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Research Progress of "Cutting Pus and Growing Flesh" Method in the Treatment of Chronic Wounds

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Abstract: ***This review summarizes the theory and clinical application of the "cutting pus and growing flesh" method in chronic wound management, synthesizing the mechanisms of moist pus induction, stage-based dressing, herbal hot compresses, and classic pastes. It evaluates the advantages and limitations of combining these approaches with modern technologies, outlines future directions for mechanistic studies and multicenter validation, and provides insights for the modernization of external Chinese medicine.***

Keywords: Chronic wound, Cutting pus and growing flesh, Shengji Yuhong ointment, TCM external therapy.

1. Introduction

Chronic wounds are defined as skin lesions that fail to achieve anatomical and functional integrity through natural healing processes[1]. These conditions, typically resulting from surgical procedures, occur when the wound cannot undergo normal tissue repair mechanisms or regain its original structure and function[2]. Common clinical manifestations include diabetic ulcers, pressure sores, infected wounds, and postoperative complications in anorectal diseases. With accelerating population aging, rising medical costs, and persistent chronic disease challenges, chronic wounds have become a major healthcare burden both domestically and globally.

The "simmering pus to promote granulation" theory first appeared in Shen Douyuan's *Xiaowu Qixuan: Ming Suangou Yiqi Tiaogao Lun* (Treatise on Plaster and Ointment for Ulcers), which proposed that applying herbal ointments (powders) during wound healing promotes local blood circulation, enhances defensive capacity, increases pus secretion, and expels pathogens to stimulate tissue regeneration. This theory emphasizes the crucial role of "pus" in healing processes——: "Toxins transform through pus, and pus originates from qi and blood." The connotation of "pus" varies across diseases and stages[3]. Lu Yaxu et al. [4] distinguish between "good" and "bad" pus: "Bad pus" consists of inflammatory exudates and liquefied necrotic tissue containing bacterial products, typically appearing yellowish, thick, foul-smelling, or thin. "Good pus," however, refers to plasma components from microcirculation vessels, including lymphocytes, macrophages, neutrophils, and growth factors. As part of body fluid metabolism, it appears yellowish-white with a distinct odor, essentially representing "qi and blood." Thus, pus not only indicates infection but also signifies robust qi-blood balance and the body's natural defense mechanism expelling pathogens

2. Boil Pus and Grow Flesh in Wet Method

The "Boil Pus and Nourish Tissue" therapy is applicable for the stage when necrotic tissue has been removed and new skin begins to regenerate. This method typically uses traditional Chinese herbs like Panax notoginseng, frankincense, and myrrh to promote blood circulation, resolve stasis, reduce swelling, relieve pain, moisturize the skin, and stimulate tissue regeneration. It is supplemented with ingredients such as borneol, pearl powder, dragon bone, and calamine to promote wound closure and epithelial regeneration[5]. By applying herbal compresses externally, the increased pus secretion in the wound creates a moist environment. Xu Jienan et al. [6] conducted a study on 132 patients with chronic lower limb ulcers using this combined therapy with oral herbal medication, achieving a total effective rate of 91.67%, an average wound healing rate of 62.57%, and an average healing time of 13.63 days—significantly better than conventional dressing changes. Xu Min[7] demonstrated that the adhesive tape sealing method, which creates a sealed moist environment to facilitate "simmering pus to promote granulation," significantly improved the healing efficiency of chronic skin ulcers, effectively reduced scar formation, and shortened healing time. Although the moist therapy and Boil Pus and Nourish Tissue methods belong to Western medicine and traditional Chinese medicine respectively the former being a Western concept while the latter is a characteristic external treatment in TCM, both aim to promote wound healing through similar processes.

