

Topical Application of *Maha Megarajanga Tailam* in Management of Diabetic Foot Ulcer - A Case Report

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ABSTRACT:

Diabetic foot ulcer (DFU) is a major cause of mortality and morbidity in diabetic patients. Diabetes management is becoming costly due to rapidly increasing socio-economical changes, dietary and lifestyle modifications. Poorly managed diabetes mellitus (DM) leads to the risk of peripheral vascular disease and peripheral neuropathy which ultimately land ups in diabetic foot ulcers in most of the adult and elderly population. Management of diabetes through the Siddha system of medicine is common in South India, especially in Tamil Nadu. *Madhumegam* is the term used in classical Siddha medical textbooks along with its detailed management. Diabetic foot ulcers (DFU) are very commonly treated by Siddha physicians in institution-based hospitals and private practice too. Scientifically promising outcomes are shown by Siddha drugs like *Mathan Tailam*, and *Vanga Virana Kalimbu* when they are used externally for treating DFUs. Among many classical preparations, the *Maha Megarajanga Tailam* (MMRT) is a unique Siddha formulation used for treating diabetic foot ulcers and chronic wounds. We present a case of a 68-year-old male with uncontrolled diabetes and non-healing foot ulcer which has healed well within a span of 120 days on topical application of MMRT.

KEY WORDS: Diabetic foot ulcer, Gangrene, *Megarajanga tailam*, Siddha.

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INTRODUCTION:

Diabetic Foot Ulcer (DFU) is a common complication which leads to the major cause of morbidity among diabetic patients. The current incidence and prevalence by 2019 estimates were that 77 million individuals had diabetes in India. It is extrapolated to raise to 134 million by 2045.^[1] Diabetes is a progressive disorder that leads to serious

complications, which are associated with increased costs to the family, community, and healthcare system. Uncontrolled diabetes leads to an increased risk of vascular disease, especially DFU. The rapid socioeconomic change in conjunction with urbanization and industrialization are the major factors for the global increase in the diabetes epidemic, with other associated

risk factors such as unhealthy eating habits, and a sedentary lifestyle also play an important role which is also becoming rampant in Indian society. The current prevalence of peripheral artery disease (PAD) is 3.2% in diabetics and it is usually associated with an increase in age and duration of uncontrolled diabetes.^[2] In the Siddha system of Medicine, Diabetic Foot Ulcer is termed *Madhumega pun* described as *pitha aiya pun* in *Siddha Aruvai Maruthuvam* and management are well defined and depend on the pathophysiological presentation with *tridosam* concept.^[3]

Since ancient times Siddha system of medicine has been practised both in humans as well as animals. Thousands of manuscripts were written by ancient Siddhars, scholars and physicians about the pathophysiology and treatment aspects of diseases. Most of the external injuries during the ancient period were handled with the available plant, mineral and animal-based products.

Many of these formulations which have earlier been put to good use by Siddhars are either sleeping in the textbooks without any appropriate use in contemporary periods or are being ridiculed as non-medical treatment. But if these preparations which have been expounded in various textbooks of Siddha can be put into use in the current medical practice, then various burning medical obstacles like highly resistant microbes (MRSA), autoimmune diseases, metabolic diseases and cancers can be managed very well, in congruence with the modern medicine.

CASE PRESENTATION:

We herewith present a case of a 68-year-old male from a semi-urban area of Chennai, retired as a school teacher and is predominantly sedentary now and has presented to our centre with complaints of a

deep wound with exposure of bone in the left medial malleolus with pain, foul odour, purulent discharge, swelling around wound and ankle joint. He also had altered gait along with mild gangrene with osteomyelitis of the left tibia in the past 7 months. All this started when he had a skin laceration from a sharp object, 7 months back. The patient is a known case of uncontrolled diabetes mellitus and hypertension for the past 30 years and under conventional treatment. The ulcer proliferated deep within a month and affected his quality of life affecting his daily activities due to poor wound hygiene and management. The patient consulted an orthopaedic surgeon and diabetologist, evaluated for blood sugar levels and blood pressure and advised appropriate oral antibiotics, oral anti-diabetic drugs, antihypertensive and anti-inflammatory drugs and regular wound care management. The patient followed the treatment advice for 45 days in vain. The patient visited our centre for advice and management about his chronic wound problem which is increasing in size and management and solution in Siddha medicine. His BMI was normal. His dietary intake included a regular South Indian diet pattern. His recent blood sugar in fasting is 180mg/dL and his blood pressure was 128/76 mmHg. He was taking Metformin 500mg twice daily and Amlodipine 2.5 mg once daily. He had poor compliance with both medications during travelling and while feeling giddiness and low sugar level.

Local examination:

Location- Medial aspect of the lower end of left leg just above the ankle joint, size- 8 x 6 cm, swelling around the left ankle with the distal end of tibia medially exposed, edges-sloped and well defined, margins were poorly defined at the distal ends, thick and fibrosed proximally, purulent discharge, had

a foul smell, surroundings were oedematous with the rise in local temperature.

Peripheral pulsation: Dorsalis pedis, popliteal and posterior tibial artery pulsations were well appreciated and the ulcer was not bleeding on touch.

