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INSIGHT INTO VARICOSE VEINS: CAUSES, PROGRESSION STAGES, AND LATEST TREATMENTS MODERN AND AYURVEDA PROSPECTIVES

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Abstract
The purpose of this article is to assess the causes, stages, and available therapies for varicose veins. Generally, varicose veins are convoluted, twisted, swollen veins that affect blood vessels and are typically present in the lower limbs. It results in painful swelling, blood clots, deformity, and incapacity, affects people of all ages more frequently, and hurts a person's proficiency, productivity, and quality of life. Normally valves in the vein keep blood flowing towards the heart, so the blood does not collect in one place. In Varicose veins, valves are either damaged or missing. This causes the vein to become filled with blood, particularly standing. Obesity and prolonged standing are the main causes of varicose veins. This review describes the stages, causes, and therapy of Varicose veins. Numerous therapies, including endovascular, surgical, and *Jalaukaavacharan* (Leech Therapy) in Ayurveda, enhance quality of life and lessen complication rates. In addition to these treatment options, daily yoga, and exercise can help prevent varicose veins. Varicose veins are typically a benign condition that can cause several issues that can negatively impact a person's quality of life and

possibly result in life-threatening consequences. Venous ulcer is the varicose vein consequence that occurs most frequently. The therapies are not only costly but also come with several hazards for the patient, including increased recurrence rates and vascular or nerve problems.

Keywords: Varicose vein, Sirajagranthi, Varices, Jalaukaavacharan, Deep vein thrombosis, Raktamokshan, hirudotherapy.

Introduction: About 30% of people may experience varicose veins at some point in their lives. [1,2] This illness affects 40% of males and 32% of women varying the ages between 18 and 64.[3] Just beneath the epidermis, these veins grow in the legs.[4] Legs are the most prevalent location for varicose veins. Blood buildup in the superficial veins of the legs causes them to expand. Sometimes after that, these veins enlarge, ascend, and become visible through the skin as purple or blue in color. In comparison to varicose veins, spider veins are less severe.

If neglected, they cause skin discoloration, bleeding, and ulcers. A persistent venous insufficiency may be present if the varicose veins are severe. Blood flow from the legs to the heart is impacted by this disorder. Blood clots may be more likely to form in people with varicose veins. One common clinical sign of chronic venous disease is varicose veins.[5] Despite the cosmetic issues created by varicose veins, it is important to evaluate the associated superficial axial venous reflux.[6] The varicose vein entity encompasses a great range of clinical and pathological symptoms, from modest leg itchiness to swelling and non-healing ulcers. [7,8,9]

The Varicose vein is referred to *as Sirajagranthi* in Ayurveda. Blood veins in this area are swollen, fibrosed, and tortuous. The veins in the lower leg, particularly in the calf and ankle, are fatigued in re-sending the blood upwards due to prolonged standing, weight carrying, exhaustion, and long walks. As a result, the veins swell, widen, and lose their capacity to contract or return to their initial state. *Vata* and *Rakta* are the main vitiated *Doshas* in the illness of *Sirajagranthi*. According to Ayurveda, it is *Krichhsadhya Vyadhi* (curable but with difficulty) in the early stages and *Asadhya* (non-curable) in the late stages.[10] *Siraakunchana* (vein dilation) and *Vakreekarana* (deformity/ tortuosity) are the results of *Rakta* accumulation and *Vata* vitiation in the *Siras* (veins). This leads to *Shoola* (pain) and *Shotha* (swelling) in that area due to the local congestion. *Acharya Sushruta*, had access to both surgical and Para surgical techniques, creating what has been referred to as a "four-fold approach" to treating illnesses. "*Shastra karma* (involves use of surgical instruments), *Kshara karma* (use of alkaline material), *Agni karma* (thermal-cautery), and *Raktamokshana karma* (bloodletting)" are the four procedures.[11]

The use of alkaline material for cauterization, the use of thermal cautery to burn away unwanted tissue, and finally the use of various techniques to release impure blood from the body are all examples of this. Varicose veins, also known as *Siraj granthi*, are successfully treated using this four-step strategy.

The terms "varicose vein" was searched for in the online databases PubMed, PubMed Central, and Google Scholar. The evaluation comprised experimental research, case studies, and case series written in English that discussed the causes and remedies for varicose veins. The review did not include studies whose abstracts were unavailable or those written in languages other than English. 53 papers in total were chosen for the final evaluation after the inclusion and exclusion criteria were used, along with the removal of duplicate studies.

Definition and classification

There is still a lot of misunderstanding surrounding the terms "chronic venous disorder", "chronic venous disease" and "chronic venous insufficiency". Leo Widmer has previously taught us the critical importance of distinguishing between a venous condition and a venous disease, both for the affected

person and the health economy as a whole.[12]

Chronic venous disorder: The complete range of morphological and functional disorders of the venous system is encompassed in this term.
Chronic venous disease: Any persistent morphological and functional defects of the venous system characterized by symptoms and/or indicators requiring additional testing and/or treatment
Chronic venous insufficiency: An acronym for an advanced form of CVD that refers to venous system dysfunctions that include skin changes, edema, or venous ulcers.

CEAP clinical classification of chronic venous disease [13]
C E A P stands for clinical symptoms, etiology, anatomic distribution, and pathophysiology.

