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An Integrated Management (Ayurveda and Modern Medicine) of Peripheral Vascular Disease with Non-Healing Wound -A Case Study

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Abstract--Peripheral vascular disease (PVD) includes peripheral arterial disease (PAD) and venous disease. PAD is a chronic progressive atherosclerotic disease leading to partial or total peripheral vascular occlusion. In ayurveda it is compared with Vatarakta, classified as a Mahavatavyadhi and as a separate disease in the literature has evoked attention of the Ayurvedic physicians and scholars because of its versatility in symptoms.

In this case study, A Case of 54 years old male patient came to OPD of *shalyatantra* department Parul institute of *Ayurveda* with complains of wound over right foot, Throbbing pain and discoloration, Swelling over foot, Pus discharge, Fever on /off, unable to walk. with past history Amputation of left 3rd toe- in 2019 and Injury with thorn before 25 days ago. with addiction of tea, alcohol and Tobacco. In general examination patient was k/c/o HTN and DM since 20-25 years.

Treatment protocol for this patient given was -

1. Blood sugar management
2. Wound care
3. *Saman chikitsa* (symptomatic management)
4. *Jalokaavacharan*
5. Debridement over sole of foot
6. Compartment syndrome (fasciotomy) over sole with 1 vertical line and above 2 vertical line incision
7. Amputation. which provided significant relief in the chief complaints and ultimately prevented major deformity in the form of amputation.

Conclusion: Life style of patient improved remarkable. Patient could be able to walk after treatment . Pain and Discoloration decreased.

Keywords: *Peripheral Vascular disease, Vatarakta, Ayurveda,* Diabetes Mellitus**.**

Introduction

Peripheral vascular disease (PVD) includes peripheral arterial disease (PAD) and venous disease. PVD is a chronic progressive atherosclerotic disease leading to partial or total peripheral vascular occlusion. The pathophysiology of atherosclerosis leading to PVD in patients with diabetes mellitus is multifactorial. In the blood vessels, hyperglycemia is thought to impair nitric oxide-mediated vasodilatation and enhance the formation of advanced glycation end products, leading to increases in pro-inflammatory factors. Hyperglycemia may also lead to atherosclerotic plaque instability by enhancing the oxidation of glycated low-density lipoprotein. Pro-coagulant effects may arise from elevated levels of C-reactive protein and coagulation factors, in addition to platelet hyper-reactivity. Taken together, these processes result in accelerated atherogenesis and diabetic atheropathy, leading to microvascular and macrovascular complications, including PVD. The prevalence of PVD increases with the duration of diabetes mellitus, with a relative risk of 1.39 for patients diagnosed with diabetes mellitus 1–5 years ago, and 4.5 for patients diagnosed more than 25 years ago. The presence of PVD, apart from its increased risk of claudication, ischemic ulcers, gangrene and possible amputation, is also a marker for generalized atherosclerosis and a strong predictor for cardiovascular ischemic events. In Ayurveda it can be correlated with uttan vatarakta. Vatarakta is a disorder where both Vata and Rakta are vitiated. The vitiating factors of Vata and Rakta are involved in the generation of this disease. There are two types of Vatarakta. 1. Utthanavatarakta (Periferal vascular disease) 2.Gambheeravatarakta (Gout). In Uttana Vatarakta, patient may present with Kandu, Daha, Ruk, Toda or Sphurana type of pain, Ayama and Syava or Tamra Varnata of Twak. The symptoms of Uttana Vatarakta owing to the Margavarana pathology simulate with the symptoms of Peripheral vascular diseases.

Case Report

A Case of 54 years old Male patient came to OPD of *shalyatantra* department Parul Ayurveda hopital with complains of wound over right foot – since 25 days, Throbbing pain and discoloration - since 25 days, Swelling over right foot-since 15 days, Pus discharge
since 15 days, Fever on /off-since 7 day, unable to walk. In past history patient having Amputation of left 3rd toe- in 2019 and Injury with thorn before 25 days ago. In general examination patient was k/c/o HTN and DM since 20-25 years.

