

A COMPREHENSIVE LITERARY REVIEW ON DUSHTA VRANA W.S.R DIABETIC  
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## ABSTRACT

A wound is a disruption of the normal structure and function of the skin and underlying tissues caused by various factors such as trauma, surgery, or pathological conditions. It maybe acute or chronic. Chronic wounds do not follow the normal healing process. Diabetic Foot Ulcer which is a chronic is a distressing, devastating complication of diabetes and is common neglected problem that can lead to amputation which can result in patient becoming handicap. Wound healing is a complex and dynamic process involving a series of overlapping stages. A *Vrana* reaches the chronic stage due to lack of adequate knowledge of the disease, exact diagnosis and the right treatment for the specific type and stage of the *Vrana*. *Dushta Vrana*, a type of *Vrana*, refers to chronic, non-healing, or infected wounds with the chronicity of more than 7 days which are due to significant tissue damage and have foul odour, discharge and severe pain. *Pramehajanya Vrana* is one of the complications of *Prameha*. In the wounds developed in *Prameha*, treatment modalities prescribed for the *Dushta Vrana* should be adopted. The treatment of *Dushta Vrana* involves a holistic approach, including both local wound care and systemic therapies. Local treatments focus on wound cleansing, debridement, and healing. Systemic therapies aim to restore balance in the *Doshas*. This review provides an in-depth compilation of dispersed concepts of *Dushta Vrana* from various classical Ayurvedic texts, which includes etiological factors, classification, pathology, symptoms, clinical features and managements.

**KEYWORDS:** *Vrana, Dushta Vrana, Pramehajanya Dushta Vrana, Wound, Diabetic Foot Ulcer, Management.*

## INTRODUCTION

Humans have suffered from wounds and have managed them since the dawn of civilization. *Acharya Sushruta* have elucidated in detail about various sorts of *Vrana*, *Nidana* [Etiology], *Samprapti* [Pathophysiology], *Roopa* [Clinical features], *Prakara* [Types], *Sadhya Asadhyata* [Prognosis], *Upadrava* [Complications], *Chikitsa* [Treatment], and *Pathya – Apathya*.<sup>[1-6]</sup> A *Vrana* reaches the chronic stage due to lack of adequate knowledge of the disease, exact diagnosis and the right treatment for the specific type and stage of the *Vrana*. *Dushta Vrana*, a type of *Vrana*, refers to chronic, non-healing, or infected wounds with the chronicity of more than 7 days which are due to significant tissue damage and have foul odour, discharge and severe pain.<sup>[7]</sup>

In the classical texts of *Ayurveda*, *Prameha* is considered as a *Maha Vyadhi* by all the *Acharyas*. *Charaka mentions Pooti Mamsa* [gangrene] as one of the *Upadhravas* of the *Prameha*.<sup>[8]</sup> *Acharya Sushruta* has expounded that the wounds developed in *Kushta* and *Prameha*, treatment

modalities prescribed for the *Dushta Vrana* should be adopted.<sup>[9]</sup>

A wound is a discontinuation in the integrity of the skin or tissues. It is associated with disruption of the structure and function.<sup>[10]</sup> Ulcer is a type of wound.<sup>[10]</sup> It maybe acute or chronic. Chronic wounds do not follow the normal healing process. No sign of improvement in the condition of the wound is seen even after 4 weeks. The inflammatory phase is prolonged due to prolonged hypoxia, reduced collagen synthesis, and bacterial colonization.<sup>[10]</sup> Management of chronic wounds demand various tedious treatment modalities which extends beyond conventional dressings.

Diabetic Foot Ulcer is a triad that mainly consists of neuropathy, infection, and ischaemia affecting the toes and feet particularly the sole.<sup>[11]</sup> Out of 62 million diabetics in India, 25% develop Diabetic Foot Ulcer, of which 50% become infected, requiring hospitalization while 20% need amputation. Diabetic Foot Ulcers

contribute approximately 80% of all non-traumatic amputations in India, annually.<sup>[12]</sup> The pillars of treatment today include the following: local wound care with surgical debridement, dressings promoting a moist environment, wound off-loading, vascular assessment, treatment of active infection, and glycaemic control.<sup>[13]</sup>

The treatment of chronic wounds is discerningly essential to reduce the risk of infections, prevent further worsening of the wounds, foster faster healing, prevent complications, improve the quality of life, reduce hospitalization days, and minimize healthcare costs.

