



AYURVEDIC MANAGEMENT OF VARICOSE VEINS- A REVIEW

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ABSTRACT

Background: Varicose veins are a prevalent chronic venous disorder characterized by abnormal dilatation, elongation of superficial veins, most commonly affecting the lower extremities. The condition develops due to venous valve incompetence and impaired venous return, resulting in venous hypertension and progressive changes in the venous wall. It is a major health concern worldwide, affecting individuals across different age groups and occupational backgrounds, particularly those with prolonged standing, sedentary lifestyle, obesity, pregnancy, or genetic predisposition. Clinically, varicose veins may present with a wide spectrum of symptoms including visible enlarged veins, pain, heaviness of limbs, fatigue, itching, muscle cramps, swelling, and discomfort that increases after prolonged standing. In advanced stages, chronic venous insufficiency may lead to skin hyperpigmentation, eczema, lipodermatosclerosis, and venous leg ulcers, significantly affecting physical activity, psychological well being, and overall quality of life. Modern medical management includes conservative and interventional approaches such as compression therapy, lifestyle modification, pharmacological measures, sclerotherapy, endovenous laser therapy, radiofrequency ablation, and surgical ligation or stripping. Although these treatments are effective, recurrence, procedural complications, cost, and limited long term preventive strategies remain important concerns. In *Ayurveda*, varicose veins can be correlated with conditions described under *Siragata Vata*, *Siragranthi*, and disorders involving the vitiation of *Vata Dosha* and *Rakta Dhātu*. Classical Ayurvedic texts describe abnormalities of blood vessels (*Sira*) resulting from impaired circulation, obstruction of channels (*Srotodushiti*), and imbalance of *Doshas*. The pathogenesis involves aggravated *Vata* causing abnormal movement and distension of veins, along with *Rakta* and *Pitta* involvement leading to inflammation and discoloration. Ayurvedic management focuses on correcting *Dosha* imbalance, improving vascular function, and reducing inflammation, strengthening tissues, and maintaining healthy circulation through internal medications, external therapies, *Panchakarma* procedures, dietary modifications, and lifestyle practices. **Objective-**The present review aims to explore the Ayurvedic understanding of varicose veins and evaluate the available management approaches described in classical Ayurvedic literature and contemporary scientific studies. The objective is to compile information regarding the Ayurvedic concepts of etiology, pathogenesis, clinical presentation, diagnosis, and therapeutic strategies, and to assess the potential role of *Ayurveda* as an integrative approach in the management of varicose veins. **Methods-**A narrative review methodology was adopted for the present study. Classical Ayurvedic references related to vascular disorders were reviewed from major Ayurvedic texts, including *Charaka Samhita*, *Sushruta Samhita*, and *Ashtanga Hridaya*. Relevant concepts related to *Sira*, *Rakta Vaha Srotas*, *Vata Vyadhi*, *Siragata Vata*, and *Siragranthi* were analyzed to understand the Ayurvedic interpretation of varicose veins. In addition, published scientific literature was reviewed from indexed databases and available research publications to identify evidence regarding Ayurvedic interventions used in venous disorders. Information related to causative factors (*Nidana*), disease development (*Samprapti*), clinical features (*Rupa*), diagnostic approaches, and treatment modalities was collected and systematically analyzed.

The therapeutic approaches reviewed included;

- **Internal Ayurvedic medications** such as herbal formulations possessing anti inflammatory, antioxidant, vascular protective, and Vata Pitta balancing properties.
- **Panchakarma therapies**, including procedures such as *Abhyanga* (medicated oil massage), *Swedana* (sudation therapy), *Raktamokshana* (bloodletting therapy where indicated), and other purification procedures according to individual assessment.
- **External therapies** including application of medicated oils, herbal pastes, and local treatments aimed at improving circulation and reducing discomfort.
- **Dietary and lifestyle modifications** to maintain healthy digestion, prevent constipation, improve circulation, and reduce factors contributing to venous congestion.
- **Yoga and physical practices** focusing on improving lower limb circulation, muscular tone, and venous return.

