

# Clinical analysis of the corona phlebectatica

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**Background:** The corona phlebectatica (CP) is classically described as the presence of abnormally visible cutaneous blood vessels at the ankle with four components: “venous cups,” blue and red telangiectases, and capillary “stasis spots.” Previous studies showed that the presence of CP is strongly related to the clinical severity of chronic venous disorders (CVD) and the presence of incompetent leg perforators. The aim of this study was to select the most informative components of the CP in the assessment of the clinical severity of CVD patients.

**Methods:** A multicentric series of 262 unselected patients (524 limbs) consulted for CVD were clinically evaluated using a standardized form to record the CEAP “C” items and the presence of the four CP components. Standard categorical and ordinal statistics were used to describe the external validity of the CP components as severity indexes, taking the “C” classes as reference.

**Results:** “Stasis spots” ( $P < .001$ ;  $r = .44$ ) and blue telangiectases ( $P < .01$ ;  $r = .32$ ) were linearly associated with the ascending order of “C” classes, whereas the relationship is less clear for the red telangiectases and the “venous cups.” The association pattern of the four components showed that only the blue telangiectases and the “stasis spots” were consistent with each other. Blue telangiectases were found more sensitive (0.91 vs 0.75) but less specific (0.52 vs 0.80) than “stasis spots” for advanced venous insufficiency (CEAP “C4-6”).

**Conclusion:** This study shows that only blue telangiectases and “stasis spots” provide valuable information in patients with CVD and deserve to be taken into account in the evaluation of such patients. Further studies are needed to show the reproducibility of this data, which we regard as essential for clinical use. (J Vasc Surg 2012;55:150-3.)

The corona phlebectatica (CP) is defined as a “fan-shaped intradermal telangiectases on the medial or lateral aspects of the foot.”<sup>1</sup> It was first described in 1960 by H.R. van der Molen<sup>2,3,4</sup> as the association of four components: Telangiectases are dilated ramified intradermal venules located at the medial and/or lateral aspects of the foot, next to the malleolar areas; they can be classified as blue (Fig 1, a) or red (Fig 1, b). “Venous cups” (Fig 1, c) extend to the plantar arch as six to eight blue cups, and are secondary to the dilatation of the triangular shaped venous convergences coming from the plantar arch. Finally, “stasis spots” are composed of subepidermal papillary capillaries grouped into nummular or coin-shaped red or purple colored areas (Fig 1, d).

The CP was used by Leo Widmer, in the Basle study, as the definition for the first grade of “Chronic Venous Insufficiency,”<sup>5</sup> as well as in the subsequent literature that used the Widmer classification.<sup>5,6</sup>

We previously found a significant correlation between the presence of a CP and the ascending severity “C” classes of the CEAP classification.<sup>7</sup> A significant link was also demonstrated between the CP and the presence of incom-

petent perforators in the calf or lower leg,<sup>8</sup> and its predictive value for the future occurrence of leg ulcers, as was also shown.<sup>9</sup>

The aim of this particular study was to describe the association pattern and clinical correlation of the four components of CP in CVD patients, in order to document which of these components could be relevant for the clinical evaluation of the severity in CVD patients.

## METHODS

Between March and September 2006, a cooperative group of 10 vascular physicians recorded specific clinical information regarding the CP in addition to their usual clinical evaluation in patients aged 18 years or more seeking medical care for CVD and presenting visible cutaneous blood vessels in the submalleolar area of at least one leg. No obligation was made to include a consecutive series of patients, but a full completion of the record sheet was required. The record sheet included examination date, birth date, and full documentation of the “C” components of the CEAP, as well as the four components of the CP: Telangiectases, “venous cups,” blue cups, and “stasis spots” (Fig 1).

The statistical analysis was performed with SPSS software (14.0 version; SPSS, Chicago, IL), using standard descriptive statistics, Fischer exact tests (two-tailed) and Spearman rank correlations were used to evaluate the relationship between each component and the CEAP “C” clinical classes, and with advanced venous insufficiency, defined as CEAP C4 to C6. A  $P$  value  $\leq 0.05$  was considered significant.

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**Fig 1.** The four components of the corona (clinical aspect). (a) Venous cups (veins); (b) Blue telangiectases (intradermal venules); (c) Red telangiectases (superficial venules); (d) Stasis spots (capillaries).

**Table I.** Distribution of the clinical “C” CEAP classes of the 524 limbs examined

CEAP “C” classes	Limbs (n = 524)	%
C0	9	1.7
C1	170	32.4
C2	222	42.4
C3	67	12.8
C4a	27	5.2
C4b	14	2.7
C5	12	2.3
C6	3	0.6

## RESULTS

The series consisted of 262 patients with clinical data recorded from June 1, 2006 to September 10, 2006. There were 216 women (82.4%) and 46 men (17.6%), with a median age of 55 years (Interquartile range, 46-64) and 64 years (Interquartile range, 54-74), respectively. The post-thrombotic syndrome was present in 10.6% of the women and in 6.3% of the men.

