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Case Report

Management of non-healing lesion from surgical treatment of necrotizing fasciitis through Ayurveda- a case report

Vaishali Kuchewar

Dept. Kayachikitsa, MGACH&RC, DMIMS(DU), Wardha, India

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ABSTRACT

Necrotizing fasciitis is a soft-tissue infection that is rare but life-threatening. The early clinical presentation of necrotizing fasciitis is local erythema, pain, and fever. It occurs in any part of the body, but it is mainly found in the extremities, abdominal wall, and perineum. It needs intensive care with appropriate antibiotics and extensive surgical debridement. This Case of necrotizing fasciitis was initially treated with surgical debridement and splint skin grafting. After two months of failed medical-surgical interventions and dressing, the 17-year old female in an irritable but oriented state approached the outpatient department of kayachikitsa with the unhealed wound. The Ayurvedic diagnosis of *Vidradhi* was deliberated after considering *Pitta Dosha* and *Rakta*, *Mamsa*, and *Meda Dhatu*. She was treated with medicines, including external applications, for one month. It resulted in complete wound healing and minimal scarring, and a satisfied patient. This Case can be the basis for future research studies.

1. Introduction

Necrotizing fasciitis is one of the soft-tissue infections. It is a rare but life-threatening condition. The mortality rate is high as 24–34 %. It depends on the time of intervention and the spread of infection [1]. It seems to be frequent in males due to the increased incidence of trauma [2].

It is a bacterial infection characterized by purulent necrosis of the fascia and subcutaneous tissue [3]. It occurs in any part of the body, but it is primarily found in the extremities, abdominal wall, and perineum [4,5].

Trauma is the most common identifiable etiological factor. The co-morbidities and risk factors are diabetes mellitus, alcohol abuse, immunodeficiency, obesity, and peripheral vascular disease [6,7]. It is also reported in young and previously healthy individuals. Local erythema, pain, and fever are the early clinical presentation of necrotizing fasciitis. Thrombosis of blood vessels at the fascia level causes skin necrosis and is often associated with severe sepsis.

Necrotizing fasciitis needs to be specially considered for debridement [8]. In 70–90 % of the cases, two or more pathogens are involved, requiring broad-spectrum antibiotics with early and aggressive drainage and debridement [9].

This Case is managed in consideration with the *Vidradhi*. The involvement of *Dosha* and *Dhatu* was specifically assessed because, it is mentioned in Ayurveda that evaluation of involved *Dosha* and *Dhatu* is the only prerequisite of treatment [10].

2. Case history

A 17-year-old female approached kayachikitsa OPD on 24 February 2020 for a non-healing wound on the right foot. She had difficulty walking due to swelling and pain. In addition, she had a history of sudden pain in the right lower limb and fever on 10 September 2019. The general practitioner treated her, but her condition deteriorated into a high-grade fever, intense pain, erythema, vomiting, and loose stools.

She got admitted to the intensive care unit. Her haemogram showed thrombocytopenia, with a platelet count of 26000/μl. Other investigations including renal panel, electrolytes, and bilirubin were unremarkable. Her pain was provoked, and she developed local reddish discoloration. She was diagnosed with necrotizing fasciitis with sepsis. The color doppler of the right lower limb showed subcutaneous soft tissue edema.

E-mail: vkuchewar@gmail.com.
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When she was presented to OPD, She was pretty irritable and was mentally disturbed due to previous experience of long-term treatment and unhealed wound.

2.1. Clinical findings

Clinical examination revealed the following findings.

Local examination: Reddish-black elongated poorly-defined lesion on the dorsum of the right foot from ankle to toe. Mild serosanguineous discharge with a foul smell was present. The surrounding area was edematous with moderate tenderness.

General examination: The patient was well oriented and irritable. Pallor and icterus were absent. Inguinal lymph nodes were non-palpable and non-tender. Systemic examination revealed no abnormalities.

2.2. Timeline of treatment

The patient was on medical-surgical treatments from 14/9/2019 to 23/2/2020 (Table 1). As there was no improvement in the wound, the surgeon advised a second skin graft but suggested waiting for some period because the patient was not mentally prepared. After approaching Ayurved OPD, she was treated from 25/2/2020 to 27/3/2020 (Table 1).

2.3. Therapeutic intervention

When the patient presented to the outpatient clinic, she was irate and mentally ungrounded due to the undesired outcome of the previous long-term treatment and resulting unhealed wound. We decided the treatment protocol on observation (*Darshana*), physical examination (*sparshana*), and detailed history of the patient. According to the paradigm of ayurvedic physiology, involvement of *pitta dosha* and *rakta*, *mamsa* & *meda-dhatu* were considered. Accordingly, a multiple modality was used, with oral medications to alter the *pitta dosha* and the involved *dhatus*, along with a topical application of medicines with a specific action to cleanse and then heal the wound.

We obtained informed consent from the patient and her parents.