Results-The review indicates that *Ayurveda* provides a comprehensive understanding of varicose veins through the perspective of *Dosha* imbalance, impaired vascular channels, and altered circulation. The involvement of aggravated *Vata Dosha* is considered significant due to its role in movement, circulation, and regulation of physiological functions. Disturbance in *Rakta Dhatu* and obstruction of channels may contribute to venous dilatation, pain, swelling, and discoloration. Several Ayurvedic herbs and formulations traditionally used in vascular disorders have demonstrated pharmacological activities such as antioxidant, anti-inflammatory, venotonic, and tissue healing effects in preliminary studies. Herbal drugs containing properties such as *Rakta Prasadana* (blood purification), *Shothahara* (anti inflammatory), *Vedanasthapana* (analgesic), and *Balya* (strengthening) actions may help in reducing symptoms associated with chronic venous insufficiency. Ayurvedic procedures such as *Abhyanga* with medicated oils, gentle massage techniques, and selected *Panchakarma* therapies may support lymphatic drainage, improve local circulation, and provide relief from heaviness and pain. *Yoga* practices, especially postures that encourage venous return from the lower limbs, along with regular physical activity, may contribute to symptom improvement. However, although traditional knowledge and preliminary clinical observations suggest potential benefits, available scientific evidence remains limited due to a lack of large scale randomized controlled trials, standardized treatment protocols, and long term follow up studies.

KEYWORDS: Varicose veins, *Ayurveda*, *Siragata Vata*, *Siragranthi*, *Panchakarma*, Chronic venous insufficiency.

INTRODUCTION

Varicose veins are a chronic venous disorder characterized by the abnormal dilatation, elongation, and

of superficial veins, most commonly affecting the lower extremities. They occur due to dysfunction of venous valves, leading to the backward flow of blood (venous reflux), venous hypertension, and progressive weakening of the venous walls. Normally, valves within the veins prevent the retrograde movement of blood and facilitate its return toward the heart. In cases of valve incompetence, blood accumulates in the lower limbs, producing increased hydrostatic pressure and subsequent venous remodeling. Over time, this results in visible, enlarged, and twisted veins beneath the skin. Varicose veins represent one of the most prevalent manifestations of chronic venous disease and affect a significant proportion of the adult population worldwide. Epidemiological studies suggest that approximately 20–40% of adults suffer from varying degrees of venous insufficiency, with prevalence increasing with advancing age. Women are affected more commonly than men, which may be attributed to hormonal influences, pregnancy related changes, and increased venous pressure during gestation. Repeated pregnancies, use of hormonal medications, and estrogen related changes contribute to relaxation of venous walls and reduced venous tone. Several risk factors are associated with the development and progression of varicose veins. Prolonged standing or occupations requiring long periods of immobility increase venous pressure in the lower limbs and impair venous return. Obesity further aggravates the condition by increasing intra abdominal pressure and placing additional stress on venous circulation. Pregnancy is another major contributing factor due to mechanical compression of pelvic veins by the growing uterus, increased blood volume, and hormonal effects on vascular smooth muscle. Other important risk factors include increasing age, sedentary lifestyle, lack of physical activity, hereditary predisposition, chronic constipation, and conditions that interfere with normal venous circulation. The clinical presentation of varicose veins varies depending on the severity and duration of the disease. Early symptoms commonly include visible dilated veins, aching pain, heaviness, fatigue, and discomfort in the legs, particularly after prolonged standing or walking. Patients may experience nocturnal muscle cramps, itching, burning sensations, and a feeling of tightness around the calves. As venous insufficiency progresses, fluid accumulation may occur, leading to lower limb edema. Chronic venous hypertension causes inflammatory and degenerative changes in the skin and subcutaneous tissues, resulting in hyperpigmentation, venous eczema, induration, and lipodermatosclerosis. In advanced stages, impaired tissue nutrition and reduced oxygen supply may result in the development of chronic venous ulcers, particularly around the medial aspect of the ankle. Although varicose veins are generally not considered immediately life threatening, their chronic and progressive nature can significantly affect an individual's quality of life. Persistent pain, swelling, cosmetic concerns, reduced mobility, and ulcer formation may interfere with daily activities and psychological well