Table 1. CEAP classification

C Clinical signs (C0-C6), with (A) for asymptomatic patients and (S) for those with symptoms.
E Etiology (congenital (Ec), primary (Ep), secondary (Es), no venous cause identified (En)
A Anatomical distribution (superficial (As), deep (Ad), or perforator (Ap), separately or together and no identified venous site (An)
P Pathophysiologic Dysfunction (reflux (Pr) or obstruction (Po), alone or in combination), no venous pathophysiology identified (Pn)

Table 2. Clinical classes of CEAP

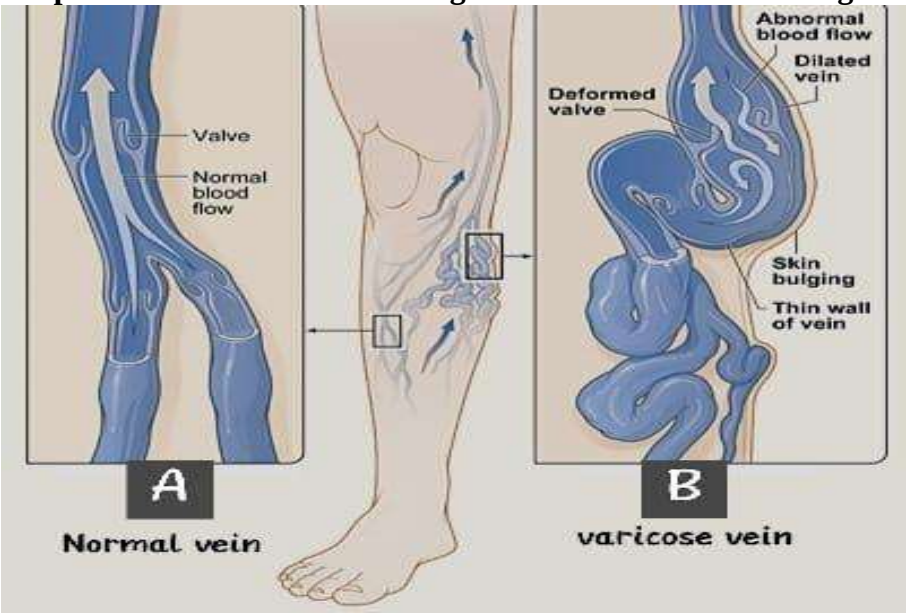
C1 Telangiectasias or reticular veins
C2 Varicose veins
C2r Recurrent varicose veins
C3 Edema
C4 Changes in the skin and subcutaneous tissue secondary to chronic venous disease
C4a Pigmentation and eczema
C4b Lipodermatosclerosis or atrophine blanche
C4c Corona phlebectatica
C5 Healed venous ulcer,
C6 Active venous ulcer
C6r Recurrent active venous ulcer

Anatomy
The superficial (As), deep (Ad), or perforating veins (Ap) anatomic locations of venous diseases are recommended by the CEAP agreement.
Any combination may involve more than one system. An additional 18 vein segment numeric list is added for thorough reporting.[14]
Another consensus panel created a complete nomenclature of the lower extremity veins that has been approved by anatomists and doctors in terms of terminology. This document has also evolved into the standard for reporting Duplex venous system examinations.[15]

Pathophysiology
In the pathophysiologic classification of CEAP, obstruction (Po), reflux (Pr), or both (Pr, o) are distinguished. These descriptors are used in conjunction with the anatomic distribution. The most important practical method to confirm reflux or obstruction in a particular venous segment is a duplex study.[16] Outflow blockages in the iliac vein, which may also have a "permissive role" in the development of venous reflux, cause leg swelling.[17] However, light that enters the lower thigh is the most important factor in skin changes and ulceration. When standing up straight, gravity must be

overcome by vein return from the lower extremities. Muscle contractions in a healthy person pump blood upward, while correct vein valves stop blood from flowing backward after gravity. Walking consequently results in a reduction in volume and pressure in the lower leg veins. Changes in the microcirculation, which happen when valves are dysfunctional and lead to an overload of blood volume in the distal veins, are what lead to edema, atypical skin, and ulceration.

Figure 1. (A)A normal vein with a working valve and consistent blood flow. (B) A varicose vein with thin, stretched walls, an irregular blood flow, and a malformed valve. The location of possible varicose veins in a leg is shown in the middle image.



Epidemiology

The American Venous Forum4 estimates that 23% of adults in the US suffer from varicose veins. According to Gloviczki et al., 20,000 new cases of venous ulcers are detected in the United States every year, and 5% of patients with varicose veins also have skin abnormalities, venous edema, and ulcerations. About 300,000 outpatient appointments are scheduled each year for varicose vein patients; 10% of these patients need hospitalization. Women seem to be more prone to varicose veins than men are.[18] In Western nations, varicosities affect 20% of males and 30% of women on average. The difference in prevalence between sexes is thought to be caused by the higher prevalence of varicose veins during pregnancy as a result of increased venous stasis. Due to the uterus' increased weight on the pelvic veins and inferior vena cava, which prevents blood return from the lower extremities, blood pools in the legs, and varicosities form during pregnancy.[19]

Causes of varicose:

