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## Short Review On Varicose Vein And Its Management

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### ABSTRACT

A varicose vein is a condition which affects a large number of people in Western countries and India especially, the northern areas. For curing this proper disease diagnosis, sufficient care for patient and treatment strategies are required, to control the symptoms and signs of varicose vein, the flavonoid group of drugs have been widely used for many years. Under this group, Daflon is the most potent and efficient drug which can be used. This enhances the bioavailability and absorption from the gastrointestinal area. Improved quality of patient's life and efficacy makes this drug therapy more potent and significant. Some of the clinical studies have shown its better action for increased venous tone, lymphatic drainage, decreases cosmetic disfigurement, inflammatory responses occur in microcirculation, protection from free radicals and improved quality of life and efficacy. When compared with other available drugs like Polidocanol, Sotradecol, Asclera, Varithena, Sodium tetradecyl sulfate etc. clinical benefits of Daflon is more. This drug is useful in the early stage and can be used in severe condition along with sclerotherapy, compression treatment and surgery. Increased patient's quality of life and increased efficacy were observed in Daflon treated group. Thus it is efficacious as a standard therapy alone and also in combination with other conservative treatment.

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### INTRODUCTION

Varicose veins are superficial veins which get enlarged and twisted typically under the skin in the legs, but also occur in other parts of the body. These veins become wider and allow flowing reversely. It

usually occurs in the lower limb. This condition is widespread, and in western countries, nearly one-third of the adults are affected ([Agarwal et al., 2016](#)). In India, the prevalence of varicose vein seems to be high in northern India with approximately half of women (46.7%), and one-third of men (27.8%) were found ([Agarwal et al., 2016](#)). The factors which cause this condition are sustained venous hypertension, leading to failure of closure of venous valves, causing the veins to appear dilated. Women are most commonly affected than men, especially during pregnancy and in people those stands for long hours. Age, sex, pregnancy, family history, obesity etc. are the factors that increase the risk of developing varicose vein ([Mulla and Pai, 2017](#)).

### Anatomy

Venous blood returns to the heart by a process called venous return against gravity; this takes

place through the superficial and deep venous system. They are divided as long saphenous veins and small saphenous veins and (Mulla and Pai, 2017). Long saphenous vein (SSV) starts from the medial end of arch of dorsal venous, then anterior to the medial malleolus and enters the medial aspect of calf and thigh, ends in the femoral vein at the Saphenofemoral junction Lateral end of the dorsal venous arch is from where the SSV originates, then through lateral malleolus and finally enter through the back of the calf to reach the popliteal fossa (Rabe and Pannier, 2012). The superficial and non-superficial systems connect at numerous places with the help of non-junction perforators (Goldman and Fronek, 1989).

Histologically, the vein wall contains mainly three layers:-the inner layers which are known as intima, media is the middle layer, and outer is the adventitious layer (Goldman and Fronek, 1989). The outer layer is fibrous. The middle layer is hypertrophied with elastic fibres. With increasing age, the structure of vein walls becomes more disorganized. Adventitia merges with the perivenous connective tissue (Goldman and Fronek, 1989).

A comprehensive classification system known as CEAP classification describes the varicose vein clinically. Signs and symptoms of chronic venous disease are standardized by using this classification given in Table 1 (Santler and Goerge, 2017).

Some of the signs and symptoms of varicose veins are Pain in the legs, cramping, swelling, itching, heaviness, Paresthesia, hyperpigmentation, oedema, lipodermatosclerosis, ulceration, bleeding (Jill *et al.*, 2012); Manifestations occur as the disease progresses, but on early stage, it is usually asymptomatic. Microscopically the defect is due to the defect in the closing of the venous valve which results in the dilation, tortuous and elongation of veins (Goldman and Fronek, 1989). Sustained venous hypertension is one main factor in the development of varicose vein, which is due to its diameter enlargement of superficial veins which further leads to the valve incompetence (Goldman and Fronek, 1989).

Several other pathophysiological mechanisms can cause varicose vein such as (Naoum *et al.*, 2007)

1. structural changes of vein
2. obstruction in venous outflow
3. Inflammation and sheer stress.

Treatments for the relief of severe symptoms generally include surgical removal of the vein, scler-

otherapy, mechanical compression and drug therapy. Among these, drug therapy is the most widely used. Hence it is useful in symptom relief, good compliance and easy way of administration (Goldman and Fronek, 1989). Risk factors of the varicose vein are Family history, Increasing age over 30, Prolonged standing, Heavy lifting, Multiple pregnancies, Limited physical activity, High blood pressure, obesity, sex (Heller and Evans, 2015).