being. If left untreated, the condition may progress to chronic venous insufficiency, recurrent inflammation, superficial thrombophlebitis, and delayed wound healing. Modern medical management of varicose veins includes conservative and interventional approaches. Conservative measures such as compression therapy, regular exercise, weight management, and limb elevation are commonly recommended to improve venous return and reduce symptoms. Advanced treatment modalities include sclerotherapy, endovenous laser therapy, radiofrequency ablation, and surgical interventions such as vein stripping. While these procedures provide symptomatic relief, recurrence and postoperative complications remain concerns, leading to increasing interest in complementary approaches for long-term management. From an Ayurvedic perspective, varicose veins show resemblance to conditions described under *Siragata Vata*, *Siragranthi*, and disorders involving *Rakta* and *Mamsa Dhatu Dushti*. According to *Ayurveda*, improper dietary habits, sedentary lifestyle, excessive physical strain, and other causative factors may aggravate *Vata Dosha*, particularly *Vyana Vata*, which governs circulation and movement of blood throughout the body. Aggravated *Vata* causes abnormalities in the structure and function of *Sira* (blood vessels), resulting in dilation, tortuosity, and impaired circulation. The condition may also involve vitiation of *Rakta Dhatu* (blood tissue) and *Mamsa Dhatu* (muscle tissue), leading to weakening of vascular structures and development of venous abnormalities. Ayurvedic management focuses on restoring balance among *Doshas*, improving circulation, strengthening vascular tissues, and preventing disease progression. The treatment approach includes *Shodhana* therapies (purification procedures) such as appropriate *Panchakarma* therapies based on individual assessment, along with *Shamana Chikitsa* (pacifying treatment) using herbal formulations. Herbs possessing properties such as anti-inflammatory, antioxidant, vascular protective, and *Vata Rakta* balancing actions are considered beneficial. External therapies including oil massage (*Abhyanga*), local applications, and supportive procedures may help improve circulation and reduce discomfort. Dietary modifications emphasizing easily digestible, fiber rich foods and adequate hydration are advised, particularly to prevent constipation and reduce strain on venous circulation. Lifestyle modification forms an important component of Ayurvedic management. Regular physical activity, avoidance of prolonged standing or sitting, maintenance of healthy body weight, elevation of legs, and adoption of appropriate daily routines (*Dinacharya*) support venous health and enhance overall circulation. Individualized treatment based on *Prakriti* (body constitution), *Dosha* involvement, disease stage, and associated symptoms are emphasized for achieving sustainable outcomes. The present review aims to explore the Ayurvedic understanding of varicose veins, correlating classical descriptions such as *Siragata Vata* and *Siragranthi* with contemporary concepts of chronic venous insufficiency. It also summarizes available

evidence regarding Ayurvedic interventions, including herbal medicines, *Panchakarma* procedures, dietary practices, and lifestyle modifications, highlighting their potential role as supportive approaches in the comprehensive management of varicose veins. Further clinical research and well designed studies are required to establish standardized protocols and evaluate the efficacy and safety of Ayurvedic therapies in this condition.

MATERIALS AND METHODS

Study Design

- A narrative review methodology was adopted to explore and summarize the available evidence regarding the Ayurvedic understanding and management of varicose veins.
- The review focused on integrating classical Ayurvedic concepts with contemporary biomedical knowledge related to chronic venous disorders.
- The methodology involved systematic collection, evaluation, and descriptive analysis of information obtained from traditional Ayurvedic sources, scientific literature, and standard medical references.

