World Journal of Biology Pharmacy and Health Sciences
eISSN: 2582-5542
Cross Ref DOI: 10.30574/wjbphs
Journal homepage: https://wjbphs.com/

(CASE REPORT)

Regression of bilateral carotid calcified atheromatous plaque through SHS Therapy: A case study

Swati Pranit Ambulkar [1] and Pranit Yadaw Ambulkar [2,*]

[1] *Madhavbaug Multidisciplinary Cardiac Care Clinic, Hinjawadi, Pune, India.*
[2] *Dr. Ambulkar's Ayurveda Clinic, Wakad, Pune, India.*

World Journal of Biology Pharmacy and Health Sciences, 2024, 20(02), 662–667

Publication history: Received on 08 October 2024; revised on 14 November 2024; accepted on 17 November 2024

Article DOI: https://doi.org/10.30574/wjbphs.2024.20.2.0920

Abstract

Macrovascular complications are a common manifestation of long-standing or poorly managed diabetes mellitus, often leading to significant mortality and morbidity. This case involves a 59-year-old male patient with type 2 diabetes, bilateral carotid calcified atheromatous plaque, and 30-40% luminal narrowing on Doppler imaging. Despite optimal medical management, the patient experienced recurrent hospitalizations. Seeking alternative treatment, the patient underwent Ayurveda-based SHS (Sampurna Hriday Shuddhikaran) Panchakarma therapy. After four months, more than 50% regression in luminal narrowing and 100% resolution of calcification were observed. This case highlights a promising non-invasive alternative for patients with carotid atherosclerosis or other vascular plaques who are unfit or unwilling for surgical intervention.

Keywords: Diabetes; Complication; Macrovascular; Blockages; Carotid; Calcified; Atheroma; ischemia

1. Introduction

Macrovascular complications such as atherosclerosis and coronary artery disease are frequent in patients with long-standing or poorly controlled diabetes mellitus. Surgical revascularization is often recommended in such cases. However, in India, the high cost of medical procedures and fear of surgery deter many patients from opting for invasive interventions. Clinical observations indicate that only 10% of non-critical patients who are advised coronary artery bypass grafting (CABG) or percutaneous transluminal coronary angioplasty (PTCA) undergo these procedures. The rest seek non-invasive alternatives, though such therapies are generally not associated with the regression of calcified atheromatous plaques.

Madhavbaug™ 'SHS' (Sampurna Hriday Shuddhikaran©) Therapies, rooted in Ayurveda's Panchakarma techniques, combined with dietary and lifestyle modifications, has been developed to target cardiovascular diseases, including atheromatous plaque regression. This case report details the successful non-invasive management of bilateral carotid calcified atheromatous plaque using this therapy.

2. Case Presentation

A 59-year-old male patient, Reg. No. P796334 approached the OPD with a complaint of weakness, weight loss, tingling in head and repeated hospitalization due to giddiness and fainting. His medical records revealed that he is a known case of bilateral carotid calcified atherosclerosis, secondary hypertension, poorly managed type two diabetes mellitus with complications like retinopathy, nephropathy and recurrent hospitalization for transient ischemic cerebrovascular events. His some of the noticeable pathology findings were- HBA1C 11.6 %, S. Cholesterol Total- 175.43 mg/dl, S.

* Corresponding author: Pranit Yadaw Ambulkar; e-mail: pranit.ambulkar@gmail.com

Triglycerides 53.35 mg/dl, S. HDL 51.69 mg/dl, S. LDL 113.07 mg/dl, S. VLDL 10.67 mg/dl. S. Creatinine was 1.46mg/dl, BUN was 25mg/dl. On examination, BMI was found to be 17.7 kg/$m^{2,}$ Blood Pressure was 187/97 mm Hg, Heart Rate 77/ min. regular and ECG was within normal Limits.

Carotid Dopler finding were :

- Right carotid- intima media thickness 1.2mm,
- Left carotid- intima media thickness 1mm,
- Atherosclerotic changes noted in both common carotid arteries,
- Calcified atherosclerotic plaque measuring 11x3.4 mm noted in right CCA bulb, extending to both ICA and ECA, with approx. 30%-40% luminal narrowing.