In general examination, he was thin-built, anaemic, and did not have any icterus. Left inguinal lymph nodes were palpable and they were non-tender and insignificant in size. He was having a limping gait due to the ulceration.

In systemic examinations, Pulse 100/min and BP - 128/76mmHg. Systemic examination revealed that he had a nocturnal cough and yellowish purulent expectoration. The rest of the systemic examination was normal. His respiratory symptoms and signs were found to be incidental.

Investigations:

On 13 Feb 2021, when the patient first visited our centre, his haemoglobin was 10

gm %, the total count was 14,200 and his ESR was 108, Fasting blood sugar was 194mg/dl and postprandial blood sugar was 310 mg/dl.

THERAPEUTIC INTERVENTION:

Initially, diet and lifestyle habits were advised as per Siddha Medicine. The patient was advised to avoid polished rice, maida product, non-vegetarian especially chicken and also advised to take brown rice with green leafy vegetables along with green gram soup daily. The wound was washed with *Triphala Choornam* decoction and application of *Maha Megarajanga Tailam* (MMRT) is done. He was advised to follow the same at home (with sterile linen provided from the hospital) twice a day with wound dressing with the cotton gauze. Internal medications were advised along with regular medication for diabetes and hypertension (Table-1). Regular follow-up every 15 days was strictly followed.

Table 1: Medication Details with Indication:

Intervention	Dose	Timeline	Indication
<i>Lavangathi choornam</i>	3g twice a day with warm water after food	96 days	Anti-inflammatory, protection of blood vessels
<i>Manjalnoi kudineer</i>	60ml decoction once in a day	Initial 60 days	Controlling diabetic complication and maintaining glucose metabolism
<i>Tripala choornam</i>	External -Decoction of medicine is used to clean the wound	96 days	anti-microbial agent
<i>Maha Megarajanga tailam</i>	external application	96 days	for tissue regeneration and wound healing
<i>Maha Megarajanga tailam</i>	Internal application	96 days	act as an anti-oxidant and facilitates tissue healing

Table 2: Chronological Order of Healing Process.

Days	Observations
Day 15	Wound seems to be clean with unhealthy osteomyelitic bone which is exposed with surrounding granulation tissue.
Day 30	Bony granulation tissue started to form over the bone
Day 45	Healthy pink granulation tissue started to cover the newly formed bony granulation.

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Day 60	Healthy granulation tissue fully covered the bone and the surrounding edges also started to contract and heal well.
Day 75	The edges seem to be contracting with the granulation tissue becoming healthier.
Day 90	The tissue overlying the bone completely flattened out with pink to yellow granulation tissue forming with the wound even more contracted.
Day 105	The surrounding skin started to form more and more to cover the healthy granulation tissue, which has decreased in area due to recovery.
Day 120	Skin completely covered the wound with healthy scar formation which is thick to prevent further injuries.