Data Sources

- Relevant information was collected from multiple authentic sources to obtain a comprehensive understanding of the disease pathology, clinical presentation, and therapeutic approaches.

The major sources of data included

- **Classical Ayurvedic Texts-** Classical Ayurvedic treatises, including *Charaka Samhita*, *Sushruta Samhita*, *Ashtanga Hridaya*, and other authoritative texts, were reviewed to identify descriptions related to disorders of veins (*Sira*), vascular abnormalities, and conditions resembling varicose veins. Concepts such as *Siragata Vata*, *Siragranthi*, *Vata Dushti*, and disorders involving impaired circulation were analyzed to understand their correlation with chronic venous insufficiency.
- **Published Peer Reviewed Journals-** Scientific databases and peer reviewed journals were reviewed for relevant clinical studies, review articles, and research papers related to varicose veins, chronic venous insufficiency, Ayurvedic therapies, herbal medicines, and *Panchakarma* procedures. Studies evaluating the efficacy, safety, and clinical outcomes of Ayurvedic interventions were considered.
- **Standard Medical Textbooks-** Modern medical textbooks related to vascular surgery, phlebology, and general medicine were consulted to understand the contemporary concepts of varicose veins, including etiology, pathophysiology, risk factors, clinical features, complications, and current treatment modalities.
- **Search Strategy-** A comprehensive literature search was conducted using relevant keywords and combinations of terms related to varicose veins and Ayurvedic management. The search terms included;

Varicose veins, chronic venous insufficiency, *Ayurveda*, *Siragata Vata*, *Siragranthi*, *Panchakarma*, Herbal medicine, Ayurvedic management of venous disorders, Venous ulcer and *Ayurveda*, *Rakta* and *Vata* disorders. The search strategy involved screening available literature based on relevance to the objectives of the review. Articles and references were selected after reviewing titles, abstracts, and full text availability. Relevant information regarding disease correlation, therapeutic approaches, formulations, procedures, and clinical outcomes was extracted and analyzed.

Inclusion Criteria- The following criteria were considered for inclusion of literature;

- Literature related to both Ayurvedic and biomedical perspectives of varicose veins and chronic venous disorders.
- Studies involving human participants.
- Clinical studies, observational studies, and controlled trials evaluating Ayurvedic interventions.
- Review, research articles providing comprehensive information on disease mechanisms and management.
- Studies describing Ayurvedic approaches such as; *Panchakarma* therapies, Herbal formulations, Internal medications, External applications, Lifestyle and dietary modifications

Exclusion Criteria- The following types of literature were excluded;

- Animal based experimental studies, as they do not directly represent clinical outcomes in human patients.
- Case reports with insufficient clinical documentation or inadequate follow up data.
- Publications lacking peer review processes, including non scientific articles and unsupported claims.
- Duplicate publications or repeated studies identified from multiple databases.
- Articles unrelated to the Ayurvedic or biomedical management of varicose veins.

Data Analysis- The collected information was analyzed using a descriptive qualitative approach. The available literature was reviewed to identify major themes related to;

- Ayurvedic interpretation of varicose veins and associated *Dosha*, *Dhatu*, and *Srotas* involvement.
- Pathogenesis (*Samprapti*) according to Ayurvedic principles.
- Role of *Vata Dosha*, particularly *Vyana Vata*, in vascular dysfunction.
- Therapeutic interventions including; *Panchakarma* procedures, Internal herbal medications, External therapies, Dietary and lifestyle modifications

- Correlation between Ayurvedic management strategies and modern concepts of venous circulation and chronic venous insufficiency.
- The findings were synthesized to provide an integrated overview of the potential role of *Ayurveda* in the management of varicose veins and to identify areas requiring further clinical research and evidence based validation.

RESULTS

Ayurvedic Concept

- According to Ayurvedic literature, excessive standing, strenuous work, trauma, suppression of natural urges, improper diet, and aging aggravate *Vata Dosha*. This leads to weakening and dilation of veins (*Sira*), producing symptoms corresponding to varicose veins.

