoderma gangrenosum is not recorded in ancient Chinese medical books. According to its clinical symptoms, it is equivalent to "carbuncle" in traditional Chinese medicine [10]. Professor Zhao Bingnan, the founder of modern dermatologic surgery of traditional Chinese medicine, believes that the TCM etiology and pathogenesis of carbuncle are mostly due to the patient's poor physical condition and the lack of healthy qi, superabundance of healthy qi will reduce pathogenic factors and exuberance of pathogenic factors will consume healthy qi accordingly[11]. When dampness and heat attack the patient, her body resistance is too weak to fight against them, which also break the harmony between yin and yang. Therefore, syndrome differentiation of the case are deficiency of qi and blood as the root cause, and local heat-dampness as the manifestation. The treatment should be strengthen healthy qi at the same time to eliminate pathogenic factors, removing blood stasis to regenerate tissues, treating both manifestation and root causes of this disease.

The dermatology of our hospital gave modified Bazhen decoction and Simiao powder orally to this case. Dangshen(*Codonopsis*) and ShuDi Huang(*Prepared Rehmannia Root*) in the prescription are Jun medicine(also be translated into king or chief, which is the most important part in a recipe), both of them reinforce the vital qi and nourish blood. Zhi Huangqi(*Radix Astragali Preparata*) helps Dangshen invigorate qi and consolidation of exterior. Baizhu(*Rhizoma Atractylodis Macrocephalae*) Fuling(*Poria Cocos*) and Yiyiren(*Coix Seed*), regulating qi-flowing for harmonizing stomach, invigorating spleen for eliminating dampness. Danggui(*Angelica*) and Chuanxiong(*Ligusticum Wallichii*) harmonize qi and blood. All of them are Chen(usually translated into minister, associate or deputy, its potency in a prescription is less than that of Jun). Cangzhu(*Rhizoma Atractylodis*) and Huangbai(*Cortex Phellodendri*) are Zuo(also be translated into assistant or adjutant) in this prescription, both of them can remove dampness and heat from lower jiao. ChuanNiuxi (*Radix Achyranthes*) as a lower limb guiding drug, dredging the meridians and collaterals, promoting blood circulation to remove blood stasis. The experience prescription for treating carbuncle in dermatology of our hospital can warm Yang for activating qi-flowing, removing dampness and heal sores. Difuzi(*Fructus Kochiae*), Huangqin(*Scutellaria Baicalensis*) and Kushen(*Radix Sophorae Flavescentis*) can clear heat-dampness. Shechuangzi(*Fructus Cnidii*) warms and recuperates kidney

yang. Chishao(*Radix Paeoniae Rubra*), Chuanxiong(*Ligusticum Wallichii*) and Danshen(*Salvia Miltiorrhiza*) activate qi and blood motion. Xixin(*Herba Asari*), Guizhi(*Ramulus Cinnamomi*) and Ganjiang(*Rhizoma Zingiberis*) warming spleen and stomach for dispelling cold, restoring yang and dredging channels. Sangzhi(*Mulberry Twig*) guide the potency of this prescription to limbs.

6. Conclusions

This case suggests that clinicians should correctly understand the pyoderma gangrenosum to avoid misdiagnosis and mistreatment. By reviewing the relevant literature of PG in CNKI, it shows that TCM treatment of PG can consolidate the curative effect and has a significant advantage in preventing recurrence of the disease[12]. In this case, the patient's ulcer healed well one month after admission in our department and has not recurred since discharge, and there are no obvious adverse reactions during treatment, which proves that the diagnosis of ulcerative colitis combined with pyoderma gangrenosum is clear and the treatment combined with traditional Chinese and western medicine is effective. In clinical practice, we can try to use traditional Chinese medicine combined with modern medical technology to carry out a comprehensive treatment plan of pyoderma gangrenosum to relieve pain and eliminate anxiety of patient.

References

- [1] WOLLINA U. *Pyoderma gangrenosum-a review [J]. Orphanet J Rare Dis*, 2007, 2:19.
- [2] Adisen E, Erduran F, Güreer MA. *Pyoderma gangrenosum: a report of 27 patients [J]. Int J Low Extrem Wounds*, 2016, 15:148-154.
- [3] BRASWELL SF, KOSTOPOULOS TC, ORTEGA-LOAYZA AG. *Pathophysiology of pyoderma gangrenosum (PG): an updated review [J]. J Am Acad Dermatol*, 2015, 73:691-698.
- [4] Li Chunting, Song Qinghua, Chen Hailong, et al. *Clinical analysis of 15 cases of pyoderma gangrenosa [J]. Chinese Journal of Liberation Army Medicine*, 2015, 40(9):742-744.
- [5] Yu Lidong, Zhang Yamei, Nie Lanjun, et al. *A case of pyoderma gangrenosa misdiagnosed as chronic ulcer [J]. Chinese Journal of Injury and Repair (electronic edition)*, 2012, 17 (1):89-91.
- [6] Yu Daoyuan, Lu Haiyan, Huang Heqing et al. *A case of pyoderma gangrenosa treated by integrated Chinese and Western medicine [J]. Beijing Journal of Traditional Chinese Medicine*, 2022, 41(10):1195-1196. (in Chinese) DOI: 10.16025/J.1674-1307.2022.10.028.
- [7] Li Lulong, Ni Jinliang, Li Xueliang, et al. *Ulcerative colitis complicated by pyoderma gangrenosa [J]. Journal of Clinical Dermatology*, 2019, 48(12):743-745. (in Chinese)
- [8] Lu Jiaying, Shi Yuling. *Application of glucocorticoids in dermatology [J]. Chinese Journal of Dermatology*, 2019, 38(4): 304-311+2-3. (in Chinese)
- [9] Wen Hong-Zhu, Zhao Qiu-feng, Fang Bang-Jiang, et al. *Treatment of ulcerative colitis complicated by gangrenous pyoderma: a case report [J]. Chinese Journal of Integrated Traditional and Western Medicine*, 2019, 39(6):756-758. (in Chinese)
- [10] Feng Chenchen, Yang Zhuanhua, Li Gaojie, et al. *Research progress in diagnosis and treatment of pyoderma gangrenosa [J]. Chinese Journal of Leprosy Dermatology*, 202, 38(6):414-418. (in Chinese)
- [11] Zhao Bingnan, Zhang Zhili. *Concise Chinese dermatology*. Beijing: China Prospect Press, 1983:104.
- [12] Yuan Yuting, Chen Yu, Li Ying, et al. *Treatment of pyoderma gangrenosa with traditional Chinese Medicine [J]. Chinese Journal of Traditional Chinese Medicine*, 2017, 32(08):3614-3617.