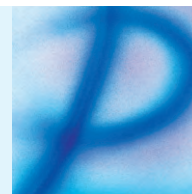


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Editorial

Fidel Fernández

Dear Readers,

In this new issue, **Oscar Maletti** and **Marzia Lugli** from Modena, Italy and **Michel Perrin** from Lyon, France present an excellent update on the very important clinical issue of postthrombotic syndrome after operative treatment. This disease can lead to severe chronic venous insufficiency in a significant number of cases due to postthrombotic deep vein obstruction and/or incompetence. Management of this disease is difficult and needs to be standardized. The most frequent combination is iliac obstruction and infrainguinal reflux. This paper presents a useful diagnostic and therapeutic strategy that can combine proximal recanalization and stenting with antireflux surgery. Currently, for the authors, four techniques for treating deep reflux are theoretically possible. They favor, in order, valvuloplasty, vein transposition, neovalve construction, and valve transplant as treatments for deep vein reflux.

Andre Cornu-Thenard and **Pierre Boivin** from Paris, France provide an interesting overview on pregnancy and chronic venous disease. The authors summarized the diagnosis and treatment of this disease in this special situation.

From Belorussia, we have received a contribution from **Vyacheslav Yanushko**, **Alexander Bayeshko**, **Sergey Sushkov**, **Yuriy Nebylitsyn**, and **Alexander Nazaruk**. They studied the benefits of Micronized Purified Flavonoid Fraction (MPFF) on primary chronic venous disease-related symptoms and quality of life in the DELTA study. This trial, with a large number of patients enrolled (522), concluded that simplicity of use, the universal nature of the standard dose, and good tolerance allows MPFF to be recommended for widespread usage in the everyday practice of physicians and general practitioners.

The article by **Peter Neglén** et al relates to the holding of the fifth EVF HOW (European Venous Forum Hands-on Workshop on Venous Disease) to be organized in Cyprus between October 30 and November 1 2014. The concept of a hands-on workshop on venous disease meets the major objectives of the European Venous Forum, which aims to develop and provide education within the venous field. The goal is not only to provide understanding of modern practical management, but also for the delegates to learn hands-on individual procedures to treat venous disease. The workshop targets those who want an introduction to or need an update on the management of venous disease. The intention is to give a wide learning on all aspects of acute and chronic venous diseases. Such an initiative to enhance the education of young specialists is to be encouraged. This is why the description of the last EVF HOW is published in the present issue.

Michel Perrin also presents another paper in this issue about the intriguing problem of the presence of varices after operative treatment (PREVAIT). This interesting review will be presented in two parts that will be published consecutively in the journal.

Finally, the present issue contains a new rubric consisting in comments on recent publications by: (i) Ramesh Tripathi, India (ii) Djordje Radak and Srdjan Babic from Serbia and ; (iii) Javier Leal-Monedero, Spain.

Enjoy reading this issue!
Fidel Fernández, Granada, Spain



Operative treatment in postthrombotic syndrome: an update

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Abstract

Postthrombotic deep vein obstruction and/or incompetence can lead to severe chronic venous insufficiency in a significant number of cases. Postthrombotic lesions are essentially of two types: (i) obstruction of various degrees; and (ii) valve destruction with subsequent reflux. These two elements are variously present at different levels. The most frequent combination is proximal occlusion or obstruction associated with subinguinal reflux. The leading technique for treating proximal obstruction is stenting. Conversely, the leading technique for treating obstruction located below the inguinal ligament is endophlebectomy mainly in the common femoral vein. The treatment of deep venous reflux in postthrombotic syndrome is based on a precise strategy deriving from an accurate diagnostic evaluation, based on several investigations. This phase should give us useful information for addressing the treatment. Various procedures can be used including valve transfer, neovalve according to investigation data. When treating conditions characterized by proximal obstruction and distal reflux, the treatment should be divided into two actions and usually venous stenting addresses the first action. This allows us to check the degree of improvement obtained after the first treatment.

Keywords:

chronic venous insufficiency; deep venous obstruction; deep vein reconstructive surgery; deep venous reflux; neovalve; postthrombotic syndrome; valve transfer; valvuloplasty; venous stenting; venous ulcer

Introduction

Postthrombotic deep vein incompetence can lead to severe chronic venous insufficiency (CVI) in 20% to 60% of cases.¹ However, a postthrombotic deep vein lesion is not only related to valve incompetence, but also to various degrees of obstruction including occlusion. Moreover, the postthrombotic syndrome (PTS) may comprise four hemodynamic disorders: the two mentioned above, as well as superficial vein insufficiency and perforator incompetence. The deep venous lesions (obstruction and valve destruction) are variously combined at different levels.

The increase in resistance to blood flow is due to stenosis and rigidity of the venous wall. Stenosis is caused by endoluminal processes (endoluminal fibrosis and synechiae) (*Figure 1*) or exoluminal processes (extrinsic fibrotic compression). Both are inflammatory postthrombotic sequelae. The reflux is determined by the absence of valvular competence as a result of lesions extending, to a greater or lesser degree, to the valvular apparatus itself. Actually, although obstruction and reflux can be associated with various combinations such as to sites and severity, the obstructive

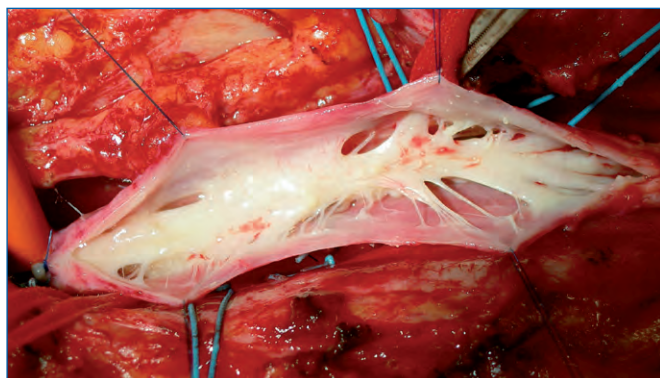


Figure 1. Endoluminal fibrosis and synechiae in postthrombotic syndrome.

lesions are usually located at the proximal iliac and common femoral site, while the reflux involves the femoral-popliteal crural segment. Postthrombotic recanalization is more complete at the subinguinal area while it is less complete at the iliac area. The reasons for this difference in recanalization are not well known.

Physiopathology

The isolated proximal venous obstruction is the principal cause of PTS in approximately one-third of cases, while in two-thirds of all cases, CVI is caused by the association of obstruction and reflux following the above-mentioned lesions: iliac proximal obstruction and distal reflux.

CVI with deep venous disease and without perforator and superficial venous system incompetence, can be divided into four main types according to the A and the P of the CEAP (Clinical; Etiological, Anatomical, Pathophysiological) classification Table I.²

1. $A_{d'} P_{o 6-7-9}$
2. $A_{d'} P_{o 6-7-9-11}$
3. $A_{d'} P_{o 6-7-9-11-13}$
4. $A_{d'} P_{o 6-7-9-11-13-14-15}$

Given that each type can be associated with $A_{d'} P_{r 11-12-13-14-15'}$ we can find scenarios characterized by an obstructive process at vena cava, iliac, and common femoral level and/or at femoral, popliteal, and tibial level and/or an associated reflux. However, the more frequent scenario will be $A_{d'} P_{o 7-9} P_{r 11-13-14-15'}$.

When two hemodynamic elements are associated, it is advisable to distinguish the more significant to correct it first.

Clinical classification

- C0: no visible or palpable signs of venous disease.
 - C1: telangiectasies or reticular veins.
 - C2: varicose veins - distinguished from reticular veins by a diameter of 3 mm or more.
 - C3: edema.
 - C4: changes in the skin and subcutaneous tissue secondary to CVD are divided into two subclasses to better define the differing severity of venous disease:
 - C4a: pigmentation and/or eczema;
 - C4b: lipodermatosclerosis and/or atrophie blanche.
 - C5: healed venous ulcer.
 - C6: active venous ulcer.
- (S, symptomatic) or absence of symptoms (A, asymptomatic).

Etiological classification

- Ec: congenital.
- Ep: primary.
- Es: secondary (postthrombotic).
- En: no venous etiology identified.

Anatomical classification

Superficial veins:

1. telangiectasies/reticular veins.
2. Great saphenous vein (GSV) above knee.
3. GSV below knee.
4. Small saphenous vein.
5. Nonsaphenous veins.

Deep veins:

6. Inferior vena cava.
7. Common iliac vein.
8. Internal iliac vein.
9. External iliac vein.
10. Pelvic: gonadal, broad ligament veins, other.
11. Common femoral vein.
12. Deep femoral vein.
13. Femoral vein.
14. Popliteal vein.
15. Crural: anterior tibial, posterior tibial, peroneal veins (all paired).
16. Muscular: gastrocnemial, soleal veins, other.

Perforating veins:

17. Thigh.
18. Calf.

Pathophysiological classification

- Pr: reflux.
- Po: obstruction.
- Pr,o: reflux and obstruction.
- Pn: no venous pathophysiology identifiable

Table I. The CEAP (Clinical, Etiological, Anatomical, Pathophysiological) classification.

Consequently, it is important to establish which of them, an iliac obstruction or a femoral-popliteal reflux, is the most significant. Investigative procedures to separately evaluate the two components are currently not discriminant and the only parameter at our disposal is the cumulative result of both on venous function. In other words, the severity and extent to which reflux and obstruction, and their interaction, impact venous function can only be known by their global combined impact.

Venous physiology theory states that venous pressure detected distally in the standing position and after exercise are essential parameters. In reality, venous physiology is founded on more complex phenomena rather than venous pressure alone. The venous system has a variable capacity: variations in caliber affect variations in flow, which influences pressure. Another crucial factor in venous physiology is the valve function.³ Its role is evident as can be seen by observing the clinical signs and symptoms correlated to reflux. Even if a correlation between deep venous reflux and clinical severity has not yet been established, we know that axial reflux is more permissive than segmental. In addition, other factors play a role in venous function such as the extrinsic contraction of the lower limb muscles. Anatomical damage being equal, the muscular force acts as a counter force, which means that the same pathology may be more or less severe. In other words, the same pathology can manifest as a C6 or C3 class.

Investigations

The goals are to precisely identify each lesion, which means that the venous system must be investigated from the ankle to the vena cava. Several investigations are available: (i) Duplex; (ii) B-Flow; (iii) Plethysmography; (iv) Venous Pressure; (v) CT; (vi) RMI; (vii) venography; and (viii) intravascular ultrasound (IVUS).

None of the above-mentioned investigations provides the full information, but by using different investigations, valuable data can be obtained to correct the hemodynamic damage. They can also supply information on PTS evolution. This phase should give us morphologic and hemodynamic information in order to address the treatment.

The crucial information for determining ideal operative procedures is as follows:

1. Presence and/or absence of proximal obstruction including occlusion.
2. Presence of axial reflux below the inguinal ligament, from groin to calf, via femoro-popliteal axis or by superficial or profunda transfer as well as their combination.
3. Presence and/or absence of proximal competence of the profunda vein.
4. In case of profunda vein incompetence, to identify single or multiple re-entry points into the popliteal vein, it may be useful to determine what is the easiest access and way to occlude the re-entry point by endovascular procedure.
5. Presence and competence of great and small saphenous vein.
6. Popliteal vein feature (single or multiple channels) and their competence and/or incompetence.
7. Caliber of femoral and popliteal vein.
8. Femoro-popliteal flow during exercise.
9. Caliber and competence of the axillary vein.
10. Presence of endoluminal fibrosis, which determines a double channel at femoro-popliteal level.

Surgical indications

Although improvement can be achieved by wearing elastic stockings, in a significant number of patients, using compression therapy may be insufficient or not well tolerated.⁴ The C6 class, in presence of an active ulcer, is supposed to be the most severe CEAP class, however, it should be stressed that class C4b is sometimes just as invalidating as class C6. It should also be noted that class C4b is less tolerant to compression.

Actually, PTS determines a severe structural change in the leg to such an extent that variations in the structure of collagen also intervene in the extracellular matrix of the skin, as well as in the matrix of the venous tissue. This is what underlies the chronic and inflammatory processes that characterize the pathology. What is surprising in PTS is its extreme variability and the less-than-constant correspondence between anatomic damage and its hemodynamic effects. We know that a slight alteration in venous flow can lead to major hemodynamic consequences and so, from the therapeutic point of view, partial correction of a venous defect can drastically modify venous hemodynamics, leading to a compensated and acceptable clinical state.⁵ It has been asserted that the extensive damage produced by PTS was not entirely correctible and that it was impossible to restore the homeostatic conditions.

This is undoubtedly true, but it should also be remembered that our purpose is to achieve better hemodynamics in order to improve the patient's quality of life. This improvement does not mean restoring normal anatomy and physiology of the damaged system, but acting in a strategic and progressive way on particular hemodynamic lesions. That means that a leg, which, even though pathological, can allow the patient to lead a normal life, such as to perform normal activities and engage socially, in other words to improve quality of life.

Given that ulcers, lipodermatosclerosis, pain, burning, itching, and permanent edema are all signs or symptoms impeding quality of life, it is against these that we must act. The aim of treatment in PTS is to improve either sign or symptoms and finally quality of life. This can be achieved by methods less incapacitating than the pathology itself. Wearing elastic bandages or high-compression elastic stockings daily, particularly in high temperatures, cannot be defined as a therapeutic approach that improves the patient's quality of life.

Any envisaged surgical procedure deserves serious consideration, provided it is a low-risk operation. Though it may cause inconvenience, this can hardly compare with decades of poor quality of life.

We do not hesitate to submit a patient to a hip-replacement operation - which is not without risks - in order to relieve chronic pain and improve their ability to walk. By the same token, there is no reason why we should discourage deep venous system surgery, thus condemning the patient to wear compression stockings for the rest of their life. Hesitations of this nature probably stem from a taboo that deep venous system surgery is dangerous and inadvisable. What does the literature tell us about the series of patients who undergo such treatment? Mortality and complications are nil or negligible, and improvement can be achieved in many cases.

Operative treatments

As is mentioned above, it is opportune to continue step by step, starting with more simple actions and progressing, if necessary, to more sophisticated ones. Nowadays, deep venous endovascular treatment has benefited from a very efficient technique: recanalization of the occluded or obstructed vein with angioplasty and stenting. This has allowed us to treat one of the principal obstacles to lower-limb blood flow, (the iliac-cava obstruction syndrome), without the need for open surgery.

The venous endoluminal technique has proved superior in reducing mortality and morbidity, but above all, in terms of

the results achieved, results that were never achieved with open surgery. This has meant that the type $A_{dr} P_{o 6-7-9}$ could be treated successfully only with endovascular procedures (Figure 2). In the case of an obstructed and not occlusive process, the success of the treatment is so demonstrable that the procedure has received a A grade of recommendation. When the patient is $A_{dr} P_{o 6-7-9} P_{r 11-12-13-14-15}$ the result may be the same but in a more restricted number of patients. In the Raju series,⁵ half the patients obtained healing of trophic lesions reducing the need for compression support, leaving the subinguinal refluxes unchanged. This is a clear demonstration of the fact that we can improve the patient by partially correcting PTS sequelae.



Figure 2. Venous stenting for iliac venous obstruction.

In $A_{dr} P_{o 7-9-11}$ or $A_{dr} P_{o 11}$ patients, open surgery such as endophlebectomy may be necessary. The technique was described by Kistner and Puggioni⁶ and consists of removing the endoluminal fibrotic tissue in the common femoral vein. This also supports the idea that a limited action can improve the leg. Indeed, although the endoluminal fibrosis is more extensive in the distal vein, restoring a normal lumen in the common femoral vein by opening the tributaries' termination creates a re-entry point that increases inflow. At the inguinal level, the open technique is preferable to stenting since it is an area that is easily accessible to surgery, and it undergoes extrinsic compression due to the movement of the leg. Stenting yields excellent results with a minimum level of morbidity and a restenosis less than 5%; it leads to a significant improvement in pain, edema, and quality of life.