Ongoing stable medications at the time of clinic visit:

Inj. Insulin Degludec 6 IU OD, Tab. Cilnidipine (10mg) + Telmisartan (40mg) BD, Tab. Gliclazide (80mg) + Metformin (500mg) OD, Tab. Metformin 500mg SR BD, Tab. Dopaglifosin 10mg OD

3. Management

- Concomitant add-on Ayurveda panchakarma Based Madhavbaug™ Sampurna Hriday Shuddhikaran © Therapy at a frequency of once a week for around four months, comprising of
    - Centripetal oleation massage with medicated sesame oil
    - Thermal vaso-dilation steam bath with Dashamula Decoction,
    - Per rectal drug administration of Gudmar + Haridra + Amalaki decoction 100 ml,
    - Shirodhara with Jatamansi infusion
- Low carb, High protein, high fibre, moderate fat, 1000 Kcal/ day diet with high antioxidant ORAC value.
- Moderate walking exercises empty stomach in the morning.
- Oral add-on medications included
    - Cap. Ashwagandha (Withania Somnifera, 5% Withanaloids) Extract 500mg BD
    - Tab. Punarnava (Boerhavia diffusa) extract 500 mg BD
    - Cap. Gokshura (Tribulus terrestris- Saponin 25%) + Haridra (Curcuma Longa- Curcuminoids 25%) + Amalaki (Phyllanthus emblica- Polyphenols 2%) Extract 500 mg BD
    - Powder- Gudmar (Gymnema sylvestre) + Guduchi (Tinospora cordifolia) + Jamun(Syzygium cumini) 3g BD

4. Outcome

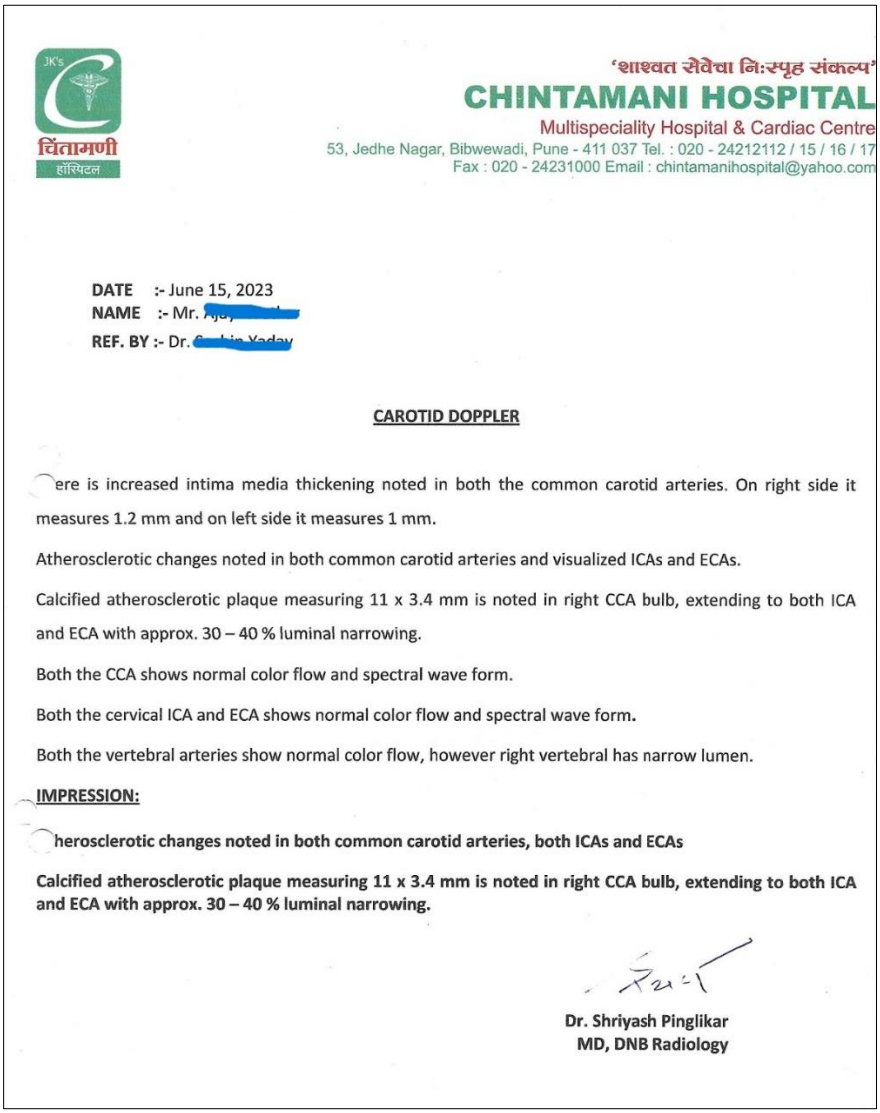
Post four months of therapy, Carotid Dopler was repeated to assess the improvement. The test revealed that,

