



## **DIABETIC FOOT GANGRENE – AN INTEGRATED APPROACH**

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### **ABSTRACT:**

Diabetic foot is a major public health issue which may lead to leg amputation and thus resulting in disability, reduction in the quality of life and high treatment cost. Non healing ulcer turning into gangrene is a common consequence of diabetic foot. Thus, saving the limb and healing of the leg ulcer are the major challenges faced in case of diabetic foot disease. In this case study, Conservative Ayurveda surgical management was followed in the case of diabetic foot gangrene. A 60 year old female patient, a known case of diabetes mellitus since three years presented with sudden onset of blackish discoloration, pus discharge in the left foot since two weeks. She was diagnosed as diabetic gangrene of left foot. She was advised amputation of foot by 3 contemporary surgeons. Patient had uncontrolled diabetes mellitus and sepsis, which was effectively managed. Once the patient was hemodynamically stable, amputation of left great toe and debridement of left foot ulcer was done. Following this treatment, extensive diabetic foot ulcer healed with formation of healthy granulation tissue with the help of internal medications and local wound care. Complete ulcer healing was noted in a span of four months without any complications, conservative Ayurveda Surgical intervention has proven very helpful to save the foot and complete healing of the ulcer in this case study.

**Keywords:** Amputation, Diabetic foot, Non healing ulcer, Conservative surgery.

## INTRODUCTION

India is deemed as the world's capital of diabetes [1]. In India, there are estimated 77 million people above the age of 18 years are suffering from diabetes (type 2) and nearly 25 million are prediabetics. More than 50% of people are unaware of their diabetic status which leads to health complications if not detected and treated early[2].

Diabetic foot gangrene is a serious complication in patients with diabetes. Adults with diabetes have a two- to three-fold increased risk of heart attack and stroke. Due to reduced blood flow, neuropathy in the feet increases the chance of foot infection, gangrene and the eventual need for limb amputation[3], which accounts for 8 out of 10 non-traumatic amputations. In severe cases, it may lead to bone marrow infection and bone destruction, with a high disability and fatality rate.

*Kotha* (Gangrene) as per Ayurveda, is an *Upadrava* of *Prameha*[4]. Acharya Sushruta explained *Chedana karma* followed with *Lekhana* and *Vrana Shodhana* (wound cleansing) for better treatment outcome[5]. Saving the limb from amputation & wound healing were the major challenges faced in this case.

A patient, K/C/O diabetes mellitus since 3 years was diagnosed with Diabetic Foot Gangrene, Stage III. She was advised for foot amputation at ankle level by three contemporary surgeons. The patient's foot was in the acute infection stage at the time of admission (laboratory indicators and

clinical symptoms indicated that the infection was more serious). The debridement procedure was performed in the first stage. Conservative surgery was proven helpful to save the foot and complete healing of ulcer.

## CASE REPORT

Objective of case study: To evaluate clinical efficacy of conservative surgery with debridement in the patient with Diabetic Foot Gangrene.

**Type of study:** Interventional single case design without control group.

### Table No: 1 Patient details

Name of the patient	Not mentioned
OPD Registration no	2210209
IPD Registration no	220886
Date of Admission	13/04/2022
Age	60 years
Occupation	housewife
Addiction	Nil

**Chief complaints:** Blackish discoloration with painful & profuse swelling in Left Foot since 2 weeks, causing inability to walk.

**Associated complaints:** Foul smell, pus discharge in left foot since 2 weeks. DM since 3 years. Not a known case of Hypertension, Asthma, Tuberculosis, Heart disease. No surgical history.

### Baseline findings

The assessment found that the patient had Uncontrolled Diabetes with wet gangrene of Left foot. Area involved was dorsum of left foot extending from hallux to lateral malleolus. Profuse edema of left foot with rapid proximally

spreading wet gangrene. Her inguinal lymph nodes were swollen, indicating systemic spreading.