In PTS, iliac venous obstruction is broadly represented, and this explains why in half of the cases we obtain very good results simply by treating this lesion. However, we do not yet have pretreatment methods to determine whether an iliac stenosis is hemodynamically significant or not, and the presence of collateral pathways shown by venography does not give us sufficient information. Intraprocedural IVUS (Figure 3) yields useful information on the degree of venous stenosis. Nevertheless, IVUS provides morphologic information, but no hemodynamic ones. Unlike in the case of arteries, the transtenotic pressure gradient is meaningless, given that its system differs in the way it fills, yielding very low-pressure values and misleading scenarios produced by collateral pathways.

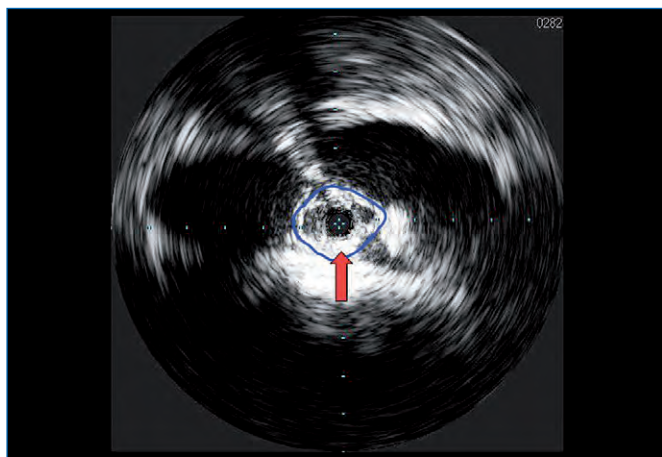


Figure 3. Intravascular ultrasound (IVUS) is able to detect iliac obstruction.

The criterion used to evaluate and treat an iliac stenosis is still more morphological than hemodynamic, and this explains why it proves impossible in a global evaluation of the lower limb to evaluate the various lesions. Therefore, the criterion to first treat an iliac stenosis combined with below inguinal reflux relies on a pragmatic principle, to start by the most simple and less invasive procedure. When the reflux is the main cause of signs and symptoms, and this is evident in $A_{dr} P_{o 7-9} P_{r 11-13-14-15}$ patients that become after stenting $A_{dr} P_{o 7-9-11-13-14-15}$ and in isolated cases of $A_{dr} Pr_{11-13-14-15}$, we must take into account the treatment of the reflux itself. We know that axial reflux is directly correlated with CVI.⁷

Paradoxically, deep venous axial reflux seems to be tolerated better than superficial reflux, but this is true only in the short term; the persistence of deep venous reflux leads to particularly severe CVI in the long term, besides contributing to recurrence of treated varices. The correction of postthrombotic reflux is obtained by applying various techniques: Kistner valvuloplasty,⁸ venous transposition,⁹ venous transplant,¹⁰ and neovalve creation.¹¹

Each of these techniques has its specific application. Valvuloplasty (Figure 4) is a procedure aimed at restoring the competence of valves. In selected PTS a proximal valve is reparable allowing valvuloplasty to be performed. By shortening the valvular cusps free borders, the valve regains competence that segments the refluxing hydrostatic column. When reparable valves are not detectable in the femoral-popliteal segment, but a competent valve is present in the proximal portion of the profunda vein, a femoral transposition might be considered and the femoral vein is transposed into the profunda vein below the competent valve. When we have a still competent great saphenous vein, a saphenous transposition is performed, creating a new deep competent axis. (Figure 5).

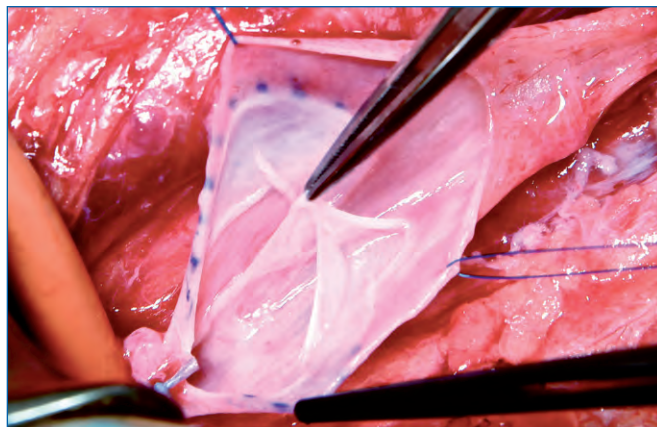


Figure 4. Kistner's valvuloplasty in a residual valve during postthrombotic syndrome.

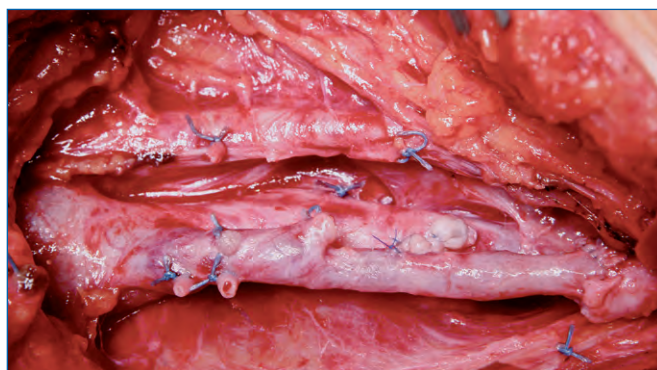


Figure 5. Maletti's saphenous transposition.

When the profunda and great saphenous veins are incompetent, a transplant taken from the axillary vein and inserted into the popliteal vein can be used. A possible alternative, when the above-mentioned operations are not technically performable in a conspicuous number of cases, a neovalve construction is the only option (Figure 6). The neovalve can be performed with various techniques, and it has proven to be a reliable procedure in the long term.

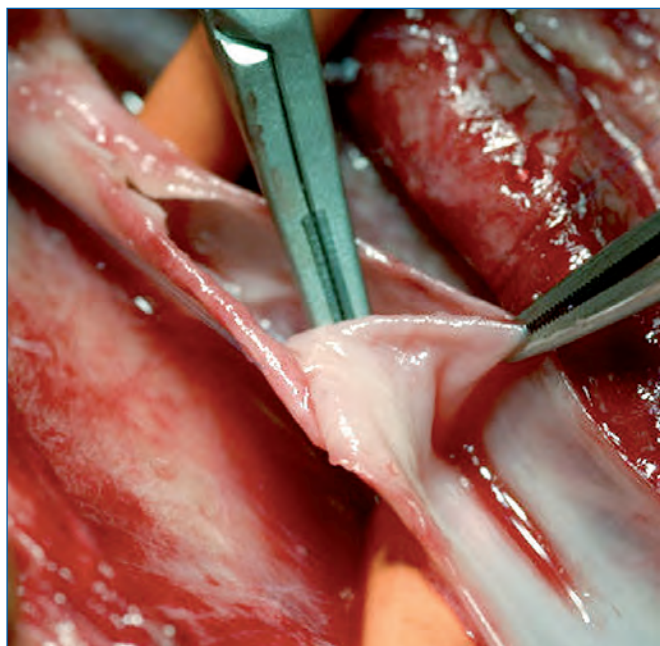


Figure 6. Maleti's neovalve.

Discussion and Conclusions

The surgical treatment of CVI has frequently addressed perforators. The reduced morbidity offered by subfascial endoscopic perforator surgery (SEPS) compared with open surgery has considerably increased its frequency of use. How should we now consider the perforators? In other words, is ablation of incompetent perforating veins recommended when deep venous obstruction and reflux are present? We know that incompetent perforators play a different role in primary superficial vein incompetence in combination with primary superficial and deep venous reflux and in combination with superficial reflux and secondary deep venous reflux and obstruction.

Unfortunately, the role of perforators has not yet been established, neither whether the incompetent perforators are the cause of superficial venous incompetence, nor whether the saphenous venous reflux is the cause of dilatation and subsequent incompetence of the perforators. Studies related to this problem provide data that suggest that there is no additional hemodynamic improvement after treatment of the superficial system. When the deep venous system is competent, the treatment of perforators associated with superficial venous treatment doesn't improve the results and the perforators can regain their competence after saphenous vein surgery alone.

When deep venous insufficiency is associated, we have no data about the regained competence of perforators after

treating the superficial system or deep venous system or both. We know that SEPS in PTS is not justified, due to the high percentage (56%) of ulcer recurrence after five years in postthrombotic limbs.¹²

In 40 to 50 years of deep vein surgery, no severe complications have been reported by the authors¹³⁻¹⁵ who have practiced it, and the fear of pulmonary embolisms have proven unfounded, but for rare exceptions. Nowadays, PTS severity commences when an acute phlebothrombosis develops, and thus restoring iliac patency during the acute phase forms the basis for preventing postthrombotic disease. The second point worth making is that early treatment of a symptomatic patient can achieve better results and probably impedes the progression of the PTS. Angioplasty and stenting in proximal lesions have shown their efficacy, and given the low risk of open surgery, the surgical correction of PTS should be considered every time the conservative treatment proves either inefficient or not well tolerated, especially in young patients. The purpose of these procedures is to improve the quality of life, given that PTS and its correlated complications are poorly tolerated.¹⁶

Before the stenting era, the role of reflux as a principal cause of CVI was probably overestimated. Nowadays, we know that proximal venous obstruction and occlusion play a crucial role and this concept does not derive from hemodynamic evaluation, but from the clinical improvement of the patient after treating obstruction. Therefore, given that both obstruction and reflux are subsumed in a single hemodynamic scenario, the strategy of correction will occur before treating the proximal obstruction and this for three principal reasons: (i) we can improve the patient's condition without the need to perform open surgery; (ii) endovascular technique is less invasive; and (iii) a deep vein reconstruction can fail if associated with a poor inflow or outflow.

The leading technique for treating proximal obstruction is stenting. Conversely, the leading technique for treating obstruction located below the inguinal level is endophlebectomy, performable at the femoral and popliteal level. When we treat a condition characterized by proximal obstruction and distal reflux the treatment should be divided into two separated actions. This allows us to check the degree of improvement obtained after the first treatment. When obstruction and reflux are associated below the inguinal ligament, endophlebectomy and correction of reflux should be performed in the same session, except for hybrid treatment in which iliac stenting and endophlebectomy are associated for technical reasons (ie, significant fibrosis in the stent's landing area).

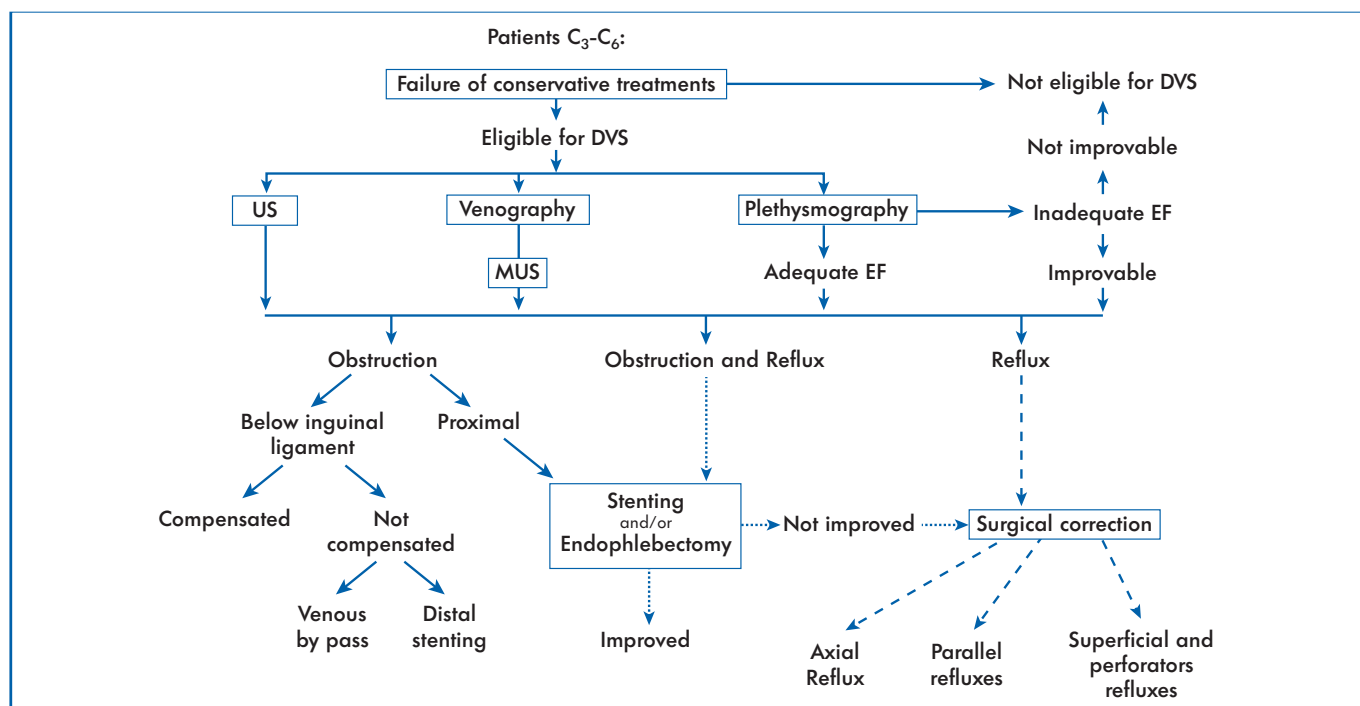


Figure 7. Diagnostic and therapeutic strategy.

At the moment, the treatment of deep venous lesions in PTS is based on a precise strategy (Figure 7) coming from an accurate diagnostic phase.¹⁷ At present, four techniques for treating deep reflux are theoretically possible. We favor, in order, valvuloplasty, vein transposition, neovalve, and valve transplant. The treatment of perforators either before or after deep venous surgery is still a subject for debate.



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Chronic venous disease during pregnancy

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Keywords:

compression stockings; hormones;
nocturnal leg elevation; postpartum
regression; pregnancy; varicose veins;
venoactive agents

Abstract

Pregnancy plays an important role in the onset and development of chronic venous disease in women. Changes to the venous system that occur during pregnancy are linked to hormonal secretions, as well as compression of the iliac veins by the gravid uterus. The clinical signs are varied and can be distressing. The reasons that pregnant women consult can be grouped under the terms aesthetic, preventative, and therapeutic. Treatment is essentially noninterventional based on: (i) the wearing of medical compression stockings, adapted to the severity of the venous disease; (ii) sufficient elevation of the lower limbs when in the supine position; and (iii) the prescription of venoactive agents in case of symptoms.

Introduction

Chronic venous disease (CVD) refers to a group of disorders associated with the dysfunction of one or more of the 3 lower extremity venous systems: superficial, deep, or perforating.¹⁻³ CVD affecting the superficial venous system results in the appearance of 3 clinical signs: telangiectasia and venulectasia, classified as C1 in the C class of the CEAP classification; and varicose veins, classified as C2. These signs are often associated with classical venous symptomatology, although this association has never been proven.⁴

Other signs of an impaired venous system include edema (C3), trophic skin disorders (C4a and C4b), and leg ulcers (healed C5 and open C6).¹ The appearance and progression of CVD often occurs during pregnancy.⁵ Women frequently consult early in pregnancy to find out about the risks, complications, and treatment options.

Pathophysiology

Pregnancy results in numerous adaptations to the circulatory system.⁵⁻¹² CVD during pregnancy is caused by a combination of two main mechanisms: (i) an increase in venous pressure of the lower limbs due to compression of the inferior vena cava and iliac veins by the gravid uterus; and (ii) an increase in venous distensibility due to the effect of hormonal mediators. There is a linear increase in lower limb venous pressure from the beginning to the end of pregnancy. By the end of pregnancy, the femoral venous pressure in the supine position is increased threefold.⁶

The increase in venous distensibility occurs from the first months of pregnancy and affects leg and arm veins in the same manner. The placenta secretes a large quantity of steroid hormones from the sixth week of pregnancy. Oestradiol and progesterone may have a vasodilating action, which would contribute to the increasing diameter of the veins observed throughout pregnancy, and the significant decrease that occurs after childbirth.^{8,9} They do not, however, exactly return to their initial diameter, particularly in patients with a history of varicose veins.^{5,8,10,12} Knowledge of this pathophysiology explains the rate of occurrence and development of CVD during pregnancy. It also explains the therapeutic effectiveness of medical compression stockings.

