Review Article

CONCEPT OF SHADKRIYAKALA OF VRANA BY SUSRUTHA W.S.R TO VENOUS ULCER

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ABSTRACT

Acharya Susruta has described about the Samprapthi (pathogenesis) of Vrana (ulcer) in detail in Susrutha samhitha sutrasthana. All the ulcers like arterial ulcer, venous ulcer, trophic ulcer etc can be considered as Vrana. But no specific term has been made by Acharya for venous ulcer. Venous ulcers are the wounds occurring as a result of inappropriate functioning of venous valves or of venous obstruction by thrombus. While going through the characteristics of Dushtavrana (chronic ulcer) like Krishna/ Suklavarna (hyper/hypopigmented areas), Deerghakaala anubandhithwa (chronicity), Durgandhitha pooyasraava (foul smelling serous/ purulent discharge) etc, venous ulcer can be considered as a Dushtavrana, particularly in its chronic stage. Sira (vein) is the deranged anatomical component in case of venous insufficiency as well as venous ulcer and this Sira has been told as one of the Vranasthaanaas (sites of Vrana) by Susrutha. Hence the term Sirajadushtavrana can be attributed to venous ulcer. Aetiopathogenesis of venous ulcer has striking similarities with that of Dushtavrana. In this article, a gentle attempt has been made to correlate the aetiopathogenesis of venous ulcer with the specific characteristics said in each stage of Shadkriyakala (aetiopathogenesis) of Vranasamprapthi (ulcer) as told by Acharya.

KEYWORDS: Venous ulcer, Sirajadushtavrana, Shadkriyakala, Vrana samprapthi.

INTRODUCTION

Vrana means splitting or tearing of the body (Vrangatracchvichoornane)[1]. The concept Vranathithiivrana indicates that Vrana can cause Gatrawavarnyam (discolouration of body part)[1]. Description of various types of Vrana (ulcer) and its management can be found even in the most ancient literatures of Vedas[2]. Father of Indian Surgery, great Susruthacharya says that the Samprapti (process of pathogenesis) of Vrana, like any other disease, can be described only on the basis of Shadkriyakaala[3] (stages of aetiopathogenesis). Vrana can be caused either due to trauma (Aganthuvrana) or pathological process inside the body (Nijavrana). Any ulcer can be considered as Vrana according to Ayurveda. No specific entity has been made by Acharya for venous ulcer.

An ulcer is a break in the continuity of covering epithelium, which may be either in skin or mucous membrane, due to molecular death[4]. Among the leg ulcers, most common one is the venous ulcer[4]. Venous ulcer can be defined as a defect in pathologically altered tissue on the lower leg on the basis of (CVI) chronic venous insufficiency[5]. Non-healing and recurrence are the main problems associated with the venous ulcer[5].
Shadkriyakaala (six stages of aetiopathogenesis)

Kriyakaala is the Kriyaavasara or the specific time for doing a specific treatment in case of a disease. Shadkriyakaala, i.e., Six Kriyakaalanas is the unique contribution of Susruta which describes the complete process of pathogenesis including aetiology, prodromal symptoms, clinical features, complications and sequelae of a disease. Vrana (ulcer) also goes through all these six stages. The term Kriyakaala can be correlated with the 'aetiopathogenesis' of a disease in modern concept. Susruta describes the Shadkriyakaala in 21st chapter of Susruta samhitha sutrasthana – Vranaprasna adhyaya[6]. These six Kriyakaalas comprises of Sanchaya, Prakopa, Prasara, Sthaanasamsraya, Vyakti and Bheda respectively. Aganthuvrana starts the first stage only after the period of Sudhavrana i.e., seven days[7]. On the contrary, Nijavrana starts the first Kriyakaala at the time of entry of Vrananidana (cause of ulcer) itself. The characteristics mentioned for each Kaala can be correlated with the signs and symptoms seen in various stages of venous ulcer formation.

Sanchaya (Stage of Accumulation)

It is the first Kriyakaala. So definitely the role of Nidana (causative factors) should be incorporated with this Kaala. Susruta says that various causative factors capable of vitiating the normal Dosha state (equilibrium of Vata, Pitha, Kapha, Raktha) of the body, like Ahara (food), Vihara (habits), Rtu (season), Kaala (time) etc can have an influence in this stage in our body. The various signs and symptoms of the person at this stage are Sthabdhapoornakoshtata (abdominal discomfort in the form of fullness or like that), Peethaavabhaasata (colour change–yellow-of the body), Mandoshmata (mild pyrexia), Gouravam (feeling of heaviness), Aalasyam (lassitude) and Chayakaaranavidwesha (dislike in certain foods or habits especially in those which are involved in derangement of Doshas)[6].