The majority of limbs examined were classified C1 or C2 (65%) according to the CEAP classification. Limbs without any sign of CVD (C0 –1.7%) were included because of the systematic examination of both limbs, including the unilateral CVD (Table I).

The correlation study of each of the four corona components with the ascending CEAP “C” classes showed no significant relationship for the cupular veins and the red telangiectases (Fig 2), but a significant relationship for blue telangiectases ( $P < .01$ ;  $r = .32$ ) and “stasis spots” ( $P < .001$ ;  $r = .44$ ; Fig 3). The study of the sensitivity and specificity of the four components for the diagnosis of advanced venous insufficiency (CEAP C4-C6) shows again (Table II) that the “stasis spots” and blue telangiectases have the highest likelihood ratio. Blue telangiectases are more sensitive than stasis spots (0.91 vs 0.75) but less

specific (0.52 vs 0.80) for the prediction of skin changes (C4 to C6). Red telangiectases and cupular veins show lower predictive values.

## DISCUSSION

Our data confirms the strong association of CP with the clinical severity of CVD, as explained by the CEAP “C” classes, and shows that among its four components, “stasis spots” and blue telangiectases are the best predictors for skin changes of venous origin.

The reliability of these results depends on the conditions of data collection. Therefore, every effort has been made to ensure the interobserver reproducibility as much as possible through use of reference illustrations and reminders of definitions. We previously tested the reproducibility using the same software and found a kappa coefficient of 0.51 when testing the interobserver reproducibility of telangiectases,<sup>10</sup> and 0.61 for the corona.<sup>11</sup> In any case, poor reliability would have produced increased variability and decreased power of the comparisons, which means that we are confident about the relevance of the significant results obtained.

**Significance of corona.** In a previous paper studying a different series of 874 patients, we found a significant association of corona<sup>7</sup> to clinical severity classes ( $\chi^2$ :  $P < .001$ , Spearman rank correlation coefficient  $r = .28$ ), which suggested that the corona should not be considered to be similar to telangiectases and reticular veins in other locations.

Although we did not check the distal venous pressure in the present study, the significant relationship between corona and distal reflux corroborates the hypothesis of Van der Molen that corona may be consequence of the venous stasis of the foot,<sup>3</sup> related to a prolonged or severe venous hypertension. This was also the hypothesis described by Cockett<sup>12</sup> as the “ankle blow out syndrome,” which was more recently supported by the data of the Edinburgh study.<sup>13</sup> This is also consistent with the findings of Hirai,<sup>14</sup> showing a shortened half filling time measured by photoplethysmography in patients with CP.

Robertson et al<sup>10</sup> also showed that CP is an independent predictor of subsequent ulceration (odds ratio, 4.52; 95% confidence interval, 1.81-11.3).

The corona cannot be seen any more like simple telangiectasies of the foot. It is a sign of severe venous stasis, correlated with the presence of incompetent perforators of the leg and has a high predictive value of the onset of skin changes.

## CONCLUSION

This study shows that only two out of the four CP components are related to the clinical severity of CVD as expressed by the CEAP “C” classes: Blue telangiectases and “stasis spots” are strongly related to the clinical severity, and even show high predictive values for an advanced CVD (C4-C6), which seems promising for clinical application. By contrast, “venous cups” and red telangiectases do not show any clinical significance, and the usefulness of

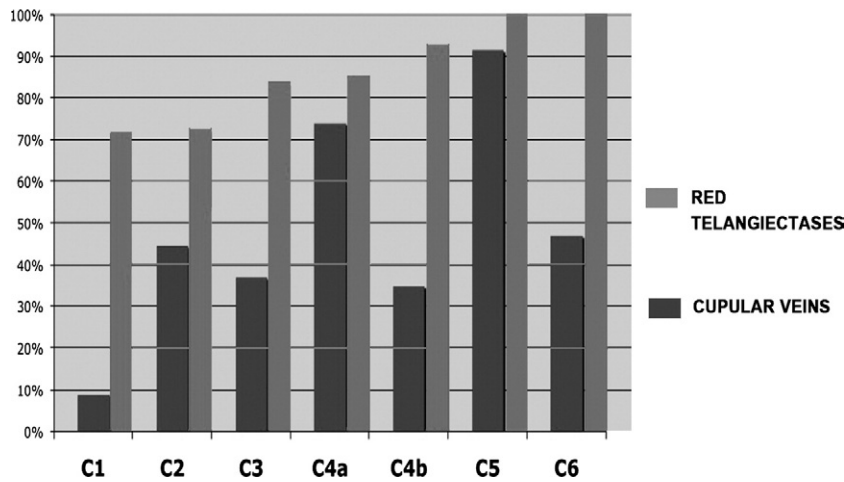


Fig 2. Prevalence of the cupular veins and red telangiectases according to the CEAP “C” classes (NS).