The harmony of the insight of Ayurveda and modern progress, can improve the standard of wound healing and patient's quality of life.

### **Dushta Vrana**

#### **Nirukti [Etymology]**

Acharya Sushruta defines Vrana as *Vrana Gaatra Vichurnane Vranayateeti Vranah*: *Gaatra* refers to the tissues, *Vichurnane* refers to damage, and *Vranayateeti* refers to discoloration.<sup>[14]</sup> Therefore, the term *Vrana* means the one which causes damage and discoloration to the tissues.

Acharya Dalhana gives the definition of Vrana as *Vranayateeti Gaatra Vaivarnyam Karoteetyarthah* which

translates to the one which causes discoloration to the tissues.<sup>[15]</sup>

#### **Paribhasha [Definition]<sup>[16]</sup>**

वृणोति यस्माद्रूढेऽपि व्रणवस्तु न नश्यति ।

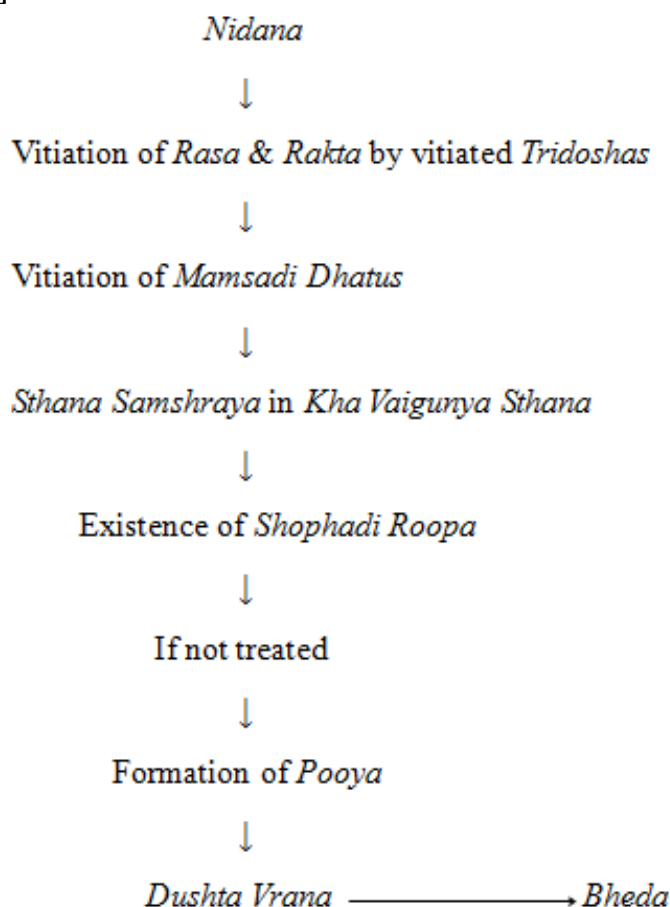
आदेहधारणात्तस्माद्व्रण इत्युच्यते बुधैः ॥ [सु.सू. 21/40]

According to Acharya Sushruta, *Vrana* is named so as it encompasses the affected site and leaves a scar that does not disappear till the person is alive even after the healing.

#### **Nidana [Aetiology]<sup>[17]</sup>**

*Acharya Charaka* explains the aetiological factors as moistening of ligaments, excess of fluid in blood vessels, increased depth, eaten by maggots, cracking of bones, presence of foreign body, presence of toxins, spreading, excessive tearing with nails or wooden pieces, the friction of skin, the friction of body hair, faulty bandage, over-application of unctuous substance, excessive emaciation due to overdose, indigestion, over-eating, intake of incompatible food items, unsuitable food, grief, anger, day-sleep, physical exercise, sexual intercourse, and inactivity. These factors lead to delay in the healing process. Ulcers having many impurities become difficult to cure due to the presence of excessive discharges, odors, defects, and complications.

#### **Samprapti [Pathogenesis]**





*Shvayathu, Vedana Pidaka* etc appearing as *Upadravas*, and *Dheerga Kalanubhandha*.