- Right carotid- intima media thickness was 0.8mm,
- Left carotid- intima media thickness was 0.7mm,
- Mild atherosclerotic changes were seen in bilateral CCA, ICA.
- Few soft plaques were seen, Soft plaque in left common carotid artery with 10%-20% luminal narrowing was reported.

Other parameters post treatment were- BP: 156/80 mm Hg, HBA1C- 6.5%, and Creatinine: 0.9 mg/dl.

Table 1 Comparison of before intervention and after intervention Carotid Doppler findings

Parameter	Before intervention	After intervention
Carotid intima media thickness on right side	1.2 mm, with plaque	0.8 mm- No plaque
Carotid intima media thickness on right side	1 mm, with plaque	0.7 mm- no plaque
Atherosclerotic plaque in right CCA bulb	11 x 3.4 mm	Mild plaque
Luminal narrowing	30-40%	10-20%
Plaque Calcification status	Calcified	Soft plaque. No calcification



'शाश्वत सेवेचा निःस्पृह संकल्प'

CHINTAMANI HOSPITAL

Multispeciality Hospital & Cardiac Centre

53, Jedhe Nagar, Bibwewadi, Pune - 411 037 Tel. : 020 - 24212112 / 15 / 16 / 17

Fax : 020 - 24231000 Email : chintamanihospital@yahoo.com

DATE :- June 15, 2023

NAME :- Mr. [redacted]

REF. BY :- Dr. [redacted]

CAROTID DOPPLER

ere is increased intima media thickening noted in both the common carotid arteries. On right side it measures 1.2 mm and on left side it measures 1 mm.

Atherosclerotic changes noted in both common carotid arteries and visualized ICAs and ECAs.

Calcified atherosclerotic plaque measuring 11 x 3.4 mm is noted in right CCA bulb, extending to both ICA and ECA with approx. 30 – 40 % luminal narrowing.

Both the CCA shows normal color flow and spectral wave form.

Both the cervical ICA and ECA shows normal color flow and spectral wave form.

Both the vertebral arteries show normal color flow, however right vertebral has narrow lumen.

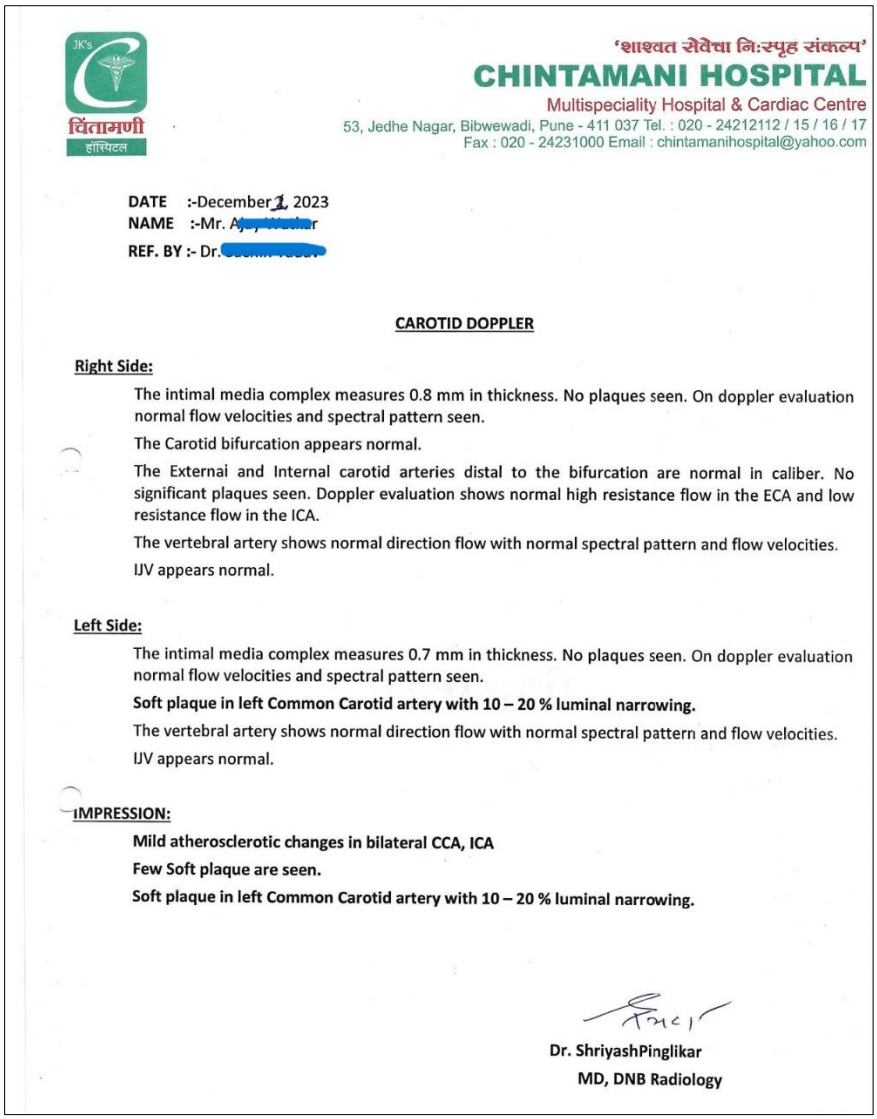
IMPRESSION:

herosclerotic changes noted in both common carotid arteries, both ICAs and ECAs

Calcified atherosclerotic plaque measuring 11 x 3.4 mm is noted in right CCA bulb, extending to both ICA and ECA with approx. 30 – 40 % luminal narrowing.

Dr. Shriyash Pinglikar
MD, DNB Radiology

Figure 1 Carotid doppler findings before treatment



'शाश्वत सेवेचा निःस्पृह संकल्प'

CHINTAMANI HOSPITAL

Multispeciality Hospital & Cardiac Centre

53, Jedhe Nagar, Bibwewadi, Pune - 411 037 Tel. : 020 - 24212112 / 15 / 16 / 17
Fax : 020 - 24231000 Email : chintamanihospital@yahoo.com

DATE :-December 1, 2023
NAME :-Mr. A[redacted]r
REF. BY :- Dr.[redacted]

CAROTID DOPPLER

Right Side:

The intimal media complex measures 0.8 mm in thickness. No plaques seen. On doppler evaluation normal flow velocities and spectral pattern seen.

The Carotid bifurcation appears normal.

The Externai and Internal carotid arteries distal to the bifurcation are normal in caliber. No significant plaques seen. Doppler evaluation shows normal high resistance flow in the ECA and low resistance flow in the ICA.

The vertebral artery shows normal direction flow with normal spectral pattern and flow velocities.

IJV appears normal.

Left Side:

The intimal media complex measures 0.7 mm in thickness. No plaques seen. On doppler evaluation normal flow velocities and spectral pattern seen.

Soft plaque in left Common Carotid artery with 10 – 20 % luminal narrowing.

The vertebral artery shows normal direction flow with normal spectral pattern and flow velocities.

IJV appears normal.

IMPRESSION:

Mild atherosclerotic changes in bilateral CCA, ICA

Few Soft plaque are seen.

Soft plaque in left Common Carotid artery with 10 – 20 % luminal narrowing.

Dr. ShriyashPinglikar
MD, DNB Radiology

Figure 2 Carotid doppler findings after treatment

5. Discussion

High blood sugar levels are known to cause damage and inflammation to endothelium of blood vessels. When vascular smooth muscle cells (VSMCs), become old, inflamed or diseased, they can undergo a process called "phenotypic switching" where they start to behave like bone-forming cells (osteoblasts), leading to the deposition of calcium and phosphate minerals within the vessel wall, essentially turning into bone-like cells, due to a complex interplay of factors including inflammation, oxidative stress, and changes in cellular signaling pathways triggered by chronic inflammation, disease conditions or aging; this process is often referred to as "vascular calcification" and can contribute to hardening of the arteries, increasing the risk of cardiovascular disease (1). This mechanism can be considered as defense mechanism of the body to withstand pressure in worn out and weak blood vessels susceptible to bursting.