### Pathophysiology

Varicose veins are normal veins which get dilated due to high venous pressure. Various compartment and chambers consist of deep and superficial veins (Goldman and Fronek, 1989). These are divided by fascia covering the muscle of leg in the lower extremities. The prominent deep veins of the lower limb are popliteal and femoral vein. The venous blood flows return to the heart through the popliteal veins which is a single trunk, as well as its continuation is the femoral vein then the common femoral vein, iliac vein and finally inferior vena cava (Goldman and Fronek, 1989). The great saphenous vein is a large venous blood vessel arises from the dorsal venous arch and drains into the femoral vein and lesser into the popliteal vein (Santler and Goerge, 2017). The superficial compartment is a low-pressure chamber, and the deep compartment is high-pressure chamber due to the action of calf muscle pumping venous blood back to the heart (Santler and Goerge, 2017).

Our body's return of venous is against gravity and depends on the muscle pumps of the leg and calf. When pressure develops on the sole of the leg and increased muscular contractions in the fascial compartment of the calf lead to compressions of the sinusoidal intramuscular veins which leads to the reach of blood to the deep system (Naoum *et al.*, 2007). The reflux of blood is prevented by the closure of valves which appear in greater density in the calf. Now, when systole happens, blood cannot enter the superficial vein system because of the closure of junction and non-junction perforators (Naoum *et al.*, 2007). This is due to the building up of external pressure in the fascia and the muscles. When we are standing without any activity, the venous valves are in the neutral position, blood enters from the arterial side, and pressure again increases (Naoum *et al.*, 2007). The valve opens and leads to the development of hydrostatic pressure. When we move compression takes place in the deep veins and sinuses. Blood moves cranially and caudally. But again, valve closure takes place, and division of the high pressure takes place into a series of low pressures. Pressure in the foot vein falls causes venous pooling and low-

**Table 1: CEAP Classification**

CEAP clinical score	Description
C0	Signs are not visible
C1	Telangiectasia's or reticular veins
C2	Varicose vein >3mm in diameter
C3	Oedema
C4	discolouration of the skin and subcutaneous tissue: pigmentation, eczema, lipodermatosclerosis or Atrophy Blanche
C5	Healed venous ulcer
C6	Active venous ulcer

ers CHP causing oedema in the feet. Raised ambulatory venous pressure is one of the other causes. This forms the reasons for the signs and symptoms in chronic venous insufficiency (Santler and Goerge, 2017).

### Diagnosis

There are various diagnosing methods available for detecting the varicose vein. It can be diagnosed according to its history, clinical presentation and duplex ultrasound is a diagnostic test which is usually used (Feliciano and Dalsing, 2011).

### Colour duplex ultrasound scan

Through this scanning, the structure of veins can be detected to identify any malformations or abnormalities. Also helps in measuring the volume of blood flowing back to legs, and to detect valve function. It can take about 20mins (Feliciano and Dalsing, 2011).

### Phlebography

This technique gives the x-ray images of veins of the leg by using a contrast medium. Due to the lesser accuracy of detection, it rarely carried out. But in some conditions, it helps in giving useful information regarding the diseases (Zhang and Melander, 2014).

### Plethysmography

Different types of plethysmography are available, such as photoplethysmography, air plethysmography and venous occlusion plethysmography. This helps in determining the volume of blood filling caused by the changes in blood pressure and blood flow by measuring the amount of the light reflected by haemoglobin. Plethysmography is the instrument used for it. In Venous occlusion plethysmography, venous drainage is measured by using a cuff on the legs. But in case of air plethysmography, the amount of blood in veins is measured by using cuff with an attached air chamber around the leg (Zhang

and Melander, 2014).

### Venogram

This technique gives x-ray imaging of the vein, which is done by inserting the dye. Ascending venography is commonly used for this condition. Descending venography is used to measure the function of valves in deep veins. It should not be used for people with CHF and pulmonary hypertension, kidney diseases etc (Feliciano and Dalsing, 2011).

### Phlebodynamometry

This is the method for measuring venous pressure intravascularly. But today it is used only to provide information regarding surgery of deep vein incompetence (post-thrombotic syndrome) (Feliciano and Dalsing, 2011).

### Other methods

Several other methods for diagnosis are available for getting images of leg veins such as (Feliciano and Dalsing, 2011);

1. medical imaging technique – CT scan
2. MRI

### Management

In earlier stage or for uncomplicated varicose vein, modification in the diet and lifestyle, exercise such as walking, avoidance of prolonged standing and heavy lifting, compression stocking use etc. should be done to increase the muscle function as well as for the reduced swelling. Treatments for the relief of severe symptoms generally include vein stripping (surgical removal of the twisted vein), sclerotherapy, laser therapy, radiofrequency ablation, ambulatory phlebectomy, mechanical compression and drug therapy (Kong et al., 2018).

