

Ayurvedic Management of a Third Degree Burn Wound in a Patient with Diabetes Mellitus - A Case Report

Case Report

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Abstract

Burn injuries are the most agonizing, excruciating type of injuries causing disfigurement and disability in the victims. Such injuries need proper wound management care, and if the victim is diabetic the management and wound healing tends to get difficult and susceptible to infections. In Third degree burns the affected area is charred, parchment like, painless and insensitive, with thrombosis of superficial vessels. It requires grafting. A 60 year old female patient, known case of Diabetes Mellitus with large approximately 25%TBSA (Total Body Surface Area) burn wound sought *Ayurvedic* treatment. A non-healing wound can cause severe complications if left untreated, and it was recommended by her surgeon to undergo a skin grafting surgery. However, the patient was unwilling for it given her diabetic condition. The patient was treated with internal and external *Ayurvedic* medicines where significant wound healing was achieved in a span of 90 days. Treatment was aimed for *Shodhana* (Cleansing) and *Ropana* (Healing) of the wound and amelioration of vitiated *Doshas* (morbific diathesis) keeping in consideration the *Prameha* (Diabetic condition) of the patient. The study proves the efficacy of Ayurvedic treatment in managing a chronic non-healing, third degree burn wound in a diabetic patient without any complications. It infers that the Burn injuries can be treated with *Ayurveda* within the expected time period of wound healing.

Keywords: Burn wound, *Dagdha Vrana*, *Dushta Vrana*, *Ayurveda*, Diabetes Mellitus, Non healing wound.

Introduction

Burn injuries are common in Indian households. Healing of the burn wound varies depending on the degree of the burn, which is the thickness of the skin involved. Charred, denatured, insensitive, contracted full thickness burn is called as eschar. No epidermal or dermal keratinocytes remain; thus, these wounds must heal by re-epithelialization from the wound edges. Treating burn wounds conventionally can be divided into three stages: Assessment, Management and Rehabilitation. First the extent and depth of the wounds is assessed and the wounds are thoroughly cleaned and debrided, then the management phase begins. Dressing of the burn wound should protect the damaged epithelium, minimize bacterial and fungal growth and should be occlusive to reduce evaporative heat loss and minimize cold stress. The dressing should provide comfort over the painful wound. Deep partial-thickness or full-thickness wounds benefit from excision and grafting for sizable burns, and the choice of initial

dressing should be aimed at holding bacterial proliferation in check and providing occlusion until the operation is performed.(1)

In Ayurveda, Acharya Sushruta has classified the *Dagdha vranas* (thermal burns) in four categories depending on the severity and depth of the wound.(2) Third degree burns show similar presentation like that of *Atidagdha vrana*, one of the four types mentioned by Acharya Sushruta. For the management of such burns Acharya Sushruta advises thorough cleaning, removing burned charred tissues and debridement. Later *Sheetal chikitsa* (cooling therapies) like dressing by application of medicated *Ghruta* (ghee) and covering by lotus leaves is advised. Further it is advised to treat the wounds by *Ropan Gruta* (Healing ghee).(3) If the wound is non-healing and infected it is classified as *Dushta Vrana* in ayurvedic texts.(4)

Case Presentation

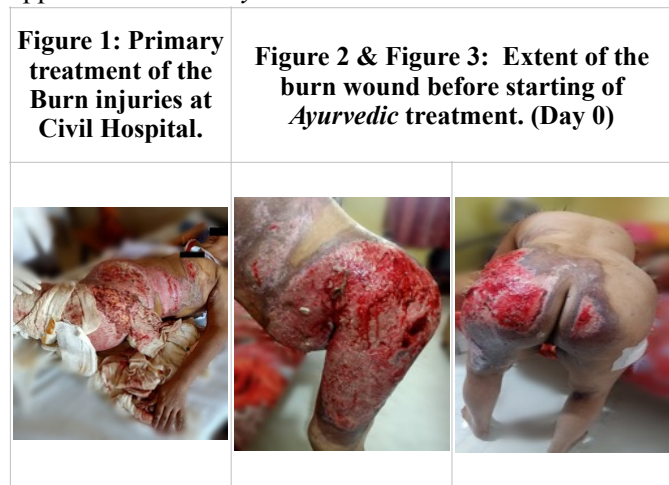
60 year old female, a known case of Diabetes mellitus was presented with a third degree burn wound on lower abdomen, thigh and hip region. Two months ago, the patient had suffered above burn injuries in household incident with resultant fire. Primary treatment was given at local Civil Hospital. All wounds were covered with bandages (Figure 1). Patient continued with antibiotics and analgesics along with conventional topical treatment, but no lasting improvement was achieved even after two months of conventional medications. The patient was then advised