While considering the aetiology of venous insufficiency and subsequent venous ulcer formation, we can see the factors such as nutritional deficiency, obesity or chronic illnesses, Vihaara like prolonged standing and reduced physical activity as a part of job or something else etc[8,9]. These might have an influence in the general health of the patient, and obviously in the circulatory system of the body. The above said signs and symptoms of the Sanchaya stage can be considered as general signs and symptoms seen in a patient in the stage of onset of the disease and it is at this stage happens the initiation of aetiopathogenesis of a disease. General weakness and gastric discomfort of the body due to unseen pathogenesis occurring inside the body reflects in this initial stage.

Sanchaya Stage

It can be summarized in a table as below

| Sanchaya Stage | Nidana of Doshas of Dushti in Sanchaya stage |
|----------------|---------------------------------------------|
| Primary causes of venous insufficiency | Nutritional deficiency, obesity, chronic illnesses, prolonged standing, reduced physical activity, pregnancy |
| General weakness and gastric discomfort of the body due to unseen pathogenesis occurring inside the body | Sthabdhapoornakoshtathapuetha avabhaasata mandoshmata, gouravam |
| May be alteration in basic biochemical investigations | Alasya, chayakaaranavidwesha |

Fig 1: Comparison of Sanchayalakshanas with predisposing factors of venous insufficiency and venous ulcer
**Prakopa (stage of excitation)**

Aggravation and vitiation of Doshas (Vata, Pitha, Kapha, Raktha) here occur in a liquefied form. It occurs when some additional and more potent factors are combined along with the already existing Chayanidanidas (causes of Sanchaya said in first stage). Excessive intake of unwholesome food, undesired dietary habits, various physical and mental strain, climatic and diurnal changes and suppression of natural urges will cause vitiation of Doshas in second stage of Samprapthi. All the Doshas are firmly incorporated in the vitiation of Doshas here. Athivyayama (inappropriate exercises), Abhighata (trauma), Ratrijagarana (sleepless nights), Bhaarararana (weight lifting), Padaaaticharya (increased walking and travelling), Katu- kashaya- Thiktha- Rooksha- Laghu- Seetha veeryaahara (spicy, dry, cold foods), Vishamasana (incorrect timings of food), Adhyasana (heavy food), foods like Sushkasaka etc (dried leafy vegetables), Veghadarana of Vata, Mutra, Pureesha etc (suppression of urges of rectal gas, urine, stool), Seethakala (cold climate), Pravata (cold breeze), Varshakaala (rainy season) etc can cause vitiation of Vata dosha.[6]

Mental factors like Krodha (anger), Soka (depression), Bhaya (fear) etc, Katu-amla-lavana-theekshna-ushna-laghu-vadhiyaharahara (spicy and junk food), Godha-matsya-aja-avikamamsa (unwholesome non vegetarian dietary habits), Sura (alcohol), Ushnakaala (summer season), hot climate in specific geographical areas, Madhyahna (working under sunlight in noon etc) etc can cause Pitha vitiation[6]. The same factors may be responsible for the vitiation of Raktha also as both these Doshas are inherently associated in a close relationship. Kapha vitiating factors which are relevant here are Divaswapna (day sleep), Ayayayama (laziness and sedentary habit), Aalasya (laziness), Madhura, Amla, Lavana, Tila, Dadhi, Krisara, Paayasa (sweets, junk foods etc), Ikshuvikara, Anupa-oudaka Mamsa (unwholesome non vegetarian foods), Adhyasana (overeating) etc.[6]

Predisposing factors of venous ulcer are overweight, obesity, restricted physical activity, depression, family history, chronic constipation etc.[8,9]. Chronic illnesses which can affect anatomical structure and functional integrity of veins are hypertension, diabetes mellitus, arterial fibrillation, heart diseases, musculoskeletal disorders, high cholesterol etc[8,9]. So the risk factors of these life style disorders including obesity can be included under Dosa prakopaka nidanas (cause of vitiation of Doshas). Risk factors of varicose vein are multiparity, heredity, traumatic history of lower limbs, obesity, prolonged standing, profession as athletes, pregnancy, old age etc[4]. In old people, atrophy and weakness of venous wall and valves may happen which is a strong predisposing factor behind the improper functioning of lower limb veins and subsequent formation of ulcer. In obese patients, excessive fatty tissue will result in poor venous circulation and increased venous pressure. Moreover their venous valves may not be patent also.

