

## INTERVIEW

# When Is the VenaSeal Closure System Appropriate for Patients With Ulcers and Combined Arterial and Venous Disease?

*An Interview With Michael Shao, MD*

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**Keywords**

[Combined Arterial And Venous Disease](#)  
[Venous Ablation](#)

October 2023  
ISSN 2152-4343

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VASCULAR DISEASE MANAGEMENT 2023;29(10):E193-E194

At the 2023 Amputation Prevention Symposium (AMP), vascular surgeon Michael Shao, MD, RVPI, from Swedish Hospital in Chicago, Illinois, presented a review of the VenaSeal closure system (Medtronic), a catheter-based closure system that delivers immediate and lasting vein closure. Dr. Shao also discussed when the system is appropriate for use in combined arterial and venous disease.

*Vascular Disease Management* spoke with Dr. Shao to discuss his presentation.

***Dr. Shao, tell us about your presentation on the VenaSeal closure system for venous ablation.***

VenaSeal is a non-thermal, catheter-based closure system to treat venous insufficiency. It's ideal for treating advanced venous ulcers, especially targeting the terminal reflux that feeds the ulcer bed itself. AMP invited me to discuss when is it appropriate to use VenaSeal in patients with mixed arterial and venous disease. In this setting, we want to be fairly conservative, because if a patient has significant arterial disease, they may need their saphenous vein as a bypass conduit in the future.

The presentation highlighted some risk factors for advanced venous ulcers, such as ulcers that are greater than 6 months old at presentation, severe obesity or lymphedema that causes poor pain tolerance, which can make it difficult for patients to comply with compression, and patients with concomitant deep venous disease. I highlighted a case that we treated with VenaSeal of a young 25-year-old male who had presented to our wound care center with venous stasis ulcer that was more than a year old. Venous duplex ultrasound demonstrated diffuse reflux in the small saphenous vein from saphenopopliteal junction to the ankle. The wound had basically languished for several months despite aggressive local wound care measures, standard compression regimens, and good patient compliance. But as soon as we treated the refluxing axial vein with VenaSeal, the ulcer had a brisk healing response within 72 hours.

It's interesting to note that the patient was offered laser ablation and foam sclerotherapy by a nearby academic medical center. In my opinion, laser ablation is suboptimal for this patient because it risks nerve injury when trying to treat reflux all the way down to the ankle. So I think for that reason, the academic medical center offered the patient adjunctive foam sclerotherapy to address the distal reflux below mid-calf. But foam sclerotherapy carries a risk for deep vein thrombosis (DVT) if the foam migrates into the deep system via a perforator vein and has inferior closure rates compared with catheter-based ablation modalities. We felt that VenaSeal would be a better option for this patient. Using VenaSeal, we were able to treat to the most distal point of reflux all the way to the ankle to achieve complete wound healing within a short period of time.

### ***When should VenaSeal be used in patients with both arterial and venous disease?***

Even though venous disease is far more prevalent than arterial disease in our wound care centers, there's a fair number of patients who have mixed arterial and venous disease. In these patients, I think one should weigh the degree of arterial insufficiency and likelihood of needing a vein bypass against the degree of venous insufficiency contributing to the wound. In general, you can stratify these patients into 3 broad categories. The first are those with severe arterial disease; these patients generally have an ankle-brachial index (ABI) less than 0.5, toe pressure less than 30 to 50 mm Hg, and flat or severely reduced photoplethysmography (PPG) waveforms. These patients ought to be treated first with arterial revascularization.

The second subset of patients have moderate arterial disease. These are generally patients with an ABI of 0.5 to 0.9, toe pressure of 50 to 80 mm Hg, and pulsatile, but perhaps moderately diminished, PPG waveforms. And these patients may be active smokers or have diabetes with a future risk of progression of arterial disease. I would still be very conservative with these patients and offer them local wound care first and arterial revascularization before doing any venous ablation.

In doing background research for this presentation, I found a treatment algorithm proposed in the literature that I disagreed with. The algorithm proposed performing venous ablation first for anybody with an ABI greater than 0.5. But that potentially takes away a vein bypass option in the future. I think you can consider doing VenaSeal ablation for severe venous ulcers in this setting as long as you perform arterial revascularization first and if the patient has undergone a trial of conservative local wound care measures without healing.

The last group of patients would be those with minimal arterial disease or no arterial disease. These are patients with an ABI greater than 0.9 and normal pulsatile PPGs. I think it's reasonable to offer these patients venous ablation with VenaSeal if they have long segment axial reflux feeding the ulcer bed and they are unlikely to need a vein bypass in the future. For example, if they have isolated iliac arterial occlusive disease that can be easily treated with endovascular therapies with good long-term durability and minimal distal disease, particularly no tibioperoneal occlusive disease, then they are less likely to ever need a vein bypass. Additionally, if a patient is of advanced age and has significant comorbidities such that they would not qualify for open surgical bypass, I think in these patients it may be reasonable to offer VenaSeal to treat venous ulcers.

### ***What is the one takeaway that you wanted attendees to get from your presentation?***

With mixed arterial and venous ulcers, I think you really have to balance the contribution of arterial insufficiency to the wound and the likelihood of ever needing a future vein bypass and weigh that against the degree of venous insufficiency contributing to the wound. Essentially, VenaSeal is a great therapeutic modality for treating venous ulcers because you can target the terminal reflux feeding the ulcer bed down to its most distal point at the ankle without risk of thermal nerve injury, but you should use it with caution in patients with anything more than minimal arterial disease. ■