Curbside Consult: What Are the Biggest Unmet Needs in…

Physicians discuss the biggest challenge or area of future growth in their respective disease focuses, including improved systems of care, device innovation, optimized treatment methods, and better understanding of disease pathophysiology.

With James Milburn, MD, FACR; Nora Tabori, MD; James B. Spies, MD, MPH; Kathleen Gibson, MD; Germano Melissano, MD; Raghu Kolluri, MD, MS, RVT; Sherene Shalhub, MD, MPH, FACS, DFSVS; Venita Chandra, MD; Steve Elias, MD, FACS, FAVLS, DABVLM; and Erin H. Murphy, MD, FACS

STROKE

James Milburn, MD, FACR

There is still potential to improve our devices and techniques, but we have already made tremendous strides in stroke thrombectomy procedures. Regarding untapped potential, I believe important advances will be made to improve our acute stroke systems of care so more patients can receive thrombectomy using new triage devices, artificial intelligence, and robotics. For chronic strokes, there is exciting potential to help patients recover dormant circuits through stem cell transplantation, and other patients may develop function with brain-computer interfaces.

INTERVENTIONAL ONCOLOGY

Nora Tabori, MD

Over the last 2 decades, we have successfully refined our techniques and patient selection for the treatment of patients across the Barcelona Clinic Liver Cancer (BCLC) staging system through rigorous research. The next frontier will be to investigate how to optimize the combination of locoregional therapy with immunotherapy to expand curative intent across the BCLC stages.

UTERINE FIBROID EMBOLIZATION

James B. Spies, MD, MPH

From an innovation perspective, the greatest need is probably still for a reliable, predictable, resorbable embolic. It remains a priority for patients, and gelatin sponge is unlikely to be the answer, as it may result in permanent occlusion of the vessels despite resorption. A resorbable bead that will cause fibroid vessel occlusion for a minimum of 12 to 24 hours and then disappear with maintenance of flow in the main uterine artery and tubal branches would be ideal. The fibroids will infarct over several hours, and once infarcted, the vascular occlusion should no longer be necessary.

PELVIC VENOUS DISORDERS

Kathleen Gibson, MD

The biggest unmet needs in the treatment of pelvic venous disease are related not so much to technical innovations but to furthering our understanding of the pathophysiology of venous disorders and chronic pelvic pain and the need for development of assessment tools. Why are some patients with pelvic venous reflux and/or obstruction asymptomatic, while others have severe symptoms? The development of an assessment tool(s) to differentiate patients with chronic pelvic pain of venous etiology from those with chronic pelvic pain from other causes is needed. Ideally, that tool might be used to monitor change in symptoms with treatment.

AORTIC DISSECTION

Germano Melissano, MD

Many stent grafts (SGs) currently used in aortic dissections were originally designed for aneurysm treatment. However, they require fixation in "necks" and aneurysm sealing, necessitating significant radial force, hooks, barbs, or proximal bare stents. When deployed in a still-dissected aorta, such devices may cause rupture of the dissecting lamella, resulting in proximal or distal SG–induced new entry. A device specifically designed for the treatment of aortic dissections and focused on obliterating the entry tears rather than sealing an aneurysm would be highly beneficial. A dissection-specific SG should possess controlled radial force, excellent conformability, and ability to adapt to smaller distal diameters. The second requirement is to preserve flow in critical branches originating from the dissected aorta, such as intercostal, visceral, or renal arteries, without jeopardizing future interventions, unlike the currently available devices. In an ideal scenario, such a device would be reabsorbable after fulfilling its purpose of relining the layers of the dissected aorta.

Lastly, the issue of the aorta proximal to the left subclavian artery needs attention. Treatment of the ascending aorta and arch in relation to aortic dissections has been limited to anecdotal cases. Efforts are being made to develop the capability to deploy SGs for type A dissections or even perform the endo-Bentall procedure, and we eagerly anticipate advancements in this area.

VENOUS DISEASE MEDICAL MANAGEMENT

Raghu Kolluri, MD, MS, RVT

In venous disease, there are several unmet needs, particularly in two key areas. First, there is a need for a physiologic assessment/diagnosis method to identify hemodynamically significant venous obstruction lesions because not all venous obstructions require treatment. Second, an important innovation would be a noninvasive imaging modality that can accurately assess the age of a thrombus.