Clinical Epidemiology

Approximately 15% of pregnant women present with varicose veins, which mostly occur at the beginning of the second trimester.¹³ Age, gender, and a family history of CVD increases the risk of occurrence of varicose veins during pregnancy.¹² The relative risk of varicose veins increases 4-fold in women over 35 years of age compared with those under 29 years of age. The risk is also increased twofold in multiparous women compared with those in their first pregnancy.⁵ If hereditary risk factors are present, the relative risk increases 6.2-fold.

The prevalence of varicose veins in women over 40 years of age is as follows: 20% in nulliparous women, 40% in women who have had 1 to 4 pregnancies, and 65% in women who have had 5 or more pregnancies.¹⁴ In addition, correlations have been found between the number of varicosities affecting the greater and smaller saphenous veins, the size of the varicosities, and the number of pregnancies.^{12,13}

Clinical Assessment

The objectives of the first assessment are to:

1. Determine the reasons for consultation by analysis of the questionnaire given to the patient prior to the visit.^{15,16}
2. Capture on a pre-prepared document (which will be included in the dossier) what the patient sees and feels. This will allow future comparisons to be made.^{1,2,17}
3. Prepare a medical record, which will include findings from the medical examination (diagram of the lower limbs).

The examination will provide information on the reason for consultation. The most common reason is the onset of physi-

cal signs and sometimes symptoms. Knowing whether or not these existed before the pregnancy is important as it gives a good indication of the progression of the condition. The examination will also confirm the stage of pregnancy and the expected delivery date.

Symptoms vary widely, from nonexistent to severe or unexpected. Pain (phlebalgia) and the sensation of edema are frequent. They often occur at the end of the day and are increased by heat, advancing pregnancy, and professional activities.¹⁷

Signs are also variable and often related to a personal and family history of CVD.

Telangiectasia and venulectasia are more dense and larger than in nonpregnant women. Varicose veins are extremely diverse. They can range from small isolated dilatations to very impressive varices "pseudo-angiomas" (Figure 1, Figure 2). The dilatations can affect isolated veins or simul-



Figure 1. Large varicose vein parallel to the path of the greater saphenous vein and telangiectasia; appeared in the fourth month of pregnancy. Note the likely perforating vein. (C1 and C2 of the CEAP classification) (Photo ACT).



Figure 2. Wooden reference dowels to illustrate the diameter (mm) of varicose veins. Allows physicians to determine the diameter of a palpable varicose vein in comparison with a reference standard (Photo ACT).

taneously affect each element of the superficial venous network: greater and smaller saphenous veins, their collaterals, and perforating veins. They can also involve one or both lower limbs. The distribution is relatively homogeneous with approximately one-third of women having the right leg affected, one third the left, and one third a bilateral distribution.^{6,13}

In order to follow the progression of these varicose veins, it is necessary to make a note of the maximum diameter of each leg. This record is a method for scoring the clinical severity of the varicose veins.¹⁸ Vulvar and perineal varicose veins exist in about 10% of cases.¹³ They are often reported by women worried about a risk of rupture (Figure 3). They are not generally painful, but can become so when their volume becomes important.^{14,19}

Complications are mainly cutaneous (skin changes or subcutaneous tissue), but these are rare given the young age of these women, the short period of progression of the condition, and improved treatment options in recent years. Any trauma to an edematous leg may, however, lead to a chronic wound. Such ulcers (C6) are more likely to occur if there is a precursor: corona phlebectatica (Figure 4).²⁰ The appearance of either of these two signs requires the immedi-

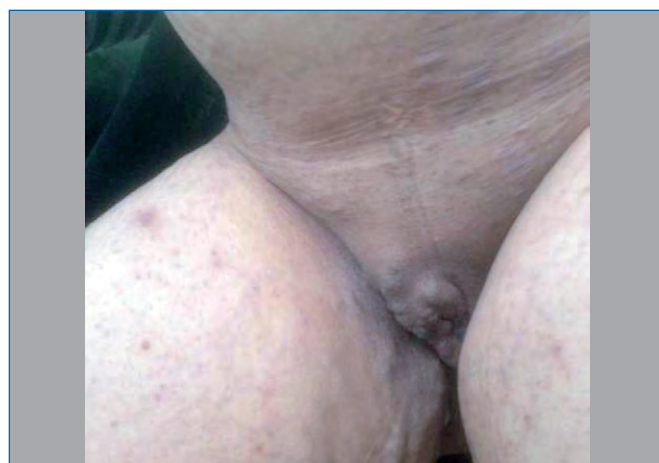


Figure 3. Large vulvar and perineal varicose veins in a pregnant woman (Photo Roger Mouyou)



Figure 4. A classic corona phlebectatica Van der Molen has been described as being composed of numerous telangiectasia grouped together at the edges.

ate initiation of treatment with medical compression therapy, preferably in combination with a venotonic agent.

Thrombotic complications in the superficial and deep venous systems are a major concern in pregnant women, in whom the risk of venous thromboembolism is four times higher than in nonpregnant women of the same age. Assessment of this risk should form part of the clinical examination.²¹ Prevention of thromboembolic risk and antithrombotic treatment should be adapted on an individual basis.²²⁻²⁴

After childbirth, C1 and C2 diminish rapidly, but often incompletely.²⁵ C3-C6, if present, improves gradually, pelvic

compressions are no longer an issue. A final assessment of the regression is only made 3 months after childbirth or after stopping breastfeeding.⁷¹⁴

Venous Echo-Doppler Examination

Every consultation during the first months of pregnancy should include a venous Doppler examination of the lower limbs. This initial assessment of the lesions may be supplemented by a more detailed patient history including details of CVD events: pelvic veins (ovarian and uterine veins), abdominal veins, and laboratory tests.^{25,26}

After the clinical examination, which will help guide treatment and determine the maximum diameters of affected veins, doctors should:

- Assess the venous networks of the affected limb as well as the contralateral limb, taking care not to let the woman stand for too long to avoid any discomfort.
- Record all findings on an initial illustration so that changes can be followed with each advancing stage of pregnancy.

Treatment

The treatment should, in order of priority: (i) reassure the patient; (ii) relieve symptoms; (iii) reduce or stop progression of the disease; and (iv) prevent complications.

Prevention counseling for lifestyle modification

Reassure. Worried patients should be reassured, explaining that most varices will diminish after childbirth and that complications are rare if treatment is followed.

Advise rest. During the day, extended rest periods are beneficial. We suggest 15 minutes of rest for every hour a patient spends on their feet. At night, the foot of the bed (and not the head) should be raised. A question often asked is “How

high?” We propose the following rule: raise 1 cm for each hour a patient spends on their feet during the day (eg, 10 hours standing=10 cm elevation).^{25,27} Note: there should be no cushion under the heels and nothing at the end of the mattress.

Exercise. Physical exercises that boost muscle power of the lower limbs and are compatible with pregnancy should be practiced as often as possible (walking, swimming, yoga, gentle gymnastics).¹³

Compression therapy

The French National Authority for Health (La Haute Autorité de Santé en France, www.has-sante.fr) has produced special recommendations for compression therapy during pregnancy (Table I). These serve as a useful starting point. Our goal is to improve them based on the experience we have gained in daily practice.

Some simple rules to follow:

1. Compression therapy should be prescribed at the appearance of the first venous disorder or at the start of pregnancy in case of preexisting CVD.^{28–30}
2. It must be continued throughout pregnancy and the physician's role should be to convince their patients of this, **“to convince, we must be convincing, therefore convinced!”** Continuing compression therapy for 9 months to 1 year is acceptable given the benefits that can be achieved.
3. Regardless of the material used, multilayer bandages are a very good therapeutic solution: two bandages (or three) one over the other form a very good bandage. The same effect is achieved with two (or three) medical compression stockings (Figure 5).³¹
4. In general, the pressures used will be higher with more pronounced signs and symptoms and with more advanced stages of pregnancy.

Clinical situation Pregnancy or postpartum	Type of compression	Duration
1. General case	Stockings (socks, thigh highs, tights) from 15 to 20 mmHg	The wearing of medical compression therapy is recommended for the duration of the pregnancy and for 6 weeks after birth
2. Patients with CVD	Stockings (socks, thigh highs, tights) 1. 20 to 36 mmHg or 2. >36 mmHg according to the severity of CVD	(6 months in case of a cesarean section)

Table I. Compression therapy for the prevention of venous thrombosis during pregnancy and postpartum (from a document published by the French National Authority for Health (La Haute Autorité de Santé en France, HAS))



Figure 5. Two layered medical compression stockings. The fabric of the two stockings is identical so that the outer stocking slips easily over the under stocking. In this photo, two knee-high stockings are worn one on top of the other.

Medical compression stockings

Above-knee stay-up compression stockings are the most frequently prescribed due to their greater acceptability during pregnancy: no abdominal discomfort, relatively easy to put on, effects felt immediately (hence the need to have some

samples to hand to patients). In case of an allergic reaction to the stay-up band, stockings with a band of anti-allergenic nonslip grips should be prescribed. Maternity tights (extendable waist) or socks (more comfortable and less constraining) may also be prescribed depending on patient preference. Indeed, there is no difference in efficacy between the different types of stocking (socks, above-knee stockings, or tights). The compression stocking material is important to consider. The choice of stocking will be based on its tolerance, comfort, and patient preference.

Compression force

Whether indicated by class of compression or by mmHg (International Unit), the compression force will be adapted to the severity of CVD and to patient acceptance (Table II).²⁸

Note: a compression stocking exerting a pressure of 40 to 45 mmHg will reduce the diameter of the varicose vein by half. A minimum of 90 mmHg pressure is required for venous reflux to disappear and the diameter of the vein to return to normal.^{32,33} A high pressure can always be obtained by layering compression stockings. Appliances exist that facilitate the application of elastic stockings at high pressure, such as the Extensor or Butler stocking aids.³⁴

Layering

The layering of compression stockings can be particularly useful during pregnancy. When layered, the pressure of the stockings is additive,³¹ similar to the number of revolutions when a bandage is used to apply pressure. For example, a compression stocking exerting a pressure of 30 to 40 mmHg can be replaced by layering two compression stockings of 20 mmHg (Figure 6).³⁵

Clinical condition	Medical compression stocking pressure	Duration
C0S – C1S	10 to 20 mmHg	The wearing of medical compression therapy is recommended for the duration of the pregnancy and for 6 weeks after the birth
C2: varices with a maximum diameter <8 mm	20 to 30 mmHg	
C2: varices with a maximum diameter >8 mm	30 to 40 mmHg	
C3: prevention of edema	15 to 20 mmHg	
C3: treatment of edema	20 to 30 mmHg	
C4, C5, C6	30 to 40 mmHg	

The use of superimposed medical compression stockings (above- and below-knee stockings) during pregnancy is particularly effective for resolving problems associated with putting on the stockings.

For example: medical compression therapy of 30 to 40 mmHg can be replaced by layering two 20 mmHg stockings.

Table II. Choice of compression force as a function of disease severity in pregnant women

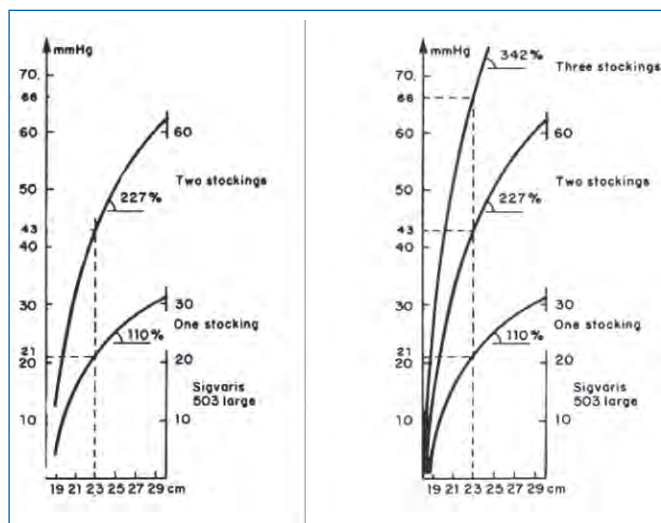


Figure 6. Hysteresis curves for one, two, and three layered medical compression stockings. The pressures are additive. One medical compression stocking on an ankle with a perimeter of 23 cm gives a pressure of ± 20 mmHg; two stockings provide a pressure of ± 42 mmHg, and a third stocking raises the pressure to ± 66 mmHg.

This technique reduces the effort required in applying and adjusting the force of compression. The top compression stocking is simply put on or removed by the patient to adjust the force of compression: stronger or weaker depending on their activities. In addition, as pregnancy advances, fitting compression therapy becomes more and more difficult due to the increased volume of the abdomen. This difficulty is increased when applying high pressure compression stockings. Layering of the stockings therefore can be particularly useful.

In the case of a localized painful varice (often associated with an incompetent perforating vein), a localized circular compression (ie, using an adhesive bandage) applied under the stocking produces effective relief.

Compression therapy is often very well accepted during pregnancy as the duration is short. The women clearly and rapidly feel the efficacy. In addition, they welcome the opportunity to conceal unsightly lesions.³⁶

After childbirth

Compression therapy still has its place, but should be adapted to changes in the level of CVD.

Venoactive agents

The use of venoactive agents is very useful for treating symptoms.³⁷ The duration of their use will depend on their toler-

ability and the preference of the patient. Their efficacy is known and recognized, but it is a function of their chemical characteristics and dosing. It should be noted that in the updated guidelines on the management of chronic venous disorders, the recommendation for the micronized purified flavonoid fraction (MPFF) is strong, based on benefits that clearly outweigh the risks and evidence of moderate quality (grade 1B).³⁷

The duration of treatment is between 1 and 3 months, but can be repeated in case of a recurrence of symptoms on discontinuation of treatment. The manufacturers do not recommend taking venoactive agents while breast feeding.

Special case: treatment of vulvar varicose veins³⁸

Treatment is only considered if there are associated symptoms: pain, feeling of heaviness, burning. In this case, we advise the application of a gel or cooling the lesions with reusable thermal pads (ie, the ColdHot 3M® device). An abdominal pregnancy support belt can also be of use. Wearing a sanitary towel can also strengthen the local compressive effect. The objective is to reduce the pressure inside the vulvar varicose veins.

Is sclerotherapy possible during pregnancy?

No causal relationship between the use of sclerotherapy and an adverse effect on either mother or child has been determined. However, there are no well-established clinical data on the use of sclerotherapy during pregnancy and lactation. For the authors, sclerotherapy is contraindicated during pregnancy and lactation. The European guidelines consider sclerotherapy as a relative contraindication (Individual benefit-risk assessment mandatory).¹³

Summary

The two fundamental treatments are: daytime medical compression therapy and nighttime elevation of the lower limbs.

Four points to remember:

1. Always consider the complaints of a woman at the beginning of a pregnancy: preventative action is likely to slow down or even stop the progression of venous disease!
2. The presence of varicose veins early in pregnancy, even of small diameter, must lead to implementation of the two fundamental treatments.
3. Without exception, no sclerotherapy during pregnancy.

4. Do not let a pregnant woman believe that nothing can be done for her legs: the combination of compression and elevation is a simple and very effective therapy!

Action to be taken in women who want to become pregnant

Opinions differ concerning what should be recommended to women wishing to become pregnant. Two situations are possible: there are no visible signs (COa of the CEAP classification) or signs are present!

- No signs are evident. Advise patients to consult a specialist in the event that venous symptoms or signs characteristic of CVD appear.³⁹
- Signs of CVD are present:

Moderate signs: previously prescribed treatment should be continued during pregnancy. Treatment should be increased if new signs or symptoms appear, or if existing signs or symptoms worsen.

