The Application of Moist Exposed Burn Ointment (MEBO) and Binahong Leaves in Treating Partial Thickness Burn : A Case Report

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Background: Burn healing is dependent on good wound care management. Infection is one of the cause of wound healing failure. Infectious wound should be treated immediately. Binahong's leaves is trusted as traditional herbal medicine which is considered capable to help wound healing process.
Patient and Method: A 35 years old women suffer from scald and got 3% surface partial thickness burn at her right hand. The patient was initialy treated by application of MEBO. After a week patient came and felt uncomforted with the gauze. So, binahong's leaves was patched on her wound to help the wound healing process.
Result: After a week with binahong's leaves therapy, the epithelialization is good and there was no infection. The result is satisfactory.
Conclusion: This study shows that binahong's leaves can be used to help wound healing process.
Keywords: *MEBO, binahong, partial thickness burn*

Latar Belakang: Penyembuhan luka bakar sangat tergantung dengan manajemen luka yang baik. Infeksi menjadi salah satu penyebab kegagalan peyembuhan luka. Luka yang terinfeksi harus segera diatasi dengan berbagai cara. Daun binahong dipercaya sebagai tanaman obat traditional yang dianggap mampu membantu menyembuhkan luka.
Pasien dan Metode: Wanita usia 35 tahun tersiram minyak panas dan terjadi luka bakar *partial thickness* seluas 3% pada tangan kanan. Pasien diberi terapi awal dengan MEBO. Satu minggu kemudian, pasien datang dengan keluhan merasa tidak nyaman dengan kain kasa. Daun binahong ditempelkan pada luka untuk membantu proses penyembuhan luka.
Hasil: Setelah satu minggu terapi dengan daun binahong, proses epitelialisasi baik dan tidak ada infeksi. Hasil sangat memuaskan.
Kesimpulan: Laporan ini menunjukkan bahwa daun binahong dapat digunakan untuk membantu proses penyembuhan luka.
Kata Kunci: *MEBO, binahong, luka bakar partial thickness*

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Burn is a common injury that can be found in daily practices. Severe burn resulting the higher morbidity and disability than another injury causes.[1] Burn is a disease due to contact with heat resources which make a damaged to skin, mucosa, and the deeper tissue. The heat can be from hot waters, hot oil, electric injury, thunder, radiation, chemical substances and sunburn.[1, 2] Based on research at Cipto Mangunkusumo Hospital from 2009 until 2010, most causative agent of burn is explosion of LPG and followed by scald.[3]

The deepness of burns is determined by the temperature and time of exposure. The deep of the burn, the recovery will take longer time. First degree of burn will recover in 5 – 7 days. Second degree of burn, the dermis is damaged but there is still epithelial layer left. With this layer, the wound will heal in two until three weeks. The third degree of burn need skin graft because there is no healthy epithelial left.[1] Systemic therapy is need for severe burn injury. For the mild one, we just do wound treatment for the patient.

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There's a healthy epithelial layer on first and second degree of burn, this wound will heal by itself. The factor that can ruin this healing process is infection.[1,4] We can prevent infection with the application of topical treatment or even oral antibiotics. Moist exposed burn ointment (MEBO) - an oil based ointment containing sesame oil, beta-sitosterol, beberine, and other small quantities of plant ingredients developed at China National Science and Technology Centre in Beijing, China, in 1989 – has been proposed as the ideal burn wound treatment. The manufacturers of MEBO claim that it accelerates healing, inhibits bacterial growth, has analgesics effects, and prevents burn wound scarring. MEBO's exact mechanism of action has not been fully elucidated, but it is thought that this oil based ointment provides a moist environment for epithelial regeneration to occur, with the added anti- inflammatory effects of betasitosterol and the antibacterial effects of berber.[5] One of traditional herbal plant which is often be used to heal wound is binahong or *Anredera cordifolia*. People believe that binahong's leaves can be used to prevent infection on burn wound healing. Based on Christiawan research on 2010, binahong extract doesn't have effect on *Staphylococcus aureus* at 10% concentration. Meanwhile, binahong extract prevent the growth of *Pseudomonas aeruginosa,* which is usually found at 20% of burn patient.[6,7]

PATIENT AND METHOD

A 35 years old woman came to our clinic with chief complaint is burn at her antebrachii and manus dextra due to hot oil two days before admission. From physical examination, we found around 3% surface partial thickness burn on right hand. There were two big blisters, one on the antebrachii below the cubiti and the other was superior of wrist. (Figure 1). Based on Visual Analog Scale with scar ranking, we asses this patient with score 70. We performed bulotomy and let the skin became biological dressing for the wound. We gave her MEBO, oral antibiotics, and oral analgesic. After a week, she came to the clinic, some of the skin is changed by new epithelial layer, but there was some area with pus. (Figure 2). Patient feel uncomforted with the gauze, she felt that the ointment is sticky. She asked what kind of leaves that can be used to her wound before close the wound with gauze. Based on some prolusion research, we told her to patch binahong leaves to her infected area after application of MEBO. (Figure 3). We still gave her oral antibiotics and oral analgesic.