In this particular case, poorly managed diabetes is shortlisted as the main culprit for development of carotid calcified atheromatous plaque. which further restricted the flow of blood to the brain resulting into symptoms like giddiness. Small Blood clot formation at damaged endothelium and blood clot when dislodges from plaque and its fragments obstructs blood flow into cerebral arteries, it causes transients ischemic cerebrovascular episodes, resulting into the headache and fainting.

So, basic objectives of the intervention were:

- To manage diabetes effectively, and thereby preventing further damage to the endothelium.
- To reduce inflammation of the endothelium, and heal the damage to the arteries.
- Improve tensile strength, elasticity and expandability of the carotid arteries, and improve blood flow through carotids even in high flow demand conditions.
- To promote regression of calcifies atheromatous plaque, and reduce further risk of cerebrovascular episodes in future

5.1. Mode of action of the intervention

Centripetal oleation massage with herbal medicated sesame oil works in three ways. a) Skin being the largest organ on the body with a huge surface area of around 1.5 square meter, medicated oil penetrates into skin and diffuses into a fine and huge network of dermal microcirculation (2). It reduces inflammation of the endothelium. Blood vessels being interconnected as a cardiovascular system, the health benefits to the superficial blood vessel are rapidly propagated to peripheral blood vessels and deep arteries as well(3) . b) Centripetal strokes of massage in a specific pattern reduces congestion in peripheral circulation and corrects pre-load and after-load on heart. c) Tactile stimulus on skin while massage relaxes the nervous system and helps lower anxiety, heart rate and blood pressure (4). Massage with sesame oil is said to be beneficial in many ways as per Ayurveda (5). In this particular case, palliation of Vata Dosha results in decreased roughness, dryness, stiffness, constriction of the blood vessel with atheromatous plaque and improved smoothness, unctuousness, elasticity, expandability and tensile strength to the diseased artery. In absence of endothelial inflammation causing factors, this process boosts HDL mediated reverse cholesterol transport mechanism and starts regression of atheromatous plaque , as well as stop calcification of the plaque and demineralize existing calcified plaque.

Thermal vasodilation steam bath with medicated Dashamula decoction improves endothelium dependent dilation of blood vessels. Dashamula is set of roots of ten herbs mentioned in Ayurveda that works on Vata Dosha (5). It reduces endothelial inflammation, reduces arterial stiffness, improves compliance and capacity to dilate and contract in response to pressure(6). It reduces risk of cardiovascular and cerebrovascular episode (7). Under this process body excretes around 400ml of sweat, it relieves congestion in circulation, improve blood pressure(8). It also helps reduce free radicals and oxidative damage.

PRDA is a kind of medicated enema meant to be absorbed. Medicinal liquids are delivered lower into the rectum. Dense network of blood vessels in rectal plexus picks up the active phytochemicals and through common iliac vein and then inferior vena-cava pours it in the heart. Drug administered in this way bypasses the digestion and breakdown at stomach; also it reduces hepatic first-pass effect and improves works efficiently (9). Gudmar, Haridra and Amalaki are proven to reduce insulin resistance and improve glucose metabolism (5).

Shirodhara with Jatamansi infusion relieves anxiety and stress. It helps to normalize blood pressure and heart rate(10).

Oral herbal medications combinedly help for better sugar control and improved HDL mediated reverse cholesterol transport mechanism, and improved endothelial function.

Diet therapy induces negative calorie balance along with good nutritional status and free radical scavenging activity (11) . It reduces insulin resistance, achieves better sugar control and boosts HDL mediated reverse cholesterol transport mechanism (12).

6. Conclusion

The intervention- Sampurna Hriday Shuddhikaran therapy was able to correct relevant steps in pathology development of calcified atheromatous plaque in coronary arteries. Over the period of four months, gradually we were successful to achieve 100% de-calcification and 50% regression of the atheromatous plaque in this case. This intervention may be very helpful for people who are unfit or unable for surgical interventions of CAD as well as atheromatous plaque in renal or coronary arteries.

Compliance with ethical standards

Acknowledgement

The authors acknowledge and thank 'Madhavbaug'- Vaidya Sane Ayurved Lab Ltd for the 'SHS' protocol.

