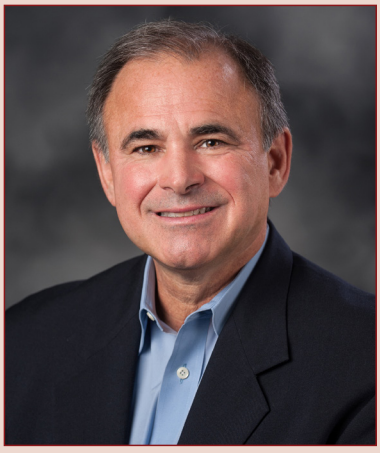
A Closer Look at Vascular Closure Devices for Venous Interventions



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Welcome to the August 2017 edition of *Vascular Disease Management*. There are multiple articles of significant clinical importance. I have chosen to comment on Arun Nagabandi and colleagues' article on the utilization of the Vascade arterial vascular closure device to close femoral vein access sites following interventional venous procedures. I have chosen to comment on this article as there has been a dramatic increase in venous interventional procedures with concomitant increased risk of venous bleeding via the venous access site.

Vascular closure devices are being utilized with greater frequency to create hemostasis following arterial interventional procedures. Facilitation of quicker ambulation, lessening time to discharge, and decreasing risk of significant bleeding are potential benefits. These same benefits may be applicable utilizing venous vascular closure. Although severe bleeding at venous access sites is less common than at arterial access sites, it does occur and it can be associated with significant morbidity. This is particularly true when there has been aggressive concomitant anticoagulation and large-bore sheaths utilized during the interventional procedures. As pointed out by Nagabandi et al, the Vascade vascular closure device, which ultimately delivers an extravascular collagen plug to the site of vessel puncture, is theoretically well suited to facilitate venous hemostasis without concomitant risk of venous thrombosis. The device is delivered via the indwelling venous sheath into the vein. A nitinol disc at the tip of the device is deployed and withdrawn to the puncture site to achieve initial hemostasis and to locate where to deliver the extravascular collagen plug. Once the plug has been delivered, the nitinol disc is collapsed and the sheath and device are removed from the patient. There is no intravascular component that remains in the patient.

The venous system is anatomically different than the arterial system, as pointed out by the authors. It has far less pressure to contribute to continued bleeding than the arterial system. This article clearly delineates how the Vascade device is designed and how it was utilized by the authors. Differences between arterial and venous closure, including potential modes of failure with alternative vascular closure devices, are eloquently described by the authors.

There are no large trials utilizing these devices in venous closure. Trials will be needed to determine where these devices should be utilized and whether or not they are cost effective. Safety and ability to regain future access must be determined. In determining cost effectiveness, all of the costs of vascular bleeding must be incorporated, including cost of increased time to discharge, transfusions, surgical closure, and need for additional medications including pain medications and intravenous fluids. With the increased utilization of central venous stenting (particularly iliac veins and inferior vena cava) and structural heart procedures, during which sheaths of 10 Fr or greater are utilized, products designed to close these large-bore venous access sites will need to be designed and assessed.

All interventional procedures begin and end with management of the vascular access site. Although historically access-site management has been focused on arteries, it is obvious that successful venous closure may have significant clinical relevance. Devices designed for venous use and studied to ensure safety will be needed.