### Vein stripping

It is the surgical removal or isolation of the affected vein from the other parts of the venous system. The

main advantages of this method are improved quality of patient life, reduces symptomatic changes and causes lesser bleeding (Kong *et al.*, 2018).

### Sclerotherapy

It is a procedure used to treat blood vessel malformations and those of the lymphatic system. In this method required volume of fluid is injected into the affected vein which irritates the blood vessels and leads to shrinkage of veins and finally causes clot formation. It is the most commonly used method because of its more straightforward method of procedure. After the examination of the patient, if any venous reflux or its source is identified then surgical removal of the particular reflux should carry out before sclerotherapy (Kong *et al.*, 2018).

### Compression stocking

It is the use of elastic-like stockings, as it gets tightened and creates pressure on the legs and ankle. After the compression of veins, the blood flows through narrow spaces and increase the flow of blood reaching the heart. This method allows less blood to pool in feet, which helps in the prevention of occurrence and progression of venous disorders and also reduces all manifestations like oedema etc (Kong *et al.*, 2018).

### Drug Therapy

Drug therapy is most widely used; hence it is useful in symptom relief, good compliance and easy way of administration. Mostly used drug lies under the flavonoid class, which is extracted from plant parts (Antignani, 2017). This enhances the bioavailability and absorption from GI. Improved quality of patient's life and efficacy makes this drug therapy more potent and significant. Polidocanol, sotradecol, asclera, varithena, daflon etc. are the drugs used (Antignani, 2017).

Among these, Daflon is an FDA approved drug, but more effective in use. Daflon is micronized purified flavonoid fraction containing 90% Diosmin and 10% flavonoids as hesperidin (Ramelet, 2001). The micronization of Diosmin to particles with a diameter less than two micrometres has improved its oral absorption (Rutherford *et al.*, 2000). Daflon helps in

1. Improving venous tone
2. Lymphatic drainage
3. Decreases cosmetic disfigurement
4. Inflammatory responses occur in microcirculation
5. Protection from free radicals

6. Prostaglandin synthesis
7. Leukocyte activation
8. Protection from valve damage
9. Increased muscle function
10. Improved quality of life and efficacy
11. Increased lymphatic system and vascular system

This drug is effective in early-stage and can also be used in severe condition along with sclerotherapy, compression treatment and surgery (Jacob, 2015). It is a potent venotropic drug which is clinically useful in managing varicose vein with a good safety profile. Oedema is one of the manifestations which make heaviness and discomfort in the leg of the patient, and this can be treated with the usages of Daflon (Ramelet, 2001). It is the first-line drug for oedema and other symptoms. Thereby the synthesis of prostaglandins and free radicals are reduced and also decreases bradykinin-induced microvascular leakage and inhibits leukocyte activation, trapping, and migration (Antignani, 2017). This leads to decreased hyperpermeability and increased capillary resistance. This causes decreased leg circumference, and assessment can be done by volumetric measurement. Skin disorders such as hyperpigmentation, itching, dermatitis, dermato fibrosclerosis etc. due to the varicose vein are also well treated by the appropriate administration of Daflon (Antignani, 2017). It also has benefits like protection from free radicals and reduced prostaglandin synthesis (Korthuis and Gute, 1997). Assessment of the effectiveness of the drug can be detected by measuring the leg perimeter due to reduced symptoms of disease (Neglén *et al.*, 2007).

### CONCLUSIONS

In earlier stage or for uncomplicated varicose vein, modification in the diet and lifestyle, exercise such as walking, avoidance of prolonged standing and heavy lifting, compression stocking use etc. should be done. Now drug therapy is most widely used; hence it is effective in symptom relief, good compliance and easy way of administration. When compared with other available drugs like Polidocanol, Sotradecol, Asclera, Varithena, Sodium tetradecyl sulfate etc. clinical benefits of Daflon is more. Our study concluded that Daflon is effective in treating Varicose vein. Reduced symptoms of VV were observed in Daflon group after three months of use by VCSS scale. Significant improvement in patient's

quality of life was observed in Daflon group as evident through the improved score of SF36 questionnaire. And in future, Studies regarding the effectiveness of different doses of Daflon in VV management in a larger number of patients can be developed.

#### Conflict of Interest

The authors declare that they have no conflict of interest for this study.

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