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for skin grafting surgery, which the patient was unwilling to go forward with because of her insulin dependent diabetic condition. Later the patient approached us for *Ayurvedic* treatment.



Clinical Findings

Local examination revealed a large, open, unhealed, third degree burn wound approximately 25% TBSA (Total Body Surface Area) on the lower abdomen, front, lateral and posterior aspect of left thigh, left gluteal region and medial parts of right gluteal region. Wounds were tender. Other minor burn wounds on lateral aspect of abdomen and thorax were healed (Figure 2 and 3). The patient was of *Kapha Vata prakruti* (body type), *Madhyam bala* (average physical endurance) and *Madhyam satva* (average psychological strength). *Jivha* was *saam*. Fasting blood sugar was 162 mg/dl and Postprandial blood sugar 268 mg/dl. HbA1c was 9.8%. Patient was a known case of Diabetes Mellitus and was on 20 units of Insulin.

Therapeutic Interventions

Treatment was started after taking the written consent from the patient. Following Internal and topical medicines were given to the patient.

Table 1: Therapeutic Interventions given to patient

DURATION	MEDICINE, DOSE AND TIME (<i>AUSHADH, MATRA AND SEVAN KAAL</i>)
DAY 1 To DAY 15	<ol style="list-style-type: none"> 1. <i>Tab. Arogyavardhini</i> (250mg) 2 Tablets three times a day before food with lukewarm water. 2. <i>Tab. Sukshma Triphala</i> (250mg) 2 Tablets three times a day before food with lukewarm water. 3. <i>Tab. Chandraprabha Vati</i> (250mg) 1 Tablet twice a day before food with lukewarm water. 4. <i>Tab. Vasantkusumakar rasa</i> (100mg) 1 Tablet morning empty stomach with water. 5. <i>Tab. Aragvadh kapila</i> (500mg) 1 Tablet at bedtime with water. 6. <i>Triphala+Yashtimadhu kwath</i> (1000ml water + 5gm powder boiled and reduced to one fourth) for local wash (<i>dhavana</i>) of wound twice a day. 7. <i>Sarjarasa Malhara</i> for local application twice or thrice a day. 8. <i>Jatyadi Ghruta</i> for local application twice a day.
DAY 16 To DAY 30	<ol style="list-style-type: none"> 1. <i>Tab. Arogyavardhini</i> (250mg) 2 Tablets twice a day before food with lukewarm water. 2. <i>Tab. Sukshma Triphala</i> (250mg) 2 Tablets three times a day before food with lukewarm water. 3. <i>Tab. Chandraprabha Vati</i> (250mg) 1 Tablet twice a day before food with lukewarm water. 4. <i>Tab. Vasantkusumakar rasa</i> (100mg) 1 Tablet morning empty stomach with water. 5. <i>Amalki + Haridra churna</i> 1gm twice a day with water. 6. <i>Triphala+Yashtimadhu+Nimb+Haridra kwath</i> (1000ml water+5gm powder boiled and reduced to one fourth) for local wash (<i>dhavana</i>) of wound twice a day. 7. <i>Sarjarasa Malhara</i> for local application twice or thrice a day. 8. <i>Jatyadi Ghruta</i> for local application twice a day.
DAY 31 To DAY 60	<ol style="list-style-type: none"> 1. <i>Tab. Sukshma Triphala</i> (250mg) 2 Tablets three times a day before food with lukewarm water. 2. <i>Tab. Chandraprabha Vati</i> (250mg) 1 Tablet twice a day before food with lukewarm water. 3. <i>Tab. Kaishore guggul</i> (250mg) 1 Tablet twice a day before food with lukewarm water. 4. <i>Amalki + Haridra churna</i> 1gm twice a day with water. 5. <i>Triphala+Yashtimadhu+Nimb+Haridra kwath</i> (1000ml water+5gm powder boiled and reduced to one fourth) for local wash (<i>dhavana</i>) of wound twice a day. 6. <i>Sarjarasa Malhara</i> for local application twice or thrice a day. 7. <i>Jatyadi Ghruta</i> for local application twice a day.
DAY 61 To DAY 90	<ol style="list-style-type: none"> 1. <i>Tab. Kaishore guggul</i> (250mg) 1 Tablet twice a day before food with lukewarm water. 2. <i>Tab. Arogyavardhini</i> (250mg) 2 Tablets twice a day before food with lukewarm water. 3. <i>Triphala+Yashtimadhu+Nimb+Haridra kwath</i> (1000ml water+5gm powder boiled and reduced to one fourth) for local wash (<i>dhavana</i>) of wound twice a day. 4. <i>Sarjarasa Malhara</i> for local application twice or thrice a day. 5. <i>Murivenna Oil</i> for local application twice a day.

