

Necrotizing fasciitis: a case study of the use of the Ayurvedic treatments ksharakarma (caustic cauterization) and jalukavacharana (hirudotherapy).

Rajesh V Giri *

* Professor and Head, Department of Post Graduate Studies in Shalyatantra, Muniyal
Institute of Ayurveda Medical Science, Manipal, Chanai

Abstract

An invasive infection of the skin and soft tissues, including the deep fascia, necrotizing fasciitis, with relative sparing of the muscle. The treatment plan often includes removing the diseased tissue or maybe amputating the limb. The purpose of this study is to compare the efficacy of Ksharakarma (caustic cautery) and Jalukavacharana (hirudotherapy) in the treatment of necrotizing fasciitis to that of surgical intervention. Substances and Techniques: Kshara was used on a case of an infected wound at the tip of the right index finger until enough debridement of slough occurred, and then Jalukavacharana was used to speed up tissue perfusion to the wound site and hasten the healing process. After 15 days, the necrotized region had been totally debrided (in two Ksharakarma sessions) and healed (in three Jalukavacharana sessions), preventing the need for surgical amputation of the terminal phalanx. The necrotizing fasciitis wound was successfully managed by Ksharakarma and Jalukavacharana, preventing the need for amputation.

Keywords: Necrotizing fasciitis, gangrene, hirudotherapy, jalukavacharana, ksharakarma, and caustic cauterization

Introduction

since ages, management of injuries has been a challenge to the surgeons of medical world. Tissue injury in the form of wounds caused by vehicular accidents, warfare, animal attacks or ulcers caused due to various diseases, have always posed significant challenges to the practitioners of medicine. Ayurveda, especially, the branch of *Shalyatantra* (surgery). The various management methods explained by Sushruta in *Sushruta Samhita* have remained valid even in this century.

Traumatic wounds as a consequence to animal attacks and warfare (*Abhighataja vrana*) and ulcers due to various pathologies (*Nija vrana*) were observed and recorded in a detailed manner by Ayurveda. The management of which posed a great challenge to the surgeons of Ayurveda in

ancient period. Giving due importance, wound management has been described under the branch of *Shalyatantra*^[1].

A great in-depth description is available in *Sushruta Samhita* (Text book by Sushruta) regarding traumatic

wounds, ulcers, their causes, examination methods and clinical features, signs of a clean wound, signs of a healing wound, signs of a healed wound, signs of infected wound, signs of chronic infected wounds and gangrenous wounds^[2]. *Sushruta Samhita* describes 60 therapeutic methods^[3] for the management of a wound/ulcer, right from the stage of abscess till the cosmetic repair of the formed scar (after healing).

The present case study has been undertaken as a preliminary effort to re-validate the therapeutic modules explained by *Acharya Sushruta* in the management of an Ulcer (Necrotising

fasciitis). Caustic cautery or *Ksharakarma* is one of the important methods mentioned for the early non-surgical debridement of slough from the wound site. *Ksharakarma* is considered as a superior treatment module as it not only has a unique effect of managing all the vitiated three *Dosha*, but also has the ability to perform various surgical procedures like *Chedana* (excision), *Bhedana* (incision) etc without the actual necessity of any surgical instruments. The caustics extracted from the plant – *Apamarga* (*Achyranthes aspera*) and various other Ayurvedic ingredients have a potent antibacterial property against *Escherichia coli*, *Enterococcus faecalis*, *Staphylococcus aureus* and *Pseudomonas species*^[4].

Thus caustic cautery has a potent antibiotic property and also debrides the dead, necrotising slough from the wound non-surgically. Its role in the form of *Ksharasutra* (medicated seton) has already been proved to be highly effective in the management of *stulain* and^[5].

Hirudotherapy (*Jalukavacharana* or therapeutic application of leeches) has been mentioned as one of the non-surgical methods of removal of superficially located *Gratitha* (coagulated or blocked vessels) *Rakta* and thus stimulating the flow of unvitiated blood to the area. Hirudotherapy by its anti-coagulant salivary secretions promotes micro-circulation of fresh blood into the tissues and removes venous obstructions, thus reducing venous congestion^[6].