ABDOMINAL ANEURYSMAL DISEASE

Sherene Shalhub, MD, MPH, FACS, DFSVS

One unmet need is an understanding of how surgeons can use genotype information (genetic information) to predict surgical phenotype (ie, the characteristics of the aortic tissue and arterial branches, how the tissue will structurally feel at the time of an open operation, or how it will remodel post–endovascular aneurysm repair [EVAR]). There is an idea that "genetics" in vascular surgery is esoteric; but in reality, 20% of aortic pathology (aneurysm or dissection) is genetic, with 20% of affected individuals having a first-degree relative with an aortic pathology. This improved understanding of biologic characteristics of the aorta and how they interface with our repairs (Dacron or SGs) will guide the next generation of medical therapeutics and operative repairs.

CLI/CLTI

Venita Chandra, MD

Despite the tremendous progress made in the past 5 to 10 years in terms of the understanding and management of critical limb ischemia/chronic limb-threatening ischemia (CLI/CLTI), I believe this is still the area with the greatest number of (and most significant) unmet needs. I would argue the most blue-sky unmet need is the ability to predict and prevent progression to CLI/CLTI. Another would be the ability to return perfusion to the leg/foot in patients with significant small-vessel disease. We know very little about how to predict which patients will progress to CLTI and, most importantly, how to stop their progression. A lower-hanging unmet need is the ability to perform durable, clinically relevant endovascular revascularizations in the below-the-knee and below-the-ankle distribution in patients with small-vessel disease.

SUPERFICIAL VENOUS DISEASE

Steve Elias, MD, FACS, FAVLS, DABVLM

As we all know, venous disease is rarely life or limb threatening. It is almost always about improving a patient's quality of life. In superficial disease, myriad modalities do a pretty good job accomplishing this. So, where can an unmet need exist? The answer: very small veins (ie, cosmetic improvement). We need more predictable and reliable methods, approaches, or technologies to get really good results when patients come to us with cosmetic concerns involving reticular veins and telangiectasia. Although this segment of vein disease is the least symptomatic, it has probably one of the highest prevalence in any population, and results vary from patient to patient and vein specialist to vein specialist. As I have asked before, "Is sclerotherapy harder than EVAR?" A patient with an abdominal aortic aneurysm usually has no symptoms and no expectations. For EVAR, you are dealing with large vessels, the patient is asleep and has minimal expectations, and results are fairly predictable. Conversely, a patient with telangiectasia/spider veins has high expectations and is awake, you are cannulating very small vessels, and results can be unpredictable. We need to find a better way to fill this need in superficial vein disease. This patient population is significant, and the demand is high. The venous conundrum: the smaller the vein, the harder it is to treat predictably and successfully.

CENTRAL VENOUS OCCLUSION/ DEEP VEIN THROMBOSIS

Erin H. Murphy, MD, FACS

Venous stenting has emerged as the leading approach for patients with venous obstruction, as supported by numerous trials consistently demonstrating significant enhancements in venous functional outcomes and overall quality of life after this intervention. Despite these positive advancements, a significant challenge in our progress remains the management of femoropopliteal and profunda inflow disease, which ultimately impedes the long-term effectiveness of venous stents in individuals with thrombotic conditions. It is crucial to develop innovative solutions to address and improve infrainguinal inflow vessels. Moreover, there is a pressing need to devise more precise techniques for handling the iliac confluence, allowing for more tailored interventions. Advancing the ability to assess venous flow dynamics will further contribute to better treatment planning and outcomes. Additionally, addressing the issue of chronically occluded venous stents is imperative, and novel approaches must be explored to find effective solutions for this problem.

In addition to the needed advancements in technology, there exists a notable knowledge gap surrounding the determination of treatment thresholds for patients with nonthrombotic conditions as well as the accurate prediction of results within this specific patient subgroup. In acute deep vein thrombosis, continuing to clarify the role of early intervention and the importance of preventing patient progression to postthrombotic syndrome is important. There is also an overarching need for education in the venous field as an entirety. Currently, a considerable portion of vascular interventionalists lack the requisite training to attain optimal patient outcomes. ■

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