

Varicose veins

DEFINITION: **Varicose veins** are superficial veins that have become enlarged and twisted. Typically they occur just under the skin in the legs. Usually they result in few symptoms but some may experience fullness or pain in the area. Complications may include bleeding or superficial thrombophlebitis. When varices occur in the scrotum it is known as a varicocele while those around the anus are known as hemorrhoids.

CAUSES

Often there is no specific cause.

Risk factors include not enough exercise, leg trauma, chronic alcohol consumption and a family history of the condition. They also occur more commonly in pregnancy. Other related factors are obesity, menopause, aging, prolonged standing, leg injury and abdominal straining. Varicose veins are unlikely to be caused by crossing the legs or ankles. Occasionally they result from chronic venous insufficiency.

Population commonly affected

Women are affected about twice as often as men.

Diagnosis

Diagnosis is typically by examination and may be supported by ultrasound.

Treatment may involve life-style changes or medical procedures with the goal of improving symptoms and appearance. Life-style changes may include compression stockings, exercise, elevating the legs, and weight loss. Medical procedures include sclerotherapy, laser surgery, and vein stripping. Following treatment there is often reoccurrence

Signs and symptoms

- Aching, heavy legs.
- Appearance of spider veins (telangiectasia) in the affected leg.
- Ankle swelling, especially in the evening.
- A brownish-yellow shiny skin discoloration near the affected veins.
- Redness, dryness, and itchiness of areas of skin, termed stasis dermatitis or venous eczema, because of waste products building up in the leg.
- Cramps may develop especially when making a sudden move as standing up.
- Minor injuries to the area may bleed more than normal or take a long time to heal.
- In some people the skin above the ankle may shrink (lipodermatosclerosis) because the fat underneath the skin becomes hard.

- Restless legs syndrome appears to be a common overlapping clinical syndrome in people with varicose veins and other chronic venous insufficiency.
- Whitened, irregular scar-like patches can appear at the ankles. This is known as atrophie blanche.

Complications

Most varicose veins are reasonably benign, but severe varicosities can lead to major complications, due to the poor circulation through the affected limb.

- Pain, tenderness, heaviness, inability to walk or stand for long hours, thus hindering work
- Skin conditions / dermatitis which could predispose skin loss
- Skin ulcers especially near the ankle, usually referred to as venous ulcers.
- Development of carcinoma or sarcoma in longstanding venous ulcers. Over 100 reported cases of malignant transformation have been reported at a rate reported as 0.4% to 1%.^[10]
- Severe bleeding from minor trauma, of particular concern in the elderly.
- Blood clotting within affected veins, termed superficial thrombophlebitis. These are frequently isolated to the superficial veins, but can extend into deep veins, becoming a more serious problem.
- Acute fat necrosis can occur, especially at the ankle of overweight people with varicose veins. Females have a higher tendency of being affected than males.

PATHOPHYSIOLOGY

The pathophysiology behind their formation is complicated and involves the concept of ambulatory venous hypertension. In healthy veins, the flow of venous blood is through the superficial system into the deep system and up the leg and toward the heart. One-way venous valves are found in both systems and the perforating veins. Incompetence in any of these valves can lead to a disruption in the unidirectional flow of blood toward the heart and result in ambulatory venous hypertension (AVH). Incompetence in the superficial venous system alone usually results from failure at valves located at the SFJ and SPJ. The gravitational weight of the column of blood along the length of the vein creates hydrostatic pressure, which is worse at the more distal aspect of the length of vein. Reflux at or near the SFJ does not always come through the terminal valve of the great saphenous vein (GSV), nor does it always involve the entire trunk of the GSV. Reflux can enter the GSV below the sub terminal valve or even immediately below the junction, passing through a failed sub terminal valve to mimic true SFJ incompetence. Reflux can also pass directly into any of the other veins that join the GSV at that level, or it may pass a few centimeters along the GSV and then abandon the GSV for another branch vessel. Incompetence of the perforating veins leads to hydrodynamic pressure. The calf pump mechanism helps to empty the deep venous system, but if perforating vein valves fail, then the pressure generated in the deep venous system by the calf pump mechanism are transmitted into the superficial system via the incompetent perforating veins. Once venous hypertension is present, the venous dysfunction continues to worsen through a vicious circle. Pooled blood and

venous hypertension leads to venous dilatation, which then causes greater valvular insufficiency. Over time, with more local dilatation, other adjacent valves sequentially fail, and after a series of valves has failed, the entire superficial venous system is incompetent. This can then cause subsequent perforator and deep venous valvular dysfunction. The clinical findings of varicose veins, reticular veins, and telangiectasias are due to the hypertension in the superficial venous system that spreads to collateral veins and tributary veins, causing dilated tortuous structures. Treatment modalities are geared towards correcting the superficial venous hypertension. In contrast to the superficial veins, the deep veins do not become excessively distended. They can withstand the increased pressure because of their construction and the confining fascia.

Note: SSV runs from the ankle to the knee, GVS runs from the ankle to the groin

Major valves which dysfunction in varicose vein are saphenofemoral junction (SFJ) and saphenopopliteal junction (SPJ). The termination point of the GSV into the common femoral vein, located proximally at the groin is called the Saphenofemoral junction. The terminal valve of the GSV is located within the junction itself.

Stages

The CEAP (Clinical, Etiological, Anatomical, and Pathophysiological) Classification, developed in 1994 by an international ad hoc committee of the American Venous Forum, outlines these stages

- C0 –no visible or palpable signs of venous disease
- C1 – telangiectasia or reticular veins
- C2 –varicose veins.
- C3 –oedema
- C4a –pigmentation or eczema
- C4b –lipodermatosclerosis, atrophie blanche
- C5 –healed venous ulcer
- C6 –active venous ulcer

Each clinical class is further characterized by a subscript depending upon whether the patient is symptomatic (S) or asymptomatic (A) e.g. C2S.