Disclosure of conflict of interest

The authors declare that they have no conflict of interest.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

References

[1] Rajnish Mehrotra, Disordered Mineral Metabolism and Vascular Calcification in Nondialyzed Chronic Kidney Disease Patients, Journal of Renal Nutrition, Volume 16, Issue 2, 2006, Pages 100-118, ISSN 1051-2276, https://doi.org/10.1053/j.jrn.2006.01.006.

[2] Alkilani AZ, McCrudden MT, Donnelly RF. Transdermal Drug Delivery: Innovative Pharmaceutical Developments Based on Disruption of the Barrier Properties of the stratum corneum. Pharmaceutics. 2015 Oct 22;7(4):438-70. doi: 10.3390/pharmaceutics7040438. PMID: 26506371; PMCID: PMC4695828.

[3] Swati Ambulkar, Pranit Ambulkar, Improvement in Duke's Treadmill Score and VO2Max using IRP Adjunct Therapy in Ischemic Heart Disease Patients- A Clinical Observational Study, International Journal of Research Publication and Reviews, Vol 5, no 2, pp 2868-2873 February 2024, https://doi.org/10.55248/gengpi.5.0224.0556 .

[4] Fazeli MS, Pourrahmat MM, Massah G, Lee K, Lavoie PM, Fazeli M, Esser A, Collet JP. The Effect of Massage on the Cardiac Autonomic Nervous System and Markers of Inflammation in Night Shift Workers: a Pilot Randomized Crossover Trial. Int J Ther Massage Bodywork. 2020 Aug 27;13(3):6-17. PMID: 32922577; PMCID: PMC7454237.

[5] The Ayurvedic Pharmacopoeia of India, GOVERNMENT OF INDIA MINISTRY OF HEALTH AND FAMILY WELFARE DEPARTMENT OF AYUSH, Part 1.

[6] Laukkanen JA, Laukkanen T, Kunutsor SK. Cardiovascular and Other Health Benefits of Sauna Bathing: A Review of the Evidence. Mayo Clin Proc. 2018 Aug;93(8):1111-1121. doi: 10.1016/j.mayocp.2018.04.008. PMID: 30077204.

[7] Lim, G. Sauna bathing associated with reduced cardiovascular mortality. Nat Rev Cardiol 12, 257 (2015). https://doi.org/10.1038/nrcardio.2015.35

[8] Lee E, Kolunsarka I, Kostensalo J, Ahtiainen JP, Haapala EA, Willeit P, Kunutsor SK, Laukkanen JA. Effects of regular sauna bathing in conjunction with exercise on cardiovascular function: a multi-arm, randomized controlled trial. Am J Physiol Regul Integr Comp Physiol. 2022 Sep 1;323(3):R289-R299. doi: 10.1152/ajpregu.00076.2022. Epub 2022 Jul 4. PMID: 35785965; PMCID: PMC9394774.

[9] Hua S. Physiological and Pharmaceutical Considerations for Rectal Drug Formulations. Front Pharmacol. 2019 Oct 16;10:1196. doi: 10.3389/fphar.2019.01196. PMID: 31680970; PMCID: PMC6805701.

[10] Kundu, Chittaranjan1; Shukla, V. D.2; Santwani, M. A. M.D.3; Bhatt, N. N.4,. The role of psychic factors in pathogenesis of essential hypertension and its management by Shirodhara and Sarpagandha Vati. AYU (An International Quarterly Journal of Research in Ayurveda) 31(4):p 436-441, Oct–Dec 2010. | DOI: 10.4103/0974-8520.82035

[11] Imran, S., Sabir, I., Mandole, R., and Khan, S. (2023). Role of ayurveda detoxification and dietary modification on restoration of euglycemia in T2DM patients. International Journal of Research in Medical Sciences, 12(1), 188–193. https://doi.org/10.18203/2320-6012.ijrms20233998

[12] Sane, R., Mandole, R., Amin, G., and Ghadigaonkar, P. (2024). Effect of a reverse diet kit on the regression of atherosclerosis plaque and its effect on the lipid profile in patients with coronary artery disease. International Journal of Research in Medical Sciences, 12(10), 3684–3690. https://doi.org/10.18203/2320-6012.ijrms20242926