Case report

Unmasking the Underdiagnosed: Resolving Decade-Old Wounds with Innovative Interventions in Chronic Venous Insufficiency and Follow Up After 2 Years

ABSTRACT :

Chronic venous disorders or the more severe chronic venous insufficiency (CVI) commonly affect aging populations, causing venous hypertension and other complications in the lower limbs. This report discusses a 59-year-old Indonesian woman with a ten-year history of unresponsive foot ulcers and associated symptoms. Despite multiple treatments, including two debridement surgeries, the ulcers persisted. A duplex ultrasound diagnosis revealed CVI in the right mid-saphenous and popliteal veins. Subsequent endovascular laser therapy led to wound closure over a two-year follow-up period. The under-recognition of such chronic wound and CVI cases in Indonesia highlights the significance of this case.

Keywords: Endovascular Therapy, Chronic Venous Disease, Chronic venous insufficiency, Malang, Indonesian, Chronic Wounds,

Chronic Venous Insufficiency (CVI) can present itself in a variety of ways, ranging from subtle aesthetic concerns to significant symptomatic conditions such as spider veins, varicose veins, swelling (edema), alterations in skin color (pigmentation), eczema, lipodermatosclerosis, atrophie blanche, and venous skin sores (ulcers)[1]. Despite its widespread occurrence, CVI often remains undetected due to lack of awareness about the disease spectrum, its implications, and varied signs in primary and secondary venous diseases[2]. While about half of individuals show abnormal venous circulation in lower limbs, the reported CVI prevalence varies among population studies.[3]

Multiple elements such as advancing age, inherited predisposition, extended periods of standing, excessive weight, tobacco use, inactive lifestyle, trauma to the lower extremities, history of venous thrombosis, arteriovenous shunt, elevated estrogen conditions, and gestation can instigate Chronic Venous Insufficiency (CVI). [3,4] Even though the incidence of CVI among Asian populations is notably lesser compared to non-Hispanic white populations, there may be a future increase in Indonesia, primarily driven by potential under-recognition of the condition, escalating rates of obesity, and an aging population. [4,5].

1. INTRODUCTION

Chronic Venous Insufficiency (CVI) can present itself in a variety of ways, ranging from subtle aesthetic concerns to significant symptomatic conditions such as spider veins, varicose veins, swelling (edema), alterations in skin color (pigmentation), eczema, lipodermatosclerosis, atrophie blanche, and venous skin sores (ulcers)[1]. Despite its widespread occurrence, CVI often remains undetected due to lack of awareness about the disease spectrum, its implications, and varied signs in primary and secondary venous diseases[2]. While about half of individuals show abnormal venous circulation in lower limbs, the reported CVI prevalence varies among population studies.[3]

Multiple elements such as advancing age, inherited predisposition, extended periods of standing, excessive weight, tobacco use, inactive lifestyle, trauma to the lower extremities, history of venous thrombosis, arteriovenous shunt, elevated estrogen conditions, and gestation can instigate Chronic Venous Insufficiency (CVI)[3,4] . Biochemical venous insufficiency (BVI) is a condition in which there are changes in the biochemical markers of venous function. These changes can be seen in people with chronic venous insufficiency (CVI), a condition that is characterized by poor circulation in the legs. Some of the biochemical markers that are affected in include Fibrinogen, Elastin, and Venous endothelial dysfunction[6].

Fibrinogen is a protein that helps to clot blood. In CVI, there is an increase in fibrinogen levels, which can lead to blood clots[6]. Elastin is a protein that gives the walls of veins their elasticity. In CVI, there is a decrease in elastin levels, which can lead to veins that are more likely to collapse[7]. Venous endothelial dysfunction is a condition in which the lining of the veins does not function properly. This can lead to an increase in inflammation and blood clots[11]

Even though the incidence of CVI among Asian populations is notably lesser compared to non-Hispanic white populations, there may be a future increase in Indonesia, primarily driven by potential under-recognition of the condition, escalating rates of obesity, and an aging population[4,5].

