

# It's Time We Reassess Our Primitive Understanding of the Venous System

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If one includes the entire spectrum of venous disease, it is a more common pathology than peripheral arterial disease. The financial impact of venous disease is substantial, notes Dr. Ken Ouriel in this issue of *The Methodist DeBakey Cardiovascular Journal*. Why, then, has it taken so long to generate enthusiasm for venous disease of the femorocaval and subclaviocaval segments? For years, the endovascular management of venous disease used technology and techniques borrowed from the arterial space; although results were encouraging, it is clear that they varied widely.

In peripheral arterial disease, there has been much education and research focused on understanding atherosclerosis and its interaction with arterial devices. However, the paucity of investigation and enlightenment in the venous domain is evident when a literature search is performed. Certainly there is data from Comerota et al. showing an increased amount of collagen in the walls of chronically diseased veins. While this is a reasonable start, it is not sufficient data on which to build an entire treatment paradigm. Just like peripheral arterial disease, venous pathology presents in a continuum. Without an in-depth appreciation of the variability of those presentations, it is difficult to envision targeted therapies.

Although vendors have recently engaged in the development of venous-specific devices, it is in great part grounded in expert opinion rather than hard data. The Medicare Evidence Development & Coverage Advisory Committee (MEDCAC) has made it known that we need more evidence on the efficacy of all venous procedures. Peter Glocviczki, a vascular surgeon at Mayo Clinic, put it very succinctly in an issue of *Venous News*: "We need to focus on venous research and never forget that whoever owns research owns the disease. We must continue innovation and collaboration, with other venous specialties and with industry."

In this issue of the *Methodist DeBakey Cardiovascular Journal*, we strive to give some insight into the research and innovation occurring in the venous space. We start with reviews from Peter Henke and Dragoslava Vekilov, who provide the fundamental building blocks of venous disease. Their basic science research focuses on pathological considerations of venous thrombosis, including the consequences related to mechanical behavior. In

our opinion, these considerations are elemental in determining the next steps in the research paradigm.

Translational investigation by Justinas Silickas and colleagues provides insight into innovative ways to use computed tomography and magnetic resonance imaging. The ability to stage venous disease noninvasively could have a profound impact on how and why we manage the pathology. In the following articles by Tony Lu and Ponraj Chinnadurai, we gain a better understanding of how various interventional/operative imaging tools transcend our ability to empower the user. Intravascular ultrasound, one of these techniques, is well described by users and essential to the management of venous disease because it enables us to visualize and appreciate the pathology being treated in real time. Until recently, we have not been able to bring the power of cross-sectional imaging into the operative space. The authors describe how priceless multimodal imaging techniques such as magnetic resonance venography and fluoroscopic image fusion can potentially guide future interventional treatments and optimize therapeutic decision making.

Ultimately, as described in this issue, we believe that diseased veins behave differently than arteries. Therefore, managing veins with tools meant for another space is likely not ideal. Articles by Adeline Schwein and Stephen Black describe how many venous interventions use arterial devices that are not optimized for venous pathologies and underline the work being done to develop tools specifically designed for the venous space. Finally, Anthony Comerota shares his experience with the ATTRACT trial, which has been extremely impactful in the treatment paradigm of venous thrombosis. Although the results remain heavily debated and, on some level, contested, it is a critical trial and should in many ways serve as an example of the good research being executed in venous disease.

We hope you enjoy this issue and that it stimulates additional interest in the venous forum—ultimately inspiring additional exploration into this underdeveloped space. For further discussion and CME opportunities, I invite you to visit the journal's website at <http://journal.houstonmethodist.org>, where you can log in and use the "Dialogue with Authors" link to have an open Q&A with the authors of this issue.