1) **Standing for a longer duration of time-** i.e., Long-standing, standing jobs increase the volume and pressure of blood in the lower limbs due to gravity. It has been discovered that having excess body weight and standing for long periods at work both contribute to varicose veins. [20-25]
2) **Pregnancy-**The body's blood volume rises during pregnancy, and there is also an increase in uterine blood loss. As a result, there is an increase in pelvic venous pressure, iliac vein engorgement, and a decrease in the capacity of the lower extremity to collect veins to drain blood. More than 30% extra blood is produced during pregnancy, primarily as a result of plasma activity. [26-35]
3) **Age over 50 years-** Vein valves deteriorate with age due to wear and strain. The tissues in vein walls become less elastic as age increases, which also contributes to the failure of the valve system. Roughly one-third of men and women between the ages of 18 and 64 showed trunk varices. [36-41]

4) **Obesity-** Obese people are more prone to have varicose veins, especially pregnant women.[42] Obesity can widen the femoral vein's diameter and lessen blood flow, which raises the possibility of deep vein thrombosis.[43] Varicose veins are also influenced by other variables, such as aberrant vein stretching and constriction brought on by estrogen.[44] The World Health Organization defines obesity as having a BMI of 35.0–39.9 kg/m2 or above, which is associated with varicose veins, particularly in women. Overweight is defined as having a BMI of 30 kg/m^2 or higher. [45-48] Veins may experience increased pressure from carrying blood back to the heart due to being overweight. Because of their physical weight, Varicose veins are more prone to appear in women. [49]
5) **Family history-** This disorder may run in families (runs in families). It's regarded as a basic case of varicose veins. i.e., a genetic venous wall weakening that affects certain members of the same family. [50-54] Tobacco smoking- Smoking contributes significantly to oxidative stress, [55] hypoxia [56, 57] and endothelial damage [58] by the fixation of carbon monoxide and nitric oxide to hemoglobin. One of the many physio-pathological factors that contribute to the onset of lower limb venous insufficiency is hypoxia, which is associated with precapillary sphincter closure and causes edema. [59] Endothelial cells, leukocytes, and the generation of reactive oxygen may play a role in the cellular and molecular pathways that cause tissue injury. [60]
6) **Gender-** The walls of the vein can expand due to female hormones. Because of changes in hormone levels, varicose veins are more prevalent in pregnant women, women who take birth control, and women who are going through menopause. Because of their higher systolic blood pressure, decreased physical activity, and increased smoking, women suffer varicose veins more frequently than males. [61-66]
7) **Lack of movement-** prolonged sitting can force the vein to work more to pump blood to the heart, especially when legs are bent or crossed. Typically, it is caused by weak vein walls and valves. There are tiny one-way valves inside the vein that open to let blood flow and seal to stop it from returning. Sometimes the vein's walls stretch and lose their elasticity, weakening the valves in the process. If this occurs, the blood builds up in your veins, causing them to swell and enlarge. [67-70]
8) **Hereditary-** The FOXC2 gene, which can cause venous valve failure, is frequently linked to varicose veins which are thought to be inherited. [71] A rare genetic condition termed lymphoedema distichiasis, which frequently includes varicose veins, can be brought on by FOXC2 mutations. [72] FOXC2 mutations may potentially contribute to the advancement of varicose veins in people who are not afflicted. The TM gene and the C677T MTHFR functional polymorphism have both been connected to the development of varicose veins. This polymorphism increased the prevalence of varicose veins disease in those who had it. In individuals with both diseases, venous thrombosis (VT) has also been connected to vein varices. [73-76]

Hetu (Causative factors) of Siragranthi: [77]

a. Shramatiyogat (Weak person working above their capacity).
b. Adhwagamana (weak person who walks longer).
c. If he dips his leg into the water, particularly if it's cold.
d. A person who exercises vigorously. *Bharavahana* (weight lifting)

Vata becomes vitiated in the body as a result of a variety of Vata-vitiating stimuli, and this vitiated Vata Dosha obtains Sthansanshraya (localization) in various bodily regions. According to Acharya Sushruta, the vitiated Vata Dosha builds up in one area or one Dhatu, causing symptoms like Shotha (inflammation), Shoola (pain), etc. [78] When vitiated Vata Dosha is not properly managed at the same time, it spreads to other bodily areas and, if left untreated, causes several illnesses including Siragranthi (i.e. Varicose vein). [79]

Clinical examination

Presentation

Only a clinical examination is frequently able to diagnose varicose veins. Asymptomatic patients who are bothered by the aesthetics of their lower limb veins may go to the doctor. Patients may also be concerned about symptoms linked to CVD or varicose veins, on the other hand. These warning signs and symptoms include leg swelling, itchy skin, restless legs, fatigue, and exhaustion in the legs, as well as general lethargy and burning, tingling, aching, and stiffness. [80] The discomfort could be alleviated by relaxing or raising the lower limbs. Heat or the legs being in a dependent position may also make them worse.

