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RAPID HEALING AND ANTIMICROBIAL EFFECT OF MRIDU PALASAKSHARA IN CHRONIC VENOUS ULCER- A CASE REPORT

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ABSTRACT:

Venous ulcers are the wounds occurring most probably in the lowerlimb due to inappropriate functioning of venous valves or venous thrombosis. It is the most common ulcer occurring in legs in Indian population. As the pathology lies in *sira* and chronicity is inherently attributed as its nature, venous ulcer can be called as *siraja dushtavrana*. A 67 years old male patient with venous ulcer in left leg was admitted in salyatantra dept., Govt. Ayurveda College, Tripunithura in May 2019. He was given *vranahara* medicines internally and daily dressing was done with *jathyadi ghrita*. On assessment after one month, the rate of healing was found to be slow, pus culture and sensitivity was done and a bacterial infection making hindrance to healing was found out. *Palasakshara prathisarana* was done for 4 days with 3 days interval and after twelve days, his pus culture result became negative and significant healing of the ulcer was observed. After that he was given conventional management of *vrana* and complete healing occurred within seven days after that and the patient was discharged on 10th day after ksharakarma.

Key words: venous ulcer, *siraja dushtavrana*, *palasakshara*

INTRODUCTION

Chronic venous ulceration is the most severe and debilitating outcome of chronic venous insufficiency in the lower limb¹. Pathology is present either in superficial, deep or perforator veins. Inadequate venous return can lead to de-compensation of venous and microcirculatory function and finally produce ulcer in lower limbs. Varicose vein and deep vein thrombosis are the main pathologies behind such an ulcer. Lower one third of the leg either above the medial malleolus or lateral malleolus is the common site of venous ulcer. Vertically oval or irregular shape, shallow depth, slightly indurated sloping edges, slight serous or seropurulent discharge, foul smell, itching, eczematous or hyperpigmented surrounding area and most probably the presence of varicose veins in lower limb are the characteristics of a venous ulcer².

Gatravichurnana (splitting or tearing of the body) and *gatravaivarnya* (discolouration of body part) are the general characteristics of *vrana*³. *Properties of dushtavrana*⁴(chronic ulcer) like *atisamvrithatwa* (nonjoining of ulcer edges), *athikadinatwa* (induration of base and edge due to chronicity), *poothipooya-mamsa-sira-snayu* (foul smelling discharge and putrefaction of tissues like muscle, blood vessels and ligaments), *kandu* (itching), *atharthavedana-paka-raga-daha* (dolor, tumor, rubor, calor), *sopha* (inflammation) etc can be seen associated with a chronic venous ulcer and these indicate the presence of an infective organism inside. Susrutha suggests the use of *ksharakarma* (application of caustic alkali) in a *vrana* having the characteristics that have been mentioned above. Microorganisms produce a protective biofilm over the ulcer by which normal healing process is interrupted and then antimicrobial drugs becomes mandatory for the healing to occur at the earliest. Microbes in an ulcer can be correlated with *bahyakrimi* and ayurveda drugs having *krimihara* property can make better results than mere *vranahara* drugs.

Kshara obtained from the ashes of medicinal plants, being alkaline in nature can do *chedana* (excision of tissues), *bhedana* (incision) and *lekhana* (scrapping) *karmas* and is having *vranahara* and *krimihara* properties also according to Susrutha⁴. As *palasa* (*Butea monosperma* Linn) is also having the *krimihara* and *vranahara* properties, *palasakshara* can be considered as a good choice in *vrana* with *krimi*, so in an infected ulcer also. Healing property of the drug has been evident from some of the previous clinical trials in *dushtavrana* when used as external application^{5,6}. Here,

mridupalasakshara prepared from the bark of *palasa* was used for *prathisarana* (external application) for 4 days with 3 days interval and as the ulcer became completely relieved off slough tissue and microbes and the non-granulation tissue was replaced with healthy granulation tissue with this intervention, the ulcer could attain rapid healing and it was completely healed within 7 days after the *kshara* intervention.