DISCUSSION

Partial-thickness burn wounds involve the deeper layers of the epidermis and upper layers of the dermis and may be either superficial or deep. Superficial partial-thickness burns are characterized by erythema, blister formation, edema and pain. This type of injury should heal spontaneously within two or three weeks. Deep partial-thickness burns appear marble-white and edematous and result in destruction of the epidermis and upper layers of the dermis. Skin appendages, i.e. sweat glands, hair follicles, and sebaceous glands remain intact. These wounds may heal without grafting with epithelium from the skin appendages and wound margins spreading to cover the wound surface. Autografting may be indicated depending on severity.[1,8]

The Rules of Nine is the simplest way to determine the size of burn, it divides the surface area of the body into segments of 9%. Wet heat (scald) travels more rapidly into tissue than dry heat (flame) because water conducts heat 100 times greater than air. Treatment begins with cleansing and debridement of loose epidermis and remaining large blisters from the wound surface. Large blisters should remain intact for no more than 2 days, as the infection risk is increased. Burns expose the deeper tissues of the skin or body to invasive microbes.Topical preparations for treating burn wounds, to be useful, should ideally have antibiotic power and promote healing.[8,9] The topical preparations that often be used are silver sulphadiazines and MEBO. The study showed that MEBO ointment for topical treatment of burn injuries presents an attractive alternative for the topical treatment of limited partial thickness thermal burns. Hong-qi Zhang et all, on their research claimed that MEBO had a better wound healing rate than the dry exposure treatment, it did not show the medical advantage statistically and MEBO is not suitable for deep burn wound treatment,

MEBO's active component is β-sitosterol, based on beeswax, sesame oil and other components. Clinical and experimental studies reported in the Chinese literature suggested, that the ointment reduces evaporation from the wound surface. Based on research at India about wound healing activity of sesame oil on rate, claimed that sesame oil reduce the period of epithelization and wound contraction on burn model. [12,13] Oils soothe wounds, retain moisture, and relieve pain. Beta-sitosterol promotes epithelialization.[9] Indonesian culture believes that binahong's leaves can be used to heal wound. Some research claims that binahong or *Anredera cordifolia* contain flavonoids, saponins, steroids/triterpenoids, and coumarins.[14] Flavonoid have diverse biological activities such as antioxidant. ethanolic extract of Binahong leaf possess total flavonoids 11,266 mg/kg (fresh) and 7,687 mg/kg (dry). Flavonoids contain in both extracts were flavonols group. Ethanolic extract of Binahong possess total antioxidant 4,25 mmol/100g (fresh) and 3,68 mmol/100g (dry).[15] Miladiyah research on 2012 showed that groups treated with ethanolic extract of binahong leaves at concentrations of 20% and 40% experienced better wound healing activity than negative and positive controls.[16] The classical definition of saponins is based on their surface activity and many saponins have detergent properties, give stable foams in water, and show hemolytic activity. The functions as a cleaner, is able to stimulate the formation of collagen, a protein that plays a role in the process of wound healing. Triterpenoids has an anti-inflamatory properties that can reduce pain in burn.[17]

We reported case of burn wound management with the application of binahong's leaves. We use the leaves to cover the wound due to the patient feel uncomforted with the gauze. Because MEBO is oil based ointment, the patient felt it's too sticky, it less comfortable and she felt hurt when the gauze is opened. We didn't do any extraction of binahong leaves due to facilities. Based on reasearch at Medical Faculty Universitas Airlangga on 2011, binahong's ethanol extract shows that there is no antibacterial activity against *Staphylococcus aureus*. Meanwhile against *Pseudomonas aeruginosa*, it is seen that at 10% of concentration binahong extract can kill germ colonies.[6] Binahong leaf extract ointment at concentration 10%, it already exhibit healing effectivity, although concentration 20% and 40% shows more healing effectivity. The increases of concentration of Binahong leaf extract ointment effectively heal the wound infected with *Staphylococcus aureus.*There is a different result of reasearch can be caused by the difference of preparation and methods.[18] Binahong extact also can inhibit the growth of *Escherichia Coli* and *Klebsiella Pneumoniae* in vitro.[19,20`]

From the explanation above, the advantages of using binahong's leaves in wound treatment are cheap, easy to find, and able to inhibit the growth of bacteria that commonly found on burn wound infection. After application of binahong leaves, patient felt that it is more comfortable, cooler, and less sticky. The disadvantages of application of binahong's leaves on wound healing are the sterility and form. People usually take the binahong's directly from the plant, wash it, and then cover it. So, it is not sterile enough. Because the lack of evidence and research, there's no any medication that contains extract of binahong leaves. So most people pound or directly cover the wound with the leaves. Both of MEBO and binahong's leaves have antibacterial effect. MEBO offers the advantages of a moist environment for wound healing in addition to those of the open treatment technique avoiding cumbersome, bulky, and expensive dressings. Clinical and experimental studies reported in the Chinese literature have demonstrated that the ointment markedly reduces evaporation from the wound surface.[21,22]

Mildiyah's research show significance of the binahong leaf extract has a potential for wound healing in guinea pig.[14] Both of MEBO and binahong leave's can be used to heal wound healing. Binahong's leaves can reduced the ammount of MEBO on wound healing with semi exposed methode.

Figure 1: The condition at first admission.

Figure 2: Condition after a week therapy.

Figure 3: The application of binahong leaves.

Figure 4: The Result after 2 week treatment.

Our patient came to the clinic with acute burn injury at her hand. After a week of MEBO application, she came and felt uncomforted with the gauze, we told her to apply binahong's leaves after MEBO. We believe that MEBO and binahong leaves can heal the infection. Even we used the real leaves, based on its compound, binahong itself can help to eradicate the infection even it is not as effective as the extracts. There is still need a further research to find the correlation between burn wound healing and binahong leaves. We can't find any research about the application of binahong leaves on wound on human, most the research use animals. So this paper can be an initial idea to develop the herbal medicine on wound healing on human.

SUMMARY

We reported a case of burn wound healing with application of binahong's leaves to treat the infection. From this study, we learn that binahong's leaves can be used to help heal the infection on burn wound healing, but it still need a further reasearch on human.

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