

Atherosclerotic Ulcer Treated with Hirudo-Therapy and Herbo-Medicinal Ointment: Marham-E-Raal

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Abstract

Introduction: Atherosclerosis is mainly a worsening problem related to advancing age with a chronic inflammatory involvement. It leads to the blockage of normal blood flow pathway and hence ischemia of the distal part of limb. The saliva of leech contains number of anti-thrombotic chemicals such as hirudin, bfrudin, haemadin and granulin-like. These chemicals inhibit thrombin fibrin binding and prevent formation of atheroma or plaque. Marham-e-raal is well known formulation for non-healing ulcers irrespective of their origin. It contains potent healing agents that are greatly beneficial for achieving the healing of ulcers.

Methodology: One patient of atherosclerotic gangrene of lower limbs was taken into study after written informed consent. Hirudo medicinalis applied at the course of arteries of occlusion twice weekly and Marham-e-raal was used for local application after proper washing with Alusol (alum powder solution). The treatment continued for two months.

Discussion: The patients especially belong to older age group and present with chronic non healing ulcer at distal limbs with severe burning pain. These ulcers are resilient to healing by modern treatment.

Conclusion: The optimal treatment of atherosclerotic ischemic ulcer is application of medicinal leeches over the course of arteries showing occlusion with local application of Marham-e-raal.

Keywords: Atherosclerosis • Non healing ulcers • Hirudo-therapy • Marham-e-raal • Alusol

Introduction

Presentation of the patient

A male patient of about 60 years old visited in surgical OPD of our institute with main complaints of multiple wounds with intense burning sensation over the great toe of right side since last 4 months. He was a known case of essential hypertension on regular antihypertensive medication. He was addicted to cigarette smoking; about 10 to 15 per day and alcohol; about 20 ml per day. Professionally he was a farmer.

Materials and Methods

Medical presentation

As per the statement of the patient, he was quite good before 4 months. Then he noticed a small swelling; brownish black in color, on the tip of his right great toe. This swelling initially was very small but

gradually it increased in size. After passage of few days, it spontaneously shed off giving rise to formation of ulceration at the same site. The ulceration so formed increased in size involving half distal end of the great toe. This involvement was achieved within 4 months. According to him he was also having severe burning pain since last 4 months. The pain started gradually aggravating on walking, prolonged standing and exertion and relieved on lying down with hanging leg down the bed. The pain usually started at the tip of great toe first which referred up to the ankle joint. The pain was not associated with fever, nausea, vomiting, palpitation and oppression.

Local examination

1. Positions: Anterolateral aspect of right great toe.
2. Number: Solitary.
3. Shape: Oval shaped.
4. Edges: Slopping.
5. Floor: Covered with unhealthy pale slough.

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6. Discharge: No discharge.
7. Surrounding area: Mildly brownish pigmented with ischemic changes.
8. Tenderness: Severe tenderness present.
9. Discharge on touch: No discharge on pressure.
10. Examination of peripheral pulsation: All the lower leg peripheral pulsation such as dorsalis pedis, anterior tibial artery and posterior tibial artery were not palpable. Popliteal artery was feeble and femoral artery was well palpable. The pulsations of upper limbs were clearly palpable.

Investigations

All the routine investigations of patient were carried out after admission to our hospital. The hematological findings were Hb; 11.9 gm%, total leucocytes count; 8200 cells/mm³, Differential counts (polymorphs 70%, lymphocytes 18%, eosinophils 06%, monocytes 06%, basophils 0.0%) and ESR 34 mm/1hr. The blood sugar level was quite normal; fasting blood sugar was 91 mg/dl and post prandial blood sugar was 100 mg/dl, serum cholesterol was 181 mg/dl, serum triglycerides was 98 mg/dl and HDL was cholesterol 37 mg/dl. Renal functions were normal i.e. Blood urea as 21 mg/dl and Serum Creatinine as 1.2 mg/dl. Serological findings such as HIV I and II and HbsAg were negative. The laboratory report of culture and sensitivity of wound swab showed no bacterial growth after 48 hours of aerobic incubation. The ECG was normal. Arterial Doppler study of right lower limb showed the flowing velocity of blood in common femoral artery 120 cm/sec, 85, 127 and 32 cm/sec in proximal, mid and distal superficial femoral artery respectively. No flow in popliteal artery. 29 cm/sec was recorded in peroneal artery. 18 and 9 cm/sec were present in proximal and distal anterior tibial artery respectively. 23 and 20 cm/sec were noted in proximal and distal posterior tibial artery respectively. No flow was noted in dorsalis pedis artery.