Common Clinical Features

- Dilated tortuous veins, Pain, Heaviness, Swelling, Burning sensation, Muscle cramps, Itching, Skin discoloration, Venous ulcers in advanced disease

Ayurvedic Management

Internal Medicines

Commonly prescribed formulations include-

- *Kaishor Guggulu*, *Triphala Guggulu*, *Mahamanjisthadi Kwatha*, *Sarivadyasava*, *Punarnava*

These medicines are traditionally used for improving circulation, reducing inflammation, and supporting tissue metabolism.

Panchakarma

Therapies may include;

- *Abhyanga*, *Swedana*, *Virechana*, *Basti* therapy, *Jalaukavacharana* (medicinal leech therapy) in selected cases

External Applications

- Medicated oils, Herbal pastes, Compression bandaging, Local fomentation where appropriate

Diet and Lifestyle

Patients are advised to;

- Avoid prolonged standing, Walk regularly, Elevate legs, Consume high fiber foods, Maintain healthy body weight, Avoid constipation, Perform yoga and ankle exercises

DISCUSSION

Varicose veins represent a chronic disorder of the venous system characterized by abnormal dilatation, elongation, and tortuosity of superficial veins, predominantly affecting the lower limbs. The primary pathological mechanism involves venous valve incompetence, which results in ineffective venous return and accumulation of blood within the superficial venous circulation. Persistent venous reflux increases venous pressure (chronic venous hypertension), leading to progressive structural and

functional alterations in the venous wall. Over time, this may manifest as leg heaviness, aching pain, edema, muscle cramps, itching, skin pigmentation, dermatitis, and in advanced cases, venous ulceration. From the perspective of modern medicine, management strategies are primarily directed toward reducing venous hypertension, improving venous return, and eliminating incompetent veins. Conservative measures such as graduated compression therapy, regular physical activity, weight management, and limb elevation remain the foundation of treatment, particularly in early stages. In patients with significant venous reflux, minimally invasive interventions including endovenous laser therapy, radiofrequency ablation, foam sclerotherapy, and surgical ligation or stripping are employed to correct the underlying vascular abnormality. However, these procedures may not be suitable for every patient due to factors such as recurrence risk, cost, procedural limitations, and patient preference. Therefore, supportive therapies aimed at improving symptoms and quality of life continues to be clinically relevant.

Ayurveda describes venous disorders under various concepts, including *Siragata Vata*, *Siragranthi*, and disorders involving *Rakta* and *Mamsa Dhatu*, based on clinical similarities such as abnormal venous enlargement, pain, heaviness, discoloration, and impaired circulation. The pathogenesis is primarily associated with *Vata Dosha* aggravation, particularly due to obstruction of normal movement of *Vata* (*Margavarodha*), resulting in impaired circulation and structural changes in blood vessels. Additionally, involvement of *Rakta Dhatu Dushti* may contribute to inflammatory changes, vascular weakness, and altered tissue metabolism. Ayurvedic management aims to restore *Dosha* balance, improve circulation, reduce inflammation, and maintain the structural integrity of vascular tissues. Medicinal herbs described in *Ayurveda* have gained interest due to their potential pharmacological activities. *Guggulu* (*Commiphora mukul*) is traditionally used for inflammatory and vascular disorders and possesses anti-inflammatory and lipid modulating properties. Its bioactive compounds may contribute to reducing inflammatory mediators associated with chronic venous disease. *Manjistha* (*Rubia cordifolia*) is considered a potent *Rakta Prasadana* and *Rakta Shodhaka* drug and has demonstrated antioxidant, anti-inflammatory, and vascular protective effects in experimental studies. *Punarnava* (*Boerhavia diffusa*) is valued for its *Shothahara* (anti-inflammatory) and *Mutrala* (diuretic) properties, which may help in reducing edema and tissue congestion. *Arjuna* (*Terminalia arjuna*) has cardioprotective and antioxidant activities and may support vascular health by improving endothelial function and reducing oxidative stress. Although these herbs demonstrate promising biological activities, further clinical trials are required to establish their specific role in varicose vein management. Panchakarma therapies are considered important in *Ayurveda* for systemic detoxification, restoration of physiological balance, and