Treatment

Treatment can be either conservative or active.

Active

Active treatments can be divided into surgical and non-surgical treatments. Newer methods including endovenous laser treatment, radiofrequency ablation and foam sclerotherapy appear to work as well as surgery for varices of the greater saphenous vein.

Conservative

The National Institute for Health and Clinical Excellence (NICE) produced clinical guidelines in July 2013 recommending that all people with symptomatic varicose veins (C2S) and worse should be referred to a vascular service for treatment. Conservative treatments such as support stockings should not be used unless treatment was not possible.

The symptoms of varicose veins can be controlled to an extent with the following:

- Elevating the legs often provides temporary symptomatic relief.
- Advice about regular exercise sounds sensible but is not supported by any evidence.^[27]
- The wearing of graduated compression stockings with variable pressure gradients (Class II or III) has been shown to correct the swelling, nutritional exchange, and improve the microcirculation in legs affected by varicose veins.^[28] They also often provide relief from the discomfort associated with this disease. Caution should be exercised in their use in patients with concurrent peripheral arterial disease.
- The wearing of intermittent pneumatic compression devices have been shown to reduce swelling and increase circulation
- Diosmin/hesperidin and other flavonoids.
- Anti-inflammatory medication such as ibuprofen or aspirin can be used as part of treatment for superficial thrombophlebitis along with graduated compression hosiery – but there is a risk of intestinal bleeding. In extensive superficial thrombophlebitis, consideration should be given to anti-coagulation, thrombectomy, or sclerotherapy of the involved vein.¹
- Topical gel application helps in managing symptoms related to varicose veins such as inflammation, pain, swelling, itching, and dryness.

Procedures

Stripping

Stripping consists of removal of all or part the saphenous vein (great/long or lesser/short) main trunk. The complications include deep vein thrombosis (5.3%), pulmonary embolism (0.06%), and wound complications including infection (2.2%). There is evidence for the great saphenous vein regrowing after stripping. For traditional surgery, reported recurrence rates, which have been tracked for 10 years, range from 5–60%. In addition, since stripping removes the saphenous main trunks, they are no longer available for use as venous bypass grafts in the future (coronary or leg artery vital disease).

Other

Other surgical treatments are:

- Ambulatory phlebectomy
- Vein ligation is done at the saphenofemoral junction after ligating the tributaries at the saphenofemoral junction without stripping the long saphenous vein provided the perforator

veins are competent and absent DVT in the deep veins. With this method, the long saphenous vein is preserved.

- Cryosurgery- A cryoprobe is passed down the long saphenous vein following saphenofemoral ligation. Then the probe is cooled with NO₂ or CO₂ to -85° F. The vein freezes to the probe and can be retrogradely stripped after 5 seconds of freezing. It is a variant of Stripping. The only point of this technique is to avoid a distal incision to remove the stripper.

Sclerotherapy

A commonly performed non-surgical treatment for varicose and "spider" leg veins is sclerotherapy, in which medicine (sclerosant) is injected into the veins to make them shrink. The medicines that are commonly used as sclerosants are polidocanol, Sclerodex

Sclerotherapy has been used in the treatment of varicose veins for over 150 years. Sclerotherapy is often used for telangiectasias (spider veins) and varicose veins that persist or recur after vein stripping. Sclerotherapy can also be performed using foamed sclerosants under ultrasound guidance to treat larger varicose veins, including the great saphenous and small saphenous veins.

Endovenous thermal ablation

There are three kinds of endovenous thermal ablation treatment possible: laser, radiofrequency, and steam.

Steam treatment consists in injection of pulses of steam into the sick vein. This treatment which works with a natural agent (water) has similar results than laser or radiofrequency. The steam presents a lot of post-operative advantages for the patient (good aesthetic results, less pain, etc.)

Nursing care

All patients having a varicose vein procedure, under general or local anaesthetic, require standard pre and post-operative care. Pre-operatively patients undergoing surgery should have the position of their varicose veins marked on the skin with a marker pen as they will not be visible when the patient is lying on the operating table.

Patients undergoing a sapheno-popliteal junction ligation should also have the junction marked, as its position is variable. Post-operatively patients are able to return home as soon as they have recovered, which will depend on the type of anaesthetic given. Patients who have received a general anaesthetic may need to stay longer, but generally do not need to stay overnight. All patients will have bandages or compression hosiery to support the veins while they are healing. This also reduces the risk of haemorrhage or haematoma which, in turn, reduces bruising and may improve the result of the procedure.

Health promotion Measures to lower high pressure of blood in the vein and assist function can reduce the chance of developing varicose veins, prevent them from worsening, relieve associated symptoms and aid recovery following intervention.

Such measures include: Exercise – using the leg muscles assists the venous system to return blood up the leg via the calf muscle pump. It is important that the individual is advised not to sit or stand still for long periods of time as not using the leg muscles means that blood can reflux down the leg putting pressure on the veins and potentially worsening any symptoms. If this is unavoidable moving from one leg to the other on the spot or tensing and relaxing the calf muscles repeatedly will aid venous return.

Compression hosiery – this provides graduated compression (more compression at the foot than the knee) to encourage blood to travel up the leg, and is particularly useful for those unable to avoid standing for long periods of time.

Raise the feet whenever possible – this reverses the effects of gravity and reduces the pressure on the veins.

Lose weight – this will decrease the workload of the heart and, in turn, reduce the pressure in the arteries and veins.