JNP

Varicose Veins: Diagnosis, Management, and Treatment

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ABSTRACT

Varicose veins are manifestations of chronic venous disease and affect over 20% of the United States adult population. The direct medical cost for chronic venous disease is estimated to be between $150 million and $1 billion annually in the US. Although usually thought to be no more than a cosmetic nuisance, varicose veins can be the source of more serious complications. This article is intended to aid the nurse practitioner in the diagnosis and treatment of varicose veins. Updated analysis of short- and long-term treatment outcomes from newer procedures are described.

Keywords: chronic venous disease, conservative management of varicose veins, endovenous thermal ablation, lifestyle changes for varicose veins, sclerotherapy, varicose veins

Varicose veins of the lower limbs are dilated, tortuous, and palpable veins that are typically larger than 3 mm.[1,2] Varicosities are manifestations of chronic venous disease (CVD), which includes various other venous abnormalities, such as dilated intradermal veins, spider veins, reticular veins, and telangiectasia.[3] Although varicose veins have long been thought to be a simple cosmetic nuisance, they can actually be the source of more serious complications, including pain and discomfort that can lead to missed work days, a lower quality of life, and even the loss of a limb or life.[4]

INCIDENCE

According to the American Venous Forum,[4] an estimated 23% of the US adult population suffers from varicose veins. According to Gloviczki et al,[3] about 5% of those who have varicose veins also suffer from skin changes, venous edema, and venous ulcerations, and there are over 20,000 new diagnoses of venous ulcers in the United States annually. There are approximately 300,000 outpatient appointments each year for patients with varicose veins, and 10% of these patients undergo hospital treatment.[2] Women seem to be more affected by varicose veins than men. In Western populations, approximately 30% of women and only 20% of men suffer from varicosities.[5] The difference in prevalence in sexes is hypothesized to be caused by the increased incidence of varicose veins during pregnancy as a result of increased venous stasis.[5] During pregnancy, the weight of the growing uterus on the pelvic veins and the inferior vena cava slows blood return from the lower extremities, and this results in the pooling of blood in the legs and varicosities. The management and treatment of varicose veins can be a source of immense financial burden for patients. According to Gloviczki et al,[3] the estimated direct medical cost of CVD in the US is between $150 million and $1 billion yearly.

THE VENOUS SYSTEMS OF THE LOWER LIMBS

The 2 main superficial veins of the legs are the great saphenous vein (GSV) and the small saphenous vein (SSV), and they are located in the subcutaneous tissue layer under the skin and above the deep fascia layer that covers the muscles of the legs. The deep venous system (DVS) of the lower limbs is located beneath the fascia layer and in the muscle compartments and runs along the same track as the main arteries in the legs. The superficial venous system and DVS are connected to each other by the perforating veins that run across the deep fascia layer, thus allowing the superficial veins to drain into the deep veins.

According to Vandy and Wakefield,[1] as the gastrocnemius and soleus muscles of the calf contract, the pressure in the DVS increases and helps pump the blood towards the heart. The authors[1] also explain that when blood exits the DVS, there is a drop in the pressure of the deep veins, thus allowing blood to passively flow from the superficial venous system through the perforating veins to the DVS. When the muscles of the calf contract again, the circulation of blood from the legs to the heart begins again. As blood flows through the venous systems of the legs back to the heart, 1-way bicuspid valves that are located in the deep veins, the perforating veins, and the superficial veins promote the unidirectional flow of blood and prevent backflow.[1,5]

ETIOLOGY AND PATHOPHYSIOLOGY OF VARICOSE VEINS

Varicose veins are caused by either primary or secondary disease. According to Gloviczki et al,[3] primary venous disease, the most common cause of varicose veins, occurs as a result of an internal biochemical or morphologic abnormality of the vein wall. A prolonged period of standing is an important factor that leads to an intrinsic morphologic abnormality and progressive dilation of the superficial leg veins.[1,5] According to Matfin,[5] standing for long periods of time raises the venous pressure in the leg veins as a result of the hydrostatic effect that occurs in the standing position and the absence of the calf muscles helping to pump blood back to the heart. The absence of the calf muscles aiding in the pumping of blood back to the heart leaves the work completely to the veins, which become stressed and incompetent over time. The vein wall becomes progressively dilated and elastic, thus leading to valvular damage and incompetence.[2]

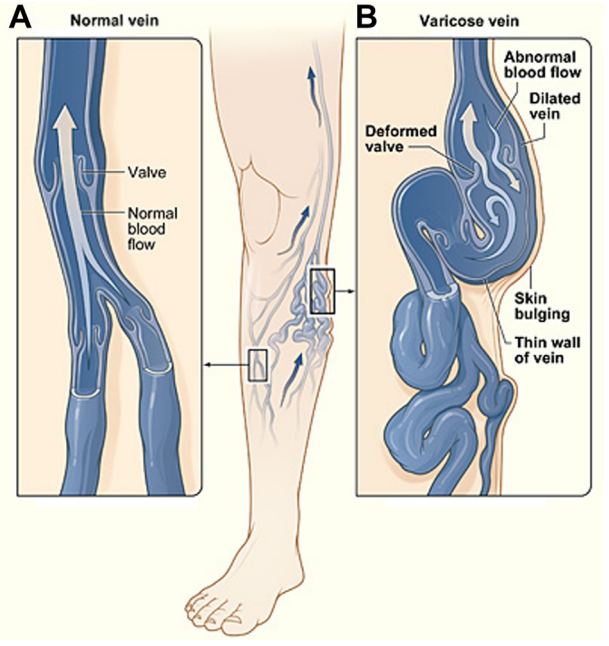
Secondary causes of varicose veins include deep vein thromboses (DVT), deep venous obstructions, superficial thrombophlebitis, congenital or acquired arteriovenous fistulas, and pressure on the veins in the abdomen during pregnancy or from a tumor.[3,5] According to Matfin,[5] thromboses in the deep veins, the most common cause of secondary varicosities, increase the pressure in the deep veins, which drain about 80% to 90% of the superficial veins. As a result, an obstruction in the deep vein causes a progressive dilation in the superficial veins that leads to varicosities (Figure).[5]

CLINICAL EXAMINATION

Presentation

Many times, the diagnosis of varicose veins can be made by clinical examination alone. Patients may be asymptomatic and present to the office concerned about the cosmetic appearance of the lower limb veins. On the other hand, patients may also complain of symptoms related to varicose veins or CVD. These symptoms include tingling, burning, aching, pain, muscle cramps, throbbing sensations, a feeling of heaviness, swelling of the legs, itchy skin, restless legs, leg fatigue and tiredness, and general fatigue.[3,6] Gloviczki et al[3] and Matfin[5] point out that these symptoms may also be worsened by heat or by the legs being in a dependent position and may be alleviated by resting or elevating the lower limbs. Furthermore, varicosities may also cause venous

Figure. (A) A normal vein with a working valve and normal blood flow. (B) A varicose vein with a deformed valve, abnormal blood flow, and thin stretched walls. The middle image shows where varicose veins might appear in a leg.



Courtesy of The National Heart, Lung, and Blood Institute, part of the National Institutes of Health and the US Department of Health and Human Services.