In case of an athlete, forceful contractions of calf muscle lead to reverse blood flow and valve damage, while in sedentary people and people having long-standing occupation, the pressure exerted over the venous valves by the blood column results in valvular damage, dysfunctioning of calf muscle pump and increased venous hypertension[4]. Minor trauma may be the cause of venous ulcer formation if he has an already vitiated venous system.

### Table 1. Dosa Prakopanidanidas and Predisposing Factors of Venous Ulcer: A Comparison

| Causative factors | Factors causing Vatakopa | Factors causing Pitha/Rakthakopa | Factors causing Kaphakopa | Predisposing factors of venous insufficiency and varicose vein formation |
|-------------------|--------------------------|---------------------------------|---------------------------|---------------------------------------------------------------------|
| Ahara             | Katu, Kashaya, Thiktha, Rooksha, Seethaahara, Vishama asana Adhyasana Foods like Sushkasaka (dry vegetables) | Katu, Amla, Lavana, Teekshna, Ushna, Vidhaiyaharahara Mamsa-godha, Matsya, aja, avika, Sura (drava, Snigda, Guru ahara, Virudha, Adhyasana-rakthakopa) | Madhura, Amla, Lavana, Seethe, Snigda, Guru, Pichila, Abhishyandhihara Ahara like Tila, Godhuma, Yavaka etc, Adhyasana | Improper dietary habits (Spicy foods, Junk food Fast food, untimely food habits Alcohol consumption Bakery sweets and high calorie diet) leads obesity, diabetes mellitus, high cholesterol, hypertension etc. |
| Vihara            | Athivyayama               | Srama (Raktha)                  | Athletes, heavy strenuous works |                                                                                   |

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In this second stage of Samprapti also, no manifestation of the specific disease can be seen. The Prakopalakshanams are Koshtatoda sancharana (abdominal discomfort), Amleeka (burning sensation in chest), Pipasa (thirst), Paridaha (burning sensation in chest), Annadwesha (anorexia) etc[6] and these symptoms can be considered as the general signs and symptoms of the pathological process happening inside the body due to a disease. As the factors like reduced exercise, prolonged standing, dependency, improper functioning of calf-muscle pump mechanism etc have been told in the aetiopathogenesis of varicose vein[4], a Vata-Kapha Prakopa leading to an additional Rakthaprakopa (both Rakthavaha srothas and Raktha dhathu dushti) can be seen in this case. Likewise, the factors like change in contents and texture of blood resulting in increased viscosity and thrombus formation can be seen in the aetiopathogenesis of deep vein thrombosis, so a Pitta-raktha- Kapha prakopa finally associated with a Vataprakopa may be told as happened here. So here all the Doshas i.e. Vata, Pitta, Raktha and Kapha has been involved in the second Kriyakaala of Siraja dushtavran.

**Prasara (spreading stage)**

Doshas start spreading in this stage. Susruta explains this spread symbolically as an overflowing like the mixture of yeast, water and flour[6], Vata is the main cofactor playing in this third Kriyakaala. Doshas (Raktha, Pitha, Kapha) vitiated and liquefied in the second Kriyakaala move away from its natural sites in this stage with the help of Vayu and they move inside the whole body or half or sometimes only a part of the body (Kritsneardheavayaveva)[6]. Here it is better to think that Prasara happens in Ardhaangga (lower half of the body), in the sense that only the lower limb venous system is involved in the pathophysiology of venous ulcer. Vayu is the causative agent of the spread because of being mobile even though inconspicuous (Vayorgtimatwa). The spreading Doshas can break the barrier and this spread may happen either to individual Doshas or combination of Doshas. Hence totally, there are 15 types of Prasara occurring in the Vranasamprapti like Vata, Pitta, Kapha, Raktha, Vatapitha, Vataraktha, Vatakapha, Pithakapha, Pitharaktha, Kapharaktha, Vatapitharaktha, Vatakapharaktha, Vatapithakapha, Pithakapharaktha and Vatapithakapharaktha[6].