Diet and Regimen

Patient's Diet and Regimen (*Ahaar and Vihaar*) play a vital role in the treatment. Acharya Sushruta mentions that if proper diet and regimen is not followed the wound may develop into a *Dushta Vrana* (infected wound).(4) Patient was advised to avoid stale, salty,

spicy, fermented foods, dairy products, rice and items made from rice, groundnuts, pickles, curd etc. in her diet. She was also asked to avoid sleeping in day time and staying awake late at night. Patient was advised to maintain proper hygiene.

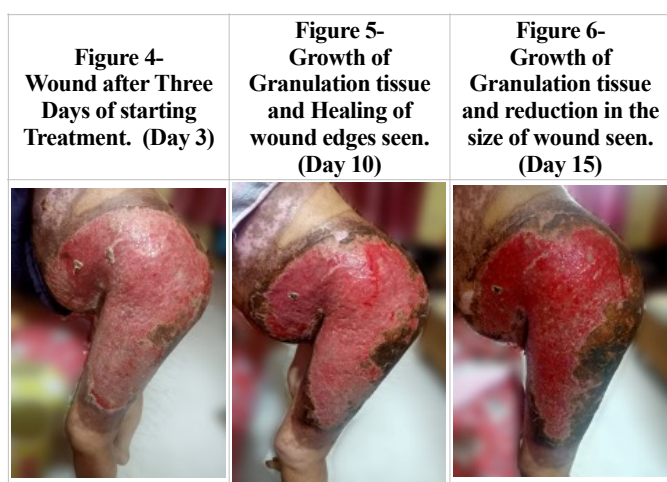
Effect of Interventions on Presenting Symptoms

Table 2. Effect of Interventions on Presenting Symptoms

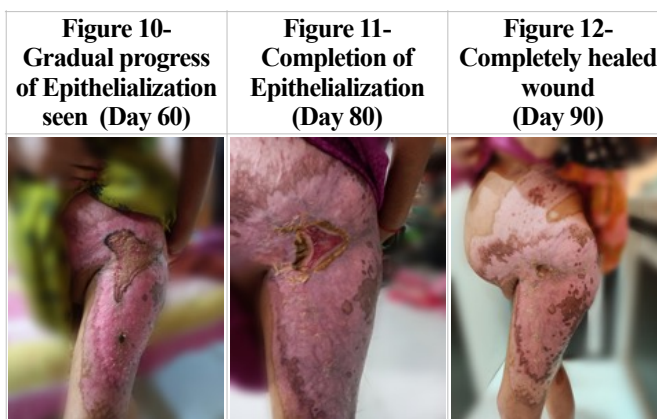
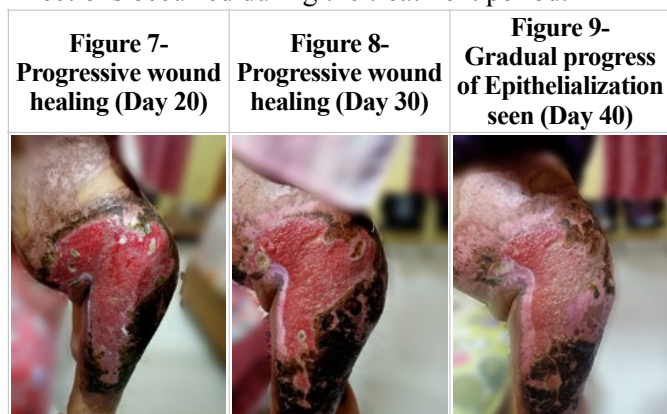
SYMPTO MS	DAY 1 – 15	DAY 16-30	DAY 31-60	DAY 61-90
Tenderness	+++	++	+	None
Size of wound	≈ 25% TBSA	≈ 20% TBSA	≈ 15% TBSA	0% TBSA (healed)
Discharge	Present	Absent	Absent	Absent
Tenderness Assessment criteria: 0-No Tenderness; + - Patient whine pain; ++- winces; +++-Does not allow to touch				
Size of wound-was measured by The Rule of Nines, also known as the Wallace Rule of Nines.(5)				

