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Consensus Statement

Classification and Grading of Chronic Venous Disease in the Lower Limbs: A Consensus Statement

This Consensus Statement was prepared by an ad hoc committee at the American Venous Forum 6th Annual Meeting, 22–25 Feburary 1994, Maui, Hawaii (organized by the Straub Foundation).

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Part I: Classification

Introduction

Chronic venous disease is an important cause of discomfort and disability and is present in a significant percentage of the population worldwide. Methods to diagnose and measure severity have evolved rapidly so that accurate classification of venous disease is now possible. Standards for reporting venous disease have been based on a clinical classification developed in 1988 by a subcommittee of the Society for Vascular Surgery (SVS) and International Society for Cardiovascular Surgery (ISCVS) [1]. This classification has contributed to the uniform presentation of diagnosis and results of treatment. However, advances in the knowledge of chronic venous disease have created a need to expand definitions to cover many aspects, including anatomy, pathophysiology and aetiology. The aim of this document is to present a more precise classification of chronic venous dysfunction which is simple enough to encourage its universal acceptance. Acceptance of a standard classification provides a basis for uniformity in reporting and assessing different modalities of diagnosis and treatment.

The classification has been developed under the headings listed in Table 1.

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Table 1. Classification

C	For clinical signs ($grades_{0-6}$), supplemented by ($_A$) for asymptomatic and ($_S$) for symptomatic presentation
E	For etiological classification (congenital, primary, secondary)
A	For anatomical distribution (superficial, deep or perforator, alone or in combination)
P	For pathophysiological dysfunction (reflux or obstruction, alone or in combination)

Clinical Classification (C_{0-6})

The clinical classification is based on objective clinical signs of chronic venous disease (C_{0-6}) (Table 2) supplemented according to presentation for (A) asymptomatic (e.g. $C_{0-6,A}$) or (S) for symptomatic limbs (e.g. $C_{0-6,S}$). Symptoms include aching, pain, congestion, skin irritation and muscle cramps as well as other complaints attributable to venous dysfunction. This clinical classification is organized in terms of ascending severity of disease [1]. Limbs in higher categories have more severe manifestations of chronic venous disease and may have some or all of the findings associated with less severe categories.

Table 2. Clinical classification

Class 0	No visible or palpable signs of venous disease
Class 1	Telangiectases or reticular veins
Class 2	Varicose veins
Class 3	Oedema
Class 4	Skin changes ascribed to venous disease (e.g. pigmentation, venous eczema, lipodermatosclerosis)
Class 5	Skin changes as defined above with healed ulceration
Class 6	Skin changes as defined above with active ulceration

Therapy may alter the clinical signs and symptoms and the limb should be reclassified after treatment.

Telangiectases are defined as dilated intradermal venules up to a diameter of approximately 1 mm and reticular veins are defined as dilated subdermal veins up to a size of about 4 mm which are not palpable. Varicose veins are palpable, dilated subcutaneous veins usually larger than 4 mm [2]. Telangiectases and reticular veins are separated from varicose veins in this classification as it is considered that the telangiectases do not lead to venous ulceration while the reticular veins may [2]. Both may be associated with patient symptoms [3].

Etiological Classification (E_C,.E_P or E_S)

This etiological classification recognizes three categories of venous dysfunction: congenital, primary and secondary (Table 3). Congenital problems may be apparent at birth or be recognized later. Primary problems are neither congenital nor do they have an identifiable cause. Secondary problems are those acquired conditions that have a known pathological cause, such as thrombosis. These categories are mutually exclusive.

Table 3. Etiological classification

Congenital (E_C)
Primary (E_P) – with undetermined cause
Secondary (E_S) – with known cause
Post-thrombotic
Post-traumatic
Other

Anatomical Classification ($A_{S,D,P}$)

This classification describes the anatomical extent of venous disease, whether in the superficial (A_S), deep (A_D) or perforating (A_P) veins. Disease may involve one, two or all three systems. For those reports for which greater detail is required, the site and extent of involvement of the superficial, deep and perforating veins may be categorized using the anatomical segments listed in Table 4.

Table 4. Anatomical classification

Segment no.	
	Superficial veins (A_S)
1	Telangiectases/reticular veins
	Greater (long) saphenous (GSV)
2	Above knee
3	Below knee
4	Lesser (short) saphenous (LSV)
5	Non-saphenous
	Deep veins (A_D)
6	Inferior vena cava
	Iliac
7	Common
8	Internal
9	External
10	Pelvic – gonadal, broad ligament, other
	Femoral
11	Common
12	Deep
13	Superficial
14	Popliteal
15	Crural – anterior tibial, posterior tibial, peroneal (all paired)
16	Muscular – gastrocnemial, soleal, other
	Perforating veins (A_P)
17	Thigh
18	Calf

Pathophysiological Classification ($P_{R,O}$)

Clinical signs and symptoms of venous dysfunction may be the result of reflux (P_R), obstruction (P_O) or both ($P_{R,O}$). Therefore, the simplest pathophysiological classification of a limb would be P_R, P_O or $P_{R,O}$.