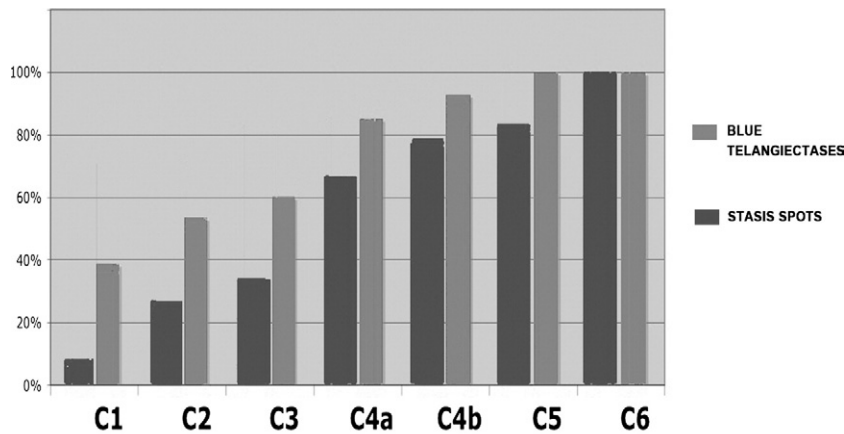


Fig 3. Prevalence of the blue telangiectases according to the CEAP “C” classes (significant correlation  $P < .01$ ;  $r = .32$ ) and of the stasis spots classes (significant correlation  $P < .001$ ;  $r = .44$ ).

**Table II.** Diagnostic value of corona phlebectatica components for advanced venous insufficiency (CEAP C4-C6), and rank correlation with “C” classes

Corona components	Likelihood ratio	Sensitivity	Specificity	Spearman rank correlation
“Stasis spots”	3.83	0.75	0.80	0.39
Blue telangiectases	1.89	0.91	0.52	0.31
“Venous cups”	1.79	0.68	0.65	0.21
Red telangiectases	1.24	0.91	0.27	0.29

their evaluation appears questionable. Further studies are needed to reconfirm our findings and to ensure reproducibility is achieved in the clinical assessment of blue telangiectases and “stasis spots,” which is essential to validate their use in clinical research and practice.

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**AUTHOR CONTRIBUTIONS**

Conception and design: J-FU, AC-T  
 Analysis and interpretation: PC, BS  
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 Critical revision of the article: PC, AC-T, BS  
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## INVITED COMMENTARY

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The advantages of a uniform nomenclature are so obvious that it is surprising no attempts to develop one for chronic venous diseases (CVD) were made until the 1990s. Development of the CEAP by the American Venous Forum (AVF) in 1993 to 1994, followed by a rapid international acceptance of this classification, introduced a uniformity of reporting, and the systematic investigation of CVD commenced.

It soon became clear that what seems to be a simple and precise description of the signs of venous disorders is a matter of disagreement and controversy. The original CEAP classification specified four signs: venous dilation (including telangiectases, and reticular and varicose veins), edema, skin pigmentation, and ulcer. Malleolar flare was included in the C<sub>1</sub> clinical class. Despite the perceived clarity of CEAP, analysis of the European Venous Registry demonstrated significant variability in assigning patients to the clinical classes. This prompted the international consensus meeting in Rome in 2001, and refinements of the clinical classification, the C in CEAP.<sup>1</sup> Additional signs, such as atrophie blanche, eczema, and lipodermatosclerosis were described and included in definition of clinical classes. The term "malleolar flair" was replaced by a synonym "corona phlebectatica." Although this sign was not identified as a criterion for any of the C<sub>0</sub>-C<sub>6</sub> clinical classes, it was stated that corona phlebectatica is "commonly thought to be an early sign of advanced venous disease."

The article by Uhl et al is a further attempt to improve the precision of descriptions and the reliability of the classification. It

demonstrated that only two of the four elements of the current definition (blue telangiectases and stasis spots) can potentially serve as markers of the CVD severity. These data support the authors' continuous effort to modify the CEAP classification to include corona phlebectatica in the C<sub>4</sub> clinical class.

Knowing that CEAP, however imperfect, already serves its purpose, one may wonder how much improvement it needs and how much of the change is reasonable. After all, CEAP is an empiric descriptive classification and, as such, may be replaced in the future by a more accurate system reflecting specific underlying pathologic processes and mechanisms. Acquiring this knowledge, however, requires consistency, and changes in classification may jeopardize the results of the 15-year progress resulted from creation and adaption of CEAP.

A remarkable aspect of this publication is that at the time when in-depth investigation of disease processes at all levels of biologic organization—from system to submolecular—became scientific routine, venous diseases are still at a stage when so much energy is devoted to issues of descriptive classification. This underlines a greater problem of lack in knowledge of basic physiological and pathologic mechanisms involved.

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