Follow Up and Outcomes

During first fifteen days the wound was severely tender. At the end of first month of treatment tenderness was reduced. Size of the wound also reduced as the treatment progressed. Discharge from the wound was not seen after first two days of starting the treatment (Figure 4). Granulation tissue growth was seen after five days of starting the treatment. First week showed considerable healing of edges (Figure 5, 6).



Epithelialization progressed gradually (Figure 7 to 12) and was complete by twelve weeks after which the wound was completely healed with no associated complaints. The patient occasionally reported pruritus, but it was under control. No local or systemic infections occurred during the treatment period.



Discussion

Ayurveda scripts elaborately describe burns and their related complications. *Atidagdha Vrana* (over burnt) is a burn in which the flesh hangs down, and where the veins, nerves and bones are destroyed, accompanied with fever, burning, thirst, fainting and such like disturbances, and which leads to a permanent disfiguration of the body, retarding the healing of the incidental ulcer which leaves a discolored cicatrix even after healing.(2) *Atidagdha Vrana* shows similar features that of the third and fourth degree burns. According to Ayurvedic perspective the pathology of burn can be explained in further manner. Fire agitates the *Rakta* (blood) aggravating it leading to the vitiation of *Pitta*. And since the *Rakta* and *Pitta* are similar in their *rasa* (taste), *virya* (potency) and *dravatvya* (fluidity) the effects of *Pitta* (burning sensation etc.), are naturally aggravated and augmented through a contact with fire leading to severe pain, burning, the quick appearance of blisters, fever, and thirst. (6)

Acharya Sushruta further describes that *Vrana* (wound) will develop into a *Dushta Vrana* if kept untreated and improperly taken care of. Such a wound is difficult to heal on account of it becoming aggravated by vitiated *Doshas* (morbific diathesis) involved therein. (4)

The medical and surgical treatment of a *Vrana* (wound) is divided into sixty different steps.(7) Out of these sixty, *Kahsaya* (washing with medicated decoctions) and *Sarpi* (application of medicated Ghee) are the two steps used for *Shodhana* (cleansing) and *Ropana* (healing) of the wound. In treating wounds *Shodhana* is of equal importance as that of *Ropana*. *Virechana* (therapeutic purgation) is for pacifying the vitiated *Doshas* (morbific diathesis).

In the present case external medicines were directed towards *Shodhana* and *Ropana* of the wound. Internal medicines were directed towards amelioration of vitiated *Doshas* (morbific diathesis) and *Vrana ropana* (healing of wound). *Prameha* (Diabetic Condition) of the patient was also taken into consideration while prescribing the medications as it tends to slow down the healing process.

Arogyavardhini is a herbo-mineral medicine to ameliorate the *Pitta* and *Rakta*. It helps in maintaining Hepatic functions, reduces fats (*meda*), eliminates waste from the body (*malshuddhikar*), improves digestion and

increases appetite.(8) It has antibacterial potential against tested gram positive and gram negative bacterial species and provide as an alternative treatment to synthetic antibiotics against bacterial infections.(9)