Treatment given to the patient

After full clinical examination and laboratory investigations, he was diagnosed as thrombotic occlusion in right lower limb arteries with ischemic ulcer at right great toe. The wound was cleansed with solution of alum powder and dressing was done with herbo-medicinal ointment; Marham-e-raal twice a day. Hirudo medicinalis was applied at the course of dorsalis pedis artery, anterior tibial and posterior tibial artery. Hirudo-therapy was given twice weekly and each desired site for application of Hirudo medicinalis was followed for two weeks. After each sitting of Hirudo-therapy, sterile fine turmeric powder was applied over the bite site. This treatment was continued for two months when complete healing achieved with subsidence of pain.

Table 1. The comparison of flow pattern and velocity before and after the treatment.

Name of artery	Before treatment		After treatment	
	Velocity	Flow pattern	Velocity	Flow pattern
Proximal anterior tibial artery	18 cms/sec	Low velocity Very low flow	35 cms/sec	Monophasic
Distal anterior tibial artery	9 cms/sec	Very low flow	11 cms/sec	Monophasic
Distal posterior tibial artery	20 cms/sec	Low velocity	22 mms/sec	Monophasic
Dorsalispedis artery	-	-	9 cms/sec	Monophasic

Results and Discussion

Atherosclerosis is the formation of atheromatous plaques inside the arterial wall resulting into the hampering of blood supply and finally ischemic necrosis and gangrene distal to intimal narrowing [1]. The risk factors include hypercholesterolemia, smoking, alcohol consumption, hypertension, diabetes mellitus, older age group and obesity [1]. All risk factors cause injury to endothelium, both mechanical and toxic, of artery reducing normal atheroprotective mechanism of endothelium. Following injury of endothelium, aggregation of white blood cells, platelets and lipids occur at the site of injury [1,2]. Migration and proliferation of vascular smooth muscle cells occur into intima. Newly migrated and proliferated smooth muscle acts as neointima and becomes secretory to produce matrix of plaques. Lipids (LDL) get oxidized to release factors which promote inflammation and coagulation and factors which prevent production of protective nitrous oxide. This collectively results in atheromatous and thrombus plaque formation with inflammatory involvement of the vascular wall. Clinically the conditions manifest as severe burning pain at the site and gangrene and necrosis distal to the blockage in later days [1].

It is not clear that why the underlying mechanism involved in process of atherogenesis does not involve vein but involve the sites of pulsatile activities and water hammer effect [2]. This phenomenon is further aggravated by increased blood pressure. The diagnostic criteria depend upon the history, clinical examination of the patient and necessary investigations like Doppler study, ct-abdomen, ECG and lipid profile [3]. The treatment in modern system includes prescription of antiplatelet drugs i.e. aspirin 75 mg, clopidogrel 75 mg, cilostazol 50 mg, anti lipidemic drugs like atorvastatin. Surgical interventions include percutaneous transluminal angioplasty (PTA), thrombectomy, bypass grafts and amputation in severe complicated cases [1,4].

The patient had taken oral antiplatelets and antihypertensive drugs before visiting our institute but no satisfactory result was achieved. After admitting the patient in surgical male ward of our hospital, we carried out all necessary investigations and treatment with Hirudo-therapy and Marham-e-raal. Before initiation of treatment there was no pulsation of dorsalis pedis, anterior tibial artery and posterior tibial artery in right leg. The popliteal artery was feeble. Femoral artery was palpable. But at the end of treatment, dorsalis pedis, anterior tibial and posterior tibial became pulsatile. Before treatment the flow pattern and flow velocity as evidenced by arterial Doppler was not in favor of patient. After treatment, the flow pattern and velocity showed astonishing improvements (Table 1).

The ulcer so formed as a result of ischemia was healed completely at the end of treatment which had been reluctant to healing since last 4 months. The complete healing of the ulcers was achieved in 60 days (Figure 1).