In addition, varicosities may also result in venous claudication, a condition in which discomfort experienced during and after activity is reduced by resting or elevating the legs. In later stages of the illness, patients may also develop skin abnormalities such as dermatitis, hyperpigmentation, atrophy blanche, lipodermatosclerosis and, ulceration. [81]

History and physical examination

It is essential to have the patient's complete and detailed medical history to help with the diagnosis of primary or secondary varicose veins. DVTs or thrombophlebitis in the past, thrombophilia, current medications (especially oral contraceptives), smoking, prior and ongoing pregnancies, and a family history of varicose veins are all pertinent details to include in the history. Varicose vein patients may be frustrated with their restricted ankle movement. [82] While the patient is standing the lower limbs are examined and palpated. The legs are examined for indurations, dilated veins, dermatitis, atrophied blanche, eczema, hyperpigmentation, active or healed ulcerations, dilated veins, spider veins, lipodermatosclerosis or telangiectasia, pitting or nonpitting edema, telangiectasia, and any other skin discolorations. Thin, shiny skin that may be blue-brown in hue or unevenly pigmented is a hallmark of dermatitis, often known as stasis dermatitis. It is brought on by venous insufficiency that worsens over time and affects tissue nutrition. At the site of dermatitis and skin discoloration, venous ulcerations may form as a result of trauma. [83] While the patient is upright, one hand is placed at the distal end of the varicose vein, and the other hand compresses the vein 15 to 20 cm proximally. When veins have working valves, the distal end does not alter, and there is no discernible wave transmission from the proximal to the distal end. However, according to Jarvis, if the valves are failing, a wave transmission can be felt as a discernible pulsation during the manual compression test near the distal end of the varicose veins. [84]

Stages of varicose vein: In the early stages,

Spider veins-

1. Spider veins can have arterial or venous origins and are caused by anomalies in the skin's horizontal vascular plexus of capillary loops. [85]
2. Near the skin's surface, these tiny, web-like veins or thin blood vessels can be found.
3. Typically, there are flat, tiny, reddish-purple veins that are not always associated with varicose veins and can be seen on the legs, ankles, neck, face, and other locations.
4. They are made up of feeder veins and ectatic venous sprouts in the reticular dermis and typically range in depth from 180 microns to 1 mm in the legs. [85]

Varicose vein-

1. The Varicose vein, as opposed to the spider vein, enlarges and becomes ropey.
2. When varicose veins initially appear, patients become cognizant of their vein illness. Not only are varicose veins uncomfortable, but they also look repulsive. [86]
3. Many individuals seek medical attention when varicose veins result in leg pain, itching, swelling, tingling, swollen ankles, agitation, and an overall feeling of heaviness.

The later stages of vein disease:

1. **Skin changes and swelling –**

- Leg swelling and skin discoloration are the consequences of painful varicose veins.
- The body cannot absorb fluid when leg veins are not functioning properly, which frequently results in swollen legs. The skin tone of the legs might also change as a result of internal fluid accumulation, especially around the ankle.
- At this stage, it is easier to get open sores, sores that take a while to heal, or sores that recur. [86]

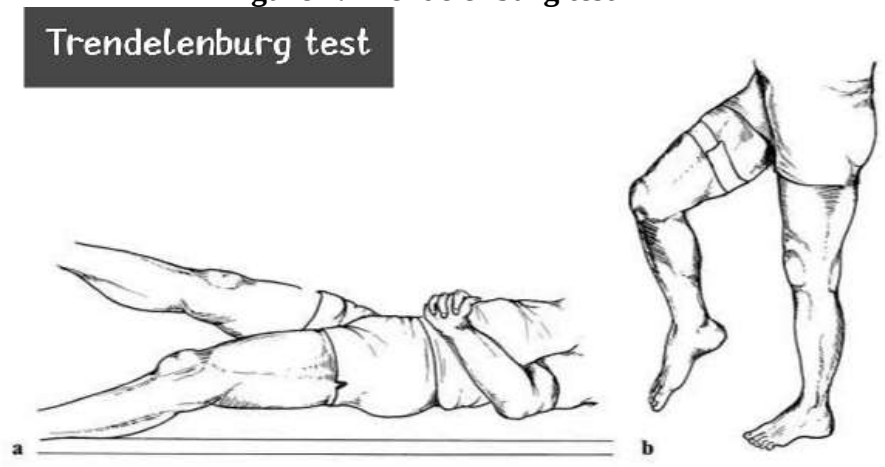
2. **Venous leg ulcer -**

- Skin darkening and limb edema are typically initiated by these ulcers. Insufficient blood flow inside the vein at this time prevents the skin from receiving the nutrients it needs to heal.
- Wounds on the skin can take a very long time to heal or never heal. Leg ulcers caused by venous blood flow can become debilitating, chronic illnesses. Moreover, because they are open sores, they increase pain and the risk of infection by spreading germs to the legs.
- This can seriously harm the lymphatic system if left untreated. Lipid deposition and subsequent vein wall deterioration can result from a malfunctioning of the lymphatic system. [87]

Diagnostic technique

Trendelenburg test: If varicose veins are found, the Trendelenburg test can be used to check the venous system and assess the severity of the condition. To determine whether the superficial venous system is involved, the patient is lying on his or her back with the affected leg raised. A tourniquet is wrapped around the patient's upper thigh on the affected leg to occlude the GSV. The patient's leg is then held raised as the blood from the venous system is allowed to drain. Standing up again causes the veins in the lower leg to fill up. [88] While the tourniquet is still in place, slow refilling that lasts for 30 seconds or more is normal and indicative of a healthy venous system. The tourniquet is removed, but abnormal test results that indicate the presence of varicose veins include a sudden excess filling of the superficial veins and a quick refilling of the superficial veins while it is still on. [88]