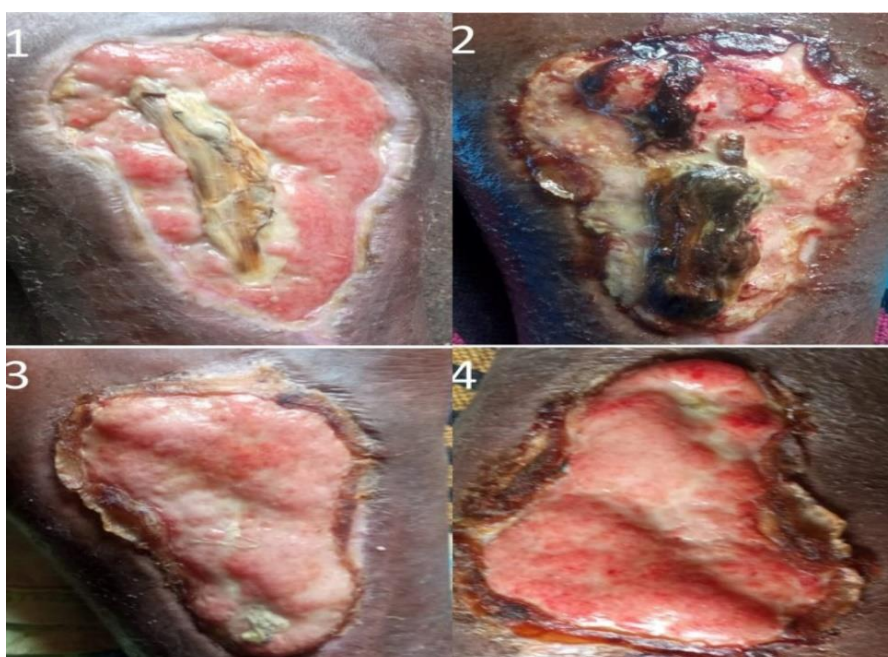


Image 1: Chronological Order of Healing Process

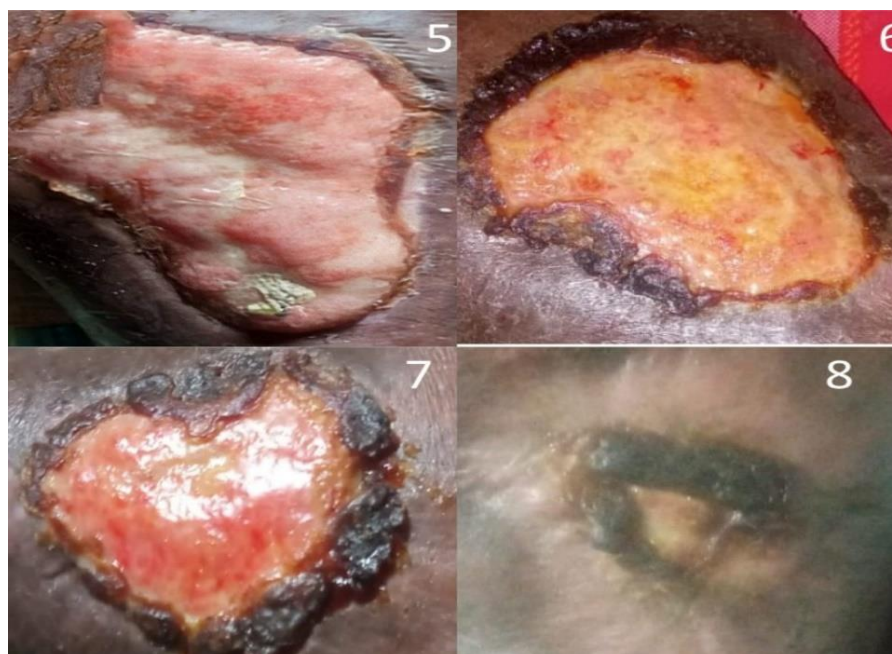


Image 2: Chronological Order of Healing Process

RESULT AND DISCUSSION:

With the above management, the patient improved well in both his diabetic control and also the diabetic ulcer appearance, morphology and infective focus.

External wounds were treated with Tailam (prepared plant and mineral-based oil or Mooligai pattu (herbal paste), Ennai (medicated Oil) etc. Numerous wound care preparations were documented in ancient Siddha literature like *Agathiyar Rana Vaidhyam*, *Theraiyar Taila Varga Surrukkam*, *Theraiyar Karisal* etc.

Maha Megarajanga Tailam is one of the classical preparations mentioned in *Theraiyar Taila Varga Surrukkam* and the formulation includes castor oil as a base added with more than 100 herbal parts and minerals.^[4] It got unique therapeutic values against chronic wounds, burns, fractures etc. it is used both internally and externally and very few Vaidyars and Siddha physicians prepare and use it for their clinical practice. As this patient had severe deep tissue damage to bone, along with osteomyelitis (Wagner Grade 3) this particular *Maha Megarajanga Tailam* was the preferred medicine for tissue regeneration.

Application of MMRT 5 ml twice a day gives a fresh tissue formation on the wound bed and can be appreciated macroscopically within 10 days and the entire closure of the exposed bone tissue occurs in 45 days.

The results are depicted in chronological order in Table 2 and Image 1 and 2.

This is the first case report about MMRT in a scientific forum. According to the literature evidence, MMRT is indicated for severe gangrene(*kiranthi*).^[5] As it shows tissue regeneration in a very short period indication which is mentioned. *Triphala Choornam* decoction wash is advised every day for cleansing the debris – for its antioxidant and antimicrobial activity.^[6]

Lavangathi choornam(*Kiraambu choornam*-Classical name) maintains blood flow in the

lower limb. The main ingredients in this formulation are clove-*kiraambu* (*Syzygium aromaticum* (L.)), cinnamon-*lavangapattai* (*Cinnamomum aromaticum* NEES), long pepper-*thippali* (*Piper longum* L.), and cumin - *cheeragam* (*Cuminum cyminum* L.) shows antioxidant properties.

Manjal noi Kudineer is a Siddha shastric preparation used in decoction form which regularises the general metabolic process of the liver which ultimately governs and maintains the glucose metabolism.^[7] This medicine works well in prediabetic and recently diagnosed diabetic patients to control the further manifestation of the disease state.

Very few case studies have been published on the Management of Diabetic foot ulcers through Siddha medicine allowing for a reduction the cost-effectiveness and complications.

Samraj et al in a case study proved intervention of Siddha medicine can potentially heal diabetic foot ulcers (DFU). The most significant result from this case study is the management of DFU, reducing recovery time at a low cost compared to the other system of medicines.^[8] Elangovan et al work revealed the antimicrobial activity of the Siddha classical medicine preparation (*Vanga Vennai and Mathan Tailam*) in the management of diabetic foot ulcers.^[9]

CONCLUSION:

The case report signifies that Maha Megarajanga Tailam can be used as a very effective adjunctive treatment in diabetic foot ulcer along with the management of appropriate antidiabetic strategy.

CONSENT:

Written consent form obtained from the patient for publication of data without disclose the identity of patients.

LIMITATION OF STUDY:

Unique preparation like *Maha Megarajanga tailam* needs thorough pre-clinical study and we should showcase Siddha medicine efficacy to the scientific fraternity.

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