Signs are important, such as dilatation of a varicose vein or edema: treatment as above including medical compression therapy, but interventional therapy may also be proposed. Pregnancy may damage the venous networks, but to what extent, and in what form?

"If the patient has had major treatment before pregnancy (for example, sclerotherapy or surgery in combination with medical compression), the varicose network will have mostly regressed; the maximum diameter will have become very small. Pregnancy will not make this reappear, especially if preventative medical compression stockings (30 to 40 mm Hg) are worn."

"Conversely, if there was no curative treatment before the pregnancy and if the objective is to stop progression, almost mandatory for varicose disease, it will be necessary to wear 30 to 40 mm Hg compression stockings during the pregnancy! This becomes all the more important if there is a major risk of thrombosis or if the woman has experienced venous problems during a previous pregnancy."²²

Conclusion

Always take into consideration women's concerns about their lower limbs in early pregnancy and do not let them believe that nothing can be done. Appropriate treatment is likely to slow down or even stop CVD progression. The presence of even moderate symptoms or signs of CVD in early pregnancy should lead to implementation of two fundamental treatments: daytime medical compression therapy and nighttime elevation of the lower limbs. Venoactive agents should be offered if patients are symptomatic. The combination of "daytime compression and nighttime elevation" of the lower limbs is a simple, "ecologic," and particularly effective treatment. It is up to us as physicians to convince people that it is possible to eradicate this condition.



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Benefits of MPFF on primary chronic venous disease-related symptoms and quality of life: the DELTA study

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Keywords:

chronic venous disease, micronized purified flavonoid fraction, quality of life, venous symptoms.

Abstract

Aim: To assess the benefits of MPFF treatment on symptomatic chronic venous disease (CVD) patients, in terms of symptom improvement, amelioration of daily activity, quality of life (QOL), patient satisfaction, and tolerability in the framework of venous oriented consultations.

Methods: Male or female patients consulting a venous specialist for symptomatic chronic venous disease (CVD), aged over 18 years, not having ongoing treatment for CVD, not consulting for an emergency or for the acute episode of an ongoing event, free of concomitant diseases that might interfere with venous treatment, informed of their involvement in the program and agreeing to take part were enrolled in the trial and started MPFF treatment, 2 500 mg tablets per day for 2 months. Patient's clinical presentation, presence of CVD signs and/or symptoms, and QOL score using CIVIQ were reported at the selection visit and at the 2- and 6-month follow-up visits. Side effects, if any, were also reported.

Results: The most significant regression of the disease-related symptoms was reported at the end of the 2nd month of MPFF treatment, with a 76% decrease in patients with night cramps, -75% in those with itching, -66% in patients with pain along the vein, -81% with feeling of burning, -66% with swelling, -59% with leg pain, and -38% with feeling of leg heaviness. All of these changes were significant ($P < 0.01$). In the meantime, the percentage of patients with edema was reduced from 42% to 36%. The global index score (GIS) equaled 32.9 ± 21.0 at baseline and decreased to 14.6 ± 14.7 ; $P < 0.0001$, after 2 months, reflecting the patients' QOL improvement after treatment. 94% of patients and 96% of physicians assessed MPFF efficacy as high and very high. The most common adverse events with MPFF were gastrointestinal.

Conclusion: A 2-month treatment with MPFF, 2 tablets per day, significantly reduces the frequency of many CVD symptoms and improves patients' QOL.

Introduction

Chronic venous disease (CVD) of the lower limbs is an umbrella term that encompasses a wide spectrum of pathology.^{1,2} CVD is defined as long-lasting morphological and functional abnormalities of the venous system manifested by symptoms (tingling, aching, burning, pain, muscle cramps, swelling, sensations of throbbing or heaviness, itching skin, restless legs, leg tiredness and/or fatigue) with or without signs indicating the need for investigation and/or care.³

Chronic venous disease (CVD) is a major cause of morbidity in the Western world, comprising medical, social, and economic aspects.^{4,7} In the European adult population, the prevalence of varicose veins has been estimated to be 25% to 50% for all types and degrees of varicosities, 10% to 15% for marked varicose veins, and 5% to 15% for chronic venous insufficiency (CVI).⁴⁻⁶ Recent surveys have sought the prevalence of venous symptoms either in the general population (ie, 3072 people of Bonn)⁸ or in consecutive subjects consulting their general practitioner for any medical reason (ie, 40 095 Polish adults⁹ and 91 545 subjects in 20 countries of the Vein Consult Program [VCP]).¹⁰ The results showed that 49% of the male and 62% of the female population of Bonn had leg complaints related to symptoms of venous diseases (eg, heaviness, sensation of swelling).⁸ Leg complaints were reported in up to 81% of the varicose veins group and up to 35% of the varicose-free patients in Poland,⁹ and almost 80% of the VCP subjects reported venous symptoms.¹⁰ Such studies show that CVD is a global phenomenon not solely limited to the western countries, as previously thought.

Daily activities and quality of life (QOL) are worse in patients suffering from CVD.^{11,12} The QOL impairment associated with venous edema has been shown to be equal to the QOL impairment in cancer and diabetes, and the impairment in venous ulcer patients is equal to that of heart failure.¹²

Initially, the progression of CVI is related to venous hypertension. The earliest complaints or symptoms, as well as vessel wall deterioration, valve restructuring, and, eventually, varicose veins, result not only from elevation of pressure, but also from a cascade of biochemical and inflammatory events related to both the macro- and microcirculation. Thickening and remodeling of the venous wall are influenced by venous inflammation. The subsequent capillary leakages and lymphatic overload resulting from higher than normal venous pressures are part of the disease.^{1,13}

Micronized purified flavonoid fraction (MPFF*), which consists of 90% micronized diosmin and 10% flavonoids (hesperidin, diosmetin, linarin, and isorhoifolin),¹⁴ has been shown to effectively reduce symptoms related to CVD and improve the QOL of CVD patients.^{13,15,16} This would result from the ability of MPFF to increase venous tone, to reinforce capillary resistance, and to improve lymphatic drainage in humans and animals. The anti-inflammatory effect of MPFF has been demonstrated in a number of studies.¹⁶ The comprehensive mechanism of action of MPFF, in addition to its micronized form, provides an explanation for its clinical efficacy at all stages of venous disease.¹⁷ Therefore, MPFF may improve major symptoms of CVD and was chosen for this trial.

*Registered as *Ardium*®, *Alvenor*®, *Arvenum*® 500, *Capiven*®, *Daffon*® 500 mg, *Detralex*®, *Elatec*®, *Flebotropin*®, *Variton*®, *Venitol*®.

Aim of the program

In a first step of this program, the detection of ambulatory-care patients in specialized consultations presenting with CVD-related symptoms and signs was enhanced. This program helped widen the scope of management of symptomatic CVD patients through the assessment of leg symptoms and characterization of their venous origin, using a validated, simple symptom screening questionnaire relevant to the clinical practice. For reporting venous signs, the Clinical, Etiological, Anatomical, Pathophysiological (CEAP) classification was used. This also contributed to better appraisals of the actual prevalence of CVD symptoms and signs in daily venous practice. Results of the first step have already been published.¹⁸

The aim of the present analysis was to assess the effects of MPFF treatment on symptomatic CVD patients, in terms of symptom improvement, amelioration of daily activity and QOL, patient satisfaction, and tolerability of the MPFF treatment in the framework of venous oriented consultations.

Material and methods

The survey was organized within the framework of specialized consultations in 37 healthcare facilities in the Belarusian State, and was surveyed and coordinated by venous specialists. Patients were selected from among those who complained of symptoms in the lower limbs and who consulted a venous specialist because of clinical presentations related to CVD. The suitability of the patients for involvement in the

program was assessed using set criteria: (i) women or men over 18 years old (not having ongoing treatment for CVD); (ii) informed of their involvement in the program and agreeing to take part; (iii) informed that they have the right to refuse to participate fully or partly; (iv) not consulting for an emergency or for an acute episode of an ongoing event; and (v) free of concomitant diseases that might interfere with venous treatment.

If these criteria were met, patients were asked about venous signs and symptoms, then underwent a leg examination, and a case report form was completed with the following information: patient's clinical presentation, presence of CVD signs and/or symptoms, QOL score at the selection visit by using the patients' self-reported specific Chronic Venous disease quality of life Questionnaire (CIVIQ),¹⁹ and mention of the MPFF treatment prescribed (ie, at the dose of 1000 mg per day, meaning 2 tablets of 500 mg daily, for 2 months). CIVIQ is made of 4 dimensions: physical, psychological, social, and pain. In our analysis, the index 0 represented the best QOL score and 100 the worst score.

Patients were advised to come for two follow-up visits, the first one scheduled at month 1 and the second one at month 2 of MPFF treatment. In the follow-up consultations, the effect of treatment was assessed on symptoms, signs, and QOL scores together with patient satisfaction. Side effects, if any, were reported.

Statistical analysis

All patients included in the survey and complying with the selection criteria were included in the analyzed population. Excel software has been used for the statistical analyses. These were performed by pooling all the data from all of the centers. The prevalence of CVD by item (CEAP class and symptoms) was assessed. Descriptive statistics are presented as mean, standard deviation (SD), minimum, maximum for continuous data, and number of cases and percentages for categorical data. A student t test was used for the confidence estimation and nonparametric statistics (Wilcoxon test) was used for bidimensional analysis.

Results

The trial was conducted between April and August 2009 by 83 venous specialists. 557 patients were enrolled, but only 522 of the patients were in compliance with the protocol requirements and therefore were analyzed. There were 423 women and 99 men. The mean age of the studied population was 51.1 ± 13.7 years (SD, 20 to 94 years).

CVD prevalence by CEAP stage

The distribution of patients according to the CEAP classification was as follows: C₀, 3.2%; C₁, 19.5%; C₂, 27.5%; C₃, 26.2%; C₄, 16.2%; C₅, 4.3%; C₆, 1.4%. (Figure 1).

Symptoms prevalence

The most often encountered symptoms were in ranking order: heaviness (93.7%), leg pain (84.5%), sensation of swelling (75.5%), night cramps (65%), pain along the course of the vein (56.3%), itching (51.2%), and sensation of burning (49.2%).

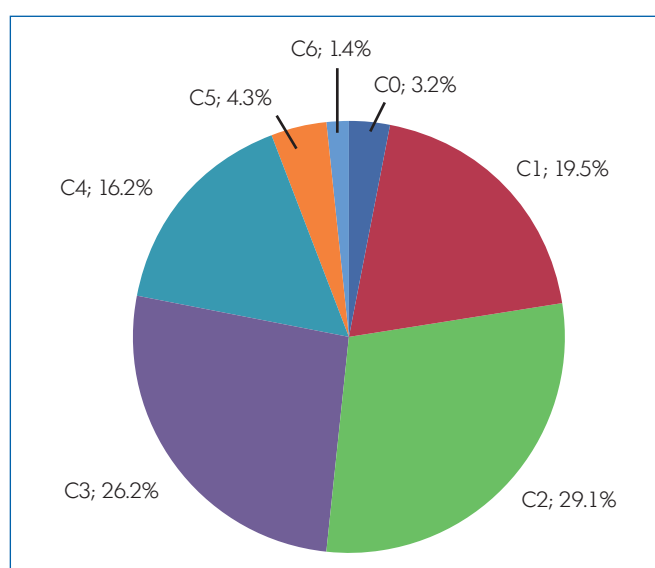


Figure 1. The distribution of patients according to the CEAP classification.

Assessment of MPFF treatment on venous-related symptoms

Assessment of patients still complaining of venous symptoms (heaviness, leg pain, pain along the veins, sensation of swelling or burning, and night cramps) at 2 and 6 months after MPFF treatment (Figure 2). The most significant regression of the disease-related symptoms was registered at the end of the 2nd month of the MPFF treatment, with a significant decrease in the percent of patients with night cramps (-76.2%), itching (-74.8%), pain along the vein (-66.4%), feeling of burning (-81.3%) and swelling (-66.2%), leg pain (-59.1%). The less dynamic change was the feeling of leg heaviness which decreased by 38.4%. All changes were significant ($P < 0.01$) at month 2. (Figure 2). In the meantime, the percentage of patients with edema was reduced after a 2 month treatment from 42% to 36%.

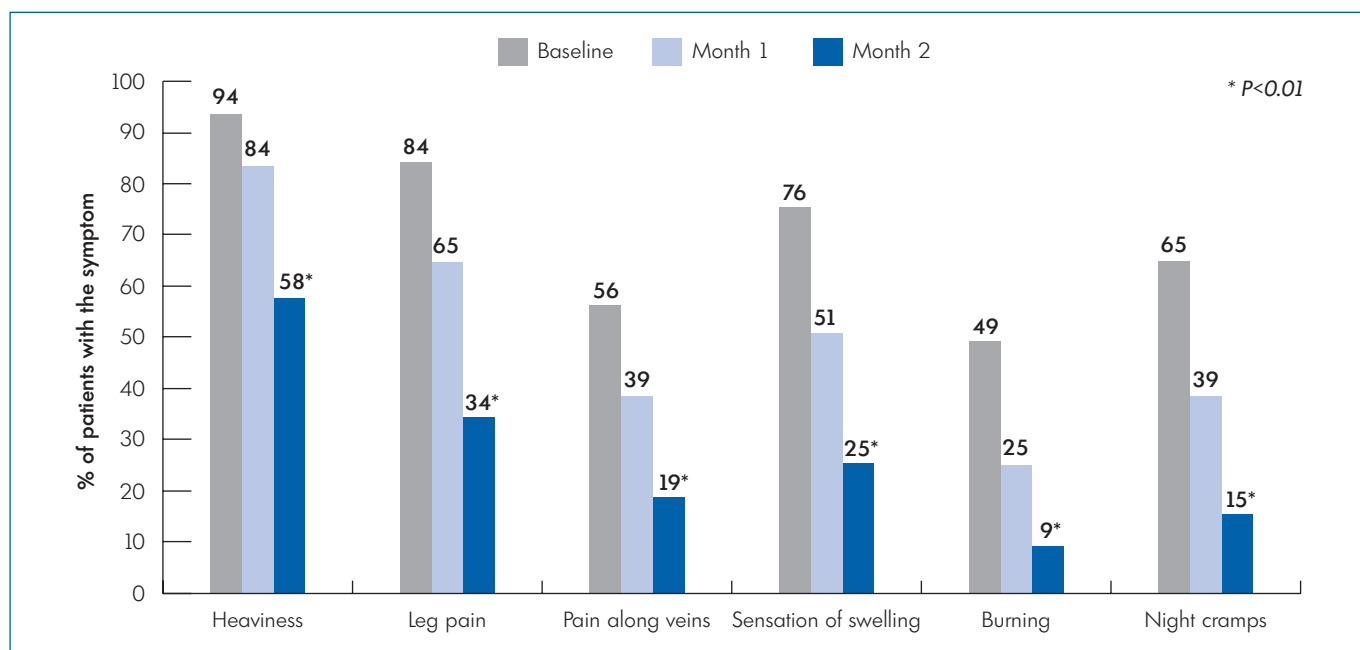


Figure 2. Percentage of patients complaining of venous symptoms at baseline, and at 2 and 6 month MPFF 500 mg treatment, 2 tablets daily.

Evaluation of the patients' quality of life after treatment

QOL was also improved as assessed by the global index score and by dimension. The global index score (GIS) equaled 67 ± 21 at baseline and increased to 85 ± 15 ; $P < 0.0001$, after 2 months, reflecting the patients' QOL improvement after treatment. This was also observed for the

physical parameter of CIVIQ with an increase in score from 63 ± 23 to 84 ± 18 , $P < 0.0001$; the psychological score, from 73 ± 22 to 87 ± 15 , $P < 0.0001$; and the social and pain scores, from 63 ± 27 to 81 ± 21 and 58 ± 20 to 83 ± 15 , respectively; $P < 0.0001$). Results are illustrated in Figure 3.