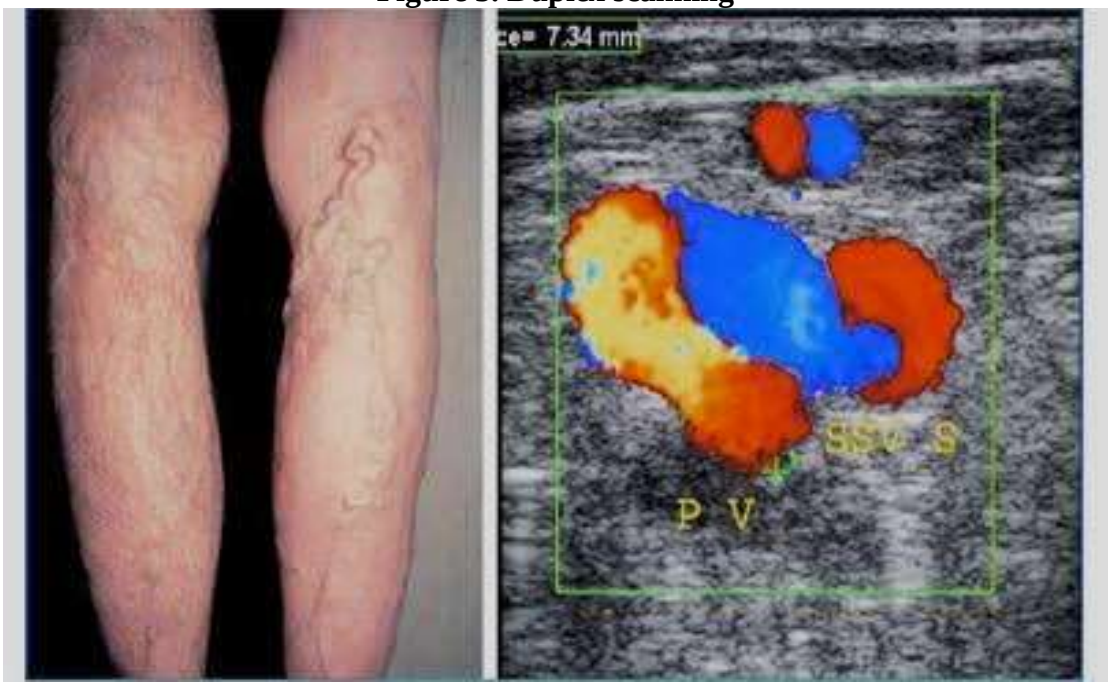
Figure 2. Trendelenburg test



Duplex scanning: Duplex ultrasound scanning is currently the gold standard and initial diagnostic method for examining the lower extremities in individuals with suspected varicose veins or CVD. [89] Duplex ultrasound screening is a low-cost, non-invasive test that can identify venous obstructions, turbulence, and the direction of venous blood flow. According to a recent study, a blockage in the deep veins would interfere with any therapy for superficial varicose veins and would have a detrimental effect on long-term outcomes. For this reason, it is critical to check the DVS for any blockages, particularly in patients who have a history of DVTs. For any reflux, the venous blood

flow direction is also evaluated. Retrograde, or backward, flow that lasts less than 0.5 seconds is considered normal (i.e., there is no reflux); however, retrograde flow that lasts more than 0.5 seconds is considered a sign of reflux and may indicate the presence of inefficient valves or veins. [89]

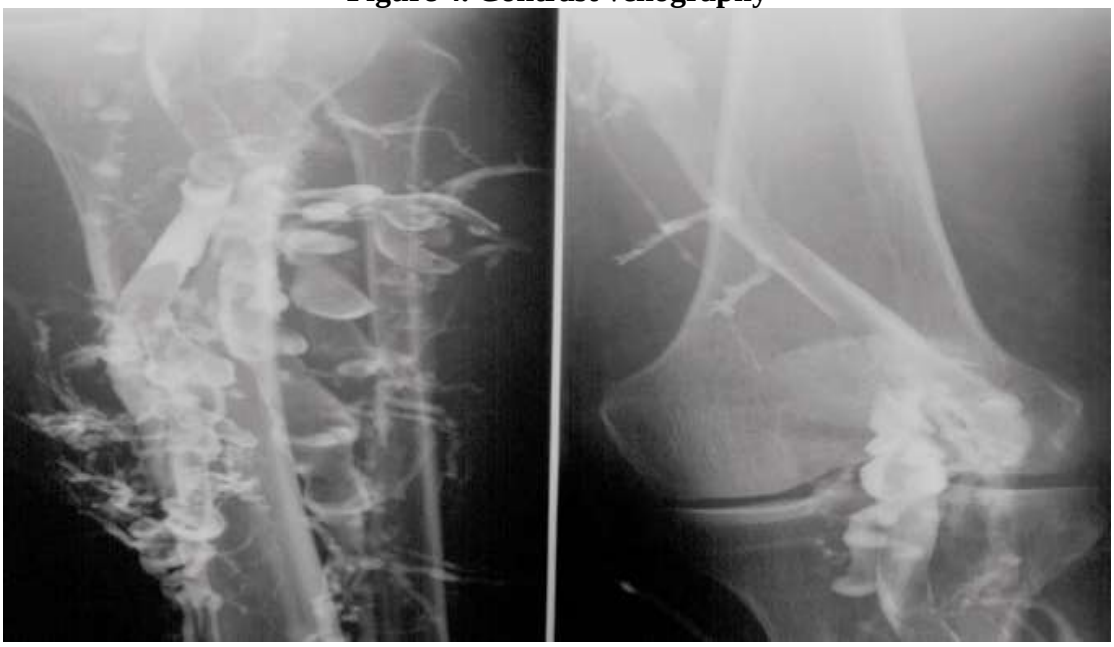
Figure 3. Duplex scanning



Imaging studies:

To detect venous blockages and other venous abnormalities in individuals with varicose veins, duplex scanning is typically sufficient. However, in more advanced stages of CVD, contrast venography, CT scans, and magnetic resonance imaging (MRI) may be required. These studies may also be used if the patient needs surgical treatment.

