

Regeneration and Repair of an Acute Thumb Trauma using the Natural Plant Antimicrobial Solution

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ABSTRACT

The natural plant antimicrobial solution (PAMs) is an herbal preparation developed from the secret prescription handed down by a Chinese famous family of Xiang's Mongolian ancestors. It has been used in local areas for the treatment of trauma for hundreds of years with multiple medical functions. Trauma to the finger or the hand is quite common in society nowadays. Here, we reported an acute case in which the thumb of a 49-year-old man was seriously severed by an electric saw and excessively bled subsequently. After treated with PAMs, the bleeding was stopped and the pain was alleviated. In the end, the patient's thumb has completely recovered only using PAMs.

Key words: Thumb trauma, herbal preparations, traditional Chinese medicine, tissue repair and regeneration

INTRODUCTION

People may suffer from different kinds of wounds by accident in daily life. Clinically, acute trauma may need surgery and corresponding medications, which is a prolonged and relatively costly therapy. Thus, an effective, low cost, quick, and convenient therapy is both in great demand and of great medical significance.

The traditional Chinese medicine (TCM) is the precious treasure of Eastern civilization and has greatly benefited the human health in the long history of China and other Asian countries.^[1,2] As a kind of TCM, the natural plant antimicrobial solution (PAMs) may hopefully be a right choice and meet the requirement. It is an herbal preparation developed from the secret prescription handed down by a Chinese famous family of Xiang's Mongolian ancestors and has been used in local areas for the treatment of trauma for hundreds of years with multiple medical functions. In 2015,

PAMs was approved to be the hospital preparation by China Yunnan Food and Drug Administration for the use in wound infection and festering, cell necrosis and dry gangrene, and blood circulation obstacles.

CASE REPORT

In 2014, a 49-year-old Beijing citizen had his right thumb (proximately 1.5 cm × 2.0 cm) cutoff by an electric saw accidentally. The pain was really sharp and the thumb bled excessively. Due to the local medical condition, the patient did not receive any treatment in hospitals. He chose to dispose the wound by himself. A cotton pad dripped with PAMs was pressed on the wound when he got home. Whereafter, PAMs was dripped on the cotton pad every 10 min, and after 20 mL PAMs, the bleeding was finally stopped [Figure 1a]. Being uncertain of PAMs, the patient went to another three local hospitals to get medical help. However, the proposed therapeutic modality was deemed unacceptable by his

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family. Hence, he decided to go home without any hospital assistance. According to the later description of the patient, the pain could be relieved about three-fourth immediately when treated with PAMs.

For the rest of the day, PAMs was used about 20 times a day. As shown in Figure 1b, 1 day later, the bleeding was

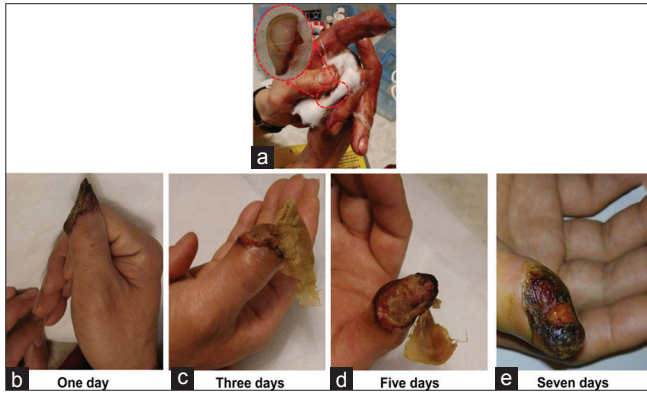


Figure 1: The thumb of a 49-year-old man was cut off by an electric saw (a) and the changes of thumb for 7 continuous days treated with plant antimicrobial solutions (b-e)

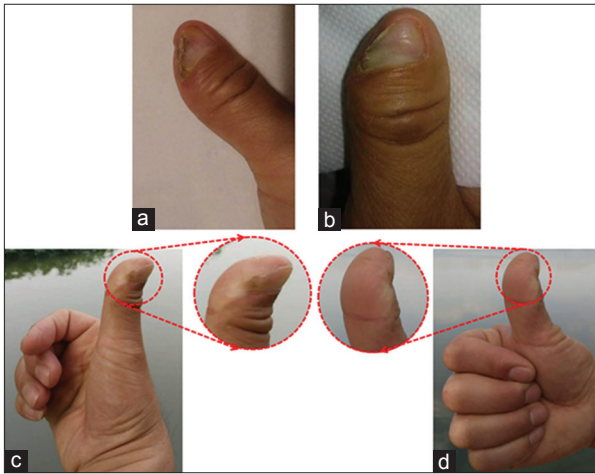


Figure 2: New tissue regeneration occurs after 2 months treatment with plant antimicrobial solutions (a and b), and now, the thumb of the patient has been completely cured (c and d)