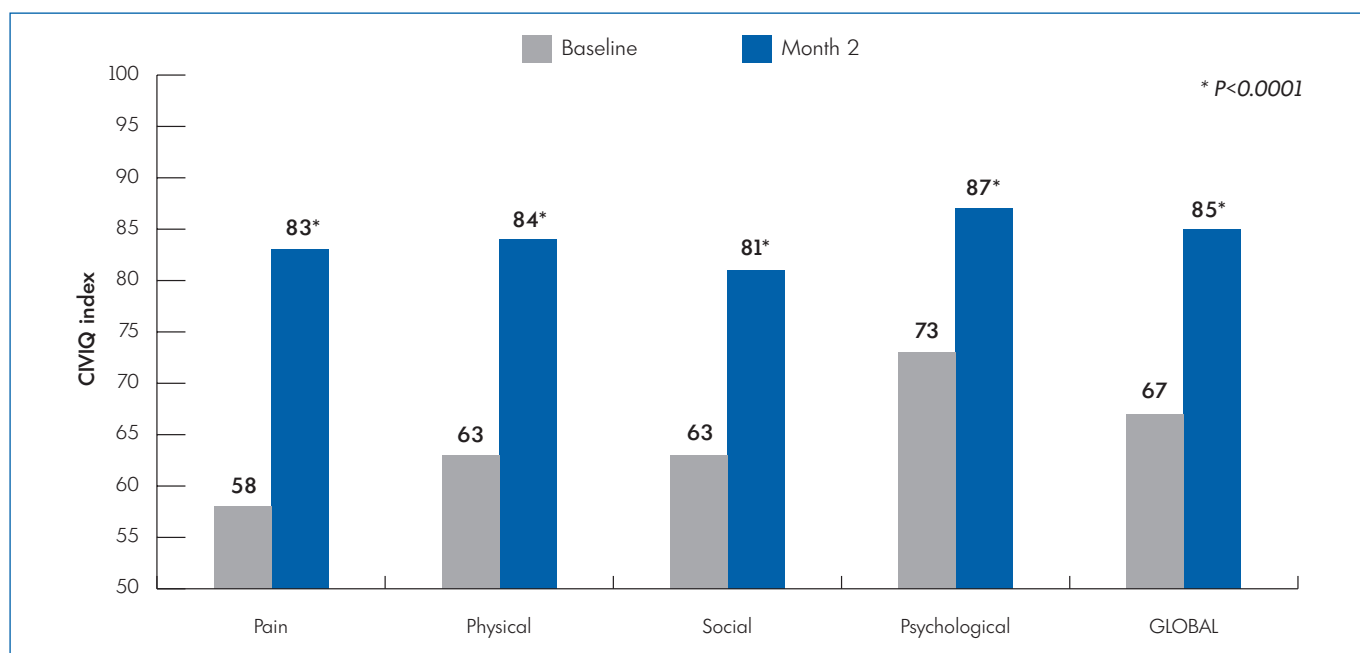


Figure 3. Quality of life improvement as assessed by the CIVIQ (100=Best quality of life).

Patients' and physicians' satisfaction

Among the patients who completed the 2-month course of treatment, a total of 493 patients (94.4%) assessed the treatment efficacy as "good" or "very good." Twenty-seven patients (5.1%) assessed the treatment efficacy as satisfactory and only 2 patients noticed no improvement. 96.0% of the physicians assessed MPFF efficacy as high or very high.

Tolerability of treatment

MPFF was associated with a small incidence of adverse events (in 4.2% of cases). It was not possible to verify whether the incidence would have been similar to that seen with a placebo. The most common adverse events with MPFF were gastrointestinal, appearing after 2 to 3 days and disappearing at the end of treatment; one single case of urticarial was reported.

Discussion

Special emphasis is to be placed on the high percentage (77.3%) of patients with advanced stages of the disease (C_2 - C_6) at baseline, which reflects the tendency that patients have of consulting their physician very late in the disease process. This corresponds with the results of the VCP that found that general practitioners (GPs) do not refer patients to a venous specialist before the C_2 stage (varicose veins), which demonstrates the critical role GPs may have in the management of CVD.¹⁰ As concluded in the VCP, public awareness campaigns are needed to alert patients to contact their physicians for care. Educational programs are also needed so that primary care physicians recognize early cases of CVD.

The VCP symptom distribution by decreasing frequency was as follows: heavy legs, pain, sensation of swelling, night cramps, sensation of pins and needles, and burning and itching in the legs. The VCP symptom prevalence was similar to our study. Venous symptoms seem to be universally felt and cannot be seen as a cultural phenomenon reserved to restricted populations.

This trial confirms that CVD causes physical and psychological suffering for patients, not to mention the social handicap and the painful and unpleasant sensations they feel, which is reflected by a worse QOL.

Results of the present trial confirm the previous findings on MPFF regarding venous symptom alleviation and QOL amelioration.^{11,15,16} Duration of MPFF treatment in most of the previ-

ous trials was 2 months. Our study shows that symptom relief occurs from the first month of MPFF treatment. In addition, the number of symptoms considered in our trial was extensive and concerned the 6 most often encountered symptoms, as identified in the Worldwide Vein Consult Program,¹⁰ that is to say, heaviness, leg pain, pain along the veins, sensation of swelling and burning, and night cramps. The efficacy of MPFF treatment is particularly comprehensive considering that these symptoms are the most frequent reason for visiting a physician.

The improvement of pain and physical components of the CIVIQ leads to the restoration of patients' usual everyday activities and to the improvement of their psychoemotional status, allowing them to feel more confident and actively participate in the social life. This is reflected in high satisfaction scores of MPFF treatment from both patients and physicians. Similar results were seen by Croatian angiologists.²⁰

Conclusion

The intake of 2 tablets of MPFF per day for 2 months significantly reduces the frequency of many CVD symptoms. Simplicity of usage, universal nature of the standard dose, and good tolerance allow us to recommend MPFF for widespread usage in the everyday practice of physicians and general practitioners.



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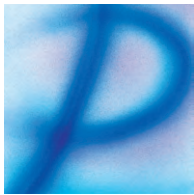
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Continued Success for EVF HOW: the 5th Workshop is Organized in Cyprus 2014

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The concept of a hands-on workshop on venous disease was introduced during the "The Arctic Fjords Conference and Workshops on Chronic Venous Disease" in 2007. The workshop was well received. One of the major objectives of the European Venous Forum (EVF) is to develop and provide education within the venous field. Since there was a lack of practical courses on the clinical management of chronic and acute venous disease, the decision was to further develop the workshop concept under the auspices of EVF. In October 2010, the 1st EVF HOW (European Venous Forum Hands-on Workshop on Venous Disease) was organized and it proved to be successful. The goal is not only to provide understanding of modern practical management, but also for the delegates to learn hands-on individual procedures to treat venous disease. An integral partner in this effort is the providers of different devices, sclerosing agents, stockings, bandages, ulcer care material, ultrasound scanning machines, etc. The objectives of the EVF HOW are impossible to fulfill without this partnership. The workshop targets those who want an introduction to or need an update on the management of venous disease. Its intention is to provide a broad teaching on all aspects of acute and chronic venous diseases. EVF HOW is open to all specialty physicians, including physicians in training. The 5th EVF HOW will take place at the Grand Resort, Limassol, Cyprus, between October 30th and November 1st, 2014. As only 100 participants are accepted on a "first-come, first-served" basis, it is recommended to register early to ensure a place. Please contact Anne Taft, Administrative Director, European Venous Forum; tel/fax +44 (0)20 8575 7044; email admin@europeanvenousforum.org. More information is available at www.europeanvenousforum.org.

The Objectives

To educate, train, and update learners (the delegates) on the current clinical management of patients with venous disease by close informal interaction with venous experts during lectures, case discussions, and hands-on activities in small groups

At the end of this course, the learner (delegate) should be able to:

1. Identify venous disease in patients.
2. Apply appropriate venous investigations.

3. Construct a plan for management.
4. Understand different interventional procedures.
5. Successfully incorporate treatment of venous patients in his/her practice.
6. Realize when to refer a patient for expert care.

The Format

The EVF HOW mission statement is to provide "education and hands-on practice for the benefit of patients with venous disease." The instruction of learning has been structured from the start on a few principles, which are important for the success of the workshop. The number of learners are limited (max 100 delegates) to facilitate interaction between instructors and delegates and thus the faculty/learner ratio is high (1/3). The hands-on sessions are truly hands-on for the delegates, and are not small lectures or only a demonstration of procedures. All learning sessions are informal in a relaxed setting to allow uninhibited communication between delegates, faculty members, and industry representatives. Plenty of time is set aside for discussion with the greatest interaction occurring at the workshop stations. The learners are encouraged to bring their own cases for presentation and discussion. There is no exhibition or parallel activity.

The format of the EVF HOW in 2014 will be similar to previous years including formal lectures, case discussions, and live demonstrations on duplex scanning covering acute and chronic venous diseases. The focus will be on hands-on training on procedures and devices. Faculty members in collaboration with the industry experts will instruct at 20 to 24 workshop stations. The delegates will attend each workshop station for 30 min in small groups (4 to 5 delegates), which will give each participant time to try out devices, practice with the bandages, etc.

Learning Enhanced by New Website

Last year the EVF VIP (European Venous Forum Venous Interactive Portfolio) was introduced. This is a web-based portfolio where each delegate has access to the presentations, important references and guidelines, the case reports, videos of procedures, supplementary information about the workshop stations, and other study material. Participation in the EVF HOW will provide access to this long-term portfolio. The long-term availability to the website gives the learners a possibility to go back, reinforce, and enhance their learning experience. The response after the EVF HOW

in Stockholm 2013 was very positive. A majority of learners used the website before the start of the workshop (86%) and as many as 48% accessed it during the workshop. All participants fully or partially agreed that the EVF VIP was a valuable supporting tool especially having access to the presentations, availability of references and guidelines in pdf format, and a user-friendly overview of the program were most appreciated.

4th EVF HOW Stockholm, 2013

The 4th EVF HOW was organized at the Marina Tower, Elite hotel in Stockholm, Sweden for three days from October 31st to November 2nd last year. The primary reason given for attendance by the delegates was to update overall knowledge about venous disease and its treatment (78%), to be introduced to venous disease (13%), and to learn particular techniques (9%). In an assessment after the course, the overwhelming majority of the delegates indicated that these goals were achieved (97%). The learners felt that the workshop stations achieved all or most stated goals between 95% and 100% at each station. Overall, the learners felt that their expectations were met (98%) and that the workshop would impact and change their practice in the future (92%).

More than half of the delegates were vascular surgeons (67%) followed by other specialties such as general surgeons (11%), phlebologists (8%), interventional radiologists (6%), angiologists, cardiologists, and dermatologists. The EVF HOW was created mainly for Europe; 55% and 22% are from Western and Eastern Europe, respectively. The workshop has attracted international attention with representation from all over the world including 11% from the Middle East, 4% from Asia, and 8% from Africa, South America, USA, and Australia. Thus, the concept of the EVF HOW (Hands-on Workshop on Venous Disease) has been internationally well received.

The Program of EVF HOW 2013

The instruction at the 4th Hands-on Workshop on Venous Disease in 2013, was provided by an international faculty with 30 experts from Europe and the USA. They not only give presentations, but also actively discussed case presentations and were an integral part of the workshop giving practical tips and tricks from their own experience. The clinical input by the faculty members balanced the specific device information presented by the industry representatives.

Presentations

The presentations spanned the following subjects:

- *Basic principles* of venous pathophysiology, accuracy of tests, and classification and assessment of treatment outcomes.
- *Treatment of varicose veins* conservatively with drugs and compression, with invasive procedures such as open surgery or saphenous ablation with laser, radiofrequency, foam sclerotherapy, steam, and pharmacomechanical means, and with techniques preserving the saphenous vein. After intense discussion, Professor Andrew Bradbury tried to make sense of it all. The controversies of the perforators were elucidated and interventions for recurrent or residual varicose veins (PREVAIT, Presence of varices after intervention) were outlined.
- *Guidelines* for prevention and treatment of venous thromboembolism (VTE) and superficial thrombophlebitis (SVT).
- *Treatment of acute VTE* with traditional conservative measures, new oral anticoagulants, catheter-directed thrombolysis, and pharmacomechanical thrombectomy was described and the outcomes presented, and the role of inferior vena cava (IVC) filters was presented.
- *Pelvic congestive syndrome*.
- *Diagnosis and treatment of chronic venous insufficiency* using a sequential treatment plan was presented including compression treatment, the role of fasciotomy in legs with increased compartment pressure, treatment of deep venous obstruction, and the role of valve reconstruction in limbs with primary deep venous reflux or postthrombotic disease including the use of the Vedensky spiral.

Case reports

There were 18 interesting cases presented. This year the case reports were imbedded among the formal presentations, which appeared to significantly increase the participation. Only five cases were brought by the delegates for discussion and the remaining were provided by the faculty. In the future, we hope that more learners will bring their own cases. Each case was presented in stages and the moderator encouraged the delegates to join in at all stages, which lead to lively discussions. There was a wide range of cases illustrating the previously given lectures: From varicose veins to acute iliofemoral deep venous thrombosis (DVT); from chronic outflow obstruction to ovarian venous reflux.

Hands-on workshops

As previously emphasized, this component of the EVF HOW is the most important. The function of the device or the method presented at each workshop station was explained in detail by the industry expert. Its role in the treatment of venous disease and personal clinical tips and tricks were highlighted by the faculty member. Each learner trained hands-on under expert supervision after a short demonstration.

Workshop 1

The learners performed live imaging in patients with different types of vein pathologies. Drs Anders Holmberg and Lena Blomgren had collected numerous patients from their practice, representing a variety of disease. The aim was two-fold. First, the learner should be able to position the patient properly, use appropriate transducers, know imaging principles, and optimize the image. Second, the learners should be able to identify acute and chronic disease, reflux, obstruction, and pathology surrounding the vessels.

Station 1: Lower limb with normal findings (Siemens; faculty Ragnhild Östmyren/Andrew Nicolaides) (Figure 1).

Station 2: Abdominal and pelvic vein investigation (GE Healthcare; faculty: Nicos Labropoulos/Stefan Rosfors).

Station 3: Lower limb with superficial reflux (Philips; faculty: Lena Blomgren/Lena Persson).

Station 4: Lower limb with deep incompetence (Zonare; faculty: Niki Georgiou/Kent Lund).



Figure 1. Learner practicing ultrasound scanning of the lower limb.

Workshop 2

- Station 1: Venous stenting. Placement of the Veniti Vici venous stent was practiced by each learner in a specially designed venous tubular model replicating the ilio-caval vein segment (Veniti; faculty: Marzia Lugli/Oscar Maleti) (Figure 2).
- Station 2: IVC filter placement and retrieval was practiced in a tube model (Cook Medical; faculty: Anthony Gasparis/Evgeny Shaydakov).
- Station 3: Compression therapy/ulcer care. The delegate learned how to choose and apply the appropriate wound dressing for a venous ulcer and how to measure a leg and apply the appropriate stocking (BSN/Jobst; faculty: Sylvain Chastenot) (Figure 3).
- Station 4: Early clot removal with the Trellis™ - Peripheral Infusion system. After a brief demonstration of the technique, the Trellis device was prepared, inserted, and used in a model by the learners (Covidien; faculty: Gerard O'Sullivan).



Figure 2. Learner practicing stent placement in a tubular model.

Workshop 3

- Station 1: Laser saphenous ablation. After longitudinal and transverse access to the vein under ultrasound guidance, saphenous laser ablation was practiced on a phantom leg using a radial fiber with a 1470 nm laser generator. Tips and tricks were given and how to decide the dosage of energy was practiced. (Biolitec; faculty: Anders Holmberg).
- Station 2: Stocking. The learners practiced choosing a correct medical compression stocking (MCS) by measurement and applying long- and short-stretched MCS with and without fitting aid and

measuring the working pressure with these stockings by using a Picopress device. (Bauerfeind; faculty: Michel Perrin).