Figure 4. Contrast venography

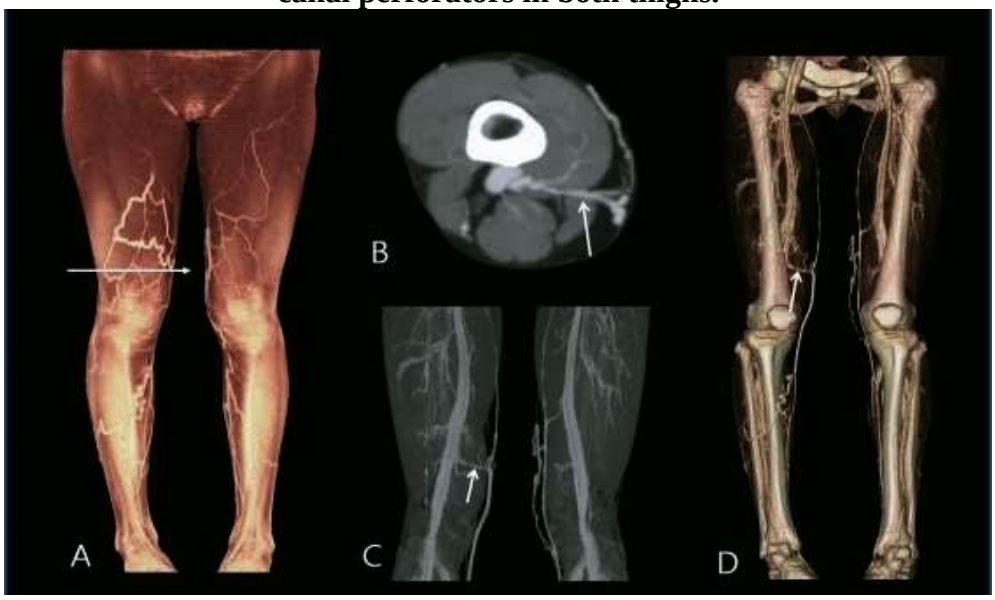


Contrast venography: Contrast venography should be performed on patients who require endovenous or open surgery, have post-thrombotic syndrome, or have profound venous obstructions.

Venography, which involves injecting contrast material into the venous system to identify the precise locations of obstructions, is performed when venous anomalies are detected. Patients getting contrast venography need to have their sensitivities assessed, especially if they have iodine allergies. When determining if a patient needs surgical therapy or has varicosities brought on by DVS obstructions, contrast venography may be useful in evaluating the patient for blockages discovered in the iliac vein. [90]

CT scan and MRI: Duplex screening may commonly identify any blockages or venous irregularities, thus patients with simple varicose veins shouldn't get CT or MRI scans very often. However, CT scans and MRIs may help identify obstructions in the pelvic venous system or the iliac vein when proximal obstructions are suspected. These tests can identify left renal vein compression, pelvic venous congestion syndrome, and gonadal vein incompetence. Furthermore, a gadolinium-contrast MRI can be used to detect cardiovascular disease (CVD) in people with vascular anomalies including congenital varicose veins. [91]

Figure 5. (A)Images of the perforator evaluated by CT venography. (B) Images of the superficial varicosity rendered in 3D volume. A perforator of the femoral canal connecting the femoral vein and GSV is visible in the axial tomography plane which is indicated by the arrow. C, (D) The femoral vein and GSV are connected via a perforator of the femoral canal in the same plane in this coronal view. A reconstructed 3D picture demonstrates the femoral canal perforators in both thighs.



Treatment:

Conservative Measures [92]

- Compression (e.g. Support, bandaging, stockings)
- Lifting the affected leg
- A change in lifestyle
- Weight loss

Endovenous or Interventional Therapy

Sclerotherapy

It is a slightly invasive outpatient procedure. Small and medium-sized varicose veins are treated using a sclerosing solution that is injected through a needle, scarring and closing the vein. The vein should disintegrate and go completely in a few weeks. After their initial operation, patients can anticipate seeing a 50–90% improvement. [92] Polidocanol and sodium tetradecyl sulfate are two sclerosing drugs that are employed. There have been a few uncommon side effects associated with

sclerotherapy, including pain, pigmentation, an allergic reaction to the sclerosing agent, thrombophlebitis, skin itchiness, nerve damage, skin necrosis, and DVTs. When compared to endovenous thermal ablations and surgical intervention, sclerotherapy results are comparable to those of ablations. [93]

Foam Sclerotherapy

Another option for treating an open vein under the direction of ultrasound is to inject a big vein with a foam solution (air or gas). Soft tissue necrosis is an uncommon but severe consequence of foam sclerotherapy that calls for prompt intervention. [93] The chemical that is injected into the vein, a foamy sclerosing agent, does not mix with the blood there; instead, it displaces it as it is thicker than a liquid. This explains why foam is superior for usage in larger veins because it operates longer and more effectively than liquids. With ultrasonic imaging, the foam is visible due to its thickness. This enables doctors to more efficiently direct and monitor the placement and distribution of the foam using ultrasound. Because of this, the process is occasionally referred to as "ultrasound-guided foam sclerotherapy for varicose veins. [94]