#### According to *Ashtanga Hridaya*<sup>[20]</sup>

Either *Samvrutha* or *Vivrutha*, *Kathina* or *Mrudu*, *Ati Utsanna* or *Avasanna*, *Ati Ushna* or *Ati Sheeta*, *Raktatva* or *Panduta*, discharges *Pooti* – *Pooya*, covered with *Pooti Mamsa*, *Sira Snayu*, associated with *Ati Ruk* - *Daha*, *Shwayathu*, *Kandu* and other complications, and *Dheerga Kaalanubhandha*.

#### According to *Madhava Nidana*<sup>[21]</sup>

Discharges *Pooti Srava* or *Dushta Asruk*, *Utsanga* [Sinuses] inside, *Chira Sthita*, emits *Pooti Gandha*, and doesn't possess any features of *Shuddha Vrana*.

#### Chikitsa [Treatment]

*Acharya Sushruta* prescribed *Saptopakramas* as the basic treatment modalities for the *Vrana*.<sup>[22]</sup> The *Shashti Upakramas* [60 treatment modalities] are incorporated in the *Saptopakramas*.

The *Saptopakramas* & the incorporated *Shashti Upakramas* are:

1. *Vimlaapana*: To soften or causing to wither [*Apatarpana*, *Alepa*, *Parisheka*, *Abhyanga*, *Sweda*, *Vimlapana*]
2. *Avasechana*: To expel the *Doshas* [*Visraavana*, *Sneha*, *Vamana*, *Virechana*]
3. *Upanaaha*: Applying a poultice [*Upanaha*, *Pachana*]
4. *Patana Kriya*: To divide/tear/make an incision [*Chedana*, *Bhedana*, *Darana*, *Lekhana*, *Eshana*, *Aaharana*, *Vyadhana*, *Vidravana*, *Seevana*]
5. *Shodhana*: To cleanse [*Sandhana*, *Peedana*, *Shonita Sthapana*, *Nirvapana*, *Utkaarika*, *Kashaya*, *Varti*, *Kalka*, *Sarpi*, *Taila*, *Rasakriya*, *Avachurnana*, *Vrana Dhupana*].
6. *Ropana*: To heal [*Sandhana*, *Peedana*, *Shonita Sthapana*, *Nirvapana*, *Utkaarika*, *Kashaya*, *Varti*, *Kalka*, *Sarpi*, *Taila*, *Rasakriya*, *Avachurnana*, *Vrana Dhupana*].
7. *Vaikrutaapaham*: To remove the deformities or undesirable changes which have occurred as a complication or sequel of wound healing [*Utsadana*, *Avasadana*, *Mrudu Karma*, *Daruna Karma*, *Kshara Karma*, *Agni Karma*, *Krishna Karma*, *Pandu Karma*, *Pratisarana*, *Roma Sanjana*, *Loma Apaharana*, *Basti Karma*, *Uttara Basti Karma*, *Bandha*, *Patra Daana*, *Krimighna*, *Brumhana*, *Vishaghna*, *Shiro Virechana*, *Nasya*, *Kavala Daarana*, *Dhooma*, *Madhu Sarpi*, *Yantra*, *Aahaara*, *Raksha Vidhana*]

*Shodhana* and *Ropana Chikitsa* are the two important treatment principles in *Dushta Vrana*. *Shodhana* [cleansing] helps in removal of the slough and discharge. Slough and discharge delay the healing of the *Vrana*. *Ropana* is healing the *Vrana* which succeeds *Shodhana*. *Kashaya* [Decoction], *Varti* [medicated wick], *Kalka* [paste of medicated drugs], *Sarpi* [medicated ghee], *Taila* [medicated oil], *Rasakriya* [semisolid extract of the drugs], and *Avachurnana* [Dusting powder] do both *Shodana* and *Ropana*.<sup>[23]</sup>

Drugs like *Dravanti*, *Karanja*, *Danti*, *Chitraka*, *Nimbapatra*, *Kasisa*, *Tutha*, *Trivrita*, *Nili*, *Haridra*, *Daruharidra*, *Saindhava Lavana*, *Tila*, *Gorakhmundi*, *Suvaha*, *Shukakhya*, *Mainshila*, *Katutumbi*, *Madyanti*, *Snuhi*, *Murva*, *Arka*, *Vidanga*, and *Hartala* are mentioned for the *Shodhana* of the *Dushta Vrana*.