- Station 3: Steam saphenous ablation. The Veni RF Plus steam device was used. The physical effect of the technique was explained followed by demonstration of the setup of the generator and catheter. Steam ablation following catheterization was practiced individually by the learners using a vein model (Veniti; faculty: Marianne De Maeseneer).
- Station 4: Foam sclerotherapy. The learners made foam using sodium tetradecyl sulphate (STD) and discussed different treatment plans according to ultrasound scanning results. This was followed by ultrasound-guided cannulation and injection of foam in a phantom leg. The appropriate compression bandage following foam sclerotherapy was placed on each other (STD Pharma; faculty: Andrew Bradbury and Gareth Bate).



Figure 3. Learners practicing application of stocking.

Workshop 4

- Station 1: Ovarian vein embolization was practiced by the learners in a specially designed tubular venous model (Cook Medical; faculty: Jan Engström).
- Station 2: RF saphenous ablation. Saphenous radiofrequency ablation using the ClosureFAST catheter was practiced by the learner including how to accurately place the catheter tip at the sapheno-femoral confluence and to sequentially position the catheter (Covidien; faculty: Lars Rasmussen/Athanasios Giannoukas).

Station 3: Bandage. Strong short-stretch compression bandage was applied by each learner, subbandage pressure measurements were monitored, and the learners were made aware of what a correctly applied bandage on their own leg feels like (Lohmann & Rauscher; faculty: Hugo Partsch/Giovanni Mosti) (Figure 4).

Station 4: The concept of medi-Circaid inelastic compression device was explained and the device applied by each delegate (medi; faculty: Sandra Shaw).



Figure 4. Learners placing bandages on each other.

Workshop 5

Station 1: Early clot removal with continuous catheter directed thrombolysis (CDT) using the Unifuse CDT catheter. The learners individually practiced insertion of the catheter and the occluding ball wire and were instructed on how to set up a protocol for CDT treatment (Angiodynamics; faculty: Niels Baekgaard)

Station 2: Venous stenting. The learners practiced deployment of a Wallstent in a tubular model at the IVC confluence and distally in the iliofemoral vein. The specific properties of a braided stent were demonstrated (Boston Scientific; faculty: Antonio Rosales).

Station 3: Laser saphenous ablation. The learner practice saphenous ablation using the KLS Martin endovenous laser including planning of adequate dosage, selection of the correct treatment set, access to the vein, precise placement of the laser fiber intraluminally and correct application of the laser energy on a phantom limb (KLS Martin Group; faculty: Zbigniew Rybak) (Figure 5).

Station 4: Foam sclerotherapy. The learner practiced how to produce foam with Aethoxysklerol® and the EasyFoam® Kit. Cannulation of larger veins and the injection of tiny spider veins were practiced using the phantoms and ultrasound or the portable vein finder Veinlite LED®. Tips and tricks for optimal results were pointed out (Kreussler; faculty: Eberhard Rabe).



Figure 5. Learner practicing saphenous ablation on a phantom leg.

Workshop 6

Station 1: Insertion of the Crux® Vena Cava Filter was performed by each delegate using a computerized Mentice simulator mimicking an angioroom set up (Volcano/Mentice; faculty: Lars Lönn) (Figure 6).

Station 2: Nonthermal saphenous ablation. After being informed about the technical aspects of the nonthermal Clarivein ablation technique, the learners practiced placement of the device by ultrasound guidance on a blue phantom limb and performed a mock treatment (Vascular Insights; faculty: Steve Elias).

Station 3: Stockings. The learners practiced measurement of the leg dimensions and application of a stocking on each other, learned how to prescribe an appropriate stocking, and experienced the difference in material use in manufacturing of stockings (Sigvaris; faculty: Olle Nelzén).

Station 4: Intravascular Ultrasound (IVUS). The learners familiarized themselves with the IVUS tower and the corresponding catheters. Case studies of procedures using IVUS video-loop recordings were reviewed to demonstrate differences in venogram

and IVUS images during treatment of patients with obstruction (Volcano; faculty: Jan Christenson).



Figure 6. Learners using a computerized simulator for IVC placement.

Evaluation and future meeting

The 4th EVF HOW in 2013 was appreciated by the delegates, faculty members, and industry representatives. They all enjoyed the learning sessions because of the informal and close interaction. A pre- and post-MCQ test was performed and showed an average improvement of 40% after the

workshop, which clearly indicated that the workshop had the intended impact on learning.

The 5th EVF HOW will have similar structure as outlined above. It will be limited to 3 days and will require full attendance. If a participant wants to include some sightseeing, we suggest that this is arranged by prolonging the stay in Cyprus. There will be no sightseeing arranged and no program for accompanying persons. The organizers hope to further improve the quality of the content by taking into account constructive criticism by previous learners. More case reports brought by the learners are necessary and encouraged. Perhaps it will be possible to further develop the EVF VIP website and create personal portfolios with additional study material.



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Presence of varices after operative treatment: a review

Part 1: This is the first of 2 chapters that will comprise the 'PREsence of Varices After operative Treatment (PREVAIT)'. These 2 chapters will be published in the journal consecutively.

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Abstract

Background: PREsence of Varices after operative Treatment (PREVAIT) occurs in 13% to 65% of patients and remains a debilitating and costly problem. The first part of this review provides an overview of the current understanding of the etiology and pathogenesis of PREVAIT.

Methods: A PubMed search was conducted in English and French for the years 2000-2013 by using keywords (Duplex scanning, endothermal ablation, neovari-
cose, REVAS, sclerotherapy, varices recurrence, varicose vein, varicose vein surgery).

Results: Epidemiology and socioeconomic consequences were analyzed according to the initial operative treatment. Then a classification of possible mechanisms and causes for PREVAIT are classified in terms of tactical and technical errors, evolution of the disease, considering that the systematic use of ultrasound investigation has minimized the former.

Conclusion: The cause and underlying mechanisms for recurrences of varicose veins are poorly understood. Large prospective studies should be performed to clear up the picture.

Keywords:

duplex scanning; endothermal ablation;
neovari-
cose; REVAS; sclerotherapy; varices
recurrence; varicose vein; varicose vein
surgery

Background

The presence of varicose veins after operative treatment is a common, complex, and costly problem for both the patients and the physicians who cope with venous diseases. An international consensus meeting was held in Paris in 1998 and guidelines were proposed for the definition and description of REcurrent Varices After Surgery (REVAS).¹ In a related article from 2000, 94 references dealing with recurrence after operative treatment or including information on its presence or absence after operative treatment were listed. Since then, 140 additional publications in English and French have been identified.²⁻¹⁴¹

Classical surgery, which used to be the most frequent operative procedure for treating varicose veins in the last decade, has been progressively taken over by chemical and thermal ablation procedures, and to a slight extent, by mini-invasive surgeries

including CHIVA (French acronym for ambulatory conservative hemodynamic management of varicose veins)¹⁴² and ASVAL (French acronym for tributary varices phlebectomy under local anesthesia).^{143,144} Therefore, the experts of the VEIN-TERM transatlantic interdisciplinary consensus meeting suggested replacing the classical surgery-related acronym REVAS with PREVAIT (PREsence of Varices After Interventional Treatment).¹⁴⁵

During the same meeting, the following terms were defined:

1. Recurrent varices: Reappearance of varicose veins in an area previously treated successfully.
2. Residual varices: Varicose veins remaining after treatment.
3. PREVAIT: PREsence of Varices (residual or recurrent) After Interventional Treatment.

The concept of PREVAIT was developed for two reasons: (i) it is often difficult to correctly classify the results of initial procedures done by others and consequently to differentiate recurrent varices from residual varices; and (ii) the term REVAS was limited to patients previously treated by surgery

as previously mentioned. The term PREVAIT encompasses both recurrent and residual varicose veins after any kind of operative treatment including open surgery and endovenous procedures, either thermal or chemical.

It was also argued that the term 'interventional treatment' was not equivalent to the term 'operative treatment,' because even noninvasive therapies such as venoactive drugs or compression therapy may modify the natural history of varicose veins and be considered as 'interventional.'

In 2000, a REVAS classification form was elaborated for future studies (Table I). The REVAS classification was then subject to intraobserver and interobserver reproducibility,⁹⁸ and then used in an international survey.^{95,97} A form similar to this should be adapted to PREVAIT for possible future studies.

AIM

The purpose of this review is to analyze all available data on PREVAIT in order to help physicians identify the best operative treatment, if any, likely to prevent PREVAIT. Such analysis might help build a revised classification, as mentioned above.

Material and methods

A PubMed search was conducted to retrieve published articles in English and French for the years 2000-2013 using the keywords varices recurrence, REVAS, endothermal ablation, sclerotherapy, varicose vein surgery, varicose vein, duplex scanning, neovascularization, and their counterparts in French. Abstracts were not selected, only publications dealing with PREVAIT were chosen, some of them focused on PREVAIT patients, others concerned patients presenting with varices and operatively treated whose follow-up specified the absence or presence of varices.

Results

Since the REVAS publication,¹ 140 articles on recurrent varices have been published.²⁻¹⁴¹ 29 randomized trials were added to the references from the REVAS articles list, taking the total papers regarding randomized trials to 34.^{6,7,13,16,17,42,52,61,62,66,69,80,83,90,92,103,107-111,117,118,120,122,124,136,137,140,146-152}

Epidemiologic data and socioeconomic consequences will be analyzed according to the initial procedures, which will be followed by a discussion of the possible mechanisms for PREVAIT occurrence.

REVAS Classification sheet	
Date of examination: <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	• N Ds is for different (new) site
Day Month Year	Only one box can be ticked
Patient Rename	Persistent
First name or given name <input type="text"/>	(Known to have been present at the time of previous surgery)
Last name or family name <input type="text"/>	New
	(Known to have been present at the time of previous surgery)
	Uncertain/not known
	(Insufficient information at the time of previous surgery)
✓ Topographical sites of REVAS	
Since more than one territory may be involved, several boxes may be ticked	
Groin <input type="checkbox"/> 1	
Thigh <input type="checkbox"/> 2	
Popliteal fossa <input type="checkbox"/> 3	
Lower leg including ankle and foot <input type="checkbox"/> 4	
Other <input type="checkbox"/> 5	
✓ Source(s) of recurrence	
Since more than one source may be involved, several boxes may be ticked	
No source of reflux <input type="checkbox"/> 0	
For pelvic or abdominal <input type="checkbox"/> 1	
Saphenofemoral junction <input type="checkbox"/> 2	
Thigh perforator(s) <input type="checkbox"/> 3	
Saphenopopliteal junction <input type="checkbox"/> 4	
Popliteal perforator <input type="checkbox"/> 5	
Gastrocnemius vein(s) <input type="checkbox"/> 6	
Lower leg perforator(s) <input type="checkbox"/> 7	
✓ Reflux	
Only one box can be ticked	
PROBABLE Clinical significance R+ <input type="checkbox"/> 1	
UNLIKE Clinical significance R- <input type="checkbox"/> 2	
UNCERTAIN Clinical significance R? <input type="checkbox"/> 3	
✓ Nature of sources	
Only one box can be ticked	
N classifies the source as to whether or not it is the site of previous surgery and describes the cause of recurrence	
• N Ss is for same site	
Only one box can be ticked	
Technical failures <input type="checkbox"/> 1	
Tactical failures <input type="checkbox"/> 2	
Neovascularization <input type="checkbox"/> 3	
Uncertain <input type="checkbox"/> 4	
Mixed <input type="checkbox"/> 5	
• N Ds is for different (new) site	
Only one box can be ticked	
Persistent	
(Known to have been present at the time of previous surgery)	
New	
(Known to have been present at the time of previous surgery)	
Uncertain/not known	
(Insufficient information at the time of previous surgery)	
✓ Contribution from persistent incompetent saphenous trunks	
Since more than one territory may be involved, several boxes may be ticked	
AK great saphenous (above knee) <input type="checkbox"/> 1	
BK great saphenous (below knee) <input type="checkbox"/> 2	
SSV short saphenous <input type="checkbox"/> 3	
0 neither/other <input type="checkbox"/> 4	
Comment:	
✓ Possible contributory factors	
Several boxes may be ticked	
General factors	
Family history <input type="checkbox"/> 1	
Obesity <input type="checkbox"/> 2	
Pregnancy* <input type="checkbox"/> 3	
Oral contraceptive <input type="checkbox"/> 4	
Lifestyle factors** <input type="checkbox"/> 5	
*Pregnancy since the initial operation	
**Prolonged standing, lack of exercise, chair sitting	
Specific factors	
Several boxes may be ticked	
Primary deep vein reflux <input type="checkbox"/> 1	
Post-thrombotic syndrome <input type="checkbox"/> 2	
Iliac vein compression <input type="checkbox"/> 3	
Angiodysplasia <input type="checkbox"/> 4	
Lymphatic insufficiency <input type="checkbox"/> 5	
Calf pump dysfunction <input type="checkbox"/> 6	

Table I. REVAS Classification sheet.

Modified after reference 98: Perrin et al. Eur J Vasc Endovasc Surg. 2006;32:326-333.

Magnitude of REVAS occurrence

With open surgery

The most documented outcomes are provided by classical surgery, but most studies are retrospective. In a 34-year follow-up study, varicose veins were present in 77% of the lower limbs examined and were mostly symptomatic: 58% were painful, 83% had a tired feeling, and 93% showed a reappearance of edema.⁵⁰

Two prospective studies concerning classical surgery are available with a follow-up of 5 years.^{72,133} In both studies, patients were preoperatively investigated with duplex scanning (DS) and treated by high ligation, saphenous trunk stripping, and stab avulsion. In the Kostas et al series, 28 out of 100 patients had PREVAIT after 5 years: recurrent varices mainly resulting from neovascularization in eight limbs (8/28, 29%), new varicose veins as a consequence of disease progression in seven limbs (7/28, 25%), residual veins due to tactical errors (eg, failure to strip the great saphenous vein) in three limbs (3/28, 11%), and complex patterns in ten limbs (10/28, 36%).⁷² In the Van Rij et al series, 127 limbs (CEAP class C₂-C₆) were evaluated postoperatively by clinical examination, DS, and air plethysmography (APG). At the clinical

evaluation, recurrence of varicose veins was progressive from 3 months (13.7%) to 5 years (51.7%). In line with clinical changes, a progressive deterioration in venous function was measured by APG and a recurrence of reflux was assessed by DS.¹³³

These 2 studies showed that recurrence of varicose veins after surgery is common, even in highly skilled centers, and even if the clinical condition of most affected limbs after surgery improved compared with 'before surgery.' Progression of the disease and neovascularization are responsible for more than half of the recurrences. Rigorous evaluation of patients and assiduous surgical techniques might reduce the recurrence resulting from technical and tactical failures.

In a four arm randomized controlled trial (RCT) by Rasmussen et al, endovenous laser ablation (EVLA), radiofrequency ablation (RFA), ultrasound-guided foam sclerotherapy (UGFS), and surgical stripping for great saphenous varicose veins (GSV) were compared with a 3-year follow-up, the rate of PREVAIT was reported in each arm (*Table II*).¹¹¹ There was no significant difference between the 4 procedures ($P=0.29$) in terms of clinical recurrence, but the presence of

Operative treatment	PREVAIT	P	Open, reluxing GSV	P	Reoperation	P
Surgery	20.2%	0.29	6.5%	NS	15.5%	NS
RFA	14.9%		7%		11.1%	
EVLA	20 %		6.8%		12.5%	
USGFS	19.1%		26.4%	<0.0001	31.6%	<0.0001

Abbreviations: EVLA, endovenous laser ablation; GSV, great saphenous vein; PREVAIT, presence of varices after operative treatment; RFA, radiofrequency ablation; USGFS, ultrasound-guided foam sclerotherapy.

Table II. Rasmussen 3-year clinical and DS outcome and reoperation percentages.

Modified after reference 111: Rasmussen et al. *J Vasc Surg: Venous and Lym Dis.* 2013;1:349-356.

