TOMORROW'S WELLNESS CENTER

Varicose Veins

I. Overview

a. Considered part of the disease process known as venous insufficiency.

b. It is a common condition in the U.S. affecting approximately half the population.

c. 55% women and 45% men are affected.

d. Common age range for development of varicose veins is between 30 to 60 years of age.

II. Causes of Varicose Veins

a. The heart pumps blood through the arterial system to the tissues delivering oxygen and nutrients. The blood returns with waste products and de-oxygenated blood through the venous system.

b. At any given time, approximately 64% of total blood volume is circulating in the venous system. 15% of the venous supply is in the superficial venous system and 85% is in the deep venous system.

c. The blood moves through the venous system, aided by the contractions of the muscles and valves which are unidirectional (one-way) located within the vein.

d. Competent valves open during muscle contractions and remain close during muscle relaxation.

e. Damaged and/or stretched valves remain continually open allowing backwards flow (or reflux) of de-oxygenated blood to collect in the veins.

f. High pressure buildup of the blood weakens the vein walls allowing further stretching to occur. As the blood continues to collect in the veins they become tortuous, twisted, gnarled, and bulging in appearance, known as a varicose vein. The vein walls may show an increase in permeability allowing fluid to leak into the tissues. Any vein may become a varicose vein.

g. Types of varicose veins, reticular veins, are flat blue veins found behind the knees. Venous lakes are pools of blood in the veins commonly found

on the face and neck. Telangiectasias are similar to Spider veins found on the upper body and face.

III. Factors Affecting Varicose Veins

a. Genetics: There is approximately 60% to 90% chance of developing varicose veins if your family is known to have the same disorder. The problem may be either a compliance and contractility problem or may be due to congenital defects of the venous system.

b. Hormones: The female hormones make the smooth muscle in the vein wall relax, soften and weaken therefore women are affected more often than men. In addition, exogenous hormones including birth control pills or hormone replacement therapy may contribute to the development and advancement of existent varicosities.

c. Age: Veins and valves will weaken over time, losing their compliance and contractility.

d. Obesity: Poor nutritional habits as well as the mechanical stress from the excess weight are contributing factors.

e. Pregnancy: This is due to several factors, including increases in hormones to support the pregnancy, increase in blood volume to support a developing fetus, and mechanical compression of the veins to the lower extremities from the enlarging uterus in the pelvis. Pregnant patients in addition to leg varicose veins may develop varicosities around the anus (i.e. hemorrhoids) and/or the labia. The patient will usually observe a worsening of this condition with subsequent pregnancies.

f. Trauma: Trauma to a vein will damage the integrity of the walls and concurrent valves allowing for the increase possibility of a varicosity. Immobilizing the lower extremity in a cast or splint decreases the ability of the muscles to contract and assist the vein in returning the blood to the heart therefore allowing for pooling of blood.

g. Deep vein thrombosis: Pooling of deoxygenated blood forms a clot that will cause an inflammatory reaction within the vein and damage the valve, allowing for the development of a varicosity.

h. Plebitis and thrombophlebitis: Inflammation of the vein associated with increase in the incidence of varicose veins. Both are inflammatory processes with the latter condition being associated with a blood clot. In addition, if a superficial varicose vein develops a clot this may lead to superficial thrombophlebitis.

i. Surgery: Inactivity of the patient post-operatively increases their risk of developing a deep vein thrombosis and/or varicose vein. This is due to the overall lack of assistance of the muscles in the lower extremity to assist in helping pump the blood toward the heart. This allows for pooling of the blood in the venous system distorting the vein wall and compromising the venous valves.

j. **Sun Exposure**: Fair skinned individuals can have damage to the dermis (skin) from sun-exposure. This encourages the development of spider veins on the face.