Unwholesome dietary habits, seasonal variations and activities of a person said as the predisposing factors of venous insufficiency and varicose vein formation can have an influence over the vital systems in our body like circulatory system,
musculoskeletal system, and gastrointestinal system which are the main systems involved in the formation and purification of blood and maintenance of good blood flow in the body. As it is the circulatory dysfunction that happens inside the Sira (veins) in the pathology of Sirajavrana (venous ulcer), Vyanaavyu is the Dosa of vitiation here and the vitiated Dhatus are Rasa and Raktha inside the vein and Mamsa and Medus in the structural base of venous wall and its valves. As some constitutional changes in the blood and impairment of circulation happens even before the manifestation of engorgement of veins and skin changes in lower limb, Prasara stage may be correlated with this prior to manifestation stage of varicose vein and deep vein thrombosis.

While describing the Prasara Samprapthi (pathogenesis in third stage), Acharya says that the vitiated Dhatus can probably stay inside its Maarga (pathway- here it is the circulatory system) for a long time without causing any symptoms (naathyarthamkupithascha api leeno maargeshu tishtathi) and when the favourable circumstances come or if proper treatment is not taken in this stage, it can just go to the stage of disease manifestation as soon (kaalena hethumasaadaya kupyathi)[6]. In case of varicose veins and venous insufficiency also, if the patient is taking proper diet and using proper prophylactic measures like use of stockings, compression bandages, exercises etc even from the starting stage itself, one can prevent varicose vein and venous ulcer formation[5] and when he doesn’t mind it, these diseases can manifest spontaneously. And also its very interesting to note that most of the Prasaralakshanas told by Susrutha can be seen in early pathogenesis of venous insufficiency also prior to the manifestation of ulcer and these Lakshanas are:

1. Vimargamagama due to Prasara caused by Vata (abnormal flow of Dosa, here either the reverse flow of blood through the same vein or recanalization in venous incompetency), 2. Osha, Ghosa, Paridaha, dhoomaayana etc caused by Pitha prasara- can be correlated with various types of pain, discomfort and burning sensation felt by patient in starting stage of venous insufficiency and prior to the formation of varicose veins) and 3. Angasada (weakness of body) caused by Kaphaprassara (prodromal symptom of lower limb venous insufficiency and varicose vein) [6]. Modern texts say that it is at the starting stage of venous incompetence and varicose vein that the pain and discomfort is maximum for the patients.

**Sthanasamsraya (Localisation)**

In the fourth Kriyakaala, Doshya Sammurchana occurs and according to Chakrapani, it will be Sookshma[7], in the sense it may be happening at a tissue, cellular or molecular level. Dhoshas which got aggravated and spread inside the body (by second and third Kriyakaalas), if doesn’t get properly managed can be localized somewhere else inside the body (Srothas) and produce some signs and symptoms, but not the actual disease manifestation, rather the Poorvaroopa (prodromal symptoms) of disease manifest[7]. Viseshaapoorvaroopa (specific prodromal symptoms) helps us to identify the main Dosa involved in the disease. According to Susrutha, Poorvaroopa of Vrana (especially Nijavrana) is Vranasopha[7]. Vranasopa can undergo Paka if untreated. Leg oedema and ankle flair which occurs in venous insufficiency prior to the ulcer formation can be compared with Vranasopha. But it is better to consider its tissue and cellular level also.

Acharya says that Grandhi can occur if the vitiated and spread Doshas get localized in Medodhatu[6] and the Dushyas of Grandhi are Mamsa, Medas and Raktha, the same structural and functional base of Sira (vein). Due to the dysfunctioning of valves and calf muscle pump mechanism, variability appears in superficial veins which are otherwise known as Siragrandhi which can be considered as a Sopha in tissue level (tissue here is one among the Rakthavahasrothuses- Sira). Prior to the formation of ulcer, inflammatory changes like fibrin cuff formation, leukocyte trapping in vessels involved in cutaneous circulation and subsequent intercellular fluid accumulation etc occur locally in the malleolar and perimalleolar region[5]. These changes can be considered as Sopha in both tissue and cellular level. According to Susrutha, Kushtha is the manifestation (Poorvaroopa) seen if Sthanamsraya of Dhoshas occurs in Twak- Mamsa- Sonitha Dhathus. Hyperpigmentation and eczematous changes happening in skin prior to the venous ulcer formation may be considered as Twakvikara i.e., Kushtha[6].