Operative treatment	VCSS (mean score)	P	AVSS (mean score)	P
Surgery	Preoperative 2.75 Postoperative 0.50	<0.0001	Preoperative 19.3 Postoperative 4.0	<0.0001
RFA	Preoperative 2.95 Postoperative 0.44	<0.0001	Preoperative 18.74 Postoperative 4.43	<0.0001
EVLA	Preoperative 2.68 Postoperative 0.34	<0.0001	Preoperative 17.97 Postoperative 4.61	<0.0001
UGFS	Preoperative 2.25 Postoperative 0.30	<0.0001	Preoperative 18.38 Postoperative 4.76	<0.0001

Abbreviations: AVSS, Aberdeen Varicose Veins Severity Score; EVLA, endovenous laser ablation; RFA, radiofrequency ablation; USGFS, ultrasound-guided foam sclerotherapy; VCSS, venous clinical severity score.

Table III. Pre and postoperative VCSS and AVSS according to operative treatment.

Modified after reference 111: Rasmussen et al. *J Vasc Surg: Venous and Lym Dis.* 2013;1:349-356.

persisting reflux in the GSV was significantly higher in UGFS compared with the other 3 methods ($P<0.0001$) as well as the reoperation rate ($P<0.0001$).

Regardless of the procedure used, the severity of varicose disease as assessed with the Venous Clinical Severity Score (VCSS) was significantly reduced, and the quality of life using the Aberdeen Varicose Veins Severity Score (AVVSS) was significantly improved after all operative treatments no matter which procedure was used ($P<0.0001$; *Table III*)

With radiofrequency ablation

From a multicenter prospective study, recurrence rates after RFA with ClosurePlus® were reported. At the 5-year follow-up, PREVAIT was estimated at 27.4%.⁸⁴ A 3-year follow-up RCT comparing ClosureFast®-RFA of the GSV with or without treatment of calf varicosities did not document the PREVAIT rate, but only the obliteration rate on DS investigation, venous clinical severity score (VCSS), and the presence of symptoms.¹⁰² In the four arm study by Rassmussen et al,¹¹¹ there was no statistical difference regarding PREVAIT rates between RFA and the other operative procedures ($P=0.29$; *Table II*).

With endovenous laser ablation

At the 2-year follow-up, a RCT by Rass et al found no significant difference ($P=0.15$) when comparing EVLA with classical surgery (EVLA 16.2% vs 23.1%).¹⁰⁷ An Italian group reported a PREVAIT rate of 6% at month 36.² In a RCT comparing EVLA with GSV stripping with a 5-year follow-up, PREVAIT was reported in 36% and 37% of patients, respectively, with no statistical difference between groups ($P=0.9$). In this study, reoperative treatment was performed in 38.6% and 37.7%, respectively, mainly by UGFS.¹¹⁰ Again in the four arm study by Rassmussen et al,¹¹¹ there was no statistical difference regarding PREVAIT rates between EVLA and the other operative procedures ($P=0.29$; *Table II*).

Ultrasound-guided foam sclerotherapy

Hamel-Desnos et al reported a 36% and 37% recanalization rate at the 2-year follow-up with UGFS, one injection with 1% and 3% polidocanol foam, respectively.⁶² In a RCT of UGFS vs surgery for the incompetent GSV with a follow-up of 2 years, PREVAIT was identified in 9% vs 11.3%, respectively. $P=0.407$, which is not significant. Conversely, reflux was significantly higher in UGFS ($P=0.003$).¹¹⁸

In the British long-term RCT by Kalodiki et al of UGFS combined with sapheno-femoral ligation vs standard surgery for GSV, clinical severity of venous disease assessed by VCSS and venous segmental disease score (VSDS) were equally

reduced in both groups, and the quality of life equally improved as well (using AVVQ and 36-Item Short-Form).⁶⁹ Unfortunately, PREVAIT was not reported in this study.

With procedures saving the saphenous trunk

CHIVA

PREVAIT was assessed when using the CHIVA method vs classical surgery in 2 RCT's with a follow-up of 5 and 10 years.^{16,90} In both studies, the Hobbs classification was used to assess PREVAIT.^{148,149}

If we add failure (presence of $VW>0.5$ cm) and slightly improved patients in terms of cosmetic appearance (presence of $VW<0.5$ cm), the outcomes were as follows: (i) At 5 years postsurgery, the PREVAIT rate in the group operated by stripping was 70.7% vs 55.6% in the CHIVA group ($P>0.001$).⁹⁰ In the 10-year follow-up RCT by Carandina, the recurrence rate of varicose veins was significantly higher in the stripping group compared with the CHIVA group (CHIVA, 18%; stripping, 35%; $P<0.04$ Fisher's exact test). The associated risk of recurrence at 10 years was doubled in the stripping group (odds ratio [OR], 2.2; 95% confidence interval [CI] 1-5; $P=0.04$).¹⁶ In both RCTs, the recurrence rate was lower with CHIVA,^{90,16} yet there is a great discrepancy between the studies, PREVAIT was unexpectedly higher in the 5-year follow-up RCT,⁹⁰ compared with the 10-year follow-up.¹⁶

ASVAL

No published data is available regarding the mid-term results.

Socioeconomic consequences

No socioeconomic data on PREVAIT has been published. When a redo surgery is performed, the cost is higher than the first surgery because of the number of peri- and post-operative complications. In one observational study, 40% of patients had complications after classical surgery for PREVAIT.⁶⁴

Possible mechanisms leading to PREVAIT

They must be classified in 2 groups: tactical errors and technical problems.

Tactical errors

Tactical errors are common to all operative treatments. It includes wrong or incomplete diagnosis of the extent and/or location of varices, source of reflux, nonidentification of

deep venous anomalies including pelvic reflux (*Figures 1, Figure 2*), primary vein compression or reflux, and postthrombotic syndrome. Fortunately, the systematic use of DS before any operative treatment has minimized this cause of error. In most of the articles published before systematic use of preoperative DS, tactical error was the most frequent mechanism leading to PREVAIT.

There is a consensus on the fact that saphenous ablation provides a better outcome when saphenous trunk incom-

petence is present and when classical surgery, thermal or chemical, is performed. Yet, the proponents of the CHIVA and ASVAL procedures contest this point by arguing that trunk conservation would provide good results. In the CHIVA procedure, the argument is that the preservation of the saphenous trunks together with sparing of their functions (cutaneous and subcutaneous drainage) is allowed thanks to appropriate shunt disconnections that breaks the higher-than-normal hydrostatic pressure and subsequently improves hemodynamics.^{16,90,142} In the ASVAL method, the ablation of the reservoir incompetent tributaries leads to a reduction in the reflux in the saphenous trunk.^{143,144}

Technical problems related to the first operative treatment (surgery, thermal, or chemical ablation)

Such problems can overlap in the same patient, and some are specific and related to the procedure used, while others are identified no matter what procedure was used.

Surgery

The most frequent technical error quoted in classical surgery was non flush ligation at the saphenofemoral junction (SFJ; *Figure 3*) or at the saphenopopliteal junction (SPJ; *Figure 4*). This point is now controversial as some series with conservation of the SFJ claim to achieve excellent results including patients with incompetent terminal valve.¹⁵² Several authors continue to state that non flush ligation of the saphenous termination is responsible for frequent recurrence,^{41,52} particularly over the long-term.⁵⁵⁻⁵⁷ In the CHIVA technique, PREVAIT would be mainly related to wrong preoperative marking and inappropriate technique.⁹⁰

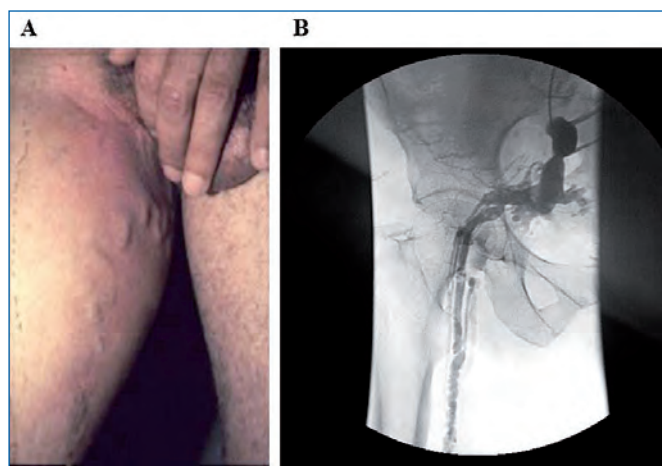
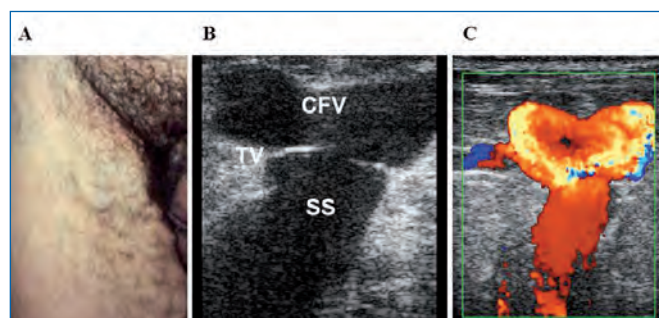


Figure 1. PREVAIT clinical aspect. A. Pelvic vein leak. B. Selective pelvic venography from the same patient as A. (Courtesy of Drs Monedero and Zubicoa).



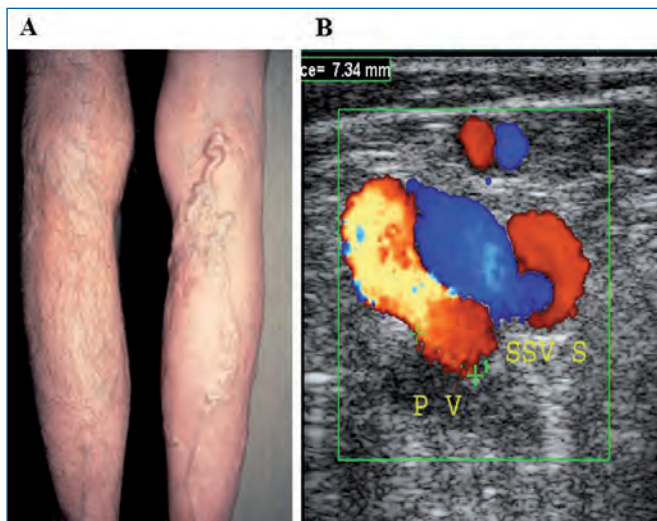
Figure 2. Selective pelvic venography. After a Valsalva maneuver. Reflux through the obturator vein feeding the nonsaphenous vein network. (Courtesy of Drs Monedero and Zubicoa).



Abbreviations: CFV, common femoral vein; SS, saphenous stump; TV, terminal valve.

Figure 3. PREVAIT clinical aspect.

A. Massive groin recurrence related to non flush high ligation in a patient with an incompetent GSV terminal valve. B. Same patient with a B mode ultrasound. The terminal valve is identified at the saphenofemoral junction. (Courtesy of Dr Gillet). C. Same patient with a color duplex ultrasound. Massive reflux induced by a Valsalva maneuver. (Courtesy of Dr Gillet).



Abbreviations: SSVS, short saphenous vein stump; PV, popliteal vein.

Figure 4. PREVAIT clinical aspect.

A. Popliteal fossa massive recurrence related to non-flush high ligation in a patient with an incompetent SSV terminal valve. B. Postoperative duplex scanning identified reflux in the SSVS, which feeds the varicose network after the compression-decompression maneuver. (Courtesy of Dr Gillet).

Thermal ablation

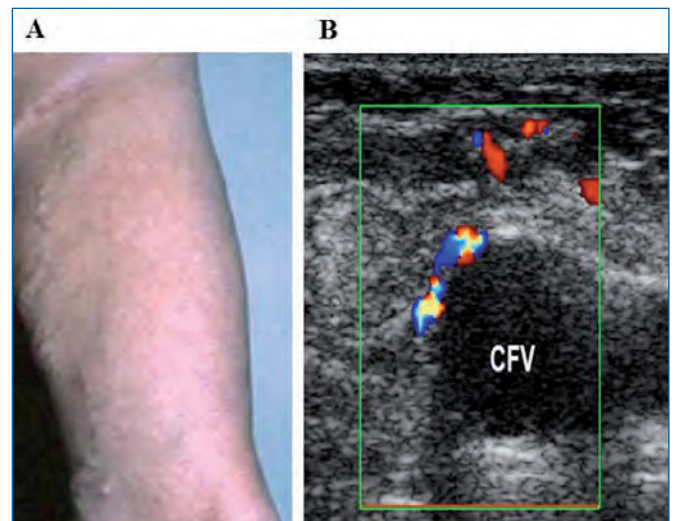
Inadequate technique consisting mainly of delivering insufficient energy, irradiance, or fluence in laser or radiofrequency procedures should be responsible for short or long-term recanalization of the treated vein.

Chemical ablation

Inadequate technique as well as inappropriate sclerosing agent dose should be responsible for short or long-term recanalization of the treated vein.

Technical problems not related to initial treatment

The neovascularization phenomenon was discovered 25 years ago, but remains not fully elucidated.¹⁵² It occurs mainly at the SFJ (Figure 5) and less frequently at the SPJ (Figures 6), and is considered, in many articles, as the main cause of PREVAIT after correct classical surgery.^{28,29,134,153,154} El Wajeh et al contests the term neovascularization and favors adaptive dilatation of preexisting venous channels (vascular remodeling), probably in response to abnormal hemodynamic forces.⁴³ According to Lemasle et al, this phenomenon is related to preexisting anatomical anomalies.⁷⁹ Egan et al minimizes its frequency as well as its importance in groin recurrence.⁴¹ However, neovascularization has been reported not only in procedures including SFJ or SPJ ligation, but also after thermal ablation,⁷⁶ albeit at a lower frequency.^{71,124}



Abbreviations: CFV, common femoral vein.

Figure 5. PREVAIT clinical aspect.

A. A varicose network at the thigh just below a previous groin incision related to neovascularization. B. Same patient with a duplex scan. Small refluxive veins identified above the CFV after a Valsalva maneuver. (Courtesy of Dr Gillet).

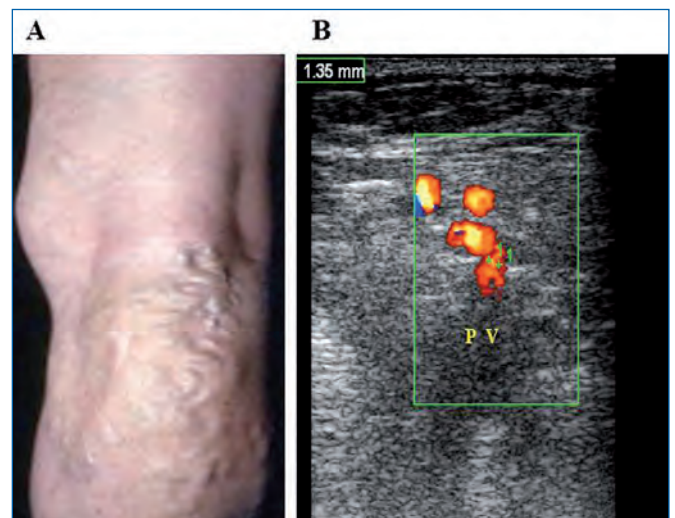


Figure 6. PREVAIT clinical aspect.

A. A varicose network at the popliteal related to neovascularization. B. Same patient with a duplex scan. Varicose network above a refluxive popliteal vein (Courtesy of Dr Gillet).

Evolution of the disease

It should never be forgotten that superficial venous disease is a chronic condition that tends to progress over time.¹⁰⁴ In other words, previously unaffected superficial veins or perforators may become incompetent. Varices may develop in the same territory initially treated including saphenous tributaries that were not incompetent at the time of the operative treatment or in another superficial vein territory.

