VENOUS DISEASES

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SUMMARY

Venous diseases mostly occur due to gravity induced hemostasis in the lower extremities. Some occupations which necessitate long time motionless standing, bad foot care, use of estrogen and progesterone, gestation, intraabdominal malignancies, hypercoagulopathy syndroms, Behet's disease, some vasculitis, right heart failure, hepatic cirrhosis, congenital malformations, iatrogenic or traumatic reasons increase the risk of venous diseases. In this article, lower extremity varicose diseases, complications and treatments are discussed in the light of current literatures as a collected study.

Key Words: Varicose Diseases, Varicosity, Venous Diseases, Lower Extremities, Venous Ulcer.

ÖZET

Venöz Hastalıklar

Venöz hastalıklar, o unlu ka alt ekstremitelerde yer ekiminden kaynaklanan hemostaz nedeniyle oluşurlar. Hareksiz ayak duran gereklerek bazı meslekler, kt ayak bakımı, strojen ve progesteron kullanm, gebelik, batın mali niteler, hiperkoaglopati sendromlar, Behet hastalığı, bazı vaskülitler, kalp yetmezliği, hipertansiyon, kongenital malformasyonlar, iatrojenik veya traumati nedenler venoz hastalıkları oluşturmaktadır. Bu makalede, alt ekstremite varik z hastalıkları, bunlar n komplikasyonları ve tedavileri gncel literatürlerin nda bir derleme formunda tartışmaktadır.


Venous diseases are diffuse and proliferative diseases. In contrast to arterial diseases they make expansive progress. The function loss of the venous valves can cause venous dilatation and even aneurysm of venous vessels. Histologically, smooth muscle of varicose veins display atrophy. The basis of the venous diseases is the venous reflux which is due to venous valve insufficiency. The inflammatory influence of the static blood, that is under the gravity induced pressure increase, causes damage to the surrounding tissue. The statically remained blood is the reason for varicose complications and symptoms. These symptoms and complications of the varicose veins are especially under the knee where the vessels are smaller in size and greater in number. The relationship between venous diseases and Restless Leg Syndrome (RLS) should be examined well. RLS is seen together with venous diseases commonly, in a high ratio. Telangiectasis and innocent reticular veins sometimes may be findings of venous diseases where RLS may be seen. Estrogen and progesterone are additional risk factors.

To understand the venous diseases; the anatomy of the lower extremity veins should be known well. In anatomical and functional aspects of these lower extremity veins can be catagorized

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into four: Superficial Veins, Deep Veins, Communicating Veins and Venules-Capillaries.

(1) Superficial veins: Vena Saphena Magna (VSM) starts in front of the medial malleolus, continues on the anteromedial and drains into the femoral vein at the inguinal region. The function of the valve at the junction where VSM drains into, is important for the surgical decision making (for stripping). Vena Saphena Parva (VSP) starts behind the lateral malleolus, and drains into the popliteal vein in the midline at the posterior of the calf.

The deep veins of the calf are vena comitantes which accompany with anterior, posterior tibial arteries and peroneal arteries. These veins which are double, unite to form the popliteal vein. These deep veins are responsible for the 90% of the lower extremity venous circulation. Musculus Soleus contains a sinusoidal valveless complex, the ‘Venous Lake’, which is the most common site of early thrombosis formation. In the adductor canal, the popliteal vein continues as the superficial femoral vein, which unites with the deep femoral vein to form the main femoral vein.

The perforating veins are called so because they cross the lower extremity deep muscular fascia while uniting the superficial and deep systems. The valves of these veins orientate the blood flow from superficial towards the deep veins.

Local valve insufficiency of the deep and perforating veins have an important contribution in the etiology of chronic venous insufficiency and venous ulcers.

The valves are the most important and special structures of the venous system. The proximal flow depends on the presence of the thin but strong venous valves which inhibit the reflux distally. Valve insufficiencies are either primary or secondary to valve destruction but mainly secondary. Superficial and deep thrombophlebitis and deep venous thrombosis are the principal causes of valve insufficiency.