3. Periodic Differentiation and Replacement of Drugs

Postoperative wound dressing changes can be categorized into three stages: initial, intermediate, and late phases. Different herbal preparations are applied according to the healing progression, embodying the core principle of TCM's "diagnosis-based treatment." In the initial stage primarily focused on "extracting pus and removing necrotic tissue", this approach is suitable for wounds with retained necrotic tissue and thick pus. Commonly used corrosive drugs such as Jiuyi Dan and Baer Dan, which contain mercury, promote the liquefaction and detachment of necrotic tissue, and eliminate sepsis[8]. During the intermediate stage (transitioning to "removing necrosis and promoting granulation"), characterized by emerging granulation tissue and increased

exudation, blood-activating agents such as Shengji Yuhong Ointment and Ziyu Ointment are employed. These promote granulation tissue growth through pus drainage while maintaining wound moisture to stimulate natural repair mechanisms. The late-stage treatment (targeting "granulation and closure") utilizes medications like Xieze and Zicao to facilitate epithelial coverage and achieve complete wound healing[9][10]. Modern research indicates that this method enhances angiogenesis and granulation tissue formation by upregulating growth factors like VEGF and bFGF, while reducing inflammatory markers such as IL-8 to minimize local inflammation. Consequently, it accelerates wound healing and reduces scar formation, making it clinically effective for postoperative conditions including anal fistula, perianal abscess, and necrotizing fasciitis.

4. Traditional Chinese Medicine Hot Poultice

The herbal heat therapy pack, a vital component of traditional Chinese medicine's external treatment methods, enhances local blood circulation and accelerates drug absorption through dual mechanisms: thermal stimulation and transdermal drug penetration. In recent years, it has been primarily applied in postoperative wound care for anorectal conditions like anal fistulas and mixed hemorrhoids. Its clinical benefits include promoting blood flow, alleviating pain, reducing edema, and accelerating wound healing[11]. Research by Liu Qinlang et al. [12] demonstrated that applying heat therapy packs based on the "simmering pus to promote granulation" theory to low-positioned anal fistula wounds significantly stimulates granulation tissue growth and improves inflammatory responses. This mechanism may involve suppressing inflammatory mediators such as IL-1β, IL-6, and TNF-α while enhancing vascular endothelial cell growth factor expression. In postoperative care for mixed hemorrhoids, Zhu Xiaoling et al. [13] implemented herbal heat therapy pack therapy. Results showed that the treatment group exhibited significantly lower pain scores and reduced wound edema at days 3 and 7 post-surgery compared to the control group.

5. Application of Chinese Herbal Ointment

5.1 Syndrome Differentiation and Ointment Preparation

According to the "simmering pus to promote granulation" theory, selecting appropriate ointments for different ulcer types is crucial for wound healing. Guo Dongjie et al. [14] emphasized that specific ointments—such as heat-clearing and dampness-drying ointment, blood-activating and stasis-resolving ointment, pungent-warm pus-reducing ointment, and nourishing tissue-regenerating pus-reducing ointment—should be applied based on ulcer characteristics. Yang Yuling et al. [15] further proposed that while applying holistic syndrome differentiation, local patterns should also be considered: damp-heat descending type ulcers require heat-clearing and dampness-drying ointments with a focus on drying and astringent herbs, whereas deficiency-cold dry scab type ulcers need nourishing tissue-regenerating ointments emphasizing blood replenishment and qi regulation. Que Huafa[16] stressed in his research that ointment selection should adapt to ulcer stages. During early necrotic phases with abundant black, dry necrotic tissue or eschar, thick oil-based ointments or cooling oil emulsions can be used to reduce pus and necrosis, stimulate pus secretion, soften dry tissues, and expose underlying tissue. For areas with excessive exudate and significant edema, decoctions of heat-clearing, dampness-eliminating, and astringent herbs can help control exudation and promote new tissue growth. In the proliferative stage, when dry skin surfaces hinder granulation tissue formation, painful dressing changes and re-injury risks increase. Oily preparations like Fuhuang Shengji Healing Oil are recommended to reduce pus and stimulate epithelial growth.