Endovascular Laser Ablation (EVLA)

An enlarged vein receives a thin catheter that can be heated using radiofrequency energy. When the catheter is removed, the heat causes the vein to collapse and seal shut, killing it. Endovenous laser ablation and foam sclerotherapy guided by ultrasound both produced faster healing times than surgery. [95] Over surgical therapy, ablation techniques offer a variety of advantages, such as less pain and suffering, the ability to resume daily activities, and an earlier return to work. Both types of endovenous thermal ablations require the insertion of a percutaneous catheter into the problematic vein while being guided by ultrasound. Tumescent local anesthesia is also used during both procedures. [96]

Ambulatory Phlebectomy

Hooks are used to remove varicose veins by minute skin incisions. Only the areas of the leg being pierced will be anesthetized, and the vein will be cut out in one procedure. Older patients who have varicose vein surgery are less likely to develop venous leg ulcers again. [97] The risk of bleeding is thought to be low during an ambulatory phlebectomy. There is a chance of complications, though, as with any treatment. When difficulties do occur, they frequently relate to: numbness of the skin, local anesthetic allergy, inflammation from vein remnants, nerve damage, and bruising and swelling.

Hydrotherapy

The warm sitz bath is the hydrotherapy is an effective non-invasive therapy for uncomplicated varicose veins, but requires a high degree of patient compliance. [98] Hydrotherapy can relieve very mild cases of varicose veins and venous insufficiency. The purpose of hydrotherapy often revolves around the effects that water pressure and temperature have on the body's muscles. The ancient Romans, Greeks, and Egyptians adopted this procedure many years ago.

Catheter-based procedures using radio Frequency or laser energy.

The primary method of treating bigger varicose veins is this operation. A medical professional places a catheter a tiny tube into an enlarged vein and uses laser or radiofrequency radiation to warm the catheter's tip. The heat destroys the vein by forcing it to collapse and seal shut when the catheter is withdrawn. [98]

Treatment according to Ayurveda:

Basti karma (medicated drug enema)- Basti Chikitsa (enema therapy) is referenced in the context of Vrana Chikitsa (a chapter for the management of ulcer-like wounds) as a Shodhana or a particular purification therapy where medications are supplied through the rectal channel. With Basti Karma or Asthpana Basti (medicines prepared with Kashyam delivered through the rectal route), the Vata

Doshaja Vrana and Adhankayaja Vrana (ulcers prone to lower limbs) are treated. [99]

Siravyadha (bloodletting)- Bloodletting, or Siravydha, is the primary or half of the cure for ailments in Shalyatantra, according to Sushruta. Therefore, it is evident that Siravedha can both cure and prevent additional issues in people with varicose veins. When bloodletting is done, the pathogenesis of Siragranthi would break as it is mainly caused by vitiated Vata and Rakta Dhatu.[100]

Jalaukaavacharan- It is extremely helpful in Dooshitha Rakta Vikara. Jalaukacharana is referred to as Anushashtra by Acharya Sushruta. It is an easier, less intrusive, and safer process. A variety of bioactive compounds are found in leech of saliva, including hirudin, which inhibits blood clotting by binding thrombin, bdellins, which reduce inflammation by inhibiting plasmin, trypsin, and hyaluronidase, which improves antimicrobial properties and interstitial viscosity. [101] Leeches are often used in Raktaja & Pittaja disorders and are Sheeta in nature.

Discussion: According to estimates, both men and women can suffer from varicose veins, making it a highly frequent illness in society**.** Varicose veins are often blue, bulging cords that travel just below the skin's surface. Legs and feet are nearly usually affected. Visible, inflated, and twisted veins, occasionally encircled by clusters of spider veins (flooded capillaries). They are often unharmful even though they can be unpleasant and disfiguring. Itchy skin, swollen ankles, and pain in the affected limb can all result from them being inflamed and becoming delicate to the touch. [102] The color of varicose veins can either be black or remain the same. They hurt constantly. In some affected areas of the legs, chronic varicose veins may cause skin peeling and skin ulcers. It is the major cause of chronic wounds, occurring in 70% to 90% of chronic wound cases. [103] Generally caused by increased blood pressure in the vein due to prolonged standing, heavy weight lifting, obesity, etc.

The pathophysiology includes hereditary elements, dysfunctional valves, and weak vascular walls. Diet, lifestyle modifications, and hydrotherapy are examples of conservative treatments for varicose veins that, to be effective, demand a high level of patient compliance. A progressive and duration-dependent reduction in testicular function is a symptom of varicocele. An increase in intrascrotal warmth harms germinal cell membranes, reduces the production of testosterone, and changes protein metabolism. Interventional therapies include surgery. Symptoms, patient preferences, cost, and potential risks all have an impact on the treatment decision. It occurs close to the skin's surface and is referred to as superficial Varicose veins. One-way valves in the vein enable blood to go in the direction of the heart. Hypoxia, inadequate gonadotoxic clearance, and increased levels of oxidative stress are all caused by impaired venous drainage. [104]

Numerous examples of conservative management for venous ulcers include using compression stockings or bandages to slow the progression of varicose veins, elevating the foot, taking antibiotics, and using the interruption of reflux source technique (TIRS) by sclerotherapy, laser ablation of varicose veins, or having surgery to stop superficial venous reflux. [105] If the primary stage is not appropriately treated or is left untreated, infection of the wound may result, causing increasing pain, swelling, redness, and pus, loss of mobility, and perhaps serious effects like osteomyelitis, septicemia, or malignancy, among others. By the fifth year following healing, statistics show that venous ulcer recurrence is extremely prevalent, ranging from 54 to 78%. Varicocelectomy, the surgical treatment used to treat varicocele, can lead to consequences like hydrocele, hematomas, infections, and damage to the scrotum. Embolization is a less invasive but more expensive alternative to surgery.