Since among these, only the Sopha in the form of lower limb oedema is visible by naked eye, only that can be used to identify the Dosa predominance in Sthanamsraya stage of Vrana samprapthi. This sophapoorvaroopa is applicable only for Nijavrana as the Aganthuvrana happens without any Poorvaroopa. Vranasopha is to be examined by three means- Darsana (inspection), Sparasana (palpation) and Prasana (history taking).

Visheshalakshana (specific signs and symptoms) of vranasopha is as follows[6]:

a. Vatasopha- Black or Arunavarna, rough or soft on touch, with intermittent pricking or other various types of pain.

b. Pitahasooph- Yellow or red in colour, soft, undergoes Paka very rapidly and with various types of Pitaja pain.
c. **Kaphaja sopha**- white, hard, smooth, having itching, cold on touch, undergoes Paka very slowly.

d. **Sannipatha Sopha**- has the lakshanas of Vata, Pitha and Kaphasophas.

e. **Rakthaja sopha**- similar to Pithasopha, colour may be black.

f. The Sopha which is associated with Aganthuvrana- symptoms of Pithaja and Rakthajasophas, colour more reddish like blood.

**Vyakthi (stage of disease manifestation)**

If proper treatment is not done in Poorvaroopa stage, Sopha will attain Pakwa stage. Fifth stage of Samprapthi follows the Pakwavastha[7]. The Pakwasopha bursts naturally or a Sastravrana (surgical incision) should be created for the removal of pus at this stage. Thus a break in the continuity of skin develops in Nijavrana. In an Aganthuvrana, this fifth stage is happening first. Both the Samanya and Visesha Lakshanas can be found in fifth Kriyakaala. Vyakthi is the stage where Lakshana of disease becomes clear (Vyaktha) and by definition, Vrana means *Gatravichurnana*[7], which means destruction or split of tissue or body part. So the **Vyakthi** stage of Vrana starts from the loss of skin or mucous membrane i.e., formation of venous ulcer. So it is at this stage, the disease is known as *Siraja Dushtavrana*.

**Samanya Lakshana of Vrana**

Pain (Ruk) is the *Samanyalakshana* of Vrana, because it is the common symptom found in all Vranas[7]. Only the nature of pain varies according to the Doshas involved which is to be considered as Viseshalakshana.

**Viseshalakshana of Vrana**[4]

Specific symptoms as differentiated by the involvement of specific Doshas can be considered as the *Visesha Lakshanas* of Vrana. There are fifteen different combinations of Doshas mentioned in Vrana by Acharya Susrutha. Nature of pain, colour, discharge etc is different for different types of Vranas according to the Doshik combination.

| Vatajavrana | Pithajavrana | Kaphajavrana | Venous Ulcer |
|-------------|--------------|--------------|--------------|
| Colour: Syava | Colour: Neelabha | Hyperpigmentation, necrosed tissue, eczema, bluish discolouration due to pooling of deoxygenated blood in veins. |
| Colour- Arunabha | Raaga | Typical eczematous lesion of surrounding skin |
| Colour: Peetha | Colour: Pandu | Slough tissue/ stage of microbial infection |
| Texture: Rooksha | Texture: Kadina, Sthoolaoshta | Fibrosis, necrosis, scar tissue, hypertrophied texture in the floor or slightly indurated edge or base of venous ulcer |
| Pain: Toda, Bheda, Ayama | Pain: Mandaavedana | Pain is a feature of venous ulcer-mild/ sharp |
| Discharge: Thanu, Alpasrava | | Scanty discharge |
| Discharge: Pichila | Discharge: Sukla, Seetha, Sandra, Pichila, Guru | Serous discharge/ purulent discharge in infected stage of venous ulcer |
| | Discharge: like water mixed with Kimsuka flower (red) | Serosanguinous/ sanguineous discharge |
| | Discharge: Ushna, Poothisrava | Color and foul smelling discharge especially when infected |

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**Table 2: Vranalakshanas and Characteristics of a Venous Ulcer: A Comparison**
Aasrava
Discharge may be more especially in infected stage

Time: Kshipra
Sometimes spontaneously formed

Kandu
Itching is a feature of venous ulcer

Associated features: Daha, Paaka, Peethapitaka, Vikarakari
Fever and inflammation is a sign of infection in venous ulcer may be because of microbes

Sthabdhasira, Snayujaala
Tortuous veins or telangiectasia in surrounding areas.