5.2 Clinical Application of Different Ointments

5.2.1 Shengji Yuhong Ointment

Shengji Yuhong Ointment, a classic topical herbal preparation rooted in the "simmering pus to promote granulationl" theory, is widely used for treating chronic wounds. Its blood-activating, necrotic tissue-eliminating, detoxifying, and pain-relieving properties, combined with skin moisturizing and tissue regeneration capabilities, promote the formation of beneficial pus, maintain moisture balance, accelerate granulation tissue growth, and shorten healing duration. The ointment exhibits anti-inflammatory, antibacterial, and antioxidant effects. Active ingredients including quercetin, 7-methoxy-2-methylisoflavone, and geniposide regulate multiple signaling pathways by targeting specific genes. These components stimulate angiogenesis and keratinocyte proliferation, thereby restoring skin barrier function to effectively treat chronic skin lesions[17]. In the study by Chen Cheng et al. [18], Shengji Yuhong Ointment effectively increased the expression of platelet-derived growth factor receptor-α (PDGF-Rα) in wound tissues through syndrome differentiation and formula modification. Chen Shengye et al. [19] demonstrated that the ointment promotes the expression of basic fibroblast growth factor (bFGF), hypoxia-inducible factor-1α (HIF-1α), and vascular endothelial growth factor (VEGF) in tissues, thereby improving ischemic-hypoxic conditions in diabetic foot ulcers by regulating these key growth factors. Zhang Jianping et al. [20] found that Shengji Yuhong Ointment inhibits the AGE/RAGE/NF-κB signaling pathway, reducing inflammatory factor release and cellular damage to alleviate wound inflammation. Mei Pingping et al. [21] reported that modified Shengji Yuhong Ointment suppresses IL-1β, TNF-α, and IL-6 protein expression via NF-κB signaling while upregulating VEGF. Tang Lili et al. [22] discovered that modified Shengji Yuhong Ointment regulates this pathway to reduce TNF-α expression and modulates aquaporin AQP3 expression, promoting healing of postoperative wounds in damp-heat type anal fistulas. Ye Lin et al. [23] showed that Shengji Yuhong Ointment significantly increased VEGF and FGF-2 levels in wound exudate of chronic skin ulcers, enhancing angiogenesis and granulation tissue formation.

5.2.2 Xiangpi Shengji Ointment

Xiangpi Shengji Ointment primarily contains ingredients such as elephant skin, Chinese angelica root, raw rehmannia root, blood-ash charcoal, calamine, raw gypsum, and vinegar turtle shell. It is renowned for its heat-clearing and detoxifying properties, blood-activating pain-relieving effects, and tissue

regeneration capabilities, commonly used in treating pressure ulcers, diabetic ulcers, and post-anal fistula surgeries. Compared to traditional antibiotic wet dressings, this ointment demonstrates superior advantages in promoting granulation tissue growth and shortening healing time[24]. Clinical studies have shown that combining Elephant Skin Regenerating Ointment with Toli Disinfecting Decoction significantly improves chronic skin ulcer treatment. The combination regulates inflammatory factor levels in wound tissues, reduces TNF-α and IL-6 concentrations, alleviates local inflammation, and enhances VEGF expression. Through modulating the Nrf2 signaling pathway, it decreases oxidative stress levels and suppresses excessive expression of NQO1 and HO-1[26], thereby reducing oxidative damage and accelerating wound repair in chronic superficial ulcers. In diabetic anal fistula treatment, the active components in Xiangpi Shengji Ointment promote local growth factor expression and improve microcirculation in wound areas[27]. Research by Zhang Xinyan et al. [28] demonstrated that the ointment reduces inflammatory factor levels in rat serum, inhibits hyperactivation of the p38/MK2 signaling pathway, and enhances VEGF and bFGF expression to mitigate wound inflammation and accelerate healing. Han Xiufang et al. [29] further discovered that through the SDF-1/CXCR4 pathway, Elephant Skin Regenerating Ointment induces macrophage M2 polarization, inhibits inflammatory factor release, and thus strengthens wound repair efficacy.