2.4. Follow-up and outcome

Four visits were required for the complete recovery of the patient. After the initial examination on 24 February 2020, the first follow-up visit was on day 7th (2nd March 2020). A significant reduction in swelling and discharge was observed. Tenderness had decreased from moderate to mild (Fig. 1a and b). During the second follow-up on 16/3/2020, healed all except one ulcers were observed (Fig. 1c). No tenderness was reported by the patient. The patient ambulated easily. During the last visit, on 27/3/2020, it was observed that all ulcers were completely healed (Fig. 1d). No tenderness and mild itching were reported by the patient.

3. Discussion

This patient had no history of trauma, or she had no co-morbid etiology. She was studying in 12th standard. She used to sit for 5–6 h continuously with late-night study and a spicy diet.

According to Ayurveda, *mithya ahar-vihar* (faulty lifestyle) is the main *hetu* (etiological factor) of *vidradhi*.

The characteristics of initial wound resembled *pittaj* and *raktaj* vidradhi i.e. *shyav sphot* (blackish red boil) with *tivra daha, peeda* (burning pain) and *jvara* (fever). *Acharya Sushrut*a had described

Table 1
Treatment period of modern medicine and Ayurvedic management.

sn	Treatment	Sept. 2019	Dec. 2019	Jan.2020	Feb. 2020	March 2020
Modern medicinal management						
1	Inj. pipperacillin & tazobactum, Inj clindamycin, Inj. Vit. K and Inj. pantoprazole, IV NS, and dextrose& platelet transfusion	14/9/2019-21/9/2019				
2	surgical debridement Tab augmentin 625 mg thrice a day for five days	24/9/2020				
3	debridement and splint skin grafting		17/12/19			
4	savlon wash - saline wash - part dry - coconut oil massage thrice daily		24/12/2019-	20/1/2020		
5	savlon wash and liquid paraffin for local application and cap A to Z -1 twice a day			21/1/2020-23/2/2020		
Ayurved management						
6	*yashad bhasma*- 125 mg twice a day with d*adima-avaleha*				25/2/2020 to 25/3/2020	
7	*kaishor guggul* 500 mg twice a day after meal with water					
8	Cap *haridra* 250 mg twice a day with water					
9	Cap *amalaki* 250 mg twice a day with water					
10	*triphala phanta* (freshly prepared) for wound wash (morning and evening)				25/2/2020 to 1/3/2020	
11	*triphala phanta* (freshly prepared) for wound wash (morning only)					2/3/2020 to 16/3/2020
12	*jatyadi taila* for dressing twice a day				25/2/2020 to 16/3/2020	
13	*jatyadi taila* for local application once a day					16/3/2020 to 27/3/2020

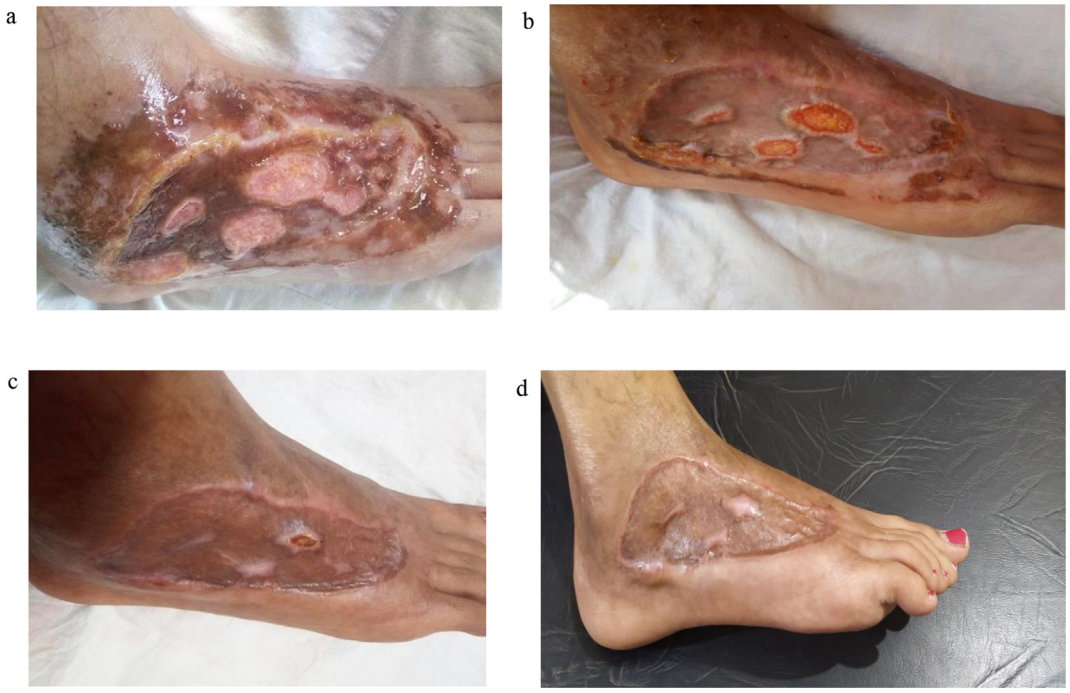

Fig. 1. a – wound before treatment (24/2/2020). b – wound on 1st follow-up (1/3/2020). c – Wound on 2nd follow-up (16/3/2020). d – Image on 3rd follow-up (27/3/2020).

vidradhi as a severe condition having lesions of different discoloration including red and blackish discoloration. The type of swelling is described as broad-based, rounded, or elongated [11]. *Acharya Charaka* has also explained *vidradhi* is a disease caused by *rakta dushti* [12].

