# Restoring Venous Inflow With Computer Assisted Vacuum Thrombectomy

*Vascular Disease Management* recently met with vascular surgeon Mikael Fadoul, MD, from ChristianaCare in Newark, Delaware, to discuss restoring venous inflow using Penumbra's Lightning Flash® Computer Assisted Vacuum Thrombectomy (CAVT™) technology. Dr. Fadoul discusses how CAVT has impacted his practice and where he sees the field heading.

***Mikael Fadoul, MD***
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## When addressing venous thrombus, why do you believe there is value not only in restoring patency of the iliofemoral segment, but also in inflow vessels, such as the profunda, great saphenous vein (GSV), and popliteal?

Sometimes, thrombus removal in the iliofemoral segment alone is not enough. Occasionally, despite restoring iliofemoral patency, patients will still be significantly symptomatic, swollen, and show no improvement in pain post-procedure. This becomes especially apparent once they start weight-bearing. What appears to be a successful result in the lab can ultimately lead to readmission, as iliofemoral clearance alone may not address the underlying issue.

## What is your current algorithm for managing lower extremity venous thrombus removal, and what factors or experiences led you to adopt this approach?

I begin with contralateral groin access, followed by ipsilateral ankle access, to establish through-and-through wire control. This approach allows management of the entire affected limb while providing ample working length for the aspiration catheter to address a broad range of occluded vessels. Coming up and over allows for the selection of the profunda vein, GSV, or fempop segments. By restoring patency in these vessels, I ensure robust inflow and outflow throughout the entire venous segment. Additionally, this approach enables tibial inflow management with Penumbra's Lightning Bolt® 6X with TraX or Lightning Bolt 7. Restoring patency at this level will help preserve fempop and iliofemoral long-term patency. In my experience, patients achieve meaningful symptomatic improvement with this thrombectomy strategy.

## How has this management paradigm impacted your practice?

It has allowed me to manage patients better in a single stage, as well as reducing my utilization of lytic therapy. Achieving through-and-through wire access from the groin to the ankle allows me to work functionally and manage a wide range of vessels with minimal assistance.

## Has CAVT technology affected the speed, efficiency, and overall workflow of these cases?

Yes, definitely. Very rarely do I need to lyse someone, and commit them to an ICU stay, which can significantly lessen the patient's total length of hospital stay. Lightning Flash has also substantially increased my procedural efficiency. Utilizing through-and-through access from the contralateral groin and in the tibial vessel gives me much more stability for tracking the aspiration catheter, especially when clearing out the iliac all the way down to the popliteal.

## Where do you feel CAVT aspiration technology is advantageous in comparison to first-generation basket scraping mechanisms?

One advantage of Penumbra's CAVT platform is it offers flexibility in catheter profile to address a range of patient anatomies. The CAVT platform ranges from 6F to 16F catheter sizes, providing a broad array of options. With tibial vein access, you can manage virtually anything below the knee while still addressing everything from the iliac down to the popliteal from your contralateral groin access site. Other first-generation thrombectomy devices lack this flexibility, making managing all these segments much more difficult. With some of these devices, you are limited to ipsilateral popliteal access. When doing this, you have limited ability to address the profunda or the GSV if they are occluded.

## Today, many patients who could benefit from thrombectomy still lack access to advanced therapy. Where do you see the field heading to improve access and adoption?

Thrombectomy technology has evolved rapidly over the last decade, and more institutions now have access to these therapies. Despite having access to advanced therapy, there is

still a big gap in non-specialty provider education. Primary care, emergency medicine practitioners, and urgent care are the first-line providers evaluating patients with venous thrombus. They need education and access to the therapy that can be provided to decide where to send these patients, what is helping them, and what are the outcomes we can provide for them. That is really where the field is lacking. Even though technology has made advances, there is a paucity of knowledge in these practices.

*This interview was sponsored by Penumbra, Inc.*