Case

Study In the present study, a girl, aged 14 years, presented at the *Shalyatantra* OPD of the Hospital, with an infected wound at the tip of right index finger, with distal portions gangrenous (**Figure 1**). There was foul smelling discharge and pain in the nail bed – since 20 days with the local tissue around the nail bed was fast turning dark (**Figure 2**) and the nail was turning brittle. **around the nail bed of the**

Fig 1: Non-healing wound tissue with gangrenous portions



Fig 2: Darkened



On taking a detailed history, about 20 days back, she complained of pain in the tip of right index finger, with an associated mild swelling and fever. A local physician, diagnosing it as an abscess, conducted Incision and Drainage, and advised analgesics and antibiotics. But within a day, the swelling increased and blackish discoloration appeared. On visiting another surgeon, the case was diagnosed as a case of Necrotising fasciitis. I & D was again done, and thick creamy pus was drained and abscess cavity was found to reach bone. After thorough debridement and toileting, abscess cavity was packed with betadine and was advised IV antibiotics, 12 hourly. Pus culture showed presence of heavy *Staphylococcus aureus* growth. Radiography clearly ruled out any osteomyelitis of the distal phalanx of the index finger.

On referral to a Plastic and Reconstructive, Hand and Burns Surgeon, she was advised amputation of distal half or more of tip of finger and also was advised about the necessity of skin graft or flap from the neighboring finger. To avoid amputation and loss of most useful part of the finger (used for writing) and more importantly to avoid cosmetic disfigurement, she approached for an alternative to amputation. After educating the patient regarding the treatment modalities available, and taking consent from her mother, she was put on caustic cautery and hirudotherapy measures.

Treatment History:

Under aseptic measures, wound was first washed with distillate of Cow's urine and then, *Apamarga Teekshna Kshara* was applied and left in situ for about 1 minute. The area was then washed with lemon juice (to neutralize *Kshara*) and a *Pichu* dipped in *Jathyadi Taila* was placed on the site. *Ksharakarma* does *Ksharana* and *Kshanana karma* i.e. debrides and removes slough or the devitalized tissue from the site. Hence care was taken to do *Ksharakarma* only till slough was present in the site. Two sittings of *Ksharakarma* were done on alternate days, followed by three sittings of *Jalukavacharana* on alternate days.

After cleaning the area with warm water, one fresh leech was applied to the site for 15 minutes

Figure 3 During the procedure, the leech was covered with a thin piece of cotton soaked in water to keep the leech moist. After the passage of 15 minutes, leech was removed by sprinkling

Fig 3: Hirudotherapy on the non-healing wound



Oral medications

1. Tab. Munibeotic 2 TID after food

Table 5: Grading of granulation tissue in the wound

Granulation tissue	Grade
Healthy granulation tissue in the complete	0 wound
Unhealthy granulation in 25% of the wound area	1
Unhealthy granulation in 25-50% of the	2

Assessment criteria

a. Subjective criteria–Pain (table 1)

Table 1: Grading of pain

Pain	Grade
No pain	0
Tolerable localized pain	1
Pain requires analgesics	2
Pain even during rest, disturbing the sleep	3

b. Objective criteria–Size of the wound (table 2), odor (table 3), discharge (table 4), granulation tissue (table 5)

Table 2: Grading of the size of the wound

Size of the wound	Grade
Completely healed wound	0
Up to 0.5cm	1
0.6 – 1 cm	2
1.1 – 1.5cms	3

Table 3: Grading of odor of the wound

Odor	Grade
No odor	0
Foul odor	1

Table 4: Grading of discharge from the wound

Discharge	Grade
No discharge, dry dressing	0

turmeric powder on its anterior sucker. The site was then covered with a *Pichu* dipped in *Jathyadi taila* and bandaged tightly.

wound area

Unhealthy granulation in more than 50% of the wound area 3

Assessment of results

2. Mahamanjishtadi Kashaya 30 ml BD with equal water, before food was advised

Duration of the study

Duration of study was for 15 days, during which on alternate days, she underwent two sittings of *Ksharakarma*, followed by three sittings of *Jalukavacharana*. Assessment of the results was made based on the above mentioned criteria and findings recorded as Follow up 1 as F1, Follow up 2 as F2 and so on, on alternate days.