By assessing these symptoms, we can say that generally in a venous ulcer, Lakshana of Vataja and Kaphajavranas predominate and once it get infected, the Lakshanas of Vataja and Pithajavranas predominate.

**Bheda (Stage of Chronicity and Complications)**

If the Nijavrana or Aganthuvrana is not properly treated, it becomes chronic and reaches the sixth stage of Samprapthi - Bheda. Also Dushtavrana is the Bhedavastha of diseases like Pramehapitaka, Vidhradhi, Visarpa, Kushta and many other similar diseases.

| Susrutha | Chronic Venous ulcer |
|----------|----------------------|
| Atisamvrutha | Edge being not united though stays together, is a sign of non-healing of ulcer. Also a feature of malignancy |
| Athivivrutha | Sometimes large/expanded, Sign of non heating ulcer |
| Athikadina | Slight/moderate level of induration due to chronicity, fibrosis, scar, necrotic tissue etc. Feature of malignant ulcer also |
| Athimridu | Loose consistency due to inflammation of underlying tissues |
| Utsanna | May be raised rarely |
| Avasanna | Indicates depth of the ulcer (usually venous ulcer is shallow) |
| Atiushna | Calor is sign of inflammation |
| Atiseeta | May be a sign of ischemia (arterial insufficiency may be associated with venous ulcer) |
| Krishna | Gangrene/necrosis/hyperpigmented surroundings |
| Raktha | Bleeding from the ulcer and on touch also, may be a feature of malignancy |
| Peetha, sukla | Pale granulation tissue is a sign of non-healing |
| Bhairava | Irregular surface and edges due to chronicity, scar tissue, or malignant changes |
| Poothipooya | Foul smelling discharge especially if infected by microbes |
| Poothimamsa | Infection affects underlying tissues which leads to putrifaction |
| Poothisira | Infection affects blood vessels and nerves which may undergo putrefaction |
| Poothisnayu | Degeneration of underlying ligaments, tendons etc due to infection and subsequent putrefaction |
| Dushtarakthasrava | Serosanguinous/sanguinous discharge |
| Amanojnagandha | Foul smell, due to infection, necrosis, gangrene formation or malignant changes |
| Amanojnadarana | Due to infection, necrosis, gangrene formation or malignant changes |
| Athyarthavedana | Sometimes very painful |
| Athyarthadaha | Symptom of Infection |
| Athyarthapaka | Symptom of Infection |
| Athyartha raga | Rubor, sign of Inflammation |
| Pitaka | Symptom of Infection |
| Kandu | Itching is a feature of venous ulcer |
Invasion of microorganisms like streptococcus, staphylococcus, proteus species, fungi etc can occur in a chronic venous ulcer which makes it an infected one. The infection makes it a non-healing one and is difficult to cure with the general management of ulcer. Malignant transformation of the chronic venous ulcer is known as marjolin’s ulcer and it is the deadly complication of this ulcer. It is a condition with bad prognosis. Some of the symptoms told by Acharya in Dushtavatara can be compared with the poor prognostic features of malignant or premalignant condition also.

**Management of disease in each Kriyakaala**

1. **Sanchaya:** Prophylactic measures, starting of medicines considering the Dosha vitiation
2. **Prakopa:** All Doshas are vitiated here. If Vataprakopa at the site Pittha, Pithahara treatment should be given and similarly the predominant Dosha and the site should be assessed and treated in the similar manner.
3. **Prasara:** Upto this stage, treatment for cause and symptoms should be given rather than disease
4. **Sthanasamsraya:** treatment for Dosha and Dushya.
5. **Vyakthi:** treatment contrary to disease is to be given
6. **Bheda:** Incurable

**DISCUSSION**

The concept of Shadkriyakaala contributed by Susrutha is the best way of explaining the Aetiopathogenesis of a disease. Besides the mere clinical features of the disease, these six Kriyakalas can describe all the aspects of the disease like aetiology, pathophysiological changes, complications and characteristics of chronicity of a disease. While considering the complete pathological changes of venous ulcer, the apt term which can be given for it is Siraja dushtavatara.