5.2.3 Zihuang Shengji Ointment

Zihuang Shengji Ointment, formulated with ingredients including lithospermum, rhubarb, angelica dahurica, dragon's blood resin, and pearl powder, operates on the "simmering pus to promote granulation" principle. By maintaining wound moisture while continuously releasing antibacterial and repair-promoting components, it effectively shortens healing time for chronic infected wounds[30]. He Zongqi et al. [31] demonstrated that topical application of Zihuang Shengji Ointment significantly reduces pain scores and accelerates recovery in patients with anal fistula surgery, attributed to its mechanism of upregulating VEGF and Ang-1 expression in wounds while promoting granulation tissue angiogenesis. Yang Xiao et al. [32] further confirmed that this formula significantly promotes neovascularization and accelerates wound healing in chronic infected rat models.

5.2.4 Chinese herbal hard plasters

Chinese herbal plaster therapy, rooted in the traditional principle of "simmering pus to promote granulation," delivers therapeutic effects through localized application of medicinal ointments containing specific herbs. These formulations create an optimal microenvironment that stimulates pus formation and granulation tissue growth, thereby facilitating wound repair. Research by He Chunhong et al. [33] demonstrated that He's Black Plaster Ointment—a proprietary formula combining anti-inflammatory properties with tissue regeneration mechanisms—achieved 93.3% efficacy in treating diabetic gangrene when combined with conventional therapies. Notably, its effectiveness rate reached 95.9% for postoperative lymphedema in breast cancer patients, significantly surpassing the 79.6% achieved through traditional rehabilitation exercises. This treatment effectively reduces bilateral arm circumference differences while enhancing lymphatic drainage, thereby alleviating edema and improving quality of life[34]. Furthermore, when integrated with TDP irradiation (Thermal Device Phototherapy), this herbal approach has been shown to reduce fracture pain, shorten hospital stays, and improve patient satisfaction[35].

5.2.5 Fu-Huang Shengji Healing Ointment

Fu-Huang Shengji Healing Ointment contains ingredients such as rhubarb, egg yolk oil, blood lacquer, pearl powder, and lithospermum. Through the mechanism of "simmering pus to promote granulation" it continuously releases components that activate blood circulation, resolve stasis, promote tissue regeneration, and reduce wound healing time. This ointment can significantly suppress inflammatory factors like IL-6, TNF-α, and IL-1β in diabetic ulcerated mice, while upregulating β-catenin, CyclinD1, and C-myc expression. It activates the Wnt/β-catenin signaling pathway to enhance epidermal cell proliferation and granulation tissue formation, thereby reducing inflammation and accelerating wound healing [36]. Wang Zhenyi et al. [37] further confirmed that the ointment showed significantly higher TGF-β1 mRNA expression in wounds by day 3 compared to control groups, promoting dynamic balance between type I and III collagen. By day 11, it inhibited excessive TGF-β1 expression to reduce scar formation. Xiao Xiuli et al. [38] also found that Fuhuang Ointment initially elevated type III collagen mRNA levels and moderately suppressed type I collagen expression later, achieving rapid repair of refractory wounds with minimal scarring. In treating chronic lower limb ulcers, it demonstrated better efficacy than Western medications like Befuji in promoting tissue regeneration and controlling infections [39].

6. Joint treatment

Guided by the "simmering pus to promote granulation" theory, combined therapies that integrate topical Chinese herbal applications with negative pressure drainage or laser treatments demonstrate significant efficacy in promoting chronic wound healing. In treating diabetic foot gangrene, Zhang Ning et al. [40] reported that the combination of "Qingjin Shu (Muscle-Relaxing Technique) and Boil-Healing Ointment" effectively removes necrotic fascia and degenerated tendons early, blocks infection spread, significantly shortens wound healing time, and reduces toe amputation rates to 26.67%. Wang Lixiang et al. [41]'s study indicated that the synergistic effect of Detoxifying Vessel-Unblocking Powder combined with Pus-Transforming Granulation Ointment enhances chronic wound healing through "internal detoxification and external support". Clinical evidence shows oral Detoxifying Vessel-Unblocking Powder can significantly suppress systemic inflammation and improve microcirculation, while topical Pus-Transforming Granulation Ointment works through its "pus-lifting and necrosis-eliminating" mechanism. This dual action liquefies necrotic tissue, increases local pus secretion, and promotes granulation tissue and epidermal regeneration. Its deeper effects enhance local anti-infection capacity, improve microcirculation, and promote vascular regeneration – methods commonly used for chronic wounds like diabetic foot. Yang Xiao et al. [42]' s research demonstrated that