Various types of *Lepas* like *Aalepa*, *Pradeha*, *Pralepa* are mentioned for the application on the *Vrana* after the *Shodana*.

*Bandhana* [bandaging] is indicated after the application of the *Lepa* for the protection of the wound, keeping the dressing intact, and *Shodhana* and *Ropana* of the *Dushta Vrana*. *Bandhana* is contraindicated in *Kusthajanya* and *Pramehajanya Vrana*. The decision to do the *Bandhana* in these *Vranas* is taken up by the expert *Vaidhya*.<sup>[24]</sup>

If the condition of the *Dushta Vrana* still remains unaltered, then the suitable technique of *Ashtavidha Shastra Karma* [8 surgical modalities] i.e *Chedana*, *Bhedana*, *Lekhana*, *Aaharana*, *Eshana*, *Vyadhana*, *Visraavana*, and *Seevana* must be adopted for the *Shodana* of the *Vrana*.

*Acharya Sushruta* has mentioned the use of *Kshara* in the *Dushta Vrana* condition. *Kshara* does *Shodana* [cleaning], *Ropana* [healing], *Shoshana* [absorbing the moisture], *Sthambhana* [arresting the secretions], *Lekhana* [scraping the unwanted tissue], *Tridoshaghna* specifically *Vata* and *Kapha*, *Chedana* [Excision] & *Bhedana*. *Kshara* invades the cells of the lesion and tissue destruction occurs by corrosive property [*Kshanana guna*]. It has indicated in *Vrana* as supporter of *Dushta Vrana Nashaka* & has the property to kill the bacteria [*Krimighna*]. *Kshara* is alkaline in nature so it modifies the media & inhibits the growth of the bacteria thus acting as bacteriostatic. It removes the sloughs present in the ulcer and promotes the healing. *Kshara* controls the bleeding due to its *Stambhaka Guna* acting as a sclerotic agent.<sup>[25]</sup>

*Pathya* and *Apathya* plays an important role in the treatment of the *Dushta Vrana*. *Pathya Ahara*: *Shashtika Shali*, *Snigdha*, *Jaangala Mamsa*, *Tanduleeyaka*, *Jeevanti*, *Vatsaka*, *Moolaka*, *Patola*, *Kaaravellaka*, *Saindhava Lavana*, *Daadima*, *Aamalaka*, and *Mudga*. *Apathya Ahara* and *Vihara*: *Nava Dhanya*, *Mastu*, *Sarshapa*, *Kalaaya*, *Kulatha*, *Nishpaava*, *Haritaka Shaaka*, *Amla*, *Lavana*, *Katu Dravyas*, *Shushka Maamsa*, *Shushka Shaaka*, *Aja Maamsa*, *Aavi Maamsa*, and *Anoop Maamsa*, *Ati Sheeta Jala Sevana*, *Krushara*, *Dadhi*, *Dugdha* etc. The *Vranita* should avoid *Vata*, *Aatapa*, *Raja*, *Dhooma*, *Ati Bhojana* and *Irshya*, *Krodha*, *Bhaya*, *Shoka*, *Raatri Jaagarana*, irregular food habits, sleeping on an uneven bed, *Langhana*, *Adhyashana*, *Ajeerna* etc.



**DIABETIC FOOT ULCER****Definition<sup>[26]</sup>**

Infection, ulceration or destruction of tissues of the foot associated with neuropathy and/or peripheral artery disease in the lower extremity of a person with (a history of) diabetes mellitus.

**Risk factors<sup>[27]</sup>**

Males are more prone than females, especially males above the age of 50 years. Diabetes Mellitus of the chronicity of more than 10 years, uncontrolled blood sugar levels, Peripheral Vascular Disease, smoking, hypertension, & genetic factors.

**Aetiology<sup>[28]</sup>**

An increase in the glucose levels in the tissues which precipitate the infection, microcirculation affected by the diabetic microangiopathy, oxygen dissociation decreases due to increased glycosylated hemoglobin, oxygen utilization due to increased glycosylated tissue protein, diabetic neuropathy which involves all the sensory, motor and autonomous components, and atherosclerosis.