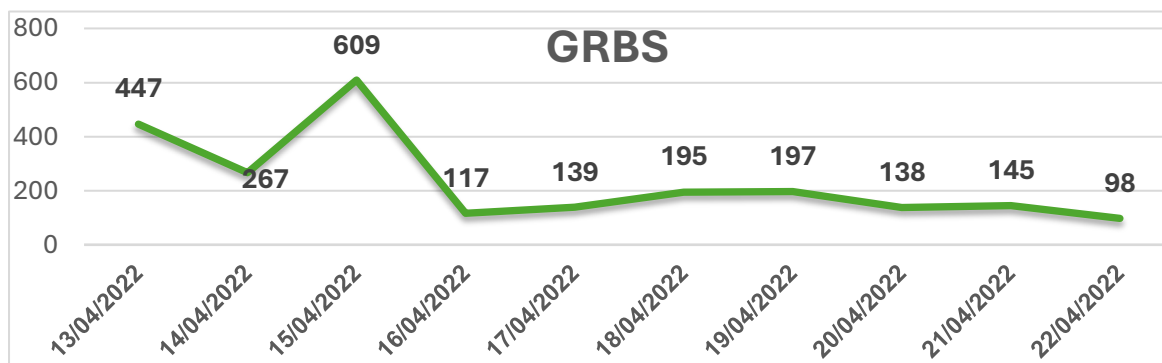


Fig 1. Graph showing the GRBS

### History of presenting complaints

Patient is a known case of diabetes mellitus since 3 years. she came to our hospital with complaints of progressive blackish discoloration of Left hallux since two weeks. It was spreading proximally associated with Pain, Profuse edema over left foot with Pus discharge. On admission her fasting blood sugar was 447 mg/dl, Total count was 13450 cells/cumm. Left lower limb Doppler study - Initial calcific plaque thickening involving arteries of left lower limb and large inguinal lymph nodes noted. She was diagnosed with Diabetic Wet Gangrene of Left Foot, Stage III. She was advised for Foot Amputation at ankle level by three contemporary surgeons.

### Table No: 2 General examination

General Condition	Conscious & oriented
BP	130/70 mm of hg
Pulse rate	90 bpm
Temperature	98.2° F
SPO <sub>2</sub>	98 %

### Table No: 3 Local examination: Day :1

Site	Extending from hallux to lateral malleolus of left foot.
Size	17×9 cm (L×B)
Shape	Quadrangle
Edge	Undermined
Floor	Slough
Discharge	Pus
Smell	Foul
Discoloration	Blackish
Tenderness	+++
Margin	Ill defined, red, edematous

**Diagnosis** Diabetic Wet Gangrene of Left Foot – Stage III

### Samprapti Ghataka

*Dosa: Tridosaja*

*Dusya: Tvacha, Mamsa, Sira, Snayu, Sandhi Koshta and Marma.*

*Srotas: Annavaha, Rashavaha, Raktavaha, Mamsavaha.*

*Agni: Manda, Visama.*

*Marga: Sakha.*

*Adhithana: : Tvacha, Mamsa, Sira, Snayu, Sandhi Koshta and Marma.*

*Pratamya Lakshana: Gatravicornane.*

#### Material and methods

*Chedana and Lekhana* are among *Ashtavidha Shastra karma* indicated in *Kotha*, and among *Shasti Upakramas, Vrana Parisheka* were implied. Treatment plan was to initially turn wet gangrene to dry gangrene, followed by Great toe amputation and wound healing.

**Table 4: Intervention**

Allopathic Intervention				
1.	Inj. Insulin	72IU/ day to 20IU/day. In tapering dosage.		13/04/2022 to 27/04/2022
2.	IV. Cefotaxim 1gm	Twice per day		13/04/2022 to 27/04/2022
3.	IV Metonidazole 500mg	Twice per day		13/04/2022 to 27/04/2022
4.	Inj. Pantop	Once per day		13/04/2022 to 27/04/2022
Ayurvedic Intervention				
1.	<i>Pramehahara kashaya</i>	50ml, Thrice per day.		13/04/2022 to 15/08/2022
2.	<i>Gandaka Rasayana</i>	1 Tablet, Thrice per day.		13/04/2022 to 15/08/2022
3.	Munibeyotic plus tablet [Ayurvedic proprietary medicine]	1 Tablet, Thrice per day.		13/04/2022 to 15/08/2022
4.	<i>Kaishore gugglu</i> tablet	1 Tablet, Thrice per day		13/04/2022 to 15/08/2022
Procedure				
1.	Wound debridement & dressing	<i>Muniheal Oil</i> [Ayurvedic proprietary medicine].	Once per day.	13/04/2022 to 15/08/2022
2.	Amputation	Left great toe	Under Local Anesthesia with Xylocaine 2%.	20/04/2022
3.	Vrana Parisheka	With <i>Triphala Kashaya</i>	Once per day, with 250 ml for 10 min.	13/04/2022 to 15/08/2022

**Table No 5: Effect of therapy**

	13/04/2022	16/04/2022	20/04/2022	29/04/2022
<b>Pus Discharge</b>	Profuse	Moderate	Moderate	-
<b>Pain</b>	Severe	Moderate	Moderate	-
<b>Edema</b>	Severe	Moderate	Mild	-
<b>Granulation Tissue</b>	Absent	Absent	Absent	Present
<b>Total Count (cells/cumm)</b>	13450	5850		
<b>Wound Size</b>	17×9 cm (L×B)			15×8 cm(L×B).