combining Boil-Healing Ointment with superficial vein laser therapy for gangrene improves local venous hypertension and congestion through laser-induced fibrosis. Topical application of Boil-Healing Ointment clears heat, eliminates dampness, activates blood circulation, and accelerates wound healing, significantly shortening treatment duration. For chronic lower limb skin ulcers, Xiangpi Shengji Ointment combined with VSD is used for preoperative wound bed preparation, rapidly removing necrotic tissue and promoting granulation growth, providing an optimal foundation for flap transplantation. In clinical practice, the combination of Astragalus and Angelica Root Ointment with self-made VAC can significantly reduce wound inflammation through the "swelling and tissue regeneration" mechanism. The formula contains Astragalus and Angelica Root to replenish qi and blood while removing toxins and pus, along with Xiangpi (a traditional Chinese medicine ingredient) and calamine to eliminate necrotic tissue and promote wound closure. Combined with VAC negative pressure drainage, it effectively removes liquefied necrotic tissues and prevents infection foci formation. Clinical observations show that this combined therapy achieves significantly better wound healing than the control group after 4 weeks[44], making it suitable for treating refractory wounds like high-position perianal abscesses. Gao Wenjing et al. [45] confirmed that the "swelling and tissue regeneration" herbal dressing method (Biyu Powder) combined with PRP can completely heal chronic skin ulcers within 15 days. The high concentration of platelet-derived growth factors (PDGF, EGF) in PRP synergizes with Bihua Powder's components like Phellodendron and lacquer tree resin, which inhibit bacterial biofilms and improve microcirculation, significantly accelerating granulation tissue regeneration and wound re-epithelialization. In summary, the combined therapy under the "simmering pus to promote granulation" theory regulates inflammatory microenvironment through dual mechanisms: "Removing putrefaction and promoting granulation" and "Draining abscessed pus" promoting angiogenesis and granulation formation to accelerate chronic wound healing.

7. Summary

In recent years, the traditional Chinese medicine (TCM) external therapy based on the "simmering pus to promote granulation" theory has gained significant attention in chronic wound management. Extensive research indicates that various TCM formulations can significantly reduce inflammatory responses, promote granulation tissue angiogenesis and epithelial regeneration, thereby shortening healing time and minimizing scar formation by modulating key growth factor signaling pathways. Furthermore, the combined TCM external treatment strategy integrating VSD, PRP, laser therapy, or tendon release surgery under this theoretical framework demonstrates substantial clinical value in chronic wound care. However, while existing evidence preliminarily reveals the therapeutic advantages of the "simmering pus to promote granulation" method, systematic understanding of its core active components, dose-response relationships, and molecular mechanisms remains insufficient. Most current studies employ single-center, small-sample designs lacking long-term follow-up and safety evaluation systems. To further clarify its efficacy and mechanisms, future research should focus on multi-level studies utilizing transcriptomics, proteomics, and metabolomics to decipher the cellular and molecular networks involved in "good pus" formation during the swelling process. Additionally, multicenter, randomized, controlled, and blinded clinical trials should verify therapeutic differences and adverse reaction profiles of various swelling formulations across different wound types and populations. This will provide chronic wound patients with more precise, safe, and cost-effective TCM external treatment options while advancing the modernization and internationalization of the "simmering pus to promote granulation" theory.

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