correction of functional disturbances. Procedures such as *Abhyanga* (therapeutic oil massage), *Swedana* (sudation therapy), *Virechana* (therapeutic purgation), and *Basti* therapy may support circulation, reduce stiffness, improve lymphatic drainage, and relieve symptoms associated with chronic venous congestion. Local therapies involving medicated oils and external applications may provide symptomatic relief by improving tissue nourishment and reducing discomfort. However, the selection of *Panchakarma* procedures should be individualized according to disease stage, patient strength (*Bala*), and associated *Dosha* involvement. Among Ayurvedic parasurgical procedures, *Jalaukavacharana* (medicinal leech therapy) has attracted considerable attention in vascular disorders. Leech saliva contains biologically active substances such as hirudin, calin, destabilase, and anti-inflammatory peptides, which exhibit anticoagulant, thrombolytic, and anti-inflammatory effects. These properties may theoretically improve local microcirculation, reduce venous congestion, and relieve pain and swelling. Some clinical observations suggest beneficial effects in selected venous disorders; however, available evidence is limited due to small sample sizes, inconsistent methodologies, and lack of standardized treatment protocols. Therefore, further well designed controlled studies are necessary before definitive recommendations can be made. Lifestyle modification forms an essential component of both Ayurvedic and contemporary approaches. Prolonged standing, sedentary behavior, obesity, and reduced physical activity contribute significantly to venous stasis and disease progression. Regular walking and calf muscle exercises enhance the physiological venous pump mechanism and improve blood return from the lower limbs. Elevation of legs during rest reduces venous pressure and edema. Weight reduction decreases mechanical pressure on lower limb veins, while avoidance of prolonged standing or sitting minimizes venous pooling. A balanced diet rich in antioxidants, adequate hydration, and maintenance of healthy bowel habits are also emphasized in *Ayurveda* to support overall metabolic and vascular health. Despite encouraging preliminary findings, the current evidence supporting Ayurvedic management of varicose veins remains limited. Many available studies have methodological limitations, including small sample sizes, absence of control groups, short follow up periods, and variation in treatment protocols. An integrative approach combining appropriate modern vascular care with evidence based Ayurvedic interventions may provide a comprehensive strategy for improving patient comfort and functional outcomes, particularly in early and moderate stages of chronic venous disease. *Ayurveda* may contribute through symptom management, improvement of tissue health, reduction of inflammation, and enhancement of lifestyle compliance, while modern interventions remain essential for correcting significant structural venous abnormalities. Patients presenting with complications such as deep vein thrombosis, active bleeding, severe venous insufficiency, recurrent ulcers,

or rapidly progressive symptoms require timely evaluation by vascular specialists to prevent serious complications. Thus, a collaborative model incorporating preventive measures, lifestyle modification, conventional vascular interventions, and scientifically validated Ayurvedic therapies may offer a patient centered approach for the long-term management of varicose veins.