In the first Kriyakaala (Sanchaya), various causative factors capable of vitiating the normal Doshic state of the body like Ahara, Vihara, Rtush can produce some Lakshanas in the body like Sthabdha poornakoshthatha, Mandomshmatha, Chayakarana vidwesha etc. The same things happen in aetiopathogenesis of venous ulcer also. Nutritional deficiency, obesity, chronic illnesses, reduced physical activities etc can cause general weakness and gastric discomfort which are the generalized manifestation of a disease pathogenesis happening inside the body. So this stage can be compared with the first Kriyakaala. In Prakopa, which is the second Kriyakaala, the same causative factors do persist but some additional and potent factors makes the condition worsen and the vitiation of Doshas happens in an aggressive form, still in unmanifested condition. Various causes of Vata vitiation like Ativyayama, Abhihghata, Padaaticharya, Katu-rooksha Ahara, the causes of Pitha- Raktha Prakopa like Krodha, Soka, Katu-Thiktha Vidahi Ahara, Sura, Ushna Kala etc and the causes of Kapha Prakopa such as Avayayama, Alasya, Madhura- Amla- Lavana Ahara, Dadhi, Krisara, Mamsahara etc can cause various Lakshanas in the body like Koshtatoda Sancharana, Paridaha, Annadwesha etc. In modern concept, venous insufficiency, varicose vein and deep vein thrombosis are the basic pathologies happening prior to the manifestation of venous ulcer. The predisposing factors of the former pathologies can be included under Prakopa nidanas and these factors are improper dietary habits like spicy food, fast food, bakery sweets, alcohol consumption, high calorie diet etc which causes obesity and various chronic diseases (diabetes mellitus, hypertension etc) heavy strenuous works, sedentary lifestyle, long time standing occupation, restricted physical activities, long time walking, chronic constipation, emotional stress, depression, extreme hot and cold climate etc.

In Prasara, the third Kriyakaala, the Doshas spread to other sites either individually or in combination to produce symptoms like Vimargagamana, Osha, Chosha, Paridaha dhumayana, Angasada etc. The Doshas exist in Leena state here as remain suppressed until it gets favourable circumstances to get manifested as a disease. Prior to the manifestation of ulcer, abnormal flow of blood in lower limb veins, recanalisation, discomfort, pain and burning sensation felt in lower limb veins can be compared with the Prasara lakshanas. Sthanasamsraya is the fourth Kriyakaala, when localisation of disease happens. Here, varicose vein (Siragrandhi) formation and thrombus formation inside deep veins, ankle flair and lower limb oedema, various inflammatory and pathological changes like fibrin cuff formation and white cell trapping can be taken as Sopha occurring in various levels such as tissue, cellular and molecular levels. Sopha being the Poorvaroopaka of Vrana is the feature of Sthanasamsraya stage.

Manifestation of the disease in its entire form happens in fifth Kriyakâala- ‘Vyakthi’. All the clinical features of venous ulcer such as slight pain, serous or...
serosanguinous or seropurulent discharge, chronicity, slight induration of edge and base of ulcer due to its chronic nature etc can be seen in venous ulcer also. 

Bhedā is the last Kriyākāla, which is said to be incurable according to Achārya. It is the stage of ominous structural abnormalities and complications happening in a venous ulcer. Infection by microorganisms and subsequent non-healing occurs as a complication in this last stage. It is better to check the deadly complication of venous ulcer also in this stage i.e., marjolin's ulcer which is the malignant transformation happening in a venous ulcer. Prognosis is bad for a malignant ulcer.

CONCLUSION

Shadkriyākāla of Vrana described by Susrutha can be correlated with different stages of aetio-pathogenesis venous ulcer. The changes happening inside the body which can’t be seen by the surgeon before the manifestation of ulcer may become evident from the other signs and symptoms which might think to be irrelevant in the manifestation of that particular disease. If a surgeon is able to understand the correct Kriyākāla, he gets a chance to select the apt treatment said for that particular stage and thus the quality of treatment and that of life of the patient can be improved. So understanding the stage of Samprapthi of Vrana can be said as beneficial in venous ulcer management which otherwise has a tendency to become chronic.

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