2. CASE REPORT

A 60-year-old hypertensive and obese woman consulted with a ten-year history of unresolved chronic leg pain. Despite numerous medical consultations and unsuccessful debridement surgeries spanning over five years, the wound persisted. Consequently, she was referred to the cardiovascular center at Saiful Anwar Hospital Malang for further evaluation. The patient's physical examination revealed a BMI of 40, blood pressure of 152/81, a regular pulse rate of 80 beats per minute, and a respiratory rate of 20 breaths per minute. The physical examination also revealed an unhealed wound on the patient's right leg at the crural level. Biochemical analysis revealed a slightly low hemoglobin level at 12.90 g/dL (normal range: 13.4 - 17.7 g/dL). A slightly high leukocyte count was also found, at 11,450 /uL (normal range: 4,300 - 10,000). Fibrinogen levels were 440 mg/dL, but all other counts, including platelets, liver function, and blood sugar levels, were within the normal range. The patient had a history of taking the following medications Candesartan 1x16 mg, amlodipine 10mg-0, bisoprolol 2.5 mg-0, simvastatin 0-20mg. The patient had no prior history of anticoagulant treatment

A Duplex ultrasound examination exposed severe chronic venous insufficiency (CVI) in the right middle-distal great saphenous vein (1293ms) and the right popliteal vein (754ms). The patient then underwent endovascular laser therapy (EVLT) from the level of the popliteal vein. Post-procedure, the wound was dressed with elastomull or tensocrepe bandages and was covered with sterile gauze and micropore.

The patient was discharged the day after and was kept under observation for the next two years. There was a marked improvement in the wound, indicating healing. A year later, a second [9]debridement procedure was performed, leading to enhanced results. By the end of the second year after the initial procedure, the wound had completely closed and the patient reported no instances of an open wound.

3. DISCUSSION

Chronic Venous Disease affects lower-limb venous circulation. It may affect the superficial or deep vein system. Chronic Venous Disease causes enlarged, twisted, and slow-flowing vein [6,7] . Chronic Venous Disease symptoms range from telangiectasias to severe venous ulceration. Leg pain, fatigue, itching, muscle cramps, edoema, and lower-limb discomfort are common symptoms. Telangiectasias, reticular veins, varicose veins, hyperpigmentation, lipodermatosclerosis, eczema, and ulceration may occur.[3,6,8].The Clinical-Etiology-Anatomy-Pathophysiology (CEAP) classification for chronic venous disorders was introduced in 1994 to systematically guide and standardize the documentation process for Chronic Venous Disease patients (Table 1)[3].

Endovenous Laser Treatment (EVLT) incurs thermal damage to the venous wall, leading to selective photothermolysis-induced intimal destruction and collagen denaturation, resulting in eventual fibrotic vein closure. Two theories explain this process: the first involves intravascular steam bubbles formed by the laser, while the second posits direct vein wall heating[9]. Pre-procedure duplex ultrasound is vital to identify and address all refluxing venous segments to minimize varicose vein recurrence. Relative contraindications to EVLT encompass non-correctable coagulopathy, liver dysfunction, anesthetic restrictions, immobility, and pregnancy, none of which were presented by the patient [9,10]. Post-procedure care includes wearing graduated compression stockings continuously for two weeks, followed by six weeks during upright activity. Prompt and regular walking is strongly recommended post-procedure [9].

While the literature indicates that complications after EVLT are rare, Deep Vein Thrombosis (DVT) is a significant concern. However, the incidence of DVT remains extremely low [4,10]

In Figure 1, an open wound is visible on the right leg area and is localized. The wound has pus, an annular shape, irregular edges with dimensions of 3-4 cm x 2-3 cm and an initial diagnosis of Severe Chronic Venous Insufficiency **C**6**E**P**A**s**P**or and Chronic Ulcer region of the Right Foot. As shown in figure 1, there was improvement in the wound on the right leg following the initial action. Two years later, shows that the wound appeared to be healing and beginning to close. The patient's case emphasizes the crucial role of early detection and continuous management in achieving progress in the treatment of chronic venous diseases.