Valves of sapheno-femoral (SFJ) and sapheno-popliteal junctions (SPJ) are ostial valves, which have great anatomic importance.

In the diagnosis and especially in the surgical strategy determination of the lower extremity varicose disease, doppler ultrasonography (gray scale, color doppler and spectral analysis) and phlebography methods are used.

Indications for the Varicose Operations (2)

1- Asymptomatic group (cosmetic and prophylactic reasons)
2- Symptomatic group
   a- Superficial Thrombophlebitis
   b- Dermatitis
   c- Lipodermatosclerosis
   d- Skin pigmentation
   e- Ulcerating Varicose vessels

Situations in which surgery is not considered (3)

1- Cases who have the surgical indications but either due to old age or associating diseases in which surgery has high risk (Varicose surgery mortality should be close to zero).
2- The localized varicosities not having surgical indications. In these cases to relieve the symptoms and sometimes for cosmetic purposes interventions may be applied.

When surgery is not considered; compression therapy with elastic socks, sclerotherapy, laser-microcoagulation treatment (especially in small varicoses and telangiectasis), drugs (antiedematous drugs or drugs that increase the venoactive vein smooth muscle tonus) are recommended. Drug therapy is symptomatic.

The most effective treatment to come over varicose symptoms is surgery combined with elastic socks.

Surgical treatment of the lower extremity varicose disease is examined in two forms (4, 5).
1- The Simple Form: The superficial venous valve insufficiency. Radical Venectomy is applied and total sufficient venous return is obtained.

2- The Complex Form: Radical venectomy does not supply optimum results in the second form. In these cases ligation (via supra or subfascial methods) of the insufficient perforating crus veins (77.4% is the Cockett group) is indicated.

* Radical Venectomy in the simple form consists of stripping and localized varicosity excision. The surgical strategy in short is as follows:
  * SFJ REFLUX ABSENT + THIGH PERFORATING REFLUX ABSENT: SFJ LIGATION AND STRIPPING IS AVOIDED.
  * SFJ REFLUX PRESENT + THIGH PERFORATING VEIN INSUFFICIENCY + VARICOSE VSM: SFJ HIGH LIGATION + OVER KNEE STRIPPING + MULTIPLE EXCISION OF LOCALIZED VARICOSITIES.
  * SFJ REFLUX PRESENT + PERFORATING THIGH VEIN INSUFFICIENCY ABSENT + NON-VARICOSE VSM: SFJ HIGH LIGATION + MULTIPLE EXCISION OF LOCALIZED VARICOSITIES.
  * SFJ REFLUX PRESENT + THIGH PERFORATING VEIN INSUFFICIENCY + NONVARICOSE VSM: SFJ HIGH LIGATION + OVER KNEE STRIPPING + MULTIPLE EXCISION OF LOCALIZED VARICOSITIES.

The thigh perforating vein is a Dodd group perforating vein. Surgical strategies are explained theoretically in the above conditions but insufficiency of the thigh perforating vein may not be diagnosed by the radiologist routinely. Thus; in SFJ and VSM insufficiency, if deep venous insufficiency is absent, high ligation, stripping and excision of localized varicosities should be applied.

If VSM insufficiency in the above situations, high ligation and total stripping should be applied instead of over knee stripping.

** Operation strategies of the second form (complex form) are as follows:

** SFJ + VSM INSUFFICIENCY + PERFORATING VENOUS INSUFFICIENCY (IF DEEP VENOUS INSUFFICIENCY IS ABSENT): TOTAL STRIPPING + PERFORATING VEIN LIGATION

Isolated perforating vein insufficiency without deep venous insufficiency is very rare.

** SFJ + VSM INSUFFICIENCY + PERFORATING VENOUS INSUFFICIENCY + DEEP VENOUS INSUFFICIENCY: TOTAL STRIPPING IS AVOIDED, PERFORATING VEIN LIGATION MAY BE APPLIED FOR VENOUS ULCERS OR ULCER PROPHYLAXIS.

