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# Jaloukavacharana in diabetic foot ulcer - A Case Study

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## ABSTRACT

Diabetic foot is the one of the commonest chronic complications of diabetes. It is leading indication for hospital admission and prolonged stay. A classical triad of neuropathy, ischemia and infection characterizes the diabetic foot. The presence of infection rapidly worsens the clinical picture, often requiring limb amputation. Diabetic foot ulcers are common and estimated to effect 15% of all diabetics. Mainstay of treatment includes antibiotics, debridement. and local wound care and footwear improvisation. In spite of all advances in health sciences, statistics reveals that about 3% patients yet have to undergo lower limb amputation. In Sushruta Samhita. we get the most scientific description of wound and its management. Similarly, Sushruta has given the importance to Bloodletting therapy and considered Leech as the most unique and effective method of bloodletting even in infected wounds and abscesses. Patient with Diabetic foot ulcer was advised to continue anti diabetic medicine along with weekly application of Leech around the ulcer which was followed by washing the wound with *Panchavalkala Kashaya* and dressing with *Jatyadi Ghrita*. This Leech therapy proved very effective and the ulcer healed completely within 30 days. However, further evaluation is required to be done by taking a large sample size to prove its significance in treating Diabetic foot ulcer and avoiding lower limb amputation.

**Key words:** Diabetic foot ulcer, *Sushruta Samhita*. *Jalauka*, *Vrana*, Leech therapy.

## INTRODUCTION

Diabetic foot ulcers have a considerable negative impact on patient's lives and are highly susceptible to infection that often leads to amputation. Foot complication are common in people with diabetes. High blood glucose levels for longer durations damage blood vessels leading to reduced blood flow to the foot. This poor blood circulation contributes to the

formation of ulcers and impairs wound healing. Elevated blood glucose levels over time can damage the nerves of foot, decreasing person's ability to notice pain and pressure. Loss of sensation further lead to develop pressure spots and accidentally injure the skin, soft tissues and bone. Nerve damage, poor circulation and chronically high blood glucose levels increase the risk of foot ulcer. Diabetes is a serious chronic disease that needs attention. Approximately 15% of all people with diabetes will be affected by a foot ulcer during their lifetimes.<sup>[1]</sup> Recurrence rate of diabetic foot ulcers are 70% upto 85% of all amputations in relation to people with diabetes are preceded by diabetic foot ulcer. People with diabetes have a 50% mortality rate in the 5 years following the initial amputation.<sup>[2]</sup>

### Risk factors for diabetic foot ulcers

- Above 50 years.
- DM of more than 10 years.
- Blood glucose levels not controlled.

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- Peripheral neuropathy.
- Abnormal structure of foot.
- Peripheral vascular disease.
- Smoking and hypertension.
- Genetic factors.

#### Clinical features

- Pain in the foot
- Ulceration
- Absence of sensation
- Absence of pulsation in the foot
- Loss of joint movements

#### Grading of diabetic foot ulcers (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 ulcer or osteomyelitis.
- Grade 4 - gangrene of the portion of forefoot
- Grade 5 - extensive gangrene of foot.

#### According to Ayurveda

In Sushruta Samhita, diabetic foot is correlated with 'Madhumehaja Vrana'. During its description, Sushruta stated that the management of these Vranas are difficult ie Kastasadhya.<sup>[3]</sup> According to Sushruta, Meda and Rakta along with other Doshas and Dushyas lead to the formation of Prameha Pidika which later converted to non-healing wounds and also further specified that wound over lower limb are difficult to heal.<sup>[4],[5]</sup>

#### Samprapti of diabetic ulcer

In Madhumeha the lower limbs vessels become weakened and unable to expel Doshas. This leads to accumulation of Doshas (Meda and Rakta along with other Doshas Dushyas) followed by formation of

Prameha Pidika which converts into wounds after putrefaction i.e. Diabetic ulcer.

#### Treatment

Diabetic is due to the vitiation of Tridosha, so there is need of Shodhana and Vranavat Chikitsa is adopted. In Sushruta Samhita Chikitsa Sthana it is found that leech therapy is advocated in all inflammatory condition of ulcer. if Samsodhana is not done, the Doshas get aggravated, vitiates blood and muscles and produce swelling or other complications. The treatment prescribed for swelling are vene puncture. If these are not done, the swelling increases greatly give rise to pain and burning sensation, then it should be treated by sharp instruments followed by treatment of wound.

#### Reference of leech therapy

In Sushruta Samhita Chikitsa Sthana chapter 12 and 16, Sushruta has advocated that Blood letting by means of Leech can be practiced in all inflammatory, suppurative and painful conditions to relieve pain and inhibit suppuration including that of Diabetic ulcerative lesions. Sushruta further describes that in case of diabetic, if Samsodhana is not done, the Doshas get aggravated, vitiates blood and muscles and produce swelling or other complications.

#### Benefits of leech therapy

It is considered most unique and most effective method of blood letting. It can be tried in all mankind including females, children, old and Patients having poor threshold to pain, It drains impure blood, useful in Pitta Dushita Rakta diseases, various skin disorders and all types of inflammatory conditions.