Mediational History:

1. Tab Glycomet GP 1-0-1 (BF) (glimepiride 1mg + metformin 500 mg)
2. Tenlimac M 500 1-0-1(Metformin 500mg+ Teneligliptin 20 mg)
3. Tab LTK H 1-0-0 (Losartan 50 mg+ Hydroclorothiazide)

Addiction:

- Tea- 20-25 year
- Smoking-20-25 year
- Alcohol- 20-25 year

For complains patient have taken consult from contemporary system of medicine and taken NSAIDS but didn't get relief in wound healing point of view and he was advised high risk Below knee amputation but patient didn't get fitness for any surgical intervention due to uncontrolled blood sugar.

General Examination

- BP-130/80 MM/HG
- PULSE-80/MIN
- TEMP-101.8 F
- SPO2- 98%

Examination of the local part:

Table 2. **Inspection:**

Discoloration	Present
Ulceration	Present
Sign of gangrene	Present
Pus discharge	Present
Burger's test	can't assessed

Table 3. **Palpation:**

Arterial Pulse:	
Dorsalis pedis	Absent
Tibialis posterior	very sluggish
Popliteal	present
Femoral	Present
Sensation	lost
Local Coldness	present

Investigations:

Table 4. Hemogram

Hb	9.7 g/dl
Total RBC count	3.97 mill/cmm
Total WBC Count	14100// cmm
PCV	26.7%
MCV	67.25 Femtolitre
Polymorph	93%
Lymphocyte	04%
Platelet Count	402000/cmm

Table 5. Urine examination

Color	Reddish
Blood	++
Appearance	Hazy.
Protein	Present (+++)
Glucose	Present (++)
Pus cell	8-10 /H. P. F
Red cell	12-15 / H.P. F

Table 6. Blood sugar

RBS	130 mg/dL
HBA1C	10%
Estimated Average glucose	240.4 mg/dl

Table 7 Lower Limb Arterial

ARTERY	**RIGHT LEG**
CFA	Triphasic
SFA	Triphasic
DEEP FEMORAL ARTERY	Biphasic
POPLITEAL ARTERY	Triphasic
ATA	Biphasic
PTA	Biphasic
DPA	Biphasic

Table 8 Lower Limb Venous Doppler

VEIN	**RIGHT LEG**
CFV	Compressible
SFV	Compressible
POPLITEAL VEIN	Compressible
ATV	Compressible
PTV	Compressible

DPV	Compressible
GSV	Compressible
SSV	Compressible

Figure 1. Haematological Investigations.

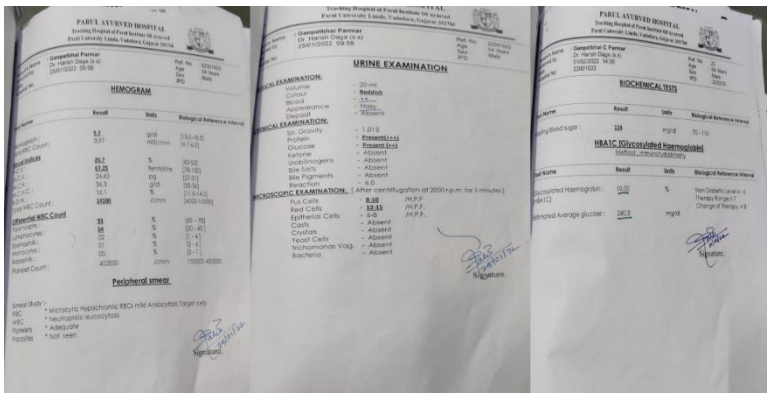


Figure : 02 Lower Limb Usg Doppler

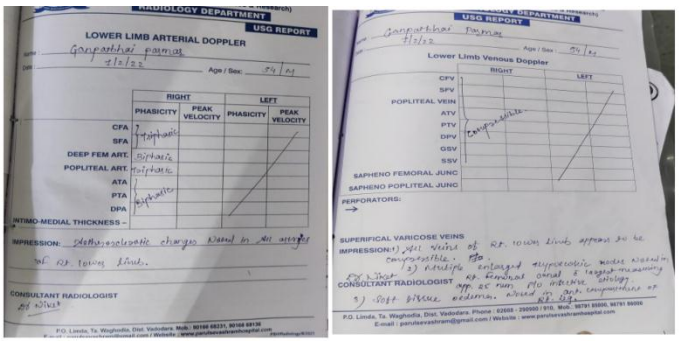
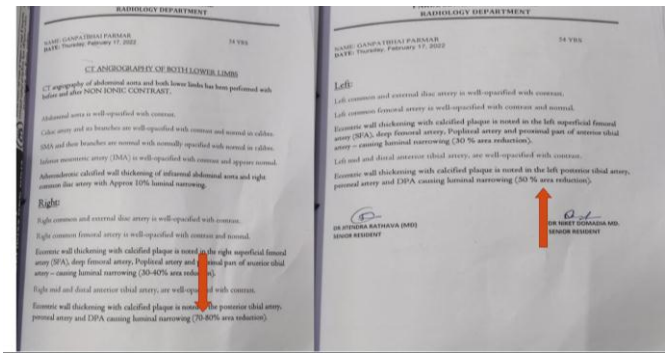