**Pathophysiology**

The development of DFUs is a multifactorial process and it several interrelated factors. Peripheral Sensory Neuropathy due to Diabetes Mellitus leads to nerve damage, particularly in the lower extremities. It results in the loss of protective sensation. Patients will not sense the pain from minor injuries, or trauma, which can progress unnoticed. Peripheral Motor Neuropathy causes muscle weakness and atrophy. This leads to deformities such as claw toes and Charcot foot. These deformities create abnormal pressure points on the foot in turn increasing the risk of ulceration. Autonomic Neuropathy reduces sweating. This leads to dry and cracked skin, making it more prone to infections.

Diabetes accelerates atherosclerosis in peripheral arteries. This leads to the reduced blood flow to the extremities. Ischemia results in inadequate oxygen and nutrient delivery to tissues. This impairs wound healing and increasing the risk of infection.

Chronic Hyperglycaemia leads to the glycation of proteins. This impairs the normal function of the extracellular matrix and cellular components. Thus, delaying the wound healing. Hyperglycaemia also impairs white blood cell function. Thus, reducing the healing of the wound.

In diabetes, wound healing is impaired due to several factors, including prolonged inflammation, reduced angiogenesis, and impaired collagen synthesis. The inflammatory phase is prolonged, delaying the healing process. Additionally, decreased angiogenesis limits the transport of essential nutrients and oxygen to the wound, further hindering the recovery. Impairment in collagen synthesis affects the structural integrity of the wound,

making it more prone to complications and delayed closure.

Infection plays an important role in the progression of diabetic foot ulcers, with high glucose levels creating a supportive environment for bacterial overgrowth. This in turn leads to an increased risk of infection, as bacteria thrive in the nutrient-rich environment. Additionally, chronic wounds often develop biofilms—complex communities of bacteria that are highly resistant to both antibiotics and the immune system—making treatment and healing even more strenuous.

**Sites<sup>[28]</sup>**

Foot-plantar aspect, leg, upper limb, back, scrotum, and perineum.

**Clinical Features<sup>[28]</sup>**

Spreading, and deep.

Diabetic Neuropathic Ulcer typically occur on weight-bearing areas of the foot (e.g., under the metatarsal heads, on the heels, and on the tips of the toes). They are painless, even though the ulcer may be deep, surrounded by callus due to abnormal pressure and walking patterns (because patients may not feel pain). round or punched-out shape, minimal drainage unless infected. Sensation is reduced or absent in the area due to neuropathy. Foot deformity is seen as neuropathy leads to changes in the structure of the foot (e.g., Charcot foot). The foot may be warm and have palpable pulses unless vascular issues coexist.

Diabetic Arteriopathy (Ischemic) Ulcer are caused by poor blood flow due to peripheral arterial disease (PAD), leading to ischemia. They usually occur on the tips of the toes, the lateral aspect of the foot, or the margins of the heel, areas distal to the blood supply. They are often painful, especially when walking or elevating the leg (claudication), having a pale, necrotic, or blackened tissue (gangrene) appearance. Borders may be irregular and poorly defined with the floor having minimal granulation tissue (due to poor blood supply). Ulcers are dry, with little to no drainage. Sensation is intact but with significant pain. The surrounding skin may be thin, shiny, hairless, and the temperature is reduced. Peripheral pulses are decreased or absent due to arterial insufficiency.

Diabetic Infective Ulcer is another type of Diabetic Foot Ulcer. Infection can complicate both neuropathic and ischemic ulcers, leading to distinct signs. The area around the ulcer appears red, swollen, with increase in the local temperature. There is increased drainage, possibly purulent (pus) with a foul odor, especially in advanced infection. Presence of necrotic tissue, abscess formation, or even signs of deeper tissue involvement like osteomyelitis may be seen. Systemic features such as fever, malaise, and elevated white blood cell count may be present in severe cases. Pain may or may not be present, depending on the presence of neuropathy.