Results:

During the treatment it was observed that from the 3rd follow up the pain started reducing and by the end of follow up the pain had become

Scanty discharge, little wet dressing	1
Moderate discharge, requires daily dressing	2
Profuse discharge, requires dressing twice a day	3

relieved, indicating that the therapy had a good healing property (table 6). The caustic cautery and hirudotherapy, reduced infection, pus and slough and along with distillate of cow's urine prevented re-infection of the wound and thus helped in the early relief in pain.

Till the 3rd follow up (figure 4), though there were other changes, the wound size continued to be the same, and later there was good reduction and by the end of the 7th follow up the wound had completely reduced in size. After the slough, infected material had been debrided by caustic cautery, cow's urine, hirudotherapy and *Jathyadi Taila*, reduced venous congestion, improved micro-circulation and thus oxygenation might have supported early wound healing (table 6).

The odor from the wound reduced by the 4th follow up. Caustic cautery along with distillate of cow's urine, helped to control infection. Controlled infection along with improved oxygenation to the tissue (through hirudotherapy) might have helped in early reduction in the odor from the wound (table 6).

The most interesting ending was till the 4th follow up the discharge was constantly on the higher side, with improvement in other parameters. This indicates towards the debriding action of the caustics used in the therapy. Caustics used could debride the slough from the wound without the necessity of any surgical intervention.

Fig 4: 3rd follow-up



Fig 5: 4th follow-up



Fig 6: 5th follow-up



Fig 7: 6th follow-up



Figure 10: 1 month after after the 8th follow up

Figure 11: 1 month the 8th follow up



There was a gradual decrease in the quantity of unhealthy granulation tissue in each follow up to

usually be completely removed by the seventh follow up (Figure 5-11). This reduction in unhealthy granulation tissue confirms the debriding action of caustics and also confirms the improved blood supply to the area. This reasserts the role of hirudotherapy and *Jathyadi Taila* in healing the wound (table 6).

Table 6: Grade wise representation of therapeutic effect on assessment parameters
Figure 8: 7th follow-up Figure 9: 7th follow-up

Discussion

The *Gomutra Arka* (Distillate of Cow's urine) has good antimicrobial property^[7]. Hence it was used for washing the wound site. Various studies have also already proved that the *Kshara* of *Achyranthes aspera* has antibacterial property against *Escherichia coli*, *Enterococcus faecalis*, *Staphylococcus aureus* and *Pseudomonas species*^[4]. The *Kshara* debrided the gangrenous slough and along with *Gomutra Arka* provided a clean environment for the wound to heal. *Jalukavacharana* by stimulating micro-circulation and

Assessment

reducing venous congestion improved oxygen and nutrients perfusion to the healing tissues thus promoting the clean wound to heal^[6]. *Jathyadi Taila*, the topical application also supported the faster wound healing^[8]. *Jati* mainly contains tannins. Tannins have the capacity to combine with tissue protein and precipitate them. They act as mild antiseptics and check small hemorrhages; forms protective covering on the surface of wound, which helps in the process of wound healing^[9]. *Tab. Munibyeotic* with its ingredients *Triphala*, *Pippali*, *Shuddha Guggulu*, *Swarna*

Makshika Bhasma, Mukta shukti Bhasma, Shuddha Gairika, Kapardika Bhasma, Gandhaka Rasayana, Nimba Twak, Haridra – possesses immunomodulatory, antioxidant, anti-inflammatory and anti-microbial properties, stimulates phagocytosis, increases the level of antibody-forming cells and also specially sensitizes T lymphocytes.

Conclusion

The procedures have revealed encouraging results in the management of infected, gangrenous wounds. Their therapeutic application needs to be reassessed in a larger sample of cases and in gangrene of various etiologies viz, gangrene secondary to diabetic ulcer, gangrene secondary to arterial diseases in order to observe if the limb can be saved from amputation, thus providing a superior relief to the patient medically as well as psychologically.

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