Figure: 03 Lower Limb Ct Angiography



CT angiography of right leg shows 30-40% area reduction in CFA, SFA, deep femoral artery, popliteal artery, proximal part of ATA and 70-80% area reduction in distal part of ATA, PTA, DPA.

Table 09: Sapeksa Nidan

PROVISIONAL DIAGNOSIS- Peripheral vascular disease
DIFFERENTIAL DIAGNOSIS- Diabetic foot ulcer, Neuropathic foot ulcer
DIAGNOSIS- Pperipheral vascular disease
PROGNOSIS- Kruccha Sadhya

Treatment Protocol

1. **Blood Sugar Management**

Blood Sugar Management With H.A.I.[i]

Table 10 Hai Scale

BLOOD GLUCOSE(mg/dl)	**INSULIN (units)**
61-150	0
151-200	3
201-250	5
251-300	8
301-350	10
351-400	12
More then 400	15

2. **Wound Care**

- Vimlapan for Increasing blood circulation.
- Yavaksar with tankan Dressing.
- Tila kalka with rason kalka application.
- Madhu ghrit dressing.

3. **Saman Chikitsa (Symptomatic Management)**

Symptomatic treatment for Fever, pain etc. Symptoms.

4. **Jalokaavacharan**

For reducing swelling

for Increasing blood circulation at local area.

5. **Debridement Over Sole Of Foot**

with vimlapan and surgical debridement.

6. **Fasciotomy**

Compartment syndrome treatment over sole with 1 vertical line and above 2 vertical line incision

7. **Amputation - Amputation** (of 2ND 3RD 4TH TOE OF RT LEG) and then 1st toe. Ankle block-- Deep Tibial nerve and the deep peroneal nerve Superficial nerves are the superficial peroneal, sural, and saphenous nerves .

WEEK	TREATMENT GIVEN	AYURVEDA	MODERN
4TH WEEK	1.Wound care	Panchavalkal kwath Praksalan	Inj HAI (acc to RBS)
	2.Sugar management	Jalokaavacharan	Tab Glycomet GP 1-0-1 (BF)
	3.Jalokaavacharan	Katuki churna + Tamra bhasma+ + Kapot vitta 1 TSF	Tenlimac M 500 1-0-1
		Pipali	Tab LTK H 1-0-0 (AF)
		Eladi churna	
		Tran panchamula kasay anupan	
5TH WEEK	1.Wound care	Tab Gandhak rasayan 2-2-2	Inj NS 500 gm IV BD
	2.Saman ausadhi	Tab Chandraprabha Vati 2-0-2	Inj HAI (acc to RBS)
	3.Sugar control	Tab Punarnava Mandur Vati 2 -0-2	
	4.Amputation of 2nd 3rd 4th ,5th toe	Tab Navayas Loha 1-0-1	Tab Glycomet GP 1-0-1 (BF)
			Tenlimac M 500 1-0-1

			Tab LTK H 1-0-0 (AF) Tab Zifi CV 360 mg 1 BD Tab Pan 40 mg 1 BD
6TH WEEK	1.Wound care 2.Saman ausadhi 3.Sugar control	Katuki churna + Tamra bhasma+ + Kapot vitta 1 TSF with milk Pipali Eladi churna Tran panchamula kasay anupan	Tab Glycomet GP 1-0-1 (BF) Tenlimac M 500 1-0-1 Tab LTK H 1-0-0 (AF)
7TH WEEK	1.Amputation of greater toe 2. sugar control	Katuki churna + Tamra bhasma+ + Kapot vitta 1 TSF Pipali Eladi churna Tran Panchamula kasay anupan	Rays Amputation Of Greater toe Tab Glycomet GP 1-0-1 (BF) Tenlimac M 500 1-0-1 Tab LTK H 1-0-0 (AF)