IV. Signs and Symptoms of Varicose Veins

a. **Varicose veins** are greater than **3mm**, raised and palpable. They may be flesh colored or a purple to bluish discoloration. Although any vein may become a varicosity, most are on the legs due to the ability of the vein to pump the blood against gravity up to the heart.

b. **Spider veins** are **less than 3mm** seen on the face and legs as a bluish red discoloration that resembles a spider web or tree with branches. A simple test for the diagnosis of spider veins of the lower extremities is to lie flat and elevate the legs above the heart. The small spider veins should empty out of the residual blood.

c. Common complaints of varicose veins are a heavy, achy, burning, throbbing, sensation in one or both of the lower extremeties with possible edema. Symptoms increase with prolonged sitting and standing. Swollen extremities that demonstrate indentations from pressure suggest venous insufficiency.

d. Skin changes may include prurities over the varicosity. Overtime this may develop into a varicose eczema. Discoloration of the skin (darkened, blue,

and shiny) will result from the constant pressure secondary to fluid leaking out of the varicose vein into the interstitium of the extremity. This is known as stasis dermatitis.

e. Trauma to varicose vein may result in prolonged bleeding and healing of the affected area.
f. Unusual presentations of varicose veins include those involving the upper extremities. This may be seen post-mastectomy or could be secondary to a tumor in the chest. Further diagnostics would be suggested for either of these conditions.

V. Diagnoses

a. Diagnosis is made by a thorough history, family history of venous disease, and physical examination.
b. A venous duplex ultrasound is encouraged in order to rule out more sever venous disease.
c. A venogram may be utilized for more extensive diagnostic testing.
d. Once it has been determined that the varicosities are in the superficial venous system then education, preventive care, and both medical and cosmetic interventions should be reviewed.
e. Medical treatment is certainly indicated for those patients in which the disease causes chronic pain and discomfort.
f. Cosmetic concerns of the patient are valid and should be addressed.

VI. Preventive Care

a. Individuals need to maintain their ideal body weight through exercise and diet and avoid tight fitting clothing around their waist, groin, and legs.
b. Individuals should shift their position every 30 minutes when standing and every 2 hours when sitting for prolonged periods and elevate their legs above the level of the heart 3-4 times a day.
c. Stop smoking!! The effects of smoking on the vascular system have been well documented.
d. Sunscreen use is encouraged for all individuals.

e. Compression stockings are important in preventive care management of varicose and spider veins of the lower extremities.
    i. There are two kinds: uniform versus gradient, with gradient being clinically superior for the treatment of varicose veins of the lower extremity.
    ii. Gradient stockings have the firmest compression at the ankle due to the fact that gravity causes the greatest amount of pressure at the ankle. In addition, the pressure is also dependent on the vertical column of blood from the ankle to the heart. The greatest pressure is at the greatest distance from the heart (i.e. ankle).
f. Effects noted from the stockings are:
    i. The pressure increase in the subcutaneous tissue from the fitted stocking helps move the excess fluid back into the capillary system and decrease the amount of leaking fluid into the subcutaneous tissue.
    ii. The superficial veins will have a decreased ability to accept additional blood due to the compression from the stockings.
g. The stockings are most effective for individuals who complain of leg fatigue, aching, and heaviness in the legs and who are committed to wearing them.
h. Herbal medication used is Horse Chestnut (Aesculus Hippocastanum)
    i. It has been used to treat venous insufficiency, post-traumatic and post-operative soft tissue swelling.
    ii. In chronic venous disease or trauma to the vein the activity of lysosomal enzymes increase in the vein breaking down the glycoacalyx in the capillary wall. This leads to an increase permeability of the wall allow leaking of fluids into the surrounding tissue. The mechanism of action is a reduction of this enzyme activity which subsequently inhibits the breakdown of glycoacalyx (or mucopoyaccaride) in the capillary wall.

iii. This will maintain the integrity of the vein wall, decreasing the permeability of the wall and preventing a leaking of fluids (low-molecular proteins, electrolytes, and water) into the interstitium.
iv. Dosage is 30-150 mg po daily.
v. Adverse reactions include gastrointestinal mucous membrane irritation including vomiting and diarrhea. The individual may experience severe thirst, flushing of the facial skin, enlargement of the pupils, vision changes, severe pruritis, worsening of renal failure and liver damage. More severe reactions such as anaphylaxis are noted with the administration by intramuscular injection or intravenously.