This particular illness is referred to as "Siragranthi" (i.e., varicose veins) in Ayurvedic literature.
It is controllable with the right shodhana therapy. According to Ayurvedic belief, "Siragat Vat Janya Vrana" is connected to varicose ulcers. Sushruta advises Jalauka (leech) as one of the most effective methods of bloodletting, useful even in infected and non-healing wounds. Because the blood vessels

are impacted, Pitta Dosha is unquestionably involved. The affected area, which is a weight-bearing area like the calf and ankle, is also vitiated by Pitta, Vata alone, or Vata and Kapha. Ultimately, the out-of-balance Doshas cause the surrounding veins and venous blood to become disrupted. Due to the blood vessels' passageway being blocked, the blood becomes stagnant. Therefore, the veins in their weak areas are dilated. As a result, Vata vitiates the Rakta Dhatu, leading Sira to undergo Sankochan, Sampidana, and Vishoshana, which results in Siragranthi. Varicose vein symptoms and signs are caused by vein vitiation at the location of the vein. Veins become Sankuchit, or tortuous, due to a change in size and morphology. Additionally, due to Ruksha Guna (dryness), veins become rough and hard (i.e., Visohoshana), and eventually, veins take on the appearance of an innocuous, non-pulsatile bulge. [106] Susruta Samhita Chikitsasthana, chapters 12 and 16, recommends bloodletting via Jalauka in all inflammatory, suppurative, and painful circumstances of elevated Pitta and Rakta state to alleviate pain and prevent suppuration. Acharya Sushruta discussed the severity of the ailment, i.e., which form of treatment should be used according to stage, when describing the Siragranthi. It is believed that Siragranthi is tough to treat if the Granthi, is unpleasant and moveable. It can be challenging to treat (i.e., Kruchyasadhya) if it is not unpleasant but is huge, immovable, and located at Marmasthana (i.e., at critical locations). If it is huge, it will bleed heavily when we operate, which will again result in a life-threatening situation. [107]

Jaulakaavacharan is an extremely effective therapy for this condition. Hirudotherapy dramatically reduces the symptoms of varicose veins. This is because leech has strong anti-inflammatory, blood-thinning, and lymph flow-increasing properties. Leech therapy produces antinociceptive effects, which reduce pain. Leech jaws pierce deeper tissue, allowing for the dispersion of these pharmacologically active chemicals. In the treatment of all venous illnesses, Jalaukavcharna is mentioned by Sushruta and Vagbhatta. Leech therapy is a component of the Ayurvedic Panchkarma known as Raktmokshana. [108] Leech saliva contains a natural steroid that helps heal varicose veins. [109] Leech saliva also contains anesthetic chemicals as well as bacterium-inhibiting compounds that stop bacteria from developing and analgesic chemicals that lessen localized pain. Since ancient times, leech therapy has been documented, and numerous medical diseases have been examined and found to benefit from it. Pitta and Rakta have an Aashrayashri Sambandha. Bheshaja Chikitsa and Jalaukavacharan are two treatments for Pitta Rakta Dushtijanya Vyadhi. The goal of Ayurveda is to treat the patient while maintaining the patient's health.[110]
Hirudotherapy is effective in treating symptoms like vein engorgement, edema, itching, heaviness, and limb discomfort without having any unfavorable side effects. Hirudotherapy was also recommended as a way to enhance venous valvular function by reducing SFJ incompetence with reflux on the Valsalva and SPJ incompetence in circumstances with minor saphenous vein involvement. [111] Raktamokshana helps to relieve pain, swelling, burning sensations, and skin discoloration by removing vitiated Dosha through the blood. [112,113] The primary technique of treatment for Sirajagranthi is Raktamokshana, and Jalaukavacaharana is a simple, secure, and affordable form of care. Jalauka suckers tainted blood, lowers the area temperature, and leech enzymes and chemical substances that aid in blood circulation and relieve congestion. [114]
Ayurveda is known to possess a rich collection of medical and Para surgical techniques. Through the entire management, there are no negative incidents. The method of treatment is very easy. Therefore, compared to modern therapies, Jalaukaavcharna is a safe and effective way for managing varicose veins. [115]

Conclusion: Varicose veins may be due to primary or secondary causes. Lifestyle factors play an important role in the manifestation of this disease. Though varicose veins may merely be an aesthetic issue for certain people. It may not develop any symptoms for symptomatic individuals. But complications of Varicose veins such as ulcers, and gangrene may be life-threatening and not easy to treat. Hence, various treatments are suggested. Treatment options include conservative, surgical, and Ayurvedic management with lifestyle modifications. However, Jalaukaavacharan is a panacea treatment for it.

Article Cover Page

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