*Roga pariksha (*assessment of disease*), rogi pariksha (*assessment of patient*)* was performed following *dashavidha pariksha* protocol for its *sadhyasadhyata* (prognosis).

Following were the findings of *dashavidh pariksha* showing predominance of *pitta.*

Prakriti – pitta-vataj.
Vikriti – pitta dosha, rakta, mamsa & meda dhatu.
Sara and samhanan - madhyam.
Satmya – sarvarasa.
Satva – uttam.
Aharshakti – madhyam.
Vyayamshakti – madhyam.
Vaya - tarunavastha.

The treatment was outlined as per the involvement of *dosha* and *dhatu*. The treatment comprised of *abhyantar* and *bahya chikitsa* (internal and local treatment). For internal treatment, the following medicines were preferred considering their *Pittashamak* (~alleviation of *pitta*), *Raktashodhak* (~blood purifier), *Shothashamak* (anti-inflammatory) and *Vranaropak* (wound healing), and *Rasayan* (rejuvenation) properties. External medicines were selected for their *Vranashodhak* (wound cleaning), *Krimighna* (antimicrobial) and *Vranaropak* action.

Following is the probable mode of action of medicines.

Among all the *pittashamak* drugs, *Yashad bhasma* was selected because of its *Kashaya rasa*, v*ranaropak* property and specific indication in *Dushta vrana.* It correlated with the clinical symptoms of oozing and was used to dehydrate the wound area of excessive discharge and warmth.

Yashad bhasma is a derivative of zinc, supplied to the body in a herbo-metallic form. Biochemically, zinc is required to develop and activate T-lymphocytes, a significant component of the immune system. Thus, it is essential from the proliferation to maturation phase. In addition, it accelerates the process of re-epithelialization to strengthen the wound [13]. Zinc is commonly known to play a substantial part in the wound-healing process, but the evidence of routine zinc supplementation is inadequate [14].

Kaishor guggul contains *guduchi*, *triphala*, *trikatu*, *dantimula*, *trivrutmula*, *vidanga*, *guggul* and *goghruta*. It is indicated in *Vrana*, *Vatarakta* and *Kushtha.* It is a novel combination of medicines having *Krimighna* (antimicrobial), *Raktashodhak* (blood purifier), and *Shothashamak* (anti-inflammatory) properties [15].

According to Ayurveda, *Haridra* (*curcuma longa*) possesses *Katu, Tikta rasa, Ruksha guna, Ushna veerya* and *Kapha-pitta shamaka*. In addition, it has antimicrobial and anti-inflammatory activities.

The study conducted by Singh et al. found powerful modifying effects of Haridra on wound healing [16].

Amalaki (*Emblica officinalis*) is known for its *Rasayan*a property. It pacifies all three *dosha* (*vata, pitta & kapha*).

It is one of the richest sources of vitamin-C, amino acids and minerals. Vitamin C is required for the synthesis of collagen fibre. In addition, it is vital for tissue repair and healing [17].

A freshly prepared *Triphala phant* was used to wash the wound. *Acharya Sushrut*a recommended *Triphala* to purify the wound. According to Kumar et al., *Triphala* has antibacterial, antioxidant, and wound healing properties required to treat infected wounds [18].

Jatyadi taila was explicitly selected for dressing over *Jatyadi ghrita* because it contains mainly *Jatipatra*, *Haridra, Daruharidra*, *Neem, Tuthha, Lodhra* and *Haritaki.* All ingredients of *taila* and *ghrita* are same except *Tuthha, Lodhra* and *Haritaki* which are having *Shothahara* (anti-inflammatory), *Vedanasthapana* (analgesic), and *Vranaropana* (wound healing) properties. It is indicated in various ulcers caused due to toxins, injury, and bites. The study conducted by Shailajan S. et al. to evaluate the wound healing efficacy of *jatyadi taila* in excision wound model in rats found a faster reduction in wound than modern topical formulation [19].

4. Conclusion

This Case demonstrates the systematic observations of a wound in clinical practice to arrive at a diagnosis that correlates closely with the classic medical texts. According to the clinical guidelines of *Vidradhi*, medicines were chosen and applied successfully to achieve quick and successful wound healing. Ayurveda thus provides tools for emergent and urgent care of non-healing wounds, as well as for medical-surgical failures of treatment of necrotizing fasciitis.

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Conflict of interest

None.

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