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INTERVIEW

Technical Advances in Deep Venous Arterialization With the LimFlow Device

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At the 2024 VEITH Symposium, vascular surgeon Anahita Dua, MD, MS, MBA, from Massachusetts General Hospital in Boston, gave a presentation entitled "Technical Advances in Deep Venous Arterialization With the LimFlow Device: Improved Access, Better Post Procedural Care, and Wound Management Are Essential." *Vascular Disease Management* spoke with Dr Dua about her presentation and how the LimFlow device (Inari Medical) can help with deep venous arterialization (DVA).

What are the key technical advances in the LimFlow procedure that have contributed to improved access for patients with no-option critical limb-threatening ischemia?

The LimFlow system is very unique in that it has a number of mechanisms within the procedure that allow it to be easy and technically successful, and that is really important. Deep venous arterialization is not something new; it has been around for many years and there are many people who are doing it off the shelf. But as part of the actual procedure you have to be able to cross into the vein, which can be challenging, and then you have to be able to break all those valves and keep them open for a durable amount of time so the stent can be put in and you can get the flow that you need down all the way to the foot. These procedures, from a technical standpoint, can be very challenging and can lead to 6- or 7-hour operations. But in the LimFlow system, because the kit has a tapered stent, it has a valvulotome that is included within the kit, and it has access to a number of specialists who do it, who can answer questions and work together as a community to get these patients the care they need. We are able to provide a level of care to these patients that they have not seen historically. In fact, even with the LimFlow system, we have a group of people that do these procedures who are all on a group chat to share cases and ideas to get the patients what they need.

In terms of the company, Inari Medical, they have been excellent about putting together training sessions that put you in touch with people who are doing this work so you can advance patient care.

We are dealing with a 3-pronged approach: One, we are advancing the science with actual data--does this work or not? There are PROMISE studies, PROMISE I and PROMISE II, and PROMISE III is currently enrolling, that are really showing that when DVA is done, compared to the standard of care, you are seeing higher rates of limb salvage. Second, we are creating a community of people who deal with these types of patients so we can see all the things that can potentially happen and help each other get these patients through the procedures. And third and most importantly, extreme technical success. In fact, in the studies, the technical success was 99% because the LimFlow system has made it very easy to do these procedures. I personally take about 90 minutes to do a procedure. A couple of hours is the maximum time I have ever taken to do it. And that is because the kit is designed in such a way that the crossing, the snaring, and the stenting are easy and durable.

How do you tailor post-procedural care to optimize outcomes for patients who undergo DVA, and are there any specific strategies that have shown the most promise?

Post-procedurally, the most important thing for these patients is psychologically understanding that by doing the DVA all you have done is planted the seeds. The DVA is actually the starting line of your journey. What gets these patients to the actual goal, which is limb salvage, is excellent wound care in conjunction with appropriate anticoagulation and optimization of the comorbidities that got the patient to that position in the first place. This includes ensuring that Infectious Disease is on board to get them the antibiotics

they need to keep the wound at bay until the DVA has matured enough that you are able to do a transmetatarsal amputation or a wound debridement that will actually heal, and ensuring that the wound care is also prominent in the patient's life so they don't turn septic or have a problem that can actually take their life in an attempt to save their limb, which is totally unacceptable. Also, ensuring that the anticoagulation is appropriate, so they are not bleeding, but they are also not clotting off their stents and are appropriately getting the flow down to the foot. In conjunction with that, you need excellent surveillance of the graft in the foot to ensure that there are no stealing vessels that are taking blood away and shunting it from the foot and that you are actually getting all that arterialized blood honed down in the area that you need it to be, which is the foot itself.

In your experience, how does successful DVA influence the wound healing trajectory?

If you have a successful DVA, what that really means is that your pedal venous loop now has arterialized blood in it and has created little connections that previously were not there, neorevascularization, that allows this arterialized blood to get out into the foot. And a successful procedure would be potentially losing the toes but then being able to skin graft in that area and having enough blood flow that the skin graft would take, and therefore, the foot would be saved and the leg as a result also saved. So, success really is, even from the company standpoint and certainly from the ones that do it, that the wounds are completely healed, and the foot itself is attached to the patient's body up to a year, and now 2 years, and we have new data out from the procedure.

Looking ahead, what innovations do you foresee in DVA?

I think there are a few innovations. This is the “iPhone 1” version of the kit, which is what we currently have. I think that there is going to be betterment of the kit itself in terms of the stent, which already has hit the scene. They have a new handle that allows for easier stent deployment. Also, ensuring that things like the crossing catheter can get through things like calcium, because sometimes when we are trying to put the needle through it will hit calcium and we have to change the angle, just making that whole process easier. But I also think that we are going to optimize some of the surveillance that can tell us, okay, this is enough blood flow and enough velocity through its stent, therefore you are going to have this outcome. And being able to really quantify how the patient is going to do depending on how the patient currently is in front of you. Because right now we are still very much, even though we know scientifically this works in the right patient at the right time, we still are working on who is exactly the right patient, what is the right time, what is the surveillance, what is the appropriate wound care and anticoagulation, and right now that is kind of an art in that everyone who does this has their own way and flavor of doing it that works for them. I think as we move forward to making this readily available to patients around the world who cannot travel and cannot go to these epicenters, we have a standardized approach that is guidelines-based so that everyone gets optimal care at the same level. So, I think as we move forward and more and more people do this, we will learn more and more and have enough of a sample size to be able to decipher some of these points so that the next person who picks this up maybe 2 years from now does not have to reinvent the wheel every time they start the procedure. ■