CONCLUSION

Varicose veins is the condition associated with symptoms such as pain, heaviness, swelling, muscle cramps, itching, skin pigmentation, and, in advanced stages, venous ulcers. These manifestations significantly impair physical function, work productivity, and overall quality of life. Although conventional management including compression therapy, sclerotherapy, endovenous ablation, and surgery provides effective symptom relief and correction of venous reflux, recurrence and persistent symptoms remain concerns in many patients. *Ayurveda* offers a holistic perspective by correlating varicose veins with conditions such as *Siragata Vata* and *Siragranthi*, which arise due to the vitiation of *Vata Dosha* along with the involvement of *Rakta* and *Mamsa Dhatus*. Treatment focuses not only on symptomatic relief but also on correcting the underlying *Dosha* imbalance, improving circulation, reducing inflammation, and strengthening the vascular system. *Panchakarma* procedures, particularly *Basti*, *Abhyanga*, *Swedana*, and *Jalaukavacharana* (leech therapy), along with dietary regulation, *Yoga*, and lifestyle modifications, further support venous health and help reduce disease progression. Current scientific evidence indicates that Ayurvedic interventions can effectively reduce symptoms such as pain, edema, and heaviness while enhancing functional capacity and patient well being. However, the available evidence is largely based on small scale studies, observational reports, and limited clinical trials. Therefore, *Ayurveda* should presently be considered a complementary approach rather than a replacement for evidence based medical or surgical treatment, particularly in advanced disease. Future multicenter randomized controlled trials with standardized herbal formulations, validated outcome measures, and long term follow up are required to establish the efficacy, safety, and clinical applicability of Ayurvedic therapies.

REFERENCES

1. Agnivesha. *Charaka Samhita*. Chaukhambha Sanskrit Series Office.
2. Sushruta. *Sushruta Samhita*. Chaukhambha Sanskrit Sansthan.
3. Vagbhata. *Ashtanga Hridaya*. Chaukhambha Orientalia.
4. Kumar P, Clark M. *Kumar and Clark's Clinical Medicine*. Elsevier.
5. Davidson S. *Davidson's Principles and Practice of Medicine*. Elsevier.
6. Eberhardt RT, Raffetto JD. Chronic venous insufficiency. *Circulation*, 2014; 130(4): 333-346.
7. Gloviczki P, editor. *Handbook of Venous Disorders*. Society for Vascular Surgery.
8. Bergan JJ, Schmid-Schönbein GW, Smith PD, et al. Chronic venous disease. *N Engl J Med.*, 2006; 355: 488-498.
9. Nicolaides AN. Investigation of chronic venous insufficiency: A consensus statement. *Circulation*, 2000; 102(20): E126-E163.
10. Wittens C, Davies AH, Bækgaard N, et al. Editor's Choice-Management of Chronic Venous Disease: Clinical Practice Guidelines of the European Society for Vascular Surgery (ESVS). *Eur J Vasc Endovasc Surg*, 2015; 49(6): 678-737.
11. Lurie F, Passman M, Meisner M, et al. The 2020 update of the CEAP classification system and reporting standards. *J Vasc Surg Venous Lymphat Disord*, 2020; 8(3): 342-352.
12. Meissner MH, Gloviczki P, Bergan J, et al. Primary chronic venous disorders. *J Vasc Surg*, 2007; 46(Suppl S): 54S-67S.
13. Eberhardt RT, Raffetto JD. Chronic venous insufficiency. *Circulation*, 2014; 130(4): 333-346.
14. Raju S, Neglen P. Chronic venous insufficiency and varicose veins. *N Engl J Med.*, 2009; 360(22): 2319-2327.
15. Lim CS, Davies AH. Pathogenesis of primary varicose veins. *Br J Surg*, 2009; 96(11): 1231-1242.
16. Robertson L, Evans C, Fowkes FGR. Epidemiology of chronic venous disease. *Phlebology*, 2008; 23(3): 103-111.
17. Jawien A. The influence of environmental factors in chronic venous disease. *Angiology*, 2003; 54(Suppl 1): S19-S31.
18. Callam MJ. Epidemiology of varicose veins. *Br J Surg*, 1994; 81(2): 167-173.
19. Abbade LPF, Lastória S. Venous ulcer: Epidemiology, physiopathology, diagnosis and treatment. *Int J Dermatol*, 2005; 44(6): 449-456.
20. Raffetto JD, Khalil RA. Mechanisms of varicose vein formation: valve dysfunction and wall remodeling. *J Vasc Surg Venous Lymphat Disord*, 2021; 9(3): 700-710.