Case report

A 67 year old male came to Salyatantra OPD with the complaint of non healing ulcer over the lateral aspect of left leg on 22nd May 2019. He had been working in a tea shop and had to stand for about 6-8 hours in a day. He had varicose veins in both the lower limbs which started 15 years back. He hadn't taken any medicine for this. According to the patient, three years back he had an oedema around both the ankle joints (left > right) and a moderate degree of fever also associated with it. Within three days, an ulcer appeared over the lateral malleolar region on left leg. Fever got subsided within 5 days, but the ulcer kept on increasing in size with watery purulent discharge and foul smell. He did some local herbal applications, but got no much relief. Gradually he found difficulty in walking and became unable to go for his work. He had no other diseases like diabetes mellitus, hypertension, heart disease etc. The patient was admitted in our hospital on the same day of OPD consultation.

On careful examination on the day of admission, the ulcer measured 7.5 cm × 5.2 cm × 2.0 mm and showed the typical features of a venous ulcer like shallow depth, scanty serous discharge, and moderate level of foul smell, sloping edge, hyper pigmented surrounding areas, tortuous and dilated veins in leg, itching, ankle oedema etc. The floor was covered with pale granulation tissue and some slough also was present. On blood investigation, he had normal values in routine examination, FBS, PPBS, lipid profile, LFT and RFT, but WBC and ESR was found to be raised. He was given *amrithothara kashaya*, *kaisoraguggulu* tab and *punarnavasava* in the first week and after that replaced with *punarnavadi kashaya*, *triphala guggulu* and *khadirarishta*. Daily cleaning and dressing with *jathyadi ghritha* was done from the day of admission itself. Discharge from the ulcer and foul smell was reduced a little, and the floor and edge remained as unchanged, without showing any evidence of healing even after one month of treatment. Non-healingness and discharge being the main symptoms of an infected ulcer, patient was

advised to do pus culture and sensitivity test. Moderate growth of *pseudomonas aeruginosa* was detected in the test.

MRIDU PALASAKSHARA PREPARATION⁴

Kshara preparation was done in our hospital by classical method as described by Susrutha. Dried *twak* (bark) of *palasa* was burnt into ashes and mixed with 6 times of water. It was allowed to settle down and supernatant *ksharajala* was taken and filtered 21 times with cloth. This *ksharajala* was boiled in mild fire and finally white coloured *kshara* was obtained as fine powder which was then stored in air tight glass container.

KSHARAKARMA

Internal medication was continued and the external application of *jathyadi ghrita* was stopped for 12 days for the intervention of *ksharakarma*. On the first day of *ksharakarma*, *mridupalasakshara* was applied with *salaka* in a thickness of 4 mm over the floor and edges of the ulcer and kept there for 1 minute. As a *paschath karma* (post operative procedure), lemon juice was used for *kshalana* (cleansing) over the ulcer and after that the ulcer was cleaned with distilled water. Dressing was done with *yashtighrita*. The *ksharakarma* was repeated for 3 more sittings with an interval of 3 days. On all other days in between the *kshara* application and for two more days after the last *ksharakarma*, cleaning of the ulcer was done with *triphala kashaya* and rebandage done with plain sterile pad and gauze. Microbial load of the ulcer was assessed by swab test after 2 sittings of *ksharakarma* and also after 4 sittings of *ksharakarma*.



Fig 1. *Palasakshara* (mridu) Fig. 2. Equipments needed for *ksharaprathisarana karma*

OBSERVATION AND RESULT

After the application of *kshara*, a blackish blue colour appeared over the site of *ksharakarma* and mild pain and burning sensation was said to be felt by the patient. After the lemon juice application, and dressing with *yashtighrita*, the discomfort was found to be reduced. Hypertrophied granulation tissue became soft after the *ksharakarma* and the slough and crust residues could easily get removed without giving much pain to the patient. Microbial load was changed from moderate to nil with 4 sittings of *ksharakarma* and there was significant change in the amount of discharge, type of discharge, odour, granulation tissue and epithelialisation of the ulcer with this 12 day period itself. Size was reduced to 2.5 cm × 2cm × 1 mm. After 7 days, epithelialisation occurred completely over the ulcer and he was discharged after 3 days. He had no recurrence of the ulcer within 1 year of follow up.