Triphala is reported to exert antibacterial effects on both gram-positive and gram-negative species. It's potential uses also include antioxidant, anti-inflammatory, immunomodulating, appetite stimulation, gastric hyperacidity reduction, dental caries prevention, antipyretic, analgesic, antibacterial, antimutagenic, wound healing, anticariogenic, antistress, adaptogenic, hypoglycemic, anticancer, hepatoprotective, chemoprotective, radioprotective, and chemopreventive effects.(10) *Triphala* alleviates *Kapha* and *Pitta doshas*. It is curative in *Prameha*, and in diseases of the skin.(11)

Chandraprabha Vati balances vitiated *Vata*, *Pitta* and *Kapha*. *Chandraprabha vati* exhibited anti-hyperglycemic effect and attenuated alterations in lipid profile.(12) *Chandraprabha vati* is found to have *Vrana Shodhan* (antimicrobial) as well as *Vrana Lekhan & Rukshan* property (wound cleaning and drying action). Along with this it has wound healing action (*Ropan*) also. *Chandraprabha vati* helps to restore normal wound healing by stimulating correct *dhatupariposhan* (tissue metabolism).(13)

Vasant Kusumakar Ras is an anti-diabetic agent with an organo-protective action.(14) Diabetic ulcers are a serious complication caused by a combination of poor circulation, susceptibility to infection and nerve damage from high blood sugar levels. When there is limited blood flow to the wounded area, the body struggles to heal its skin wounds. *Vasant kusumakar rasa* helps in healing such wounds.(15)

Aragvadha kapila was used intending *Mrudu Virechana* (mild purgation) which helped in eliminating of the vitiated doshas. Along with the other activities such as antitumor, antioxidant, hypoglycemic, hepatoprotective, antibacterial, hypocholesterolaemic, and antidiabetic activity, the healing potential of *Aragvadha* provides a scientific rationale for the traditional use of this medicine in the management of infected dermal wound.(16)

Kaishore Guggulu has antiallergic, antibacterial and blood-purifying properties and is a skin health promoter.(17) It has wound healing properties and is also used to treat skin diseases.(18)

External measures were focused on attaining the desired effects such as cleansing of wound; reduce inflammation, prevention of any secondary infection, promotion of healthy granulation tissue, and epithelialization of skin.

Triphala Kashaya possesses sufficient efficacy in *Vrana Shodhana* (cleansing) and *Ropana* (healing) without producing any adverse effect. Decoction of *Haridra* has *Vrana Shodhana* (cleansing) and *Ropan* (healing) action it helps in debridement of wound. Prevent infections which help the wound to heal more quickly. *Haridra* have excellent properties to accelerate the wound healing.(19)

Sarjarasa Malhara is mainly *Snigdha* (oily), *Vranaropak* (healing), *Raktastambhak* (haemostatic) and *Vatashamak* (*Vata* pacifying) in nature. This

Malahara is used for local application on *Agnidagdha vrana* (burn wounds), *Gudapaka* in children, *Dushta Vrana*, *Arsha* etc. Application of this *Malhara* reduces burning sensation so induces calmness and sleep.(20)

Jatyadi Ghruta possess potent antibacterial and anti-inflammatory properties that could be involved in chronic wound healing activity and has the potential to be used as external add-on therapy in the management of multidrug-resistant bacterial infections at the wound.(21)

These internal and external measures were used to attain significant wound healing. White discoloration of the skin was observed after wound healing. No scar formation was seen nor were there any skin contractures observed. No changes in the range of motion were observed. No adverse effects were observed during the management of the wound or afterwards. No conventional medicines were required after starting of the treatment.

Many advances over the past decade in multiple fields have made pharmacological options plentiful in burn care. That said, there are many problems for the burn patient which persist, making burn injury still the most severe form of trauma.(22) Burn injuries are excruciatingly painful, highly susceptible to infections, and often take a long time to heal. In addition, they can leave permanent scars on the affected area. Ayurvedic treatment may be a mainstay in managing burn wounds based on their presentation. To validate that further well-designed studies are necessary to optimize the current treatment paradigms and eventually improve the outcome for burn wounds using *Ayurveda*.

Conclusion

Present case study proves the efficacy of Ayurvedic treatment in managing a chronic non-healing, third degree burn wound in a diabetic patient without any complications. It infers that the Burn injuries can be treated with *Ayurveda* within the expected time period of wound healing.

Consent

Written informed consent was obtained from patient for publication of this case report.

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