

Leg Infection and Ulceration in Type 2 Diabetes Mellitus (T2DM) Patient with Critical Limb Ischemia managed through an Ayurvedic Protocol- A Case Study

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ABSTRACT:

Critical limb ischemia (CLI) is the chronic end-stage condition of lower extremity peripheral artery disease (PAD), which occurs as a complication of patients with chronic type 2 diabetes mellitus (T2DM). It can be associated with infection and ulcers in the extremities that may land up into amputation. In this case report, a 65-year-old female patient with type 2 DM presented with non-healing ulcer on the shin of the right leg associated with oedema, discolouration and rest pain. Case is clinically correlated to *margavarodha vyadhi* with *vrana* and was effectively managed through ayurvedic treatment protocol following, *vatashonitha chikitsa*, *pramehahara chikitsa* and *dushtavrana chikitsa*. After sixty days of treatment patient got complete relief from pain, edema and ulcer got completely healed. Treatment protocol showed curative effect by healing ulcer and improving circulation in this macrovascular complication of type 2 DM.

KEYWORDS: Critical Limb Ischemia, *Margaavarodhajanya Vyadhi*, *Vatashonitha Chikitsa*, *Dushtavrana Chikitsa*.

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INTRODUCTION:

Critical limb ischemia is defined as limb pain that occurs at rest. Or the presence of ischemic ulcer or gangrene or impending limb loss that is usually accompanied by atherosclerotic stenoses or occlusions in multiple segments of arteries in the lower extremities. CLI represents the end stage of peripheral arterial disorders, in which macrovascular lesions induce such a reduction of the distal perfusion pressure that microcirculation and nutrient blood flow to the tissues are severely compromised. [1-2]

Type 2 diabetes mellitus (DM) is a major risk factor for PAD. The severity and duration of

the DM are also related to PAD. In DM, the arteries of the lower limbs are the ones that are mostly involved; and most often the distal arteries, especially the dorsalis pedis artery. Type 2 diabetes is also a risk factor to number of macrovascular and microvascular complications like nephropathy and retinopathy. [3-4]

In Ayurveda, correlate to *Dhamani Pratichaya* (Atherosclerosis) which is a *Margavarodha-Janya* (obstructive) disease where *Dhamani Avarodh* occurs due to *Dusta Rakta Dhatu* (vitiated blood). *Dushta raktha* (vitiated blood) is caused due to accumulation of *Kapha* (biological humor) and *Medha* (fat) in blood. This excess

accumulation of *Kapha* (biological humor) and *Medha* (fat) in blood leads to *granthi* in *dhamani*. Conservative management in ayurveda includes treatment principle of *vataraktha*, *prameha* and *dushtavrana*. [5]

CASE REPORT:

Patient aged 65 years known case of DM for 10 years came to OPD, Salyatantra, Govt. Ayurveda College, Tripunithura, Kerala with complaints of nonhealing ulcers on the shin of the right leg associated with oedema, discolouration and severe pain on the leg at rest. Complaint started before three years as a local infection in the small toe with pain and pus for which she undergone pus drainage and wound debridement. Later she had recurrent infection and atrophy on her big toe and small toe associated with fever, also had severe pain in right leg.

Before two years she had an extensive infection of her leg with severe oedema and redness associated with fever and suggested amputation for which she was not willing so underwent pus drainage and wound management along with antibiotics was also done. Before 3 months she developed an

ulcer on the shin of the right leg with severe pain on rest later two more ulcer developed within one week. Venous doppler study excluded deep vein thrombosis. Routine laboratory investigations were done before and after treatment (Table-1)

THERAPEUTIC INTERVENTION:

Conservative treatment was done under *vataraktha chikitsa*, *prameha hara chikitsa* and *dushtavrana chikitsa* protocol. *Samanya chikitsa* - Internal medications and external medications (Table-2)

Shodhana chikitsa:

1. Jalouka avacharana from 21/10/22, repeated at 3 days interval from 21/11/22 up to 20/12/22. number of jaloukavacharana in total is fourteen times
2. Vicharana snehapanam with guggulu thiktaka ghritha from 31/10/22-10/12/22 in 10ml bd after food
3. Anulomanam on 03.12.2022 morning 6am with Avipathi choorna (20 gm) with hot water, 3vegas noted.