Figure 1. Shows Improvement before, 1 year after and also 2 years after the EVLT procedure

Clinical Manifestation	**Etiology**	**Anatomy**	**Pathophysiology**
C1 : Telangeiactasias / Reticular Vein	Ec : Congenital	As : Superficial Venous System	Po : Obstruction
C2: Varicose Vein Recurrent Varicose Vein	Ep : Primary	Ad : Deep Venous System	Pr : Reflexes
C3 : Edema	Es : Secondary	Ap : Perforatators	
C4 : Pigmentation Lipodermatosclerosis Corona Phlebectatica			
C5 : Healed Ulcer			
C6 : Active Venous Ulcer Recurrent Active Venous Ulcer			

Table 1: CEAP Classification Of Venous Disorders

4. CONCLUSION

In conclusion, this case of a 59-year-old Indonesian woman shows the importance of early diagnosis and treatment for Chronic Venous Disease (CVD) or CVI. Her chronic wounds only improved after Duplex ultrasound diagnostic and

Endovascular Laser Therapy. It emphasises the importance of advanced diagnostic tools and the need for accurate diagnosis and targeted treatment in underdiagnosed regions.

CONSENT

As per international standard or university standard, patient(s) written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

As per international standard or university standard, patient(s) written consent has been collected and preserved by the author(s).."

REFERENCES

1. Youn YJ, Lee J. Chronic venous insufficiency and varicose veins of the lower extremities. Korean J Intern Med. 2019;34(2):269-283. doi:10.3904/kjim.2018.230

2. Bush RL, Kallen MA, Liles DR, Bates JT, Petersen LA. Knowledge and Awareness of Peripheral Vascular Disease Are Poor Among Women at Risk for Cardiovascular Disease. J Surg Res. 2008;145(2):313-319. doi:10.1016/j.jss.2007.03.022

3. Depopas E, Brown M. Varicose Veins and Lower Extremity Venous Insufficiency. Semin Intervent Radiol. 2018;35(1):56-61. doi:10.1055/s-0038-1636522

4. Kim Y, Png CYM, Sumpio BJ, DeCarlo CS, Dua A. Defining the human and health care costs of chronic venous insufficiency. Semin Vasc Surg. 2021;34(1):59-64. doi:10.1053/j.semvascsurg.2021.02.007

5. Vuylsteke ME, Colman R, Thomis S, Guillaume G, Van Quickenborne D, Staelens I. An Epidemiological Survey of Venous Disease Among General Practitioner Attendees in Different Geographical Regions on the Globe: The Final Results of the Vein Consult Program. Angiology. 2018;69(9):779-785. doi:10.1177/0003319718759834

6. Eberhardt RT, Raffetto JD. Chronic venous insufficiency. Circulation. 2014;130(4):333-346. doi:10.1161/CIRCULATIONAHA.113.006898

7. Molnár AÁ, Nádasy GL, Dörnyei G, et al. The aging venous system: from varicosities to vascular cognitive impairment. GeroScience. 2021;43(6):2761-2784. doi:10.1007/s11357-021-00475-2

8. De Maeseneer MG, Kakkos SK, Aherne T, et al. Editor's Choice – European Society for Vascular Surgery (ESVS) 2022 Clinical Practice Guidelines on the Management of Chronic Venous Disease of the Lower Limbs. Eur J Vasc Endovasc Surg. 2022;63(2):184-267. doi:10.1016/j.ejvs.2021.12.024

9. Mulia E, Dakota I, Andriantoro H, Kaligis RWM, Sunu I. Endovenous laser therapy for varicose vein. Med J Indones. 2013;22(2):117-120. doi:10.13181/mji.v22i2.539

10. Galanopoulos G, Lambidis C. Minimally invasive treatment of varicose veins: Endovenous laser ablation (EVLA). Int J Surg. 2012;10(3):134-139. doi:10.1016/j.ijsu.2012.02.013

11. Carrasco OF, Ranero A, Hong E, Vidrio H. Endothelial function impairment in chronic venous insufficiency: effect of some cardiovascular protectant agents. Angiology. 2009 Dec-2010 Jan;60(6):763-71. doi: 10.1177/0003319709332108. Epub 2009 Feb 23. PMID: 19240105.

DEFINITIONS, ACRONYMS, ABBREVIATIONS

Here is the Definitions section. This is an optional section.

Term: Definition for the term