**Classification: Amit Jain's diabetic foot classification**

Class of diabetic foot ulcer	Description	Causation	Examples
Class 1	Simple ulcers	There is no intrinsic cause of non-healing	Trophic ulcers
Class 2	Complex ulcers	There is an intrinsic cause of non-healing like bony or ischaemia	Claw toe ulcers, ischemic ulcers, etc.
Class 3	Complicated ulcers	These ulcers have an underlying infection	Ulcers with osteomyelitis

**Grading: Modified Wagner grading system**

Grade 0	No skin changes
Grade 1	Superficial ulcer
Grade 2	Ulcer extension
	a. Involves ligament, tendon, joint capsule, or fascia b. No abscess, no osteomyelitis
Grade 3	Deep ulcer with abscess or osteomyelitis
Grade 4	Gangrene of the portion of forefoot
Grade 5	Extensive gangrene of foot

**Complications<sup>[29]</sup>**

Cellulitis, abscess, wet gangrene, necrotizing fasciitis, claw toe, hammer toe, Charcot foot, diabetic bullae, osteomyelitis, dry gangrene with secondary infection.

**Investigations<sup>[30]</sup>**

Complete blood Count, Glycaemic profile: RBS, FBS, PPBS, HbA1c, Urine sugar estimations, Pus for culture/sensitivity, X-ray of the foot, Liver function test [LFT], ECG, chest X-ray, blood urea, serum creatinine as a routine, Lower limb arterial duplex scan: important investigation to check the patency of vessels, hand held Doppler and measurement of ankle brachial index [ABI], and CT angiogram.

**Treatment**

Glycaemic Control: Diabetes precipitates infections and this worsens the status of the wound. Control of infection: Appropriate systemic antibiotics should be administered after the culture/sensitivity investigation to control the infection.

Local wound care: Regular cleaning, debridement, and dressing to convert the non-healing ulcer in to a healing ulcer.

Regular Foot Examinations: To detect early signs of neuropathy, vascular insufficiency, or skin changes.

Patient Education: Educating patients about proper foot care. This includes daily inspections, moisturizing the foot, and proper nail care. These methods reduce the risk of developing an ulcer.

Appropriate Footwear: Wearing well-fitted shoes that provide adequate support and protection can prevent pressure points and injuries.

Offloading: Use of customized orthotic devices, casts and footwear reduce the pressure and provides an aid in healing of the ulcer.

Surgical Intervention: Presence of Necrotic or Gangrenous Tissue, Osteomyelitis (Bone Infection), Abscess Formation, Severe or Uncontrolled Infection (Sepsis), Non-Healing Ulcers, Foot Deformities Contributing to Ulceration, Critical Limb Ischemia (Severe Peripheral Arterial Disease), Failed Conservative Management, Amputation for Limb Salvage are the indications for the surgical intervention. Revascularisation procedures like endarterectomy or thrombectomy or balloon angioplasty or arterial bypass graft are done to improve the blood flow. Other surgical interventions like toe/foot/leg amputations.

**CONCLUSION**

Diabetic foot ulcer is a significant and severe complication of diabetes. It often leads to debilitating outcomes such as infection and amputation. In a developing country like India, Diabetic Foot Ulcer is very common and has a high recurrence rate. The pathophysiology of Diabetic Foot Ulcer is complex, and it involves multiple interrelated factors that hinder the normal healing process. This makes the management of these ulcers challenging and time-consuming. Contemporary treatment emphasizes a multifaceted approach that includes thorough vascular assessment, local wound care, surgical interventions, infection management, and strict glycaemic control. From the standpoint *Ayurveda*, *Chikitsa* of *Dushta Vrana*, including *Pramehajanya Dushta Vrana*, involves *Shodhana* and *Ropana*, employing an integration of internal medications, *Sthanika Chikitsa* [local wound management] using *Kashaya* [Decoction], *Varti* [medicated wick], *Kalka* [paste of medicated drugs], *Sarpi* [medicated ghee], *Taila* [medicated oil], *Rasakriya* [semisolid extract of the drugs], and *Avachhoornana* [Dusting powder] and lifestyle modifications can

potentially improve patient outcome. Competent management of *Dushta Vrana* is critical not only in the treatment of the ulcer but also in preventing complications and improving the quality of life for patients with Diabetes. Thus, by capitalizing on the strengths of both *Ayurvedic* and contemporary medical sciences, we can provide comprehensive care that tackles the complex nature of *Pramehajanya Dushta Vrana* [Diabetic Foot Ulcer], eventually minimizing the burden of the challenges on the patients and the healthcare system.

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