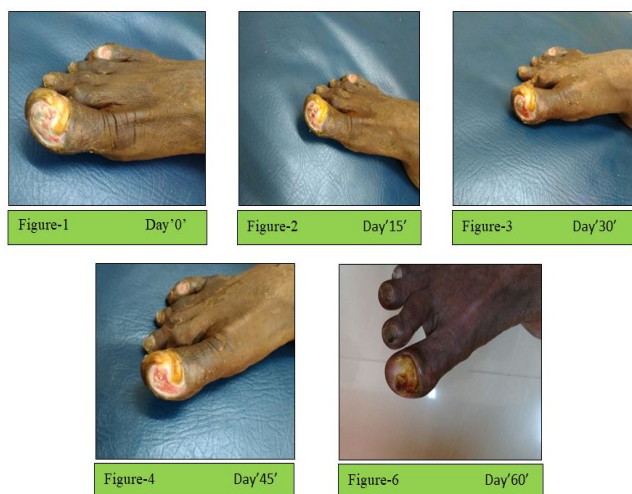


Figure 1. The comparative photographs of the ulcers before and after the treatment have been shown below.

The pain which was severe and burning before treatment gradually subsided at the end of treatment. The almost subsidence of pain was achieved within 25 days.

The Unani formulation Marham-e-Raal is widely preferred for the treatment of chronic wounds. Its effective results are well versed and best documented in the classical text. It positively results in wound healing and gives a quicker and promising response. It aids in shedding off the dead and devitalized tissue from the wound floor [5]. The constituents of the Marham-e-Raal includes Mom (*Bees wax/Cera*), Kafoor (*Cinnamomum camphora*), Raal hindi (*Vateria indica Linn*), Kaat hindi (*Acacia catechu*) and Roghan-e-gao/Ghee [6]. Mom (*bees wax*) is the main constituent of this ointment which aids in penetration and absorption of other important contents of the ointment in in wound bed. Kafoor (*Cinnamomum camphora*) possesses favourable properties for wound healing like antiseptic, stimulant and rubefacient, demulcent and anodyne activities. When Kafoor (*Cinnamomum camphora*) is applied over the skin, it causes vasodilatation, and hence, increased circulation in the same area, thus speeding up the healing process [7]. It also has some other important properties like antiseptic, demulcent and anodyne activities [8,9]. Raal hindi (*Vateria indica Linn*) exhibits detergent property [9]. It cleanses the wound bed from unhealthy discharge and makes it free from unhealthy tissues. The ointments containing Raal hindi (*Vateria indica Linn*) aids in chronic ulcers [7]. It contains anti-parasitic and rubefacient properties when applied locally [8]. The ointments containing Kaat hindi (*Acacia catechu*) are used for the management of pruritus of skin and burn wounds. If the fine powder (*sufuf*) of Kaat hindi (*Acacia catechu*) is sprinkled over a bleeding wound, the bleeding gets stopped [7]. Kaat hindi is widely known for having strong astringent and anti-parasitic effects [8,9]. Zaaj abyaz (alum) is a well-known potent Qaabiz (astringent) drug having Mundamil-e-qurooh (healing) property.

It causes the secretions from wound bed to dry which ultimately forms the ground for healthy granulation and hence healing of the wound [10]. It has been revealed by recent scientific studies that the efficacy of leech (especially *H. medicinalis*) is due to presence of specific thrombin inhibitor; hirudin found in its saliva [11-14]. Moreover, number of different thrombin inhibitors has been isolated from various leech species. As for example, bufrudin isolated from *H. menillensis* is closely similar to the chemical structure of hirudin [11,15]. A tight-binding thrombin inhibitor; haemadin has been extracted from the body of leech species *Haemadipsa sylvestris* [16]. Similarly, one of the most anti-thrombin; granulin-like has been identified in the body of leech species *H. nipponia* [17]. Astheromin, which has been isolated from the head extract of *Theromyzontessulatum*, exhibits anti-thrombin activity by means of inhibiting human granulocyte and monocyte proteins [18]. Number of studies has revealed that hirudin possesses more efficacies as compared to heparin in preventing vessels thrombosis. Moreover, hirudin has promising results in patients who are at a greater-risk of developing cardiovascular manifestations as it blocks thrombin-fibrin binding favoring the prevention of thrombus growth [19].

Conclusion

Marham-e-raal is well known herbo-medicinal ointment for chronic and acute wounds irrespective of their etiologies. Marham-e-raal is used for chronic ulcers to gain intensive and quick response. It helps in growth of healthy tissue at the site of the ulcer. It removes the dead tissue from the site. It is well established formulation for the ulcers which are resilient to healing. The potency, adverse reactions (local or systemic) and acceptance towards patients should further be evaluated by clinical trials on large number of cases.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images.

Conflict of Interest

The authors declare that they have no conflict of interest.

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