Varicose VSP may be excised together with VSM, but if deep venous insufficiency is suspicious or insignificant, as a precaution VSP should be preserved.

In the second form there is insufficiency in perforating and deep veins. Venous ulcers may occur. Most commonly venous ulcers are seen around the ankle where the perforating veins are in great number. Secondary varicose veins due to postphlebitic syndrome (there is venous hypertension in a large area and the valves are disturbed) may cause ulcers but is not the main factor of the ulcer process. As a general compromise, valvular malformation follows the deep vein thrombosis process. Recanalization develops within a few months, this long period is the cause of valvular malformations. In the development of ulcers, the role of perforating veins in the knee and below the knee is well known. These are usually drained into the posterior tibial vein. Posterior tibial vein is relatively dilated and insufficient in venous ulcers.

The hemodynamic changes in the venous ulcer pathogenesis is important. According to the chronological order the development is as follows; valvular insufficiency, venous hypertension, A-V shunt formation, capillary ischemia (oxygenated arterial blood bypasses the capillary system), venular thrombosis, skin ulcer.
Apart from the perforating venous insufficiency, increased ambulatory venous pressure, some venographic studies, potential ischemic reasons and the degree of deep venous system reflux may cause ulcerations.

In the diagnosis, evaluating the patient with ambulatory venous pressure, phlebography and duplex scanning (doppler) is important.

In the surgical procedure of the primary valvular and postthrombophlebitic diseases, the medial and lateral calf veins are ligated in order to decrease the venous reflux and venous hypertension on the feet.

The stripping of the saphen vein underestimating the insufficient perforating veins may cause serious ulcer recurrences. Patients with stasis changes on the skin and/or patients with active or healed ulcers, are candidates for subfascial ligation. Recurrence is more common amongst postthrombotic and especially deep venous obstructions than primary valvular insufficiency.

**General treatment principles in venous ulcers:**

- Conservative therapy; zinc oxide paste and sclerozing therapy.
- Ultrasound guided coil embolization.
- Subfascial endoscopic venous surgery (SEPS) (posterior intervention is preferred).
- Subfascial ligation via posterior midline or rarely transvers incision.
- Linton operation.
- Anterior interventions; through the ulcer, skin incision is performed and the previously determined perforating veins are reached via separate incisions and either ligation is performed or the perforating superficial veins lying at the base of the ulcer are knotted.
- Treatment with split skin grafts.

The recurrence rate is quite high in coil embolization and split skin grafting. Lately SEPS technique is the choice of treatment, in which the two year cumulative recurrence rate has been estimated 12% for primary valvular insufficiency and 28% for postthrombotic cases in Mayo Clinic (6). The Linton operation when compared to SEPS, is quite brutal.

The interpretation of doppler and phlebography in varicose surgery remains very important since the operation strategy is defined according to results of these studies. Therefore the cooperation of experienced radiologist and surgeon becomes clear in venous diseases. Surgical treatment does not give optimum results except for superficial insufficiencies. In cases of thrombophlebitis and phlebothrombosis which may end up with secondary valvular insufficiencies, early and appropriate medical treatment can prevent postthrombotic or thrombophlebitic syndrome development.

If the radiologist is not experienced enough to interpretate the doppler, classic physical examination like controlling edema which shows deep or perforating vein insufficiency may be applied to reassure the diagnosis. If deep venous insufficiency is manifest, stripping should not be applied in VSM varicosity, if it is suspicious, at least an intervention to VSP should be avoided even if it is varicosed.

As a result early diagnosis, prophylaxis, medical and appropriate surgical treatment of the venous diseases can save the patient from chronic venous insufficiency process or keep the insufficiency at minimal rate. Compression sock application is the most effective way to minimize preoperative and postoperative complications of venous insufficiency and of prophylaxis.
REFERENCES