Table 1 : Course of treatment given to the patient in the hospital

Date	Internal medication	External medication	Investigations
22 May 2019	<i>Amrithothara kashaya</i> 90 ml bd (B/F) <i>Kaisoraguggulu</i> tab 1-0-1 with kashaya <i>Punarnavasava</i> 25 ml bd (A/F)	Daily cleaning with <i>triphalakashaya</i> and dressing with <i>jathyadi ghrita</i>	BLOOD RBC : 5.2 million cells/ mL WBC : 9800 cells/ mL Platelet count : 1.5 Lakhs/ mL Hb : 13.6 g/dL, DC : P ₃₅ L ₆₀ E ₅ ESR : 72 mm/hr, BT : 2 min 30 sec CT : 4 min 20 sec, FBS : 77 mg/dL PPBS : 128 mg/dL T.cholesterol : 201 mg/ dL SGOT : 40 U/L, SGPT : 14 U/L ALP : 66 IU/L
29 May 2019	<i>Punarnavadi kashaya</i> 90 ml bd (B/F) <i>Triphala guggulu</i> tab 2-0-2 <i>Khadirarishta</i> 30 ml bd (A/F)	Same medication	

22 June 2019	Same medicines	<i>Palasakshara</i> application ☑ first day	Pus culture : <i>Pseudomonas aeruginosa</i> (moderate in load)
25 June 2019	Same medicines	<i>Palasakshara</i> application ☑ 2 nd day	-
28 June 2019	Same medicines	<i>Palasakshara</i> application ☑ 3 rd day	Pus culture : <i>Pseudomonas aeruginosa</i> (moderate in load)
01 July 2019	Same medicines	<i>Palasakshara</i> application- 4 th day	-
04 July 2019	Same medicines		Pus culture : no evidence of bacteria
05 July 2019	Aragwadhadi kashaya -90 ml bd (B/F) Kaisoraguggulu tab 1-0-1 with ks Khadirarishta - 25 ml bd (A/F)	Cleaning with triphalakashaya & dressing with jathyadighrita	
14 July 2019	Discharge medicines ☑ Aragwadhadi kashaya Kaisoraguggulu tab 1-0-1	Discharge medicine for external application- jathyadigritha	BLOOD investigation ESR : 15 mm/hr WBC : 8500 cells/ mL DC : P ₄₆ L ₅₁ E ₃ No pathological changes in the values of other blood investigations.

FIRST DAY OF KSHARA KARMA

Fig 3 . Before ksharakarma.



Fig 4. Ksharakarma.



Fig 5 . After ksharakarma

LAST DAY OF KSHARAKARMA

Fig 6. Reduced size of ulcer on 12th day

Table 2. Assessment of healing done during the course of treatment

Healing assessment Criteria	Day of admission	Starting day of kshara application	After 2 sittings of kshara application	After 4 sittings of kshara application	Day of discharge
Date	22/ 05/ 2019	22/ 06/ 2019	28/ 06/ 2019	04/ 07/ 2019	14/ 07/ 2019
Day	1 st day	31 st day	37 th day	43 rd day	53 rd day
Discharge amount	Discharge made the dressing pad completely wet after 3 hours of dressing	Discharge made the dressing pad completely wet after 8 hours of dressing	Discharge made only half of the dressing pad wet after 8 hours of dressing	No measurable discharge in pad even in the next morning	No measurable discharge in pad in the next morning
Type of discharge	Seropurulent	Serous, thin	Serosanguinous, thin	No measurable	No discharge at

e				discharge	all
Odour	Odour evident on entering the room of the patient	Odour evident on entering the room of the patient	Odour evident only at close proximity to the patient (dressing not removed)	No odour evident, even after removing the dressing	No odour evident even after removing the dressing
Granulation tissue	Pale granulation tissue	Pale granulation tissue	Red granulation tissue	Red granulation tissue	Granulation tissue completely replaced by epithelialisation
Epithelialisation	No epithelialisation	No epithelialisation at all	Epithelialisation over 30 % of the wound	Epithelialisation over 85 % of the wound.	Epithelialisation over complete area of previous ulcer.
Size of the ulcer	7.5 cm * 5.2 cm * 2.0 mm	7.0 cm * 5.0 cm * 2.0 mm	6.1 cm * 4.0 cm * 1.7 mm	2.5 cm * 2.0 cm * 1.0 mm	No ulcer present

DISCUSSION

Long time standing occupation is an important cause for the formation of incompetence of venous valves and varicose veins. The blood pooling in the lower limb and subsequent venous hypertension causes impairment in microcirculation around the ankle and produces inflammatory changes there and finally the venous ulcer formation.

