

Toward physiological assessment of venous obstruction and reflux

Chronic venous disease (CVD) has a relatively simple pathological profile. There are only two dominant features: reflux and obstruction. Such apparent simplicity conceals the complex nature of hemodynamic sequelae of these pathologies, especially when both of them coexist. The anatomical location and extent of reflux is strongly associated with the severity of CVD. The same is true with regard to obstruction. Such relationships, however, are far from being straightforward. The symptoms, signs, and the severity of CVD vary substantially even among patients with same anatomical characteristics of these pathologies.

Attempts to quantify the physiological impact of an individual lesion, such as an incompetent valve, or a compressed iliac vein, were mostly unsuccessful. Collateral flow is one of the factors complicating the assessment of venous obstruction. However, the major limitation of all the existing tests is that the maneuvers that are used are grossly antiphysiologic. Patients with venous reflux rarely do Valsalva maneuver, and almost never experience external compression with rapid decompression of their Calves. Yet, these are the maneuvers that are widely used for testing of venous competency. Occlusion plethysmography tests venous outflow at the venous pressure that far exceeds its physiological values. Venous symptoms typically occur after a prolong standing, or walking (venous claudication). Despite this, patients are tested at rest. Most importantly, a test which can assess relative hemodynamic impact of coexisting reflux and obstruction currently does not exist.

The diagnostic approach suggested by the authors of the paper published in the *Vascular Investigation and Therapy*^[1] opens the door for solving two of the main problems of assessing hemodynamic impact of venous lesions. First of all, measuring venous resistance at physiological pressure (25 mmHg) not only becomes clinically relevant, but also is likely to help to assess the impact of collateral flow. Second, assessing both reflux and obstruction by the same test can help to differentiate their relative importance, at least qualitatively.

Any new diagnostic approach needs to be validated. Reliability, both interobserver and test-retest, can be

easily studied. Studying the construct validity will be challenging. Perhaps, clinical correlations, as imperfect as it is, is the only reasonable option. Time will show if the new approach proves itself to be a valuable addition to the current arsenal of diagnostic tools. In the meantime, this publication in the *Vascular Investigation and Therapy* opens an exciting opportunity to improve our understanding of the pathophysiology of CVD.

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Submitted: 01-Mar-2020

Revised: 08-Mar-2020

Accepted: 12-Mar-2020

Published: 30-Mar-2020

Reference

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Access this article online	
Quick Response Code:	Website: http://www.vitonline.org/
	DOI: 10.4103/IT.VIT_6_20

How to cite this article: Lurie F. Toward physiological assessment of venous obstruction and reflux. *Vasc Invest Ther* 2020;3:32.