Risks factors for chronic venous disease progression and, in particular, varices have been investigated in many prospective studies.¹⁵⁵ However, underpinnings and constitution risk factors for disease progression are still poorly understood. It is generally accepted that there is a strong family predisposition, not only for presenting varicose veins, but also for developing recurrence related to disease evolution. The precise nature of the genetic basis for this family predisposition is far from clear. To shed more light on this issue, it will not be sufficient to study single genes, potentially implicated in varices. Instead, genome wide association studies will be needed using very large sample sizes to further unravel the genetic basis of varices and chronic venous insufficiency.¹⁵⁶



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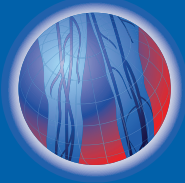
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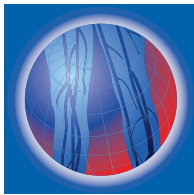
Foreword

VEINews; a new heading

The VEINews rubric is now incorporated in Phlebology and may take various forms such as comments on a recent international publication (the most common) or on several publications on the same topic. It might also be controversial views of 2 authors on the same publication, or a state-of-the-art article on a timely topic.

In this issue, Prof Djorge RADAK (Belgrad, Serbia); Drs Ramesh K TRIPATHI and Himanshu VERMA (Bangalore, India), and Dr Javier LEAL MONEDERO (Madrid, Spain) will comment on the following publications:

- "How specific are venous symptoms for diagnosis of chronic venous disease?" authored by Van der Velden S, Shadid N, Nelemans P, Sommer A. *Phlebology*. 2014 Jan 3. (Epub ahead of print). **Commented by Prof Djorge RADAK and Srdjan BABIC (Belgrad, Serbia)**
- "Endovenous management of venous leg ulcers" authored by Raju S, Kirk OK, Jones TL. *J Vasc Surg: Venous and Lym Dis* 2013;1:165-73. **Commented by Drs Ramesh K Tripathi and Himanshu Verma (Bangalore, India)**
- "Clinical results after coil embolization of the ovarian vein in patients with primary and recurrent lower-limb varices with respect to vulval varices" authored by Castenmiller PH, de Leur K, de Jong TEAM, van der Laan L. *Phlebology* 2013;28:234-8. **Commented by Dr Javier LEAL MONEDERO (Madrid, Spain)**



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How specific are venous symptoms for diagnosis of chronic venous disease?

Van der Velden S, Shadid N, Nelemans P, Sommer A.
Phlebology. 2014 Jan 3. (Epub ahead of print).

Are the symptoms of venous disease specific for chronic venous disease (CVD)? Is the pain or swelling the most important venous symptoms? Does the presence of pain predict CVD progression? What is the best medical treatment to prevent development of CVD? When should we start with medical treatment, to be more efficient in prevention of CVD progression? Those are the questions that should be answered by large prospective multicentric international studies including patients with CVD, analyzed by CEAP classification and presence of ultrasonographic signs of vein reflux or obstruction. This is the design that was used in present study, but it did not have statistical power because of an insufficient number of patients. In any case, the design that was used could be the proposal for future big studies, which are more than necessary.

The authors evaluated which 'venous' symptoms are characteristic for patients affected with chronic venous disease (CVD) compared with patients with other diseases of the lower limbs. The study was comprised of 76 patients suffering from CVD compared with 74 patients with other diseases of the legs without reflux. The authors used VEINES-Sym of the VEINES-QOL/Sym questionnaire to evaluate the frequency of symptoms.

The study showed that the differences between groups were small and statistically non-significant; presence of venous symptoms was slightly more often reported in the CVD group. Severity of chronic venous disease as classified by the CEAP classification was not associated with higher proportions of patients reporting symptoms than in non-chronic venous disease patients, except for swelling ($P=0.016$) and itching ($P=0.007$) in C3-C6 patients. Significant difference was found at the time of the day at which symptoms were most intense; the CVD patients were more likely to experience symptoms at the end of the day.

Identification of subjects with venous-type leg symptoms is a very difficult mission and it seems to be extremely complex especially in groups of patients without clear signs of CVD, who are in the early stages of a visible disease. Signs of CVD may be associated with a whole range of symptoms such as pain, heaviness, restless legs, tingling, aching, burning, night muscle cramps, swelling, sensations of throbbing or itching skin, leg tiredness and/or fatigue.¹ However, this range of symptoms could be part of some other non venous chronic and acute diseases and conditions: obesity, neurological reasons, standing or sitting profession, arterial occlusive disease.² Therefore, the very first step in determining the prevalence of lower-limb symptoms related to CVD should be to exclude all patients with symptoms of non venous origin.

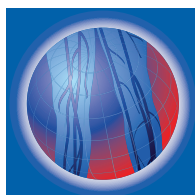
Development and implementation of the universal clinical, etiological, anatomical, pathophysiological (CEAP) classification allowed each CVD stage to be precisely

defined and the results to be compared between countries and continents.³ However, there are several disadvantages of the CEAP classification: any assessment of the level of the symptoms is not included; with the classes only categorized as "symptomatic" or "asymptomatic." As a result, symptoms are often underestimated by the physicians and these limitations require additional questionnaires.

It has to be noted, venous pain and other venous-related sensations greatly worsen patients' quality of life. Even so, lack of the epidemiological studies concerning this issue is frustrating. These types of research are more than necessary, not only to determine which of the symptoms are related to venous origin, but also to incorporate levels of symptoms and their change during the time period, and the proper time for best medical treatment.

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Endovenous management of venous leg ulcers

Raju S, Kirk OK, Jones TL.

J Vasc Surg Venous Lymphat Disord. 2013;1:165-173.

This is an important paper highlighting the various modalities of treatment that come into play in the treatment of venous leg ulceration due to chronic venous insufficiency.

The authors apparently were able to follow-up on 192 limbs that had failed conservative therapy and then underwent endovascular treatment that included 39 endovenous laser ablation (ELVA) of superficial axial veins, 99 iliac vein stents and 59 using both procedures in combination. The numbers treated are impressive in a short time although they add up to 197, so we have little information on the 5 patients who have been missed out in the analyses.

The criteria defining treatment modality does, however, need some detailed explanations and objective definitions of limb swelling and disability or pain score. Authors have also used diameter of refluxing vein as insufficiency criteria, rather than time of reflux. This is not the standard protocol used by other venous researchers including the reviewer.

Although thrombophilia workup was done in every patient, the reader does not get an idea of its yield and whether it influenced decision making for therapy with one modality or another.

Transfemoral venography was done in 160 limbs, however, there was no clarity regarding whether these were performed with the intention to treat deep venous obstruction once obstructive lesions were uncovered by venography.

Sensitivity of venography alone was only 50% for iliac venous obstruction. Therefore, a combination of venography and intravascular ultrasound imaging (IVUS) were performed in patients considered for a stent procedure and not when ELVA alone was planned.

Preoperative venograms (n=160) showed direct or indirect venographic evidence for an obstructive lesion in 52% (83 of 160). IVUS was performed in 158 limbs with a median area stenosis by IVUS planimetry of $\geq 70\%$.

IVUS planimetry measured an area stenosis $\geq 50\%$ in 135 limbs (85%) and a stenosis $< 50\%$ in 23 limbs (15%). Trial balloon sizing in 14 of 23 (61%) of the latter limbs unmasked significant stenoses.

Overall, IVUS, trial balloon sizing maneuver, or both revealed stentable stenosis in 94% of limbs with venous leg ulcers when the criteria to stent was $\geq 50\%$ stenosis, which is unusual for most venous practices around the world.

The diameter stenosis of the deep vein was also in reference to the dilated pre-stenotic vein that may overestimate the degree of stenosis, another practice that is different from other operators of iliac vein stenting including the reviewer.

IVUS planimetry measured an area stenosis $\geq 50\%$ stenosis in 135 limbs (85%) and a stenosis $< 50\%$ in 23 limbs (15%). Balloon sizing in 14 of 23 of the latter limbs unmasked significant stenoses.

149 limbs were diagnosed to have significant stenoses that made up for 149/192 (77.6%) of venous ulcer limbs. Also, 158 limbs were stented, so 9 limbs that were stented had neither significant ($\geq 50\%$ stenosis) on IVUS nor significant stenosis on balloon sizing.

Table III. shows median stenosis detected by IVUS was 70% in 192 limbs, whereas IVUS was performed in only 158 limbs. This may need further clarification.

Saphenous vein ablation was performed in 30 limbs. 27% of these (n=8) did not have any reflux at all (*Table III*): the rationale behind laser ablation in limbs without any reflux is unclear.

Despite its weaknesses, this paper highlights 4 major aspects of venous ulcer management.

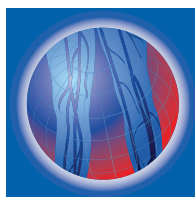
Firstly, it describes a focused algorithmic approach for venous ulcers especially in relation to clinical and imaging findings, which has been missing from literature so far.

Secondly, non-use of compression stockings following endovascular treatment, though attractive and desirable, contrasts current literature on the adjunctive value of compression therapy to heal C6 ulcers.

Thirdly, simultaneous iliac vein stenting along with endovenous ablation is an interesting concept and has its origin historically when venous surgeons were performing deep venous valve repairs in conjunction with GSV/SSV stripping. Although there is evidence that the individual contribution of each modality of treatment may be masked by that of the other, it will be of great interest to observe in further studies whether these impacts will have additional benefits.

Finally, and perhaps most importantly are the details of pitfalls of IVUS, that Dr Raju humbly submits to after championing it for almost a decade. Ours and other authors have for some time believed that the IVUS diameter of a postthrombotic vein is, at best, only in reference to the trabeculated mass track that the IVUS catheter lies in. It is unrepresentative of other channels wider or narrower than the channel it lies in.

Overall, it is a comprehensive paper that not only provides an algorithmic approach to venous ulcers, imaging options and impressive healing rates of venous ulcers. It also promises patients with the difficult problem of chronic venous insufficiency, an independence from compression therapy.



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Clinical results after coil embolization of the ovarian vein in patients with primary and recurrent lower-limb varices with respect to vulval varices

Castenmiller PH, de Leurk, de Jong Team, van der Loan L,
Phlebology. 2013;28:234-238.

This article presents an evaluation of the effects of insufficient ovarian veins embolization in the prevalence of lower limb and vulvar varices. It presents a follow-up of a series of patients treated with ovarian veins embolization in order to study the effects on the recurrence of varicose veins in the lower limb and vulva. They use as a diagnosis method.

However, it presents a series of flaws concerning the experimental and clinical design. The main objective and purpose of the article is not clear. The introduction and overview of the insufficiency of ovarian veins (IOV) is not comprehensive enough, using only 10 references; and is out of date, referring to articles until 2009. It fails to focus on the problem to be solved, making it difficult to follow if they are going to focus on ovarian vein insufficiency or on varicose veins. It presents a series of erratic facts, for example, a recurrence intervals in a span of 5% to 49% or a different number of total patients in different points of the study.

It is not clear what the inclusion/exclusion criteria was for select the patients, which criteria are poorly presented and summarized. We were not able to understand the experimental design of use. For example, it is not necessary to mention that all patients were females, because the interest is focused on the ovarian vein, however, even as they mention that pregnancy is an important issue in IOV, they do not present the pregnancy medical record. It's also difficult to follow the study, presenting results as a part of the methods. Also, it lacks of some data that we consider necessary, such as what happened to nonembolized patients.

The results, again, we found a mix of data that would have been necessary in the methods and, therefore, redundant in this section. Also, it is quite redundant to present the same data in the text and tables. Only one follow-up after three months is a short time, it would have been very interesting to see a continuous follow-up, with Duplex ultrasound studies in order to investigate the permeabilization state and the recurrence of the varicose veins. In other terms, giving the influence of iliac vein leaks in lower limbs in the presence of pelvic and lower limb varicose veins, it would have been important to study the incompetence of iliac veins in all cases.

Finally, in the discussion of this work, the authors do not add any other reference to discuss his conclusions. Besides, it is not all clear if they consider their results as an improvement or advance in the field. A more detailed discussion and comparison with other results should have been provided, such as present in previous studies (1-4).

The authors mention the limitations of their study, that would have been easily avoided with a better working procedure and experimental design.

From an endovascular point of view, in our experience, we recommend to perform a selective phlebography of gonadal veins by puncturing in the brachial vein, accessing from the flexure in the elbow, or, if it is not possible, from the jugular vein. Using this approach is a more accurate way to selectively and distally canalize both gonadal veins, especially in the case of right gonadal vein. In addition, it is also possible to canalize the tributary branches of the internal iliac veins, which are also a common cause of refluxes and leaks in lower limbs. An approach from the femoral vein, as performed in the present article, would be difficult to canalize and access gonadal veins, mainly due to a pronounced angulation that would disturb the catheter manipulation.

In other terms, we prefer to perform a bilateral occlusion, using a "sandwich" technique, using controlled-release coils, as a desirable choice in the proximal side, and 2% etoxisclerol foam in the distal portion of the vein. Using this strategy, we consider that a better occlusion of vessels is obtained, minimizing the apparition of recidivism or repermeabilizations.

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Congress and conference calendar

DATES	CONGRESS	COUNTRY	CITY
10-14 August 2014	XXVI WORLD CONGRESS OF THE INTERNATIONAL UNION OF ANGIOLOGY	Australia	Sydney
September 2014	ANVIN SYMPOSIA	Indonesia	not confirmed yet
4-6 September 2014	96. JAHRESVERSAMMLUNG DER SGD V 2014	Switzerland	Basel
5-6 September 2014	JAHRESTAGUNG DER ÖSTERREICHISCHEN LYMPH-LIGA	Austria	Leoben
11-13 September 2014	46. JAHRESTAGUNG DER ÖSTERREICHISCHEN GESELLSCHAFT FÜR GEFÄSSCHIRURGIE	Austria	Graz
October 2014	XV INTERNATIONAL SYMPOSIUM OF ANGIOLOGY AND VASCULAR SURGERY	Portugal	Oporto
2-5 October 2014	1ST MULTINATIONAL CHAPTER MEETING (IUA)	Italy	Palermo
3-4 October 2014	ÖGDC ANNUAL MEETING	Austria	Vienna
3-5 October 2014	XVII NATIONAL CONGRESS CIF (COLLEGIO ITALIANO DI FLEBOLOGIA)	Italy	Florence
9-12 October 2014	5TH BALKAN VENOUS FORUM	Bulgaria	Sofia
15-18 October 2014	VASCULAR SOCIETY OF INDIA CONFERENCE	India	Bhubaneswar
16-18 October 2014	9TH INTERNATIONAL CONGRESS OF THE CENTRAL EUROPEAN VASCULAR FORUM (CEVF)	Italy	Rome

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17-18 October 2014	XV INTERNATIONAL SYMPOSIUM OF ANGIOLOGY AND VASCULAR SURGERY	Portugal	Oporto
23- 24 October 2014	PHILIPPINE SOCIETY OF VASCULAR MEDICINE 11TH ANNUAL CONVENTION	Philippines	Manila
23-25 October 2014	IX CONGRESO DEL FORUM VENOSO LATINOAMERICANO/ XVI CONGRESO INTERNACIONAL DEL COLEGIO ARGENTINO DE CIRUGÍA VENOSA Y LINFÁTICA	Argentina	Buenos Aires
30 October - 2 November 2014	13TH TURKISH CARDIOVASCULAR SURGERY CONGRESS (NATIONAL AND INTERNATIONAL PARTICIPANTS)	Turkey	Antalya
3-6 November 2014	39º CONGRESO ARGENTINO DE COLOPROCTOLOGÍA	Argentina	Buenos Aires
7-8 November 2014	ANNUAL MEETING OF THE AUSTRIAN ASSOCIATION FOR PHLEBOLOGY	Austria	Vienna
7-9 November 2014	INTERNATIONAL VASCULAR COURSE OF THE ITALIAN SOCIETY FOR VASCULAR INVESTIGATION (SIDV)	Italy	Rimini
12 November 2014	15. JAHRESTAGUNG DER USGG	Switzerland	St. Gallen
13-15 November 2014	XXVII NATIONAL CONGRESS SIF (SOCIETÀ ITALIANA FLEBOLOGIA)	Italy	Turin
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