Table-1: Laboratory Investigations:

Investigations	Normal value/range	Before treatment (20.10.2022)	After treatment (18.12.2022)
Hb%	12.00- 17.00 gm%	11.2gm%,	13gm%
ESR	<20mm/hr	50mm/hr	35mm/hr
Total count	4000-11000 cells/mm ³	9200 cells/mm ³	9200cells/mm ³
FBS	70.00-110.00 mg/dl	200mg/dl	120mg/dl
PPBS	80.00-150.00mg%	356gm%	178gm%
HDL	55.00-0.00 mg/dl	30mg/dl	35mg/dl
LDL	0.00-150 mg/dl	200mg/dl	150mg/dl
Triglycerides	0.00-150 mg/dl	330mg/dl	200mg/dl
T. Cholesterol	150.00-200.00 mg/dl	296mg/dl	240mg/dl
VLDL	0.00-40.00 mg/dl	66mg/dl	26mg/dl

Table-2: Internal and external medications:

Duration	Procedure	Medicines	Dose
18/10/22 – 18/12/22	Deepana, Pachana, Shophahara	Punarnavadi kashayam	90ml bd bf
	Pramehahara oushadi	Nishakatakadi kashayam	180ml muhur muhu
		Pramehaoushadi tab	2bd
	Wound management	Jathyadi ghritham	Cleaning and dressing
25/10/22-01/12/22		Guggulu panchapala choornam	5gm bd af
31/10/22-10/12/22	Abhyanthara sneham	Guggulutikthakam ghritham	10ml bd
	Dhara	Triphala kashaya	As dhara
11/11/22	Wound debridement		Once
21/10/22-18/11/22			Twice in a week
21/11/22- 20/12/22	Rakthamokshana	Jaloukavacharana	Repeated 3 days interval with one Jalouka in each sitting

Table-3: Observed findings before and after treatment:

Examination of right lower limb	Observed findings (Before treatment)	Observed findings (After treatment)
Inspection	Presence of ulcers on the shin with serous discharge, sloping edges, sloughy floor, edematous shiny limb with discoloration and edema	Completely healed ulcer with reduced blackish discoloration, oedema reduced and progression arrested.
Palpation	Grade 2 tenderness, no bleeding on touch, no relation with deeper structures	Non tender
Perpheral Pulse Examination	Dorsalis pedis, anterior tibial and posterior tibial artery are feeble with low pulse volume on right. Left limb normal	Dorsalis pedis, anterior and posterior tibial artery are in normal volume

Clinical Images:



Fig 1-Before treatment



Fig 2: Jaloukavacharana



Fig 3- After wound debridement



Fig 4-Healing stage



Fig 5-Completely healed ulcer

RESULTS & DISCUSSION:

Leg infection and ulceration with CLI, in type 2 DM patient was effectively managed through ayurvedic treatment protocol following *pramehachikitsa*, *vatashonitha chikitsa* [6] and *dushtavrana chikitsa*. Patient got complete relief from pain, edema and ulcer got completely healed. After treatment circulation of effected limb became normal and rest pain stage reversed to mild claudication stage (Table-3). [7-9]

Adopted *jalouka avacharana* from *vatashonitha chikitsa* to improve circulation. *Jalouka avacharana* improved circulation and arrested the progression of ulcer with analgesic and healing effects. *Hirudin*, a polypeptide found in leech saliva, inhibits thrombin, a crucial step in the coagulation cascade. [10] *Vrana shodhana*, *Vrana ropana* were achieved through external medications like *Triphala kashaya kshalana*. [11], *Jatyadi ghrita dressing*. *Pramehara* hara internal medications like *nishakathakadi kashaya* [12] and *pramehahara* tab helped to reduce sugar level. In *nishakatakadi kashayam* maximum drugs possess *kashaya*, *tikata rasa*, *laghu*, *ruksha guna*. *Madhumeha* is caused by *Kapha vata medo dusti*, as *Nishakathakadi Kashayam* had *Vatakaphahara* properties due to *Sheeta*, *Ushna Veerya* and *Madhura*, *Katu vipaka* of drugs helps in alleviating the disease. *Guggulu thiktaka ghrita snehapana* showed analgesic and healing effect.

Guggulu Tiktaka Ghrita contains predominantly *Tikta Rasa* and *Ushna Virya* drugs. Owing to the *Snigdha* and *Ushna Guna*, *Guggulu Tiktaka Ghrita* [13] helps in the pacification of aggravated *Vata*. Pharmacologically, *Guggulu* has anti-inflammatory, immunomodulatory, and anti-lipidemic properties.

Diet: *Pathya Apathya* plays supportive role in the management of *Yapya Vyadhi* especially like that of *Prameha*. [14]

Indicated food- *Yava* (barley), *sastika shali* (rice), *godhuma* (wheat) *mudga* (Green gram, *kulattha* (*Dolichos biflorus* amalaki) *amalaki* (Indian gooseberry) *dadima* (Pomogranite).

Contraindicated food: One should not regularly take *guruahara*, pastries, newly harvested rice, *sushka shaka* (dry vegetables), *dadhi* (curd), *masha* (phaseolus mungo), *prithuka* (boiled & flattened paddy)

Contra indicated activities-Increased physical and mental stress, sedentary life style and laxity in physical work, day sleep and sitting at one place for long time

Limitation of study:

The possibility of the ulcer recurrence cannot be assessed as there was no follow-up. This is a single case study, so to prove effectiveness of *Chikitsa*, it should be conducted on large sample size.

Declaration of patient Consent:

Obtained the appropriate patient consent form. In the form, the patient has given her consent for her images and other clinical information to be reported in the journal. The patient understands that name and initials will not be published and due efforts will be made to conceal identity.

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