Fig 1: Wound examination day 1



Fig 2 : Wound examination day 20



Fig 3: Wound examination day 120



Fig 4: Wound site on 20/03/2023

**DISCUSSION:**

Patients with diabetes are at increased risk of foot gangrene due to high blood sugar levels, neuropathy and ischemia of the lower limb. In

India, Diabetic gangrene leading to amputation is becoming an increasing problem. In order to avoid morbidity, high cost and prolonged hospitalization, solution is probably in

prevention, by patient education of foot care. So that, most of them can be spared. Glycemic control, Control of sepsis, and local wound care are main stay in the management of diabetic foot gangrene. Wound care involves debridement of local necrotic tissue, which is particularly important, so that it can reduce systemic infection and foot ulcer symptoms.

Diabetic foot gangrene in Ayurveda may be considered as *Pravrudha avastha* of *Prameha Pidaka*. In a *Prameha Rogi*, *Pravruddha doshas* located in the *Basti* tend to migrate to *Sarva Sharira*. Because of *Prasara* of *Pravruddha Doshas* from the *Basti* towards *Pada* in *Prameha rogi*, and due to *Kha Vaigunya* and *Dourbalya* of *Rasayani* in *Adhasakhas*, the *Pravruddha Doshas* gets *Sthanasamshraya* in *Twak* and *Mamsa* resulting in *Pada Sopha* and manifests itself in the form of *Prameha Pidaka*.

In this case report, Patient initially, presented with the features of *Ugra Ruk*, *Visarpi Sopha* and reddish black discoloration of left foot, which is suggestive of *Alaji* {Type of *Prameha Pidaka*}. Soon, it resulted in *Paka*, thus *Sopha* was complicated by *Kotha* of *Twak* and *Mamsa* of *Pada* including entire *Vama Angushta*.

Diabetic Gangrene requires immediate treatment & specialized approach to offer better results. As Sushrutacharya stated: In emergency conditions, *Bhishak* should take quick measures to control the spread of disease, as fast as if a house has caught fire<sup>[6]</sup>. This patient was in *Pravruddha rogavastha*, as the infection was fast spreading, and blood

sugar was fluctuating. First priority in this case was to stabilize the patient haemodynamically. The manifestation of *Kotha* has to be treated early by *Chedana karma*, this eliminates most of the dead and necrotic tissue and effectively controls the *Paka*. The *Sesha Doshas* were treated by *Lekhana* of *Dushta vrana* at regular intervals and daily *Vranashodhana* with *Triphala Kashaya Parisheka* was performed. After 20 days, the *Lakshanas* of *Suddha vrana* like *Jihwatalabha*, *Avedana*, *Nirasrava* were noticed. Her general condition considerably improved, good appetite and mobility was noted. At an interval of 30 days, *Ruhyamaan vrana lakshanas* such as absence of *Kleda*, *Sthiratwa*, *Pitikas*, slight decrease in the size of *Vrana* were observed. Following this *Vrana Ropana Chikitsa* with Muniheal oil until the wound healed completely, within a span of 4 months. Patient came for regular follow up till 1 year duration, with aesthetic, strong and healthy scar. The wound healing was uneventful. There was no recurrence of Diabetic foot lesion in the next 1 year of follow up.

In this case patient's limb could be saved, which improved her psychological and emotional wellbeing. She could do the household routine.

#### **CONCLUSION:**

Diabetes and associated complications are increasing at an alarming pace in India.

After a unilateral amputation rates of mortality is around 80% within 5 years<sup>[7]</sup>. As foot is more prone to infection every patient diagnosed with

diabetes mellitus should be educated about foot care.

This case study demonstrates diabetic foot gangrene can be successfully managed and foot can be saved following the conservative surgical approach advocated by Acharya Sushruta.

#### **Declaration of patient consent**

The authors confirm that they have acquired a patient consent form, in which the patient or caregiver has granted permission for the publication of the case, including accompanying images and other clinical details, in the journal. The patient or caregiver acknowledges that their name and initials will not be disclosed, and sincere attempts will be undertaken to safeguard their identity. However, complete anonymity cannot be assured.

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