Palasakshara is a potent herbal formulation in Ayurveda. *Palasa* (*Buteamonosperma* Linn.), which is an easily available drug in India is the one and only drug needed for the preparation of *palasakshara*. Properties of *palasa* are *katu-thikta-kashaya rasa*, *ushnaveerya*, *katuvipaka* and these properties are the basic factors behind the *vrana*haratwa and *krimi*haratwa action of the drug. *Kshara* is considered to be the best among *sastra-anusastras* and is having properties like *chedana*, *bhedana*, *lekhana*, *dahana*, *pachana*, *daarana*, *vilayana*, *ropana*, *soshana* and *tridosaharatwa* which makes it capable of doing *ksharana* and *kshanana karma*, hence the name⁴. *Ksharakarma* has been told by Susrutha to be used in *dushtavrana* having the characteristics like *kadina* (indurated due to chronicity) *utsanna mamsa* (raised hypertrophied mass), *kandu* (itching) *chirothita* (chronic) and *dushodhya*³ (non healing one) and since a chronic venous ulcer is having all these properties, *ksharakarma* is a better option in chronic nonhealing venous ulcer. Even though *kshara* is *teekshna* in action, at the same time it is *soumya* too. When *palasa* is used for making *kshara*, *kshara* gets an added advantage on *vrana*haratwa and *krimi*haratwa properties.

Due to the above said properties and being *mridu* in nature, *palasakshara* is able to destroy, dissolve, soften and liquefy the *dhatu* (tissue) on which it is applied. It thus helps easy debridement of the slough and devitalised tissues over the ulcer, without harming the underlying healthy tissues. *Vranasodhana* is the direct action of *kshara*. When the ulcer becomes *sudha* (devoid of all the slough and devitalised tissues) further *kshara* application is not needed and so stopped the *kshara* intervention after 12 days in this patient. Once the *vrana* becomes *sudha* by *kshara*, naturally *vrana*ropana occurs. *Vranaropana* is hence an indirect effect of *kshara karma*. *Soshana* (of *vrana kleda*) property helps the *kshara* to eliminate the discharge, which is the main indicator of microbial invasion. *Prathisanakshara* is indicated in *bahya krimi*, which can be compared with microorganisms present in an ulcer.

The aseptic inflammation produced by *kshara* makes the devitalised tissues get sloughed out. While considering the pharmacological action, the particle size and molecular weight of *kshara* being very low, helps its molecules to enter the base tissues and nearby capillaries easily and thus to help anti-inflammatory process and natural antimicrobial efforts of the underlying tissues. *Kshara* helps the tissues of the body in all the stages of wound healing-haemostasis, inflammation, degeneration and repair. Being a strong alkali, it can remove all the devitalised tissues from the ulcer very effectively and also can reduce the microbial load of the ulcer. *Palasakshara* has high pH which may explain the corrosiveness and ability of performance in doing surgical, parasurgical and critical care procedures.

When an ulcer becomes infected, it produces a polymeric slime layer which encases microbes and this layer creates a physical barrier which limits the action of most of the topical applications. Removing this wound biofilm matrix may be the only way of initiating wound healing in an infected ulcer. Modern antimicrobial medicines have some side effects when used for long time and the ulcer gradually becomes nonresistant to the particular antibiotic. There lies the importance of a herbal substitute of a topical antimicrobial agent and *palasakshara* is a good choice in this aspect due to its *vranahara* and *krimihara* properties which was evident in the present case by the pus culture and clinical observation.

CONCLUSION

Presence of microbes is the main factor which makes the wound healing delay in a venous ulcer. Easy removal of slough after the *palasakshara* application helps reduce the biofilm over the floor of the ulcer, which harbours most of the microbes and can arrest the growth of pathological organisms there, which are the main barriers of normal wound healing. Topical application of herbal medicines with *vranahara* and *krimihara* properties which is having the advantage of no side effects is a need of present era in the management of chronic venous ulcer.

Advantages of *prathisarana kshara karma*

- Mild post-operative pain
- Simple and safe procedure
- Needs no anaesthesia

- Can reduce the period of hospitalisation
- No bleeding compared to surgical debridement
- Rapid healing

Rapid healing occurs due to reduced microbial load, easy removal of slough tissue and unwanted crust materials and dramatic change of pale granulation into healthy granulation tissue. All these together promote epithelialisation also. *Palasakshara* is a safe and effective debriding agent which can assure better healing rate and improve the quality of life of the patient also.

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