completely stopped and there was no sign of infection and inflammation, and on the 3rd day, the injured thumb began to regenerate [Figure 1c]. After a week, the wound had recovered a lot [Figure 1d and e]. The patient continued to use PAMs 3 times a day for 2 months. During these periods, we recorded the changes. Nails and tissues began to slowly regenerate and no side effects had been observed [Figure 2a and b]. It should be emphasized that during the treatment, there were no other treatments used such as antibiotics and vaccination of tetanus. We could see the completely recovered thumb of the patient in Figure 2c and d.

DISCUSSION

It is now acknowledged that herbal medicine may provide new therapeutic approaches and play key roles in disease treatment including wound healing.^[3] In this case, we reported an ancient Chinese folk medicinal preparation (PAMs) for its superb wound healing and regeneration effects on a patient with a serious electric saw-severed thumb. PAMs was the ethanol extracts of multiple Chinese natural and folk medicinal plants including *Carthamus tinctorius*, *Lithospermum erythrorhizon*, *Cymbopogon distans*, and *Solanum indicum*. Hydroxysafflor yellow A, which can be extracted from *C. tinctorius*, has been reported to have various pharmaceutical activities such as anti-inflammatory action,^[4] antioxidative effect,^[5] lowering blood pressure and heart rate,^[6] and antitumor effect.^[7] Shikonin derivatives from *L. erythrorhizon* have anticancer, antimicrobial, anti-inflammatory, and wound healing activities.^[8-10] Allantoin from *C. distans* has also been reported to have prominent anti-inflammatory and antinociceptive effects in mice.^[11] Likewise, diosgenin from *S. indicum* possesses diverse biological activities covering anti-inflammatory properties.^[12] In fact, on the basis of our previous study, it was proved that PAMs could inhibit the inflammatory cytokines to exert anti-inflammatory and analgesic effect.

This is the first report of PAMs showing such remarkable therapeutic effects on the regeneration and repair of a human injured thumb. This case report illustrates the marvelous effects of PAMs on wound healing. Similar clinical effects

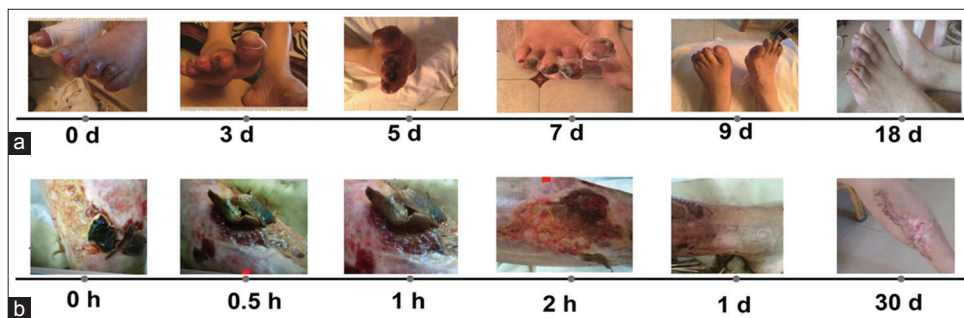


Figure 3: Wound cases of another two patients were recovered by plant antimicrobial solutions treatment. (a) Foot finger ulcers caused by vasculitis, (b) Post-operative infection

were also found in other applications of PAMs including foot finger ulcers caused by vasculitis [Figure 3a] and post-operative infection [Figure 3b]. All the cases indicate that PAMs might play an essential role on tissue regeneration and repair. This is reasonable, as in our early study, we found that PAMs can enhance the ulcer healing in both the normal and streptozotocin-induced diabetic mouse. This is also consistent with our discovery that PAMs could not only inhibit the translocation of nuclear factor kappa B and production of inflammatory cytokines in tumor necrosis factor- α /interferon- γ -induced HaCaT cell inflammation model and imiquimod-induced psoriasis-like skin disease in mice^[13] but also promote the proliferation of neural and mesenchymal stem cells at lower concentrations. In fact, some medicines have been proved to be able to activate and recruit local endogenous stem cells to the site for new tissue regeneration.^[14] Taking together, in this case report, we proposed that the injured thumb was stimulated by the multiple components of PAMs, and afterward, new tissue regeneration was provoked. Thus, the proliferation and differentiation of stem cells may be promoted ultimately. Nevertheless, further study of PAMs for wound healing and tissue regeneration is earnestly needed either for the understanding of molecular mechanisms or for the new drug development based on PAMs.

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