Because the severity of venous dysfunction is determined by the location and anatomical extent of reflux and/or obstruction [4,5], it may be desirable to report this in greater detail by using the anatomical segments listed in Table 4. The availability of duplex scanning allows this to be done non-invasively [6,13]. In addition, it may be appropriate to report duplex-derived severity and duration of reflux [8,9,14], as presented in part III.

Reporting of segmental obstruction can be simplified and standardized using the well-recognized major sites of occlusion [15]: caval, iliac, femoral, popliteal and crural (P_{O-Cav}, P_{O-I}, P_{O-F}, P_{O-P}, P_{O-C}). If obstruction is more extensive, this can also be reported using multiple subscripts (e.g. $P_{O-I,F,P}$). Functional obstruction is discussed in part III.

Part II: Scoring of Venous Dysfunction

A scoring system of chronic venous dysfunction provides a numerical base for scientific comparison of limb condition and evaluation of results of treatment. This is based on three elements: the number of anatomical segments affected (anatomical score); grading of symptoms and signs (clinical score); and disability (disability score). Although the grading of symptoms is subjective, the grading of signs is objective. The accuracy of this scoring system needs to be tested and may be modified in the future as experience accumulates.

Anatomical Score

This is the sum of the anatomical segments, each scored as 1 point (Table 4).

Clinical Score

This is the sum of the values assigned to the signs and symptoms listed in Table 5.

Table 5. Clinical score

Pain	0 = none; 1 = moderate, not requiring analgesics; 2 = severe, requiring analgesics
Oedema	0 = none; 1 = mild/moderate; 2 = severe
Venous claudication	0 = none; 1 = mild/moderate; 2 = severe
Pigmentation	0 = none; 1 = localized; 2 = extensive
Lipodermatosclerosis	0 = none; 1 = localized; 2 = extensive
Ulcer – Size (largest ulcer)	0 = none; 1 = <2 cm diameter; 2 = >2 cm diameter
Ulcer – duration	0 = none; 1 = <3 months; 2 = >3 months
Ulcer – recurrence	0 = none; 1 = once; 2 = more than once
Ulcer – number	0 = none; 1 = single; 2 = multiple

Disability Score

This is derived from the categories outlined in Table 6.

Table 6. Disability score

0	Asymptomatic
1	Symptomatic, can function without support device
2	Can work 8-hour day *only* with support device
3	Unable to work even with support device

Part III: The Diagnostic Process

The history and physical examination are the basis for the initial evaluation of patients with suspected chronic venous disease [16]. Since valvular incompetence or obstruction form the basis for most complications, continuous-wave (CW) Doppler can be used at the time of the initial clinical evaluation to assist in the diagnosis [17,18]. Absence or diminution of a Doppler velocity signal despite an augmentation manoeuvre suggests obstruction. Reflux may be detected with a Valsalva manoeuvre or limb compression. Because CW Doppler provides subjective information, if positive, findings should be followed by objective tests.

If a patient presents with symptoms that are questionably related to venous disease, such as mild oedema or aching, a non-invasive test may be required. Duplex scanning is the method of choice used to confirm or exclude the presence of venous dysfunction [6–14]. In the absence of duplex scanning, strain-gauge plethysmography [19,20], air-plethysmography (APG) [21,22] or photoplethysmography (PPG) [23,24] may be used. Because the accuracy of PPG has been challenged [25–27], confirmation of the presence of chronic venous disease by another technique may be required if PPG is positive.

Duplex scanning has become the method of choice for testing individual veins of the superficial, deep and perforating systems [6–13]. If the problem is confined to superficial veins, duplex scanning will determine whether this involves the greater and/or lesser saphenous veins and their tributaries. It can also detect the presence of incompetent perforating veins [5,28,29]. In addition, duplex scanning can determine the anatomy of veins in the popliteal fossa [30–32]. Also, it will detect reflux at other sites such as vulval veins or lateral thigh incompetent perforating veins. In the presence of deep venous disease, duplex scanning will determine whether the problem is due to anatomical obstruction, reflux or both. In addition, it will provide information about the anatomical extent. Measurements to quantify reflux in individual veins by duplex scanning have been recently developed, e.g. valve closure time [9], venous reflux index [33] and velocity at peak reflux [14], but experience with these is still limited [34]. Several other methods to quantify reflux are available. They include strain-gauge plethysmography [19,20], foot volumetry [35,36] and the more recently developed air-plethysmography [21,22], which measures global reflux in ml/s. Ascending and descending phlebography should be performed when deep venous valvular reconstruction is contemplated [37,38].

Several tests are available to determine the functional severity of chronic obstruction. They include the arm–foot pressure differential [39], the outflow fraction using air-plethysmography [16,40] and femoral or popliteal pressure measurements during exercise [41,42]. Ascending phlebography should be performed if venous reconstruction (bypass) is being considered.

Ambulatory venous pressure is a test measuring global venous hypertension [43,44]. A high ambulatory venous pressure is associated with a high incidence of ulceration [45].

In the presence of both obstruction and reflux, the quantitative tests outlined above can be used to assess which is predominant.

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