8-9TH WEEK	1.Wound care	Dressing with Jatyadi Ghrita	Tab Glycomet GP 1-0-1 (BF)
	2.Saman ausadhi	Tab Gandhak rasayan 2-2-2	Tenlimac M 500 1-0-1
	3.Sugar control	Tab Chandraprabha Vati 2-0-2	Tab LTK H 1-0-0 (AF)
		Tab Punarnava Mandur Vati 2 -0-2	
		Tab Navayas Loha 1-0-1	

Table: 11 Treatment Timeline

Figure 04: Foot Before Treatment

Figure 06: Fasciotomy

Figure:07 Jalokaavacharan

Figure 08: Amputation (Of 2nd 3rd 4th Toe Of Rt Leg)

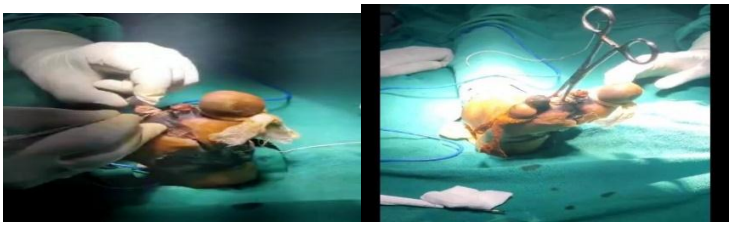


Figure 09: Foot After Amputation.

Figure: 10 Fresh Granulation Started In Wound

Figure:11 Foot After All Digit Amputation And Wound Healing.

Criteria of Assessment:

Table No:13 Observation And Results

SYMPTOMS	BEFORE TREATMENT	AFTER TREATMENT
Throbing pain (VAS SCALE)	8	0
Discolouration	Present	Decreased
Claudication distance	Rest pain	600 metres
Peripheral pulses	Absent	Sluggish
Wound	Non-healing ulcer	healing ulcer
Buerger's test	30	80
Sugar	uncontrolled	Controlled

Discussion

The scenario of *Vatarakta* occurred owing to the *margavarana* pathology, which can very well be correlated with atherosclerotic peripheral arterial disease. In the above case, having the predisposing factor as diabetes mellitus with *nidana sevana* of smoking (tobacco), eating salty food (*ushna-tikshna*) lead *to tridosha dushti* and *rakta dushti* as tobacco is *visha dravya*. Since *sira* (arteries) is *upadhatu* of *rakta* lead to pathology of *vatarakta*. This result in obstruction in the flow of both *vata* and *rakta* at the peripheral vessels of lower limb manifested in leg pain, discoloration, burning sensation, ulceration and eventually gangrene. In such cases *Samprapti vighatana (chikitsa)* can be achieved by relieving *avarana* and correcting the vitiated *vata and rakta.*[ii]

Guggulu is one extraordinary drug that possesses *Anabhishyandhi*, *Snigdha*, and *Sroto Shuhdhikara*

Tab. *Gandhaka rasayana*[iii] is *having yogavahi guna. Gandhaka* as main ingredient and many bhavana *dravyas* it is *raktaprasadaka, pittaghna, dahashamaka* and *rasayana*. Considering the predisposing factor as diabetis mellitus Tab. Chandraprabha vati given.

Gomutra arka acts as debriding agent. In case of PAD disease and ulcer management, ***Jalauka avacharan*** has proved effective[iv]. Leech possesses various metabolically active substances in its saliva. It has hirudin, the anticoagulant and ananesthetic also.

Conclusion

Knowledge of pathogenesis and Complications of a disease according to Ayurveda and Modern science is necessary for proper planning of the treatment. In an attempt to treat PAD on the principles of ayurveda where Blood sugar management, Wound care, *Saman chikitsa (*symptomatic management), *Jalokaavacharan*, Debridement over sole of foot, Compartment syndrome treatment(fasciotomy), digital Amputation knowledge is must require. With the success, it can be concluded that the pain presented as intermittent claudication or rest pain and end stage gangrene where surgical intervention is required can be effectively managed and affected limb saved. Diabetes is under control. Life style of patient markly improved as BK amputataion prevented, Patient can walk now, Pain reduced, Discoloration markly decreased,

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Conflict of Interest – There is no conflict of interest.

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