#### CASE REPORT

A 52 years old male attended the OPD of Panchakarma at Shree Sidharodha Charitable Hospital, Bidar with the complaints of non-healing ulcer over the left ankle joint. Often serous discharge mixed with mild pus and unpleasant smell associated with pain and swelling over left ankle joint. On enquiry, patient was found to be a case of controlled diabetes since 15 years. He was on anti-diabetic

treatment from nearby allopathic hospital and his blood glucose levels were within normal limits. But from last two months he developed non-healing wound over the left ankle joint. He took treatment for the same from similar allopathic hospital but not got relief. Finally, he came to our hospital for further management. After careful examination of wound it was found that they were irregular in shape with rough edges and unhealthy granulation tissue. On further inspection the surrounding areas of wound show inflammatory changes with unpleasant serous discharges.

#### Treatment Plan

After careful examination of wound, 4 leeches were applied for once in a week for 30 days. When leeches leave the site after proper sucking of impure blood, then wound was washed with *Panchavalkala Kashaya* and *Jatyadi Ghrita* applied and bandaging is done.

#### Purvakarma

1. Cleaning the wound with *Panchavalkala Kashaya*.
2. Purification of leech in turmeric water was done.

#### Pradhana Karma

1. Leeches were applied to the area where the ulcer is to be treated.
2. The leech was covered with wet cotton swab during blood sucking.
3. After proper sucking the impure blood, leeches leave the site.

#### Paschat Karma

1. After removing the leech, it is made to vomit the blood by pouring the turmeric powder over its mouth.
2. The leech was then immersed in turmeric water for purification.
3. After that the leech was put in fresh water and used it after seven days.
4. Then wound was cleaned and washed with *Panchavalkala Kashaya* and proper bandaging was done with gauge piece soaked in *Jatyadi Ghrita*.



Figure 1: Clinical Presentation on 1<sup>st</sup> Day



Figure 2: Leech application



Figure 3: Clinical Presentation on 14<sup>th</sup> Day



Figure 4: Clinical Presentation on 21<sup>st</sup> Day



**Figure 5: Clinical Presentation on 30<sup>th</sup> Day**

Leech therapy was repeated once in week for 4 sittings. Total duration of treatment was 30 days Patient was advised to continue Anti-diabetic medicine (Tab Glucored - BD BT). Changes occurred during and after the treatment period was assessed according to wound parameters.

The effect of therapy was observed on different sign and symptoms of Diabetic ulcer, The signs considered were discharge, smell, edge, floor and size where as symptom considered was only pain.

### OBSERVATION AND RESULT

Sign and symptoms	BT	A T			
	Day 1	7 <sup>th</sup> day	14 <sup>th</sup> day	21 <sup>st</sup> day	30 <sup>th</sup> day
Size	+++	+++	++	+	-
Pain	++	++	+	-	-
Edge	++	++	+	+	-
Floor	++	++	+	+	-
Discharge	++	++	+	-	-
Smell	++	+	-	-	-
Blood Sugar - fasting	115mg/dl				110mg/dle
- PP	186mg/dl				170mg/dl

### RESULT

Leech therapy provided a better result in primary outcome measures as there was a significant improvement in pain after leech therapy. The colour of the wound changes from blackish to near normal whereas there was no discharge and burning sensation after receiving leech therapy. With Leech Therapy and daily washing the wound with *Panchavalka Kashaya* and dressing with *Jatyadi Ghrita* the wound completely healed within 30 days, hence patient was cured.

### DISCUSSION

After leech therapy, the expulsion of impure blood takes place, due to which, toxin and other unwanted metabolize are remove from the body. It improves the blood circulation and thus enhances the process of wound healing which in turn normalizes the skin colour. From modern perspective, the saliva of leech contains about hundred biological active substances. The saliva of leech consist of hirundine and calin, hista.

Leech application improves blood circulation and reduces congestion due to presence of Carboxypeptidase. A inhibitors, Histamine like substances and acetylcholine. Thus it corrects Diabetic Microangiopathy. Leech application has peripheral vasodilator effect due to presence or vasodilator constituent in the saliva which improves blood circulation which corrects 'Ischemia due to Diabetic Atherosclerosis. Leech application has Anti-inflammatory action on nerves due to presence of substance like *Bdellins* and *Eglins* in the saliva hence corrects Diabetic Neuropathy.

#### Mechanism according to Ayurveda

##### *Vrana Shodhana* effect

After Leech application expulsion or impure blood takes place, due to which local vitiated *Doshas* (toxins and unwanted metabolites) are removed.

##### *Vrana Ropana* effect

Leech application facilitates fresh blood supply and promotes formation of 'Healthy Newer Tissues'.

*Panchavalkala Kashaya* has *Sodhana* property, daily washing of wound with well prepared *Kashaya* leads to cleansing of wound. '*Jatyadi Ghrita*' has both *Shodhana* and *Ropana* property. Hence, it helps in simultaneous cleansing and healing of infected wounds.

#### **Madhumeha pacifying effect**

Blood letting with leech application pacifies *Madhumeha* i.e. it breaks the pathogenesis of *Madhumeha* at cellular level and inhibition of infection (In diabetes tissues are glucose laden which promotes propensity of bacteria to multiply), thus promotes wound healing.

#### **CONCLUSION**

Leech therapy along with daily washing the wound with *Panchavalkala Kashaya* and dressing done with *Jatyadi Ghrita* were found to be very effective in treating the 'diabetic foot ulcer' and the wound healed completely within 30 days, whereas statistic reveals that about 30% of DM neuropathic ulcers receiving standard care requires around 20 weeks for healing. Thus 'Leech therapy' proves to be effective, time saving, affordable and acceptable treatment. Though treating 'Diabetic foot' is a difficult task, we have managed to treat it with 'Leech Therapy' along with *Panchavalkala Kashaya* and *Jatyadi Ghrita*.

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