VII. Treatment

a. The treatment options are:
    i. Sclerotherapy
    ii. Endovenous Laser Treatment
    iii. Radiofrequency Occlusion
    iv. Ambulatory Phlebectomy
    v. Venous ligation
    vi. Venous stripping
b. Sclerotherapy
    i. Injecting the varicose veins or spider vein with a saline or chemical solution that causes scarring of the vein walls and collapsing them. The body absorbs the treated vein.
    ii. Compression bandages or support hose for two to three works after treatment.
    iii. Several treatments may be necessary.
    iv. Individuals may expect 80% to 90% improvement.
    v. Microsclerotherapy uses a smaller needle and less solution…
    vi. Minor side effects are at the injection site. They include stinging, muscle cramping, raised red patches of skin, small sores, bruising

and spots around the treated vein. All of those side effects are temporary.

vii. Serious side effects include reactions are the injection site that could become inflamed, residual blood that has pooled and clotted, or an ulcer secondary to infiltration of the solution into the surrounding tissues.

c. Laser treatments
    i. Treatments consist of a laser placed closed to the vein that sends out bursts of light. The wavelengths of light are absorbed by the hemoglobin in the targeted vein causing an obliteration of the hemoglobin and collapsing of the vein.
    ii. Lasers are very direct and accurate and may be used on all skin types depending on the type of laser used.
    iii. Individuals may feel a pinch or a rubber band snap as well as a warming sensation to the skin as the laser passes over the skin. This is counterbalanced by cooling of the skin prior to and after the treatment.
    iv. Typically the treatments last 15-20 minutes and may need to be repeated several times to treat the varicosity.
    v. Redness, swelling or discoloration may be noticed but will fade. Scarring is possible if the operator is not careful.
    vi. Advantages are no needles or incisions are needed and individuals may return to normal activity quickly.
d. Encdovenous Laser Treatment
    i. This procedure treats the great saphenous vein which runs from the groin to the ankle.
    ii. It is performed by inserting a small catheter in the vein. Local anesthesia is administered to the vein and is followed by the introduction of the laser diode fiber. It will deliver the laser energy, heating the inside of the vein as it is slowly withdrawn. This will obliterate the blood inside the vein, irritating the vein

wall and causing it to collapse as the laser diode is withdrawn slowly from the vein.

iii. The procedure takes 30-60 minutes and individuals may return to work the next day.

iv. Side effects include skin numbness, blood clots, bruising and vein inflammation.

v. The laser does not touch the walls of the vein; therefore there is no limitation of size of the varicose vein to be treated.

e. Radiofrequency Occlusion Treatment

i. The procedure is the same as for the Endovenous Laser Treatment but uses radiofrequency energy to treat the varicosity. A fan-shaped catheter is inserted into the vein and advanced to the endpoint of treatment. It will deliver radiofrequency energy to the vein wall causing it to heat up, collapsing it. Eventually the vein will scar shut allowing no further blood flow.

ii. Can treat veins up to 12mm in diameter.

iii. Side effects are similar to EVLT.

f. Surgical options

i. Vein ligation involves tying off the varicosity allowing the flow of blood to stop making it less visible. This treatment is not recommended often due to the high recurrence rate.

ii. Vein ligation and stripping. This involves general or local anesthesia and complete removal of the vein. Serious complications include reactions to the anesthesia, inflammation and infection at the sites of incisions. Individuals may also have bruising, swelling, redness. Permanent scars are also possible. Nerve damage is common around the treated vein.

iii. Ambulatory Phlebectomy. Tiny incisions are made over the varicose vein which is then grasped with tin surgical hooks, pulling the vein out of the leg. This requires anesthesia (local or regional).

Small scars may occur. Side effects are similar to ligation and stripping.